

Tier 2 & Tier 3 Geotechnical and Geoenvironmental Report

Site: Land off Kelvedon Street, Newport

Prepared For: MVR Solutions Limited

Issue Date: May 2026

Job No: 13203

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REPORT TITLE : **Tier 2 & Tier 3 Geoenvironmental and Geotechnical Report: Proposed Residential Development, Land off Kelvedon Street, Newport**

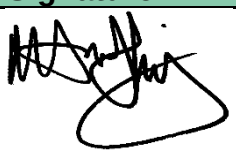
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Executive Summary

Site Location and Proposed Development	*MVR Solutions Limited (the Client) is proposing the construction of a new residential development at land located on the corner of Kelvedon Street and Feering Street in Newport, NP19 0DT. The proposed development will consist of a three-storey apartment block containing 30 residential units and associated infrastructure including access road, car parking, SuDS, and shared soft landscaping.*
Ground Conditions	

Depth (m)			Thickness (m)	Stratum
0.00	-	0.30/1.20	0.30-1.20	**MADE GROUND** – Gravelly **CLAY**
0.30/1.20	-	6.00	5.70	Very soft and soft **CLAY**
6.00	-	10.50	4.50	Firm **CLAY**
10.50	-	13.55	2.90	Stiff and very stiff sandy **CLAY**
10.50/13.55	-	>35.00	>21.45	Extremely weak to strong **MUDSTONE** with interbedded limestone conglomerates. **ST MAUGHANS FORMATION**

Tier 2 Soil Contamination	*Arsenic, lead, PAHs, TPH, VOCs, SVOCs*
Tier 2 Groundwater Contamination	*(DNAPL) cis 1,2-Dichloroethene, Trichloroethene, Tetrachloroethene*
Tier 3 Assessment of Groundwater	*It is concluded that based on the information compiled to date, the aquatic environment is at insignificant risk from the impacts of the site's past use.* *The proposed building is to be founded on piles. The piles could create a new pathway for contaminants to migrate from the shallow soil and perched groundwater into the deeper aquifer. A piling risk assessment should be carried out.*
Foundation Solution	*Due to the soft superficial deposits, a traditional strip or pad foundation will be unsuitable. A piled foundation is therefore required.* *Due to the presence of adjacent buildings vibrations should be kept to a minimum. It is recommended a bored piled foundation solution socketed into bedrock at depth of 13.55m below existing ground level is used. For a 300mm bored pile with a typical length of 16m an allowable working load of 500kN should be achieved.* *Measurements should be put in place to monitor vibrations during pile installation. If vibrations exceed guideline levels, then measures should also be taken to dampen such vibrations. If, however, vibrations exceed permissible values then consideration should be given to an alternative solution.* *The estimated working pile loads, pile type and lengths are given for guidance only and should be confirmed by a specialist piling contractor. It may also be prudent to test drive/install piles at selected locations.* *For the quoted pile sizes, founded within the competent in-situ materials, total settlements should not exceed 10mm with differential movements between adjacent piles being less than half this value.* *Floor slabs should be designed and constructed as suspended.*
Recommended Further Works	*An Options Appraisal and Remediation Strategy will be required for the site. A Verification Plan for the proposed vapour mitigation measures will also need to be prepared.* *A desk-based piling risk assessment should also be carried out and the recommendations agreed with NRW. A programme of groundwater monitoring should then be undertaken and include the installation of additional groundwater monitoring wells, monitoring on two occasions prior to commencement of the piling works, fortnightly monitoring during the piling works, and a further three rounds of monitoring following completion of the piling works, also at fortnightly intervals.* *The results should be assessed to determine whether the piling works have had any detrimental impact on the aquifer and to confirm that the identified contamination does not pose an unacceptable risk to the River Usk.*

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SECTION 1 Introduction & Proposed Development

1.1 Background

MVR Solutions Limited (the Client) is proposing the construction of a new residential development at land located on the corner of Kelvedon Street and Feering Street in Newport, NP19 0DT. The proposed development will consist of a three-storey apartment block containing 30 residential units and associated infrastructure including access road, car parking, SuDS, and shared soft landscaping. The development does not include private gardens The proposed layout can be seen in **Figure 1.1**.

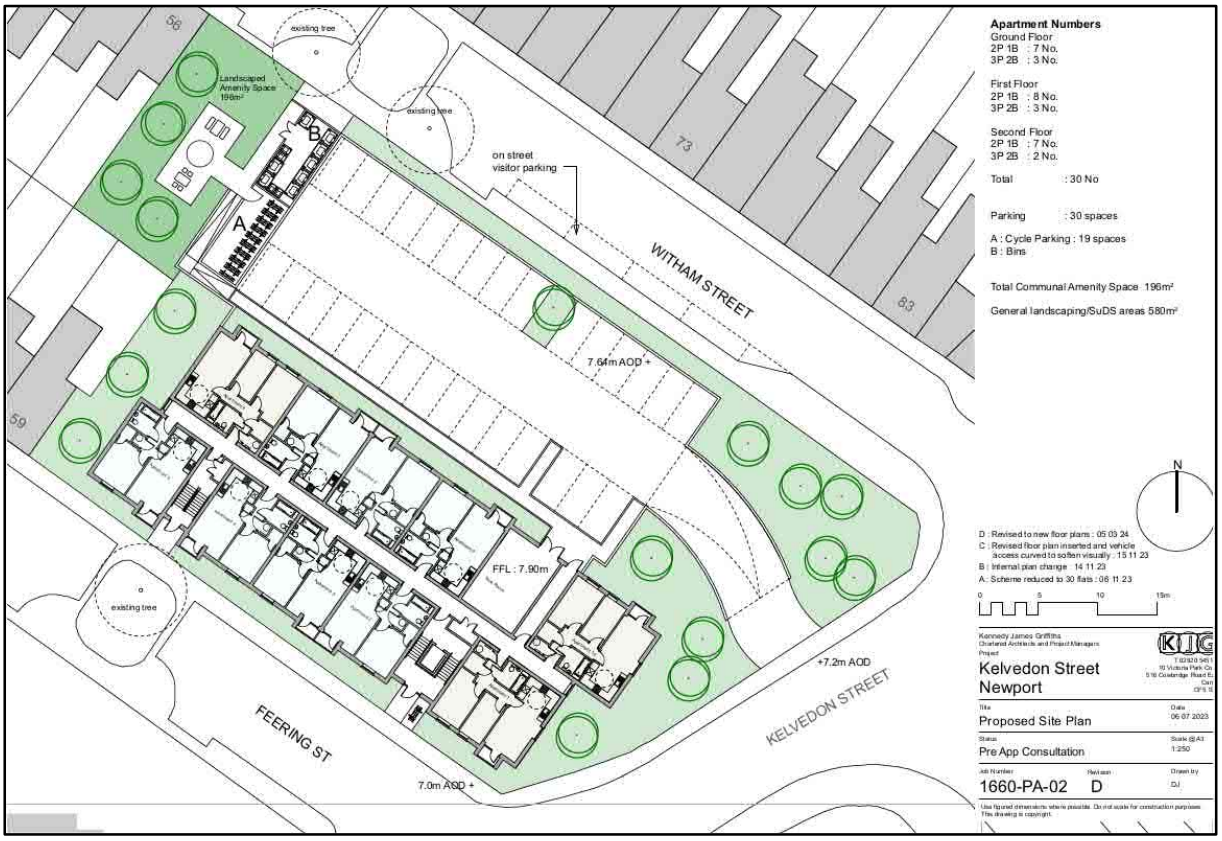


Figure 1.1 Proposed Site Layout

TFW Group Ltd (Terra Firma) have been commissioned by the Client to undertake a Geotechnical and Geoenvironmental Report

A Tier 1 (Desk Study) including a Preliminary Geoenvironmental and Geotechnical Risk Assessment was completed by Terra Firma. The findings of the Tier 1 Assessment are summarised in Section 2 of this report.

This report contains a Tier 2 assessment (Site Investigation) including a Generic Quantitative Geoenvironmental Risk Assessment and Geotechnical Ground Investigation.

1.2 Objectives

Land Contamination Risk Management (LCRM) guidance provided by the Environment Agency advocates using a tiered approach. This comprises Tier 1; the Preliminary Risk Assessment, Tier 2; the Generic Quantitative Risk Assessment and Tier 3; the Detailed Quantitative Risk Assessment. As each tier is completed a decision is made whether it is necessary to advance to the next tier.

In addition to LCRM, geotechnical aspects of the development also need to be considered and are approached in a similar manner, with the risks identified in the preliminary assessment, and then investigated through subsequent phase of investigation.

1.2.1 Tier 2

The main objectives of the Tier 2 Generic Quantitative Geoenvironmental Risk Assessment programme are:

- investigate the potential human health and environmental liabilities at the site associated with any contamination; and
- provide a summary of the human health and environmental conditions at the site, together with any necessary further intrusive works and / or remediation works to render the site fit for its intended use.

The main objectives of the Geotechnical Site Investigation are:

- investigate the type, strength and bearing characteristics of the shallow superficial and underlying solid geology;
- investigate the risk, if any, from historical shallow underground mining features;
- provide engineering foundation and floor slab recommendations for the proposed development;
- provide infiltration rates and stormwater drainage viability; and
- provide recommendations regarding any other geotechnical aspects pertaining to the development.

In order to achieve the above objectives, Terra Firma carried out an assessment programme a review of existing data, followed by a field investigation to collect geotechnical and geoenvironmental data from selected locations.

The scope of the works including the schedule for in-situ and laboratory testing was determined by Terra Firma.

1.3 Geotechnical Category

In accordance with BS EN 1997-1:2004+A1:2013, the proposed development comprises the following geotechnical category:

Geotechnical Category 2: conventional types of structures and foundation with no exceptional risk of difficult soil or loading conditions (e.g., spread, raft & pile foundations; retaining structures; excavations; earthworks and ground anchors).

1.4 Information Sources

The following sources of information have been referenced in support of this assessment:

- client provided information, plans etc. (**Figure 1.1**); and
- Geotechnical and Geoenvironmental Site Investigation Report (13203-GGR-01).

1.5 Roles & Responsibilities

Table 1.1 Roles and Responsibilities

Role	Organisation
Client/Developer	MVR Solutions Limited
Local Authority	Newport City Council

1.6 Limitations & Exceptions of Investigation

The Client has requested that a Tier 2 Geoenvironmental and Geotechnical Report (GGR) be undertaken to enable the outlined main objectives.

The GGR was conducted, and this report has been prepared for the sole internal reliance of the Client and their design and construction team. This report shall not be relied upon or transferred to any other parties without the express written authorisation of TFW Group Ltd. If an unauthorised third party comes into possession of this report, they rely on it at their peril and the authors owe them no duty of care and skill. The report represents the findings and opinions of experienced geoenvironmental and geotechnical consultants. TFW Group Ltd does not provide legal advice and the advice of lawyers may be required.

The subsurface geological profiles, any contamination and other plots are generalised by necessity and have been based on the information found at the locations of the exploratory holes and depths sampled and tested.

Human health and environmental risk assessment outcomes may not take into account the potential for the creation of new contaminant linkages as a result of variation to the proposed development and recommended engineering solutions. It is therefore imperative that the Client engages a geoenvironmental consultant to re-visit the conceptual site model and potential risks upon completion of final designs, prior to development.

Whilst this report assesses the suitability of soils in respect to human health and the environment, it is beyond the scope of this report to determine the legal status of imported and re-used soils/aggregates. It is the responsibility of the Client to confirm imported and re-used soils/aggregates have reached ‘Non-Waste’ status.

The investigation was limited by the following site constraints:

- the presence of underground services and utilities;
- the presence of spoil mounds comprising demolition rubble;

1.7 Quality Assurance

The quality, health, safety and environmental aspects of the assessment comply with Terra Firma business management system which is UKAS accredited and complies with the requirements of BS EN ISO 9001:2015, BS EN ISO 14001:2015 and BS EN ISO 45001:2018 standards.

SECTION 2 Tier 1 Assessment

The site has been the subject of a previous Tier1 Geoenvironmental Desk Study, which is included as part of the previous phase of investigation:

- *Terra Firma, Geotechnical & Geoenvironmental Report Reference 13203-GGR-01 dated December 2024.*

The salient points of the Tier 1 Assessment are summarised in **Section 2.1**.

2.1 Summary of Tier 1 Assessment

The findings of the Tier 1 Assessment are summarised in **Table 2.1**.

Table 2.1 Summary of Tier 1 Assessment

Site History	*The site was empty until 1956 wherein the site was developed for use as a dry cleaner, with small building layout changes throughout its history. The site became used as a warehouse by 1968. The warehouse was demolished between 2006 and 2023.*
Geology	*The site is shown to be underlain by alluvium and tidal flat deposits which sit atop the St Maughans formation of the Old Red Sandstone.*
Radon	*No radon protection is necessary for new developments at site.*
Potential Sources of Contamination	<table><tr><th>ID</th><th>Source</th><th>Contaminant</th></tr><tr><td>S1</td><td>Historical development as a dry cleaner and warehouse</td><td>Metals, Metalloids, PAH, Hydrocarbons (TPH CWG, BTEX), Benzene, MTBE, VOC and SVOC, Glycols, Detergents, Asbestos Containing Material</td></tr><tr><td>S2</td><td>Made ground soils left over from demolition</td><td>Waste construction materials (metals, metalloids, sulphate, asbestos), fuel wastes – ash (PAH) methane, carbon dioxide, hydrogen sulphide</td></tr></table>
Plausible Pollutant Pathways	*P1 – Direct soil and dust ingestion* *~~P2 – Consumption of home grown produce~~* *P3 – Dermal contact* *P4 – Inhalation of dust and vapours* *P5 – Vertical migration of leachates (unsaturated zone)* *P6 – Horizontal and vertical migration of contaminants (saturated zone)* *P7 – Artificial contaminant pathway (borehole, pile, excavation etc)* *P8 – Surface run-off* *P9 – Plant uptake* *P10 – Horizontal and vertical migration of ground gasses and vapours* *P11 – Direct contact with construction materials* *P12 – Inhalation of asbestos fibres*
Plausible Pollutant Receptors	*R1 – Construction and maintenance workers* *R2 – Future site users (residents)* *R3 – Passers-by or neighbouring site users* *R4 – Groundwater (aquifer)* *R5 – Surface waters (river)* *R6 – Area of public open space* *R7 – Construction materials (concrete/potable water pipes)*

SECTION 3 Field Investigation

3.1 Site Works

A geotechnical and geoenvironmental site investigation comprising four window sample boreholes, five trial pits, and one rotary core borehole was undertaken between the 23rd and 28th of October 2024.

The fieldwork was supervised by Terra Firma, who logged the exploratory holes to the requirements of BS 5930:2015+A1:2020. The proposed locations of the exploratory holes were determined by Terra Firma in general accordance with BS 10175:2011+A2:2017 in order to assess the findings of the preliminary conceptual site model. Exploratory holes are presented in **Annex A**.

Trial pits referenced TP01 to TP05, were formed using a JCB 3CX excavator with a 0.60m wide bucket.

Representative disturbed samples were taken and retained in airtight containers for environmental and geotechnical testing.

On completion all trial pits were backfilled with materials arisings compacted in layers using the excavator bucket. The ground surface was left proud to accommodate future settlement of backfilled materials.

Soakaway tests were carried out in trial pits TP01 to TP03 in general accordance with BRE DG 365:2016. The excavation sides were squared using the excavator bucket and dimensions recorded within the test section. The trial pit was partially filled with clean water using a dedicated bowser with a 75mm diameter outlet and the fall in level recorded against time. The results are presented in **Annex B.**

The boreholes referenced BH01 to BH04, were formed using a Terrier 2000 rig. The locations were dug to 1.20m using hand tools to confirm the absence of buried services. Dynamic sampling techniques were then employed to produce a continuous disturbed sample.

Standard penetration tests (SPT) were carried out at regular intervals in general accordance with BS1377: Part 9:1990:3.3. SPT results summarised as N values are presented on the borehole log.

Boreholes were monitored for groundwater ingress as drilling proceeded.

Representative disturbed samples were taken and retained in airtight containers for environmental and geotechnical testing.

Borehole reference RC01 was formed using a track mounted rotary drilling rig. Dynamic sampling techniques were employed from surface to produce a continuous disturbed sample. On refusal to dynamic sample the boreholes were continued by rotary core drilling methods utilising an air mist flush.

All core samples were retained in sequence in labelled core boxes.

Standard penetration tests (SPT) were carried out at regular intervals in general accordance with BS1377: Part 9:1990:3.3. SPT results summarised as N values are presented on the borehole log.

Boreholes were monitored for groundwater ingress as drilling proceeded.

A second phase of investigation was carried out on the 20th and 21st of August 2025 and comprised the excavation of five machine excavated trial pits and two rotary percussive boreholes.

Boreholes reference RBH02 to RBH03 were formed using a track mounted rotary drilling rig. Dynamic sampling techniques were employed from surface to produce a continuous disturbed sample. On refusal to dynamic sample the boreholes were continued by rotary openhole drilling methods utilising a water/air mist flush.

Boreholes were monitored for groundwater ingress as drilling proceeded.

On completion, boreholes were installed with slotted standpipes consisting of a 50mm ID HDPE slotted tube set in a granular filer zone and sealed above with a bentonite plug. Installations were protected at surface with an upstanding cover. Full installation details are recorded on the relevant logs.

Exploratory hole locations are shown on **Drawing 01**.

3.2 Ground Conditions

The ground conditions encountered by the exploratory holes can in general be summarised as shown in **Table 3.1**.

Table 3.1 Summary of Typical Ground Conditions

Depth (m)			Thickness (m)	Stratum
0.00	-	0.30/1.20	0.30-1.20	**MADE GROUND** – Gravelly **CLAY**
0.30/1.20	-	6.00	5.70	Very soft and soft **CLAY**
6.00	-	10.50	4.50	Firm **CLAY**
10.50	-	13.55	2.90	Stiff and very stiff sandy **CLAY**
10.50/13.55	-	>35.00	>21.45	Extremely weak to strong **MUDSTONE** with interbedded limestone conglomerates. **ST MAUGHANS FORMATION**

3.3 Groundwater

Groundwater information recorded during the site investigation period is summarised in **Table 3.2**.

Table 3.2 Groundwater Summary

Location	Depth (m)	Details
TP01	2.00	Slow inflow
TP02	2.00	Slow inflow
TP03	1.50	Slow inflow
RC01	6.00	Slow inflow
RC01	11.50	Slow inflow

3.4 Stability & Obstructions

Trial pits remained stable and vertical during excavation.

3.5 Installation Well Construction

Groundwater well locations were selected on a non-targeted basis to characterise the groundwater contamination status of the site. A triangular pattern was adopted. The shallow groundwater wells were also selected on a targeted basis to identify contamination within the perched groundwater above the tidal flat deposits.

Groundwater installation well construction details are summarised in **Table 3.3**.

Table 3.3 Installation Well Summary

Location	Response Zone		Stratum
	From (m)	To (m)	
BH01	1.0	3.0	Near surface soils
BH02	1.0	3.0	Near surface soils
BH03	1.0	3.0	Near surface soils
RC01	11	20.0	Mudstone
RBH01	8.0	17.5	Mudstone
RBH02	9	20.0	Mudstone

3.6 Groundwater Level Monitoring

Groundwater was monitored within installed standpipes post investigation, the results of which are shown in **Table 3.4**.

Table 3.4 Groundwater Summary

Location	Surface Level Ordnance Datum (m)	Groundwater Depth (m)	Groundwater Level Ordnance Datum (m)
BH01	6.78	0.38	6.40
BH02	6.90	0.47	6.43
BH03	6.85	0.41	6.44
RC01	6.76	1.35	5.41
RBH01	6.84	0.55	6.29
RBH02	6.90	0.74	6.16

It is interpreted that the main groundwater body was recorded in RC01, RBH01, and RBH02. The main groundwater body falls steeply towards the southwest and the River Usk, which lies 203m to the west.

A hydraulic gradient of 0.044 has been calculated for the deeper groundwater body using this site specific data.

An alternative hydraulic gradient of 0.028 has been calculated using the highest recorded groundwater level in the deeper groundwater monitoring wells and the mean level of 0.54m AOD at the nearby Usk estuary (https://riverlevels.uk/newport-gwent-tidal-level). This is a shallower gradient than recorded on site.

3.7 Laboratory Chemical Testing

3.7.1 Sampling Strategy

Soil and groundwater sampling locations were selected on both a targeted basis to investigate suspected sources of contamination and a non-targeted basis to characterise the contamination status of the site. A regular triangular sampling pattern was used for the groundwater, and a herringbone sampling pattern was adopted for the soil.

Sample locations, depths and suspected/known contamination source targets are summarised in **Table 3.5**:

Table 3.5 Sample Locations and Targets

Location	Depth (m)	Type	Contamination Targets
TP01	0.1-0.2	Soil	S1, S2
TP02	1.8-1.9	Soil	S1
TP03	0.1-02	Soil	S1, S2
TP04	0.1-0.2	Soil	S1, S2
TP05	0.1-0.2	Soil	S1, S2
BH01	0.2	Soil	S1, S2
BH02	0.7	Soil	S1, S2
BH03	0.3	Soil	S1, S2
BH03	2.3	Soil	S1
BH04	0.4	Soil	S1
BH01	-	Water	S1, S2
BH03	-	Water	S1, S2
RC01	-	Water	S1, S2
TP201	0.1	Soil	S1, S2
TP201	0.4	Soil	S1, S2
TP202	0.1	Soil	S1, S2
TP202	0.5	Soil	S1, S2
TP203	0.2	Soil	S1, S2
TP203	0.4	Soil	S1, S2
TP204	0.3	Soil	S1, S2
TP204	0.5	Soil	S1, S2
TP205	0.1	Soil	S1, S2
TP205	0.6	Soil	S1, S2
BH01	-	Water	S1, S2
BH02	-	Water	S1, S2
BH03	-	Water	S1, S2
RC01	-	Water	S1, S2
RBH01	-	Water	S1, S2
RBH02	-	Water	S1, S2

3.7.2 Sample Analysis

During the site investigation works soil and groundwater samples were collected and despatched under a chain of custody to the accredited laboratories of Eurofins Chemtest for chemical analysis. A summary of testing is listed in **Table 3.6** and **3.7**.

Table 3.6 Soil Laboratory Analysis

Metals & Metalloids	In-Organics	Organics	Others
Arsenic	Cyanide	Phenols	pH (acidity)
Cadmium	Sulphate	PAH	Asbestos
Chromium III		Petroleum Hydrocarbons	
Chromium VI		PCBs	
Copper		BTEX	
Lead		VOC	

Mercury		SVOC	
Nickel			
Selenium			
Zinc			

Table 3.7 Groundwater Laboratory Analysis

Metals & Metalloids	In-Organics	Organics	Others
Arsenic	Cyanide	Phenols	pH (acidity)
Cadmium	Sulphate	Petroleum Hydrocarbons	Hardness
Chromium III	Sulphide	PAH	Electrical Conductivity
Chromium VI		Volatile Organic Compounds	Oxygen Demands
Chromium		Semi-Volatile Organic Compounds	
Copper			
Lead			
Mercury			
Nickel			
Selenium			

The laboratory test results certificates may be found in **Annex C**.

3.8 Soil Property Testing

3.8.1 In-situ Permeability Testing (Soakaways)

Soakaway test results are summarised in **Table 3.8**.

Table 3.8 Summary of Soakaway Results

Trial Pit	Depth Range of Test (m)	Geology Description	Infiltration Rate (ms^{-1})
TP01	1.00-1.50	Tidal Flat Deposits	Insufficient water take to calculate infiltration rate
TP02	1.00-1.50	Tidal Flat Deposits	Insufficient water take to calculate infiltration rate
TP03	1.00-1.50	Tidal Flat Deposits	Insufficient water take to calculate infiltration rate

The test results and calculation sheets may be found in **Annex B**.

3.8.2 Laboratory Geotechnical Testing

A schedule of laboratory tests was prepared by Terra Firma and samples were despatched to the accredited laboratories of Apex Testing Solutions. A summary of the testing carried out is presented in **Table 3.9**.

Table 3.9 Summary of Geotechnical Testing

Geotechnical Test	No. Samples Tested
BRE SD1 (Concrete classification)	3

The geotechnical test results are presented in **Annex D**.

SECTION 4 Evaluation of Geoenvironmental Analytical Results

4.1 Assessment Methodology

4.1.1 Soils

An assessment of the analytical results has been made with comparison with the following generic assessment criteria with preference in most onerous order:

- Land Quality Management (LQM) and the Chartered Institute of Environmental Health (CIEH) Suitable 4 Use Levels (S4UL) (Nathanail, CP *et al.*:2015);
- Category 4 Screening Levels (C4SL) provided by the Department for Environment, Food and Rural Affairs (DEFRA:2014);
- Soil Guideline Values (SGV) by the Environment Agency (2009);
- Generic Assessment Criteria (GAC) provided by EIC/AGS/CL:AIRE (2010); and
- Generic Assessment Criteria (GAC) derived in-house.

In the absence of generic assessment criteria, the laboratory limit of detection has been used for comparison, in order to establish the presence/absence of determinants and for initial screening purposes.

A conservative value of 1% SOM has been adopted for the site when assessing appropriate threshold values for analysed determinants.

4.1.2 Controlled Waters

In the case of groundwater and/or leachate, analytical results have been compared with available published guidelines in the Water Framework Direction (Standards and Classification) Directions (England and Wales) 2015 and the Water Supply (Water Quality) Regulations 2016.

In the absence of any published guideline, a conservative threshold is suggested.

4.2 Soil Test Results

A summary of the chemical test results which include the regulatory soil guideline values used in a **residential setting without plant uptake** are given in the following tables. The complete results can be found in **Annex C**.

4.2.1 Inorganics

Twenty samples were tested for a standard suite of inorganics, pH and organic matter. The summarised results are in **Table 4.1**.

Table 4.1 Summary of Soil Chemical Test Results – Inorganics

Substance	Threshold Value (mg/kg)	Source	Measured Concentrations (mg/kg)		Number of Exceedances
			Minimum	Maximum	
Arsenic	40	LQM/CIEH	5.4	60	3
Cadmium	85	LQM/CIEH	<0.10	0.56	0
Chromium III	910	LQM/CIEH	9.1	38	0
Chromium VI	6	LQM/CIEH	<0.5	<0.5	0
Copper	7100	LQM/CIEH	6.2	140	0

Lead	310	pC4SL	16	270	0
Mercury (inorganic)	56	LQM/CIEH	<0.05	0.52	0
Nickel	180	LQM/CIEH	13	57	0
Selenium	430	LQM/CIEH	0.39	1.70	0
Zinc	40000	LQM/CIEH	62	230	0
Cyanide	-	-	<0.5	<0.5	-
Boron	11000	LQM/CIEH	<0.40	2.80	0
Organic Matter (%)	-	-	2.0	6.7	-
pH	-	-	7.6	10.4	-

Notes:
- No available guideline

4.2.2 Organics

Twenty samples were tested for speciated polycyclic aromatic hydrocarbons (PAH). The summarised results are in **Table 4.2**.

Table 4.2 Summary of Soil Chemical Test Results – Speciated PAH

Substance	Threshold Value (mg/kg)	Source	Measured Concentrations (mg/kg)		Number of Exceedances
			Minimum	Maximum	
Naphthalene	2.3	LQM/CIEH	<0.1	46	7
Acenaphthylene	2900	LQM/CIEH	<0.1	1.7	0
Acenaphthene	3000	LQM/CIEH	<0.1	44	0
Fluorene	2800	LQM/CIEH	<0.1	43	0
Phenanthrene	1300	LQM/CIEH	<0.1	310	0
Anthracene	31000	LQM/CIEH	<0.1	89	0
Fluoranthene	1500	LQM/CIEH	<0.1	330	0
Pyrene	3700	LQM/CIEH	<0.1	270	0
Benzo(a)anthracene	11	LQM/CIEH	<0.1	150	11
Chrysene	30	LQM/CIEH	<0.1	140	7
Benzo(b)fluoranthene	3.9	LQM/CIEH	<0.1	160	6
Benzo(k)fluoranthene	110	LQM/CIEH	<0.1	62	0
Benzo(a)pyrene	3.2	LQM/CIEH	<0.1	150	15
Indeno(123cd)pyrene	45	LQM/CIEH	<0.1	81	2
Dibenzo(ah)anthracene	0.31	LQM/CIEH	<0.1	78	16
Benzo(ghi)perylene	360	LQM/CIEH	<0.1	26.0	0
Total PAH	-	-	<2.0	2000	-

Notes:
Thresholds based on 1.0% soil organic matter
- No available guidelines

Twenty samples were tested for petroleum hydrocarbon. The summarised results are shown in **Table 4.3**.

Table 4.3 Summary of Soil Chemical Test Results – Petroleum Hydrocarbons

Substance	Threshold Value (mg/kg)	Source	Measured Concentrations (mg/kg)		Number of Exceedances
			Minimum	Maximum	

Aliphatic					
PH C5 – C6 Ali	42	LQM/CIEH	<1.0	<1.0	0
PH C6 – C8 Ali	100	LQM/CIEH	<1.0	<1.0	0
PH C8 – C10 Ali	27	LQM/CIEH	<1.0	<1.0	0
PH C10 – C12 Ali	130	LQM/CIEH	<2.0	7.0	0
PH C12 – C16 Ali	1100	LQM/CIEH	<1.0	16	0
PH C16 – C21 Ali	65000*	LQM/CIEH	<2.0	39.0	0
PH C21 – C35 Ali	65000*	LQM/CIEH	<1.0	200.0	0
PH C35 – C44 Ali	65000	LQM/CIEH	<1.0	77.0	0
Aromatic					
PH C5 – C7 Arom	70	LQM/CIEH	<1.0	3.0	0
PH C7 – C8 Arom	130	LQM/CIEH	<1.0	<1.0	0
PH C8 – C10 Arom	34	LQM/CIEH	<1.0	<1.0	0
PH C10 – C12 Arom	74	LQM/CIEH	<1.0	18	0
PH C12 – C16 Arom	140	LQM/CIEH	<1.0	200	2
PH C16 – C21 Arom	260	LQM/CIEH	6.0	1300.0	5
PH C21 – C35 Arom	1100	LQM/CIEH	<2.0	2500	4
PH C35 – C44 Arom	1100	LQM/CIEH	<1.0	120	0

Notes:
PH – Petroleum Hydrocarbon
Ali – Aliphatic
Arom – Aromatic
Thresholds based on 1.0% soil organic matter
* – Ali C16-21 and C21-C35 based on criteria for Ali EC >16-35

Twenty samples were tested for Phenols, BTEX and MTBE compounds. The summarised results are in **Table 4.4**.

Table 4.4 Summary of Soil Chemical Test Results – Phenols, BTEX & MTBE

Substance	Threshold Value (mg/kg)	Source	Measured Concentrations (mg/kg)		Number of Exceedances
			Minimum	Maximum	
Phenols	120	LQM/CIEH	<0.1	<0.1	0
Benzene	0.087	LQM/CIEH	<0.001	4.20	1
Toluene	130	LQM/CIEH	<0.001	<0.001	0
Ethylbenzene	47	LQM/CIEH	<0.001	<0.001	0
o- xylene	60	LQM/CIEH	<0.001	11	0
m- xylene	59	LQM/CIEH	<0.001	<0.001	0
p- xylene	56	LQM/CIEH	<0.001	<0.001	0
MTBE	-	-	<0.001	<0.001	-

Notes:
- No available guideline

Twenty samples were tested for a full suite of volatile and semi-volatile organic compounds. Noteworthy compounds exceeding laboratory limits of detection are summarised in **Table 4.5**. Compounds exceeding threshold values are summarised in **Table 4.6**.

Table 4.5 Summary of Soil Chemical Test Results – Noteworthy VOC & SVOC

Substance *(and possible origin)*	**Measured Concentrations (µg/kg)**

	Minimum	Maximum
Dibenzofuran *(coal tar/combustion)*	<0.50	2.7
Carbazole *(coal tar)*	<0.50	2.6
(SVOC TIC) 9H-Xanthene *(coal tar/combustion)*	<0.001	0.46
(SVOC TIC) Dibenzothiophene *(directly from fuels and coal tar)*	0.67	0.79
(SVOC TIC) Perylene *(combustion or natural organic floodplain deposits)*	<0.001	2.91
(SVOC TIC) Picene *(coal tar/combustion)*	1.04	1.11
1,1-Dichloroethene *(downstream degradation of product of dry cleaning products i.e. 1,1,1-TCA →1,1-DCA →1,1-DCE)*	<1.0	36.0
Trans 1,2-Dichloroethene *(dry cleaning agent)*	<1.0	140.0
cis 1,2-Dichloroethene *(dry cleaning agent created by reductive dehalogenation of trichloroethene)*	<1.0	>10000
2-Methylnaphthalene *(coal tar or directly from fuels)*	<0.50	2.10

Table 4.6 Summary of Soil Chemical Test Results – Noteworthy VOC & SVOC

Substance *(and possible origin)*	Threshold Value (µg/kg)	Source	Measured Concentrations (µg/kg)		Number of Exceedances
			Minimum	Maximum	
Chloroethene (Vinyl Chloride) *(dry cleaning agent)*	6.4	C4SL	<1.0	830	4
Trichloroethene *(dry cleaning agent)*	9.7	C4SL	<0.1	>10000	5
Notes Thresholds based on 1.0% soil organic matter					

4.2.3 Asbestos Testing

Twenty soil samples were scheduled for asbestos screening. Asbestos was detected in one sample. Samples testing positive for asbestos were further scheduled for gravimetric quantification of ACM and fibres in soil/fibre quantification in soils. The results are summarised in **Table 4.7**.

Table 4.7 Summary of Soil Chemical Test Results – Asbestos Quantification

Sample	Depth (m)	Comment	Result (mass %)
TP203	0.2	Chrysotile (insulation)	0.67

4.3 Groundwater Test Results

Nine groundwater samples were collected from three shallow wells (installed within the shallow tidal flat deposits) and three deeper wells (installed within the gravelly deposits and bedrock beneath the tidal flat deposits). The samples were tested for suite of inorganic and organic determinants. The results are summarised in **Table 4.8** and **Table 4.9**.

Table 4.8 Summary of Groundwater Chemical Test Results – Inorganics

Substance	Threshold Value (µg/l)	Source	Measured Concentrations (µg/l)		Number of Exceedances
			Minimum	Maximum	
Arsenic	50	WFD2	1.4	12.0	0
Cadmium	0.08	WFD1	<0.11	<0.11	BLDL
Chromium III*	4.7	WFD2	<0.5	<0.5	BLDL
Chromium VI*	3.4	WFD2	<0.5	<0.5	BLDL

Copper	1.0	WFD2	<0.5	2.9	6
Lead	1.2	WFD1	<0.5	<0.5	0
Mercury	0.07	WFD3	<0.05	<0.05	0
Nickel	4	WFD1	0.57	8.7	2
Selenium	10	DWD	<0.5	0.97	0
Zinc	10.9	WFD2	3.0	11	1
Cyanide, Total	1.0	WFD2	<50	<50	BLDL
Sulphate (mg/l)	400	BRE	64	280	0
pH	-	-	7.9	8.5	-
BOD (mg/l)	-	-	<4.0	8.0	-
COD (mg/l)	-	-	<10	33	-
Hardness (mg/l)	-	-	210	670	-

Notes:
WFD1 - Water Framework Directive – Inland Surface Waters (AA)
WFD2 - Water Framework Directive – Freshwater (Long Term Mean)
WFD3 - Water Framework Directive – Inland Surface Waters (MAC)
DWD – Drinking Water Directive
BRE – British Research Establishment
- No available guideline
* Based on result for total chromium
BLDL - Below laboratory detection limit
ALDL - Above laboratory detection limit

Table 4.9 Summary of Groundwater Chemical Test Results – Organics

Substance	Threshold Value (µg/l)	Source	Measured Concentrations(µg/l)		Number of Exceedances
			Minimum	Maximum	
Naphthalene	2	WFD1	<0.01	<0.01	0
Acenaphthylene	-	-	<0.01	<0.01	BLDL
Acenaphthene	-	-	<0.01	<0.01	BLDL
Fluorene	-	-	<0.01	<0.01	BLDL
Phenanthrene	-	-	<0.01	<0.01	BLDL
Anthracene	0.1	WFD1	<0.01	<0.01	0
Fluoranthene	0.0063	WFD1	<0.01	<0.01	BLDL
Pyrene	-	-	<0.01	<0.01	BLDL
Benzo(a)anthracene	-	-	<0.01	<0.01	BLDL
Chrysene	-	-	<0.01	<0.01	BLDL
Benzo(b)fluoranthene	0.017	WFD3	<0.01	<0.01	0
Benzo(k)fluoranthene	0.017	WFD3	<0.01	<0.01	0
Benzo(a)pyrene	0.00017	WFD1	<0.01	<0.01	BLDL
Indeno(123cd)pyrene	-	-	<0.01	<0.01	BLDL
Dibenzo(ah)anthracene	-	-	<0.01	<0.01	BLDL
Benzo(ghi)perylene	0.0082	WFD3	<0.01	<0.01	BLDL
TPH (C6-C40)	-	-	<10	70	BLDL
Phenols	7.7	WFD2	<5	<5	0

Notes:
WFD1 - Water Framework Directive – Inland Surface Waters (AA)
WFD2 - Water Framework Directive – Freshwater (Long Term Mean)
WFD3 - Water Framework Directive – Inland Surface Waters (MAC)
- No available guideline

ALDL - Above laboratory detection limit
BLDL - Below laboratory detection limit

The groundwater was also tested for, Petroleum Hydrocarbons, BTEX and MTBE compounds, and a full suite of volatile and semi-volatile organic compounds. Noteworthy compounds exceeding laboratory limits of detection are summarised in **Table 4.10**.

Table 4.10 Summary of Groundwater Chemical Test Results – Noteworthy VOC, SVOC, &TPH

Substance	Threshold Value (µg/l)	Source	Measured Concentrations (µg/kg)		Number of Exceedances
			Minimum	Maximum	
cis 1,2-Dichloroethene (156-59-2)	-	-	<1.0	15	4
Trichloroethene (79-01-6)	10	WFD1	<1.0	25	4
Tetrachloroethene (127-18-4)	10	WFD1	<1.0	98	5
Aromatic C7-C8	700	CL:AIRE	<0.1	70	0

Notes:
WFD1 - Water Framework Directive – Inland Surface Waters (AA)
CL:AIRE – Petrleum Hydrocarbons in Groundwater 2017
- No available guideline

The three compounds identified as exceeding their target concentration in **Table 4.10** are substances commonly found at site previously used as dry cleaners. They were also recorded at elevated concentrations within the soil.

SECTION 5 Ground Gas Risk Assessment

5.1 Gas Risk Characterisation

Gas wells were installed in the relevant strata in order to monitor ground gas. Since installation groundwater levels have risen beyond the response zone of the monitoring stations rendering monitoring unachievable.

5.1.1 Gas Source

The risk from ground gas would be from decomposing organic material within the made ground found on site. However, the made ground encountered did not present any organic material. Additionally, the made ground is a relatively thin layer (1.2m max) and as such combined with the rarity of organic material unlikely to generate sufficient volumes of gas. Furthermore, the migration potential for such a source would also be negligible.

No other ground gas source has been identified.

5.1.2 Gas Migration Pathways

Ordinarily ground gas might have the potential to diffuse from the source material, but due to the high water table this would not be conceivable.

5.1.3 Potential Receptors

Receptors would be the future site residents.

5.2 Gas Risk Characterisation

With regard to the high water table and lack of gas generating material the overall risk to residents is considered to be negligible as no contaminant linkage has been realised.

The site is therefore classified as CS1, requiring no special ground gas protection mitigation.

The risk from volatiles and the requirement for mitigation measures is discussed in **Section 6** of the report.

SECTION 6 Generic Quantitative Risk Assessment

6.1 Contaminants of Concern

Contaminants of concern identified as part of the investigation are summarised in **Table 6.1**, along with an interpretation of the likely contamination source. Where applicable, the contaminant, source relationship is based on the inferences made in the preliminary conceptual site model.

Table 6.1 Contaminants of Concern

Location	Depth	Contaminant	Source
TP01	0.1-0.2	Lead, **trichloroethene**, dibenz(a,h)Anthracene	S1 – Past use as a dry cleaners and warehouse S2 – Made ground soils left over from demolition
TP03	0.1-0.2	Acenaphthene, carbazole, benzo[a]anthracene. benzo[b]fluoranthene, benzo[a]pyrene, dibenz(a,h)Anthracene, (SVOC TIC) 9H-Xanthene, (SVOC TIC), benzo[a]pyrene, (SVOC TIC), dibenzothiophene, (SVOC TIC) Picene	
TP04	0.1-0.2	Lead, acenaphthene, dibenzofuran, carbazole, benzo[a]anthracene, benzo[b]fluoranthene, benzo[a]pyrene, dibenz(a,h)Anthracene, (SVOC TIC) 9H-Xanthene, (SVOC TIC) Dibenzothiophene, (SVOC TIC) Perylene, (SVOC TIC) Picene	
TP05	0.1-0.2	Benzo[b]fluoranthene, benzo[a]pyrene Dibenz(a,h)Anthracene, (SVOC TIC), benzo[e]pyrene	
TP201	0.1	Arsenic	
TP201	0.4	Arsenic, benzo(b)fluoranthene, benzo(a)pyrene, dibenzo(ah)anthracene	
TP202	0.1	Benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, dibenzo(ah)anthracene	
TP202	0.5	Arsenic, benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, dibenzo(ah)anthracene	
TP203	0.2	**Naphthalene**, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(a)pyrene, indeno(1,2,3-c,d)Pyrene, dibenzo(ah)anthracene, asbestos	
TP203	0.4	**Naphthalene**, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(a)pyrene, dibenzo(ah)anthracene	
TP204	0.3	**Naphthalene**, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(a)pyrene, indeno(1,2,3-c,d)Pyrene, dibenzo(ah)anthracene	
TP204	0.5	**Naphthalene**, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(a)pyrene, dibenzo(ah)anthracene	
TP205	0.1	Benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(a)pyrene, dibenzo(ah)anthracene.	
TP205	0.6	Benzo(b)fluoranthene, benzo(a)pyrene, dibenzo(ah)anthracene.	
BH01	0.2	Aromatic EPH >C16-C21, **vinyl chloride**, **trichloroethene**, **2-Methylnaphthalene**, dibenzofuran, carbazole, benzo[a]anthracene, bis(2-ethylhexyl)Phthalate, benzo[b]fluoranthene, bthyenzo[a]pyrene, dibenz(a,h)Anthracene	
BH02	0.7	**Vinyl chloride**, **cis 1,2-Dichloroethene**, **trichloroethene**, benzo[b]fluoranthene, benzo[a]pyrene, dibenz(a,h)Anthracene	
BH03	0.3	Lead, **trichloroethene**, **naphthalene** **2-Methylnaphthalene**, dibenzofuran, carbazole Benzo[a]anthracene, chrysene, benzo[b]fluoranthene, benzo[a]pyrene, dibenz(a,h)Anthracene	

BH03	2.3	**Vinyl chloride**, **trans 1,2-Dichloroethene**, **cis 1,2-dichloroethene**, **trichloroethene**	
BH04	0.4	**Vinyl Chloride**, **1,1-dichloroethene**, **trans 1,2, dichloroethene**, **cis 1,2-Dichloroethene**, **benzene**, **trichloroethene**	
RC01	Water	Copper, **cis 1,2-Dichloroethene**, **trichloroethene**, **tetrachloroethene**	
BH01	Water	Copper, nickel, **cis 1,2-Dichloroethene**, **trichloroethene**, **tetrachloroethene**	
BH03	Water	Nickel, **cis 1,2-Dichloroethene**, **trichloroethene**, **tetrachloroethene**	
RBH01	Water	Copper, **tetrachloroethene**	
RBH02	Water	Copper, zinc	

Notes:
- Contaminants in bold are potentially a vapour risk-based on their Henry's Law coefficient (K_{aw}), vapour pressure and boiling point
- Aromatic EPH >C16-C21 is not a vapour risk due to inhalation of vapour (indoor) contributing only 0.2% to total exposure.
- Inhalation of vapour (indoor) contributes 100% to total exposure for trichloroethene and vinyl chloride
- Inhalation of vapour (indoor) contributes 50% to total exposure for tetrachloroethene
- Inhalation of vapour (indoor) contributes 99.8% to total exposure for benzene
- Inhalation of vapour (indoor) contributes 64.7% to total exposure for naphthalene

6.2 Contaminant Linkages

Based on the findings of the intrusive site investigation and identified contaminants, the preliminary conceptual site model has been revised. Remaining contaminant linkages are tabulated in the refined conceptual site model presented in **Table 6.2**. Identified contaminant linkages may require further investigation, detailed risk assessment and appropriate mitigation or remedial measures.

Table 6.2 Refined Conceptual Site Model

Source	Pathway	Receptor
Made ground/ Impacted near surface soils. S1	Direct soil and dust ingestion P1 Dermal contact P3 Inhalation of dust and vapours P4	Construction and maintenance workers R1
		Passers-by or neighbouring site users R3
		Future site users (Residents) R2
Impacted Groundwaters S1	Horizontal and vertical migration of vapours P10	Future site users (Residents) R2
	Horizontal and vertical migration of contaminants (saturated zone) P6 Dermal contact P3	Construction and maintenance workers R1
Impacted Groundwaters S2	Horizontal and vertical migration of contaminants (saturated zone) P6 Dermal contact P3	Construction and maintenance workers R1 Groundwater (aquifer) R4 Surface waters (river/lake) R5
Vapours – Impacted Soils S1	Horizontal and vertical migration of ground gasses and vapours P10	Future site users (Residents) R2, Construction and maintenance workers R1
Contaminated Made Ground Soils S1	Direct Contact P11	Construction materials (water pipes) R7

Contamination is present across the site within all locations tested, comprising both metals, hydrocarbons, as well as volatile organic compounds.

The likely source of contamination is from spillages and solvents used by the dry cleaning operation that occurred between 1956 and 1973 (the warehouse building that followed the dry cleaning operation was constructed in 1973 https://www.loopnet.co.uk/listing/kelvedon-st-

newport/26220225/). Uncontrolled disposal of wastes and contaminated workwear also can be a source.

The contaminants listed in **Table 6.1** typically match the range of contaminants stated within the DoE industrial profiles with the addition of some marginal exceedances of heavy metals. These potential spillages and other events have contaminated the soils and groundwaters, likely migrating within the saturated zone in the direction of any groundwater flow. Over time it is likely the contaminants have stratified according to density and mobility properties and will eventually break down into secondary 'daughter' contaminants with different properties. The contamination can migrate and impact aquifers and neighbouring water bodies. A contamination plume, if present, is potentially persistent, and can be a source of vapours which pose a high risk to future users via vapour intrusion and inhalation.

Potential future users of the site will face significant risks from the contaminated soil and groundwater vapour intrusion. Contamination within the soil will present risk to future users via gardening and soft landscaped areas and will also impact and accelerate the degradation of potable water pipes.

The groundwater contamination could have also impacted the aquifers and potentially nearby water features.

6.3 Refined Illustrative Conceptual Site Model

See **Drawing 02**.

6.4 Remediation Options Appraisal

On review of the available data there it is considered that sufficient information is available to allow an options appraisal of the possible remediation methodologies to be undertaken. This should be followed by a remediation strategy, which must be agreed with Newport City Council's planning department before being put into practice.

6.5 Mitigation & Remedial Measures

The following sections summarise the likely mitigation and remedial measures suitable for the identified contamination and proposed development. Detailed methodology to achieve the measures should be prescribed in a Remediation Strategy Report and the results presented in a Validation Report upon completion of the development. They also summarise the required further assessment.

6.5.1 Human Health

6.5.1.1 Contaminated Soils

Given the elevated concentrations of contamination, a basic capping solution will not be suitable at the site.

In external areas, an engineered capping system is likely to be the most suitable for the identified contamination. This is likely to comprise a 600mm capping with no-dig barrier and a capillary break to prevent the capping system being contaminated by the shallow groundwater table. A detailed remediation strategy must be carried out to determine the most appropriate method of breaking the existing source-pathway-receptor linkage that currently exists between the soil and the future site users.

A piling risk assessment must also be carried out to determine the risk to future site users and contractors from the potential additional pathways introduced to the site from piling.

As good practice, construction workers should adhere to good site management, COSHH, good standards of hygiene and appropriate health & safety on site, with personal protection equipment (PPE) and dust suppression where appropriate.

All imported soils should be validated as clean and suitable for use in accordance with 'Requirements for the Chemical Testing of Imported Soils for Various End Uses and Validation Cover Systems'.

For proposed new supply water pipes, the UK Water Industry Research publication 'Guidance for the Selection of Water Supply Pipes to be used in Brownfield Sites (Report 10/WM/03/21)' should be consulted.

In accordance with EC Regulation 1272/2008 and Environment Agency Guidance WM3 soils destined for off-site disposal should be classified on the basis of their hazard phrases prior to disposal. Soils are classified as a mirror entry waste and should be classified on the basis of their specific chemical properties.

If during earthworks ground conditions are encountered that are markedly different to those found during the investigation then the ground should be subject to additional sampling and testing and any necessary remedial measures designed and implemented before continuing with the works.

6.5.1.2 Vapours

Volatile organic compounds comprising chlorinated hydrocarbons, petroleum hydrocarbons, and polycyclic aromatic hydrocarbons have been identified in both the soil and groundwater beneath the site.

Table 6.3 summarises the compounds that are considered a potential vapour inhalation risk based upon their chemical and physical properties such as their molecular weight, solubility, vapour pressure, sorption, and Henry's constant.

Table 6.3 Compounds that pose a vapour risk

Location	Depth	Contaminant
TP01	0.1-0.2	Trichloroethene
TP203	0.2	Naphthalene
TP203	0.4	Naphthalene
TP204	0.3	Naphthalene
TP204	0.5	Naphthalene
BH01	0.2	Vinyl chloride, trichloroethene, 2-Methylnaphthalene
BH02	0.7	Vinyl chloride, cis 1,2-Dichloroethene, trichloroethene
BH03	0.3	Trichloroethene, naphthalene, 2-Methylnaphthalene
BH03	2.3	Vinyl chloride, trans 1,2-Dichloroethene, cis 1,2-dichloroethene, trichloroethene
BH04	0.4	Vinyl Chloride, 1,1-dichloroethene, trans 1,2, dichloroethene, cis 1,2-Dichloroethene, benzene, trichloroethene
RC01	Groundwater	Cis 1,2-Dichloroethene, trichloroethene, tetrachloroethene
BH01	Groundwater	cis 1,2-Dichloroethene, trichloroethene, tetrachloroethene
BH03	Groundwater	cis 1,2-Dichloroethene, trichloroethene, tetrachloroethene
RBH01	Groundwater	Tetrachloroethene

The source-pathway-receptor linkages identified are;

- **partitioning** from soil beneath the site, upward migration via the unsaturated zone and indoor inhalation by future residents.
- **exsolving** from groundwater beneath the site, upward migration via the unsaturated zone and indoor inhalation by future residents.

Volatilisation is a process whereby a substance is transformed into the gaseous phase. Above the compound's critical temperature, they will become vapours. Consequently, given the concentrations and physical properties of many of the compounds, they could migrate through cracks into the proposed building (i.e. vapour intrusion) and be inhaled by the residents.

Due to the very shallow groundwater table beneath the site, it is not considered viable to retrieve vapour samples from the unsaturated zone using sorbent tubes or canisters.

It is therefore recommended that based on the soil test results, the proposed building requires vapour protection. The mitigation measures will need to be designed by a Specialist Designer with appropriate contaminated land experience, professional accreditation and suitable indemnity, who is competent in justification of the vapour protection system design.

6.5.2 Aquatic Environment

Metals (copper, nickel, and zinc) in exceedance are considered to present a very low potential risk to the site due to the relatively low concentrations that are recorded within the made ground, and the effects of attenuation and dilution over the 203m between the site and the River Usk.

It is also likely that the effects of retardation, dispersion, and biodegradation will diminish the elevated concentrations of DNAPL (cis 1,2-Dichloroethene, Trichloroethene, and Tetrachloroethene) in the groundwater before it reaches the River Usk, or before migrating that far beyond the site boundary through the aquifer for that matter.

To demonstrate the low level of risk that the DNAPL presents to the surrounding aquatic environment, a Tier 3 detailed quantitative risk assessment should be carried out using the existing site data. The DQRA is presented in **Section 7** of the report.

During the construction period, there is a risk to the environment/adjacent sites from de-watering, digging foundations, moving contaminated soil, drainage misconnections, discharges to local surface waters or the ground, runoff from construction materials and/or exposed ground, wheel washings and oil or chemical spills.

The risk is considered to be negligible as any adverse effects will be easily preventable by due diligence to good construction practise and housekeeping in preventing surface runoff and the spillage of materials.

The basic measures that must be taken are as follows:

- Prepare a drainage plan and mark the manholes to prevent pollutants accidently reaching the surface water sewers;
- Carry out any activities that could cause pollution in a designated, bunded area, away from rivers or boreholes. Where possible it should drain to the foul sewer;
- Use settlement ponds to remove silty water;
- Store all oils and chemicals in a fully bunded area to prevent leaks or spills;
- Get advice on whether you need an environmental permit and apply in good time

SECTION 7 Detailed Quantitative Risk Assessment of Groundwater

As discussed in **Section 6**, there is an unquantified risk to the aquatic environment from the presence of elevated DNAPL (cis 1,2-Dichloroethene, Trichloroethene, and Tetrachloroethene) in the groundwater. A detailed quantitative risk assessment has therefore been carried out on the data collected from previous phases of site investigation to quantify the risk to controlled waters.

The detailed quantitative risk assessment requires the following.

1. Objectives of the DQRA
2. Description of the CSM
3. State which model has been used and why it is appropriate
4. Justification for selection of COPC
5. List and justify the model parameter values / assumptions
6. Model results and outputs
7. Sensitivity analysis and what this means / assessment of uncertainties
8. Risk evaluation
9. Conclusions – linking back to DQRA objectives
10. Recommendations
11. References

7.1 Objectives of DQRA

To determine which of the following are required.

- No remedial action, i.e. the level of contamination does not, or is not likely to, cause pollution of surface water or groundwater, or their dependent ecosystems;
- Remedial action to protect an identified groundwater or surface water receptor;
- Further data collection and analysis to better evaluate the degree of risk to the receptor.

7.2 Description of CSM

An illustrative conceptual site model (CSM) is presented in **Drawing 02**. The model assumes a plume beneath the site that has been created by numerous spills and accumulation of contaminants from the site's previous use as a dry cleaner. The spills have migrated from the surface into the soil, gradually migrating into the unsaturated zone into perched water bodies and into the main shallow groundwater body. The low permeability of the tidal flat deposits (TFD) will have provided some constraint to the migration, however some of the dense non aqueous phase liquid will have passed through and accumulated in the more permeable clayey sandy gravel below.

Given the much higher permeability of the clayey sandy gravel at the base of the TFD, the main pathway for contaminants to migrate to River Usk is through the clayey sandy gravel.

The CSM has also included potential future migration pathways created by the installation of piled foundations through the TFD, and into the St Maughan's Formation beneath the clayey sandy gravel. It also considers the migration of vapours from the soil, perched water, and groundwater into the buildings.

7.3 Justification for Use of Model

The Environment Agency's Remedial Targets Worksheet (Domenic Steady State analytical solution) was used to facilitate a detailed quantitative risk assessment for the site. The basis for using the model and approach is for a mix of regulatory, scientific, and practical reasons.

The RTW Domenico Steady State Solution is scientifically defensible and provides the following.

1. A conservative but realistic risk assessment tool – it assumes that contaminant plumes have reached a stable configuration where the source concentration is constant, plume length and mass flux is stabilised, and attenuation processes operate consistently over time. This approach is intentionally conservative and avoids under-estimating risk but not unrealistically worst-case.
2. It offers a closed-form analytical solution (fast, transparent, reproducible).
3. Appropriate for long-term compliance points, which are assessed over multi-decadal timescales, assumes the plume has reached a steady state which represents the maximum possible concentration.
4. Aligns with hydrological risk assessment practice and is one of the most widely used analytical models in contaminated land hydrogeology.
5. A steady state model avoids time dependent uncertainties.

7.4 Justification for Selecting Contaminants of Concern

The contaminants of concern were selected due to particularly high concentrations in the perched and main groundwater body, which far exceed either laboratory detection limits (cis 1,2-Dichloroethene) or WFD environmental quality standards (trichloroethene and tetrachloroethene). All three contaminants were identified at elevated concentrations in the soil and are consistent with those expected at a site previously operated by a dry cleaner.

Other contaminants were also identified in the soil. However, none of them were recorded above laboratory detection limits apart from modest concentrations of copper, nickel and zinc, which are likely to be background concentrations in the groundwater.

7.5 Model Parameters and Assumptions

A summary of the parameters used is summarised in **Table 7.1**.

Table 7.1 Model Parameters and Assumptions

Parameter/Assumption	Value	Justification
Initial contaminant concentration in groundwater at plume core	cis 1,2-Dichloroethene = 0.015 mg/l	Highest concentration recorded during groundwater monitoring
	Trichloroethene = 0.025 mg/l	
	Tetrachloroethene = 0.098 mg/l	
Half-life for degradation of contaminant in water	cis 1,2-Dichloroethene = 336 days	Taken from '*Agency for Toxic Substances and Disease Registry. Toxicological profile for 1,2-dichloroethene. Atlanta, GA, US Department of Health and Human Services, 1990*'. The value used was the value for the lowest rate of anaerobic biodegradation in anaerobic environment.
	Trichloroethene =2352 days	
	Tetrachloroethene = 2352 days	
Soil water partition coefficient	cis 1,2-Dichloroethene = 49 l/kg	*SR7*
	Trichloroethene = 2150 l/kg	
	Tetrachloroethene = 2430 l/kg	
Width of plume	75m	Taken as the maximum length of site perpendicular to flow of groundwater. This is considered to be a highly conservative estimation.

Plume thickness at source	5.9m	Taken as 98% of the total thickness of the clayey sandy gravel located beneath the TFD. The greatest thickness that the model would accept.
Saturated aquifer thickness	6.0m	Taken as the thickest recorded clayey sandy gravel in vicinity of the site (6.0m). This is thicker than that recorded on site so is a conservative estimate.
Bulk density of aquifer materials	2g/cm^3	Typical bulk density for compacted soil (conservative value).
Effective porosity of aquifer	0.25	Maximum estimated value for clayey sandy gravel. Conservative estimate given recorded presence of clay and sand within aquifer beneath the site. *Lovanh et al 2000*.
Hydraulic gradient	0.044	Site groundwater level monitoring records.
Hydraulic conductivity of aquifer	0.432m/d	Maximum typical value for clayey sandy gravel (*structx.com/soil_properties_007.html*)
Distance to compliance point	50m	Default compliance distance. This is less than a quarter of the distance to the River Usk; the closest surface water body.

7.6 Model Results and Outputs

The results from the Remedial Targets Worksheet show significant decrease in the concentration of the contaminants of concern over a very short distance from the site. **Table 7.2** summarises the calculated concentrations for distance from the site.

Table 7.2 Model Results and Outputs

Distance (m)	cis 1,2-Dichloroethene		Trichloroethene		Tetrachloroethene	
	Concentration (mg/l)	Target Concentration (mg/l)	Concentration (mg/l)	Target Concentration (mg/l)	Concentration (mg/l)	Target Concentration (mg/l)
0	0.015	0.001	0.025	0.01	0.098	0.01
2.5	$7.28x10^{-04}$		$9.09 x10^{-06}$		$2.13 x10^{-05}$	
5.0	$3.53x10^{-05}$		$3.31 x10^{-09}$		$4.62 x10^{-09}$	
7.5	$1.71x10^{-06}$		$1.20 x10^{-12}$		$1.00 x10^{-12}$	
10	$8.30x10^{-08}$		$4.37 x10^{-16}$		$2.18 x10^{-16}$	
15	$1.95x10^{-10}$		$5.78 x10^{-23}$		$1.03 x10^{-23}$	
20	$4.60x10^{-13}$		$7.64 x10^{-30}$		$4.86 x10^{-31}$	
25	$1.08x10^{-15}$		$1.01 x10^{-36}$		$2.29 x10^{-38}$	
30	$2.54x10^{-18}$		$1.34 x10^{-43}$		$1.08 x10^{-45}$	
40	$1.40x10^{-23}$		$2.33 x10^{-57}$		$2.40 x10^{-60}$	
50	$7.73x10^{-29}$		$4.05 x10^{-71}$		$5.32 x10^{-75}$	

The results are based upon using the most conservative parameters available. The calculated concentrations show significant degradation before reaching the compliance point.

Copies of the Remedial Targets Worksheets are presented in **Annex D**

7.6 Sensitivity Analysis

Unless otherwise stated, the compliance point remains at 50m from the site boundary.

7.1.1 Hydraulic Gradient

An alternative hydraulic gradient of 0.028 has been calculated using the highest recorded groundwater level in the deeper groundwater monitoring wells and the mean level of 0.54m AOD at the nearby Usk estuary (https://riverlevels.uk/newport-gwent-tidal-level). This is a shallower gradient than recorded on site. Therefore, the model has not been re-run using the less conservative shallower gradient.

7.1.2 Initial Contaminant Concentration

The highest concentration of contamination in the groundwater, whether it be in the perched groundwater or deeper was used as part of the assessment. A higher concentration could therefore not be justified based on the information gathered to date. However, a sensitivity analysis has been carried out to assess the risk to the nearby River Usk in a scenario where significantly higher concentrations of contaminants were recorded in the groundwater bodies beneath the site. To this end, an initial contaminant concentration in groundwater plume core of 1000 times higher than the highest recorded concentration has been used in the model. The results have been summarised in **Table 7.3**. The sensitivity analysis demonstrates that even with concentrations 1000 times higher than those already encountered, the risk to the River Usk would be negligible.

Table 7.3 Initial Contaminant Concentration – Sensitivity Analysis Result

Parameter/Assumption	Value	Result (mg/litre)	Target Concentration (mg/l)
Initial contaminant concentration in groundwater at plume core	cis 1,2-Dichloroethene = 15 mg/l	$7.73x10^{-26}$	0.001
	Trichloroethene = 25 mg/l	$4.05x10^{-71}$	0.01
	Tetrachloroethene = 98 mg/l	$5.32x10^{-72}$	0.01

7.1.3 Half-Life for Degradation of Contaminant in Water

A less conservative half-life than that already used could not be obtained from a reputable source. The model was run using half-lives ten times greater than the most conservative published values. The results of the sensitivity analysis using increased half-life degradations is summarised in **Table 7.4**. The results show that even with half-lives ten times greater than the most conservative published values, the concentrations at the River Usk are many orders of magnitude lower than the target concentrations.

Table 7.4 Half-Life Degradation – Sensitivity Analysis Result

Parameter/Assumption	Value	Result (mg/litre)	Target Concentration (mg/l)
Half-life for degradation of contaminant in water	cis 1,2-Dichloroethene = 3360 days	$1.30\ x10^{-09}$	0.001
	Trichloroethene =23520 days	$1.08\ x10^{-22}$	0.01
	Tetrachloroethene = 23520 days	$1.65\ x10^{-23}$	0.01

7.1.4 Soil Water Partition Coefficient

The model has been run using a partition coefficient (Kd) ten times lower than the values published in SR7. The model shows the contaminant concentrations at the 50m compliance zone will remain several orders of magnitude below the target concentration. The results are summarised in **Table 7.5**.

Table 7.5 Partition Coefficient – Sensitivity Analysis Result

Parameter/Assumption	Value	Result	Target Concentration (mg/l)
Soil water partition coefficient	cis 1,2-Dichloroethene = 4.9 l/kg	$9.74\ x10^{-10}$	0.001
	Trichloroethene = 215 l/kg	$1.06\ x10^{-22}$	0.01
	Tetrachloroethene = 243 l/kg	$1.62\ x10^{-23}$	0.01

7.1.5 Plume Width

A sensitivity analysis using an estimated plume width that is double the site's length has been used. The results presented in **Table 7.6** show negligible change from the original model.

Table 7.6 Plume Width – Sensitivity Analysis Result

Parameter/Assumption	Value	Contaminant	Result	Target Concentration (mg/l)
Width of plume	150m	cis 1,2-Dichloroethene	1.73×10^{-29}	0.001
		Trichloroethene	4.05×10^{-71}	0.01
		Tetrachloroethene	5.32×10^{-75}	0.01

7.1.6 Plume Thickness

A sensitivity analysis has been carried out using an estimated plume thickness that is double the conservative estimation that was used in the original model. The results presented in **Table 7.7** show negligible change from the original model.

Table 7.7 Plume Thickness – Sensitivity Analysis Result

Parameter/Assumption	Value	Contaminant	Result	Target Concentration (mg/l)
Plume thickness at source	11.8m	cis 1,2-Dichloroethene	7.73×10^{-29}	0.001
		Trichloroethene	4.09×10^{-71}	0.01
		Tetrachloroethene	5.37×10^{-75}	0.01

7.1.7 Effective Porosity and Hydraulic Conductivity

A sensitivity analysis has been carried out using an effective porosity for a clean gravel. It was found that the change was negligible. The more conservative effective porosity was therefore combined with a hydraulic conductivity, also representative of a clean gravel. It is found that the modelled concentration at the 50m compliance point increases dramatically, as shown in **Table 7.8**. However, it should be noted that the use of such a high hydraulic conductivity is unrealistic given the gravels beneath the site and surrounding area contain a clay matrix or are dominated by clay. It is considered that the value used in the original model is far more representative of the aquifer and still provides a conservative value on which the assessment can be based.

It should also be noted that the tidal effects of the estuary, which the RTW model does not consider, will reduce the groundwater velocity meaning the contaminant travel time is underestimated. The modelled concentration at the compliance point is therefore very likely to be overestimated.

Table 7.8 Effective Porosity and Hydraulic Conductivity – Sensitivity Analysis Result

Parameter/ Assumption	Value		Contaminant	Result	Target Concentration (mg/l)
	Effective Porosity	Hydraulic Conductivity			
Effective Porosity and Hydraulic Conductivity	0.44	2592 m/d	cis 1,2-Dichloroethene	1.39×10^{-2}	0.001
			Trichloroethene	1.63×10^{-2}	0.01
			Tetrachloroethene	6.02×10^{-2}	0.01

A hydraulic conductivity of 100m/day for a sandy gravel has been used in **Table 7.9**. This is also considered highly conservative as it does not account for fines amongst the sand and gravel, which will significantly reduce an aquifer's hydraulic gradient. Cis 1,2-Dichloroethene

slightly exceeds the target concentration in this scenario, however it is significantly lower than the target concentration when it is modelled reaching the River Usk (**Table 7.10**).

Table 7.9 Effective Porosity and Hydraulic Conductivity – Sensitivity Analysis Result

Parameter/ Assumption	Value		Contaminant	Result	Target Concentration (mg/l)
	Effective Porosity	Hydraulic Conductivity			
Effective Porosity and Hydraulic Conductivity	0.44	100 m/d	cis 1,2-Dichloroethene	2.79×10^{-3}	0.001
			Trichloroethene	2.67×10^{-5}	0.01
			Tetrachloroethene	5.60×10^{-5}	0.01

Table 7.10 Effective Porosity and Hydraulic Conductivity at 203m Compliance Point – Sensitivity Analysis Result

Parameter/ Assumption	Value		Contaminant	Result	Target Concentration (mg/l)
	Effective Porosity	Hydraulic Conductivity			
Effective Porosity and Hydraulic Conductivity	0.44	100 m/d	cis 1,2-Dichloroethene	2.08×10^{-5}	0.001

Copies of the sensitivity analysis Remedial Targets Worksheets are presented in **Annex E**.

7.7 Conclusion

The assessment shows significant degradation of the contaminants with increasing distance from site. Target concentrations for cis 1,2-Dichloroethene, Trichloroethene, and Tetrachloroethene were set at 0.001mg/litre, 0.01mg/litre, and 0.01mg/litre respectively. The Remedial Target Worksheet shows all calculated results fall below the target concentrations by 2.5m distance from the site. By the 50m compliance point, calculated concentrations are many orders of magnitude below the target concentration.

The sensitivity analysis indicates that the model is most sensitive to variations in hydraulic conductivity. If a more permeable aquifer were present beneath the tidal flat deposits, the potential risk to the River Usk would increase significantly. However, the available site data indicates that the gravel aquifer is discontinuous and contains a substantial proportion of clay material. Consequently, the hydraulic conductivity value adopted within the RTW model is representative of the site conditions and appropriate for the assessed aquifer.

It is concluded that based on the information compiled to date, the aquatic environment is at insignificant risk from the impacts of the site's past use.

The proposed building is to be founded on piles. The piles could create a new pathway for contaminants to migrate from the shallow soil and perched groundwater into the deeper aquifer. A piling risk assessment should be carried out. This is discussed further in **SECTION 10**.

SECTION 8 Laboratory Geotechnical Testing Results Analysis

Laboratory geotechnical testing results are summarised in the following sections.

8.1 Concrete Classification Testing

Three samples were subject to testing for concrete classification in accordance with BRE SD1:2015. The results are summarised in **Table 8.1**

Table 8.1 BRE SD1 Testing Summary

Location	Depth (m)	2:1 Water/Soil Extract		Total Potential Sulphate (%)	pH	Design Sulphate Class for Location	ACEC Class for Location
		SO_4 (mg/l)	Mg (mg/l)				
BH01	0.5	1	1	0.06	8.4	DS-1	AC-1s
BH03	1.2	1	1	0.09	8.6	DS-1	AC-1s
BH04	0.2	1	1	0.15	8.8	DS-1	AC-1s

Notes:
The following stoichiometric equation was employed to determine the Total Potential Sulphate (TPS). TPS (% as SO4) = 3.0 x Total Sulphur (TS % as S).
The amount of Oxidisable Sulphides (OS as %SO4) has been conservatively calculated by the following equation. OS = TPS – Acid Soluble Sulphate (AS).

Based on the above assessment the DS Class for the site is determined as DS-1, and the ACEC Class is AC-1s.

SECTION 9 Engineering Recommendations

9.1 Preparation of Site

Areas of vegetation including all roots should be stripped and removed from beneath the proposed development site.

Allowances should be made for any temporary/permanent support works to any existing adjacent structure necessary as a result of the proposed works.

Contingencies should be made for the protection/diversion of any underground/overhead services present beneath/above the site brought about as a result of the proposed works.

Any reduced levels should be brought up to the required levels with suitable inert mainly granular materials. Department of Transport (DTp) type 2 sub-base or similar should be used and compacted in layers to the requirements of the Specification for Highway Works.

Allowances should also be made for the excavation of any soft spots/areas and their replacement with well compacted imported granular materials.

In accordance with EC Regulation 1272/2008 and Environment Agency Guidance WM3 soils and other materials destined for off-site disposal should be classified on the basis of their hazard phrases prior to disposal. Soils are classified as a mirror entry waste and should be classified on the basis of their specific chemical properties. TFW Group Limited offer this service if required.

9.2 Foundation & Floor Slab Solution

Due to the soft superficial deposits, a traditional strip or pad foundation will be unsuitable. A piled foundation is therefore required.

Due to the presence of adjacent buildings vibrations should be kept to a minimum. It is recommended a bored piled foundation solution socketed into bedrock at depth of 13.55m below existing ground level is used. For a 300mm bored pile with a typical length of 16m an allowable working load of 500kN should be achieved.

Measurements should be put in place to monitor vibrations during pile installation. If vibrations exceed guideline levels, then measures should also be taken to dampen such vibrations. If, however, vibrations exceed permissible values then consideration should be given to an alternative solution.

The estimated working pile loads, pile type and lengths are given for guidance only and should be confirmed by a specialist piling contractor. It may also be prudent to test drive/install piles at selected locations.

For the quoted pile sizes, founded within the competent in-situ materials, total settlements should not exceed 10mm with differential movements between adjacent piles being less than half this value.

Floor slabs should be designed and constructed as suspended.

9.3 Excavations & Formations

Most of the shallow excavations will be possible with normal soil excavating machinery.

Shallow perched water and groundwater flows were encountered during the investigation. Any water inflows together with rainwater infiltration should be dealt with by conventional pumping techniques. However, it should be noted that during times of heavy rainfall a higher water table will be encountered.

The sides of any excavations deeper than 1.20m, or shallower if unstable, should be supported by planking and strutting or other proprietary means.

The sub-formations/formations are likely to be susceptible to loosening, softening and deterioration by exposure to weather (rain, frost and drying conditions), the action of water (flood water or removal of groundwater) and site traffic.

Formations should never be left unprotected and continuously exposed to rain causing degradation, or left exposed/uncovered overnight, unless permitted by a qualified engineer.

Construction plant and other vehicular traffic should not be operated on unprotected formations.

As a minimum the formation/excavation surfaces must be protected by blinding concrete immediately after exposure.

Allowances should be made for the removal of soft spots/areas and their replacement with well compacted granular materials.

Allowances should also be made for special precautions to prevent formation deterioration in addition to the above.

9.4 Protection of Buried Concrete

When the results are compared with Table C2 of BRE Digest 1:2005, it indicates that buried concrete should generally conform to DS-1, Class AC-1s.

9.5 Access Roads & Car Parking Areas

For car parking and road areas, formations within the in-situ natural soils a CBR value of 3% may be used for design purposes.

Allowances should be made for the removal of any ‘soft spots/areas’ and their replacement with well-compacted granular materials as previously described.

Please note that the Local Council / Highways Authority may require in-situ CBR testing to be undertaken before a road is adopted. In-situ CBR Testing should be performed following earthworks to verify the performance of the engineered fill.

9.6 Storm Water Drainage

During the site investigation three soakaway tests were undertaken in general accordance with BRE DG 365:2016. The soakaway tests were carried out in trial pits TP01 to TP03 within natural materials.

The soakaway tests recorded insufficient infiltration and were subsequently terminated early.

It is considered that soakaway storm water drainage is unsuitable at the site.

SECTION 10 Recommended Further Work

An Options Appraisal and Remediation Strategy will be required for the site and should be developed in accordance with the final development proposals, including the proposed landscaping and sustainable drainage systems (SuDS). A Verification Plan for the proposed vapour mitigation measures will also need to be prepared.

In addition, a desk-based piling risk assessment should be undertaken and submitted to the Local Planning Authority to demonstrate that the proposed piling methodology and associated risk management measures are acceptable to Natural Resources Wales (NRW).

Subject to confirmation that the desk-based piling risk assessment satisfies NRW requirements, a programme of groundwater monitoring should subsequently be undertaken. The purpose of the monitoring programme will be to assess whether the piling works are adversely affecting the deeper groundwater body, which in turn could impact the nearby River Usk.

Prior to commencement of the monitoring programme, additional groundwater monitoring wells should be installed, with particular focus on the down-gradient area of the site. Proposed monitoring well locations are shown on **Drawing 03**. The monitoring installations should be installed by cable percussion boreholes, with the response zones screened within the gravel aquifer beneath the tidal flat deposits.

The groundwater monitoring programme is anticipated to include sampling and laboratory testing on two occasions prior to commencement of the piling works, fortnightly monitoring during the piling works, and a further three rounds of monitoring following completion of the piling works, also at fortnightly intervals.

Upon completion of the monitoring programme, the results should be assessed to determine whether the piling works have had any detrimental impact on the aquifer and to confirm that the identified contamination does not pose an unacceptable risk to the River Usk.

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ANNEX A
Exploratory Hole Logs

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Borehole No.

BH01-24

Sheet 1 of 1

Project Name	Project No.	Date	Hole Type
Kelvedon Street	13203	20/09/2024 to 20/09/2024	WS

Client	Co-ords	Water Strike Details			Logged By
		Depth Strike	After 20 mins	Remarks	FL
MVR Solutions Limited	E: 332264.52				
Contractor / **Plant Used**	N: 187714.66				**Approved By** FL
	L: 6.85				Scale 1:50

Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend	Well
Results	Type	Depth					
			(0.30)		MADE GROUND. [Firm] Dark brown slightly sandy slightly gravelly CLAY with occasional glass and brick fragments. Sand is fine to coarse. Gravels are subrounded and rounded medium of mudstone. **()**		
			0.30	6.55	Firm light brown mottled light grey slightly gravelly CLAY with rare pockets of sand. Gravels are rounded and subrounded medium of mudstone. **()**		
			(0.80)				
N=10 (2,3/3,3,2,2)	SPT(C)	1.00	1				
			1.10	5.75	Soft light brown mottled light grey slightly gravelly CLAY with rare pockets of sand. Gravels are rounded and subrounded medium of mudstone. **()**		
			(0.10)	5.65			
			1.20		Soft bluish grey slightly gravelly CLAY. Gravel is subangular to subrounded medium sandstone with occasional pockets of yellow sand. **()**		
			(1.40)				
N=4 (1,1/1,1,1,1)	SPT(C)	2.00	2				
			2.60	4.25	Very soft light grey and dark grey CLAY with rare pockets of sand. **()**		
N=0 (0,0/0,0,0,0)	SPT(C)	3.00	3				
			(1.10)				
			3.70	3.15	Very soft dark grey gravelly CLAY with occasional pockets of sand. Gravels are subrounded and rounded fine and medium mudstone. **()**		
N=6 (1,2/2,2,1,1)	SPT(C)	4.00	4				
			(0.80)				
			4.50	2.35	Soft bluish grey slightly gravelly CLAY. Gravel is subangular and subrounded medium sandstone. **()**		
			(0.50)				
N=4 (1,1/1,1,1,1)	SPT(C)	5.00	5	5.00	1.85	End of Borehole at 5.00m	
			6				

Remarks

1] Borehole terminated on refusal. 2] On completion, a slotted standpipe (50mm) was installed to 3.00m depth with a granular response zone 1.00m-3.00m, bentonite seal 1.00-0.3m, concrete, tarmacadam and a flush cover 0.30-0.00m. 3] Groundwater not recorded.

Borehole Diameter

Base Depth	Diameter

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

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Borehole No.

BH02-24

Sheet 1 of 1

Project Name	Project No.	Date	Hole Type
Kelvedon Street	13203	20/09/2024 to 20/09/2024	WS

Client	Co-ords	Water Strike Details			Logged By
		Depth Strike	After 20 mins	Remarks	FL
MVR Solutions Limited	E: 332241.60				Approved By
Contractor / Plant Used	N: 187735.38				FL
	L: 6.98				Scale 1:50

Samples and Results			Depth, (Thickness)		Level	Stratum Description	Legend	Well
Results	Type	Depth						
				(0.33)		MADE GROUND. [Firm] Dark brown mottled yellow slightly gravelly sandy CLAY with occasional brick fragments and rootlets. Sand is coarse. Gravels are sub-rounded and rounded medium of sandstone. ()		
				0.33	6.65			
				(0.17)		MADE GROUND. Cobble sized fragments of brick. ()		
				0.50	6.48			
				(0.50)		MADE GROUND. Light grey mottled yellow gravelly SAND with occasional brick fragments. Sand is coarse. Gravels are angular fine and medium of sandstone and mudstone. ()		
N=9 (1,4/2,2,2,3)	SPT(C)	1.00	1	1.00	5.98	Grey clayey gravelly fine and medium SAND. Gravel is sub-rounded medium of sandstone and mudstone. ()		
				(1.00)				
N=5 (1,1/1,2,1,1)	SPT(C)	2.00	2	2.00	4.98	Soft bluish grey slightly gravelly CLAY with occasional pockets of sand. Gravel is subangular and subrounded medium of sandstone. ()		
				(0.70)				
				2.70	4.28	Very soft light grey mottled dark grey CLAY with rare pockets of sand. ()		
N=4 (1,1/1,1,1,1)	SPT(C)	3.00	3	(0.70)				
				3.40	3.58	Very soft dark grey gravelly CLAY with occasional pockets of sand. Gravels are subrounded and rounded fine and medium of mudstone ()		
				(0.90)				
N=4 (1,2/1,1,1,1)	SPT(C)	4.00	4					
				4.30	2.68	Soft bluish grey slightly gravelly CLAY. Gravel is subangular and subrounded medium of sandstone. ()		
				(0.70)				
N=4 (1,1/1,1,1,1)	SPT(C)	5.00	5	5.00	1.98			
						End of Borehole at 5.00m		
			6					

Remarks

1] Borehole terminated on refusal. 2] On completion, a slotted standpipe (50mm) was installed to 3.00m depth with a granular response zone 1.00m-3.00m, bentonite seal 1.00-0.3m, concrete, tarmacadam and a flush cover 0.30-0.00m. 3] Groundwater not recorded.

Borehole Diameter

Base Depth	Diameter

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

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Borehole No.

BH03-24

Sheet 1 of 1

Project Name	Project No.	Date	Hole Type
Kelvedon Street	13203	20/09/2024 to 20/09/2024	WS

Client	Co-ords	Water Strike Details			Logged By
		Depth Strike	After 20 mins	Remarks	FL
MVR Solutions Limited	E: 332271.39				
Contractor / **Plant Used**	N: 187722.80				**Approved By** FL
	L: 6.82				Scale 1:50

Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend	Well
Results	Type	Depth					
			(0.30)		MADE GROUND. [Firm] dark brown slightly gravelly sandy CLAY with occasional sand inclusions and brick fragments. Sand is fine to coarse. Gravels are angular fine and medium of mudstone. **()**		
			0.30	6.52			
					MADE GROUND. [Firm] light brown gravelly CLAY with occasional sand inclusions and brick fragments. Gravels are angular fine and medium of mudstone. **()**		
			(0.70)				
N=4 (1,2/1,1,1,1)	SPT(C)	1.00	1 1.00	5.82			
					Firm light grey and brown mottled sandy slightly gravelly CLAY with occasional sand inclusions. Gravels are angular and subangular fine and medium of mudstone. **()**		
			(1.00)				
N=0 (0,0/0,0,0,0)	SPT(C)	2.00	2 2.00	4.82			
					Very soft light grey and dark grey mottled CLAY with rare pockets of sand. **()**		
			(0.80)				
			2.80	4.02			
N=0 (0,0/0,0,0,0)	SPT(C)	3.00	3		Very soft dark grey gravelly CLAY with occasional pockets of sand. Gravels are subrounded and rounded fine and medium mudstone **()**		
			(1.40)				
N=0 (0,1/0,0,0,0)	SPT(C)	4.00	4				
			4.20	2.62			
					Soft bluish grey slightly gravelly CLAY. Gravel is subangular and subrounded medium of sandstone. **()**		
			(0.80)				
N=1 (1,1/0,0,0,1)	SPT(C)	5.00	5 5.00	1.82			
					End of Borehole at 5.00m		
			6				

Remarks

1] Borehole terminated on refusal. 2] On completion, a slotted standpipe (50mm) was installed to 3.00m depth with a granular response zone 1.00m-3.00m, bentonite seal 1.00-0.3m, concrete, tarmacadam and a flush cover 0.30-0.00m. 3] Groundwater not recorded.

Borehole Diameter

Base Depth	Diameter

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

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Borehole No.

BH04-24

Sheet 1 of 1

Project Name	Project No.	Date	Hole Type
Kelvedon Street	13203	20/09/2024 to 20/09/2024	WS

Client	Co-ords	Water Strike Details			Logged By
		Depth Strike	After 20 mins	Remarks	FL
MVR Solutions Limited	E: 332233.26				
Contractor / **Plant Used**	N: 187727.67				**Approved By** FL
	L: 6.76				Scale 1:50

Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend	Well
Results	Type	Depth					
			(0.20)		MADE GROUND. [Medium] dark brown clayey fine and medium SAND with occasional rootlets and glass fragments. ()		
			0.20	6.56			
			(0.40)		MADE GROUND. [Dense] Light grey gravelly coarse SAND with frequent fragments of brick and concrete. Gravel is angular fine and medium mixed lithologies. ()		
			0.60	6.16			
			(0.60)		Very soft light grey mottled dark grey CLAY with rare pocket of sand. ()		
N=7 (2,1/3,2,1,1)	SPT(C)	1.00	1				
			1.20	5.56			
					Soft bluish grey slightly gravelly CLAY with occasional pockets of sand. Gravel is subangular and subrounded medium of sandstone. ()		
N=4 (1,2/1,1,1,1)	SPT(C)	2.00	2				
			(2.10)				
N=1 (1,1/0,0,1,0)	SPT(C)	3.00	3				
			3.30	3.46			
			(0.40)		Very soft light grey mottled dark grey CLAY with rare pockets of sand. ()		
			3.70	3.06			
					Very soft dark grey gravelly CLAY with occasional pockets of sand. Gravels are subrounded and rounded fine and medium of mudstone. ()		
N=0 (0,0/0,0,0,0)	SPT(C)	4.00	4				
			(1.30)				
N=4 (1,1/1,1,1,1)	SPT(C)	5.00	5	5.00	1.76		
					End of Borehole at 5.00m		
			6				

Remarks

1] Borehole terminated on refusal. 2] Groundwater not recorded.

Borehole Diameter	
Base Depth	Diameter

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

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Borehole No.

RBH01

Sheet 1 of 2

Project Name Kelvedon Street	**Project No.** 13203	**Date** 20/08/2025 to 20/08/2025	**Hole Type** RO
Client MVR Solutions Limited	**Co-ords** E: 332286.08 N: 187724.72 L:	**Water Strike Details** Depth Strike / After 20 mins / Remarks	**Logged By** Drillers
Contractor GK Drilling Ltd	**Plant Used** Massenza MI5		**Approved By** SW
			Scale 1:50

Samples and Results			TCR SCR RQD	FI	Depth, (Thickness)	Level	Stratum Description	Legend	Well
Results	Type	Depth							
					1 (2.00)		Made ground. (Drillers log) **()**		
					2 2.00		Alluvium clay , grey/blue. (Drillers log) **()**		
					3				
					4				
					5				
					6				
					7 (10.00)				
					8				
					9				

Remarks

1] Borehole terminated 17.5.0m below ground level. 2] On completion a 50mm standpipe (50mm) was installed to 17.50m depth. Slotted pipe with granular response zone from 8.0m-17.50m, solid standpipe with bentonite seal GL-1.0m, and a standpipe cover.

Borehole Diameter

Base Depth	Diameter

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

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Borehole No.

RBH01

Project Name Kelvedon Street	**Project No.** 13203	**Date** 20/08/2025 to 20/08/2025	**Hole Type** RO
Client MVR Solutions Limited	**Co-ords** E: 332286.08 N: 187724.72 L:	**Water Strike Details** Depth Strike / After 20 mins / Remarks	**Logged By** Drillers
Contractor GK Drilling Ltd	**Plant Used** Massenza MI5		**Approved By** SW
			Scale 1:50

Samples and Results			TCR SCR RQD	FI	Depth, (Thickness)	Level	Stratum Description	Legend	Well
Results	Type	Depth							
					11		Alluvium clay , grey/blue. (Drillers log) **()**		
					12	12.00			
							Mudstone. (Drillers log) **()**		
					13				
					14				
						(5.50)			
					15				
					16				
					17				
						17.50	End of Borehole at 17.50m		
					18				
					19				

Remarks

1] Borehole terminated 17.5.0m below ground level. 2] On completion a 50mm standpipe (50mm) was installed to 17.50m depth. Slotted pipe with granular response zone from 8.0m-17.50m, solid standpipe with bentonite seal GL-1.0m, and a standpipe cover.

Borehole Diameter

Base Depth	Diameter

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

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Borehole No.

RBH02

Project Name Kelvedon Street	**Project No.** 13203	**Date** 21/08/2025 to 21/08/2025	**Hole Type** RO
Client MVR Solutions Limited	**Co-ords** E: 332237.32 N: 187759.97 L:	**Water Strike Details** Depth Strike / After 20 mins / Remarks	**Logged By** Drillers
Contractor GK Drilling Ltd	**Plant Used** Massenza MI5		**Approved By** SW
			Scale 1:50

Samples and Results			TCR SCR RQD	FI	Depth, (Thickness)	Level	Stratum Description	Legend	Well
Results	Type	Depth							
					1 (2.00)		Made ground. (Drillers log) **()**		
					2 2.00		Alluvium clay , grey/blue. (Drillers log) **()**		
					3				
					4				
					5				
					6 (8.50)				
					7				
					8				
					9				

Remarks

1] Borehole terminated 20.0m below ground level. 2] On completion a 50mm standpipe (50mm) was installed to 3.0m depth. Slotted pipe with granular response zone from 1.0m-3.0m, solid standpipe with bentonite seal GL-1.0m, and a standpipe cover.

Borehole Diameter

Base Depth	Diameter

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

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Borehole No.

RBH02

Project Name	**Project No.**	**Date**	**Hole Type**
Kelvedon Street	13203	21/08/2025 to 21/08/2025	RO
Client	**Co-ords**	**Water Strike Details**	**Logged By**
MVR Solutions Limited	E: 332237.32	Depth Strike / After 20 mins / Remarks	Drillers
Contractor / **Plant Used**	N: 187759.97		**Approved By**
GK Drilling Ltd / Massenza MI5	L:		SW
			Scale 1:50

Samples and Results			TCR SCR RQD	FI	Depth, (Thickness)	Level	Stratum Description	Legend	Well
Results	Type	Depth							
							Alluvium clay , grey/blue. (Drillers log) **()**		
					10.50		Mudstone. (Drillers log) **()**		
					11				
					12				
					13				
					14				
					15				
					(9.50)				
					16				
					17				
					18				
					19				
					20.00		End of Borehole at 20.00m		

Remarks

1] Borehole terminated 20.0m below ground level. 2] On completion a 50mm standpipe (50mm) was installed to 3.0m depth. Slotted pipe with granular response zone from 1.0m-3.0m, solid standpipe with bentonite seal GL-1.0m, and a standpipe cover.

Borehole Diameter

Base Depth	Diameter

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

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Borehole No. **RC01**

Project Name	Project No.	Date	Hole Type
Kelvedon Street	13203	24/10/2024 to 28/10/2024	RC

Client	Co-ords	Water Strike Details			Logged By
		Depth Strike	After 20 mins	Remarks	ES
MVR Solutions Limited	E: 332256.72	6.00	4.90	1	Approved By
	N: 187722.55	11.50	4.40	1	ES
Contractor / Plant Used	L: 7.05				Scale 1:50

Samples and Results			TCR SCR RQD	FI	Depth, (Thickness)	Level	Stratum Description	Legend	Well
Results	Type	Depth							
					(1.20)		MADE GROUND. [Soft] dark brown mottled black slightly gravelly CLAY with rare brick fragments. Gravel is angular and subangular fine to coarse of mixed lithologies. **()**		
N=5 (1,1/1,2,1,1)	SPT(S)	1.00			1				
					1.20	5.85	Soft grey and bluish grey CLAY. **()**		
N=4 (1,0/0,1,1,2)	SPT(S)	2.00			2				
N=6 (1,1/1,1,2,2)	SPT(S)	3.00			3				
					(4.85)				
N=7 (2,3/2,1,2,2)	SPT(S)	4.00			4				
N=9 (3,3/2,3,2,2)	SPT(S)	5.00			5				
N=13 (2,4/3,4,3,3)	SPT(S)	6.00			6	6.05	1.00	Firm bluish grey CLAY **()**	
					(0.95)				
N=15 (2,4/4,5,3,3)	SPT(S)	7.00			7	7.00	0.05	Firm grey and bluish grey CLAY. **()**	
N=13 (3,3/3,4,2,4)	SPT(S)	8.00			8				
					(2.85)				
N=19 (4,5/4,5,5,5)	SPT(S)	9.00			9				
					9.85	-2.80			
N=25 (5,5/6,7,6,6)	SPT(S)	10.00			(0.15)	-2.95	Stiff brown and reddish brown sandy CLAY. Sand is fine to coarse. **()**		

Remarks

1] Borehole terminated on target depth. 2] On completion, a slotted standpipe (50mm) was installed to 20.00m depth with a granular response zone 20.00-11.00m, bentonite seal 11.00 -0.30m, concrete, tarmacadam and a raised cover 0.30-0.00m. 3] Groundwater recorded at 6.00m rising to 4.90m, and 11.50m rising to 4.40m.

Borehole Diameter

Base Depth	Diameter

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

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Borehole No. **RC01** Sheet 2 of 4

Project Name	Project No.	Date	Hole Type
Kelvedon Street	13203	24/10/2024 to 28/10/2024	RC

Client	Co-ords	Water Strike Details			Logged By
MVR Solutions Limited		Depth Strike	After 20 mins	Remarks	ES
	E: 332256.72	6.00	4.90	1	Approved By
Contractor / Plant Used	N: 187722.55	11.50	4.40	1	ES
	L: 7.05				Scale 1:50

Samples and Results			TCR SCR RQD	FI	Depth, (Thickness)	Level	Stratum Description	Legend	Well
Results	Type	Depth							
					10.00		Firm grey and bluish grey CLAY. ()		
					(0.50)				
					10.50	-3.45	Stiff brown and reddish brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is angular and subangular fine and medium of mudstone. ()		
N=33 (7,6/7,9,8,9)	SPT(S)	11.00			11				
					(2.30)				
50 (5,8/50 for 190mm)	SPT(S)	12.00			12				
					12.80	-5.75	Very stiff reddish brown slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is angular and subangular fine and medium of mudstone. ()		
50 (25 for 100mm/50 for 110mm)	SPT(S)	13.00			13				
					(0.75)				
					13.55	-6.50	Strong greyish brown limestone CONGLOMERATE with abundant coarse gravel sized clasts of reddish brown mudstone. Fractures are closely spaced, horizontal and subhorizontal, planar rough clean. St Maughans Formation ()		
		13.00 - 14.50	100 63 13		(0.45)				
					14.00	-6.95	Non intact - Highly fractured. Extremely weak reddish brown mottled bluish grey MUDSTONE recovered as fine to coarse gravel. Fractures are extremely closely to very closely spaced, random orientation, planar rough clean. St Maughans Formation ()		
50 (25 for 35mm/50 for 70mm)	SPT(S)	14.50			14				
					(2.00)				
		14.50 - 16.00	100 0 0		15				
50 (25 for 100mm/50 for 85mm)	SPT(S)	16.00			16	16.00	-8.95	Extremely weak reddish brown mottled bluish grey MUDSTONE. Fractures are very closely spaced, horizontal and subhorizontal, planar rough clean. St Maughans Formation ()		
		16.00 - 17.50	87 7 7		17				
					(2.30)				
50 (25 for 45mm/50 for 50mm)	SPT(S)	17.50			18				
		17.50 - 19.00	100 40 40	4		18.30	-11.25	Very weak reddish brown mottled bluish grey MUDSTONE. Fractures are closely and medium spaced, horizontal and subhorizontal, planar rough clean. St Maughans Formation ()		
50 (25 for 80mm/50 for 65mm)	SPT(S)	19.00			19				
					(2.70)				
		19.00 - 20.50	100 100 100	4					

Remarks

1] Borehole terminated on target depth. 2] On completion, a slotted standpipe (50mm) was installed to 20.00m depth with a granular response zone 20.00-11.00m, bentonite seal 11.00 -0.30m, concrete, tarmacadam and a raised cover 0.30-0.00m. 3] Groundwater recorded at 6.00m rising to 4.90m, and 11.50m rising to 4.40m.

Borehole Diameter

Base Depth	Diameter

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

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Borehole No. **RC01**

Project Name	Project No.	Date	Hole Type
Kelvedon Street	13203	24/10/2024 to 28/10/2024	RC

Client	Co-ords	Logged By
MVR Solutions Limited	E: 332256.72 N: 187722.55 L: 7.05	ES

Contractor	Plant Used	Approved By
		ES

Scale 1:50

Water Strike Details

Depth Strike	After 20 mins	Remarks
6.00	4.90	1
11.50	4.40	1

Samples and Results			TCR SCR RQD	FI	Depth, (Thickness)	Level	Stratum Description	Legend	Well
Results	Type	Depth							
50 (25 for 105mm/50 for 100mm)	SPT(S)	20.50					Very weak reddish brown mottled bluish grey MUDSTONE. Fractures are closely and medium spaced, horizontal and subhorizontal, planar rough clean. St Maughans Formation **()**		
		20.50 - 22.00	100 53 33	7	21 21.00 (0.70) 21.70	-13.95 -14.65	Non intact - Highly fractured. Extremely weak reddish brown mottled bluish grey MUDSTONE recovered as fine to coarse gravel. Fractures are extremely closely to very closely spaced, random orientation, planar rough clean. St Maughans Formation **()**		
50 (25 for 81mm/50 for 110mm)	SPT(S)	22.00			22		Moderately strong reddish brown mottled bluish grey MUDSTONE. Fractures are very closely and closely spaced, horizontal, planar rough clean. St Maughans Formation **()**		
		22.00 - 23.50	100 100 87	12	23 (3.40)				
50 (25 for 55mm/50 for 45mm)	SPT(S)	23.50			24				
		23.50 - 25.00	100 100 95	6					
50 (25 for 40mm/50 for 35mm)	SPT(S)	25.00			25 25.10	-18.05	Non intact - Highly fractured. Weak reddish brown mottled bluish grey MUDSTONE recovered as fine to coarse gravel. Fractures are extremely closely to very closely spaced, random orientation, planar rough clean. St Maughans Formation **()**		
		25.00 - 26.50	100 7 7		(1.50) 26				
50 (25 for 90mm/50 for 80mm)	SPT(S)	26.50			26.60	-19.55	Moderately strong reddish brown mottled bluish grey MUDSTONE. Fractures are closely spaced, horizontal, planar rough with calcite infilling. St Maughans Formation **()**		
		26.50 - 28.00	100 100 93	11	27 (2.45)				
50 (25 for 40mm/50 for 60mm)	SPT(S)	28.00			28				
		28.00 - 29.50	100 93 67	12	29 29.05	-22.00	Strong reddish brown limestone CONGLOMERATE with abundant coarse gravel sized clasts of dark reddish brown mudstone. Fractures are closely spaced, horizontal and subhorizontal, planar rough with calcite infilling. St Maughans Formation **()**		
50 (25 for 55mm/50 for 40mm)	SPT(S)	29.50			(1.00)				

Remarks

1] Borehole terminated on target depth. 2] On completion, a slotted standpipe (50mm) was installed to 20.00m depth with a granular response zone 20.00-11.00m, bentonite seal 11.00 -0.30m, concrete, tarmacadam and a raised cover 0.30-0.00m. 3] Groundwater recorded at 6.00m rising to 4.90m, and 11.50m rising to 4.40m.

Borehole Diameter

Base Depth	Diameter

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

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Borehole No. **RC01** Sheet 4 of 4

Project Name	Project No.	Date	Hole Type
Kelvedon Street	13203	24/10/2024 to 28/10/2024	RC

Client	Co-ords	Water Strike Details			Logged By
		Depth Strike	After 20 mins	Remarks	ES
MVR Solutions Limited	E: 332256.72	6.00	4.90	1	Approved By
	N: 187722.55	11.50	4.40	1	ES
Contractor / Plant Used	L: 7.05				Scale 1:50

Samples and Results			TCR SCR RQD	FI	Depth, (Thickness)	Level	Stratum Description	Legend	Well
Results	Type	Depth							
		29.50 - 31.00	100 33 30	3	30.05 (0.95)	-23.00	Strong reddish brown limestone CONGLOMERATE with abundant coarse gravel sized clasts of dark reddish brown mudstone. Fractures are closely spaced, horizontal and subhorizontal, planar rough with calcite infilling. St Maughans Formation **()**		
							Non intact - Highly fractured. Very weak reddish brown mottled bluish grey MUDSTONE recovered as fine to coarse gravel. Fractures are extremely closely to very closely spaced, random orientation, planar rough clean. St Maughans Formation **()**		
50 (25 for 70mm/50 for 40mm)	SPT(S)	~~31.00~~			31 31.00	-23.95	Moderately strong reddish brown mottled bluish grey MUDSTONE. Fractures are very closely and closely spaced, horizontal, planar rough with calcite infilling. St Maughans Formation **()**		
		31.00 - 32.50	100 27 13	18	(1.50) 32				
50 (25 for 35mm/50 for 60mm)	SPT(S)	~~32.50~~			32.50	-25.45	Moderately strong reddish brown mottled bluish grey MUDSTONE. Fractures are closely spaced, horizontal, planar rough and clean. St Maughans Formation **()**		
		32.50 - 34.00	100 100 100	5	33		*33.30 to 33.50m - 33.30m to 33.50m: Strong reddish brown limestone CONGLOMERATE with abundant coarse gravel sized clasts of dark reddish brown mudstone.*		
					34 (3.00)		*34.30 to 34.70m - 34.40m to 34.70m: Strong reddish brown limestone CONGLOMERATE with abundant coarse gravel sized clasts of dark reddish brown mudstone.*		
		34.00 - 35.50	93 53 53	8	35				
					35.50	-28.45	End of Borehole at 35.50m		
					36				
					37				
					38				
					39				

Remarks

1] Borehole terminated on target depth. 2] On completion, a slotted standpipe (50mm) was installed to 20.00m depth with a granular response zone 20.00-11.00m, bentonite seal 11.00 -0.30m, concrete, tarmacadam and a raised cover 0.30-0.00m. 3] Groundwater recorded at 6.00m rising to 4.90m, and 11.50m rising to 4.40m.

Borehole Diameter

Base Depth	Diameter

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

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Borehole No.

TP01

Sheet 1 of 1

Project Name	Project No.	Date	Hole Type
Kelvedon Street	13203	23/10/2024 to 23/10/2024	TP

Client	Co-ords	Water Strike Details		Logged By
MVR Solutions Limited	E:	Depth Strike	Remarks	SW

Contractor	Plant Used		Approved By
TFW Group Ltd	1.9 T Excavator – Hitachi ZX19	N: L:	MW

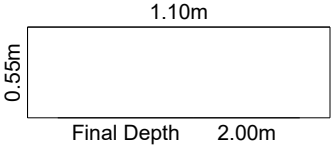
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Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend
Results	Type	Depth				
	ES	0.10 - 0.20	(0.70)		MADE GROUND. [Loose] dark greyish black sandy silty GRAVEL with frequent rootlets. Sand is fine to coarse. Gravel is angular and sub angular fine to coarse of brick fragments and concrete. ()	
			0.70		Firm light brown mottled orange CLAY. Becoming soft from 1.1m. ()	
			1			
			(1.30)			
			2 2.00		End of Trial Pit at 2.00m	
			3			
			4			

Remarks

1] Consistency, strength and density indicators are based upon field judgement. 2] Density indicator is in brackets and is for guidance only, and is not in accordance with BS 5930:2015. 3] Trial pit terminated to perform infiltration test. 4] Trial pit backfilled with arisings on completion of test.

Pit Stability: Stable



Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

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Borehole No.

TP02

Sheet 1 of 1

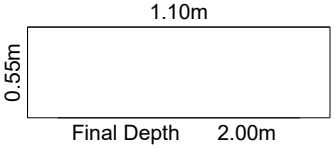
Project Name	**Project No.**	**Date**	**Hole Type**
Kelvedon Street	13203	23/10/2024 to 23/10/2024	TP
Client	**Co-ords**	**Water Strike Details**	**Logged By**
MVR Solutions Limited	E:	Depth Strike / Remarks	SW
Contractor / **Plant Used**	N:		**Approved By**
TFW Group Ltd / 1.9 T Excavator – Hitachi ZX19	L:		MW
			Scale 1:50

Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend
Results	Type	Depth				
			(0.60)		MADE GROUND. [Loose] dark greyish black sandy silty GRAVEL with frequent rootlets. Sand is fine to coarse. Gravel is angular and sub angular fine to coarse of brick fragments and concrete. ()	
			0.60		Firm light brown and grey mottled orange CLAY. Becoming soft from 1.2m. ()	
			1			
			(1.40)			
	ES	1.80 - 1.90				
			2 2.00		End of Trial Pit at 2.00m	
			3			
			4			

Remarks

1] Consistency, strength and density indicators are based upon field judgement. 2] Density indicator is in brackets and is for guidance only, and is not in accordance with BS 5930:2015. 3] Trial pit terminated to perform infiltration test. 4] Trial pit backfilled with arisings on completion of test.

Pit Stability: Stable



Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

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Borehole No.

TP03

Sheet 1 of 1

Project Name Kelvedon Street	**Project No.** 13203	**Date** 23/10/2024 to 23/10/2024	**Hole Type** TP
Client MVR Solutions Limited	**Co-ords** E: N: L:	**Water Strike Details** Depth Strike / Remarks	**Logged By** SW
Contractor TFW Group Ltd	**Plant Used** 1.9 T Excavator – Hitachi ZX19		**Approved By** MW
			Scale 1:50

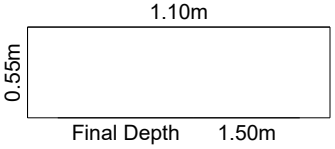
Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend
Results	Type	Depth				
	ES	0.10 - 0.20	(0.40) 0.40		MADE GROUND. [Loose] dark greyish black sandy silty GRAVEL with frequent rootlets. Sand is fine to coarse. Gravel is angular and sub angular fine to coarse of brick fragments and concrete. ()	
			(1.10) 1.50		Firm light brown and grey mottled orange CLAY. Becoming soft from 1.2m. ()	
					End of Trial Pit at 1.50m	

Remarks

1] Consistency, strength and density indicators are based upon field judgement. 2] Density indicator is in brackets and is for guidance only, and is not in accordance with BS 5930:2015. 3] Trial pit terminated due to hard strata 4] Trial pit backfilled with arisings.

Pit Stability: Stable

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.



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Borehole No.

TP04

Sheet 1 of 1

Project Name	**Project No.**	**Date**	**Hole Type**
Kelvedon Street	13203	23/10/2024 to 23/10/2024	TP
Client	**Co-ords**	**Water Strike Details**	**Logged By**
MVR Solutions Limited	E:	Depth Strike / Remarks	SW
Contractor / **Plant Used**	N: L:		**Approved By** MW
			Scale 1:50

Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend
Results	Type	Depth				
	ES	0.10 - 0.20	(0.40)		MADE GROUND. [Loose] dark greyish black sandy silty GRAVEL with frequent rootlets. Sand is fine to coarse. Gravel is angular and sub angular fine to coarse of brick fragments and concrete. ()	
			0.40		Firm light brown and grey mottled orange CLAY. Becoming soft from 1.0m. ()	
			(1.00)			
			1.40		End of Trial Pit at 1.40m	

Remarks

1] Consistency, strength and density indicators are based upon field judgement. 2] Density indicator is in brackets and is for guidance only, and is not in accordance with BS 5930:2015. 3] Trial pit terminated due to hard strata 4] Trial pit backfilled with arisings.

Pit Stability: Stable

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

180.00False1.10m

70.00False0.55m

Final Depth 1.40m

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Borehole No.

TP05

Sheet 1 of 1

Project Name	Project No.	Date	Hole Type
Kelvedon Street	13203	23/10/2024 to 23/10/2024	TP

Client	Co-ords	Water Strike Details		Logged By
MVR Solutions Limited	E:	Depth Strike	Remarks	SW
Contractor / **Plant Used**	N:			**Approved By** SW
	L:			Scale 1:50

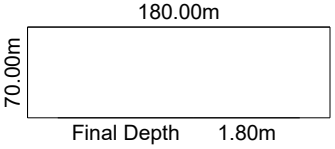
Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend
Results	Type	Depth				
	ES	0.10 - 0.20	(0.40)		MADE GROUND. [Loose] dark greyish black sandy silty GRAVEL with frequent rootlets. Sand is fine to coarse. Gravel is angular and sub angular fine to coarse of brick fragments and concrete. ()	
			0.40		Firm light brown and grey mottled orange CLAY. Becoming soft from 1.0m. ()	
			1			
			(1.40)			
			1.80		End of Trial Pit at 1.80m	
			2			
			3			
			4			

Remarks

1] Consistency, strength and density indicators are based upon field judgement. 2] Density indicator is for guidance only, and is not in accordance with BS 5930:2015. 3] Trial pit terminated upon refusal. 4] Trial pit backfilled with arisings. 5] Groundwater was encountered at 2.00m.

Pit Stability: Stable

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.



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Borehole No.

TP201

Sheet 1 of 1

Project Name	**Project No.**	**Date**	**Hole Type**
Kelvedon Street	13203	20/08/2025 to 20/08/2025	TP
Client	**Co-ords**	**Water Strike Details**	**Logged By**
MVR Solutions Limited	E: 332228.92	Depth Strike: 2.30 / Remarks: Slow infiltration	SW
Contractor / **Plant Used**	N: 187750.70		**Approved By**
M&J Plant & transport Ltd / Hitachi ZX55U 8t Excavator	L:		MW
			Scale 1:50

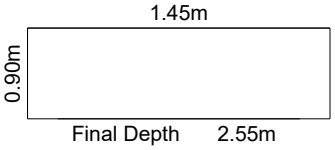
Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend
Results	Type	Depth				
	ES	0.10	(0.18)		(Loose) Greyish black mottled white and brown silty sandy GRAVEL. Gravel is fine to coarse subangular to sub rounded of brick fragments, clinker ,concrete and ceramic. ()	
			0.18			
	ES	0.40	(0.30)		Firm dark greyish brown mottled black slightly sandy gravelly SILT. Gravel is fine to coarse subangular of brick fragments concrete and occasional ceramics. ()	
			0.48			
					Firm blueish brown mottled orange silty CLAY becoming soft from 1.20m. ()	
			1			
			(2.07)			
			2			
			2.55		End of Trial Pit at 2.55m	
			3			
			4			

Remarks

1] Consistency, strength and density indicators are based upon field judgement. 2] Density indicator is in brackets and is for guidance only, and is not in accordance with BS 5930:2015. 3] Trial pit terminated at scheduled depth. 4] Trial pit backfilled with arisings.

Pit Stability: Stable

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.



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Borehole No.

TP202

Sheet 1 of 1

Project Name	Project No.	Date	Hole Type
Kelvedon Street	13203	20/08/2025 to 20/08/2025	TP

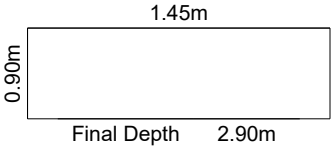
Client	Co-ords	Water Strike Details		Logged By
MVR Solutions Limited	E: 332243.89	Depth Strike	Remarks	SW
	N: 187751.88	2.90	Very slow infiltration	Approved By
Contractor: M&J Plant & transport Ltd	L:	Plant Used: Hitachi ZX55U 8t Excavator		MW
				Scale 1:50

Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend
Results	Type	Depth				
	ES	0.10	(0.14) 0.14		(Loose) Greyish black mottled white and brown silty sandy GRAVEL. Gravel is fine to coarse subangular to subrounded of brick fragments, clinker, concrete and ceramic. ()	
			(0.44)		(Medium dense) dark greyish brown mottled black sandy gravelly SILT. Gravel is fine to coarse subangular of brick fragments, concrete, plastic waste and occasional ceramics. ()	
	ES	0.50	0.58		Firm blueish brown mottled orange silty CLAY becoming soft from 1.20m. ()	
			1			
			(2.32)			
			2			
			2.90		End of Trial Pit at 2.90m	
			3			
			4			

Remarks

1] Consistency, strength and density indicators are based upon field judgement. 2] Density indicator is in brackets and is for guidance only, and is not in accordance with BS 5930:2015. 3] Trial pit terminated at extent of excavator's reach. 4] Trial pit backfilled with arisings.

Pit Stability: Stable



Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

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PO2 8FA

Borehole No.

TP203

Sheet 1 of 1

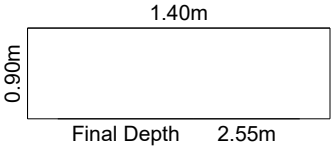
Project Name Kelvedon Street	**Project No.** 13203	**Date** 20/08/2025 to 20/08/2025	**Hole Type** TP
Client MVR Solutions Limited	**Co-ords** E: 332274.64 N: 187730.39 L:	**Water Strike Details** Depth Strike / Remarks	**Logged By** SW
Contractor M&J Plant & transport Ltd	**Plant Used** Hitachi ZX55U 8t Excavator		**Approved By** MW
			Scale 1:50

Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend
Results	Type	Depth				
	ES	0.20	(0.20) 0.20		(Loose) Greyish black mottled white and brown silty sandy GRAVEL. Gravel is fine to coarse subangular to subrounded of brick fragments, clinker, concrete and ceramic. ()	
	ES	0.30	(0.38) 0.58		(Medium dense) Dark greyish brown mottled black slightly sandy gravelly SILT. Gravel is fine to coarse subangular of brick fragments, concrete ,plastic waste and occasional ceramics. ()	
			1 (1.50)		Firm brownish orange mottled blue silty CLAY becoming soft from 1.15m. ()	
			2 2.08 (0.47) 2.55		Soft to very soft blueish brown mottled orange silty CLAY. ()	
			3 4		End of Trial Pit at 2.55m	

Remarks

1] Consistency, strength and density indicators are based upon field judgement. 2] Density indicator is in brackets and is for guidance only, and is not in accordance with BS 5930:2015. 3] Trial pit terminated at scheduled depth. 4] Trial pit backfilled with arisings.

Pit Stability: Stable



Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

terra firma earth matters

Consulting Geotechnical, Geo-Environmental Engineers & Site Investigation Contractors

Phone: 033 022 36380 Email: hello@tfwgroup.co.uk

Cardiff Office
5 Deryn Court
Wharfedale Road
Pentwyn
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Exeter Office
The Slate Barn
Lower Lowley
Dunsford
Exeter
EX6 7BP

Portsmouth Office
Technopole
Kingston Crescent
North End
Portsmouth
PO2 8FA

Borehole No.

TP204

Sheet 1 of 1

Project Name	**Project No.**	**Date**	**Hole Type**
Kelvedon Street	13203	20/08/2025 to 20/08/2025	TP
Client	**Co-ords**	**Water Strike Details**	**Logged By**
MVR Solutions Limited	E: 332272.49	Depth Strike / Remarks	SW
Contractor / **Plant Used**	N: 187708.26		**Approved By**
M&J Plant & transport Ltd / Hitachi ZX55U 8t Excavator	L:		MW
			Scale 1:50

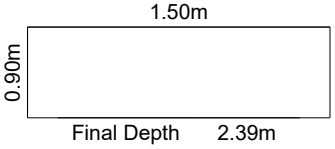
Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend
Results	Type	Depth				
			(0.21) 0.21		(Loose) Greyish black mottled white and brown silty sandy GRAVEL. Gravel is fine to coarse subangular to subrounded of brick fragments, clinker, concrete and ceramic. ()	
	ES	0.30				
	ES	0.50	(0.62) 0.83		(Medium dense) dark greyish brown mottled black slightly sandy gravelly SILT. Gravel is fine to coarse subangular of brick fragments, concrete, plastic waste ash and ceramics. ()	
			1		Firm brownish orange mottled blue silty CLAY becoming soft from 1.25m. ()	
			(0.99) 1.82			
			2		Soft to very soft blueish brown mottled orange silty CLAY. ()	
			(0.57) 2.39			
					End of Trial Pit at 2.39m	
			3			
			4			

Remarks

1] Consistency, strength and density indicators are based upon field judgement. 2] Density indicator is in brackets and is for guidance only, and is not in accordance with BS 5930:2015. 3] Trial pit terminated at scheduled depth. 4] Trial pit backfilled with arisings.

Pit Stability: Stable

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.



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Dunsford
Exeter
EX6 7BP

Portsmouth Office
Technopole
Kingston Crescent
North End
Portsmouth
PO2 8FA

Borehole No.

TP205

Sheet 1 of 1

Project Name	Project No.	Date	Hole Type
Kelvedon Street	13203	20/08/2025 to 20/08/2025	TP

Client	Co-ords	Water Strike Details		Logged By
MVR Solutions Limited	E: 332263.17	Depth Strike	Remarks	SW

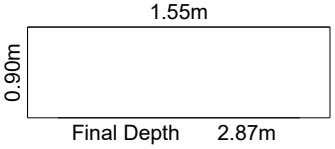
Contractor	Plant Used		Approved By
M&J Plant & transport Ltd	Hitachi ZX55U 8t Excavator	N: 187724.15 L:	MW

Scale 1:50

Samples and Results			Depth, (Thickness)	Level	Stratum Description	Legend
Results	Type	Depth				
	ES	0.10	(0.17) 0.17		(Loose) Greyish white mottled black and brown silty sandy GRAVEL. Gravel is fine to coarse subangular to subrounded of brick fragments, clinker, concrete and ceramic. ()	
			(0.28) 0.45		(Medium dense) Dark greyish brown mottled black sandy gravelly SILT. Gravel is fine to coarse subangular of brick fragments, concrete, plastic waste and ceramics. ()	
	ES	0.60	1 (1.03)		Firm brownish orange mottled blue silty CLAY becoming soft from 1.20m.. ()	
			1.48		Soft to very soft blueish brown mottled orange silty CLAY. ()	
			2 (1.39)			
			2.87		End of Trial Pit at 2.87m	
			3			
			4			

Remarks

1] Consistency, strength and density indicators are based upon field judgement. 2] Density indicator is in brackets and is for guidance only, and is not in accordance with BS 5930:2015. 3] Trial pit terminated at scheduled depth. 4] Trial pit backfilled with arisings.



Pit Stability: Stable

Notes: For all symbols and abbreviations please see key sheet. All depths and measurements in metres. Stratum thicknesses given in brackets.

ANNEX B
Soakaway Test Results

SOAKAWAY TEST

terra firma
Geotechnical & Geoenvironmental Specialists

Site Name: Kelvedon Street
Project Number: 13203
Date: 23/11/2024
Engineer: Sam Williams

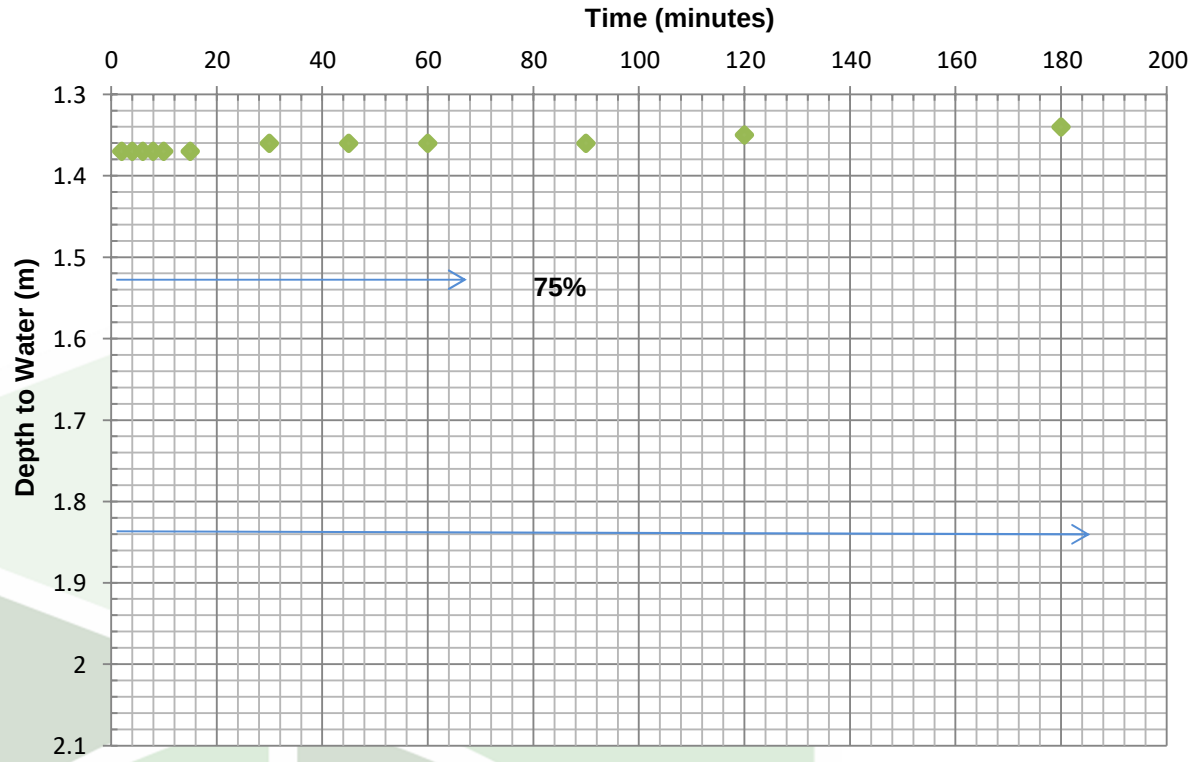
Trial Pit: 1

TEST 1

Length	1.80	m
Width	0.71	m
Depth	2.00	m
Fill Level	1.37	m

V_{p75-25}	0.125	m^3
a_{p50}	1.098	m^2
t_{p75-25}	0	minutes

Soil Infiltration Rate, f Too little intake to calculate infiltration rate



REMARKS:
Test carried out in general accordance with BRE DIGEST 365 (2016)

terra firma
Geotechnical & Geoenvironmental Specialists
www.terrafirmawales.co.uk

SOAKAWAY TEST

Time (mins)	Depth to Water (m)
2	1.37
4	1.37
6	1.37
8	1.37
10	1.37
15	1.37
30	1.36
45	1.36
60	1.36
90	1.36
120	1.35
180	1.34

Effective Depth (m)	0.63
Height to 0.75H	1.5275
Height to 0.25H	1.8425
tp75	
tp25	

Time (mins)	Depth to Water (m)
2	1.37
4	1.37
6	1.37
8	1.37
10	1.37
15	1.37
30	1.36
45	1.36
60	1.36
90	1.36
120	1.35
180	1.34

Effective Depth (m)	0.00
Height to 0.75H	0
Height to 0.25H	0
tp75	
tp25	

Time (mins)	Depth to Water (m)

Effective Depth (m)	0.00
Height to 0.75H	0
Height to 0.25H	0
tp75	
tp25	

SOAKAWAY TEST

terra firma
Geotechnical & Geoenvironmental Specialists

Site Name: Kelvedon Street
Project Number: 13203
Date: 05/11/2024
Engineer: Sam Williams

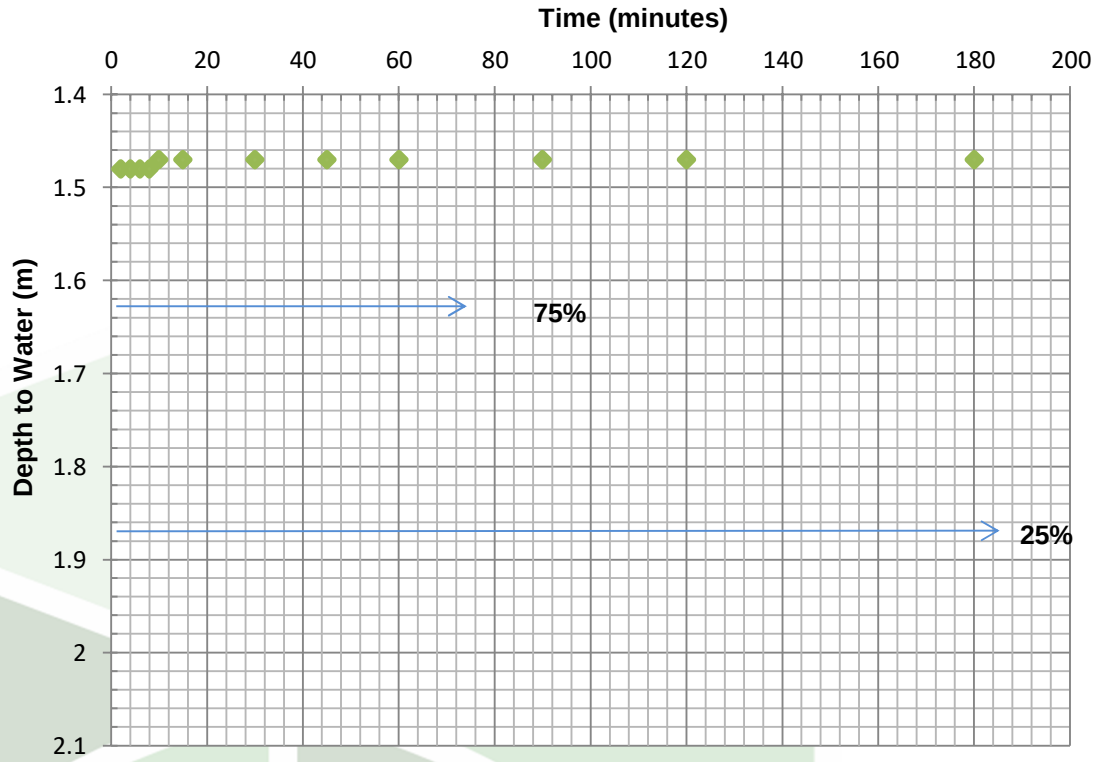
Trial Pit: 2

TEST 1

Length	1.80	m
Width	0.70	m
Depth	2.00	m
Fill Level	1.49	m

V_{p75-25}	0.098	m^3
a_{p50}	0.945	m^2
t_{p75-25}	0	minutes

Soil Infiltration Rate, f Too little intake to calculate infiltration rate



REMARKS:
Test carried out in general accordance with BRE DIGEST 365 (2016)

SOAKAWAY TEST

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Time (mins)	Depth to Water (m)
2	1.48
4	1.48
6	1.48
8	1.48
10	1.47
15	1.47
30	1.47
45	1.47
60	1.47
90	1.47
120	1.47
180	1.47

Effective Depth (m)	0.51
Height to 0.75H	1.6175
Height to 0.25H	1.8725
tp75	
tp25	

1.98
1.98
1.98
1.98
1.97
1.97
1.97
1.97
1.97
1.97
1.97
1.97
1.97
0.5

Time (mins)	Depth to Water (m)

Effective Depth (m)	0.00
Height to 0.75H	0
Height to 0.25H	0
tp75	
tp25	

Time (mins)	Depth to Water (m)

Effective Depth (m)	0.00
Height to 0.75H	0
Height to 0.25H	0
tp75	
tp25	

SOAKAWAY TEST

terra firma
Geotechnical & Geoenvironmental Specialists

Site Name: Kelvedon Street
Project Number: 13203
Date: 05/11/2024
Engineer: Sam Williams

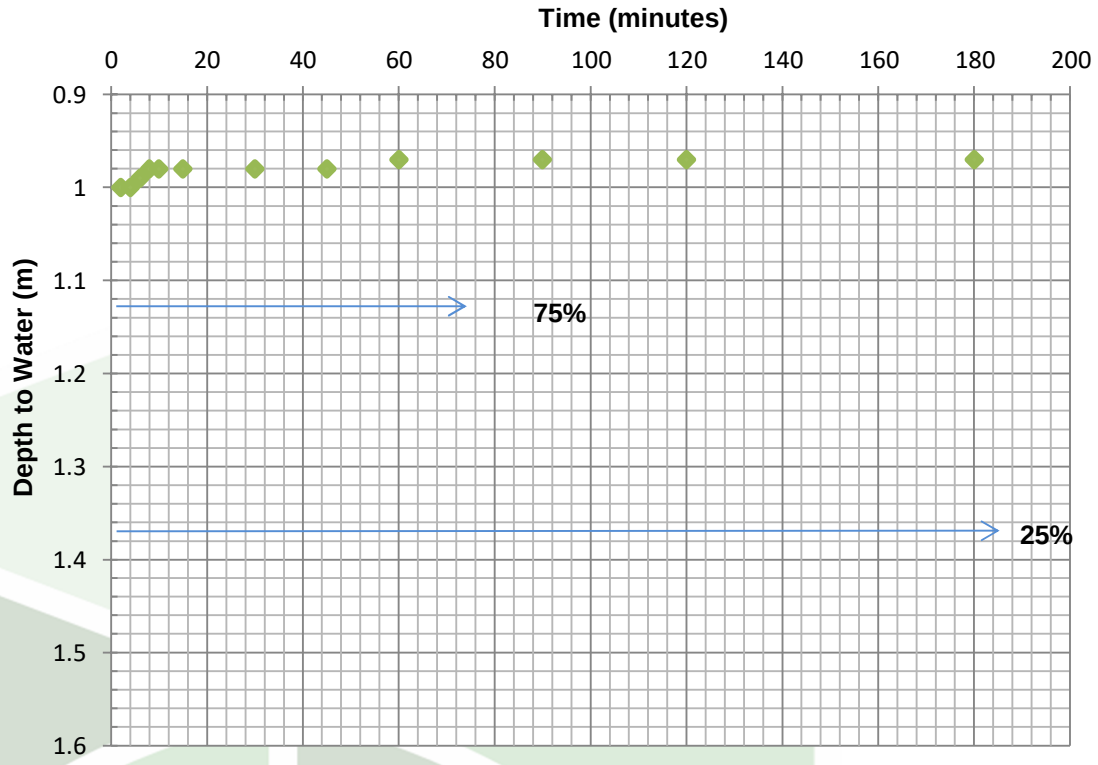
Trial Pit: 3

TEST 1

Length	1.80	m
Width	0.70	m
Depth	1.50	m
Fill Level	0.98	m

V_{p75-25}	0.100	m^3
a_{p50}	0.956	m^2
t_{p75-25}	0	minutes

Soil Infiltration Rate, f Too little intake to calculate infiltration rate



REMARKS:
Test carried out in general accordance with BRE DIGEST 365 (2016)

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SOAKAWAY TEST

Time (mins)	Depth to Water (m)
2	1
4	1
6	0.99
8	0.98
10	0.98
15	0.98
30	0.98
45	0.98
60	0.97
90	0.97
120	0.97
180	0.97

Effective Depth (m)	0.52
Height to 0.75H	1.11
Height to 0.25H	1.37
tp75	
tp25	

Time (mins)	Depth to Water (m)

Effective Depth (m)	0.00
Height to 0.75H	0
Height to 0.25H	0
tp75	
tp25	

Time (mins)	Depth to Water (m)

Effective Depth (m)	0.00
Height to 0.75H	0
Height to 0.25H	0
tp75	
tp25	

ANNEX C
Laboratory Chemical Test Results

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	24-34970-1
Initial Date of Issue:	01-Nov-2024
Re-Issue Details:	
Client	Terra Firma
Client Address:	5 Deryn Court Wharfedale Road Pentwyn Cardiff CF23 7HA
Contact(s):	s.williams@tfwgroup.co.uk; elliot@terrafirmawales.co.uk
Project	13203

Quotation No.:		**Date Received:**	28-Oct-2024
Order No.:	13203	**Date Instructed:**	28-Oct-2024
No. of Samples:	5		
Turnaround (Wkdays):	5	**Results Due:**	01-Nov-2024
Date Approved:	01-Nov-2024		

Approved By:



Details: David Smith, Technical Director

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Soil

Project: 13203

Client: Terra Firma				**Chemtest Job No.:**		24-34970	24-34970	24-34970	24-34970	24-34970
Quotation No.:				**Chemtest Sample ID.:**		1886684	1886685	1886686	1886687	1886688
Order No.: 13203				Client Sample Ref.:		TP1	TP2	TP3	TP4	TP5
				Client Sample ID.:		TP1	TP2	TP3	TP4	TP5
				Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):		0.10	1.80	0.10	0.10	0.10
				Bottom Depth (m):		0.20	1.90	0.20	0.20	0.20
				Date Sampled:		23-Oct-2024	23-Oct-2024	23-Oct-2024	23-Oct-2024	23-Oct-2024
				Time Sampled:		12:00	12:00	12:00	12:00	12:00
				Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**					
ACM Type		U	2192		N/A	-	-	-	-	-
Asbestos Identification		U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture		N	2030	%	0.020	14	21	14	20	21
Soil Colour		N	2040		N/A	Brown	Brown	Brown	Brown	Brown
Other Material		N	2040		N/A	Stones	Stones	Stones and Roots	Stones	Stones
Soil Texture		N	2040		N/A	Sand	Clay	Sand	Sand	Sand
pH at 20C		M	2010		4.0	10.4	8.3	8.9	8.2	8.4
Boron (Hot Water Soluble)		M	2120	mg/kg	0.40	0.76	1.6	0.83	0.89	0.54
Cyanide (Complex)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Free)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Sulphate (Acid Soluble)		U	2430	%	0.010	0.20	0.065	0.10	0.079	0.077
Arsenic		M	2455	mg/kg	0.5	36	8.1	12	29	32
Beryllium		U	2455	mg/kg	0.5	1.7	0.6	0.6	1.4	1.4
Cadmium		M	2455	mg/kg	0.10	0.42	< 0.10	0.29	0.28	0.40
Chromium		M	2455	mg/kg	0.5	35	23	18	16	27
Mercury Low Level		N	2450	mg/kg	0.05	0.26	< 0.05	0.14	0.37	0.52
Manganese		M	2455	mg/kg	1.0	710	460	640	270	570
Molybdenum		M	2455	mg/kg	0.5	3.7	< 0.5	0.8	3.3	2.2
Antimony		N	2455	mg/kg	2.0	4.2	< 2.0	< 2.0	4.5	2.9
Copper		M	2455	mg/kg	0.50	79	7.5	32	140	74
Nickel		M	2455	mg/kg	0.50	50	21	19	36	31
Lead		M	2455	mg/kg	0.50	230	18	74	210	180
Selenium		M	2455	mg/kg	0.25	1.7	0.39	0.64	1.4	1.4
Zinc		M	2455	mg/kg	0.50	230	63	130	200	220
Chromium (Trivalent)		N	2490	mg/kg	1.0	35	23	18	16	27
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Aliphatic VPH >C5-C6	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C7	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C7-C8	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C8 (Sum)	HS_2D_AL	N	2780	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic VPH >C8-C10	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Aliphatic VPH >C5-C10	HS_2D_AL	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Aliphatic EPH >C10-C12 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0

Results - Soil

Project: 13203

Client: Terra Firma				**Chemtest Job No.:**		24-34970	24-34970	24-34970	24-34970	24-34970
Quotation No.:				**Chemtest Sample ID.:**		1886684	1886685	1886686	1886687	1886688
Order No.: 13203				Client Sample Ref.:		TP1	TP2	TP3	TP4	TP5
				Client Sample ID.:		TP1	TP2	TP3	TP4	TP5
				Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):		0.10	1.80	0.10	0.10	0.10
				Bottom Depth (m):		0.20	1.90	0.20	0.20	0.20
				Date Sampled:		23-Oct-2024	23-Oct-2024	23-Oct-2024	23-Oct-2024	23-Oct-2024
				Time Sampled:		12:00	12:00	12:00	12:00	12:00
				Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**					
Aliphatic EPH >C12-C16 MC	EH_2D_AL_#1	M	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aliphatic EPH >C16-C21 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Aliphatic EPH >C21-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	3.00	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Aliphatic EPH >C35-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	< 10	< 10	< 10	< 10	< 10
Total Aliphatic EPH >C10-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	5.00	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Aliphatic EPH >C10-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	< 10	< 10	< 10	< 10	< 10
Aromatic VPH >C5-C7	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C7-C8	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C8-C10	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Aromatic VPH >C5-C10	HS_2D_AR	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Aromatic EPH >C10-C12 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic EPH >C12-C16 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Aromatic EPH >C16-C21 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	11	6.0	49	12	7.0
Aromatic EPH >C21-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	13	< 2.0	58	6.9	5.3
Aromatic EPH >C35-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	1.00	1.6	< 1.0	6.5	< 1.0	< 1.0
Total Aromatic EPH >C10-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	5.00	24	6.0	110	18	12
Total Aromatic EPH >C10-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	10.00	26	< 10	110	18	12
Total VPH >C5-C10	HS_2D_Total	U	2780	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Total EPH >C10-C35 MC	EH_2D_Total_#1	U	2690	mg/kg	10.00	25	< 10	110	19	14
Total EPH >C10-C40 MC	EH_2D_Total_#1	N	2690	mg/kg	10.00	26	< 10	110	19	14
Dichlorodifluoromethane		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloromethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane		M	2760	µg/kg	20	< 20	< 20	< 20	< 20	< 20
Chloroethane		U	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichlorofluoromethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans 1,2-Dichloroethene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromochloromethane		U	2760	µg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trichloromethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene		M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010

Results - Soil

Project: 13203

Client: Terra Firma				**Chemtest Job No.:**		24-34970	24-34970	24-34970	24-34970	24-34970
Quotation No.:				**Chemtest Sample ID.:**		1886684	1886685	1886686	1886687	1886688
Order No.: 13203				Client Sample Ref.:		TP1	TP2	TP3	TP4	TP5
				Client Sample ID.:		TP1	TP2	TP3	TP4	TP5
				Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):		0.10	1.80	0.10	0.10	0.10
				Bottom Depth (m):		0.20	1.90	0.20	0.20	0.20
				Date Sampled:		23-Oct-2024	23-Oct-2024	23-Oct-2024	23-Oct-2024	23-Oct-2024
				Time Sampled:		12:00	12:00	12:00	12:00	12:00
				Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**					
Benzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane		M	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichloroethene		N	2760	µg/kg	1.0	5.3	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane		M	2760	µg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
cis-1,3-Dichloropropene		N	2760	µg/kg	10	< 10	< 10	< 10	< 10	< 10
Toluene		M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Toluene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene		N	2760	µg/kg	10	< 10	< 10	< 10	< 10	< 10
1,1,2-Trichloroethane		M	2760	µg/kg	10	< 10	< 10	< 10	< 10	< 10
Tetrachloroethene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane		U	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Dibromochloromethane		U	2760	µg/kg	10	< 10	< 10	< 10	< 10	< 10
1,2-Dibromoethane		M	2760	µg/kg	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chlorobenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane		M	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene		M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Ethylbenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene		M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
m & p-Xylene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene		M	2760	mg/kg	0.0010	< 0.0010	0.0040	< 0.0010	< 0.0010	< 0.0010
o-Xylene		M	2760	µg/kg	1.0	< 1.0	4.0	< 1.0	< 1.0	< 1.0
Styrene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane		N	2760	µg/kg	50	< 50	< 50	< 50	< 50	< 50
N-Propylbenzene		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tert-Butylbenzene		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Sec-Butylbenzene		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results - Soil

Project: 13203

Client: Terra Firma				**Chemtest Job No.:**		24-34970	24-34970	24-34970	24-34970	24-34970
Quotation No.:				**Chemtest Sample ID.:**		1886684	1886685	1886686	1886687	1886688
Order No.: 13203				Client Sample Ref.:		TP1	TP2	TP3	TP4	TP5
				Client Sample ID.:		TP1	TP2	TP3	TP4	TP5
				Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):		0.10	1.80	0.10	0.10	0.10
				Bottom Depth (m):		0.20	1.90	0.20	0.20	0.20
				Date Sampled:		23-Oct-2024	23-Oct-2024	23-Oct-2024	23-Oct-2024	23-Oct-2024
				Time Sampled:		12:00	12:00	12:00	12:00	12:00
				Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**					
4-Isopropyltoluene		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Butylbenzene		U	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane		U	2760	µg/kg	50	< 50	< 50	< 50	< 50	< 50
1,2,4-Trichlorobenzene		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene		N	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene		U	2760	µg/kg	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether		M	2760	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Methyl Tert-Butyl Ether		M	2760	µg/kg	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Nitrosodimethylamine		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenol		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chlorophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,3-Dichlorobenzene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,4-Dichlorobenzene		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2-Dichlorobenzene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methylphenol		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachloroethane		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Methylphenol		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Nitrobenzene		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Isophorone		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitrophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dimethylphenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroethoxy)Methane		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dichlorophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2,4-Trichlorobenzene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Naphthalene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chloroaniline		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobutadiene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chloro-3-Methylphenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methylnaphthalene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Nitrophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4,6-Trichlorophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

Results - Soil

Project: 13203

Client: Terra Firma				**Chemtest Job No.:**		24-34970	24-34970	24-34970	24-34970	24-34970
Quotation No.:				**Chemtest Sample ID.:**		1886684	1886685	1886686	1886687	1886688
Order No.: 13203				Client Sample Ref.:		TP1	TP2	TP3	TP4	TP5
				Client Sample ID.:		TP1	TP2	TP3	TP4	TP5
				Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):		0.10	1.80	0.10	0.10	0.10
				Bottom Depth (m):		0.20	1.90	0.20	0.20	0.20
				Date Sampled:		23-Oct-2024	23-Oct-2024	23-Oct-2024	23-Oct-2024	23-Oct-2024
				Time Sampled:		12:00	12:00	12:00	12:00	12:00
				Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**					
2,4,5-Trichlorophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chloronaphthalene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitroaniline		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Acenaphthylene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dimethylphthalate		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,6-Dinitrotoluene		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Acenaphthene		M	2790	mg/kg	0.50	< 0.50	< 0.50	0.99	0.97	< 0.50
3-Nitroaniline		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibenzofuran		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	0.62	< 0.50
4-Chlorophenylphenylether		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dinitrotoluene		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fluorene		M	2790	mg/kg	0.50	< 0.50	< 0.50	0.90	0.89	< 0.50
Diethyl Phthalate		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Nitroaniline		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Azobenzene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Bromophenylphenyl Ether		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobenzene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenanthrene		M	2790	mg/kg	0.50	< 0.50	< 0.50	10	11	1.1
Anthracene		M	2790	mg/kg	0.50	< 0.50	< 0.50	2.7	2.8	< 0.50
Carbazole		M	2790	mg/kg	0.50	< 0.50	< 0.50	0.77	0.82	< 0.50
Di-N-Butyl Phthalate		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fluoranthene		M	2790	mg/kg	0.50	< 0.50	< 0.50	15	17	3.5
Pyrene		M	2790	mg/kg	0.50	< 0.50	< 0.50	14	15	3.5
Butylbenzyl Phthalate		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[a]anthracene		M	2790	mg/kg	0.50	< 0.50	< 0.50	8.4	10	2.6
Chrysene		M	2790	mg/kg	0.50	< 0.50	< 0.50	8.0	11	2.8
Bis(2-Ethylhexyl)Phthalate		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Di-N-Octyl Phthalate		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[b]fluoranthene		M	2790	mg/kg	0.50	< 0.50	< 0.50	11	12	4.0
Benzo[k]fluoranthene		M	2790	mg/kg	0.50	< 0.50	< 0.50	3.9	5.0	1.4
Benzo[a]pyrene		M	2790	mg/kg	0.50	< 0.50	< 0.50	8.8	11	2.9
Indeno(1,2,3-c,d)Pyrene		N	2790	mg/kg	0.50	< 0.50	< 0.50	4.6	5.7	1.9
Dibenz(a,h)Anthracene		N	2790	mg/kg	0.50	< 0.50	< 0.50	1.6	2.1	0.66
Benzo[g,h,i]perylene		M	2790	mg/kg	0.50	< 0.50	< 0.50	5.4	6.5	2.3
Naphthalene		M	2800	mg/kg	0.10	0.73	< 0.10	0.90	0.31	0.19
Acenaphthylene		N	2800	mg/kg	0.10	0.26	< 0.10	0.61	0.29	0.15

Results - Soil

Project: 13203

Client: Terra Firma				**Chemtest Job No.:**		24-34970	24-34970	24-34970	24-34970	24-34970
Quotation No.:				**Chemtest Sample ID.:**		1886684	1886685	1886686	1886687	1886688
Order No.: 13203				Client Sample Ref.:		TP1	TP2	TP3	TP4	TP5
				Client Sample ID.:		TP1	TP2	TP3	TP4	TP5
				Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):		0.10	1.80	0.10	0.10	0.10
				Bottom Depth (m):		0.20	1.90	0.20	0.20	0.20
				Date Sampled:		23-Oct-2024	23-Oct-2024	23-Oct-2024	23-Oct-2024	23-Oct-2024
				Time Sampled:		12:00	12:00	12:00	12:00	12:00
				Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**					
Acenaphthene		M	2800	mg/kg	0.10	0.97	< 0.10	3.2	0.38	0.29
Fluorene		M	2800	mg/kg	0.10	0.89	< 0.10	2.5	0.43	0.45
Phenanthrene		M	2800	mg/kg	0.10	8.6	0.16	27	5.2	7.2
Anthracene		M	2800	mg/kg	0.10	2.1	< 0.10	8.0	1.4	2.3
Fluoranthene		M	2800	mg/kg	0.10	13	0.33	42	9.8	15
Pyrene		M	2800	mg/kg	0.10	11	0.25	34	7.8	12
Benzo[a]anthracene		M	2800	mg/kg	0.10	6.2	< 0.10	24	6.8	12
Chrysene		M	2800	mg/kg	0.10	6.3	< 0.10	18	5.1	8.8
Benzo[b]fluoranthene		M	2800	mg/kg	0.10	9.4	< 0.10	30	8.3	14
Benzo[k]fluoranthene		M	2800	mg/kg	0.10	3.5	< 0.10	10	2.5	4.3
Benzo[a]pyrene		M	2800	mg/kg	0.10	8.0	< 0.10	27	7.7	12
Indeno(1,2,3-c,d)Pyrene		M	2800	mg/kg	0.10	5.3	< 0.10	19	5.0	7.7
Dibenz(a,h)Anthracene		N	2800	mg/kg	0.10	1.0	< 0.10	2.9	0.90	1.4
Benzo[g,h,i]perylene		M	2800	mg/kg	0.10	5.3	< 0.10	14	3.5	5.5
Total Of 16 PAH's		N	2800	mg/kg	2.0	83	< 2.0	260	65	100
PCB 81		N	2815	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
PCB 77		N	2815	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
PCB 105		N	2815	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
PCB 114		N	2815	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
PCB 118		N	2815	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
PCB 123		N	2815	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
PCB 126		N	2815	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
PCB 156		N	2815	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
PCB 157		N	2815	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
PCB 167		N	2815	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
PCB 169		N	2815	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
PCB 189		N	2815	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Total PCBs (12 Congeners)		N	2815	mg/kg	0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Total Phenols		M	2920	mg/kg	0.10	< 0.10	< 0.10	0.10	< 0.10	< 0.10
Organic Matter BS1377		N	2930	%	0.10	4.2	2.0	3.5	5.1	4.1
SVOC TIC		N	2790	mg/kg	N/A	None Detected	None Detected	See Below	See Below	See Below
(SVOC TIC) 9H-Xanthene		N	2790	mg/kg	N/A			0.44	0.46	
(SVOC TIC) Benzo[e]pyrene		N	2790	mg/kg	N/A			6.74		2.96
(SVOC TIC) Dibenzothiophene		N	2790	mg/kg	N/A			0.79	0.67	
(SVOC TIC) Perylene		N	2790	mg/kg	N/A				2.91	

Results - Soil

Project: 13203

Client: Terra Firma				**Chemtest Job No.:**		24-34970	24-34970	24-34970	24-34970	24-34970
Quotation No.:				**Chemtest Sample ID.:**		1886684	1886685	1886686	1886687	1886688
Order No.: 13203				Client Sample Ref.:		TP1	TP2	TP3	TP4	TP5
				Client Sample ID.:		TP1	TP2	TP3	TP4	TP5
				Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):		0.10	1.80	0.10	0.10	0.10
				Bottom Depth (m):		0.20	1.90	0.20	0.20	0.20
				Date Sampled:		23-Oct-2024	23-Oct-2024	23-Oct-2024	23-Oct-2024	23-Oct-2024
				Time Sampled:		12:00	12:00	12:00	12:00	12:00
				Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**					
(SVOC TIC) Picene		N	2790	mg/kg	N/A			1.04	1.11	
VOC TIC		N	2760	µg/kg	N/A	None Detected	None Detected	None Detected	None Detected	None Detected

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
2010	pH Value of Soils	pH at 20°C	pH Meter	
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <30°C.	
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930	
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES	
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry	
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.	
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.	
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.	
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.	
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.	
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40	Acetone/Heptane extraction / GCxGC FID detection	
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.	
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8-C10 Aromatics: >C5–C7,>C7-C8,>C8–C10	Water extraction / Headspace GCxGC FID detection	
2790	Semi-Volatile Organic Compounds (SVOCs) in Soils by GC-MS	Semi-volatile organic compounds(cf. USEPA Method 8270)	Acetone/Hexane extraction / GC-MS	
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS	
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS. Reported PCB 101 results may contain contributions from PCB 90 due to inseparable chromatography.	
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.	
2930	Organic Matter	Organic Matter	Acid Dichromate digestion/Titration	

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

This report shall not be reproduced except in full, and only with the prior approval of the laboratory.
Any comments or interpretations are outside the scope of UKAS accreditation.
The Laboratory is not accredited for any sampling activities and reported results relate to the samples 'as received' at the laboratory.
Uncertainty of measurement for the determinands tested are available upon request .
None of the results in this report have been recovery corrected.
All results are expressed on a dry weight basis.

The following tests were analysed on samples 'as received' and the results subsequently corrected to a dry weight basis EPH, VPH, TPH, BTEX, VOCs, SVOCs, PCBs, Phenols.

For all other tests the samples were dried at ≤ 30°C prior to analysis.
All Asbestos testing is performed at the indicated laboratory .
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1.

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt.
All water samples will be retained for 14 days from the date of receipt.
Charges may apply to extended sample storage.

Water Sample Category Key for Accreditation

DW - Drinking Water
GW - Ground Water
LE - Land Leachate
NA - Not Applicable

Report Information

PL - Prepared Leachate
PW - Processed Water
RE - Recreational Water
SA - Saline Water
SW - Surface Water
TE - Treated Effluent
TS - Treated Sewage
UL - Unspecified Liquid

Clean Up Codes

NC - No Clean Up
MC - Mathematical Clean Up
FC - Florisil Clean Up

HWOL Acronym System

HS - Headspace analysis
EH - Extractable hydrocarbons – i.e. everything extracted by the solvent
CU - Clean-up – e.g. by Florisil, silica gel
1D - GC – Single coil gas chromatography
Total - Aliphatics & Aromatics
AL - Aliphatics only
AR - Aromatic only
2D - GC-GC – Double coil gas chromatography
#1 - EH_2D_Total but with humics mathematically subtracted
#2 - EH_2D_Total but with fatty acids mathematically subtracted
+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	24-35081-1
Initial Date of Issue:	06-Nov-2024
Re-Issue Details:	
Client	Terra Firma
Client Address:	5 Deryn Court Wharfedale Road Pentwyn Cardiff CF23 7HA
Contact(s):	f.linklater@tfwgroup.co.uk
Project	Kelvedon 13203

Quotation No.:		**Date Received:**	29-Oct-2024
Order No.:	13203	**Date Instructed:**	29-Oct-2024
No. of Samples:	8		
Turnaround (Wkdays):	5	**Results Due:**	04-Nov-2024
Date Approved:	06-Nov-2024		

Approved By:



Details: David Smith, Technical Director

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Soil

Project: Kelvedon 13203

Client: Terra Firma				**Chemtest Job No.:**		24-35081	24-35081	24-35081	24-35081	24-35081	24-35081	24-35081
Quotation No.:				**Chemtest Sample ID.:**		1887074	1887075	1887076	1887077	1887078	1887079	1887080
				Client Sample ID.:		BH1 0.5	BH3 1.2	BH4 0.2	BH1 0.2	BH3 0.3	BH4 0.4	BH3 2.3
				Sample Location:		Kelvedon	Kelvedon	Kelvedon	Kelvedon	Kelvedon	Kelvedon	Kelvedon
				Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):		0.5	1.2	0.2	0.2	0.3	0.4	2.3
				Bottom Depth (m):		0.5	1.2	0.2	0.2	0.3	0.4	2.3
				Date Sampled:		25-Oct-2024	25-Oct-2024	25-Oct-2024	25-Oct-2024	25-Oct-2024	25-Oct-2024	25-Oct-2024
				Time Sampled:		12:00	12:00	12:00	12:00	12:00	12:00	12:00
				Asbestos Lab:					DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**							
ACM Type		U	2192		N/A				-	-	-	-
Asbestos Identification		U	2192		N/A				No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
Moisture		N	2030	%	0.020	22	19	13	11	16	29	29
Soil Colour		N	2040		N/A				Brown	Brown	Black	Grey
Other Material		N	2040		N/A				Stones and Roots	Stones and Roots	Stones and Roots	Roots
Soil Texture		N	2040		N/A				Sand	Sand	Sand	Clay
pH at 20C		M	2010		4.0	8.4	8.6	8.8	8.5	8.4	7.6	8.4
Boron (Hot Water Soluble)		M	2120	mg/kg	0.40				< 0.40	0.63	1.3	2.8
Magnesium (Water Soluble)		N	2120	g/l	0.010	0.010	0.011	< 0.010				
Sulphate (2:1 Water Soluble) as SO4		M	2120	g/l	0.010	< 0.010	0.013	< 0.010				
Total Sulphur		U	2175	%	0.010	0.020	0.030	0.050				
Chloride (Water Soluble)		M	2220	g/l	0.010	< 0.010	< 0.010	< 0.010				
Nitrate (Water Soluble)		N	2220	g/l	0.010	< 0.010	< 0.010	< 0.010				
Cyanide (Complex)		M	2300	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Free)		M	2300	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
Cyanide (Total)		M	2300	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
Ammonium (Water Soluble)		M	2220	g/l	0.01	< 0.01	< 0.01	< 0.01				
Sulphate (Acid Soluble)		U	2430	%	0.010	0.046	0.032	0.054	0.079	0.037	0.087	0.085
Arsenic		M	2455	mg/kg	0.5				16	25	26	5.4
Beryllium		U	2455	mg/kg	0.5				0.7	1.0	1.0	0.8
Cadmium		M	2455	mg/kg	0.10				0.40	0.29	0.18	< 0.10
Chromium		M	2455	mg/kg	0.5				15	33	12	22
Mercury Low Level		N	2450	mg/kg	0.05				0.16	0.33	0.16	< 0.05
Manganese		M	2455	mg/kg	1.0				460	550	150	550
Molybdenum		M	2455	mg/kg	0.5				1.7	2.9	4.0	< 0.5
Antimony		N	2455	mg/kg	2.0				< 2.0	2.2	< 2.0	< 2.0
Copper		M	2455	mg/kg	0.50				47	52	51	6.7
Nickel		M	2455	mg/kg	0.50				23	39	31	20
Lead		M	2455	mg/kg	0.50				110	210	77	16
Selenium		M	2455	mg/kg	0.25				0.78	0.85	1.3	0.46
Zinc		M	2455	mg/kg	0.50				170	150	120	62
Chromium (Trivalent)		N	2490	mg/kg	1.0				15	33	12	22
Chromium (Hexavalent)		N	2490	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
Aliphatic VPH >C5-C6	HS_2D_AL	U	2780	mg/kg	0.05				< 0.05	< 0.05	< 0.05	< 0.05

Results - Soil

Project: Kelvedon 13203

Client: Terra Firma				**Chemtest Job No.:**		24-35081	24-35081	24-35081	24-35081	24-35081	24-35081	24-35081
Quotation No.:				**Chemtest Sample ID.:**		1887074	1887075	1887076	1887077	1887078	1887079	1887080
				Client Sample ID.:		BH1 0.5	BH3 1.2	BH4 0.2	BH1 0.2	BH3 0.3	BH4 0.4	BH3 2.3
				Sample Location:		Kelvedon	Kelvedon	Kelvedon	Kelvedon	Kelvedon	Kelvedon	Kelvedon
				Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):		0.5	1.2	0.2	0.2	0.3	0.4	2.3
				Bottom Depth (m):		0.5	1.2	0.2	0.2	0.3	0.4	2.3
				Date Sampled:		25-Oct-2024	25-Oct-2024	25-Oct-2024	25-Oct-2024	25-Oct-2024	25-Oct-2024	25-Oct-2024
				Time Sampled:		12:00	12:00	12:00	12:00	12:00	12:00	12:00
				Asbestos Lab:					DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**							
Aliphatic VPH >C6-C7	HS_2D_AL	U	2780	mg/kg	0.05				< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C7-C8	HS_2D_AL	U	2780	mg/kg	0.05				< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C8 (Sum)	HS_2D_AL	N	2780	mg/kg	0.10				< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic VPH >C8-C10	HS_2D_AL	U	2780	mg/kg	0.05				< 0.05	< 0.05	< 0.05	< 0.05
Total Aliphatic VPH >C5-C10	HS_2D_AL	U	2780	mg/kg	0.25				< 0.25	< 0.25	< 0.25	< 0.25
Aliphatic EPH >C10-C12 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00				< 2.0	< 2.0	< 2.0	3.5
Aliphatic EPH >C12-C16 MC	EH_2D_AL_#1	M	2690	mg/kg	1.00				8.6	2.5	2.6	< 1.0
Aliphatic EPH >C16-C21 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00				15	3.5	3.8	< 2.0
Aliphatic EPH >C21-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	3.00				8.0	< 3.0	16	11
Aliphatic EPH >C35-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00				< 10	< 10	12	16
Total Aliphatic EPH >C10-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	5.00				32	8.6	24	15
Total Aliphatic EPH >C10-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00				32	< 10	36	31
Aromatic VPH >C5-C7	HS_2D_AR	U	2780	mg/kg	0.05				< 0.05	< 0.05	3.0	< 0.05
Aromatic VPH >C7-C8	HS_2D_AR	U	2780	mg/kg	0.05				< 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C8-C10	HS_2D_AR	U	2780	mg/kg	0.05				< 0.05	< 0.05	< 0.05	< 0.05
Total Aromatic VPH >C5-C10	HS_2D_AR	U	2780	mg/kg	0.25				< 0.25	< 0.25	3.0	< 0.25
Aromatic EPH >C10-C12 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00				2.0	4.6	< 1.0	< 1.0
Aromatic EPH >C12-C16 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00				34	38	< 1.0	< 1.0
Aromatic EPH >C16-C21 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00				270	220	12	< 2.0
Aromatic EPH >C21-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00				490	330	26	6.4
Aromatic EPH >C35-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	1.00				120	73	3.0	65
Total Aromatic EPH >C10-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	5.00				800	590	38	7.4
Total Aromatic EPH >C10-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	10.00				920	670	41	72
Total VPH >C5-C10	HS_2D_Total	U	2780	mg/kg	0.50				< 0.50	< 0.50	3.0	< 0.50
Total EPH >C10-C35 MC	EH_2D_Total_#1	U	2690	mg/kg	10.00				830	600	62	23
Total EPH >C10-C40 MC	EH_2D_Total_#1	N	2690	mg/kg	10.00				960	680	77	100
Dichlorodifluoromethane		U	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0	< 1.0
Chloromethane		M	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride		M	2760	µg/kg	1.0				1.6	< 1.0	830	39
Bromomethane		M	2760	µg/kg	20				< 20	< 20	< 20	< 20
Chloroethane		U	2760	µg/kg	2.0				< 2.0	< 2.0	< 2.0	< 2.0
Trichlorofluoromethane		M	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene		M	2760	µg/kg	1.0				< 1.0	< 1.0	36	< 1.0
Dichloromethane		N	2760	µg/kg	50				< 50	< 50	< 50	< 50
Trans 1,2-Dichloroethene		M	2760	µg/kg	1.0				< 1.0	< 1.0	140	9.7
1,1-Dichloroethane		M	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0	< 1.0

Results - Soil

Project: Kelvedon 13203

Client: Terra Firma				**Chemtest Job No.:**		24-35081	24-35081	24-35081	24-35081	24-35081	24-35081	24-35081
Quotation No.:				**Chemtest Sample ID.:**		1887074	1887075	1887076	1887077	1887078	1887079	1887080
				Client Sample ID.:		BH1 0.5	BH3 1.2	BH4 0.2	BH1 0.2	BH3 0.3	BH4 0.4	BH3 2.3
				Sample Location:		Kelvedon	Kelvedon	Kelvedon	Kelvedon	Kelvedon	Kelvedon	Kelvedon
				Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):		0.5	1.2	0.2	0.2	0.3	0.4	2.3
				Bottom Depth (m):		0.5	1.2	0.2	0.2	0.3	0.4	2.3
				Date Sampled:		25-Oct-2024	25-Oct-2024	25-Oct-2024	25-Oct-2024	25-Oct-2024	25-Oct-2024	25-Oct-2024
				Time Sampled:		12:00	12:00	12:00	12:00	12:00	12:00	12:00
				Asbestos Lab:					DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**							
cis 1,2-Dichloroethene		M	2760	µg/kg	1.0				< 1.0	< 1.0	> 10000	260
Bromochloromethane		U	2760	µg/kg	5.0				< 5.0	< 5.0	< 5.0	< 5.0
Trichloromethane		M	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane		M	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane		M	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene		U	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0	< 1.0
Benzene		M	2760	mg/kg	0.0010				< 0.0010	< 0.0010	0.0042	< 0.0010
Benzene		M	2760	µg/kg	1.0				< 1.0	< 1.0	4.2	< 1.0
1,2-Dichloroethane		M	2760	µg/kg	2.0				< 2.0	< 2.0	< 2.0	< 2.0
Trichloroethene		N	2760	µg/kg	1.0				2.5	1.8	> 10000	130
1,2-Dichloropropane		M	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane		M	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane		M	2760	µg/kg	5.0				< 5.0	< 5.0	< 5.0	< 5.0
cis-1,3-Dichloropropene		N	2760	µg/kg	10				< 10	< 10	< 10	< 10
Toluene		M	2760	mg/kg	0.0010				< 0.0010	< 0.0010	< 0.0010	< 0.0010
Toluene		M	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene		N	2760	µg/kg	10				< 10	< 10	< 10	< 10
1,1,2-Trichloroethane		M	2760	µg/kg	10				< 10	< 10	< 10	< 10
Tetrachloroethene		M	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane		U	2760	µg/kg	2.0				< 2.0	< 2.0	< 2.0	< 2.0
Dibromochloromethane		U	2760	µg/kg	10				< 10	< 10	< 10	< 10
1,2-Dibromoethane		M	2760	µg/kg	5.0				< 5.0	< 5.0	< 5.0	< 5.0
Chlorobenzene		M	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane		M	2760	µg/kg	2.0				< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene		M	2760	mg/kg	0.0010				< 0.0010	< 0.0010	< 0.0010	< 0.0010
Ethylbenzene		M	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene		M	2760	mg/kg	0.0010				< 0.0010	< 0.0010	< 0.0010	< 0.0010
m & p-Xylene		M	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene		M	2760	mg/kg	0.0010				< 0.0010	< 0.0010	< 0.0010	< 0.0010
o-Xylene		M	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0	< 1.0
Styrene		M	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane		U	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene		M	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene		M	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane		N	2760	µg/kg	50				< 50	< 50	< 50	< 50
N-Propylbenzene		U	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0	< 1.0

Results - Soil

Project: Kelvedon 13203

Client: Terra Firma				**Chemtest Job No.:**		24-35081	24-35081	24-35081	24-35081	24-35081	24-35081	24-35081
Quotation No.:				**Chemtest Sample ID.:**		1887074	1887075	1887076	1887077	1887078	1887079	1887080
				Client Sample ID.:		BH1 0.5	BH3 1.2	BH4 0.2	BH1 0.2	BH3 0.3	BH4 0.4	BH3 2.3
				Sample Location:		Kelvedon	Kelvedon	Kelvedon	Kelvedon	Kelvedon	Kelvedon	Kelvedon
				Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):		0.5	1.2	0.2	0.2	0.3	0.4	2.3
				Bottom Depth (m):		0.5	1.2	0.2	0.2	0.3	0.4	2.3
				Date Sampled:		25-Oct-2024	25-Oct-2024	25-Oct-2024	25-Oct-2024	25-Oct-2024	25-Oct-2024	25-Oct-2024
				Time Sampled:		12:00	12:00	12:00	12:00	12:00	12:00	12:00
				Asbestos Lab:					DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**							
2-Chlorotoluene		M	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene		M	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene		U	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0	< 1.0
Tert-Butylbenzene		U	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene		M	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0	< 1.0
Sec-Butylbenzene		U	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene		M	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0	< 1.0
4-Isopropyltoluene		U	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene		M	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0	< 1.0
N-Butylbenzene		U	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene		M	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane		U	2760	µg/kg	50				< 50	< 50	< 50	< 50
1,2,4-Trichlorobenzene		M	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene		N	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene		U	2760	µg/kg	2.0				< 2.0	< 2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether		M	2760	mg/kg	0.0010				< 0.0010	< 0.0010	< 0.0010	< 0.0010
Methyl Tert-Butyl Ether		M	2760	µg/kg	1.0				< 1.0	< 1.0	< 1.0	< 1.0
N-Nitrosodimethylamine		M	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
Phenol		M	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
2-Chlorophenol		N	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether		M	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
1,3-Dichlorobenzene		M	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
1,4-Dichlorobenzene		N	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
1,2-Dichlorobenzene		M	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
2-Methylphenol		M	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether		M	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
Hexachloroethane		N	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine		M	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
4-Methylphenol		M	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
Nitrobenzene		N	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
Isophorone		M	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
2-Nitrophenol		N	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dimethylphenol		N	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroethoxy)Methane		M	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dichlorophenol		N	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
1,2,4-Trichlorobenzene		M	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50

Results - Soil

Project: Kelvedon 13203

Client: Terra Firma				**Chemtest Job No.:**		24-35081	24-35081	24-35081	24-35081	24-35081	24-35081	24-35081
Quotation No.:				**Chemtest Sample ID.:**		1887074	1887075	1887076	1887077	1887078	1887079	1887080
				Client Sample ID.:		BH1 0.5	BH3 1.2	BH4 0.2	BH1 0.2	BH3 0.3	BH4 0.4	BH3 2.3
				Sample Location:		Kelvedon	Kelvedon	Kelvedon	Kelvedon	Kelvedon	Kelvedon	Kelvedon
				Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):		0.5	1.2	0.2	0.2	0.3	0.4	2.3
				Bottom Depth (m):		0.5	1.2	0.2	0.2	0.3	0.4	2.3
				Date Sampled:		25-Oct-2024	25-Oct-2024	25-Oct-2024	25-Oct-2024	25-Oct-2024	25-Oct-2024	25-Oct-2024
				Time Sampled:		12:00	12:00	12:00	12:00	12:00	12:00	12:00
				Asbestos Lab:					DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**							
Naphthalene		M	2790	mg/kg	0.50				1.5	3.3	< 0.50	< 0.50
4-Chloroaniline		N	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobutadiene		M	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
4-Chloro-3-Methylphenol		N	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
2-Methylnaphthalene		M	2790	mg/kg	0.50				1.1	2.1	< 0.50	< 0.50
4-Nitrophenol		N	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
2,4,6-Trichlorophenol		N	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
2,4,5-Trichlorophenol		N	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
2-Chloronaphthalene		M	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
2-Nitroaniline		N	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
Acenaphthylene		M	2790	mg/kg	0.50				0.68	< 0.50	< 0.50	< 0.50
Dimethylphthalate		M	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
2,6-Dinitrotoluene		N	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
Acenaphthene		M	2790	mg/kg	0.50				3.2	3.1	< 0.50	< 0.50
3-Nitroaniline		N	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
Dibenzofuran		M	2790	mg/kg	0.50				2.0	2.7	< 0.50	< 0.50
4-Chlorophenylphenylether		M	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dinitrotoluene		N	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
Fluorene		M	2790	mg/kg	0.50				3.5	3.5	< 0.50	< 0.50
Diethyl Phthalate		M	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
4-Nitroaniline		N	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
Azobenzene		M	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
4-Bromophenylphenyl Ether		M	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobenzene		M	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
Phenanthrene		M	2790	mg/kg	0.50				35	29	< 0.50	< 0.50
Anthracene		M	2790	mg/kg	0.50				9.6	8.0	< 0.50	< 0.50
Carbazole		M	2790	mg/kg	0.50				2.2	2.6	< 0.50	< 0.50
Di-N-Butyl Phthalate		N	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
Fluoranthene		M	2790	mg/kg	0.50				59	37	1.2	< 0.50
Pyrene		M	2790	mg/kg	0.50				53	33	1.0	< 0.50
Butylbenzyl Phthalate		N	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
Benzo[a]anthracene		M	2790	mg/kg	0.50				30	19	< 0.50	< 0.50
Chrysene		M	2790	mg/kg	0.50				29	17	0.76	< 0.50
Bis(2-Ethylhexyl)Phthalate		N	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
Di-N-Octyl Phthalate		N	2790	mg/kg	0.50				< 0.50	< 0.50	< 0.50	< 0.50
Benzo[b]fluoranthene		M	2790	mg/kg	0.50				40	23	< 0.50	< 0.50

Results - Soil

Project: Kelvedon 13203

Client: Terra Firma				**Chemtest Job No.:**		24-35081	24-35081	24-35081	24-35081	24-35081	24-35081	24-35081
Quotation No.:				**Chemtest Sample ID.:**		1887074	1887075	1887076	1887077	1887078	1887079	1887080
				Client Sample ID.:		BH1 0.5	BH3 1.2	BH4 0.2	BH1 0.2	BH3 0.3	BH4 0.4	BH3 2.3
				Sample Location:		Kelvedon	Kelvedon	Kelvedon	Kelvedon	Kelvedon	Kelvedon	Kelvedon
				Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
				Top Depth (m):		0.5	1.2	0.2	0.2	0.3	0.4	2.3
				Bottom Depth (m):		0.5	1.2	0.2	0.2	0.3	0.4	2.3
				Date Sampled:		25-Oct-2024	25-Oct-2024	25-Oct-2024	25-Oct-2024	25-Oct-2024	25-Oct-2024	25-Oct-2024
				Time Sampled:		12:00	12:00	12:00	12:00	12:00	12:00	12:00
				Asbestos Lab:					DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**							
Benzo[k]fluoranthene		M	2790	mg/kg	0.50				13	7.4	< 0.50	< 0.50
Benzo[a]pyrene		M	2790	mg/kg	0.50				33	19	0.76	< 0.50
Indeno(1,2,3-c,d)Pyrene		N	2790	mg/kg	0.50				17	9.8	< 0.50	< 0.50
Dibenz(a,h)Anthracene		N	2790	mg/kg	0.50				5.5	3.3	< 0.50	< 0.50
Benzo[g,h,i]perylene		M	2790	mg/kg	0.50				21	12	< 0.50	< 0.50
Naphthalene		M	2800	mg/kg	0.10				1.1	1.1	0.54	< 0.10
Acenaphthylene		N	2800	mg/kg	0.10				0.70	0.22	0.14	< 0.10
Acenaphthene		M	2800	mg/kg	0.10				1.9	1.2	< 0.10	< 0.10
Fluorene		M	2800	mg/kg	0.10				1.7	1.3	< 0.10	< 0.10
Phenanthrene		M	2800	mg/kg	0.10				19	12	1.9	< 0.10
Anthracene		M	2800	mg/kg	0.10				6.5	3.3	0.33	< 0.10
Fluoranthene		M	2800	mg/kg	0.10				45	20	2.3	< 0.10
Pyrene		M	2800	mg/kg	0.10				39	17	2.1	< 0.10
Benzo[a]anthracene		M	2800	mg/kg	0.10				28	9.9	1.5	< 0.10
Chrysene		M	2800	mg/kg	0.10				27	10	1.9	< 0.10
Benzo[b]fluoranthene		M	2800	mg/kg	0.10				44	12	2.4	< 0.10
Benzo[k]fluoranthene		M	2800	mg/kg	0.10				16	4.3	0.72	< 0.10
Benzo[a]pyrene		M	2800	mg/kg	0.10				36	9.4	1.9	< 0.10
Indeno(1,2,3-c,d)Pyrene		M	2800	mg/kg	0.10				27	5.6	1.3	< 0.10
Dibenz(a,h)Anthracene		N	2800	mg/kg	0.10				5.5	1.6	< 0.10	< 0.10
Benzo[g,h,i]perylene		M	2800	mg/kg	0.10				26	5.1	1.5	< 0.10
Total Of 16 PAH's		N	2800	mg/kg	2.0				320	110	19	< 2.0
PCB 81		N	2815	mg/kg	0.0010				< 0.0010	< 0.0010	< 0.0010	< 0.0010
PCB 77		N	2815	mg/kg	0.0010				< 0.0010	< 0.0010	< 0.0010	< 0.0010
PCB 105		N	2815	mg/kg	0.0010				< 0.0010	< 0.0010	< 0.0010	< 0.0010
PCB 114		N	2815	mg/kg	0.0010				< 0.0010	< 0.0010	< 0.0010	< 0.0010
PCB 118		N	2815	mg/kg	0.0010				< 0.0010	< 0.0010	< 0.0010	< 0.0010
PCB 123		N	2815	mg/kg	0.0010				< 0.0010	< 0.0010	< 0.0010	< 0.0010
PCB 126		N	2815	mg/kg	0.0010				< 0.0010	< 0.0010	< 0.0010	< 0.0010
PCB 156		N	2815	mg/kg	0.0010				< 0.0010	< 0.0010	< 0.0010	< 0.0010
PCB 157		N	2815	mg/kg	0.0010				< 0.0010	< 0.0010	< 0.0010	< 0.0010
PCB 167		N	2815	mg/kg	0.0010				< 0.0010	< 0.0010	< 0.0010	< 0.0010
PCB 169		N	2815	mg/kg	0.0010				< 0.0010	< 0.0010	< 0.0010	< 0.0010
PCB 189		N	2815	mg/kg	0.0010				< 0.0010	< 0.0010	< 0.0010	< 0.0010
Total PCBs (12 Congeners)		N	2815	mg/kg	0.0010				< 0.0010	< 0.0010	< 0.0010	< 0.0010
Total Phenols		M	2920	mg/kg	0.10				< 0.10	< 0.10	< 0.10	< 0.10

Results - Soil

Project: Kelvedon 13203

Client: Terra Firma						24-35081	24-35081	24-35081	24-35081	24-35081	24-35081	24-35081
Quotation No.:		**Chemtest Sample ID.:**				1887074	1887075	1887076	1887077	1887078	1887079	1887080
		Client Sample ID.:				BH1 0.5	BH3 1.2	BH4 0.2	BH1 0.2	BH3 0.3	BH4 0.4	BH3 2.3
		Sample Location:				Kelvedon	Kelvedon	Kelvedon	Kelvedon	Kelvedon	Kelvedon	Kelvedon
		Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
		Top Depth (m):				0.5	1.2	0.2	0.2	0.3	0.4	2.3
		Bottom Depth (m):				0.5	1.2	0.2	0.2	0.3	0.4	2.3
		Date Sampled:				25-Oct-2024	25-Oct-2024	25-Oct-2024	25-Oct-2024	25-Oct-2024	25-Oct-2024	25-Oct-2024
		Time Sampled:				12:00	12:00	12:00	12:00	12:00	12:00	12:00
		Asbestos Lab:							DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**							
Organic Matter BS1377		N	2930	%	0.10				5.0	2.4	4.5	2.9

Results - Soil

Project: Kelvedon 13203

Client: Terra Firma				**Chemtest Job No.:**		24-35081
Quotation No.:				**Chemtest Sample ID.:**		1887081
				Client Sample ID.:		BH2 0.7
				Sample Location:		Kelvedon
				Sample Type:		SOIL
				Top Depth (m):		0.7
				Bottom Depth (m):		0.7
				Date Sampled:		25-Oct-2024
				Time Sampled:		12:00
				Asbestos Lab:		DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**	
ACM Type		U	2192		N/A	-
Asbestos Identification		U	2192		N/A	No Asbestos Detected
Moisture		N	2030	%	0.020	8.1
Soil Colour		N	2040		N/A	Brown
Other Material		N	2040		N/A	Stones
Soil Texture		N	2040		N/A	Sand
pH at 20C		M	2010		4.0	9.5
Boron (Hot Water Soluble)		M	2120	mg/kg	0.40	1.3
Magnesium (Water Soluble)		N	2120	g/l	0.010	
Sulphate (2:1 Water Soluble) as SO4		M	2120	g/l	0.010	
Total Sulphur		U	2175	%	0.010	
Chloride (Water Soluble)		M	2220	g/l	0.010	
Nitrate (Water Soluble)		N	2220	g/l	0.010	
Cyanide (Complex)		M	2300	mg/kg	0.50	1.4
Cyanide (Free)		M	2300	mg/kg	0.50	< 0.50
Cyanide (Total)		M	2300	mg/kg	0.50	1.4
Ammonium (Water Soluble)		M	2220	g/l	0.01	
Sulphate (Acid Soluble)		U	2430	%	0.010	0.31
Arsenic		M	2455	mg/kg	0.5	10
Beryllium		U	2455	mg/kg	0.5	< 0.5
Cadmium		M	2455	mg/kg	0.10	0.47
Chromium		M	2455	mg/kg	0.5	16
Mercury Low Level		N	2450	mg/kg	0.05	0.06
Manganese		M	2455	mg/kg	1.0	520
Molybdenum		M	2455	mg/kg	0.5	0.9
Antimony		N	2455	mg/kg	2.0	< 2.0
Copper		M	2455	mg/kg	0.50	15
Nickel		M	2455	mg/kg	0.50	13
Lead		M	2455	mg/kg	0.50	57
Selenium		M	2455	mg/kg	0.25	0.40
Zinc		M	2455	mg/kg	0.50	80
Chromium (Trivalent)		N	2490	mg/kg	1.0	16
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50
Aliphatic VPH >C5-C6	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05

Results - Soil

Project: Kelvedon 13203

Client: Terra Firma				**Chemtest Job No.:**		24-35081
Quotation No.:				**Chemtest Sample ID.:**		1887081
				Client Sample ID.:		BH2 0.7
				Sample Location:		Kelvedon
				Sample Type:		SOIL
				Top Depth (m):		0.7
				Bottom Depth (m):		0.7
				Date Sampled:		25-Oct-2024
				Time Sampled:		12:00
				Asbestos Lab:		DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**	
Aliphatic VPH >C6-C7	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05
Aliphatic VPH >C7-C8	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05
Aliphatic VPH >C6-C8 (Sum)	HS_2D_AL	N	2780	mg/kg	0.10	< 0.10
Aliphatic VPH >C8-C10	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05
Total Aliphatic VPH >C5-C10	HS_2D_AL	U	2780	mg/kg	0.25	< 0.25
Aliphatic EPH >C10-C12 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	3.1
Aliphatic EPH >C12-C16 MC	EH_2D_AL_#1	M	2690	mg/kg	1.00	5.3
Aliphatic EPH >C16-C21 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	39
Aliphatic EPH >C21-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	3.00	200
Aliphatic EPH >C35-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	77
Total Aliphatic EPH >C10-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	5.00	250
Total Aliphatic EPH >C10-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	320
Aromatic VPH >C5-C7	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05
Aromatic VPH >C7-C8	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05
Aromatic VPH >C8-C10	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05
Total Aromatic VPH >C5-C10	HS_2D_AR	U	2780	mg/kg	0.25	< 0.25
Aromatic EPH >C10-C12 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	< 1.0
Aromatic EPH >C12-C16 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	2.1
Aromatic EPH >C16-C21 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	37
Aromatic EPH >C21-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	23
Aromatic EPH >C35-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	1.00	27
Total Aromatic EPH >C10-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	5.00	63
Total Aromatic EPH >C10-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	10.00	90
Total VPH >C5-C10	HS_2D_Total	U	2780	mg/kg	0.50	< 0.50
Total EPH >C10-C35 MC	EH_2D_Total_#1	U	2690	mg/kg	10.00	310
Total EPH >C10-C40 MC	EH_2D_Total_#1	N	2690	mg/kg	10.00	410
Dichlorodifluoromethane		U	2760	µg/kg	1.0	< 1.0
Chloromethane		M	2760	µg/kg	1.0	< 1.0
Vinyl Chloride		M	2760	µg/kg	1.0	1.8
Bromomethane		M	2760	µg/kg	20	< 20
Chloroethane		U	2760	µg/kg	2.0	< 2.0
Trichlorofluoromethane		M	2760	µg/kg	1.0	< 1.0
1,1-Dichloroethene		M	2760	µg/kg	1.0	< 1.0
Dichloromethane		N	2760	µg/kg	50	< 50
Trans 1,2-Dichloroethene		M	2760	µg/kg	1.0	< 1.0
1,1-Dichloroethane		M	2760	µg/kg	1.0	< 1.0

Results - Soil

Project: Kelvedon 13203

Client: Terra Firma				**Chemtest Job No.:**		24-35081
Quotation No.:				**Chemtest Sample ID.:**		1887081
				Client Sample ID.:		BH2 0.7
				Sample Location:		Kelvedon
				Sample Type:		SOIL
				Top Depth (m):		0.7
				Bottom Depth (m):		0.7
				Date Sampled:		25-Oct-2024
				Time Sampled:		12:00
				Asbestos Lab:		DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**	
cis 1,2-Dichloroethene		M	2760	µg/kg	1.0	22
Bromochloromethane		U	2760	µg/kg	5.0	< 5.0
Trichloromethane		M	2760	µg/kg	1.0	< 1.0
1,1,1-Trichloroethane		M	2760	µg/kg	1.0	< 1.0
Tetrachloromethane		M	2760	µg/kg	1.0	< 1.0
1,1-Dichloropropene		U	2760	µg/kg	1.0	< 1.0
Benzene		M	2760	mg/kg	0.0010	< 0.0010
Benzene		M	2760	µg/kg	1.0	< 1.0
1,2-Dichloroethane		M	2760	µg/kg	2.0	< 2.0
Trichloroethene		N	2760	µg/kg	1.0	12
1,2-Dichloropropane		M	2760	µg/kg	1.0	< 1.0
Dibromomethane		M	2760	µg/kg	1.0	< 1.0
Bromodichloromethane		M	2760	µg/kg	5.0	< 5.0
cis-1,3-Dichloropropene		N	2760	µg/kg	10	< 10
Toluene		M	2760	mg/kg	0.0010	< 0.0010
Toluene		M	2760	µg/kg	1.0	< 1.0
Trans-1,3-Dichloropropene		N	2760	µg/kg	10	< 10
1,1,2-Trichloroethane		M	2760	µg/kg	10	< 10
Tetrachloroethene		M	2760	µg/kg	1.0	< 1.0
1,3-Dichloropropane		U	2760	µg/kg	2.0	< 2.0
Dibromochloromethane		U	2760	µg/kg	10	< 10
1,2-Dibromoethane		M	2760	µg/kg	5.0	< 5.0
Chlorobenzene		M	2760	µg/kg	1.0	< 1.0
1,1,1,2-Tetrachloroethane		M	2760	µg/kg	2.0	< 2.0
Ethylbenzene		M	2760	mg/kg	0.0010	< 0.0010
Ethylbenzene		M	2760	µg/kg	1.0	< 1.0
m & p-Xylene		M	2760	mg/kg	0.0010	< 0.0010
m & p-Xylene		M	2760	µg/kg	1.0	< 1.0
o-Xylene		M	2760	mg/kg	0.0010	< 0.0010
o-Xylene		M	2760	µg/kg	1.0	< 1.0
Styrene		M	2760	µg/kg	1.0	< 1.0
Tribromomethane		U	2760	µg/kg	1.0	< 1.0
Isopropylbenzene		M	2760	µg/kg	1.0	< 1.0
Bromobenzene		M	2760	µg/kg	1.0	< 1.0
1,2,3-Trichloropropane		N	2760	µg/kg	50	< 50
N-Propylbenzene		U	2760	µg/kg	1.0	< 1.0

Results - Soil

Project: Kelvedon 13203

Client: Terra Firma				**Chemtest Job No.:**		24-35081
Quotation No.:				**Chemtest Sample ID.:**		1887081
				Client Sample ID.:		BH2 0.7
				Sample Location:		Kelvedon
				Sample Type:		SOIL
				Top Depth (m):		0.7
				Bottom Depth (m):		0.7
				Date Sampled:		25-Oct-2024
				Time Sampled:		12:00
				Asbestos Lab:		DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**	
2-Chlorotoluene		M	2760	µg/kg	1.0	< 1.0
1,3,5-Trimethylbenzene		M	2760	µg/kg	1.0	< 1.0
4-Chlorotoluene		U	2760	µg/kg	1.0	< 1.0
Tert-Butylbenzene		U	2760	µg/kg	1.0	< 1.0
1,2,4-Trimethylbenzene		M	2760	µg/kg	1.0	< 1.0
Sec-Butylbenzene		U	2760	µg/kg	1.0	< 1.0
1,3-Dichlorobenzene		M	2760	µg/kg	1.0	< 1.0
4-Isopropyltoluene		U	2760	µg/kg	1.0	< 1.0
1,4-Dichlorobenzene		M	2760	µg/kg	1.0	< 1.0
N-Butylbenzene		U	2760	µg/kg	1.0	< 1.0
1,2-Dichlorobenzene		M	2760	µg/kg	1.0	< 1.0
1,2-Dibromo-3-Chloropropane		U	2760	µg/kg	50	< 50
1,2,4-Trichlorobenzene		M	2760	µg/kg	1.0	< 1.0
Hexachlorobutadiene		N	2760	µg/kg	1.0	< 1.0
1,2,3-Trichlorobenzene		U	2760	µg/kg	2.0	< 2.0
Methyl Tert-Butyl Ether		M	2760	mg/kg	0.0010	< 0.0010
Methyl Tert-Butyl Ether		M	2760	µg/kg	1.0	< 1.0
N-Nitrosodimethylamine		M	2790	mg/kg	0.50	< 0.50
Phenol		M	2790	mg/kg	0.50	< 0.50
2-Chlorophenol		N	2790	mg/kg	0.50	< 0.50
Bis-(2-Chloroethyl)Ether		M	2790	mg/kg	0.50	< 0.50
1,3-Dichlorobenzene		M	2790	mg/kg	0.50	< 0.50
1,4-Dichlorobenzene		N	2790	mg/kg	0.50	< 0.50
1,2-Dichlorobenzene		M	2790	mg/kg	0.50	< 0.50
2-Methylphenol		M	2790	mg/kg	0.50	< 0.50
Bis(2-Chloroisopropyl)Ether		M	2790	mg/kg	0.50	< 0.50
Hexachloroethane		N	2790	mg/kg	0.50	< 0.50
N-Nitrosodi-n-propylamine		M	2790	mg/kg	0.50	< 0.50
4-Methylphenol		M	2790	mg/kg	0.50	< 0.50
Nitrobenzene		N	2790	mg/kg	0.50	< 0.50
Isophorone		M	2790	mg/kg	0.50	< 0.50
2-Nitrophenol		N	2790	mg/kg	0.50	< 0.50
2,4-Dimethylphenol		N	2790	mg/kg	0.50	< 0.50
Bis(2-Chloroethoxy)Methane		M	2790	mg/kg	0.50	< 0.50
2,4-Dichlorophenol		N	2790	mg/kg	0.50	< 0.50
1,2,4-Trichlorobenzene		M	2790	mg/kg	0.50	< 0.50

Results - Soil

Project: Kelvedon 13203

Client: Terra Firma				**Chemtest Job No.:**		24-35081
Quotation No.:				**Chemtest Sample ID.:**		1887081
				Client Sample ID.:		BH2 0.7
				Sample Location:		Kelvedon
				Sample Type:		SOIL
				Top Depth (m):		0.7
				Bottom Depth (m):		0.7
				Date Sampled:		25-Oct-2024
				Time Sampled:		12:00
				Asbestos Lab:		DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**	
Naphthalene		M	2790	mg/kg	0.50	< 0.50
4-Chloroaniline		N	2790	mg/kg	0.50	< 0.50
Hexachlorobutadiene		M	2790	mg/kg	0.50	< 0.50
4-Chloro-3-Methylphenol		N	2790	mg/kg	0.50	< 0.50
2-Methylnaphthalene		M	2790	mg/kg	0.50	< 0.50
4-Nitrophenol		N	2790	mg/kg	0.50	< 0.50
2,4,6-Trichlorophenol		N	2790	mg/kg	0.50	< 0.50
2,4,5-Trichlorophenol		N	2790	mg/kg	0.50	< 0.50
2-Chloronaphthalene		M	2790	mg/kg	0.50	< 0.50
2-Nitroaniline		N	2790	mg/kg	0.50	< 0.50
Acenaphthylene		M	2790	mg/kg	0.50	< 0.50
Dimethylphthalate		M	2790	mg/kg	0.50	< 0.50
2,6-Dinitrotoluene		N	2790	mg/kg	0.50	< 0.50
Acenaphthene		M	2790	mg/kg	0.50	< 0.50
3-Nitroaniline		N	2790	mg/kg	0.50	< 0.50
Dibenzofuran		M	2790	mg/kg	0.50	< 0.50
4-Chlorophenylphenylether		M	2790	mg/kg	0.50	< 0.50
2,4-Dinitrotoluene		N	2790	mg/kg	0.50	< 0.50
Fluorene		M	2790	mg/kg	0.50	< 0.50
Diethyl Phthalate		M	2790	mg/kg	0.50	< 0.50
4-Nitroaniline		N	2790	mg/kg	0.50	< 0.50
Azobenzene		M	2790	mg/kg	0.50	< 0.50
4-Bromophenylphenyl Ether		M	2790	mg/kg	0.50	< 0.50
Hexachlorobenzene		M	2790	mg/kg	0.50	< 0.50
Phenanthrene		M	2790	mg/kg	0.50	4.7
Anthracene		M	2790	mg/kg	0.50	1.3
Carbazole		M	2790	mg/kg	0.50	< 0.50
Di-N-Butyl Phthalate		N	2790	mg/kg	0.50	< 0.50
Fluoranthene		M	2790	mg/kg	0.50	6.3
Pyrene		M	2790	mg/kg	0.50	6.1
Butylbenzyl Phthalate		N	2790	mg/kg	0.50	< 0.50
Benzo[a]anthracene		M	2790	mg/kg	0.50	3.7
Chrysene		M	2790	mg/kg	0.50	3.7
Bis(2-Ethylhexyl)Phthalate		N	2790	mg/kg	0.50	< 0.50
Di-N-Octyl Phthalate		N	2790	mg/kg	0.50	< 0.50
Benzo[b]fluoranthene		M	2790	mg/kg	0.50	4.5

Results - Soil

Project: Kelvedon 13203

Client: Terra Firma				**Chemtest Job No.:**		24-35081
Quotation No.:				**Chemtest Sample ID.:**		1887081
				Client Sample ID.:		BH2 0.7
				Sample Location:		Kelvedon
				Sample Type:		SOIL
				Top Depth (m):		0.7
				Bottom Depth (m):		0.7
				Date Sampled:		25-Oct-2024
				Time Sampled:		12:00
				Asbestos Lab:		DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**	
Benzo[k]fluoranthene		M	2790	mg/kg	0.50	1.5
Benzo[a]pyrene		M	2790	mg/kg	0.50	3.7
Indeno(1,2,3-c,d)Pyrene		N	2790	mg/kg	0.50	2.1
Dibenz(a,h)Anthracene		N	2790	mg/kg	0.50	0.65
Benzo[g,h,i]perylene		M	2790	mg/kg	0.50	2.5
Naphthalene		M	2800	mg/kg	0.10	0.19
Acenaphthylene		N	2800	mg/kg	0.10	< 0.10
Acenaphthene		M	2800	mg/kg	0.10	0.29
Fluorene		M	2800	mg/kg	0.10	0.27
Phenanthrene		M	2800	mg/kg	0.10	2.5
Anthracene		M	2800	mg/kg	0.10	0.74
Fluoranthene		M	2800	mg/kg	0.10	4.6
Pyrene		M	2800	mg/kg	0.10	4.2
Benzo[a]anthracene		M	2800	mg/kg	0.10	2.4
Chrysene		M	2800	mg/kg	0.10	2.4
Benzo[b]fluoranthene		M	2800	mg/kg	0.10	3.1
Benzo[k]fluoranthene		M	2800	mg/kg	0.10	1.1
Benzo[a]pyrene		M	2800	mg/kg	0.10	2.8
Indeno(1,2,3-c,d)Pyrene		M	2800	mg/kg	0.10	1.5
Dibenz(a,h)Anthracene		N	2800	mg/kg	0.10	0.39
Benzo[g,h,i]perylene		M	2800	mg/kg	0.10	1.6
Total Of 16 PAH's		N	2800	mg/kg	2.0	28
PCB 81		N	2815	mg/kg	0.0010	< 0.0010
PCB 77		N	2815	mg/kg	0.0010	< 0.0010
PCB 105		N	2815	mg/kg	0.0010	< 0.0010
PCB 114		N	2815	mg/kg	0.0010	< 0.0010
PCB 118		N	2815	mg/kg	0.0010	< 0.0010
PCB 123		N	2815	mg/kg	0.0010	< 0.0010
PCB 126		N	2815	mg/kg	0.0010	< 0.0010
PCB 156		N	2815	mg/kg	0.0010	< 0.0010
PCB 157		N	2815	mg/kg	0.0010	< 0.0010
PCB 167		N	2815	mg/kg	0.0010	< 0.0010
PCB 169		N	2815	mg/kg	0.0010	< 0.0010
PCB 189		N	2815	mg/kg	0.0010	< 0.0010
Total PCBs (12 Congeners)		N	2815	mg/kg	0.0010	< 0.0010
Total Phenols		M	2920	mg/kg	0.10	< 0.10

Results - Soil

Project: Kelvedon 13203

Client: Terra Firma				**Chemtest Job No.:**		24-35081
Quotation No.:				**Chemtest Sample ID.:**		1887081
				Client Sample ID.:		BH2 0.7
				Sample Location:		Kelvedon
				Sample Type:		SOIL
				Top Depth (m):		0.7
				Bottom Depth (m):		0.7
				Date Sampled:		25-Oct-2024
				Time Sampled:		12:00
				Asbestos Lab:		DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**	
Organic Matter BS1377		N	2930	%	0.10	2.2

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
2010	pH Value of Soils	pH at 20°C	pH Meter	
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <30°C.	
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930	
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES	
2175	Total Sulphur in Soils	Total Sulphur	Determined by high temperature combustion under oxygen, using an Eltra elemental analyser.	
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry	
2220	Water soluble Chloride in Soils	Chloride	Aqueous extraction and measurememrnt by 'Aquakem 600' Discrete Analyser using ferric nitrate / mercuric thiocyanate.	
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.	
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.	
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.	
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.	
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.	
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40	Acetone/Heptane extraction / GCxGC FID detection	
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.	
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8-C10 Aromatics: >C5–C7,>C7-C8,>C8–C10	Water extraction / Headspace GCxGC FID detection	
2790	Semi-Volatile Organic Compounds (SVOCs) in Soils by GC-MS	Semi-volatile organic compounds(cf. USEPA Method 8270)	Acetone/Hexane extraction / GC-MS	
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS	
2815	Polychlorinated Biphenyls (PCB) ICES7Congeners in Soils by GC-MS	ICES7 PCB congeners	Acetone/Hexane extraction / GC-MS. Reported PCB 101 results may contain contributions from PCB 90 due to inseparable chromatography.	
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.	

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
2930	Organic Matter	Organic Matter	Acid Dichromate digestion/Titration	

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

This report shall not be reproduced except in full, and only with the prior approval of the laboratory.
Any comments or interpretations are outside the scope of UKAS accreditation.
The Laboratory is not accredited for any sampling activities and reported results relate to the samples 'as received' at the laboratory.
Uncertainty of measurement for the determinands tested are available upon request .
None of the results in this report have been recovery corrected.
All results are expressed on a dry weight basis.

The following tests were analysed on samples 'as received' and the results subsequently corrected to a dry weight basis EPH, VPH, TPH, BTEX, VOCs, SVOCs, PCBs, Phenols.

For all other tests the samples were dried at ≤ 30°C prior to analysis.
All Asbestos testing is performed at the indicated laboratory .
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1.

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt.
All water samples will be retained for 14 days from the date of receipt.
Charges may apply to extended sample storage.

Water Sample Category Key for Accreditation

DW - Drinking Water
GW - Ground Water
LE - Land Leachate
NA - Not Applicable

Report Information

PL - Prepared Leachate
PW - Processed Water
RE - Recreational Water
SA - Saline Water
SW - Surface Water
TE - Treated Effluent
TS - Treated Sewage
UL - Unspecified Liquid

Clean Up Codes

NC - No Clean Up
MC - Mathematical Clean Up
FC - Florisil Clean Up

HWOL Acronym System

HS - Headspace analysis
EH - Extractable hydrocarbons – i.e. everything extracted by the solvent
CU - Clean-up – e.g. by Florisil, silica gel
1D - GC – Single coil gas chromatography
Total - Aliphatics & Aromatics
AL - Aliphatics only
AR - Aromatic only
2D - GC-GC – Double coil gas chromatography
#1 - EH_2D_Total but with humics mathematically subtracted
#2 - EH_2D_Total but with fatty acids mathematically subtracted
+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: info@chemtest.com

Final Report

Report No.:	24-38437-1
Initial Date of Issue:	29-Nov-2024
Re-Issue Details:	
Client	Terra Firma
Client Address:	5 Deryn Court Wharfedale Road Pentwyn Cardiff CF23 7HA
Contact(s):	elliot@terrafirmawales.co.uk
Project	13203 kelvedon street

Quotation No.:		**Date Received:**	22-Nov-2024
Order No.:	13203	**Date Instructed:**	22-Nov-2024
No. of Samples:	3		
Turnaround (Wkdays):	5	**Results Due:**	28-Nov-2024
Date Approved:	29-Nov-2024		

Approved By:



Details: David Smith, Technical Director

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Water

Project: 13203 kelvedon street

Client: Terra Firma				**Chemtest Job No.:**		24-38437	24-38437	24-38437
Quotation No.:				**Chemtest Sample ID.:**		1899696	1899697	1899698
				Client Sample ID.:		RC01-W	BH01-W	BH03-W
				Sample Location:		RC01	BH01	BH03
				Sample Type:		WATER	WATER	WATER
				Sample Sub Type:				
				Date Sampled:		18-Nov-2024	18-Nov-2024	18-Nov-2024
				Time Sampled:		12:00	12:00	12:00
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**			
Asbestos Fibres In Water		N	1185	in 100ml	N/A	Not Detected	Not Detected	Not Detected
pH at 20C		U	1010		4.0	8.5	7.9	7.9
Biochemical Oxygen Demand		N	1090	mg O2/l	4.0	6.0	5.0	8.0
Chemical Oxygen Demand		U	1100	mg O2/l	10	16	24	31
Sulphate		U	1220	mg/l	1.0	64	77	89
Cyanide (Total)		U	1300	mg/l	0.050	< 0.050	< 0.050	< 0.050
Cyanide (Free)		U	1300	mg/l	0.050	< 0.050	< 0.050	< 0.050
Total Hardness as CaCO3		U	1270	mg/l	15	210	490	620
Arsenic (Dissolved)		U	1455	µg/l	0.20	9.6	3.4	12
Cadmium (Dissolved)		U	1455	µg/l	0.11	< 0.11	< 0.11	< 0.11
Chromium (Dissolved)		U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50
Copper (Dissolved)		U	1455	µg/l	0.50	0.98	1.5	< 0.50
Mercury (Dissolved)		U	1455	µg/l	0.05	< 0.05	< 0.05	< 0.05
Nickel (Dissolved)		U	1455	µg/l	0.50	0.96	8.7	3.7
Lead (Dissolved)		U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50
Selenium (Dissolved)		U	1455	µg/l	0.50	0.81	0.97	0.75
Zinc (Dissolved)		U	1455	µg/l	2.5	4.6	6.6	3.0
Chromium (Hexavalent)		U	1490	µg/l	20	[B] < 20	[B] < 20	[B] < 20
Total Organic Carbon		U	1610	mg/l	2.0	5.8	7.1	9.2
Aliphatic TPH >C5-C6	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C6-C8	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C8-C10	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C10-C12	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C12-C16	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C16-C21	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C21-C35	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C35-C44	EH_2D_AL_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Total Aliphatic Hydrocarbons	EH_2D_AL_#1	N	1675	µg/l	5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C7-C8	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C8-C10	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C10-C12	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C12-C16	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C16-C21	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C21-C35	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C35-C44	EH_2D_AR_#1	N	1675	µg/l	0.10	< 0.10	< 0.10	< 0.10
Total Aromatic Hydrocarbons	EH_2D_AR_#1	N	1675	µg/l	5.0	< 5.0	< 5.0	< 5.0
Total Petroleum Hydrocarbons	EH_2D_Total_#1	N	1675	µg/l	10	< 10	< 10	< 10

Results - Water

Project: 13203 kelvedon street

Client: Terra Firma				**Chemtest Job No.:**		24-38437	24-38437	24-38437
Quotation No.:				**Chemtest Sample ID.:**		1899696	1899697	1899698
				Client Sample ID.:		RC01-W	BH01-W	BH03-W
				Sample Location:		RC01	BH01	BH03
				Sample Type:		WATER	WATER	WATER
				Sample Sub Type:				
				Date Sampled:		18-Nov-2024	18-Nov-2024	18-Nov-2024
				Time Sampled:		12:00	12:00	12:00
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**			
Dichlorodifluoromethane		U	1760	µg/l	1.0	< 1.0	[C] < 1.0	< 1.0
Chloromethane		U	1760	µg/l	1.0	< 1.0	[C] < 1.0	< 1.0
Vinyl Chloride		N	1760	µg/l	1.0	< 1.0	[C] < 1.0	< 1.0
Bromomethane		U	1760	µg/l	5	< 5	[C] < 5	< 5
Chloroethane		U	1760	µg/l	2.0	< 2.0	[C] < 2.0	< 2.0
Trichlorofluoromethane		U	1760	µg/l	1.0	< 1.0	[C] < 1.0	< 1.0
1,1-Dichloroethene		U	1760	µg/l	1.0	< 1.0	[C] < 1.0	< 1.0
Trans 1,2-Dichloroethene		U	1760	µg/l	1.0	< 1.0	[C] < 1.0	< 1.0
1,1-Dichloroethane		U	1760	µg/l	1.0	< 1.0	[C] < 1.0	< 1.0
cis 1,2-Dichloroethene		U	1760	µg/l	1.0	15	[C] < 1.0	< 1.0
Bromochloromethane		U	1760	µg/l	5	< 5	[C] < 5	< 5
Trichloromethane		U	1760	µg/l	1.0	< 1.0	[C] < 1.0	< 1.0
1,1,1-Trichloroethane		U	1760	µg/l	1.0	< 1.0	[C] < 1.0	< 1.0
Tetrachloromethane		U	1760	µg/l	1.0	< 1.0	[C] < 1.0	< 1.0
1,1-Dichloropropene		U	1760	µg/l	1.0	< 1.0	[C] < 1.0	< 1.0
Benzene		U	1760	µg/l	1.0	< 1.0	[C] < 1.0	< 1.0
1,2-Dichloroethane		U	1760	µg/l	2.0	< 2.0	[C] < 2.0	< 2.0
Trichloroethene		N	1760	µg/l	1.0	19	[C] < 1.0	< 1.0
1,2-Dichloropropane		U	1760	µg/l	1.0	< 1.0	[C] < 1.0	< 1.0
Dibromomethane		U	1760	µg/l	10	< 10	[C] < 10	< 10
Bromodichloromethane		U	1760	µg/l	5	< 5	[C] < 5	< 5
cis-1,3-Dichloropropene		N	1760	µg/l	10	< 10	[C] < 10	< 10
Toluene		U	1760	µg/l	1.0	< 1.0	[C] < 1.0	< 1.0
Trans-1,3-Dichloropropene		N	1760	µg/l	10	< 10	[C] < 10	< 10
1,1,2-Trichloroethane		U	1760	µg/l	10	< 10	[C] < 10	< 10
Tetrachloroethene		U	1760	µg/l	1.0	52	[C] < 1.0	< 1.0
1,3-Dichloropropane		U	1760	µg/l	2.0	< 2.0	[C] < 2.0	< 2.0
Dibromochloromethane		U	1760	µg/l	10	< 10	[C] < 10	< 10
1,2-Dibromoethane		U	1760	µg/l	5	< 5	[C] < 5	< 5
Chlorobenzene		N	1760	µg/l	1.0	< 1.0	[C] < 1.0	< 1.0
1,1,1,2-Tetrachloroethane		U	1760	µg/l	2.0	< 2.0	[C] < 2.0	< 2.0
Ethylbenzene		U	1760	µg/l	1.0	< 1.0	[C] < 1.0	< 1.0
m & p-Xylene		U	1760	µg/l	1.0	< 1.0	[C] < 1.0	< 1.0
o-Xylene		U	1760	µg/l	1.0	< 1.0	[C] < 1.0	< 1.0
Styrene		U	1760	µg/l	1.0	< 1.0	[C] < 1.0	< 1.0
Tribromomethane		U	1760	µg/l	1.0	< 1.0	[C] < 1.0	< 1.0
Isopropylbenzene		U	1760	µg/l	1.0	< 1.0	[C] < 1.0	< 1.0
Bromobenzene		U	1760	µg/l	1.0	< 1.0	[C] < 1.0	< 1.0

Results - Water

Project: 13203 kelvedon street

Client: Terra Firma				**Chemtest Job No.:**		24-38437	24-38437	24-38437
Quotation No.:				**Chemtest Sample ID.:**		1899696	1899697	1899698
				Client Sample ID.:		RC01-W	BH01-W	BH03-W
				Sample Location:		RC01	BH01	BH03
				Sample Type:		WATER	WATER	WATER
				Sample Sub Type:				
				Date Sampled:		18-Nov-2024	18-Nov-2024	18-Nov-2024
				Time Sampled:		12:00	12:00	12:00
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**			
1,2,3-Trichloropropane		N	1760	µg/l	50	< 50	[C] < 50	< 50
N-Propylbenzene		U	1760	µg/l	1.0	< 1.0	[C] < 1.0	< 1.0
2-Chlorotoluene		U	1760	µg/l	1.0	< 1.0	[C] < 1.0	< 1.0
1,3,5-Trimethylbenzene		U	1760	µg/l	1.0	< 1.0	[C] < 1.0	< 1.0
4-Chlorotoluene		U	1760	µg/l	1.0	< 1.0	[C] < 1.0	< 1.0
Tert-Butylbenzene		U	1760	µg/l	1.0	< 1.0	[C] < 1.0	< 1.0
1,2,4-Trimethylbenzene		U	1760	µg/l	1.0	< 1.0	[C] < 1.0	< 1.0
Sec-Butylbenzene		U	1760	µg/l	1.0	< 1.0	[C] < 1.0	< 1.0
1,3-Dichlorobenzene		N	1760	µg/l	1.0	< 1.0	[C] < 1.0	< 1.0
4-Isopropyltoluene		U	1760	µg/l	1.0	< 1.0	[C] < 1.0	< 1.0
1,4-Dichlorobenzene		U	1760	µg/l	1.0	< 1.0	[C] < 1.0	< 1.0
N-Butylbenzene		U	1760	µg/l	1.0	< 1.0	[C] < 1.0	< 1.0
1,2-Dichlorobenzene		U	1760	µg/l	1.0	< 1.0	[C] < 1.0	< 1.0
1,2-Dibromo-3-Chloropropane		U	1760	µg/l	50	< 50	[C] < 50	< 50
1,2,4-Trichlorobenzene		U	1760	µg/l	1.0	< 1.0	[C] < 1.0	< 1.0
Hexachlorobutadiene		U	1760	µg/l	1.0	< 1.0	[C] < 1.0	< 1.0
1,2,3-Trichlorobenzene		U	1760	µg/l	2.0	< 2.0	[C] < 2.0	< 2.0
Methyl Tert-Butyl Ether		N	1760	µg/l	1.0	< 1.0	[C] < 1.0	< 1.0
N-Nitrosodimethylamine		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Phenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2-Chlorophenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
1,3-Dichlorobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
1,4-Dichlorobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
1,2-Dichlorobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2-Methylphenol (o-Cresol)		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Hexachloroethane		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Methylphenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Nitrobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Isophorone		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2-Nitrophenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2,4-Dimethylphenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroethoxy)Methane		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2,4-Dichlorophenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
1,2,4-Trichlorobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Chloroaniline		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50

Results - Water

Project: 13203 kelvedon street

Client: Terra Firma				**Chemtest Job No.:**		24-38437	24-38437	24-38437
Quotation No.:				**Chemtest Sample ID.:**		1899696	1899697	1899698
				Client Sample ID.:		RC01-W	BH01-W	BH03-W
				Sample Location:		RC01	BH01	BH03
				Sample Type:		WATER	WATER	WATER
				Sample Sub Type:				
				Date Sampled:		18-Nov-2024	18-Nov-2024	18-Nov-2024
				Time Sampled:		12:00	12:00	12:00
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**			
Hexachlorobutadiene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Chloro-3-Methylphenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2-Methylnaphthalene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2,4,6-Trichlorophenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2,4,5-Trichlorophenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2-Chloronaphthalene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2-Nitroaniline		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Dimethylphthalate		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2,6-Dinitrotoluene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
3-Nitroaniline		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Dibenzofuran		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Chlorophenylphenylether		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2,4-Dinitrotoluene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Diethyl Phthalate		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Nitroaniline		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
2-Methyl-4,6-Dinitrophenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Azobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Bromophenylphenyl Ether		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Hexachlorobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Carbazole		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Di-N-Butyl Phthalate		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Butylbenzyl Phthalate		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Bis(2-Ethylhexyl)Phthalate		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Di-N-Octyl Phthalate		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
4-Nitrophenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50
Naphthalene		U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene		U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Acenaphthene		U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Fluorene		U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Phenanthrene		U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Anthracene		U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Fluoranthene		U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Pyrene		U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene		U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Chrysene		U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene		U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene		U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene		U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10

Results - Water

Project: 13203 kelvedon street

Client: Terra Firma				**Chemtest Job No.:**		24-38437	24-38437	24-38437
Quotation No.:				**Chemtest Sample ID.:**		1899696	1899697	1899698
				Client Sample ID.:		RC01-W	BH01-W	BH03-W
				Sample Location:		RC01	BH01	BH03
				Sample Type:		WATER	WATER	WATER
				Sample Sub Type:				
				Date Sampled:		18-Nov-2024	18-Nov-2024	18-Nov-2024
				Time Sampled:		12:00	12:00	12:00
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**			
Indeno(1,2,3-c,d)Pyrene		U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene		U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene		U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's		U	1800	µg/l	2.0	< 2.0	< 2.0	< 2.0
PCB 28		N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010
PCB 52		N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010
PCB 101		N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010
PCB 118		N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010
PCB 153		N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010
PCB 138		N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010
PCB 180		N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010
Total PCBs (7 congeners)		N	1815	µg/l	0.010	< 0.010	< 0.010	< 0.010
Resorcinol		U	1920	mg/l	0.0050	< 0.0050	< 0.0050	< 0.0050
Phenol		U	1920	mg/l	0.0050	< 0.0050	< 0.0050	< 0.0050
Cresols		U	1920	mg/l	0.0050	< 0.0050	< 0.0050	< 0.0050
Xylenols		U	1920	mg/l	0.0050	< 0.0050	< 0.0050	< 0.0050
1-Naphthol		N	1920	mg/l	0.0050	< 0.0050	< 0.0050	< 0.0050
Trimethylphenols		U	1920	mg/l	0.0050	< 0.0050	< 0.0050	< 0.0050
Total Phenols		U	1920	mg/l	0.030	< 0.030	< 0.030	< 0.030

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request.The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Sample:	Sample Ref:	Sample ID:	Sample Location:	Sampled Date:	Deviation Code(s):	Containers Received:
1899696		BH01-W	BH01	18-Nov-2024	B	Coloured Winchester 1000ml
1899696		BH01-W	BH01	18-Nov-2024	B	EPA Vial 40ml
1899696		BH01-W	BH01	18-Nov-2024	B	Plastic Bottle 1000ml
1899697		WS01-W	WS01	18-Nov-2024	BC	Coloured Winchester 1000ml
1899697		WS01-W	WS01	18-Nov-2024	BC	Plastic Bottle 1000ml
1899698		WS03-W	WS03	18-Nov-2024	B	Coloured Winchester 1000ml
1899698		WS03-W	WS03	18-Nov-2024	B	EPA Vial 40ml
1899698		WS03-W	WS03	18-Nov-2024	B	Plastic Bottle 1000ml

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
1010	pH Value of Waters	pH at 20°C	pH Meter	RE PW TE TS PL DW GW
1090	Biochemical Oxygen Demand	Biochemical Oxygen demand (BOD)	Colorimetric determination of dissolved oxygen in seeded sample after 5 days incubation at 20°C.	
1100	Chemical Oxygen Demand	Chemical Oxygen demand (COD)	Dichromate oxidation of organic matter in sample followed by colorimetric determination of residual Cr[VI].	TE TS PL LE GW
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.	RE PW PL LE DW GW
1270	Total Hardness of Waters	Total hardness	Calculation applied to calcium and magnesium results, expressed as mg l-1 CaCO3 equivalent.	RE PW PL SW DW GW
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.	GW
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).	RE PW PL SW DW GW
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.	PL GW
1610	Total/Dissolved Organic Carbon in Waters	Organic Carbon	TOC Analyser using Catalytic Oxidation	PL SW GW
1675	TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG)	Aliphatics: >C5–C6, >C6–C8, >C8– C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Pentane extraction / GCxGC FID detection	
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.	PL GW
1790	Semi-Volatile Organic Compounds (SVOCs) in Waters by GC-MS	Semi-volatile organic compounds	Solvent extraction / GCMS detection	
1800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GCMS detection	PL GW
1815	Polychlorinated Biphenyls (PCB) ICES7 Congeners in Waters by GC-MS	ICES7 PCB congeners	Solvent extraction / GCMS detection	
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.	PL GW

Report Information

Key

U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection

This report shall not be reproduced except in full, and only with the prior approval of the laboratory.
Any comments or interpretations are outside the scope of UKAS accreditation.
The Laboratory is not accredited for any sampling activities and reported results relate to the samples 'as received' at the laboratory.
Uncertainty of measurement for the determinands tested are available upon request .
None of the results in this report have been recovery corrected.
All results are expressed on a dry weight basis.

The following tests were analysed on samples 'as received' and the results subsequently corrected to a dry weight basis EPH, VPH, TPH, BTEX, VOCs, SVOCs, PCBs, Phenols.

For all other tests the samples were dried at ≤ 30°C prior to analysis.
All Asbestos testing is performed at the indicated laboratory .
Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1.

Sample Deviation Codes

A - Date of sampling not supplied
B - Sample age exceeds stability time (sampling to extraction)
C - Sample not received in appropriate containers
D - Broken Container
E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt.
All water samples will be retained for 14 days from the date of receipt.
Charges may apply to extended sample storage.

Water Sample Category Key for Accreditation

DW - Drinking Water
GW - Ground Water
LE - Land Leachate
NA - Not Applicable

Report Information

PL - Prepared Leachate
PW - Processed Water
RE - Recreational Water
SA - Saline Water
SW - Surface Water
TE - Treated Effluent
TS - Treated Sewage
UL - Unspecified Liquid

Clean Up Codes

NC - No Clean Up
MC - Mathematical Clean Up
FC - Florisil Clean Up

HWOL Acronym System

HS - Headspace analysis
EH - Extractable hydrocarbons – i.e. everything extracted by the solvent
CU - Clean-up – e.g. by Florisil, silica gel
1D - GC – Single coil gas chromatography
Total - Aliphatics & Aromatics
AL - Aliphatics only
AR - Aromatic only
2D - GC-GC – Double coil gas chromatography
#1 - EH_2D_Total but with humics mathematically subtracted
#2 - EH_2D_Total but with fatty acids mathematically subtracted
+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

If you require extended retention of samples, please email your requirements to:
customerservices@chemtest.com

eurofins | Chemtest
Eurofins Chemtest Ltd
Depot Road
Newmarket
CB8 0AL
Tel: 01638 606070
Email: cs@etuki.eurofins.com

Amended Report

Report No.:	25-36690-3		
Initial Date of Issue:	25-Nov-2025	**Date of Re-Issue:**	11-Dec-2025
Re-Issue Details:	This report has been revised and directly supersedes 25-36690-2 in its entirety		
Client	*Terra Firma*		
Client Address:	*5 Deryn Court* *Wharfedale Road* *Pentwyn* *Cardiff* *CF23 7HA*		
Contact(s):	*s.williams@tfwgroup.co.uk*		
Project	*Terra Firma Suites - Cardiff*		
Quotation No.:	*Q25-38938*	**Date Received:**	14-Nov-2025
Order No.:		**Date Instructed:**	14-Nov-2025
No. of Samples:	*16*		
Turnaround (Wkdays):	18	**Results Due:**	09-Dec-2025
Date Approved:	11-Dec-2025		

Approved By:



Details: David Smith, Technical Director

For details about application of accreditation to specific matrix types, please refer to the Table at the back of this report

Results - Soil

Project: Terra Firma Suites - Cardiff

Client: Terra Firma						**Chemtest Job No.:**	25-36690	25-36690	25-36690	25-36690	25-36690	25-36690	25-36690
Quotation No.: Q25-38938						**Chemtest Sample ID.:**	2053224	2053225	2053226	2053227	2053228	2053229	2053230
Order No.:						*Client Sample Ref.:*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
						Client Sample ID.:	*TP201*	*TP201*	*TP202*	*TP202*	*TP203*	*TP203*	*TP204*
						Client Reference:	*TP201*	*TP201*	*TP202*	*TP202*	*TP203*	*TP203*	*TP204*
						Sample Type:	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*
						Top Depth (m):	*0.10*	*0.40*	*0.10*	*0.50*	*0.20*	*0.40*	*0.30*
						Date Sampled:	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*
						Time Sampled:	*12:00*	*12:00*	*12:00*	*12:00*	*12:00*	*12:00*	*12:00*
						Asbestos Lab:	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**								
ACM Type		N	2192		N/A		-	-	-	-	insulation	-	-
Asbestos Identification		U	2192		N/A		No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	Chrysotile	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage		U	2192		N/A		-	-	-	-	Stereo Microscopy	-	-
Asbestos by Gravimetry		U	2192	%	0.001						0.67		
Total Asbestos		U	2192	%	0.001						0.67		
Moisture		N	2030	%	0.020		24	27	18	22	20	25	22
Soil Colour		N	2030		N/A		Brown	Brown	Brown	Brown	Brown	Brown	Brown
Other Material		N	2030		N/A		Stones, Roots, plastic and Glass	Stones, Roots and leaf	Stones and Roots	Stones, Roots and brick	Stones and Roots	Stones and Roots	Stones and Roots
Soil Texture		N	2030		N/A		Sand	Sand	Sand	Sand	Clay	Clay	Clay
pH at 20C		M	2010		4.0		8.1	8.2	8.4	9.2	8.6	8.4	8.8
Boron (Hot Water Soluble)		M	2120	mg/kg	0.40		1.5	1.3	1.5	1.0	0.80	0.95	0.73
Cyanide (Total)		M	2300	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Sulphate (Acid Soluble)		U	2430	%	0.010		0.13	0.17	0.099	0.15	0.012	0.074	0.026
Arsenic		M	2455	mg/kg	0.5		51	53	17	60	14	25	7.2
Cadmium		M	2455	mg/kg	0.10		0.48	0.56	0.34	0.54	0.24	0.44	< 0.10
Chromium		M	2455	mg/kg	0.5		21	22	13	27	38	30	10
Mercury Low Level		N	2450	mg/kg	0.05		0.26	0.27	0.16	0.28	0.25	0.43	0.14
Copper		M	2455	mg/kg	0.50		110	130	53	110	62	80	22
Nickel		M	2455	mg/kg	0.50		50	49	20	57	23	38	16
Lead		M	2455	mg/kg	0.50		190	270	97	230	210	180	53
Selenium		M	2455	mg/kg	0.25		1.2	1.3	0.68	1.5	0.42	0.92	< 0.25
Zinc		M	2455	mg/kg	0.50		430	400	150	450	120	250	69
Chromium (Trivalent)		N	2490	mg/kg	1.0		21	22	13	27	38	30	10
Chromium (Hexavalent)		N	2490	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Aliphatic VPH >C5-C6	HS_2D_AL	U	2780	mg/kg	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C7	HS_2D_AL	U	2780	mg/kg	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C7-C8	HS_2D_AL	U	2780	mg/kg	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C8 (Sum)	HS_2D_AL	N	2780	mg/kg	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic VPH >C8-C10	HS_2D_AL	U	2780	mg/kg	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Aliphatic VPH >C5-C10	HS_2D_AL	U	2780	mg/kg	0.25		< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Aliphatic EPH >C10-C12 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00		< 2.0	< 2.0	< 2.0	< 2.0	2.1	7.0	4.5
Aliphatic EPH >C12-C16 MC	EH_2D_AL_#1	M	2690	mg/kg	1.00		4.2	6.7	2.1	6.2	7.1	16	15

Results - Soil

Project: Terra Firma Suites - Cardiff

Client: Terra Firma						**Chemtest Job No.:**	25-36690	25-36690	25-36690	25-36690	25-36690	25-36690	25-36690
Quotation No.: Q25-38938						**Chemtest Sample ID.:**	2053224	2053225	2053226	2053227	2053228	2053229	2053230
Order No.:						*Client Sample Ref.:*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
						Client Sample ID.:	*TP201*	*TP201*	*TP202*	*TP202*	*TP203*	*TP203*	*TP204*
						Client Reference:	*TP201*	*TP201*	*TP202*	*TP202*	*TP203*	*TP203*	*TP204*
						Sample Type:	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*
						Top Depth (m):	*0.10*	*0.40*	*0.10*	*0.50*	*0.20*	*0.40*	*0.30*
						Date Sampled:	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*
						Time Sampled:	*12:00*	*12:00*	*12:00*	*12:00*	*12:00*	*12:00*	*12:00*
						Asbestos Lab:	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**								
Aliphatic EPH >C16-C21 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00		5.0	7.4	6.5	9.0	9.8	13	17
Aliphatic EPH >C21-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	3.00		20	22	53	29	16	25	21
Aliphatic EPH >C35-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00		< 10	< 10	< 10	< 10	< 10	< 10	< 10
Total Aliphatic EPH >C10-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	5.00		31	38	62	46	35	61	58
Total Aliphatic EPH >C10-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00		34	41	65	50	36	62	59
Aromatic VPH >C5-C7	HS_2D_AR	U	2780	mg/kg	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C7-C8	HS_2D_AR	U	2780	mg/kg	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C8-C10	HS_2D_AR	U	2780	mg/kg	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Total Aromatic VPH >C5-C10	HS_2D_AR	U	2780	mg/kg	0.25		< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25	< 0.25
Aromatic EPH >C10-C12 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00		< 1.0	< 1.0	< 1.0	< 1.0	4.8	13	18
Aromatic EPH >C12-C16 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00		12	1.1	22	8.1	120	170	200
Aromatic EPH >C16-C21 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00		75	35	160	71	890	900	1300
Aromatic EPH >C21-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00		130	100	340	190	1800	1800	2500
Aromatic EPH >C35-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	1.00		12	15	56	32	240	260	320
Total Aromatic EPH >C10-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	5.00		220	140	520	270	2800	2900	4000
Total Aromatic EPH >C10-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	10.00		230	150	570	310	3100	3200	4300
Total VPH >C5-C10	HS_2D_Total	U	2780	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Total EPH >C10-C35 MC	EH_2D_Total_#1	U	2690	mg/kg	10.00		250	180	580	320	2800	3000	4100
Total EPH >C10-C40 MC	EH_2D_Total_#1	N	2690	mg/kg	10.00		260	190	640	360	3100	3200	4400
Naphthalene		M	2700	mg/kg	0.10		0.51	0.44	0.47	0.50	0.49	0.59	0.57
Acenaphthylene		M	2700	mg/kg	0.10		1.4	1.3	1.4	1.5	1.6	1.5	1.4
Acenaphthene		M	2700	mg/kg	0.10		2.2	2.1	2.4	2.4	3.1	2.6	2.6
Fluorene		M	2700	mg/kg	0.10		2.0	2.3	2.6	2.6	3.3	2.8	2.7
Phenanthrene		M	2700	mg/kg	0.10		19	19	21	22	27	23	23
Anthracene		M	2700	mg/kg	0.10		8.0	7.5	8.7	9.0	11	9.4	8.8
Fluoranthene		M	2700	mg/kg	0.10		45	45	47	48	56	49	50
Pyrene		M	2700	mg/kg	0.10		44	45	47	49	55	49	50
Benzo[a]anthracene		M	2700	mg/kg	0.10		24	24	24	26	28	26	26
Chrysene		M	2700	mg/kg	0.10		23	23	23	24	27	24	25
Benzo[b]fluoranthene		M	2700	mg/kg	0.10		34	33	33	35	37	35	36
Benzo[k]fluoranthene		M	2700	mg/kg	0.10		13	13	13	13	14	13	14
Benzo[a]pyrene		M	2700	mg/kg	0.10		28	27	27	29	31	30	29
Indeno(1,2,3-c,d)Pyrene		M	2700	mg/kg	0.10		17	17	16	17	19	18	18
Dibenz(a,h)Anthracene		M	2700	mg/kg	0.10		4.9	5.5	5.3	5.9	6.2	5.6	5.8
Benzo[g,h,i]perylene		M	2700	mg/kg	0.10		17	17	16	16	19	18	18
Total Of 16 PAH's		M	2700	mg/kg	2.0		280	280	290	300	340	310	310

Results - Soil

Project: Terra Firma Suites - Cardiff

Client: Terra Firma						**Chemtest Job No.:**	25-36690	25-36690	25-36690	25-36690	25-36690	25-36690	25-36690
Quotation No.: Q25-38938						**Chemtest Sample ID.:**	2053224	2053225	2053226	2053227	2053228	2053229	2053230
Order No.:						*Client Sample Ref.:*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
						Client Sample ID.:	*TP201*	*TP201*	*TP202*	*TP202*	*TP203*	*TP203*	*TP204*
						Client Reference:	*TP201*	*TP201*	*TP202*	*TP202*	*TP203*	*TP203*	*TP204*
						Sample Type:	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*
						Top Depth (m):	*0.10*	*0.40*	*0.10*	*0.50*	*0.20*	*0.40*	*0.30*
						Date Sampled:	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*
						Time Sampled:	*12:00*	*12:00*	*12:00*	*12:00*	*12:00*	*12:00*	*12:00*
						Asbestos Lab:	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**								
Dichlorodifluoromethane		N	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloromethane		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane		M	2760	µg/kg	20		< 20	< 20	< 20	< 20	< 20	< 20	< 20
Chloroethane		U	2760	µg/kg	2.0		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichlorofluoromethane		N	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans 1,2-Dichloroethene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromochloromethane		U	2760	µg/kg	5.0		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Trichloromethane		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene		U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane		M	2760	µg/kg	2.0		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichloroethene		N	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane		M	2760	µg/kg	5.0		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
cis-1,3-Dichloropropene		N	2760	µg/kg	10		< 10	< 10	< 10	< 10	< 10	< 10	< 10
Toluene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene		N	2760	µg/kg	10		< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,1,2-Trichloroethane		M	2760	µg/kg	10		< 10	< 10	< 10	< 10	< 10	< 10	< 10
Tetrachloroethene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane		U	2760	µg/kg	2.0		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Dibromochloromethane		U	2760	µg/kg	10		< 10	< 10	< 10	< 10	< 10	< 10	< 10
1,2-Dibromoethane		M	2760	µg/kg	5.0		< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chlorobenzene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane		M	2760	µg/kg	2.0		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene		M	2760	µg/kg	1.0		11	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane		U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results - Soil

Project: Terra Firma Suites - Cardiff

Client: Terra Firma						**Chemtest Job No.:**	25-36690	25-36690	25-36690	25-36690	25-36690	25-36690	25-36690
Quotation No.: Q25-38938						**Chemtest Sample ID.:**	2053224	2053225	2053226	2053227	2053228	2053229	2053230
Order No.:						*Client Sample Ref.:*	*1*	*1*	*1*	*1*	*1*	*1*	*1*
						Client Sample ID.:	*TP201*	*TP201*	*TP202*	*TP202*	*TP203*	*TP203*	*TP204*
						Client Reference:	*TP201*	*TP201*	*TP202*	*TP202*	*TP203*	*TP203*	*TP204*
						Sample Type:	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*
						Top Depth (m):	*0.10*	*0.40*	*0.10*	*0.50*	*0.20*	*0.40*	*0.30*
						Date Sampled:	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*
						Time Sampled:	*12:00*	*12:00*	*12:00*	*12:00*	*12:00*	*12:00*	*12:00*
						Asbestos Lab:	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**								
Isopropylbenzene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane		N	2760	µg/kg	50		< 50	< 50	< 50	< 50	< 50	< 50	< 50
N-Propylbenzene		U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene		U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tert-Butylbenzene		U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Sec-Butylbenzene		U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Isopropyltoluene		U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Butylbenzene		U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane		N	2760	µg/kg	50		< 50	< 50	< 50	< 50	< 50	< 50	< 50
1,2,4-Trichlorobenzene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene		N	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene		U	2760	µg/kg	2.0		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Nitrosodimethylamine		M	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenol		M	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chlorophenol		N	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether		M	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,3-Dichlorobenzene		M	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,4-Dichlorobenzene		N	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2-Dichlorobenzene		M	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methylphenol		M	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether		N	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachloroethane		N	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine		M	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Methylphenol		M	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Nitrobenzene		N	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Isophorone		M	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitrophenol		N	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dimethylphenol		N	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

Results - Soil

Project: Terra Firma Suites - Cardiff

Client: Terra Firma				**Chemtest Job No.:**		25-36690	25-36690	25-36690	25-36690	25-36690	25-36690	25-36690
Quotation No.: Q25-38938				**Chemtest Sample ID.:**		2053224	2053225	2053226	2053227	2053228	2053229	2053230
Order No.:				*Client Sample Ref.:*		*1*	*1*	*1*	*1*	*1*	*1*	*1*
				Client Sample ID.:		*TP201*	*TP201*	*TP202*	*TP202*	*TP203*	*TP203*	*TP204*
				Client Reference:		*TP201*	*TP201*	*TP202*	*TP202*	*TP203*	*TP203*	*TP204*
				Sample Type:		*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*
				Top Depth (m):		*0.10*	*0.40*	*0.10*	*0.50*	*0.20*	*0.40*	*0.30*
				Date Sampled:		*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*
				Time Sampled:		*12:00*	*12:00*	*12:00*	*12:00*	*12:00*	*12:00*	*12:00*
				Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**							
Bis(2-Chloroethoxy)Methane		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dichlorophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2,4-Trichlorobenzene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Naphthalene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	12	1.7	1.5	3.8
4-Chloroaniline		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobutadiene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chloro-3-Methylphenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methylnaphthalene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	4.0	1.5	1.2	2.3
4-Nitrophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4,6-Trichlorophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4,5-Trichlorophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chloronaphthalene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitroaniline		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Acenaphthylene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dimethylphthalate		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,6-Dinitrotoluene		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Acenaphthene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	2.4	3.9	3.8	3.3
3-Nitroaniline		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibenzofuran		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	2.4	2.6	2.3	2.3
4-Chlorophenylphenylether		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dinitrotoluene		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fluorene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	2.6	3.9	3.8	2.8
Diethyl Phthalate		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Nitroaniline		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Azobenzene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Bromophenylphenyl Ether		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobenzene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenanthrene		M	2790	mg/kg	0.50	1.6	1.8	4.8	17	37	40	29
Anthracene		M	2790	mg/kg	0.50	< 0.50	< 0.50	1.3	4.3	11	11	7.7
Carbazole		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	2.5	3.1	2.6	2.5
Di-N-Butyl Phthalate		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fluoranthene		M	2790	mg/kg	0.50	3.2	4.1	10	16	50	64	38
Pyrene		M	2790	mg/kg	0.50	2.9	3.6	8.6	13	42	55	32
Butylbenzyl Phthalate		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[a]anthracene		M	2790	mg/kg	0.50	1.7	2.3	5.4	8.0	23	32	18
Chrysene		M	2790	mg/kg	0.50	1.8	2.3	5.7	8.3	21	30	17

Results - Soil

Project: Terra Firma Suites - Cardiff

Client: Terra Firma				**Chemtest Job No.:**		25-36690	25-36690	25-36690	25-36690	25-36690	25-36690	25-36690
Quotation No.: Q25-38938				**Chemtest Sample ID.:**		2053224	2053225	2053226	2053227	2053228	2053229	2053230
Order No.:				*Client Sample Ref.:*		*1*	*1*	*1*	*1*	*1*	*1*	*1*
				Client Sample ID.:		*TP201*	*TP201*	*TP202*	*TP202*	*TP203*	*TP203*	*TP204*
				Client Reference:		*TP201*	*TP201*	*TP202*	*TP202*	*TP203*	*TP203*	*TP204*
				Sample Type:		*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*	*SOIL*
				Top Depth (m):		*0.10*	*0.40*	*0.10*	*0.50*	*0.20*	*0.40*	*0.30*
				Date Sampled:		*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*
				Time Sampled:		*12:00*	*12:00*	*12:00*	*12:00*	*12:00*	*12:00*	*12:00*
				Asbestos Lab:		DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**							
Bis(2-Ethylhexyl)Phthalate		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Di-N-Octyl Phthalate		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[b]fluoranthene		M	2790	mg/kg	0.50	2.4	3.1	7.6	8.9	24	35	19
Benzo[k]fluoranthene		M	2790	mg/kg	0.50	0.82	1.1	2.4	3.1	8.8	12	6.5
Benzo[a]pyrene		M	2790	mg/kg	0.50	1.9	2.3	5.8	6.7	19	29	15
Indeno(1,2,3-c,d)Pyrene		N	2790	mg/kg	0.50	0.99	1.3	3.2	3.1	11	15	8.0
Dibenz(a,h)Anthracene		N	2790	mg/kg	0.50	< 0.50	< 0.50	0.95	1.2	3.4	5.2	2.6
Benzo[g,h,i]perylene		M	2790	mg/kg	0.50	1.2	1.5	3.8	3.5	12	16	8.8
Naphthalene		M	2800	mg/kg	0.10	0.66	0.88	1.9	2.3	46	8.1	11
Acenaphthylene		N	2800	mg/kg	0.10	0.28	0.61	0.55	0.68	1.7	1.0	1.3
Acenaphthene		M	2800	mg/kg	0.10	0.34	1.1	2.7	2.3	44	8.9	15
Fluorene		M	2800	mg/kg	0.10	0.46	1.4	2.8	2.8	43	9.7	15
Phenanthrene		M	2800	mg/kg	0.10	4.0	12	24	24	310	82	130
Anthracene		M	2800	mg/kg	0.10	1.1	3.3	6.4	7.3	89	24	36
Fluoranthene		M	2800	mg/kg	0.10	7.9	21	38	37	330	110	170
Pyrene		M	2800	mg/kg	0.10	6.9	17	31	31	270	92	140
Benzo[a]anthracene		M	2800	mg/kg	0.10	4.8	11	20	18	150	57	79
Chrysene		M	2800	mg/kg	0.10	4.1	11	18	17	140	55	79
Benzo[b]fluoranthene		M	2800	mg/kg	0.10	6.6	14	24	23	160	66	93
Benzo[k]fluoranthene		M	2800	mg/kg	0.10	2.3	5.2	8.6	8.3	62	25	34
Benzo[a]pyrene		M	2800	mg/kg	0.10	5.6	12	22	21	150	59	79
Indeno(1,2,3-c,d)Pyrene		M	2800	mg/kg	0.10	3.2	6.7	12	12	81	33	46
Dibenz(a,h)Anthracene		N	2800	mg/kg	0.10	0.70	1.3	2.5	2.4	16	7.0	9.4
Benzo[g,h,i]perylene		M	2800	mg/kg	0.10	3.2	6.3	11	11	78	31	44
Total Of 16 PAH's		N	2800	mg/kg	2.0	52	120	230	220	2000	670	980
Total Phenols		M	2920	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.21	< 0.10	< 0.10
Organic Matter BS1377		N	2930	%	0.10	6.7	6.7	6.7	6.7	5.3	4.7	3.7

Results - Soil

Project: Terra Firma Suites - Cardiff

Client: Terra Firma					**Chemtest Job No.:**	25-36690	25-36690	25-36690
Quotation No.: Q25-38938					**Chemtest Sample ID.:**	2053231	2053232	2053233
Order No.:					*Client Sample Ref.:*	*1*	*1*	*1*
					Client Sample ID.:	*TP204*	*TP205*	*TP205*
					Client Reference:	*TP204*	*TP205*	*TP205*
					Sample Type:	*SOIL*	*SOIL*	*SOIL*
					Top Depth (m):	*0.50*	*0.10*	*0.60*
					Date Sampled:	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*
					Time Sampled:	*12:00*	*12:00*	*12:00*
					Asbestos Lab:	DURHAM	DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**			
ACM Type		N	2192		N/A	-	-	-
Asbestos Identification		U	2192		N/A	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage		U	2192		N/A	-	-	-
Asbestos by Gravimetry		U	2192	%	0.001			
Total Asbestos		U	2192	%	0.001			
Moisture		N	2030	%	0.020	20	11	29
Soil Colour		N	2030		N/A	Brown	Brown	Brown
Other Material		N	2030		N/A	Stones and Roots	Stones and Roots	Stones and Roots
Soil Texture		N	2030		N/A	Clay	Sand	Clay
pH at 20C		M	2010		4.0	9.2	9.0	8.2
Boron (Hot Water Soluble)		M	2120	mg/kg	0.40	0.70	0.50	1.2
Cyanide (Total)		M	2300	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Sulphate (Acid Soluble)		U	2430	%	0.010	0.091	0.046	0.031
Arsenic		M	2455	mg/kg	0.5	15	6.1	9.3
Cadmium		M	2455	mg/kg	0.10	0.20	0.18	< 0.10
Chromium		M	2455	mg/kg	0.5	19	9.1	19
Mercury Low Level		N	2450	mg/kg	0.05	0.22	0.05	0.05
Copper		M	2455	mg/kg	0.50	45	15	13
Nickel		M	2455	mg/kg	0.50	27	12	20
Lead		M	2455	mg/kg	0.50	92	38	33
Selenium		M	2455	mg/kg	0.25	0.47	< 0.25	< 0.25
Zinc		M	2455	mg/kg	0.50	170	54	60
Chromium (Trivalent)		N	2490	mg/kg	1.0	19	9.1	19
Chromium (Hexavalent)		N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Aliphatic VPH >C5-C6	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C7	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C7-C8	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05
Aliphatic VPH >C6-C8 (Sum)	HS_2D_AL	N	2780	mg/kg	0.10	< 0.10	< 0.10	< 0.10
Aliphatic VPH >C8-C10	HS_2D_AL	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05
Total Aliphatic VPH >C5-C10	HS_2D_AL	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25
Aliphatic EPH >C10-C12 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	5.3	< 2.0	2.4
Aliphatic EPH >C12-C16 MC	EH_2D_AL_#1	M	2690	mg/kg	1.00	14	5.8	5.9

Results - Soil

Project: Terra Firma Suites - Cardiff

Client: Terra Firma				**Chemtest Job No.:**		25-36690	25-36690	25-36690
Quotation No.: Q25-38938				**Chemtest Sample ID.:**		2053231	2053232	2053233
Order No.:				*Client Sample Ref.:*		*1*	*1*	*1*
				Client Sample ID.:		*TP204*	*TP205*	*TP205*
				Client Reference:		*TP204*	*TP205*	*TP205*
				Sample Type:		*SOIL*	*SOIL*	*SOIL*
				Top Depth (m):		*0.50*	*0.10*	*0.60*
				Date Sampled:		*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*
				Time Sampled:		*12:00*	*12:00*	*12:00*
				Asbestos Lab:		DURHAM	DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**			
Aliphatic EPH >C16-C21 MC	EH_2D_AL_#1	M	2690	mg/kg	2.00	11	13	8.6
Aliphatic EPH >C21-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	3.00	28	11	51
Aliphatic EPH >C35-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	< 10	< 10	15
Total Aliphatic EPH >C10-C35 MC	EH_2D_AL_#1	M	2690	mg/kg	5.00	58	31	68
Total Aliphatic EPH >C10-C40 MC	EH_2D_AL_#1	N	2690	mg/kg	10.00	61	35	83
Aromatic VPH >C5-C7	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C7-C8	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05
Aromatic VPH >C8-C10	HS_2D_AR	U	2780	mg/kg	0.05	< 0.05	< 0.05	< 0.05
Total Aromatic VPH >C5-C10	HS_2D_AR	U	2780	mg/kg	0.25	< 0.25	< 0.25	< 0.25
Aromatic EPH >C10-C12 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	10	< 1.0	1.1
Aromatic EPH >C12-C16 MC	EH_2D_AR_#1	U	2690	mg/kg	1.00	87	11	13
Aromatic EPH >C16-C21 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	530	140	140
Aromatic EPH >C21-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	2.00	1300	360	340
Aromatic EPH >C35-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	1.00	210	300	60
Total Aromatic EPH >C10-C35 MC	EH_2D_AR_#1	U	2690	mg/kg	5.00	2000	520	490
Total Aromatic EPH >C10-C40 MC	EH_2D_AR_#1	N	2690	mg/kg	10.00	2200	820	550
Total VPH >C5-C10	HS_2D_Total	U	2780	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Total EPH >C10-C35 MC	EH_2D_Total_#1	U	2690	mg/kg	10.00	2000	550	560
Total EPH >C10-C40 MC	EH_2D_Total_#1	N	2690	mg/kg	10.00	2200	850	630
Naphthalene		M	2700	mg/kg	0.10	0.50	0.50	0.52
Acenaphthylene		M	2700	mg/kg	0.10	1.6	1.6	1.5
Acenaphthene		M	2700	mg/kg	0.10	3.0	2.8	2.6
Fluorene		M	2700	mg/kg	0.10	3.3	3.1	2.5
Phenanthrene		M	2700	mg/kg	0.10	26	25	23
Anthracene		M	2700	mg/kg	0.10	11	10	9.3
Fluoranthene		M	2700	mg/kg	0.10	55	53	50
Pyrene		M	2700	mg/kg	0.10	55	53	50
Benzo[a]anthracene		M	2700	mg/kg	0.10	27	26	26
Chrysene		M	2700	mg/kg	0.10	26	26	25
Benzo[b]fluoranthene		M	2700	mg/kg	0.10	37	37	35
Benzo[k]fluoranthene		M	2700	mg/kg	0.10	14	14	14
Benzo[a]pyrene		M	2700	mg/kg	0.10	31	31	30
Indeno(1,2,3-c,d)Pyrene		M	2700	mg/kg	0.10	19	19	18
Dibenz(a,h)Anthracene		M	2700	mg/kg	0.10	6.0	6.2	5.9
Benzo[g,h,i]perylene		M	2700	mg/kg	0.10	19	19	18
Total Of 16 PAH's		M	2700	mg/kg	2.0	330	330	310

Results - Soil

Project: Terra Firma Suites - Cardiff

Client: Terra Firma						**Chemtest Job No.:**	25-36690	25-36690	25-36690
Quotation No.: Q25-38938						**Chemtest Sample ID.:**	2053231	2053232	2053233
Order No.:						*Client Sample Ref.:*	*1*	*1*	*1*
						Client Sample ID.:	*TP204*	*TP205*	*TP205*
						Client Reference:	*TP204*	*TP205*	*TP205*
						Sample Type:	*SOIL*	*SOIL*	*SOIL*
						Top Depth (m):	*0.50*	*0.10*	*0.60*
						Date Sampled:	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*
						Time Sampled:	*12:00*	*12:00*	*12:00*
						Asbestos Lab:	DURHAM	DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**				
Dichlorodifluoromethane		N	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
Chloromethane		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
Vinyl Chloride		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
Bromomethane		M	2760	µg/kg	20		< 20	< 20	< 20
Chloroethane		U	2760	µg/kg	2.0		< 2.0	< 2.0	< 2.0
Trichlorofluoromethane		N	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
1,1-Dichloroethene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
Trans 1,2-Dichloroethene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
1,1-Dichloroethane		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
Bromochloromethane		U	2760	µg/kg	5.0		< 5.0	< 5.0	< 5.0
Trichloromethane		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
Tetrachloromethane		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
1,1-Dichloropropene		U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
Benzene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
1,2-Dichloroethane		M	2760	µg/kg	2.0		< 2.0	< 2.0	< 2.0
Trichloroethene		N	2760	µg/kg	1.0		< 1.0	2.6	< 1.0
1,2-Dichloropropane		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
Dibromomethane		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
Bromodichloromethane		M	2760	µg/kg	5.0		< 5.0	< 5.0	< 5.0
cis-1,3-Dichloropropene		N	2760	µg/kg	10		< 10	< 10	< 10
Toluene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene		N	2760	µg/kg	10		< 10	< 10	< 10
1,1,2-Trichloroethane		M	2760	µg/kg	10		< 10	< 10	< 10
Tetrachloroethene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
1,3-Dichloropropane		U	2760	µg/kg	2.0		< 2.0	< 2.0	< 2.0
Dibromochloromethane		U	2760	µg/kg	10		< 10	< 10	< 10
1,2-Dibromoethane		M	2760	µg/kg	5.0		< 5.0	< 5.0	< 5.0
Chlorobenzene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane		M	2760	µg/kg	2.0		< 2.0	< 2.0	< 2.0
Ethylbenzene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
m & p-Xylene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
o-Xylene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
Styrene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
Tribromomethane		U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0

Results - Soil

Project: Terra Firma Suites - Cardiff

Client: Terra Firma						**Chemtest Job No.:**	25-36690	25-36690	25-36690
Quotation No.: Q25-38938						**Chemtest Sample ID.:**	2053231	2053232	2053233
Order No.:						*Client Sample Ref.:*	*1*	*1*	*1*
						Client Sample ID.:	*TP204*	*TP205*	*TP205*
						Client Reference:	*TP204*	*TP205*	*TP205*
						Sample Type:	*SOIL*	*SOIL*	*SOIL*
						Top Depth (m):	*0.50*	*0.10*	*0.60*
						Date Sampled:	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*
						Time Sampled:	*12:00*	*12:00*	*12:00*
						Asbestos Lab:	DURHAM	DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**				
Isopropylbenzene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
Bromobenzene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane		N	2760	µg/kg	50		< 50	< 50	< 50
N-Propylbenzene		U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
2-Chlorotoluene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
4-Chlorotoluene		U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
Tert-Butylbenzene		U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
Sec-Butylbenzene		U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
4-Isopropyltoluene		U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
N-Butylbenzene		U	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane		N	2760	µg/kg	50		< 50	< 50	< 50
1,2,4-Trichlorobenzene		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
Hexachlorobutadiene		N	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene		U	2760	µg/kg	2.0		< 2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether		M	2760	µg/kg	1.0		< 1.0	< 1.0	< 1.0
N-Nitrosodimethylamine		M	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50
Phenol		M	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50
2-Chlorophenol		N	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether		M	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50
1,3-Dichlorobenzene		M	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50
1,4-Dichlorobenzene		N	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50
1,2-Dichlorobenzene		M	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50
2-Methylphenol		M	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether		N	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50
Hexachloroethane		N	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine		M	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50
4-Methylphenol		M	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50
Nitrobenzene		N	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50
Isophorone		M	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50
2-Nitrophenol		N	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50
2,4-Dimethylphenol		N	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50

Results - Soil

Project: Terra Firma Suites - Cardiff

Client: Terra Firma				**Chemtest Job No.:**		25-36690	25-36690	25-36690
Quotation No.: Q25-38938				**Chemtest Sample ID.:**		2053231	2053232	2053233
Order No.:				*Client Sample Ref.:*		*1*	*1*	*1*
				Client Sample ID.:		*TP204*	*TP205*	*TP205*
				Client Reference:		*TP204*	*TP205*	*TP205*
				Sample Type:		*SOIL*	*SOIL*	*SOIL*
				Top Depth (m):		*0.50*	*0.10*	*0.60*
				Date Sampled:		*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*
				Time Sampled:		*12:00*	*12:00*	*12:00*
				Asbestos Lab:		DURHAM	DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**			
Bis(2-Chloroethoxy)Methane		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
2,4-Dichlorophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
1,2,4-Trichlorobenzene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Naphthalene		M	2790	mg/kg	0.50	10	< 0.50	< 0.50
4-Chloroaniline		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Hexachlorobutadiene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
4-Chloro-3-Methylphenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
2-Methylnaphthalene		M	2790	mg/kg	0.50	4.6	< 0.50	< 0.50
4-Nitrophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
2,4,6-Trichlorophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
2,4,5-Trichlorophenol		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
2-Chloronaphthalene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
2-Nitroaniline		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Acenaphthylene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Dimethylphthalate		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
2,6-Dinitrotoluene		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Acenaphthene		M	2790	mg/kg	0.50	7.4	< 0.50	< 0.50
3-Nitroaniline		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Dibenzofuran		M	2790	mg/kg	0.50	6.8	< 0.50	< 0.50
4-Chlorophenylphenylether		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
2,4-Dinitrotoluene		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Fluorene		M	2790	mg/kg	0.50	10	< 0.50	< 0.50
Diethyl Phthalate		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
4-Nitroaniline		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Azobenzene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
4-Bromophenylphenyl Ether		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Hexachlorobenzene		M	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Phenanthrene		M	2790	mg/kg	0.50	64	4.4	2.2
Anthracene		M	2790	mg/kg	0.50	17	1.3	< 0.50
Carbazole		M	2790	mg/kg	0.50	5.9	< 0.50	< 0.50
Di-N-Butyl Phthalate		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Fluoranthene		M	2790	mg/kg	0.50	65	7.8	4.6
Pyrene		M	2790	mg/kg	0.50	53	6.8	4.3
Butylbenzyl Phthalate		N	2790	mg/kg	0.50	< 0.50	< 0.50	< 0.50
Benzo[a]anthracene		M	2790	mg/kg	0.50	27	4.2	2.6
Chrysene		M	2790	mg/kg	0.50	26	4.2	2.6

Results - Soil

Project: Terra Firma Suites - Cardiff

Client: Terra Firma						**Chemtest Job No.:**	25-36690	25-36690	25-36690
Quotation No.: Q25-38938						**Chemtest Sample ID.:**	2053231	2053232	2053233
Order No.:						*Client Sample Ref.:*	*1*	*1*	*1*
						Client Sample ID.:	*TP204*	*TP205*	*TP205*
						Client Reference:	*TP204*	*TP205*	*TP205*
						Sample Type:	*SOIL*	*SOIL*	*SOIL*
						Top Depth (m):	*0.50*	*0.10*	*0.60*
						Date Sampled:	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*
						Time Sampled:	*12:00*	*12:00*	*12:00*
						Asbestos Lab:	DURHAM	DURHAM	DURHAM
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**				
Bis(2-Ethylhexyl)Phthalate		N	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50
Di-N-Octyl Phthalate		N	2790	mg/kg	0.50		< 0.50	< 0.50	< 0.50
Benzo[b]fluoranthene		M	2790	mg/kg	0.50		26	6.1	3.8
Benzo[k]fluoranthene		M	2790	mg/kg	0.50		9.6	2.0	1.3
Benzo[a]pyrene		M	2790	mg/kg	0.50		22	4.9	3.3
Indeno(1,2,3-c,d)Pyrene		N	2790	mg/kg	0.50		11	2.7	1.8
Dibenz(a,h)Anthracene		N	2790	mg/kg	0.50		3.7	0.80	< 0.50
Benzo[g,h,i]perylene		M	2790	mg/kg	0.50		10	3.2	2.0
Naphthalene		M	2800	mg/kg	0.10		9.3	2.0	0.31
Acenaphthylene		N	2800	mg/kg	0.10		1.2	1.4	0.12
Acenaphthene		M	2800	mg/kg	0.10		12	3.1	0.38
Fluorene		M	2800	mg/kg	0.10		11	3.0	0.46
Phenanthrene		M	2800	mg/kg	0.10		100	33	3.9
Anthracene		M	2800	mg/kg	0.10		27	10	1.0
Fluoranthene		M	2800	mg/kg	0.10		130	67	6.3
Pyrene		M	2800	mg/kg	0.10		110	58	5.3
Benzo[a]anthracene		M	2800	mg/kg	0.10		60	33	3.0
Chrysene		M	2800	mg/kg	0.10		59	32	3.1
Benzo[b]fluoranthene		M	2800	mg/kg	0.10		68	44	4.1
Benzo[k]fluoranthene		M	2800	mg/kg	0.10		25	16	1.3
Benzo[a]pyrene		M	2800	mg/kg	0.10		56	37	3.3
Indeno(1,2,3-c,d)Pyrene		M	2800	mg/kg	0.10		33	27	2.3
Dibenz(a,h)Anthracene		N	2800	mg/kg	0.10		6.5	4.2	0.45
Benzo[g,h,i]perylene		M	2800	mg/kg	0.10		30	23	2.3
Total Of 16 PAH's		N	2800	mg/kg	2.0		740	390	38
Total Phenols		M	2920	mg/kg	0.10		< 0.10	< 0.10	< 0.10
Organic Matter BS1377		N	2930	%	0.10		3.6	3.4	2.6

Results - Water

Project: Terra Firma Suites - Cardiff

Client: Terra Firma				**Chemtest Job No.:**		25-36690	25-36690	25-36690	25-36690	25-36690	25-36690
Quotation No.: Q25-38938				**Chemtest Sample ID.:**		2053234	2053235	2053236	2053237	2053238	2053239
Order No.:				*Client Sample Ref.:*		*1*	*1*	*1*	*1*	*1*	*1*
				Client Sample ID.:		*BH01-24*	*RBH01*	*BH02-24*	*BH03-24*	*RBH02*	*RC01*
				Client Reference:		*BH01-24*	*RBH01*	*BH02-24*	*BH03-24*	*RBH02*	*RC01*
				Sample Type:		*WATER*	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
				Sample Sub Type:							
				Date Sampled:		*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*
				Time Sampled:		*12:00*	*12:00*	*12:00*	*12:00*	*12:00*	*12:00*
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**						
pH at 20C		U	1010		4.0	8.5	8.5	8.4	8.4	8.2	8.3
Electrical Conductivity at 25C		U	1020	µS/cm	1.0	3.7	1600	930	14	1300	1100
Biochemical Oxygen Demand		N	1090	mg O2/l	4.0	< 4.0	4.0	6.0	< 4.0	< 4.0	< 4.0
Chemical Oxygen Demand		U	1100	mg O2/l	10	< 10	23	33	< 10	15	< 10
Sulphate		U	1220	mg/l	1.0	72	100	200	73	280	76
Cyanide (Total)		U	1300	mg/l	0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Sulphide		U	1325	mg/l	0.050	0.059	0.056	0.052	0.057	< 0.050	< 0.050
Total Hardness as CaCO3		U	1270	mg/l	15	240	430	270	240	670	240
Arsenic (Dissolved)		U	1455	µg/l	0.20	1.4	7.6	9.7	1.5	3.1	1.7
Boron (Dissolved)		U	1455	µg/l	10.0	300	730	290	310	390	320
Chromium (Dissolved)		U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Copper (Dissolved)		U	1455	µg/l	0.50	1.6	1.3	1.0	1.5	2.9	1.3
Mercury (Dissolved)		U	1455	µg/l	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Nickel (Dissolved)		U	1455	µg/l	0.50	0.59	2.8	3.1	0.83	2.1	0.57
Lead (Dissolved)		U	1455	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Selenium (Dissolved)		U	1455	µg/l	0.50	0.68	0.67	< 0.50	< 0.50	3.9	0.93
Zinc (Dissolved)		U	1455	µg/l	2.5	5.9	8.2	6.8	6.6	11	8.5
Cadmium (Dissolved)		N	1455	µg/l	0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08
Chromium (Trivalent)		N	1490	µg/l	20	< 20	< 20	< 20	< 20	< 20	< 20
Chromium (Hexavalent)		U	1490	µg/l	20	< 20	< 20	< 20	< 20	< 20	< 20
Total TPH >C6-C40	EH_1D_Total	U	1670	µg/l	10	< 10	< 10	< 10	< 10	< 10	< 10
Aliphatic TPH >C5-C6	EH_2D_AL_#1	N	1780	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C6-C8	EH_2D_AL_#1	N	1780	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C8-C10	EH_2D_AL_#1	N	1780	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C10-C12	EH_2D_AL_#1	N	1680	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C12-C16	EH_2D_AL_#1	N	1680	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C16-C21	EH_2D_AL_#1	N	1680	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C21-C35	EH_2D_AL_#1	N	1680	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aliphatic TPH >C35-C44	EH_2D_AL_#1	N	1680	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Aliphatic Hydrocarbons	EH_2D_AL_#1	N	1675	µg/l	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Aromatic TPH >C5-C7	EH_2D_AR_#1	N	1780	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C7-C8	EH_2D_AR_#1	N	1780	µg/l	0.10	70	< 0.10	< 0.10	70	< 0.10	70
Aromatic TPH >C8-C10	EH_2D_AR_#1	N	1780	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C10-C12	EH_2D_AR_#1	N	1680	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C12-C16	EH_2D_AR_#1	N	1680	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C16-C21	EH_2D_AR_#1	N	1680	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Aromatic TPH >C21-C35	EH_2D_AR_#1	N	1680	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10

Results - Water

Project: Terra Firma Suites - Cardiff

Client: Terra Firma						**Chemtest Job No.:**	25-36690	25-36690	25-36690	25-36690	25-36690
Quotation No.: Q25-38938						**Chemtest Sample ID.:**	2053234	2053235	2053236	2053237	2053238	2053239
Order No.:						*Client Sample Ref.:*	*1*	*1*	*1*	*1*	*1*	*1*
						Client Sample ID.:	*BH01-24*	*RBH01*	*BH02-24*	*BH03-24*	*RBH02*	*RC01*
						Client Reference:	*BH01-24*	*RBH01*	*BH02-24*	*BH03-24*	*RBH02*	*RC01*
						Sample Type:	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
						Sample Sub Type:						
						Date Sampled:	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*
						Time Sampled:	*12:00*	*12:00*	*12:00*	*12:00*	*12:00*	*12:00*
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**							
Aromatic TPH >C35-C44	EH_2D_AR_#1	N	1680	µg/l	0.10		< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Aromatic Hydrocarbons	EH_2D_AR_#1	N	1675	µg/l	5.0		70	< 5.0	< 5.0	70	< 5.0	70
Total Petroleum Hydrocarbons	EH_2D_Total_#1	N	1675	µg/l	10		70	< 10	< 10	70	< 10	70
Dichlorodifluoromethane		N	1760	µg/l	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloromethane		U	1760	µg/l	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride		N	1760	µg/l	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane		U	1760	µg/l	5		< 5	< 5	< 5	< 5	< 5	< 5
Chloroethane		U	1760	µg/l	2.0		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichlorofluoromethane		N	1760	µg/l	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene		U	1760	µg/l	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans 1,2-Dichloroethene		U	1760	µg/l	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane		U	1760	µg/l	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene		U	1760	µg/l	1.0		8.0	< 1.0	< 1.0	6.1	< 1.0	7.5
Bromochloromethane		U	1760	µg/l	5		< 5	< 5	< 5	< 5	< 5	< 5
Trichloromethane		U	1760	µg/l	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane		U	1760	µg/l	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane		U	1760	µg/l	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene		U	1760	µg/l	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene		U	1760	µg/l	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane		U	1760	µg/l	2.0		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichloroethene		N	1760	µg/l	1.0		25	4.1	< 1.0	22	< 1.0	25
1,2-Dichloropropane		U	1760	µg/l	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane		U	1760	µg/l	10		< 10	< 10	< 10	< 10	< 10	< 10
Bromodichloromethane		U	1760	µg/l	5		< 5	< 5	< 5	< 5	< 5	< 5
cis-1,3-Dichloropropene		N	1760	µg/l	10		< 10	< 10	< 10	< 10	< 10	< 10
Toluene		U	1760	µg/l	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-Dichloropropene		N	1760	µg/l	10		< 10	< 10	< 10	< 10	< 10	< 10
1,1,2-Trichloroethane		U	1760	µg/l	10		< 10	< 10	< 10	< 10	< 10	< 10
Tetrachloroethene		U	1760	µg/l	1.0		43	98	5.7	53	< 1.0	50
1,3-Dichloropropane		U	1760	µg/l	2.0		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Dibromochloromethane		U	1760	µg/l	10		< 10	< 10	< 10	< 10	< 10	< 10
1,2-Dibromoethane		U	1760	µg/l	5		< 5	< 5	< 5	< 5	< 5	< 5
Chlorobenzene		N	1760	µg/l	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane		U	1760	µg/l	2.0		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Ethylbenzene		U	1760	µg/l	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
m & p-Xylene		U	1760	µg/l	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-Xylene		U	1760	µg/l	1.0		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Results - Water

Project: Terra Firma Suites - Cardiff

Client: Terra Firma				**Chemtest Job No.:**		25-36690	25-36690	25-36690	25-36690	25-36690	25-36690
Quotation No.: Q25-38938				**Chemtest Sample ID.:**		2053234	2053235	2053236	2053237	2053238	2053239
Order No.:				*Client Sample Ref.:*		*1*	*1*	*1*	*1*	*1*	*1*
				Client Sample ID.:		*BH01-24*	*RBH01*	*BH02-24*	*BH03-24*	*RBH02*	*RC01*
				Client Reference:		*BH01-24*	*RBH01*	*BH02-24*	*BH03-24*	*RBH02*	*RC01*
				Sample Type:		*WATER*	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
				Sample Sub Type:							
				Date Sampled:		*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*
				Time Sampled:		*12:00*	*12:00*	*12:00*	*12:00*	*12:00*	*12:00*
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**						
Styrene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tribromomethane		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane		N	1760	µg/l	50	< 50	< 50	< 50	< 50	< 50	< 50
N-Propylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tert-Butylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Sec-Butylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene		N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Isopropyltoluene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-Dichlorobenzene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Butylbenzene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichlorobenzene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-Chloropropane		N	1760	µg/l	50	< 50	< 50	< 50	< 50	< 50	< 50
1,2,4-Trichlorobenzene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene		U	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene		U	1760	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Methyl Tert-Butyl Ether		N	1760	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Nitrosodimethylamine		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chlorophenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis-(2-Chloroethyl)Ether		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,3-Dichlorobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,4-Dichlorobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2-Dichlorobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methylphenol (o-Cresol)		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroisopropyl)Ether		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachloroethane		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
N-Nitrosodi-n-propylamine		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Methylphenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Nitrobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Isophorone		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitrophenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

Results - Water

Project: Terra Firma Suites - Cardiff

Client: Terra Firma				**Chemtest Job No.:**		25-36690	25-36690	25-36690	25-36690	25-36690	25-36690
Quotation No.: Q25-38938				**Chemtest Sample ID.:**		2053234	2053235	2053236	2053237	2053238	2053239
Order No.:				*Client Sample Ref.:*		*1*	*1*	*1*	*1*	*1*	*1*
				Client Sample ID.:		*BH01-24*	*RBH01*	*BH02-24*	*BH03-24*	*RBH02*	*RC01*
				Client Reference:		*BH01-24*	*RBH01*	*BH02-24*	*BH03-24*	*RBH02*	*RC01*
				Sample Type:		*WATER*	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
				Sample Sub Type:							
				Date Sampled:		*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*
				Time Sampled:		*12:00*	*12:00*	*12:00*	*12:00*	*12:00*	*12:00*
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**						
2,4-Dimethylphenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bis(2-Chloroethoxy)Methane		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dichlorophenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2,4-Trichlorobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Naphthalene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chloroaniline		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobutadiene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chloro-3-Methylphenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methylnaphthalene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4,6-Trichlorophenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4,5-Trichlorophenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Chloronaphthalene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Nitroaniline		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Acenaphthylene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dimethylphthalate		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,6-Dinitrotoluene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Acenaphthene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
3-Nitroaniline		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibenzofuran		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Chlorophenylphenylether		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-Dinitrotoluene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fluorene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Diethyl Phthalate		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Nitroaniline		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2-Methyl-4,6-Dinitrophenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Azobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Bromophenylphenyl Ether		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Hexachlorobenzene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phenanthrene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Anthracene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Carbazole		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Di-N-Butyl Phthalate		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fluoranthene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Pyrene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Butylbenzyl Phthalate		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[a]anthracene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chrysene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

Results - Water

Project: Terra Firma Suites - Cardiff

Client: Terra Firma				**Chemtest Job No.:**		25-36690	25-36690	25-36690	25-36690	25-36690	25-36690
Quotation No.: Q25-38938				**Chemtest Sample ID.:**		2053234	2053235	2053236	2053237	2053238	2053239
Order No.:				*Client Sample Ref.:*		*1*	*1*	*1*	*1*	*1*	*1*
				Client Sample ID.:		*BH01-24*	*RBH01*	*BH02-24*	*BH03-24*	*RBH02*	*RC01*
				Client Reference:		*BH01-24*	*RBH01*	*BH02-24*	*BH03-24*	*RBH02*	*RC01*
				Sample Type:		*WATER*	*WATER*	*WATER*	*WATER*	*WATER*	*WATER*
				Sample Sub Type:							
				Date Sampled:		*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*	*10-Nov-2025*
				Time Sampled:		*12:00*	*12:00*	*12:00*	*12:00*	*12:00*	*12:00*
Determinand	**HWOL Code**	**Accred.**	**SOP**	**Units**	**LOD**						
Bis(2-Ethylhexyl)Phthalate		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Di-N-Octyl Phthalate		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[b]fluoranthene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[k]fluoranthene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[a]pyrene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Indeno(1,2,3-c,d)Pyrene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dibenz(a,h)Anthracene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Benzo[g,h,i]perylene		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
4-Nitrophenol		N	1790	µg/l	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Naphthalene		U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene		U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene		U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene		U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene		U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene		U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene		U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Pyrene		U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]anthracene		U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene		U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene		U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene		U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene		U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene		U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene		U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene		U	1800	µg/l	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's		U	1800	µg/l	2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Total Phenols		U	1920	mg/l	0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030	< 0.030

Deviations

In accordance with UKAS Policy on Deviating Samples TPS 63. Chemtest have a procedure to ensure 'upon receipt of each sample a competent laboratory shall assess whether the sample is suitable with regard to the requested test(s)'. This policy and the respective holding times applied, can be supplied upon request.The reason a sample is declared as deviating is detailed below. Where applicable the analysis remains UKAS/MCERTs accredited but the results may be compromised.

Chemtest Sample ID	*Clients Sample Ref:*	*Clients Sample ID:*	*Clients Reference:*	*Sampled Date:*	Deviation Code(s):	Containers Received:
2053234	*1*	*BH01-24*	*BH01-24*	*10-Nov-2025*	B	Coloured Winchester 1000ml
2053234	*1*	*BH01-24*	*BH01-24*	*10-Nov-2025*	B	EPA Vial 40ml
2053234	*1*	*BH01-24*	*BH01-24*	*10-Nov-2025*	B	Plastic Bottle 1000ml
2053235	*1*	*BH01*	*BH01*	*10-Nov-2025*	B	Coloured Winchester 1000ml
2053235	*1*	*BH01*	*BH01*	*10-Nov-2025*	B	EPA Vial 40ml
2053235	*1*	*BH01*	*BH01*	*10-Nov-2025*	B	Plastic Bottle 1000ml
2053236	*1*	*BH02-24*	*BH02-24*	*10-Nov-2025*	B	Coloured Winchester 1000ml
2053236	*1*	*BH02-24*	*BH02-24*	*10-Nov-2025*	B	EPA Vial 40ml
2053236	*1*	*BH02-24*	*BH02-24*	*10-Nov-2025*	B	Plastic Bottle 1000ml
2053237	*1*	*BH03-24*	*BH03-24*	*10-Nov-2025*	B	Coloured Winchester 1000ml
2053237	*1*	*BH03-24*	*BH03-24*	*10-Nov-2025*	B	EPA Vial 40ml
2053237	*1*	*BH03-24*	*BH03-24*	*10-Nov-2025*	B	Plastic Bottle 1000ml
2053238	*1*	*BH02*	*BH02*	*10-Nov-2025*	B	Coloured Winchester 1000ml
2053238	*1*	*BH02*	*BH02*	*10-Nov-2025*	B	EPA Vial 40ml
2053238	*1*	*BH02*	*BH02*	*10-Nov-2025*	B	Plastic Bottle 1000ml
2053239	*1*	*RC01*	*RC01*	*10-Nov-2025*	B	Coloured Winchester 1000ml
2053239	*1*	*RC01*	*RC01*	*10-Nov-2025*	B	EPA Vial 40ml
2053239	*1*	*RC01*	*RC01*	*10-Nov-2025*	B	Plastic Bottle 1000ml

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
1010	pH Value of Waters	pH at 20°C	pH Meter	RE PW TE TS PL DW GW
1020	Electrical Conductivity and Total Dissolved Solids (TDS) in Waters	Electrical Conductivity at 25°C and Total Dissolved Solids (TDS) in Waters	Conductivity Meter	TE LE SW GW
1090	Biochemical Oxygen Demand	Biochemical Oxygen demand (BOD)	Colorimetric determination of dissolved oxygen in seeded sample after 5 days incubation at 20°C.	
1100	Chemical Oxygen Demand	Chemical Oxygen demand (COD)	Dichromate oxidation of organic matter in sample followed by colorimetric determination of residual Cr[VI].	TE TS LE GW
1220	Anions, Alkalinity & Ammonium in Waters	Fluoride; Chloride; Nitrite; Nitrate; Total; Oxidisable Nitrogen (TON); Sulfate; Phosphate; Alkalinity; Ammonium	Automated colorimetric analysis using 'Aquakem 600' Discrete Analyser.	RE PW PL LE DW GW
1270	Total Hardness of Waters	Total hardness	Calculation applied to calcium and magnesium results, expressed as mg l-1 CaCO3 equivalent.	GW LE
1300	Cyanides & Thiocyanate in Waters	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Continuous Flow Analysis.	GW
1325	Sulphide in Waters	Sulphides	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using N,N–dimethyl-pphenylenediamine.	PL LE GW
1455	Metals in Waters by ICP-MS	Metals, including: Antimony; Arsenic; Barium; Beryllium; Boron; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Tin; Vanadium; Zinc	Filtration of samples followed by direct determination by inductively coupled plasma mass spectrometry (ICP-MS).	RE PW PL SW DW GW
1490	Hexavalent Chromium in Waters	Chromium [VI]	Automated colorimetric analysis by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.	PL GW
1670	Total Petroleum Hydrocarbons (TPH) in Waters by GC-FID	TPH (C6–C40); optional carbon banding, e.g. 3-band – GRO, DRO & LRO	Pentane extraction / GC FID detection	PL GW
1675	TPH Aliphatic/Aromatic split in Waters by GC-FID(cf. Texas Method 1006 / TPH CWG)	Aliphatics: >C5–C6, >C6–C8, >C8– C10, >C10–C12, >C12–C16, >C16–C21, >C21–C35, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10, >C10–C12, >C12–C16, >C16– C21, >C21– C35, >C35– C44	Pentane extraction / GCxGC FID detection	
1680	Extractable Petroleum Hydrocarbons	Aliphatics: >C5–C6, >C6–C8, >C8– C10*, >C10–C12*, >C12–C16*, >C16–C21*, >C21– C35*, >C35– C44Aromatics: >C5–C7, >C7–C8, >C8– C10*, >C10–C12*, >C12–C16*, >C16– C21*, >C21– C35*, >C35– C44	Dichloromethane extraction / GCxGC FID detection	
1760	Volatile Organic Compounds (VOCs) in Waters by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics. (cf. USEPA Method 8260)	Automated headspace gas chromatographic (GC) analysis of water samples with mass spectrometric (MS) detection of volatile organic compounds.	PL GW
1780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C8,>C8–C10 Aromatics: >C5–C6, >C6–C8,>C8–C10	Water extraction / Headspace GCxGC FID detection	
1790	Semi-Volatile Organic Compounds (SVOCs) in Waters by GC-MS	Semi-volatile organic compounds	Solvent extraction / GCMS detection	
1800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Waters by GC-MS	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Pentane extraction / GCMS detection	PL GW SW
1920	Phenols in Waters by HPLC	Phenolic compounds including: Phenol, Cresols, Xylenols, Trimethylphenols Note: Chlorophenols are excluded.	Determination by High Performance Liquid Chromatography (HPLC) using electrochemical detection.	PL GW
2010	pH Value of Soils	pH at 20°C	pH Meter	
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <30°C.	

Test Methods

SOP	Title	Parameters included	Method summary	Water Accred.
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES	
2192	Asbestos Quantification in Soils Sediments Ballast & Aggregate Crushed Concrete & Demolition Rubble	Asbestos	Polarised light microscopy / Gravimetry	
2300	Cyanides & Thiocyanate in Soils	Free (or easy liberatable) Cyanide; total Cyanide; complex Cyanide; Thiocyanate	Allkaline extraction followed by colorimetric determination using Automated Flow Injection Analyser.	
2430	Total Sulphate in soils	Total Sulphate	Acid digestion followed by determination of sulphate in extract by ICP-OES.	
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.	
2455	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.	
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.	
2690	EPH A/A Split	Aliphatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40 Aromatics: >C10–C12, >C12–C16, >C16–C21, >C21– C35, >C35– C40	Acetone/Heptane extraction / GCxGC FID detection	
2700	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-FID	Acenaphthene; Acenaphthylene; Anthracene; Benzo[a]Anthracene; Benzo[a]Pyrene; Benzo[b]Fluoranthene; Benzo[ghi]Perylene; Benzo[k]Fluoranthene; Chrysene; Dibenz[ah]Anthracene; Fluoranthene; Fluorene; Indeno[123cd]Pyrene; Naphthalene; Phenanthrene; Pyrene	Dichloromethane extraction / GC-FID (GC-FID detection is non-selective and can be subject to interference from co-eluting compounds)	
2760	Volatile Organic Compounds (VOCs) in Soils by Headspace GC-MS	Volatile organic compounds, including BTEX and halogenated Aliphatic/Aromatics.(cf. USEPA Method 8260)*please refer to UKAS schedule	Automated headspace gas chromatographic (GC) analysis of a soil sample, as received, with mass spectrometric (MS) detection of volatile organic compounds.	
2780	VPH A/A Split	Aliphatics: >C5–C6, >C6–C7,>C7–C8,>C8-C10 Aromatics: >C5–C7,>C7-C8,>C8–C10	Water extraction / Headspace GCxGC FID detection	
2790	Semi-Volatile Organic Compounds (SVOCs) in Soils by GC-MS	Semi-volatile organic compounds(cf. USEPA Method 8270)	Acetone/Hexane extraction / GC-MS	
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenz[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS	
2920	Phenols in Soils by HPLC	Phenolic compounds including Resorcinol, Phenol, Methylphenols, Dimethylphenols, 1-Naphthol and TrimethylphenolsNote: chlorophenols are excluded.	60:40 methanol/water mixture extraction, followed by HPLC determination using electrochemical detection.	
2930	Organic Matter	Organic Matter	Acid Dichromate digestion/Titration	

Report Information

Key	
U	UKAS accredited
M	MCERTS and UKAS accredited
N	Unaccredited
S	This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
SN	This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
T	This analysis has been subcontracted to an unaccredited laboratory
I/S	Insufficient Sample
U/S	Unsuitable Sample
N/E	not evaluated
<	"less than"
>	"greater than"
SOP	Standard operating procedure
LOD	Limit of detection
Text example	All items indicated in italic font represent customer-supplied information that may not be independently verified by the laboratory

This report shall not be reproduced except in full, and only with the prior approval of the laboratory.

Any comments or interpretations are outside the scope of UKAS accreditation.

The Laboratory is not accredited for any sampling activities and reported results relate to the samples 'as received' at the laboratory.

Uncertainty of measurement for the determinands tested are available upon request .

None of the results in this report have been recovery corrected.

All results are expressed on a dry weight basis.

The following tests were analysed on samples 'as received' and the results subsequently corrected to a dry weight basis EPH, VPH, TPH, BTEX, VOCs, SVOCs, PCBs, Phenols.

For all other tests the samples were dried at ≤ 30°C prior to analysis.

All Asbestos testing is performed at the indicated laboratory .

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1.

Where analysis is performed on a dried and crushed sample, it has been prepared by crushing all of the sample. If material has been removed prior to crushing, or by request of the client, this will be stated on the report.

NEW_ASB	Eurofins Chemtest Limited, 11 Depot Road, Newmarket, CB8 0AL
DURHAM	Eurofins Chemtest Limited, Unit A North Wing, Prospect Business Park, Crookhall Lane, Consett, Co Durham, DH8 7PW

Sample Deviation Codes

As a result of any of the below deviations applying, the test results may be unreliable

A - Date of sampling not supplied

B - Sample age exceeds stability time (sampling to extraction)

C - Sample not received in appropriate containers

D - Broken Container

E - The required amount of sample for analysis was not received

H - Appropriate cooling measures were not taken for sample transportation

Sample Retention and Disposal

All soil samples will be retained for a period of 30 days from the date of receipt.

All water samples will be retained for 14 days from the date of receipt.

Charges may apply to extended sample storage.

Report Information

Water Sample Category Key for Accreditation

DW - Drinking Water (Non-Regulatory)
GW - Ground Water
LE - Land Leachate
NA - Not Applicable
PL - Prepared Leachate
PW - Processed Water
RE - Recreational Water
SA - Saline Water
SW - Surface Water
TE - Treated Effluent
TS - Treated Sewage
UL - Unspecified Liquid

Clean Up Codes

NC - No Clean Up
MC - Mathematical Clean Up
FC - Florisil Clean Up

HWOL Acronym System

HS - Headspace analysis
EH - Extractable hydrocarbons – i.e. everything extracted by the solvent
CU - Clean-up – e.g. by Florisil, silica gel
1D - GC – Single coil gas chromatography
Total - Aliphatics & Aromatics
AL - Aliphatics only
AR - Aromatic only
2D - GC-GC – Double coil gas chromatography
#1 - EH_2D_Total but with humics mathematically subtracted
#2 - EH_2D_Total but with fatty acids mathematically subtracted
+ - Operator to indicate cumulative e.g. EH+EH_Total or EH_CU+HS_Total

Asbestos Tests LOD = LOQ

Limit of Detection = Limit of Quantification for asbestos results only

If you require extended retention of samples, please email your requirements to:
cs@etuki.eurofins.com

ANNEX D
Remedial Target Worksheets

Hydrogeological risk assessment for land contamination

Remedial Targets Worksheet , Release 3.2

First released: 2006. Version 3.2: January 2013

This worksheet has been produced in combination with the document 'Remedial Targets Methodology: Hydrogeological risk assessment for land contamination (Environment Agency 2006).

Users of this worksheet should always refer to the User Manual to the Remedial Targets Methodology and to relevant guidance on UK legislation and policy, in order to understand how this procedure should be applied in an appropriate context.

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The calculation of equations in this worksheet has been independently checked by Entec (UK) Ltd on behalf of the Environment Agency.

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Liability: The Environment Agency does not promise that the worksheet will provide any particular facilities or functions. You must ensure that the worksheet meets your needs and you remain solely responsible for the competent use of the worksheet. You are entirely responsible for the consequences of any use of the worksheet and the Agency provides no warranty about the fitness for purpose or performance of any part of the worksheet. We do not promise that the media will always be free from defects, computer viruses, software locks or other similar code or that the operation of the worksheet will be uninterrupted or error free. You should carry out all necessary virus checks prior to installing on your computing system.

IMPORTANT: To enable MS Excel worksheet, click Tools, Add -Ins, Analysis Tool Pak and Analysis Tool Pak-VBA (to calculate error functions)

Details to be completed for each assessment

Site Name:	**Kelvedon Street**			
Site Address:	**Newport**			
Completed by:	**Michael Watkins**			
Date:	**11-Dec-25**		**Version:**	**1**
Contaminant	**cis 1,2-Dichloroethene**			
Target Concentration (C_T)	**0.001**	**mg/l**	**Origin of C_T:**	**Laboratory detection limit**

This worksheet can be used to determine remedial targets for soils (Worksheets Level 1 Soil, Level 2 and Level 3 Soil) or to determine remedial targets for groundwater (Level 3 Groundwater). For Level 3, parameter values must be entered separately dependent on whether the assessment is for soil or groundwater. For soil, remedial targets are calculated as either mg/kg (for comparision with soil measurements) or mg/l (for comparison with leaching tests or pore water concentrations).
Site details entered on this page are automatically copied to Level 1, 2 and 3 Worksheets.
Worksheet options are identified by brown background and employ a pull-down menus. Data entry are identified as blue background.
Data origin / justification should be noted in cells coloured yellow and fully documented in subsequent reports.
Data carried forward from an earlier worksheet are identified by a light green background
It is recommended that a copy of the original worksheet is saved (all data fields in the original copy are blank).

The spreadsheet also includes a porosity calculation worksheet, a soil impact calculation worksheet and a worksheet that performs some simple hydrogeological calculations.

Remedial Targets Worksheet , Release 3.2

Level 1 - Soil

Environment Agency

Select the method of calculating the soil water Partition Co-efficient by using the pull down menu below

User specified value for partition coefficient

Contaminant		**cis 1,2-Dichloroethene**		
Target concentration	**C_T**	**0.001**	**mg/l**	

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**
Standard entry				
Water filled soil porosity	θ_W	0.00E+00	fraction	
Air filled soil porosity	θa	0.00E+00	fraction	
Bulk density of soil zone material	ρ	0.00E+00	g/cm^3	
Henry's Law constant	H	0.00E+00	dimensionless	
Entry if specify partition coefficient (option)				
Soil water partition coefficient	Kd	0.00E+00	l/kg	
Entry for non-polar organic chemicals (option)				
Fraction of organic carbon (in soil)	foc		fraction	
Organic carbon partition coefficient	Koc		l/kg	
Entry for ionic organic chemicals (option)				
Sorption coefficient for neutral species	$K_{oc,n}$		l/kg	
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg	
pH value	pH		pH units	
Acid dissociation constant	pKa			
Fraction of organic carbon (in soil)	foc		fraction	

This sheet calculates the Level 1 remedial target for soils(mg/kg) based on a selected target concentration and theoretical calculation of soil water partitioning. Three options are included for determining the partition coefficient.

The measured soil concentration as mg/kg should be compared with the Level 1 remedial target to determine the need for further action.

Soil water partition coefficient used in Level Assessment	**Kd**	**0.00E+00**	**l/kg**	*Specified value*

Level 1 Remedial Target

Level 1 Remedial Target	**#DIV/0!**	**mg/kg**	**(for comparison with soil analyses)**
	or		
	0.001	**mg/l**	**(for comparison with leachate test results)**

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 2 - Soil

Contaminant		**cis 1,2-Dichloroethene**		from Level 1
Target concentration	**C_T**	**0.001**	**mg/l**	from Level 1

This sheet calculates the Level 2 remedial target for soils (mg/kg) or for pore water (mg/l).

The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 2 remedial target to determine the need for further action. Equations presented in 'Hydrogeological risk assessment for land contamiantion' (Environment Agency 2006)

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**	
Standard entry					
Infiltration	Inf	0.00E+00	m/d		
Area of contaminant source	A	0.00E+00	m^2		Not used in calculation
Entry for groundwater flow below site					
Length of contaminant source in direction of groundwater flow	L	0.00E+00	m		
Saturated aquifer thickness	da	0.00E+00	m		
Hydraulic Conductivity of aquifer in which dilution occurs	K	0.00E+00	m/d		
Hydraulic gradient of water table	i	0.00E+00	fraction		
Width of contaminant source perpendicular to groundwater flow	w	0.00E+00	m		Not used in calculation
Background concentration of contaminant in groundwater beneath site	Cu	0.00E+00	mg/l		
Define mixing zone depth by specifying or calculating depth (using pull down list)		**Specify**			
Enter mixing zone thickness	Mz	0.00E+00	m		
Calculated mixing zone thickness	Mz		m		

Calculated Parameters

Dilution Factor	**DF**	**#DIV/0!**		
Level 2 Remedial Target		**#DIV/0!**	**mg/l**	**For comparison with measured pore water concentration. This assumes Level 1 Remedial Target is based on Target Concentrati**
		or		
		#DIV/0!	**mg/kg**	**For comparison with measured soil concentration. This assumes Level 1 Remedial Target calculated from soil-water**

Additional option

Calculation of impact on receptor

Concentration of contaminant in contaminated discharge (entering receptor)	Cc	0.00E+00	mg/l	
Calculated concentration within receptor (dilution only)		#DIV/0!	mg/l	0

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 3 - Soil

See Note

Input Parameters	Variable	Value	Unit	Source
Contaminant		cis 1,2-Dichloroethene		from Level 1
Target Concentration	C_T	0.001	mg/l	from Level 1
Dilution Factor	DF	#DIV/0!		from Level 2

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value, l

	Variable	Value	Unit	Source of parameter value
Enter source concentration		Soil concentration as mg/kg		
Enter soil concentration		0	mg/kg	
Half life for degradation of contaminant in water	$t_{1/2}$	1.00E+100	days	
Calculated decay rate	λ	6.93E-101	$days^{-1}$	calculated
Width of plume in aquifer at source	Sz	0.00E+00	m	from Level 2
Plume thickness in aquifer at source	Sy	0.00E+00	m	from Level 2
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Effective porosity of aquifer	n	0.00E+00	fraction	
Hydraulic gradient	i	#DIV/0!	fraction	from Level 2 (adjusted)
Hydraulic conductivity of saturated aquifer	K	0.00E+00	m/d	from Level 2
Distance to compliance point	x	0.00E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	1.00E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	0.00E+00	l/kg	*see options*
Longitudinal dispersivity	ax	0.000	m	*see options*
Transverse dispersivity	az	0.000	m	*see options*
Vertical dispersivity	ay	0.000	m	*see options*

Parameter values should be checked against Level 1 and 2

Calculated Parameters	Variable		
Groundwater flow velocity	v	#DIV/0!	m/d
Retardation factor	Rf	#DIV/0!	fraction
Decay rate used	λ	6.93E-101	d^{-1}
Hydraulic gradient used in aquifer flow down-gradient	i	#DIV/0!	fraction
Rate of contaminant flow due to retardation	u	#DIV/0!	m/d
Ratio of Compliance Point to Source Concentration	C_{ED}/C_0	#DIV/0!	fraction
Attenuation factor (C_0/C_{ED})	**AF**	**#DIV/0!**	**fraction**
Calculated soil leachate concentration	Co	#DIV/0!	mg/l

Remedial Targets

Level 3 Remedial Target		**#DIV/0!**	**mg/l**	For comparison with measured pore water concentration.
Ogata Banks		**or**		This assumes Level 1 Remedial Target is based on Target Concentration.
		#DIV/0!	**mg/kg**	For comparison with measured soil concentration. This
Distance to compliance point		**0**	**m**	assumes Level 1 Remedial Target calculated from soil-water partitioning equation.
Ratio of Compliance Point to Source Concentration	**C_{ED}/C_0**	**#DIV/0!**	**fraction**	Ogata Banks

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99

Enter method of defining partition co-efficient (using pull down list)

Calculate for ionic organic chemicals (acids)

Entry if specify partition coefficient (option)

Soil water partition coefficient	Kd		l/kg

Entry for non-polar organic chemicals (option)

Fraction of organic carbon in aquifer	foc		fraction
Organic carbon partition coefficient	Koc		l/kg

Entry for ionic organic chemicals (option)

Sorption coefficient for related species	$K_{oc,n}$	0.00E+00	l/kg
Sorption coefficient for ionised species	$K_{oc,i}$	0.00E+00	l/kg
pH value	pH	0.00E+00	
Acid dissociation constant	pKa	0.00E+00	
Fraction of organic carbon in aquifer	foc	0.00E+00	fraction
Soil water partition coefficient	Kd	0.00E+00	l/kg

Define dispersivity (click brown cell and use pull down list)

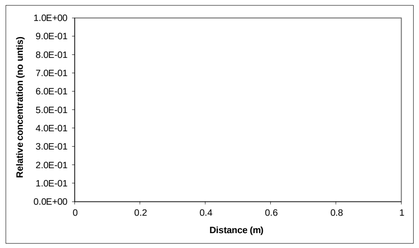
User defined values for dispersivity

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	0.00E+00	#NUM!	m
Transverse dispersivity	**az**	0.00E+00	0.00E+00	#NUM!	m
Vertical dispersivity	**ay**	0.00E+00	0.00E+00	#NUM!	m

Note values of dispersivity must be > 0

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed

Note
This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O_2, NO_3, SO_4 etc than an alternative solution should be used



Note: 'Relative concentration' is the ratio of calculated concentation at a given position compared to the source concentration. The calculations assume plume disperses from the top of the aquifer. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

This sheet calculates the Level 3 remedial target for soils(mg/kg) or for pore water (mg/l), based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.By setting a long travel time (e.g. 9E99) it will give the steady state solution, which should always be used when calculating remedial targets.

The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.9E+99.

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Calculated (relative) concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Relative concentration (No units)	Concentration mg/l
0	1.0E+00	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!

Remedial Targets Worksheet , Release 3.2

Calculation of contaminant concentration in groundwater from a soil source

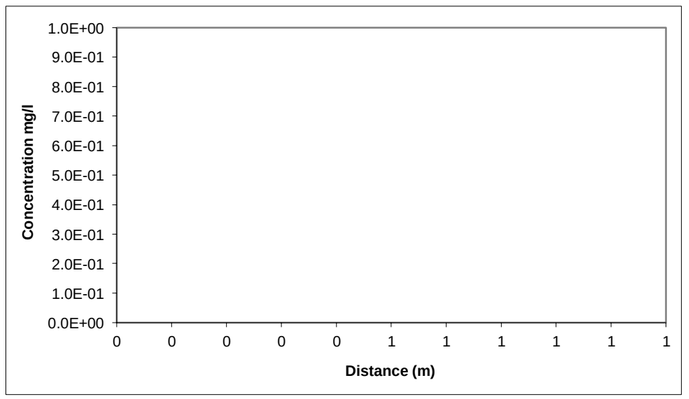
Only input required is Soil Contaminant Concentration

Input Parameters			
Soil contaminant concentration	C_0	0.00E+00	mg/kg
Level 1 Parameters			
Water filled soil porosity	θ_W	0.00E+00	fraction
Air filled soil porosity	θa	0.00E+00	fraction
Bulk density	ρ	0.00E+00	g/cm^3
Henry's Law constant	H	0.00E+00	dimensionless
Soil water partition coefficient used in Level Assessment	Kd	0.00E+00	l/kg
Factor (partitioning between soil and water)		#DIV/0!	dimensionless
Level 2 Parameters **Dilution Factor**	DF	#DIV/0!	
Level 3 Parameters **Attenuation factor (C_O/C_{ED})**	AF	#DIV/0!	

Predicted concentrations at compliance point

Level 1	C	#DIV/0!	mg/l	No dilution or attenuation
Level 2	C	#DIV/0!	mg/l	Dilution taken into account
Level 3	C	#DIV/0!	mg/l	Dilution and attenuation taken into account

Predicted concentrations between source and compliance point - Level 3



Distance m	Concentration mg/l
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

	Variable	Value	Unit	Source
Contaminant		cis 1,2-Dichloroethene		from Level 1
Target Concentration	C_T	1.00E-03	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Domenico - Steady state — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	1.50E-02	mg/l	*Site investigation data*
Half life for degradation of contaminant in water	$t_{1/2}$	3.36E+02	days	*Agency for Toxic Substances and Diseases*
Calculated decay rate	λ	2.06E-03	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	7.50E+01	m	*Length of site perpendicular to groundwater flow*
Plume thickness at source	Sy	5.90E+00	m	*Same as Mixing Zone Thickness. "For a thin aquifer (typically <10m), the mixing zone thickness can be taken as the ac*
Saturated aquifer thickness	da	6.00E+00	m	*Maximum thickness recorded in vicinity of*
Bulk density of aquifer materials	ρ	1.60E+00	g/cm^3	*Typical bulk density for river terrace deposits (conserv*
Effective porosity of aquifer	n	2.50E-01	fraction	*Maximum porosity for coarse Gravel (Lovanh et al 2000) - conservative estimate*
Hydraulic gradient	i	4.40E-02	fraction	*Borehole level data*
Hydraulic conductivity of aquifer	K	4.32E-01	m/d	*Maximum typical value for clayey sandy G*
Distance to compliance point	x	5.00E+01	m	*Default compliance distance*
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	9.90E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	4.90E+01	l/kg	*see options*
Longitudinal dispersivity	ax	5.00E+00	m	*see options*
Transverse dispersivity	az	5.00E-01	m	*see options*
Vertical dispersivity	ay	5.00E-02	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)

Soil water partition coefficient — Kd — 4.90E+01 — l/kg

Entry for non-polar organic chemicals (option)

Fraction of organic carbon in aquifer — foc — fraction

Organic carbon partition coefficient — Koc — l/kg

Entry for ionic organic chemicals (option)

Sorption coefficient for related species — $K_{OC,n}$ — l/kg

Sorption coefficient for ionised species — $K_{OC,I}$ — l/kg

pH value — pH

acid dissociation constant — pKa

Fraction of organic carbon in aquifer — foc — fraction

Soil water partition coefficient — Kd — 4.90E+01 — l/kg

Define dispersivity (click brown cell and use pull down list)

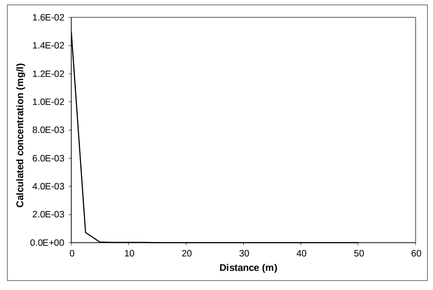
Dispersivities 10%, 1%, 0.1% of pathway length

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	5.00E+00	2.98E+00	m
Transverse dispersivity	**az**	0.00E+00	5.00E-01	2.98E-01	m
Vertical dispersivity	**ay**	0.00E+00	5.00E-02	2.98E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Calculated concentrations for distance-concentration graph

Domenico - Steady state
From calculation sheet

Distance	Concentration
	mg/l
0	1.5E-02
2.5	7.28E-04
5.0	3.53E-05
7.5	1.71E-06
10.0	8.30E-08
12.5	4.03E-09
15.0	1.95E-10
17.5	9.48E-12
20.0	4.60E-13
22.5	2.23E-14
25.0	1.08E-15
27.5	5.24E-17
30.0	2.54E-18
32.5	1.23E-19
35.0	5.98E-21
37.5	2.90E-22
40.0	1.40E-23
42.5	6.80E-25
45.0	3.30E-26
47.5	1.60E-27
50.0	7.73E-29

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Calculated Parameters

	Variable		
Groundwater flow velocity	v	7.60E-02	m/d
Retardation factor	Rf	3.15E+02	fraction
Decay rate used	λ	2.06E-03	d^{-1}
Rate of contaminant flow due to retardation	u	2.42E-04	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	7.73E-29	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**1.94E+26**	

Remedial Targets

Remedial Target		**1.94E+23**	**mg/l**	For comparison with measured groundwater concentration.
Domenico - Steady state				
Distance to compliance point		**50**	**m**	
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**7.73E-29**	**mg/l**	Domenico - Steady state

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Porosity Calculator

These results are not carried through to any of the other worksheets

DRY BULK DENSITY DATA

Variable	Value	Unit	justification
Natural Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Dry Bulk Density	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
Initial Saturation	#DIV/0!	*%*	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	
Water Filled Porosity	**#DIV/0!**	**fraction**	

WET BULK DENSITY DATA

Variable	Value	Unit	
Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Actual (wet) Bulk Density (i.e. at natural MC)	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
dry bulk density	0.00	tonnes/m^3	
Initial Saturation	#DIV/0!	*%*	
Total porosity	**1.000**	**fraction**	**#DIV/0!**
Air Filled Porosity	**#DIV/0!**	**fraction**	
Water Filled Porosity	**#DIV/0!**	**fraction**	

Analytical solutions provided by David Hall, Golder Associates (UK) Ltd

Simple hydrogeological calculations

(These are not specific to, or required in, the Remedial Targets Methodology)

Parameter	symbol		unit	justification
Hydraulic conductivity	K	0.00E+00	m/d	
Hydraulic gradient	i	0.00E+00	unitless	
Effective porosity of aquifer	n	0.00E+00	fraction	
Thickness of saturated aquifer	b	0.00E+00	m	
Width of aquifer perpendicular to flow	w	0.00E+00	m	
Distance to receptor	x	0.00E+00	m	
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Soil-water partition co-efficient	Kd	0.00E+00	l/kg	
Retardation factor of pollutant	R	#DIV/0!		

Groundwater flow velocity	v(GW)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for groundwater to reach receptor	t(GW)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years
Rate of groundwater flow through aquifer	Q	0.00E+00	m^3/s	0.00E+00	m^3/day	0.00E+00	m^3/year

Contaminant flow velocity	v(contam)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for contaminant to reach receptor	t(contam)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years

Level 1 Calculation Sheet

Contaminant **1,2-Dichloroethene**

Parameter	Value	Units
(carried over from input sheet)		
C_T	1.00E-03	mg/l
Kd	0.00E+00	l/kg
foc		fraction
koc		l/kg
θ_W	0.00E+00	fraction
θa	0.00E+00	fraction
ρ	0.00E+00	g/cm3
H	0.00E+00	dimensionless
Koc,n		l/kg
Koc,i		l/kg
pH		pH units
pKa		
foc (ionic)		fraction

Calculations (Refer toTable 4.3, R&D Publication 20)

Selected option User specified value for partition coefficient

	calc	calc	Calc Kd	l/kg
Calculation of partition coefficient for ionic organic chemical				
Partition coefficient used in Level 1 Assessment			0.00E+00	l/kg

Calculated Remedial Target **#DIV/0!** **mg/kg** **for cis 1,2-Dichloroethene**

Factor (partitioning between soil and water) #DIV/0!

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11/12/2025
Version:	1

Level 2 Calculation Sheet

Contaminant : 1,2-Dichloroethene

Site assessed:	Kelvedon Stre
Date:	11/12/2025
Version:	1

Parameter	Value	Units		
(carried over from input sheet)				
Mz	0.00E+00	m		
L	0.00E+00	m		
da	0.00E+00	m		Calculated
Inf	0.00E+00	m/d		Dilution Factor
K	0.00E+00	m/d		
i	0.00E+00		Calculation based on target concentration	#DIV/0!
A	0.00E+00	m3/d m2 m3/d	Calculation based on observed contaminant concentration	#DIV/0!
Cc	0.00E+00	mg/l		
C_T	1.00E-03	mg/l		
Cu	0.00E+00	mg/l		
w	0.00E+00	m		



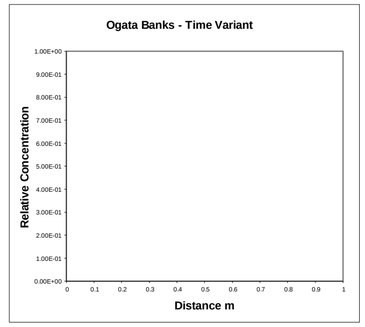
Contaminant **1,2-Dichloroethene**

OGATA BANKS SOLUTION

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-03	mg/l
DF	#DIV/0!	
λ	6.931E-101	days^{-1}
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Calc	Value	
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) -USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Date:	11/12/2025
Version:	1

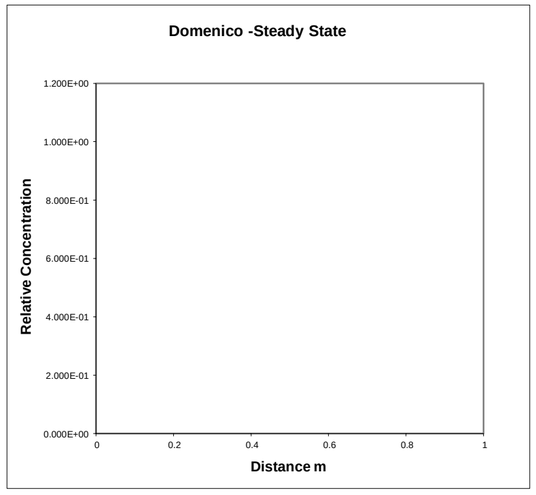
Contaminant **.,2-Dichloroethene**

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	**Value**	**Units**
C_T	1.000E-03	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

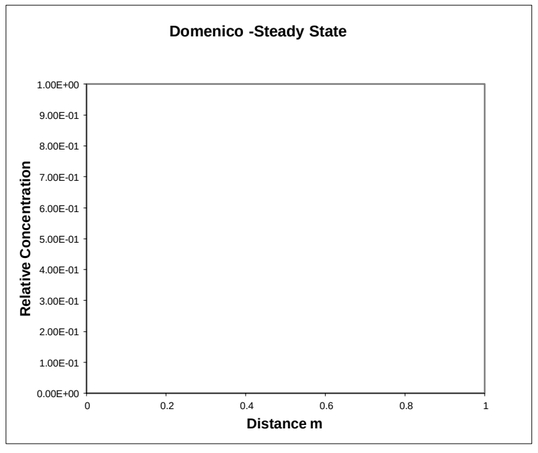


Calc	**Value**	
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Date:	11/12/2025
Version:	1

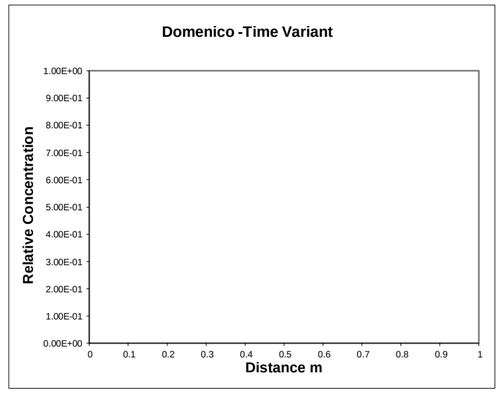
DOMENICO (TIME VARIANT)

Contaminant **l,2-Dichloroethene**

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.001	mg/l
DF	#DIV/0!	
λ	6.931E-101	days^{-1}
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

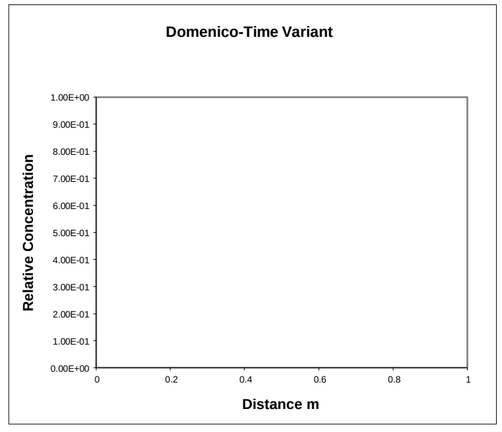


Calc **Value**

v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Date:	11/12/2025
Version:	1

OGATA BANKS SOLUTION

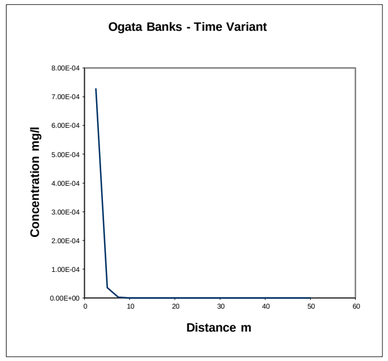
Contaminant **1,2-Dichloroethene**

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.001	mg/l
Co	1.50E-02	mg/l
λ	2.06E-03	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	4.90E+01	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.00188	-3.0E+00	4.9E-02	-4.5E+48	2.000	3.5E+00	3.4E+01	4.5E+48	0.000	1.7E+01	1	-1.7E+01	-1	4.2E+00	1	-4.2E+00	-1	7.28E-04
2	5	0.00188	-6.1E+00	2.4E-03	-4.5E+48	2.000	7.1E+00	1.2E+03	4.5E+48	0.000	1.2E+01	1	-1.2E+01	-1	3.0E+00	1	-3.0E+00	-0.99997	3.53E-05
3	7.5	0.00188	-9.1E+00	1.1E-04	-4.5E+48	2.000	1.1E+01	3.9E+04	4.5E+48	0.000	9.7E+00	1	-9.7E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	1.71E-06
4	10	0.00188	-1.2E+01	5.5E-06	-4.5E+48	2.000	1.4E+01	1.3E+06	4.5E+48	0.000	8.4E+00	1	-8.4E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	8.28E-08
5	12.5	0.00188	-1.5E+01	2.7E-07	-4.5E+48	2.000	1.8E+01	4.5E+07	4.5E+48	0.000	7.5E+00	1	-7.5E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	3.99E-09
6	15	0.00188	-1.8E+01	1.3E-08	-4.5E+48	2.000	2.1E+01	1.5E+09	4.5E+48	0.000	6.8E+00	1	-6.8E+00	-1	1.7E+00	0.984	-1.7E+00	-0.98399	1.92E-10
7	17.5	0.00188	-2.1E+01	6.3E-10	-4.5E+48	2.000	2.5E+01	5.2E+10	4.5E+48	0.000	6.3E+00	1	-6.3E+00	-1	1.6E+00	0.9743	-1.6E+00	-0.97425	9.23E-12
8	20	0.00188	-2.4E+01	3.1E-11	-4.5E+48	2.000	2.8E+01	1.8E+12	4.5E+48	0.000	5.9E+00	1	-5.9E+00	-1	1.5E+00	0.963	-1.5E+00	-0.96302	4.43E-13
9	22.5	0.00188	-2.7E+01	1.5E-12	-4.5E+48	2.000	3.2E+01	6.1E+13	4.5E+48	0.000	5.6E+00	1	-5.6E+00	-1	1.4E+00	0.9508	-1.4E+00	-0.95078	2.12E-14
10	25	0.00188	-3.0E+01	7.2E-14	-4.5E+48	2.000	3.5E+01	2.1E+15	4.5E+48	0.000	5.3E+00	1	-5.3E+00	-1	1.3E+00	0.9379	-1.3E+00	-0.93792	1.01E-15
11	27.5	0.00188	-3.3E+01	3.5E-15	-4.5E+48	2.000	3.9E+01	7.0E+16	4.5E+48	0.000	5.1E+00	1	-5.1E+00	-1	1.3E+00	0.9247	-1.3E+00	-0.92475	4.85E-17
12	30	0.00188	-3.6E+01	1.7E-16	-4.5E+48	2.000	4.2E+01	2.4E+18	4.5E+48	0.000	4.8E+00	1	-4.8E+00	-1	1.2E+00	0.9115	-1.2E+00	-0.91147	2.32E-18
13	32.5	0.00188	-3.9E+01	8.2E-18	-4.5E+48	2.000	4.6E+01	8.1E+19	4.5E+48	0.000	4.7E+00	1	-4.7E+00	-1	1.2E+00	0.8982	-1.2E+00	-0.89824	1.11E-19
14	35	0.00188	-4.2E+01	4.0E-19	-4.5E+48	2.000	4.9E+01	2.7E+21	4.5E+48	0.000	4.5E+00	1	-4.5E+00	-1	1.1E+00	0.8852	-1.1E+00	-0.88517	5.30E-21
15	37.5	0.00188	-4.5E+01	1.9E-20	-4.5E+48	2.000	5.3E+01	9.3E+22	4.5E+48	0.000	4.3E+00	1	-4.3E+00	-1	1.1E+00	0.8723	-1.1E+00	-0.87233	2.53E-22
16	40	0.00188	-4.8E+01	9.4E-22	-4.5E+48	2.000	5.6E+01	3.2E+24	4.5E+48	0.000	4.2E+00	1	-4.2E+00	-1	1.0E+00	0.8598	-1.0E+00	-0.85979	1.21E-23
17	42.5	0.00188	-5.1E+01	4.6E-23	-4.5E+48	2.000	6.0E+01	1.1E+26	4.5E+48	0.000	4.1E+00	1	-4.1E+00	-1	1.0E+00	0.8476	-1.0E+00	-0.84756	5.79E-25
18	45	0.00188	-5.4E+01	2.2E-24	-4.5E+48	2.000	6.3E+01	3.7E+27	4.5E+48	0.000	4.0E+00	1	-4.0E+00	-1	9.8E-01	0.8357	-9.8E-01	-0.83567	2.77E-26
19	47.5	0.00188	-5.7E+01	1.1E-25	-4.5E+48	2.000	6.7E+01	1.2E+29	4.5E+48	0.000	3.8E+00	1	-3.8E+00	-1	9.6E-01	0.8241	-9.6E-01	-0.82412	1.32E-27
20	50	0.00188	-6.1E+01	5.2E-27	-4.5E+48	2.000	7.1E+01	4.2E+30	4.5E+48	0.000	3.8E+00	1	-3.8E+00	-1	9.3E-01	0.8129	-9.3E-01	-0.81292	6.34E-29



Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

Calc	Value	
v	7.60E-02	m/d
Rc	3.15E+02	
u	2.42E-04	m/d

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.00188	-3.0E+00	4.9E-02	-4.5E+48	2.000	3.5E+00	3.4E+01	4.5E+48	0.000	1.7E+01	1	-1.7E+01	-1	8.3E+00	1	-8.3E+00	-1	7.28E-04
2	5	0.00188	-6.1E+00	2.4E-03	-4.5E+48	2.000	7.1E+00	1.2E+03	4.5E+48	0.000	1.2E+01	1	-1.2E+01	-1	5.9E+00	1	-5.9E+00	-1	3.53E-05
3	7.5	0.00188	-9.1E+00	1.1E-04	-4.5E+48	2.000	1.1E+01	3.9E+04	4.5E+48	0.000	9.7E+00	1	-9.7E+00	-1	4.8E+00	1	-4.8E+00	-1	1.71E-06
4	10	0.00188	-1.2E+01	5.5E-06	-4.5E+48	2.000	1.4E+01	1.3E+06	4.5E+48	0.000	8.4E+00	1	-8.4E+00	-1	4.2E+00	1	-4.2E+00	-1	8.30E-08
5	12.5	0.00188	-1.5E+01	2.7E-07	-4.5E+48	2.000	1.8E+01	4.5E+07	4.5E+48	0.000	7.5E+00	1	-7.5E+00	-1	3.7E+00	1	-3.7E+00	-1	4.03E-09
6	15	0.00188	-1.8E+01	1.3E-08	-4.5E+48	2.000	2.1E+01	1.5E+09	4.5E+48	0.000	6.8E+00	1	-6.8E+00	-1	3.4E+00	1	-3.4E+00	-1	1.95E-10
7	17.5	0.00188	-2.1E+01	6.3E-10	-4.5E+48	2.000	2.5E+01	5.2E+10	4.5E+48	0.000	6.3E+00	1	-6.3E+00	-1	3.2E+00	1	-3.2E+00	-0.99999	9.48E-12
8	20	0.00188	-2.4E+01	3.1E-11	-4.5E+48	2.000	2.8E+01	1.8E+12	4.5E+48	0.000	5.9E+00	1	-5.9E+00	-1	3.0E+00	1	-3.0E+00	-0.99997	4.60E-13
9	22.5	0.00188	-2.7E+01	1.5E-12	-4.5E+48	2.000	3.2E+01	6.1E+13	4.5E+48	0.000	5.6E+00	1	-5.6E+00	-1	2.8E+00	0.9999	-2.8E+00	-0.99992	2.23E-14
10	25	0.00188	-3.0E+01	7.2E-14	-4.5E+48	2.000	3.5E+01	2.1E+15	4.5E+48	0.000	5.3E+00	1	-5.3E+00	-1	2.6E+00	0.9998	-2.6E+00	-0.99981	1.08E-15
11	27.5	0.00188	-3.3E+01	3.5E-15	-4.5E+48	2.000	3.9E+01	7.0E+16	4.5E+48	0.000	5.1E+00	1	-5.1E+00	-1	2.5E+00	0.9996	-2.5E+00	-0.99963	5.24E-17
12	30	0.00188	-3.6E+01	1.7E-16	-4.5E+48	2.000	4.2E+01	2.4E+18	4.5E+48	0.000	4.8E+00	1	-4.8E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	2.54E-18
13	32.5	0.00188	-3.9E+01	8.2E-18	-4.5E+48	2.000	4.6E+01	8.1E+19	4.5E+48	0.000	4.7E+00	1	-4.7E+00	-1	2.3E+00	0.9989	-2.3E+00	-0.99893	1.23E-19
14	35	0.00188	-4.2E+01	4.0E-19	-4.5E+48	2.000	4.9E+01	2.7E+21	4.5E+48	0.000	4.5E+00	1	-4.5E+00	-1	2.2E+00	0.9984	-2.2E+00	-0.99839	5.98E-21
15	37.5	0.00188	-4.5E+01	1.9E-20	-4.5E+48	2.000	5.3E+01	9.3E+22	4.5E+48	0.000	4.3E+00	1	-4.3E+00	-1	2.2E+00	0.9977	-2.2E+00	-0.99769	2.90E-22
16	40	0.00188	-4.8E+01	9.4E-22	-4.5E+48	2.000	5.6E+01	3.2E+24	4.5E+48	0.000	4.2E+00	1	-4.2E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	1.40E-23
17	42.5	0.00188	-5.1E+01	4.6E-23	-4.5E+48	2.000	6.0E+01	1.1E+26	4.5E+48	0.000	4.1E+00	1	-4.1E+00	-1	2.0E+00	0.9958	-2.0E+00	-0.99579	6.80E-25
18	45	0.00188	-5.4E+01	2.2E-24	-4.5E+48	2.000	6.3E+01	3.7E+27	4.5E+48	0.000	4.0E+00	1	-4.0E+00	-1	2.0E+00	0.9946	-2.0E+00	-0.99459	3.30E-26
19	47.5	0.00188	-5.7E+01	1.1E-25	-4.5E+48	2.000	6.7E+01	1.2E+29	4.5E+48	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9932	-1.9E+00	-0.99321	1.60E-27
20	50	0.00188	-6.1E+01	5.2E-27	-4.5E+48	2.000	7.1E+01	4.2E+30	4.5E+48	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	7.73E-29

Date:	11/12/2025
Version:	1

Contaminant „2-Dichloroethene

DOMENICO (STEADY STATE)

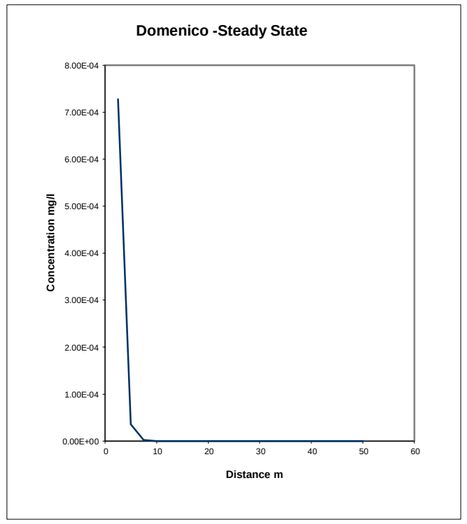
Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.001	mg/l
Co	1.50E-02	mg/l
λ	2.06E-03	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	4.90E+01	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion optio Simulate vertical dispersion in 1 direction

Calc	Value	
v	7.60E-02	m/d
Rc	3.15E+02	
u	2.42E-04	m/d

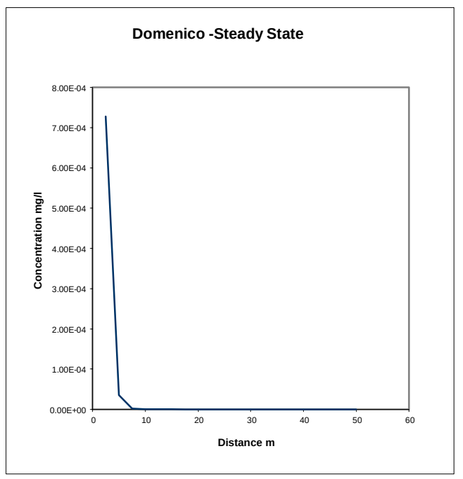
	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.00375	-3.03E+00	4.85E-02	1.68E+01	1	-1.68E+01	-1	4.17E+00	1	-4.17E+00	-1	7.28E-04
2	5	0.00375	-6.05E+00	2.35E-03	1.19E+01	1	-1.19E+01	-1	2.95E+00	1	-2.95E+00	-1	3.53E-05
3	7.5	0.00375	-9.08E+00	1.14E-04	9.68E+00	1	-9.68E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	1.71E-06
4	10	0.00375	-1.21E+01	5.54E-06	8.39E+00	1	-8.39E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	8.28E-08
5	12.5	0.00375	-1.51E+01	2.68E-07	7.50E+00	1	-7.50E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	3.99E-09
6	15	0.00375	-1.82E+01	1.30E-08	6.85E+00	1	-6.85E+00	-1	1.70E+00	0.984	-1.70E+00	-0.984	1.92E-10
7	17.5	0.00375	-2.12E+01	6.32E-10	6.34E+00	1	-6.34E+00	-1	1.58E+00	0.9743	-1.58E+00	-0.9743	9.23E-12
8	20	0.00375	-2.42E+01	3.06E-11	5.93E+00	1	-5.93E+00	-1	1.48E+00	0.963	-1.48E+00	-0.963	4.43E-13
9	22.5	0.00375	-2.72E+01	1.49E-12	5.59E+00	1	-5.59E+00	-1	1.39E+00	0.9508	-1.39E+00	-0.9508	2.12E-14
10	25	0.00375	-3.03E+01	7.21E-14	5.30E+00	1	-5.30E+00	-1	1.32E+00	0.9379	-1.32E+00	-0.9379	1.01E-15
11	27.5	0.00375	-3.33E+01	3.50E-15	5.06E+00	1	-5.06E+00	-1	1.26E+00	0.9247	-1.26E+00	-0.9247	4.85E-17
12	30	0.00375	-3.63E+01	1.70E-16	4.84E+00	1	-4.84E+00	-1	1.20E+00	0.9115	-1.20E+00	-0.9115	2.32E-18
13	32.5	0.00375	-3.93E+01	8.23E-18	4.65E+00	1	-4.65E+00	-1	1.16E+00	0.8982	-1.16E+00	-0.8982	1.11E-19
14	35	0.00375	-4.24E+01	3.99E-19	4.48E+00	1	-4.48E+00	-1	1.11E+00	0.8852	-1.11E+00	-0.8852	5.30E-21
15	37.5	0.00375	-4.54E+01	1.94E-20	4.33E+00	1	-4.33E+00	-1	1.08E+00	0.8723	-1.08E+00	-0.8723	2.53E-22
16	40	0.00375	-4.84E+01	9.39E-22	4.19E+00	1	-4.19E+00	-1	1.04E+00	0.8598	-1.04E+00	-0.8598	1.21E-23
17	42.5	0.00375	-5.14E+01	4.55E-23	4.07E+00	1	-4.07E+00	-1	1.01E+00	0.8476	-1.01E+00	-0.8476	5.79E-25
18	45	0.00375	-5.45E+01	2.21E-24	3.95E+00	1	-3.95E+00	-1	9.83E-01	0.8357	-9.83E-01	-0.8357	2.77E-26
19	47.5	0.00375	-5.75E+01	1.07E-25	3.85E+00	1	-3.85E+00	-1	9.57E-01	0.8241	-9.57E-01	-0.8241	1.32E-27
20	50	0.00375	-6.05E+01	5.20E-27	3.75E+00	1	-3.75E+00	-1	9.33E-01	0.8129	-9.33E-01	-0.8129	6.34E-29



DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.00375	-3.03E+00	4.85E-02	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	7.28E-04
2	5	0.00375	-6.05E+00	2.35E-03	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	3.53E-05
3	7.5	0.00375	-9.08E+00	1.14E-04	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	1.71E-06
4	10	0.00375	-1.21E+01	5.54E-06	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	8.30E-08
5	12.5	0.00375	-1.51E+01	2.68E-07	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	4.03E-09
6	15	0.00375	-1.82E+01	1.30E-08	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	1.95E-10
7	17.5	0.00375	-2.12E+01	6.32E-10	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	9.48E-12
8	20	0.00375	-2.42E+01	3.06E-11	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	4.60E-13
9	22.5	0.00375	-2.72E+01	1.49E-12	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-0.9999	2.23E-14
10	25	0.00375	-3.03E+01	7.21E-14	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-0.9998	1.08E-15
11	27.5	0.00375	-3.33E+01	3.50E-15	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-0.9996	5.24E-17
12	30	0.00375	-3.63E+01	1.70E-16	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	2.54E-18
13	32.5	0.00375	-3.93E+01	8.23E-18	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.9989	1.23E-19
14	35	0.00375	-4.24E+01	3.99E-19	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.9984	5.98E-21
15	37.5	0.00375	-4.54E+01	1.94E-20	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.9977	2.90E-22
16	40	0.00375	-4.84E+01	9.39E-22	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	1.40E-23
17	42.5	0.00375	-5.14E+01	4.55E-23	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.9958	6.80E-25
18	45	0.00375	-5.45E+01	2.21E-24	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.9946	3.30E-26
19	47.5	0.00375	-5.75E+01	1.07E-25	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.9932	1.60E-27
20	50	0.00375	-6.05E+01	5.20E-27	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	7.73E-29



Date:	11/12/2025
Version:	1

DOMENICO (TIME VARIANT)

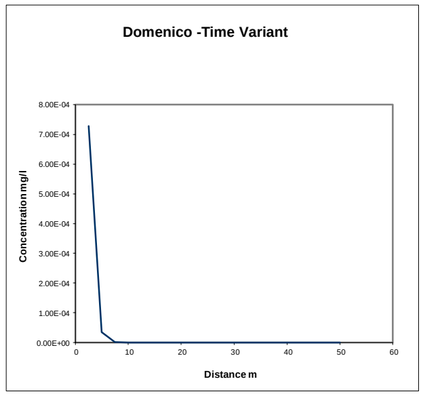
Contaminant	**ι,2-Dichloroethene**	
Input	**Value**	**Units**
C_T	0.001	mg/l
Co	1.50E-02	mg/l
λ	2.06E-03	$days^{-1}$
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	4.90E+01	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option: Simulate vertical dispersion in 1 direction

Calc	**Value**	
v	7.60E-02	m/d
Rc	3.15E+02	
u	2.42E-04	m/d

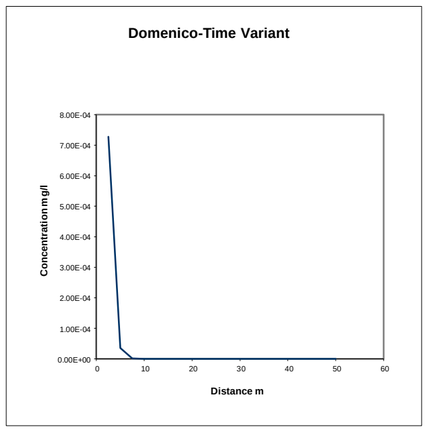
Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.00188	-3.03E+00	4.85E-02	-4.53E+48	2	1.68E+01	1	-1.68E+01	-1	4.17E+00	1	-4.17E+00	-1	7.28E-04
2	5	0.00188	-6.05E+00	2.35E-03	-4.53E+48	2	1.19E+01	1	-1.19E+01	-1	2.95E+00	1	-2.95E+00	-1	3.53E-05
3	7.5	0.00188	-9.08E+00	1.14E-04	-4.53E+48	2	9.68E+00	1	-9.68E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	1.71E-06
4	10	0.00188	-1.21E+01	5.54E-06	-4.53E+48	2	8.39E+00	1	-8.39E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	8.28E-08
5	12.5	0.00188	-1.51E+01	2.68E-07	-4.53E+48	2	7.50E+00	1	-7.50E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	3.99E-09
6	15	0.00188	-1.82E+01	1.30E-08	-4.53E+48	2	6.85E+00	1	-6.85E+00	-1	1.70E+00	0.984	-1.70E+00	-0.984	1.92E-10
7	17.5	0.00188	-2.12E+01	6.32E-10	-4.53E+48	2	6.34E+00	1	-6.34E+00	-1	1.58E+00	0.9743	-1.58E+00	-0.974	9.23E-12
8	20	0.00188	-2.42E+01	3.06E-11	-4.53E+48	2	5.93E+00	1	-5.93E+00	-1	1.48E+00	0.963	-1.48E+00	-0.963	4.43E-13
9	22.5	0.00188	-2.72E+01	1.49E-12	-4.53E+48	2	5.59E+00	1	-5.59E+00	-1	1.39E+00	0.9508	-1.39E+00	-0.951	2.12E-14
10	25	0.00188	-3.03E+01	7.21E-14	-4.53E+48	2	5.30E+00	1	-5.30E+00	-1	1.32E+00	0.9379	-1.32E+00	-0.938	1.01E-15
11	27.5	0.00188	-3.33E+01	3.50E-15	-4.53E+48	2	5.06E+00	1	-5.06E+00	-1	1.26E+00	0.9247	-1.26E+00	-0.925	4.85E-17
12	30	0.00188	-3.63E+01	1.70E-16	-4.53E+48	2	4.84E+00	1	-4.84E+00	-1	1.20E+00	0.9115	-1.20E+00	-0.911	2.32E-18
13	32.5	0.00188	-3.93E+01	8.23E-18	-4.53E+48	2	4.65E+00	1	-4.65E+00	-1	1.16E+00	0.8982	-1.16E+00	-0.898	1.11E-19
14	35	0.00188	-4.24E+01	3.99E-19	-4.53E+48	2	4.48E+00	1	-4.48E+00	-1	1.11E+00	0.8852	-1.11E+00	-0.885	5.30E-21
15	37.5	0.00188	-4.54E+01	1.94E-20	-4.53E+48	2	4.33E+00	1	-4.33E+00	-1	1.08E+00	0.8723	-1.08E+00	-0.872	2.53E-22
16	40	0.00188	-4.84E+01	9.39E-22	-4.53E+48	2	4.19E+00	1	-4.19E+00	-1	1.04E+00	0.8598	-1.04E+00	-0.86	1.21E-23
17	42.5	0.00188	-5.14E+01	4.55E-23	-4.53E+48	2	4.07E+00	1	-4.07E+00	-1	1.01E+00	0.8476	-1.01E+00	-0.848	5.79E-25
18	45	0.00188	-5.45E+01	2.21E-24	-4.53E+48	2	3.95E+00	1	-3.95E+00	-1	9.83E-01	0.8357	-9.83E-01	-0.836	2.77E-26
19	47.5	0.00188	-5.75E+01	1.07E-25	-4.53E+48	2	3.85E+00	1	-3.85E+00	-1	9.57E-01	0.8241	-9.57E-01	-0.824	1.32E-27
20	50	0.00188	-6.05E+01	5.20E-27	-4.53E+48	2	3.75E+00	1	-3.75E+00	-1	9.33E-01	0.8129	-9.33E-01	-0.813	6.34E-29



Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.00188	-3.03E+00	4.85E-02	-4.53E+48	2	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	7.28E-04
2	5	0.00188	-6.05E+00	2.35E-03	-4.53E+48	2	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	3.53E-05
3	7.5	0.00188	-9.08E+00	1.14E-04	-4.53E+48	2	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	1.71E-06
4	10	0.00188	-1.21E+01	5.54E-06	-4.53E+48	2	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	8.30E-08
5	12.5	0.00188	-1.51E+01	2.68E-07	-4.53E+48	2	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	4.03E-09
6	15	0.00188	-1.82E+01	1.30E-08	-4.53E+48	2	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	1.95E-10
7	17.5	0.00188	-2.12E+01	6.32E-10	-4.53E+48	2	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	9.48E-12
8	20	0.00188	-2.42E+01	3.06E-11	-4.53E+48	2	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	4.60E-13
9	22.5	0.00188	-2.72E+01	1.49E-12	-4.53E+48	2	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-1	2.23E-14
10	25	0.00188	-3.03E+01	7.21E-14	-4.53E+48	2	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-1	1.08E-15
11	27.5	0.00188	-3.33E+01	3.50E-15	-4.53E+48	2	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-1	5.24E-17
12	30	0.00188	-3.63E+01	1.70E-16	-4.53E+48	2	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	2.54E-18
13	32.5	0.00188	-3.93E+01	8.23E-18	-4.53E+48	2	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.999	1.23E-19
14	35	0.00188	-4.24E+01	3.99E-19	-4.53E+48	2	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.998	5.98E-21
15	37.5	0.00188	-4.54E+01	1.94E-20	-4.53E+48	2	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.998	2.90E-22
16	40	0.00188	-4.84E+01	9.39E-22	-4.53E+48	2	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	1.40E-23
17	42.5	0.00188	-5.14E+01	4.55E-23	-4.53E+48	2	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.996	6.80E-25
18	45	0.00188	-5.45E+01	2.21E-24	-4.53E+48	2	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.995	3.30E-26
19	47.5	0.00188	-5.75E+01	1.07E-25	-4.53E+48	2	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.993	1.60E-27
20	50	0.00188	-6.05E+01	5.20E-27	-4.53E+48	2	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	7.73E-29



Date:	11/12/2025
Version:	1

Hydrogeological risk assessment for land contamination

Remedial Targets Worksheet , Release 3.2

First released: 2006. Version 3.2: January 2013

This worksheet has been produced in combination with the document 'Remedial Targets Methodology: Hydrogeological risk assessment for land contamination (Environment Agency 2006).

Users of this worksheet should always refer to the User Manual to the Remedial Targets Methodology and to relevant guidance on UK legislation and policy, in order to understand how this procedure should be applied in an appropriate context.

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The calculation of equations in this worksheet has been independently checked by Entec (UK) Ltd on behalf of the Environment Agency.

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IMPORTANT: To enable MS Excel worksheet, click Tools, Add -Ins, Analysis Tool Pak and Analysis Tool Pak-VBA (to calculate error functions)

Details to be completed for each assessment				
Site Name:	Kelvedon Street			
Site Address:	Newport			
Completed by:	Michael Watkins			
Date:	11-Dec-25		Version:	1
Contaminant	Tetrachloroethene			
Target Concentration (C_T)	0.01	mg/l	Origin of C_T:	WFD for inland surface waters (annual average)

This worksheet can be used to determine remedial targets for soils (Worksheets Level 1 Soil, Level 2 and Level 3 Soil) or to determine remedial targets for groundwater (Level 3 Groundwater). For Level 3, parameter values must be entered separately dependent on whether the assessment is for soil or groundwater. For soil, remedial targets are calculated as either mg/kg (for comparision with soil measurements) or mg/l (for comparison with leaching tests or pore water concentrations).
Site details entered on this page are automatically copied to Level 1, 2 and 3 Worksheets.
Worksheet options are identified by brown background and employ a pull-down menus. Data entry are identified as blue background.
Data origin / justification should be noted in cells coloured yellow and fully documented in subsequent reports.
Data carried forward from an earlier worksheet are identified by a light green background
It is recommended that a copy of the original worksheet is saved (all data fields in the original copy are blank).

The spreadsheet also includes a porosity calculation worksheet, a soil impact calculation worksheet and a worksheet that performs some simple hydrogeological calculations.

Remedial Targets Worksheet , Release 3.2

Level 1 - Soil

Environment Agency

Select the method of calculating the soil water Partition Co-efficient by using the pull down menu below

User specified value for partition coefficient

Contaminant		**Tetrachloroethene**		
Target concentration	**C_T**	**0.01**	**mg/l**	

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**
Standard entry				
Water filled soil porosity	θ_W	0.00E+00	fraction	
Air filled soil porosity	θa	0.00E+00	fraction	
Bulk density of soil zone material	ρ	0.00E+00	g/cm^3	
Henry's Law constant	H	0.00E+00	dimensionless	
Entry if specify partition coefficient (option)				
Soil water partition coefficient	Kd	0.00E+00	l/kg	
Entry for non-polar organic chemicals (option)				
Fraction of organic carbon (in soil)	foc		fraction	
Organic carbon partition coefficient	Koc		l/kg	
Entry for ionic organic chemicals (option)				
Sorption coefficient for neutral species	$K_{oc,n}$		l/kg	
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg	
pH value	pH		pH units	
Acid dissociation constant	pKa			
Fraction of organic carbon (in soil)	foc		fraction	

This sheet calculates the Level 1 remedial target for soils(mg/kg) based on a selected target concentration and theoretical calculation of soil water partitioning. Three options are included for determining the partition coefficient.

The measured soil concentration as mg/kg should be compared with the Level 1 remedial target to determine the need for further action.

Soil water partition coefficient used in Level Assessment	**Kd**	**0.00E+00**	**l/kg**	*Specified value*

Level 1 Remedial Target

Level 1 Remedial Target	**#DIV/0!**	**mg/kg**	**(for comparison with soil analyses)**
	or		
	0.01	**mg/l**	**(for comparison with leachate test results)**

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 2 - Soil

Contaminant		**Tetrachloroethene**		from Level 1
Target concentration	**C_T**	**0.01**	**mg/l**	from Level 1

This sheet calculates the Level 2 remedial target for soils (mg/kg) or for pore water (mg/l).

The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 2 remedial target to determine the need for further action. Equations presented in 'Hydrogeological risk assessment for land contamiantion' (Environment Agency 2006)

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**	
Standard entry					
Infiltration	Inf	0.00E+00	m/d		
Area of contaminant source	A	0.00E+00	m^2		Not used in calculation
Entry for groundwater flow below site					
Length of contaminant source in direction of groundwater flow	L	0.00E+00	m		
Saturated aquifer thickness	da	0.00E+00	m		
Hydraulic Conductivity of aquifer in which dilution occurs	K	0.00E+00	m/d		
Hydraulic gradient of water table	i	0.00E+00	fraction		
Width of contaminant source perpendicular to groundwater flow	w	0.00E+00	m		Not used in calculation
Background concentration of contaminant in groundwater beneath site	Cu	0.00E+00	mg/l		
Define mixing zone depth by specifying or calculating depth (using pull down list)		**Specify**			
Enter mixing zone thickness	Mz	0.00E+00	m		
Calculated mixing zone thickness	Mz		m		

Calculated Parameters

Dilution Factor	**DF**	**#DIV/0!**		
Level 2 Remedial Target		**#DIV/0!**	**mg/l**	**For comparison with measured pore water concentration. This assumes Level 1 Remedial Target is based on Target Concentrati**
		or		
		#DIV/0!	**mg/kg**	**For comparison with measured soil concentration. This assumes Level 1 Remedial Target calculated from soil-water**

Additional option

Calculation of impact on receptor

Concentration of contaminant in contaminated discharge (entering receptor)	Cc	0.00E+00	mg/l	
Calculated concentration within receptor (dilution only)		#DIV/0!	mg/l	0

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 3 - Soil

See Note

Input Parameters	Variable	Value	Unit	Source
Contaminant		Tetrachloroethene		from Level 1
Target Concentration	C_T	0.01	mg/l	from Level 1
Dilution Factor	DF	#DIV/0!		from Level 2

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value, l

	Variable	Value	Unit	Source of parameter value
Enter source concentration		Soil concentration as mg/kg		
Enter soil concentration		0	mg/kg	
Half life for degradation of contaminant in water	$t_{1/2}$	1.00E+100	days	
Calculated decay rate	λ	6.93E-101	$days^{-1}$	calculated
Width of plume in aquifer at source	Sz	0.00E+00	m	from Level 2
Plume thickness in aquifer at source	Sy	0.00E+00	m	from Level 2
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Effective porosity of aquifer	n	0.00E+00	fraction	
Hydraulic gradient	i	#DIV/0!	fraction	from Level 2 (adjusted)
Hydraulic conductivity of saturated aquifer	K	0.00E+00	m/d	from Level 2
Distance to compliance point	x	0.00E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	1.00E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	0.00E+00	l/kg	*see options*
Longitudinal dispersivity	ax	0.000	m	*see options*
Transverse dispersivity	az	0.000	m	*see options*
Vertical dispersivity	ay	0.000	m	*see options*

Parameter values should be checked against Level 1 and 2

Calculated Parameters	Variable		
Groundwater flow velocity	v	#DIV/0!	m/d
Retardation factor	Rf	#DIV/0!	fraction
Decay rate used	λ	6.93E-101	d^{-1}
Hydraulic gradient used in aquifer flow down-gradient	i	#DIV/0!	fraction
Rate of contaminant flow due to retardation	u	#DIV/0!	m/d
Ratio of Compliance Point to Source Concentration	C_{ED}/C_0	#DIV/0!	fraction
Attenuation factor (C_0/C_{ED})	**AF**	**#DIV/0!**	**fraction**
Calculated soil leachate concentration	Co	#DIV/0!	mg/l

Remedial Targets

Level 3 Remedial Target		**#DIV/0!**	**mg/l**	For comparison with measured pore water concentration.
Ogata Banks		**or**		This assumes Level 1 Remedial Target is based on Target Concentration.
		#DIV/0!	**mg/kg**	For comparison with measured soil concentration. This
Distance to compliance point		**0**	**m**	assumes Level 1 Remedial Target calculated from soil-water partitioning equation.
Ratio of Compliance Point to Source Concentration	**C_{ED}/C_0**	**#DIV/0!**	**fraction**	Ogata Banks

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99

Enter method of defining partition co-efficient (using pull down list)

Calculate for ionic organic chemicals (acids)

Entry if specify partition coefficient (option)

Soil water partition coefficient — Kd — l/kg

Entry for non-polar organic chemicals (option)

Fraction of organic carbon in aquifer — foc — fraction
Organic carbon partition coefficient — Koc — l/kg

Entry for ionic organic chemicals (option)

Sorption coefficient for related species	$K_{oc,n}$	0.00E+00	l/kg
Sorption coefficient for ionised species	$K_{oc,i}$	0.00E+00	l/kg
pH value	pH	0.00E+00	
Acid dissociation constant	pKa	0.00E+00	
Fraction of organic carbon in aquifer	foc	0.00E+00	fraction
Soil water partition coefficient	Kd	0.00E+00	l/kg

Define dispersivity (click brown cell and use pull down list)

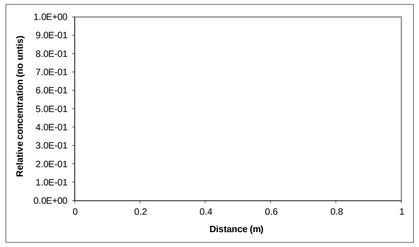
User defined values for dispersivity

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	0.00E+00	#NUM!	m
Transverse dispersivity	**az**	0.00E+00	0.00E+00	#NUM!	m
Vertical dispersivity	**ay**	0.00E+00	0.00E+00	#NUM!	m

Note values of dispersivity must be > 0

Xu & Eckstein (1995) report $ax = 0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed

Note
This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O_2, NO_3, SO_4 etc than an alternative solution should be used



Note: 'Relative concentration' is the ratio of calculated concentation at a given position compared to the source concentration. The calculations assume plume disperses from the top of the aquifer. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

This sheet calculates the Level 3 remedial target for soils(mg/kg) or for pore water (mg/l), based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.By setting a long travel time (e.g. 9E99) it will give the steady state solution, which should always be used when calculating remedial targets.

The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.9E+99.

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Calculated (relative) concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Relative concentration (No units)	Concentration mg/l
0	1.0E+00	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!

Remedial Targets Worksheet , Release 3.2

Calculation of contaminant concentration in groundwater from a soil source

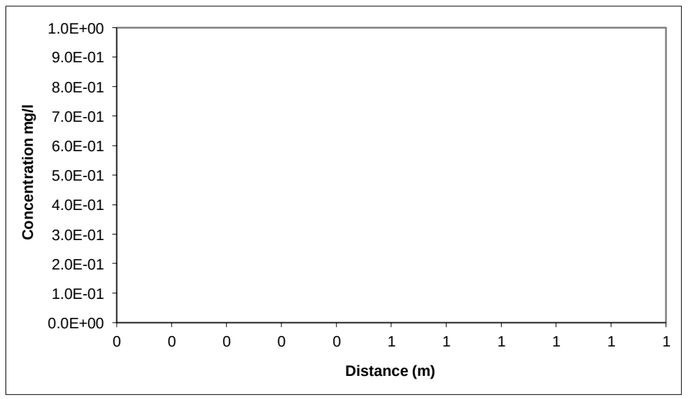
Only input required is Soil Contaminant Concentration

	Input Parameters			
	Soil contaminant concentration	C_0	0.00E+00	mg/kg
Level 1 Parameters				
	Water filled soil porosity	θ_W	0.00E+00	fraction
	Air filled soil porosity	θa	0.00E+00	fraction
	Bulk density	ρ	0.00E+00	g/cm^3
	Henry's Law constant	H	0.00E+00	dimensionless
	Soil water partition coefficient used in Level Assessment	Kd	0.00E+00	l/kg
	Factor (partitioning between soil and water)		#DIV/0!	dimensionless
Level 2 Parameters	**Dilution Factor**	DF	#DIV/0!	
Level 3 Parameters	**Attenuation factor (C_O/C_{ED})**	AF	#DIV/0!	

Predicted concentrations at compliance point

Level 1	C	#DIV/0!	mg/l	No dilution or attenuation
Level 2	C	#DIV/0!	mg/l	Dilution taken into account
Level 3	C	#DIV/0!	mg/l	Dilution and attenuation taken into account

Predicted concentrations between source and compliance point - Level 3



Distance m	Concentration mg/l
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu) | **Variable** | **Value** | **Unit** | **Source**

Contaminant		Tetrachloroethene		from Level 1
Target Concentration	C_T	1.00E-02	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Domenico - Steady state — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	9.80E-02	mg/l	*Site investigation data*
Half life for degradation of contaminant in water	$t_{1/2}$	2.35E+03	days	*Howard et al (1991) Low anaerobic biodeg*
Calculated decay rate	λ	2.95E-04	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	7.50E+01	m	*Length of site perpendicular to groundwater flow*
Plume thickness at source	Sy	5.90E+00	m	*Same as Mixing Zone Thickness. "For a thin aquifer (typically <10m), the mixing zone thickness can be taken as the ac*
Saturated aquifer thickness	da	6.00E+00	m	*Maximum thickness recorded in vicinity of*
Bulk density of aquifer materials	ρ	1.60E+00	g/cm^3	*Typical bulk density for river terrace deposits*
Effective porosity of aquifer	n	2.50E-01	fraction	*Maximum porosity for coarse Gravel (Lovanh et al 2000) - conservative estimate*
Hydraulic gradient	i	4.40E-02	fraction	*Borehole level data*
Hydraulic conductivity of aquifer	K	4.32E-01	m/d	*Maximum typical value for clayey sandy G*
Distance to compliance point	x	5.00E+01	m	*Default compliance distance*
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	9.90E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	2.43E+03	l/kg	*see options*
Longitudinal dispersivity	ax	5.00E+00	m	*see options*
Transverse dispersivity	az	5.00E-01	m	*see options*
Vertical dispersivity	ay	5.00E-02	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)

Soil water partition coefficient — Kd — 2.43E+03 — l/kg

Entry for non-polar organic chemicals (option)

Fraction of organic carbon in aquifer — foc — fraction

Organic carbon partition coefficient — Koc — l/kg

Entry for ionic organic chemicals (option)

Sorption coefficient for related species — $K_{OC,n}$ — l/kg

Sorption coefficient for ionised species — $K_{OC,I}$ — l/kg

pH value — pH

acid dissociation constant — pKa

Fraction of organic carbon in aquifer — foc — fraction

Soil water partition coefficient	Kd	2.43E+03	l/kg

Define dispersivity (click brown cell and use pull down list)

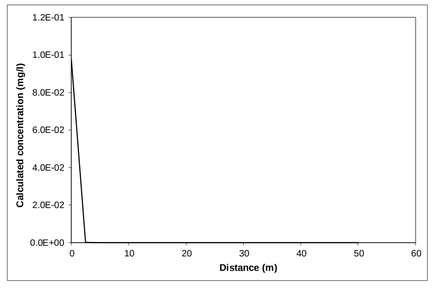
Dispersivities 10%, 1%, 0.1% of pathway length

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	5.00E+00	2.98E+00	m
Transverse dispersivity	**az**	0.00E+00	5.00E-01	2.98E-01	m
Vertical dispersivity	**ay**	0.00E+00	5.00E-02	2.98E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Calculated concentrations for distance-concentration graph

Domenico - Steady state
From calculation sheet

Distance	Concentration
	mg/l
0	9.8E-02
2.5	2.13E-05
5.0	4.62E-09
7.5	1.00E-12
10.0	2.18E-16
12.5	4.74E-20
15.0	1.03E-23
17.5	2.24E-27
20.0	4.86E-31
22.5	1.06E-34
25.0	2.29E-38
27.5	4.98E-42
30.0	1.08E-45
32.5	2.35E-49
35.0	5.10E-53
37.5	1.11E-56
40.0	2.40E-60
42.5	5.21E-64
45.0	1.13E-67
47.5	2.45E-71
50.0	5.32E-75

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared

with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Calculated Parameters | **Variable**

Groundwater flow velocity	v	7.60E-02	m/d
Retardation factor	Rf	1.56E+04	fraction
Decay rate used	λ	2.95E-04	d^{-1}
Rate of contaminant flow due to retardation	u	4.89E-06	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	5.32E-75	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**1.84E+73**	

Remedial Targets

Remedial Target		**1.84E+71**	**mg/l**	For comparison with measured groundwater concentration.
Domenico - Steady state				
Distance to compliance point		**50**	**m**	
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**5.32E-75**	**mg/l**	Domenico - Steady state

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Porosity Calculator

These results are not carried through to any of the other worksheets

DRY BULK DENSITY DATA

Variable	Value	Unit	justification
Natural Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Dry Bulk Density	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
Initial Saturation	#DIV/0!	*%*	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	
Water Filled Porosity	**#DIV/0!**	**fraction**	

WET BULK DENSITY DATA

Variable	Value	Unit	
Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Actual (wet) Bulk Density (i.e. at natural MC)	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
dry bulk density	0.00	tonnes/m^3	
Initial Saturation	#DIV/0!	*%*	
Total porosity	**1.000**	**fraction**	**#DIV/0!**
Air Filled Porosity	**#DIV/0!**	**fraction**	
Water Filled Porosity	**#DIV/0!**	**fraction**	

Analytical solutions provided by David Hall, Golder Associates (UK) Ltd

Simple hydrogeological calculations

(These are not specific to, or required in, the Remedial Targets Methodology)

Parameter	symbol		unit	justification
Hydraulic conductivity	K	0.00E+00	m/d	
Hydraulic gradient	i	0.00E+00	unitless	
Effective porosity of aquifer	n	0.00E+00	fraction	
Thickness of saturated aquifer	b	0.00E+00	m	
Width of aquifer perpendicular to flow	w	0.00E+00	m	
Distance to receptor	x	0.00E+00	m	
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Soil-water partition co-efficient	Kd	0.00E+00	l/kg	
Retardation factor of pollutant	R	#DIV/0!		

Groundwater flow velocity	v(GW)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for groundwater to reach receptor	t(GW)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years
Rate of groundwater flow through aquifer	Q	0.00E+00	m^3/s	0.00E+00	m^3/day	0.00E+00	m^3/year

Contaminant flow velocity	v(contam)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for contaminant to reach receptor	t(contam)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years

Level 1 Calculation Sheet

Contaminant Tetrachloroethene

Parameter	Value	Units
(carried over from input sheet)		
C_T	1.00E-02	mg/l
Kd	0.00E+00	l/kg
foc		fraction
koc		l/kg
θ_W	0.00E+00	fraction
θa	0.00E+00	fraction
ρ	0.00E+00	g/cm3
H	0.00E+00	dimensionless
Koc,n		l/kg
Koc,i		l/kg
pH		pH units
pKa		
foc (ionic)		fraction

Calculations (Refer toTable 4.3, R&D Publication 20)

Selected option User specified value for partition coefficient

calc calc Calc Kd l/kg

Calculation of partition coefficient for ionic organic chemical

Partition coefficient used in Level 1 Assessment 0.00E+00 l/kg

Calculated Remedial Target #DIV/0! mg/kg for Tetrachloroethene

Factor (partitioning between soil and water) #DIV/0!

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11/12/2025
Version:	1

Level 2 Calculation Sheet

Contaminant Tetrachloroethene

Site assessed:	Kelvedon Stre
Date:	11/12/2025
Version:	1

Parameter	Value	Units		
(carried over from input sheet)				
Mz	0.00E+00	m		
L	0.00E+00	m		
da	0.00E+00	m		Calculated
Inf	0.00E+00	m/d		Dilution Factor
K	0.00E+00	m/d		
i	0.00E+00		Calculation based on target concentration	#DIV/0!
A	0.00E+00	m3/d m2 m3/d	Calculation based on observed contaminant concentration	#DIV/0!
Cc	0.00E+00	mg/l		
C_T	1.00E-02	mg/l		
Cu	0.00E+00	mg/l		
w	0.00E+00	m		



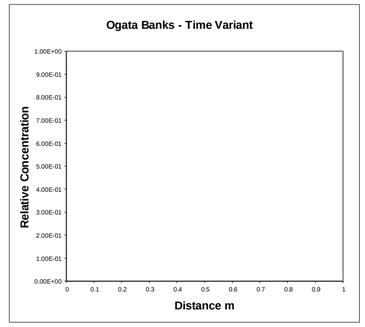
Contaminant Tetrachloroethene

OGATA BANKS SOLUTION

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-02	mg/l
DF	#DIV/0!	
λ	6.931E-101	days^{-1}
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Calc	Value	
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) -USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Date:	11/12/2025
Version:	1

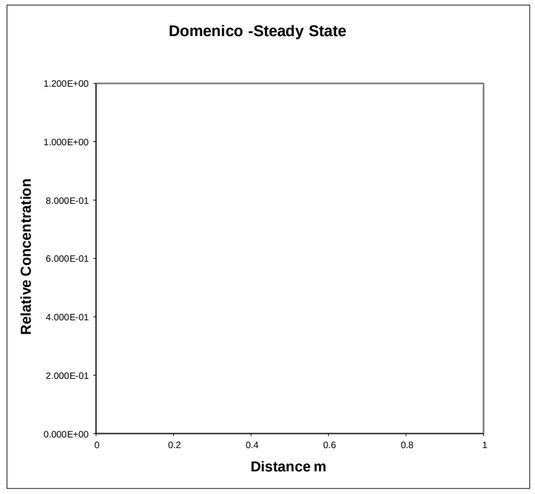
Contaminant trachloroethene

Input	Value	Units
C_T	1.000E-02	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

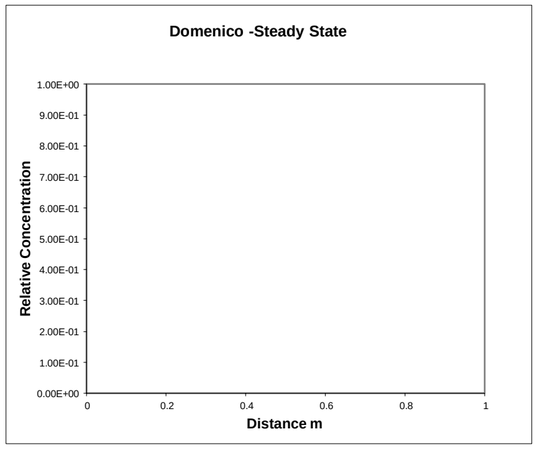


Calc	Value	Units
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Date:	11/12/2025
Version:	1

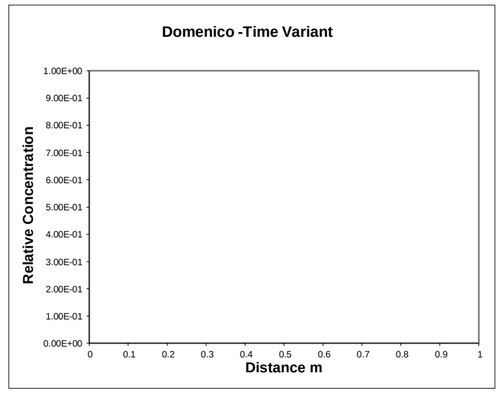
DOMENICO (TIME VARIANT)

Contaminant **Tetrachloroethene**

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.01	mg/l
DF	#DIV/0!	
λ	6.931E-101	days^{-1}
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

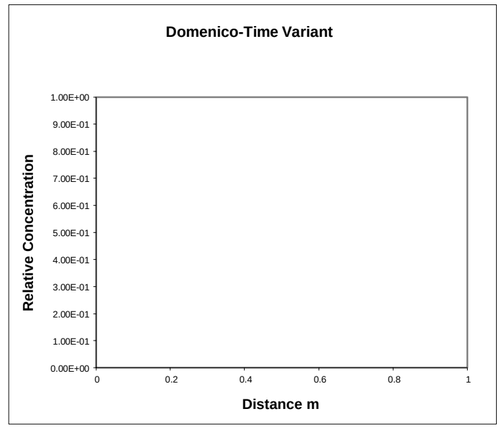
	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Calc	Value	
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Date:	11/12/2025
Version:	1

OGATA BANKS SOLUTION

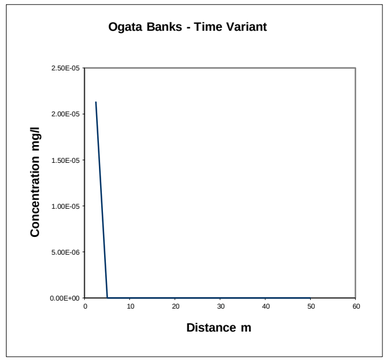
Contaminant etrachloroethene

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.01	mg/l
Co	9.80E-02	mg/l
λ	2.95E-04	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	2.43E+03	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.01225	-8.4E+00	2.2E-04	-1.7E+48	2.000	8.9E+00	7.6E+03	1.7E+48	0.000	1.7E+01	1	-1.7E+01	-1	4.2E+00	1	-4.2E+00	-1	2.13E-05
2	5	0.01225	-1.7E+01	4.7E-08	-1.7E+48	2.000	1.8E+01	5.8E+07	1.7E+48	0.000	1.2E+01	1	-1.2E+01	-1	3.0E+00	1	-3.0E+00	-0.99997	4.62E-09
3	7.5	0.01225	-2.5E+01	1.0E-11	-1.7E+48	2.000	2.7E+01	4.4E+11	1.7E+48	0.000	9.7E+00	1	-9.7E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	1.00E-12
4	10	0.01225	-3.4E+01	2.2E-15	-1.7E+48	2.000	3.6E+01	3.3E+15	1.7E+48	0.000	8.4E+00	1	-8.4E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	2.18E-16
5	12.5	0.01225	-4.2E+01	4.8E-19	-1.7E+48	2.000	4.5E+01	2.5E+19	1.7E+48	0.000	7.5E+00	1	-7.5E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	4.70E-20
6	15	0.01225	-5.1E+01	1.1E-22	-1.7E+48	2.000	5.4E+01	1.9E+23	1.7E+48	0.000	6.8E+00	1	-6.8E+00	-1	1.7E+00	0.984	-1.7E+00	-0.98399	1.01E-23
7	17.5	0.01225	-5.9E+01	2.3E-26	-1.7E+48	2.000	6.3E+01	1.5E+27	1.7E+48	0.000	6.3E+00	1	-6.3E+00	-1	1.6E+00	0.9743	-1.6E+00	-0.97425	2.18E-27
8	20	0.01225	-6.7E+01	5.0E-30	-1.7E+48	2.000	7.1E+01	1.1E+31	1.7E+48	0.000	5.9E+00	1	-5.9E+00	-1	1.5E+00	0.963	-1.5E+00	-0.96302	4.68E-31
9	22.5	0.01225	-7.6E+01	1.1E-33	-1.7E+48	2.000	8.0E+01	8.4E+34	1.7E+48	0.000	5.6E+00	1	-5.6E+00	-1	1.4E+00	0.9508	-1.4E+00	-0.95078	1.00E-34
10	25	0.01225	-8.4E+01	2.3E-37	-1.7E+48	2.000	8.9E+01	6.3E+38	1.7E+48	0.000	5.3E+00	1	-5.3E+00	-1	1.3E+00	0.9379	-1.3E+00	-0.93792	2.15E-38
11	27.5	0.01225	-9.3E+01	5.1E-41	-1.7E+48	2.000	9.8E+01	4.8E+42	1.7E+48	0.000	5.1E+00	1	-5.1E+00	-1	1.3E+00	0.9247	-1.3E+00	-0.92475	4.61E-42
12	30	0.01225	-1.0E+02	1.1E-44	-1.7E+48	2.000	1.1E+02	3.7E+46	1.7E+48	0.000	4.8E+00	1	-4.8E+00	-1	1.2E+00	0.9115	-1.2E+00	-0.91147	9.87E-46
13	32.5	0.01225	-1.1E+02	2.4E-48	-1.7E+48	2.000	1.2E+02	2.8E+50	1.7E+48	0.000	4.7E+00	1	-4.7E+00	-1	1.2E+00	0.8982	-1.2E+00	-0.89824	2.11E-49
14	35	0.01225	-1.2E+02	5.2E-52	-1.7E+48	2.000	1.3E+02	2.1E+54	1.7E+48	0.000	4.5E+00	1	-4.5E+00	-1	1.1E+00	0.8852	-1.1E+00	-0.88517	4.52E-53
15	37.5	0.01225	-1.3E+02	1.1E-55	-1.7E+48	2.000	1.3E+02	1.6E+58	1.7E+48	0.000	4.3E+00	1	-4.3E+00	-1	1.1E+00	0.8723	-1.1E+00	-0.87233	9.68E-57
16	40	0.01225	-1.3E+02	2.5E-59	-1.7E+48	2.000	1.4E+02	1.2E+62	1.7E+48	0.000	4.2E+00	1	-4.2E+00	-1	1.0E+00	0.8598	-1.0E+00	-0.85979	2.07E-60
17	42.5	0.01225	-1.4E+02	5.3E-63	-1.7E+48	2.000	1.5E+02	9.2E+65	1.7E+48	0.000	4.1E+00	1	-4.1E+00	-1	1.0E+00	0.8476	-1.0E+00	-0.84756	4.44E-64
18	45	0.01225	-1.5E+02	1.2E-66	-1.7E+48	2.000	1.6E+02	7.0E+69	1.7E+48	0.000	4.0E+00	1	-4.0E+00	-1	9.8E-01	0.8357	-9.8E-01	-0.83567	9.51E-68
19	47.5	0.01225	-1.6E+02	2.5E-70	-1.7E+48	2.000	1.7E+02	5.3E+73	1.7E+48	0.000	3.8E+00	1	-3.8E+00	-1	9.6E-01	0.8241	-9.6E-01	-0.82412	2.04E-71
20	50	0.01225	-1.7E+02	5.5E-74	-1.7E+48	2.000	1.8E+02	4.0E+77	1.7E+48	0.000	3.8E+00	1	-3.8E+00	-1	9.3E-01	0.8129	-9.3E-01	-0.81292	4.36E-75



Calc

Value	
7.60E-02	m/d
1.56E+04	
4.89E-06	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.01225	-8.4E+00	2.2E-04	-1.7E+48	2.000	8.9E+00	7.6E+03	1.7E+48	0.000	1.7E+01	1	-1.7E+01	-1	8.3E+00	1	-8.3E+00	-1	2.13E-05
2	5	0.01225	-1.7E+01	4.7E-08	-1.7E+48	2.000	1.8E+01	5.8E+07	1.7E+48	0.000	1.2E+01	1	-1.2E+01	-1	5.9E+00	1	-5.9E+00	-1	4.62E-09
3	7.5	0.01225	-2.5E+01	1.0E-11	-1.7E+48	2.000	2.7E+01	4.4E+11	1.7E+48	0.000	9.7E+00	1	-9.7E+00	-1	4.8E+00	1	-4.8E+00	-1	1.00E-12
4	10	0.01225	-3.4E+01	2.2E-15	-1.7E+48	2.000	3.6E+01	3.3E+15	1.7E+48	0.000	8.4E+00	1	-8.4E+00	-1	4.2E+00	1	-4.2E+00	-1	2.18E-16
5	12.5	0.01225	-4.2E+01	4.8E-19	-1.7E+48	2.000	4.5E+01	2.5E+19	1.7E+48	0.000	7.5E+00	1	-7.5E+00	-1	3.7E+00	1	-3.7E+00	-1	4.74E-20
6	15	0.01225	-5.1E+01	1.1E-22	-1.7E+48	2.000	5.4E+01	1.9E+23	1.7E+48	0.000	6.8E+00	1	-6.8E+00	-1	3.4E+00	1	-3.4E+00	-1	1.03E-23
7	17.5	0.01225	-5.9E+01	2.3E-26	-1.7E+48	2.000	6.3E+01	1.5E+27	1.7E+48	0.000	6.3E+00	1	-6.3E+00	-1	3.2E+00	1	-3.2E+00	-0.99999	2.24E-27
8	20	0.01225	-6.7E+01	5.0E-30	-1.7E+48	2.000	7.1E+01	1.1E+31	1.7E+48	0.000	5.9E+00	1	-5.9E+00	-1	3.0E+00	1	-3.0E+00	-0.99997	4.86E-31
9	22.5	0.01225	-7.6E+01	1.1E-33	-1.7E+48	2.000	8.0E+01	8.4E+34	1.7E+48	0.000	5.6E+00	1	-5.6E+00	-1	2.8E+00	0.9999	-2.8E+00	-0.99992	1.06E-34
10	25	0.01225	-8.4E+01	2.3E-37	-1.7E+48	2.000	8.9E+01	6.3E+38	1.7E+48	0.000	5.3E+00	1	-5.3E+00	-1	2.6E+00	0.9998	-2.6E+00	-0.99981	2.29E-38
11	27.5	0.01225	-9.3E+01	5.1E-41	-1.7E+48	2.000	9.8E+01	4.8E+42	1.7E+48	0.000	5.1E+00	1	-5.1E+00	-1	2.5E+00	0.9996	-2.5E+00	-0.99963	4.98E-42
12	30	0.01225	-1.0E+02	1.1E-44	-1.7E+48	2.000	1.1E+02	3.7E+46	1.7E+48	0.000	4.8E+00	1	-4.8E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	1.08E-45
13	32.5	0.01225	-1.1E+02	2.4E-48	-1.7E+48	2.000	1.2E+02	2.8E+50	1.7E+48	0.000	4.7E+00	1	-4.7E+00	-1	2.3E+00	0.9989	-2.3E+00	-0.99893	2.35E-49
14	35	0.01225	-1.2E+02	5.2E-52	-1.7E+48	2.000	1.3E+02	2.1E+54	1.7E+48	0.000	4.5E+00	1	-4.5E+00	-1	2.2E+00	0.9984	-2.2E+00	-0.99839	5.10E-53
15	37.5	0.01225	-1.3E+02	1.1E-55	-1.7E+48	2.000	1.3E+02	1.6E+58	1.7E+48	0.000	4.3E+00	1	-4.3E+00	-1	2.2E+00	0.9977	-2.2E+00	-0.99769	1.11E-56
16	40	0.01225	-1.3E+02	2.5E-59	-1.7E+48	2.000	1.4E+02	1.2E+62	1.7E+48	0.000	4.2E+00	1	-4.2E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	2.40E-60
17	42.5	0.01225	-1.4E+02	5.3E-63	-1.7E+48	2.000	1.5E+02	9.2E+65	1.7E+48	0.000	4.1E+00	1	-4.1E+00	-1	2.0E+00	0.9958	-2.0E+00	-0.99579	5.21E-64
18	45	0.01225	-1.5E+02	1.2E-66	-1.7E+48	2.000	1.6E+02	7.0E+69	1.7E+48	0.000	4.0E+00	1	-4.0E+00	-1	2.0E+00	0.9946	-2.0E+00	-0.99459	1.13E-67
19	47.5	0.01225	-1.6E+02	2.5E-70	-1.7E+48	2.000	1.7E+02	5.3E+73	1.7E+48	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9932	-1.9E+00	-0.99321	2.45E-71
20	50	0.01225	-1.7E+02	5.5E-74	-1.7E+48	2.000	1.8E+02	4.0E+77	1.7E+48	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	5.32E-75

Date:	11/12/2025
Version:	1

Contaminant **trachloroethene**

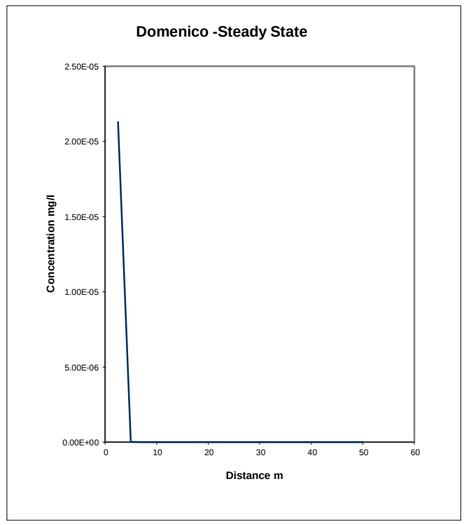
DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.01	mg/l
Co	9.80E-02	mg/l
λ	2.95E-04	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	2.43E+03	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion optio Simulate vertical dispersion in 1 direction

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.0245	-8.43E+00	2.17E-04	1.68E+01	1	-1.68E+01	-1	4.17E+00	1	-4.17E+00	-1	2.13E-05
2	5	0.0245	-1.69E+01	4.72E-08	1.19E+01	1	-1.19E+01	-1	2.95E+00	1	-2.95E+00	-1	4.62E-09
3	7.5	0.0245	-2.53E+01	1.03E-11	9.68E+00	1	-9.68E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	1.00E-12
4	10	0.0245	-3.37E+01	2.23E-15	8.39E+00	1	-8.39E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	2.18E-16
5	12.5	0.0245	-4.22E+01	4.84E-19	7.50E+00	1	-7.50E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	4.70E-20
6	15	0.0245	-5.06E+01	1.05E-22	6.85E+00	1	-6.85E+00	-1	1.70E+00	0.984	-1.70E+00	-0.984	1.01E-23
7	17.5	0.0245	-5.90E+01	2.28E-26	6.34E+00	1	-6.34E+00	-1	1.58E+00	0.9743	-1.58E+00	-0.9743	2.18E-27
8	20	0.0245	-6.75E+01	4.96E-30	5.93E+00	1	-5.93E+00	-1	1.48E+00	0.963	-1.48E+00	-0.963	4.68E-31
9	22.5	0.0245	-7.59E+01	1.08E-33	5.59E+00	1	-5.59E+00	-1	1.39E+00	0.9508	-1.39E+00	-0.9508	1.00E-34
10	25	0.0245	-8.43E+01	2.34E-37	5.30E+00	1	-5.30E+00	-1	1.32E+00	0.9379	-1.32E+00	-0.9379	2.15E-38
11	27.5	0.0245	-9.28E+01	5.08E-41	5.06E+00	1	-5.06E+00	-1	1.26E+00	0.9247	-1.26E+00	-0.9247	4.61E-42
12	30	0.0245	-1.01E+02	1.10E-44	4.84E+00	1	-4.84E+00	-1	1.20E+00	0.9115	-1.20E+00	-0.9115	9.87E-46
13	32.5	0.0245	-1.10E+02	2.40E-48	4.65E+00	1	-4.65E+00	-1	1.16E+00	0.8982	-1.16E+00	-0.8982	2.11E-49
14	35	0.0245	-1.18E+02	5.21E-52	4.48E+00	1	-4.48E+00	-1	1.11E+00	0.8852	-1.11E+00	-0.8852	4.52E-53
15	37.5	0.0245	-1.27E+02	1.13E-55	4.33E+00	1	-4.33E+00	-1	1.08E+00	0.8723	-1.08E+00	-0.8723	9.68E-57
16	40	0.0245	-1.35E+02	2.46E-59	4.19E+00	1	-4.19E+00	-1	1.04E+00	0.8598	-1.04E+00	-0.8598	2.07E-60
17	42.5	0.0245	-1.43E+02	5.34E-63	4.07E+00	1	-4.07E+00	-1	1.01E+00	0.8476	-1.01E+00	-0.8476	4.44E-64
18	45	0.0245	-1.52E+02	1.16E-66	3.95E+00	1	-3.95E+00	-1	9.83E-01	0.8357	-9.83E-01	-0.8357	9.51E-68
19	47.5	0.0245	-1.60E+02	2.52E-70	3.85E+00	1	-3.85E+00	-1	9.57E-01	0.8241	-9.57E-01	-0.8241	2.04E-71
20	50	0.0245	-1.69E+02	5.48E-74	3.75E+00	1	-3.75E+00	-1	9.33E-01	0.8129	-9.33E-01	-0.8129	4.36E-75

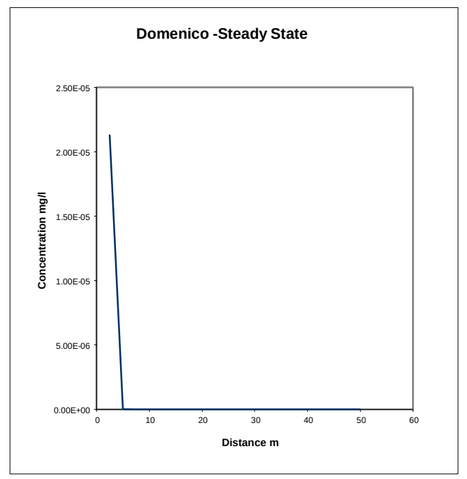


Calc	Value	Units
v	7.60E-02	m/d
Rc	1.56E+04	
u	4.89E-06	m/d

DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.0245	-8.43E+00	2.17E-04	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	2.13E-05
2	5	0.0245	-1.69E+01	4.72E-08	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	4.62E-09
3	7.5	0.0245	-2.53E+01	1.03E-11	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	1.00E-12
4	10	0.0245	-3.37E+01	2.23E-15	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	2.18E-16
5	12.5	0.0245	-4.22E+01	4.84E-19	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	4.74E-20
6	15	0.0245	-5.06E+01	1.05E-22	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	1.03E-23
7	17.5	0.0245	-5.90E+01	2.28E-26	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	2.24E-27
8	20	0.0245	-6.75E+01	4.96E-30	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	4.86E-31
9	22.5	0.0245	-7.59E+01	1.08E-33	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-0.9999	1.06E-34
10	25	0.0245	-8.43E+01	2.34E-37	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-0.9998	2.29E-38
11	27.5	0.0245	-9.28E+01	5.08E-41	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-0.9996	4.98E-42
12	30	0.0245	-1.01E+02	1.10E-44	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	1.08E-45
13	32.5	0.0245	-1.10E+02	2.40E-48	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.9989	2.35E-49
14	35	0.0245	-1.18E+02	5.21E-52	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.9984	5.10E-53
15	37.5	0.0245	-1.27E+02	1.13E-55	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.9977	1.11E-56
16	40	0.0245	-1.35E+02	2.46E-59	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	2.40E-60
17	42.5	0.0245	-1.43E+02	5.34E-63	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.9958	5.21E-64
18	45	0.0245	-1.52E+02	1.16E-66	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.9946	1.13E-67
19	47.5	0.0245	-1.60E+02	2.52E-70	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.9932	2.45E-71
20	50	0.0245	-1.69E+02	5.48E-74	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	5.32E-75



Date:	11/12/2025
Version:	1

DOMENICO (TIME VARIANT)

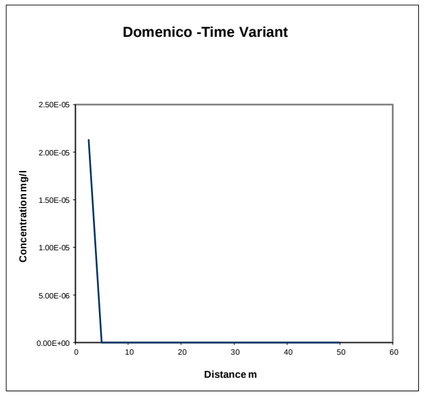
Contaminant **:trachloroethene**

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.01	mg/l
Co	9.80E-02	mg/l
λ	2.95E-04	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	2.43E+03	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

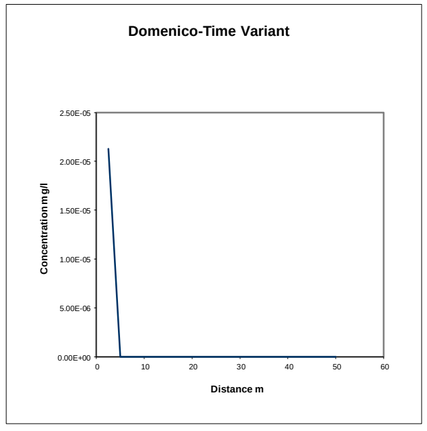
	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.01225	-8.43E+00	2.17E-04	-1.71E+48	2	1.68E+01	1	-1.68E+01	-1	4.17E+00	1	-4.17E+00	-1	2.13E-05
2	5	0.01225	-1.69E+01	4.72E-08	-1.71E+48	2	1.19E+01	1	-1.19E+01	-1	2.95E+00	1	-2.95E+00	-1	4.62E-09
3	7.5	0.01225	-2.53E+01	1.03E-11	-1.71E+48	2	9.68E+00	1	-9.68E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	1.00E-12
4	10	0.01225	-3.37E+01	2.23E-15	-1.71E+48	2	8.39E+00	1	-8.39E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	2.18E-16
5	12.5	0.01225	-4.22E+01	4.84E-19	-1.71E+48	2	7.50E+00	1	-7.50E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	4.70E-20
6	15	0.01225	-5.06E+01	1.05E-22	-1.71E+48	2	6.85E+00	1	-6.85E+00	-1	1.70E+00	0.984	-1.70E+00	-0.984	1.01E-23
7	17.5	0.01225	-5.90E+01	2.28E-26	-1.71E+48	2	6.34E+00	1	-6.34E+00	-1	1.58E+00	0.9743	-1.58E+00	-0.974	2.18E-27
8	20	0.01225	-6.75E+01	4.96E-30	-1.71E+48	2	5.93E+00	1	-5.93E+00	-1	1.48E+00	0.963	-1.48E+00	-0.963	4.68E-31
9	22.5	0.01225	-7.59E+01	1.08E-33	-1.71E+48	2	5.59E+00	1	-5.59E+00	-1	1.39E+00	0.9508	-1.39E+00	-0.951	1.00E-34
10	25	0.01225	-8.43E+01	2.34E-37	-1.71E+48	2	5.30E+00	1	-5.30E+00	-1	1.32E+00	0.9379	-1.32E+00	-0.938	2.15E-38
11	27.5	0.01225	-9.28E+01	5.08E-41	-1.71E+48	2	5.06E+00	1	-5.06E+00	-1	1.26E+00	0.9247	-1.26E+00	-0.925	4.61E-42
12	30	0.01225	-1.01E+02	1.10E-44	-1.71E+48	2	4.84E+00	1	-4.84E+00	-1	1.20E+00	0.9115	-1.20E+00	-0.911	9.87E-46
13	32.5	0.01225	-1.10E+02	2.40E-48	-1.71E+48	2	4.65E+00	1	-4.65E+00	-1	1.16E+00	0.8982	-1.16E+00	-0.898	2.11E-49
14	35	0.01225	-1.18E+02	5.21E-52	-1.71E+48	2	4.48E+00	1	-4.48E+00	-1	1.11E+00	0.8852	-1.11E+00	-0.885	4.52E-53
15	37.5	0.01225	-1.27E+02	1.13E-55	-1.71E+48	2	4.33E+00	1	-4.33E+00	-1	1.08E+00	0.8723	-1.08E+00	-0.872	9.68E-57
16	40	0.01225	-1.35E+02	2.46E-59	-1.71E+48	2	4.19E+00	1	-4.19E+00	-1	1.04E+00	0.8598	-1.04E+00	-0.86	2.07E-60
17	42.5	0.01225	-1.43E+02	5.34E-63	-1.71E+48	2	4.07E+00	1	-4.07E+00	-1	1.01E+00	0.8476	-1.01E+00	-0.848	4.44E-64
18	45	0.01225	-1.52E+02	1.16E-66	-1.71E+48	2	3.95E+00	1	-3.95E+00	-1	9.83E-01	0.8357	-9.83E-01	-0.836	9.51E-68
19	47.5	0.01225	-1.60E+02	2.52E-70	-1.71E+48	2	3.85E+00	1	-3.85E+00	-1	9.57E-01	0.8241	-9.57E-01	-0.824	2.04E-71
20	50	0.01225	-1.69E+02	5.48E-74	-1.71E+48	2	3.75E+00	1	-3.75E+00	-1	9.33E-01	0.8129	-9.33E-01	-0.813	4.36E-75



Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

Calc	Value	Units
v	7.60E-02	m/d
Rc	1.56E+04	
u	4.89E-06	m/d

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.01225	-8.43E+00	2.17E-04	-1.71E+48	2	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	2.13E-05
2	5	0.01225	-1.69E+01	4.72E-08	-1.71E+48	2	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	4.62E-09
3	7.5	0.01225	-2.53E+01	1.03E-11	-1.71E+48	2	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	1.00E-12
4	10	0.01225	-3.37E+01	2.23E-15	-1.71E+48	2	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	2.18E-16
5	12.5	0.01225	-4.22E+01	4.84E-19	-1.71E+48	2	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	4.74E-20
6	15	0.01225	-5.06E+01	1.05E-22	-1.71E+48	2	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	1.03E-23
7	17.5	0.01225	-5.90E+01	2.28E-26	-1.71E+48	2	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	2.24E-27
8	20	0.01225	-6.75E+01	4.96E-30	-1.71E+48	2	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	4.86E-31
9	22.5	0.01225	-7.59E+01	1.08E-33	-1.71E+48	2	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-1	1.06E-34
10	25	0.01225	-8.43E+01	2.34E-37	-1.71E+48	2	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-1	2.29E-38
11	27.5	0.01225	-9.28E+01	5.08E-41	-1.71E+48	2	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-1	4.98E-42
12	30	0.01225	-1.01E+02	1.10E-44	-1.71E+48	2	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	1.08E-45
13	32.5	0.01225	-1.10E+02	2.40E-48	-1.71E+48	2	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.999	2.35E-49
14	35	0.01225	-1.18E+02	5.21E-52	-1.71E+48	2	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.998	5.10E-53
15	37.5	0.01225	-1.27E+02	1.13E-55	-1.71E+48	2	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.998	1.11E-56
16	40	0.01225	-1.35E+02	2.46E-59	-1.71E+48	2	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	2.40E-60
17	42.5	0.01225	-1.43E+02	5.34E-63	-1.71E+48	2	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.996	5.21E-64
18	45	0.01225	-1.52E+02	1.16E-66	-1.71E+48	2	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.995	1.13E-67
19	47.5	0.01225	-1.60E+02	2.52E-70	-1.71E+48	2	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.993	2.45E-71
20	50	0.01225	-1.69E+02	5.48E-74	-1.71E+48	2	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	5.32E-75



Date:	11/12/2025
Version:	1

Hydrogeological risk assessment for land contamination

Remedial Targets Worksheet , Release 3.2

First released: 2006. Version 3.2: January 2013

This worksheet has been produced in combination with the document 'Remedial Targets Methodology: Hydrogeological risk assessment for land contamination (Environment Agency 2006).

Users of this worksheet should always refer to the User Manual to the Remedial Targets Methodology and to relevant guidance on UK legislation and policy, in order to understand how this procedure should be applied in an appropriate context.

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The calculation of equations in this worksheet has been independently checked by Entec (UK) Ltd on behalf of the Environment Agency.

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IMPORTANT: To enable MS Excel worksheet, click Tools, Add -Ins, Analysis Tool Pak and Analysis Tool Pak-VBA (to calculate error functions)

Details to be completed for each assessment				
Site Name:	Kelvedon Street			
Site Address:	Newport			
Completed by:	Michael Watkins			
Date:	11-Dec-25		Version:	1
Contaminant	Trichloroethene			
Target Concentration (C_T)	0.01	mg/l	Origin of C_T:	WFD for inland surface waters (annual average)

This worksheet can be used to determine remedial targets for soils (Worksheets Level 1 Soil, Level 2 and Level 3 Soil) or to determine remedial targets for groundwater (Level 3 Groundwater). For Level 3, parameter values must be entered separately dependent on whether the assessment is for soil or groundwater. For soil, remedial targets are calculated as either mg/kg (for comparision with soil measurements) or mg/l (for comparison with leaching tests or pore water concentrations).
Site details entered on this page are automatically copied to Level 1, 2 and 3 Worksheets.
Worksheet options are identified by brown background and employ a pull-down menus. Data entry are identified as blue background.
Data origin / justification should be noted in cells coloured yellow and fully documented in subsequent reports.
Data carried forward from an earlier worksheet are identified by a light green background
It is recommended that a copy of the original worksheet is saved (all data fields in the original copy are blank).

The spreadsheet also includes a porosity calculation worksheet, a soil impact calculation worksheet and a worksheet that performs some simple hydrogeological calculations.

Remedial Targets Worksheet , Release 3.2

Level 1 - Soil

Environment Agency

Select the method of calculating the soil water Partition Co-efficient by using the pull down menu below

User specified value for partition coefficient

Contaminant		**Trichloroethene**		
Target concentration	**C_T**	**0.01**	**mg/l**	

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**
Standard entry				
Water filled soil porosity	θ_W	0.00E+00	fraction	
Air filled soil porosity	θa	0.00E+00	fraction	
Bulk density of soil zone material	ρ	0.00E+00	g/cm^3	
Henry's Law constant	H	0.00E+00	dimensionless	
Entry if specify partition coefficient (option)				
Soil water partition coefficient	Kd	0.00E+00	l/kg	
Entry for non-polar organic chemicals (option)				
Fraction of organic carbon (in soil)	foc		fraction	
Organic carbon partition coefficient	Koc		l/kg	
Entry for ionic organic chemicals (option)				
Sorption coefficient for neutral species	$K_{oc,n}$		l/kg	
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg	
pH value	pH		pH units	
Acid dissociation constant	pKa			
Fraction of organic carbon (in soil)	foc		fraction	

This sheet calculates the Level 1 remedial target for soils(mg/kg) based on a selected target concentration and theoretical calculation of soil water partitioning. Three options are included for determining the partition coefficient.

The measured soil concentration as mg/kg should be compared with the Level 1 remedial target to determine the need for further action.

Soil water partition coefficient used in Level Assessment	**Kd**	**0.00E+00**	**l/kg**	*Specified value*

Level 1 Remedial Target

Level 1 Remedial Target	**#DIV/0!**	**mg/kg**	**(for comparison with soil analyses)**
	or		
	0.01	**mg/l**	**(for comparison with leachate test results)**

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 2 - Soil

Contaminant		**Trichloroethene**		from Level 1
Target concentration	**C_T**	**0.01**	**mg/l**	from Level 1

This sheet calculates the Level 2 remedial target for soils (mg/kg) or for pore water (mg/l).

The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 2 remedial target to determine the need for further action. Equations presented in 'Hydrogeological risk assessment for land contamiantion' (Environment Agency 2006)

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**	
Standard entry					
Infiltration	Inf	0.00E+00	m/d		
Area of contaminant source	A	0.00E+00	m^2		Not used in calculation
Entry for groundwater flow below site					
Length of contaminant source in direction of groundwater flow	L	0.00E+00	m		
Saturated aquifer thickness	da	0.00E+00	m		
Hydraulic Conductivity of aquifer in which dilution occurs	K	0.00E+00	m/d		
Hydraulic gradient of water table	i	0.00E+00	fraction		
Width of contaminant source perpendicular to groundwater flow	w	0.00E+00	m		Not used in calculation
Background concentration of contaminant in groundwater beneath site	Cu	0.00E+00	mg/l		
Define mixing zone depth by specifying or calculating depth (using pull down list)		**Specify**			
Enter mixing zone thickness	Mz	0.00E+00	m		
Calculated mixing zone thickness	Mz		m		

Calculated Parameters

Dilution Factor	**DF**	**#DIV/0!**		
Level 2 Remedial Target		**#DIV/0!**	**mg/l**	**For comparison with measured pore water concentration. This assumes Level 1 Remedial Target is based on Target Concentrati**
		or		
		#DIV/0!	**mg/kg**	**For comparison with measured soil concentration. This assumes Level 1 Remedial Target calculated from soil-water**

Additional option

Calculation of impact on receptor

Concentration of contaminant in contaminated discharge (entering receptor)	Cc	0.00E+00	mg/l	
Calculated concentration within receptor (dilution only)		#DIV/0!	mg/l	0

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 3 - Soil

See Note

Input Parameters	Variable	Value	Unit	Source
Contaminant		Trichloroethene		from Level 1
Target Concentration	C_T	0.01	mg/l	from Level 1
Dilution Factor	DF	#DIV/0!		from Level 2

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value, l

	Variable	Value	Unit	Source of parameter value
Enter source concentration		Soil concentration as mg/kg		
Enter soil concentration		0	mg/kg	
Half life for degradation of contaminant in water	$t_{1/2}$	1.00E+100	days	
Calculated decay rate	λ	6.93E-101	$days^{-1}$	calculated
Width of plume in aquifer at source	Sz	0.00E+00	m	from Level 2
Plume thickness in aquifer at source	Sy	0.00E+00	m	from Level 2
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Effective porosity of aquifer	n	0.00E+00	fraction	
Hydraulic gradient	i	#DIV/0!	fraction	from Level 2 (adjusted)
Hydraulic conductivity of saturated aquifer	K	0.00E+00	m/d	from Level 2
Distance to compliance point	x	0.00E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	1.00E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	0.00E+00	l/kg	*see options*
Longitudinal dispersivity	ax	0.000	m	*see options*
Transverse dispersivity	az	0.000	m	*see options*
Vertical dispersivity	ay	0.000	m	*see options*

Parameter values should be checked against Level 1 and 2

Calculated Parameters	Variable		
Groundwater flow velocity	v	#DIV/0!	m/d
Retardation factor	Rf	#DIV/0!	fraction
Decay rate used	λ	6.93E-101	d^{-1}
Hydraulic gradient used in aquifer flow down-gradient	i	#DIV/0!	fraction
Rate of contaminant flow due to retardation	u	#DIV/0!	m/d
Ratio of Compliance Point to Source Concentration	C_{ED}/C_0	#DIV/0!	fraction
Attenuation factor (C_0/C_{ED})	**AF**	**#DIV/0!**	**fraction**
Calculated soil leachate concentration	Co	#DIV/0!	mg/l

Remedial Targets

Level 3 Remedial Target		**#DIV/0!**	**mg/l**	For comparison with measured pore water concentration.
Ogata Banks		**or**		This assumes Level 1 Remedial Target is based on Target Concentration.
		#DIV/0!	**mg/kg**	For comparison with measured soil concentration. This
Distance to compliance point		**0**	**m**	assumes Level 1 Remedial Target calculated from soil-water partitioning equation.
Ratio of Compliance Point to Source Concentration	C_{ED}/C_0	**#DIV/0!**	**fraction**	Ogata Banks

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99

Enter method of defining partition co-efficient (using pull down list)

Calculate for ionic organic chemicals (acids)

Entry if specify partition coefficient (option)

Soil water partition coefficient	Kd		l/kg

Entry for non-polar organic chemicals (option)

Fraction of organic carbon in aquifer	foc		fraction
Organic carbon partition coefficient	Koc		l/kg

Entry for ionic organic chemicals (option)

Sorption coefficient for related species	$K_{OC,n}$	0.00E+00	l/kg
Sorption coefficient for ionised species	$K_{OC,I}$	0.00E+00	l/kg
pH value	pH	0.00E+00	
Acid dissociation constant	pKa	0.00E+00	
Fraction of organic carbon in aquifer	foc	0.00E+00	fraction
Soil water partition coefficient	Kd	0.00E+00	l/kg

Define dispersivity (click brown cell and use pull down list)

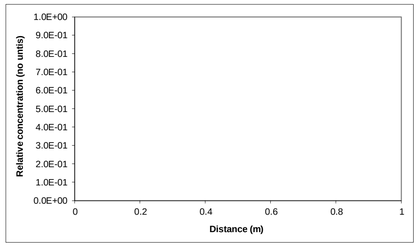
User defined values for dispersivity

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	0.00E+00	#NUM!	m
Transverse dispersivity	**az**	0.00E+00	0.00E+00	#NUM!	m
Vertical dispersivity	**ay**	0.00E+00	0.00E+00	#NUM!	m

Note values of dispersivity must be > 0

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed

Note
This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O_2, NO_3, SO_4 etc than an alternative solution should be used



Note: 'Relative concentration' is the ratio of calculated concentation at a given position compared to the source concentration. The calculations assume plume disperses from the top of the aquifer. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

This sheet calculates the Level 3 remedial target for soils(mg/kg) or for pore water (mg/l), based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.By setting a long travel time (e.g. 9E99) it will give the steady state solution, which should always be used when calculating remedial targets.

The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.9E+99.

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Calculated (relative) concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Relative concentration (No units)	Concentration mg/l
0	1.0E+00	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!

Remedial Targets Worksheet , Release 3.2

Calculation of contaminant concentration in groundwater from a soil source

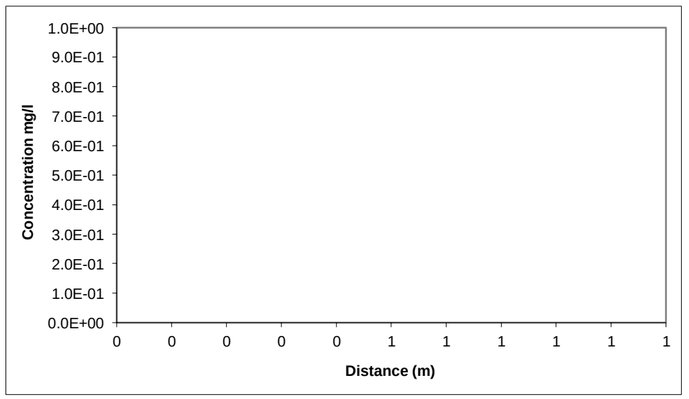
Only input required is Soil Contaminant Concentration

	Input Parameters			
	Soil contaminant concentration	C_0	0.00E+00	mg/kg
Level 1 Parameters				
	Water filled soil porosity	θ_W	0.00E+00	fraction
	Air filled soil porosity	θa	0.00E+00	fraction
	Bulk density	ρ	0.00E+00	g/cm^3
	Henry's Law constant	H	0.00E+00	dimensionless
	Soil water partition coefficient used in Level Assessment	Kd	0.00E+00	l/kg
	Factor (partitioning between soil and water)		#DIV/0!	dimensionless
Level 2 Parameters	**Dilution Factor**	DF	#DIV/0!	
Level 3 Parameters	**Attenuation factor (C_O/C_{ED})**	AF	#DIV/0!	

Predicted concentrations at compliance point

Level 1	C	#DIV/0!	mg/l	No dilution or attenuation
Level 2	C	#DIV/0!	mg/l	Dilution taken into account
Level 3	C	#DIV/0!	mg/l	Dilution and attenuation taken into account

Predicted concentrations between source and compliance point - Level 3



Distance m	Concentration mg/l
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu) | **Variable** | **Value** | **Unit** | **Source**

Contaminant		Trichloroethene		from Level 1
Target Concentration	C_T	1.00E-02	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Domenico - Steady state — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	2.50E-02	mg/l	*Site investigation data*
Half life for degradation of contaminant in water	$t_{1/2}$	2.35E+03	days	*Howard et al (1991) Low anaerobic biodeg*
Calculated decay rate	λ	2.95E-04	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	7.50E+01	m	*Length of site perpendicular to groundwater flow*
Plume thickness at source	Sy	5.90E+00	m	*Same as Mixing Zone Thickness. "For a thin aquifer (typically <10m), the mixing zone thickness can be taken as the ac*
Saturated aquifer thickness	da	6.00E+00	m	*Maximum thickness recorded in vicinity of*
Bulk density of aquifer materials	ρ	1.60E+00	g/cm^3	*Typical bulk density for river terrace deposits*
Effective porosity of aquifer	n	2.50E-01	fraction	*Maximum porosity for coarse Gravel (Lovanh et al 2000) - conservative estimate*
Hydraulic gradient	i	4.40E-02	fraction	*Borehole level data*
Hydraulic conductivity of aquifer	K	4.32E-01	m/d	*Maximum typical value for clayey sandy G*
Distance to compliance point	x	5.00E+01	m	*Default compliance distance*
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	9.90E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	2.15E+03	l/kg	*see options*
Longitudinal dispersivity	ax	5.00E+00	m	*see options*
Transverse dispersivity	az	5.00E-01	m	*see options*
Vertical dispersivity	ay	5.00E-02	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd	2.15E+03	l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc		fraction
Organic carbon partition coefficient	Koc		l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{OC,n}$		l/kg
Sorption coefficient for ionised species	$K_{OC,I}$		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction

Soil water partition coefficient	Kd	2.15E+03	l/kg

Define dispersivity (click brown cell and use pull down list)

Dispersivities 10%, 1%, 0.1% of pathway length

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	5.00E+00	2.98E+00	m
Transverse dispersivity	**az**	0.00E+00	5.00E-01	2.98E-01	m
Vertical dispersivity	**ay**	0.00E+00	5.00E-02	2.98E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed

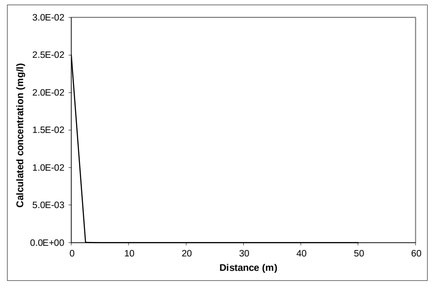
Calculated Parameters | **Variable**

Groundwater flow velocity	v	7.60E-02	m/d
Retardation factor	Rf	1.38E+04	fraction
Decay rate used	λ	2.95E-04	d^{-1}
Rate of contaminant flow due to retardation	u	5.53E-06	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	4.05E-71	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**6.17E+68**	

Remedial Targets

Remedial Target		**6.17E+66**	**mg/l**	For comparison with measured groundwater concentration.
Domenico - Steady state				
Distance to compliance point		**50**	**m**	
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**4.05E-71**	**mg/l**	Domenico - Steady state

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared
with the Level 3 remedial target to determine the need for further action.
Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Calculated concentrations for distance-concentration graph

Domenico - Steady state
From calculation sheet

Distance	Concentration
	mg/l
0	2.5E-02
2.5	9.09E-06
5.0	3.31E-09
7.5	1.20E-12
10.0	4.37E-16
12.5	1.59E-19
15.0	5.78E-23
17.5	2.10E-26
20.0	7.64E-30
22.5	2.78E-33
25.0	1.01E-36
27.5	3.67E-40
30.0	1.34E-43
32.5	4.85E-47
35.0	1.76E-50
37.5	6.41E-54
40.0	2.33E-57
42.5	8.46E-61
45.0	3.07E-64
47.5	1.12E-67
50.0	4.05E-71

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Porosity Calculator

These results are not carried through to any of the other worksheets

DRY BULK DENSITY DATA

Variable	Value	Unit	justification
Natural Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Dry Bulk Density	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
Initial Saturation	#DIV/0!	*%*	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	
Water Filled Porosity	**#DIV/0!**	**fraction**	

WET BULK DENSITY DATA

Variable	Value	Unit	
Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Actual (wet) Bulk Density (i.e. at natural MC)	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
dry bulk density	0.00	tonnes/m^3	
Initial Saturation	#DIV/0!	*%*	
Total porosity	**1.000**	**fraction**	**#DIV/0!**
Air Filled Porosity	**#DIV/0!**	**fraction**	
Water Filled Porosity	**#DIV/0!**	**fraction**	

Analytical solutions provided by David Hall, Golder Associates (UK) Ltd

Simple hydrogeological calculations

(These are not specific to, or required in, the Remedial Targets Methodology)

Parameter	symbol		unit	justification
Hydraulic conductivity	K	0.00E+00	m/d	
Hydraulic gradient	i	0.00E+00	unitless	
Effective porosity of aquifer	n	0.00E+00	fraction	
Thickness of saturated aquifer	b	0.00E+00	m	
Width of aquifer perpendicular to flow	w	0.00E+00	m	
Distance to receptor	x	0.00E+00	m	
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Soil-water partition co-efficient	Kd	0.00E+00	l/kg	
Retardation factor of pollutant	R	#DIV/0!		

Groundwater flow velocity	v(GW)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for groundwater to reach receptor	t(GW)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years
Rate of groundwater flow through aquifer	Q	0.00E+00	m^3/s	0.00E+00	m^3/day	0.00E+00	m^3/year

Contaminant flow velocity	v(contam)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for contaminant to reach receptor	t(contam)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years

Level 1 Calculation Sheet

Contaminant **Trichloroethene**

Parameter	Value	Units
(carried over from input sheet)		
C_T	1.00E-02	mg/l
Kd	0.00E+00	l/kg
foc		fraction
koc		l/kg
θ_W	0.00E+00	fraction
θa	0.00E+00	fraction
ρ	0.00E+00	g/cm3
H	0.00E+00	dimensionless
Koc,n		l/kg
Koc,i		l/kg
pH		pH units
pKa		
foc (ionic)		fraction

Calculations (Refer toTable 4.3, R&D Publication 20)

Selected option User specified value for partition coefficient

calc calc Calc Kd l/kg

Calculation of partition coefficient for ionic organic chemical

Partition coefficient used in Level 1 Assessment 0.00E+00 l/kg

Calculated Remedial Target **#DIV/0!** **mg/kg** **for Trichloroethene**

Factor (partitioning between soil and water) #DIV/0!

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11/12/2025
Version:	1

Level 2 Calculation Sheet

Contaminant **Trichloroethene**

Site assessed:	Kelvedon Stre
Date:	11/12/2025
Version:	1

Parameter	Value	Units		
(carried over from input sheet)				
Mz	0.00E+00	m		
L	0.00E+00	m		
da	0.00E+00	m		Calculated
Inf	0.00E+00	m/d		Dilution Factor
K	0.00E+00	m/d		
i	0.00E+00		Calculation based on target concentration	#DIV/0!
A	0.00E+00	m3/d m2 m3/d	Calculation based on observed contaminant concentration	#DIV/0!
Cc	0.00E+00	mg/l		
C_T	1.00E-02	mg/l		
Cu	0.00E+00	mg/l		
w	0.00E+00	m		



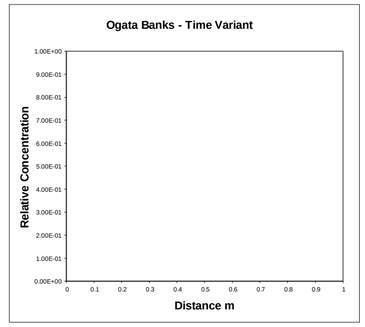
Contaminant **Trichloroethene**

OGATA BANKS SOLUTION

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-02	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Calc	Value	
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) -USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

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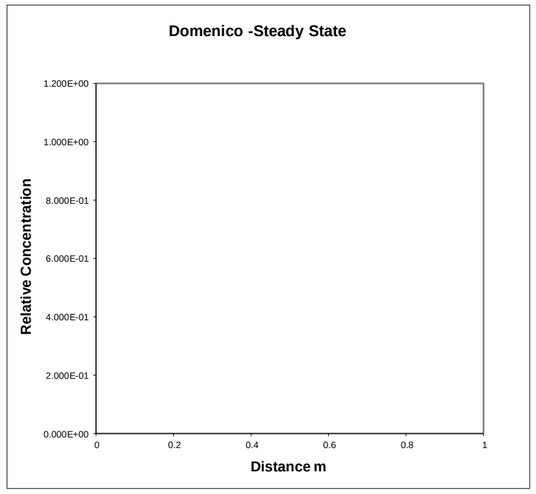
Contaminant **richloroethene**

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-02	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

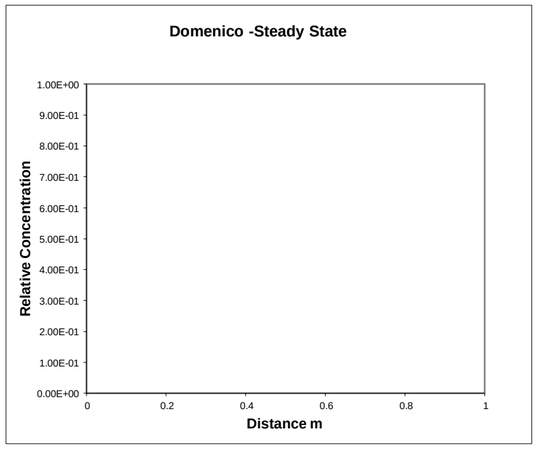


Calc	Value	Units
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Date:	11/12/2025
Version:	1

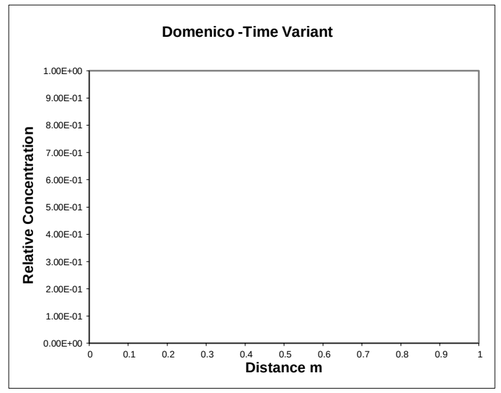
DOMENICO (TIME VARIANT)

Contaminant trichloroethene

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.01	mg/l
DF	#DIV/0!	
λ	6.931E-101	days^{-1}
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

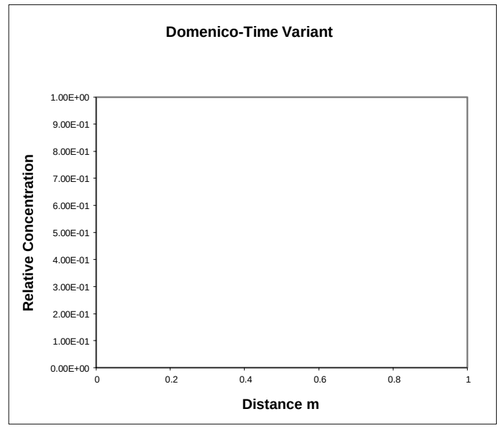


Calc **Value**

Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



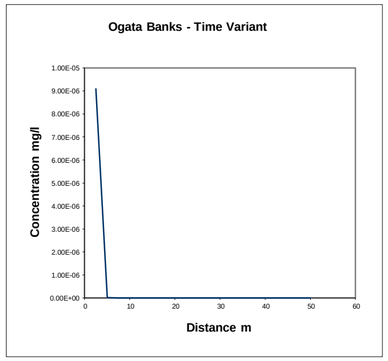
Date:	11/12/2025
Version:	1

OGATA BANKS SOLUTION

Contaminant	Trichloroethene	
Input	**Value**	**Units**
C_T	0.01	mg/l
Co	2.50E-02	mg/l
λ	2.95E-04	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	2.15E+03	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.00313	-7.9E+00	3.6E-04	-1.7E+48	2.000	8.4E+00	4.5E+03	1.7E+48	0.000	1.7E+01	1	-1.7E+01	-1	4.2E+00	1	-4.2E+00	-1	9.09E-06
2	5	0.00313	-1.6E+01	1.3E-07	-1.7E+48	2.000	1.7E+01	2.1E+07	1.7E+48	0.000	1.2E+01	1	-1.2E+01	-1	3.0E+00	1	-3.0E+00	-0.99997	3.31E-09
3	7.5	0.00313	-2.4E+01	4.8E-11	-1.7E+48	2.000	2.5E+01	9.3E+10	1.7E+48	0.000	9.7E+00	1	-9.7E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	1.20E-12
4	10	0.00313	-3.2E+01	1.7E-14	-1.7E+48	2.000	3.4E+01	4.2E+14	1.7E+48	0.000	8.4E+00	1	-8.4E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	4.36E-16
5	12.5	0.00313	-4.0E+01	6.4E-18	-1.7E+48	2.000	4.2E+01	1.9E+18	1.7E+48	0.000	7.5E+00	1	-7.5E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	1.58E-19
6	15	0.00313	-4.8E+01	2.3E-21	-1.7E+48	2.000	5.1E+01	8.7E+21	1.7E+48	0.000	6.8E+00	1	-6.8E+00	-1	1.7E+00	0.984	-1.7E+00	-0.98399	5.69E-23
7	17.5	0.00313	-5.5E+01	8.4E-25	-1.7E+48	2.000	5.9E+01	3.9E+25	1.7E+48	0.000	6.3E+00	1	-6.3E+00	-1	1.6E+00	0.9743	-1.6E+00	-0.97425	2.05E-26
8	20	0.00313	-6.3E+01	3.1E-28	-1.7E+48	2.000	6.7E+01	1.8E+29	1.7E+48	0.000	5.9E+00	1	-5.9E+00	-1	1.5E+00	0.963	-1.5E+00	-0.96302	7.36E-30
9	22.5	0.00313	-7.1E+01	1.1E-31	-1.7E+48	2.000	7.6E+01	8.1E+32	1.7E+48	0.000	5.6E+00	1	-5.6E+00	-1	1.4E+00	0.9508	-1.4E+00	-0.95078	2.64E-33
10	25	0.00313	-7.9E+01	4.0E-35	-1.7E+48	2.000	8.4E+01	3.7E+36	1.7E+48	0.000	5.3E+00	1	-5.3E+00	-1	1.3E+00	0.9379	-1.3E+00	-0.93792	9.48E-37
11	27.5	0.00313	-8.7E+01	1.5E-38	-1.7E+48	2.000	9.3E+01	1.7E+40	1.7E+48	0.000	5.1E+00	1	-5.1E+00	-1	1.3E+00	0.9247	-1.3E+00	-0.92475	3.40E-40
12	30	0.00313	-9.5E+01	5.3E-42	-1.7E+48	2.000	1.0E+02	7.5E+43	1.7E+48	0.000	4.8E+00	1	-4.8E+00	-1	1.2E+00	0.9115	-1.2E+00	-0.91147	1.22E-43
13	32.5	0.00313	-1.0E+02	1.9E-45	-1.7E+48	2.000	1.1E+02	3.4E+47	1.7E+48	0.000	4.7E+00	1	-4.7E+00	-1	1.2E+00	0.8982	-1.2E+00	-0.89824	4.37E-47
14	35	0.00313	-1.1E+02	7.1E-49	-1.7E+48	2.000	1.2E+02	1.6E+51	1.7E+48	0.000	4.5E+00	1	-4.5E+00	-1	1.1E+00	0.8852	-1.1E+00	-0.88517	1.56E-50
15	37.5	0.00313	-1.2E+02	2.6E-52	-1.7E+48	2.000	1.3E+02	7.0E+54	1.7E+48	0.000	4.3E+00	1	-4.3E+00	-1	1.1E+00	0.8723	-1.1E+00	-0.87233	5.61E-54
16	40	0.00313	-1.3E+02	9.3E-56	-1.7E+48	2.000	1.3E+02	3.2E+58	1.7E+48	0.000	4.2E+00	1	-4.2E+00	-1	1.0E+00	0.8598	-1.0E+00	-0.85979	2.01E-57
17	42.5	0.00313	-1.3E+02	3.4E-59	-1.7E+48	2.000	1.4E+02	1.4E+62	1.7E+48	0.000	4.1E+00	1	-4.1E+00	-1	1.0E+00	0.8476	-1.0E+00	-0.84756	7.20E-61
18	45	0.00313	-1.4E+02	1.2E-62	-1.7E+48	2.000	1.5E+02	6.6E+65	1.7E+48	0.000	4.0E+00	1	-4.0E+00	-1	9.8E-01	0.8357	-9.8E-01	-0.83567	2.58E-64
19	47.5	0.00313	-1.5E+02	4.5E-66	-1.7E+48	2.000	1.6E+02	3.0E+69	1.7E+48	0.000	3.8E+00	1	-3.8E+00	-1	9.6E-01	0.8241	-9.6E-01	-0.82412	9.26E-68
20	50	0.00313	-1.6E+02	1.6E-69	-1.7E+48	2.000	1.7E+02	1.3E+73	1.7E+48	0.000	3.8E+00	1	-3.8E+00	-1	9.3E-01	0.8129	-9.3E-01	-0.81292	3.32E-71



Vertical dispersion option Simulate vertical dispersion in 1 direction

Calc	Value	
v	7.60E-02	m/d
Rc	1.38E+04	
u	5.53E-06	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.00313	-7.9E+00	3.6E-04	-1.7E+48	2.000	8.4E+00	4.5E+03	1.7E+48	0.000	1.7E+01	1	-1.7E+01	-1	8.3E+00	1	-8.3E+00	-1	9.09E-06
2	5	0.00313	-1.6E+01	1.3E-07	-1.7E+48	2.000	1.7E+01	2.1E+07	1.7E+48	0.000	1.2E+01	1	-1.2E+01	-1	5.9E+00	1	-5.9E+00	-1	3.31E-09
3	7.5	0.00313	-2.4E+01	4.8E-11	-1.7E+48	2.000	2.5E+01	9.3E+10	1.7E+48	0.000	9.7E+00	1	-9.7E+00	-1	4.8E+00	1	-4.8E+00	-1	1.20E-12
4	10	0.00313	-3.2E+01	1.7E-14	-1.7E+48	2.000	3.4E+01	4.2E+14	1.7E+48	0.000	8.4E+00	1	-8.4E+00	-1	4.2E+00	1	-4.2E+00	-1	4.37E-16
5	12.5	0.00313	-4.0E+01	6.4E-18	-1.7E+48	2.000	4.2E+01	1.9E+18	1.7E+48	0.000	7.5E+00	1	-7.5E+00	-1	3.7E+00	1	-3.7E+00	-1	1.59E-19
6	15	0.00313	-4.8E+01	2.3E-21	-1.7E+48	2.000	5.1E+01	8.7E+21	1.7E+48	0.000	6.8E+00	1	-6.8E+00	-1	3.4E+00	1	-3.4E+00	-1	5.78E-23
7	17.5	0.00313	-5.5E+01	8.4E-25	-1.7E+48	2.000	5.9E+01	3.9E+25	1.7E+48	0.000	6.3E+00	1	-6.3E+00	-1	3.2E+00	1	-3.2E+00	-0.99999	2.10E-26
8	20	0.00313	-6.3E+01	3.1E-28	-1.7E+48	2.000	6.7E+01	1.8E+29	1.7E+48	0.000	5.9E+00	1	-5.9E+00	-1	3.0E+00	1	-3.0E+00	-0.99997	7.64E-30
9	22.5	0.00313	-7.1E+01	1.1E-31	-1.7E+48	2.000	7.6E+01	8.1E+32	1.7E+48	0.000	5.6E+00	1	-5.6E+00	-1	2.8E+00	0.9999	-2.8E+00	-0.99992	2.78E-33
10	25	0.00313	-7.9E+01	4.0E-35	-1.7E+48	2.000	8.4E+01	3.7E+36	1.7E+48	0.000	5.3E+00	1	-5.3E+00	-1	2.6E+00	0.9998	-2.6E+00	-0.99981	1.01E-36
11	27.5	0.00313	-8.7E+01	1.5E-38	-1.7E+48	2.000	9.3E+01	1.7E+40	1.7E+48	0.000	5.1E+00	1	-5.1E+00	-1	2.5E+00	0.9996	-2.5E+00	-0.99963	3.67E-40
12	30	0.00313	-9.5E+01	5.3E-42	-1.7E+48	2.000	1.0E+02	7.5E+43	1.7E+48	0.000	4.8E+00	1	-4.8E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	1.34E-43
13	32.5	0.00313	-1.0E+02	1.9E-45	-1.7E+48	2.000	1.1E+02	3.4E+47	1.7E+48	0.000	4.7E+00	1	-4.7E+00	-1	2.3E+00	0.9989	-2.3E+00	-0.99893	4.85E-47
14	35	0.00313	-1.1E+02	7.1E-49	-1.7E+48	2.000	1.2E+02	1.6E+51	1.7E+48	0.000	4.5E+00	1	-4.5E+00	-1	2.2E+00	0.9984	-2.2E+00	-0.99839	1.76E-50
15	37.5	0.00313	-1.2E+02	2.6E-52	-1.7E+48	2.000	1.3E+02	7.0E+54	1.7E+48	0.000	4.3E+00	1	-4.3E+00	-1	2.2E+00	0.9977	-2.2E+00	-0.99769	6.41E-54
16	40	0.00313	-1.3E+02	9.3E-56	-1.7E+48	2.000	1.3E+02	3.2E+58	1.7E+48	0.000	4.2E+00	1	-4.2E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	2.33E-57
17	42.5	0.00313	-1.3E+02	3.4E-59	-1.7E+48	2.000	1.4E+02	1.4E+62	1.7E+48	0.000	4.1E+00	1	-4.1E+00	-1	2.0E+00	0.9958	-2.0E+00	-0.99579	8.46E-61
18	45	0.00313	-1.4E+02	1.2E-62	-1.7E+48	2.000	1.5E+02	6.6E+65	1.7E+48	0.000	4.0E+00	1	-4.0E+00	-1	2.0E+00	0.9946	-2.0E+00	-0.99459	3.07E-64
19	47.5	0.00313	-1.5E+02	4.5E-66	-1.7E+48	2.000	1.6E+02	3.0E+69	1.7E+48	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9932	-1.9E+00	-0.99321	1.12E-67
20	50	0.00313	-1.6E+02	1.6E-69	-1.7E+48	2.000	1.7E+02	1.3E+73	1.7E+48	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	4.05E-71

Date:	11/12/2025
Version:	1

Contaminant **richloroethene**

DOMENICO (STEADY STATE)

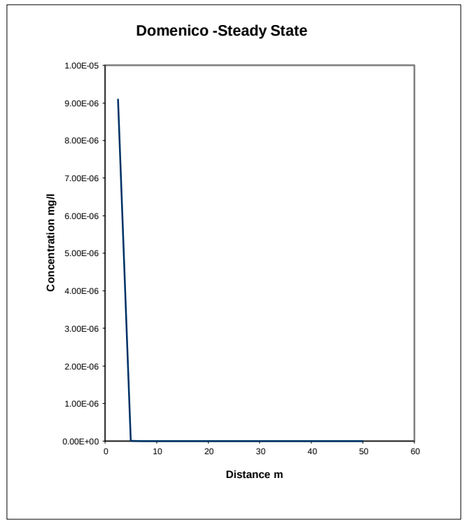
Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.01	mg/l
Co	2.50E-02	mg/l
λ	2.95E-04	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	2.15E+03	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion optio Simulate vertical dispersion in 1 direction

Calc	Value	
v	7.60E-02	m/d
Rc	1.38E+04	
u	5.53E-06	m/d

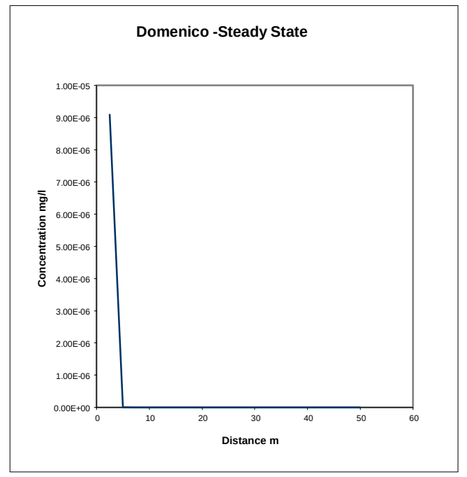
	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.00625	-7.92E+00	3.64E-04	1.68E+01	1	-1.68E+01	-1	4.17E+00	1	-4.17E+00	-1	9.09E-06
2	5	0.00625	-1.58E+01	1.32E-07	1.19E+01	1	-1.19E+01	-1	2.95E+00	1	-2.95E+00	-1	3.31E-09
3	7.5	0.00625	-2.38E+01	4.81E-11	9.68E+00	1	-9.68E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	1.20E-12
4	10	0.00625	-3.17E+01	1.75E-14	8.39E+00	1	-8.39E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	4.36E-16
5	12.5	0.00625	-3.96E+01	6.36E-18	7.50E+00	1	-7.50E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	1.58E-19
6	15	0.00625	-4.75E+01	2.31E-21	6.85E+00	1	-6.85E+00	-1	1.70E+00	0.984	-1.70E+00	-0.984	5.69E-23
7	17.5	0.00625	-5.54E+01	8.41E-25	6.34E+00	1	-6.34E+00	-1	1.58E+00	0.9743	-1.58E+00	-0.9743	2.05E-26
8	20	0.00625	-6.34E+01	3.06E-28	5.93E+00	1	-5.93E+00	-1	1.48E+00	0.963	-1.48E+00	-0.963	7.36E-30
9	22.5	0.00625	-7.13E+01	1.11E-31	5.59E+00	1	-5.59E+00	-1	1.39E+00	0.9508	-1.39E+00	-0.9508	2.64E-33
10	25	0.00625	-7.92E+01	4.04E-35	5.30E+00	1	-5.30E+00	-1	1.32E+00	0.9379	-1.32E+00	-0.9379	9.48E-37
11	27.5	0.00625	-8.71E+01	1.47E-38	5.06E+00	1	-5.06E+00	-1	1.26E+00	0.9247	-1.26E+00	-0.9247	3.40E-40
12	30	0.00625	-9.50E+01	5.35E-42	4.84E+00	1	-4.84E+00	-1	1.20E+00	0.9115	-1.20E+00	-0.9115	1.22E-43
13	32.5	0.00625	-1.03E+02	1.94E-45	4.65E+00	1	-4.65E+00	-1	1.16E+00	0.8982	-1.16E+00	-0.8982	4.37E-47
14	35	0.00625	-1.11E+02	7.07E-49	4.48E+00	1	-4.48E+00	-1	1.11E+00	0.8852	-1.11E+00	-0.8852	1.56E-50
15	37.5	0.00625	-1.19E+02	2.57E-52	4.33E+00	1	-4.33E+00	-1	1.08E+00	0.8723	-1.08E+00	-0.8723	5.61E-54
16	40	0.00625	-1.27E+02	9.35E-56	4.19E+00	1	-4.19E+00	-1	1.04E+00	0.8598	-1.04E+00	-0.8598	2.01E-57
17	42.5	0.00625	-1.35E+02	3.40E-59	4.07E+00	1	-4.07E+00	-1	1.01E+00	0.8476	-1.01E+00	-0.8476	7.20E-61
18	45	0.00625	-1.43E+02	1.24E-62	3.95E+00	1	-3.95E+00	-1	9.83E-01	0.8357	-9.83E-01	-0.8357	2.58E-64
19	47.5	0.00625	-1.50E+02	4.49E-66	3.85E+00	1	-3.85E+00	-1	9.57E-01	0.8241	-9.57E-01	-0.8241	9.26E-68
20	50	0.00625	-1.58E+02	1.63E-69	3.75E+00	1	-3.75E+00	-1	9.33E-01	0.8129	-9.33E-01	-0.8129	3.32E-71



DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.00625	-7.92E+00	3.64E-04	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	9.09E-06
2	5	0.00625	-1.58E+01	1.32E-07	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	3.31E-09
3	7.5	0.00625	-2.38E+01	4.81E-11	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	1.20E-12
4	10	0.00625	-3.17E+01	1.75E-14	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	4.37E-16
5	12.5	0.00625	-3.96E+01	6.36E-18	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	1.59E-19
6	15	0.00625	-4.75E+01	2.31E-21	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	5.78E-23
7	17.5	0.00625	-5.54E+01	8.41E-25	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	2.10E-26
8	20	0.00625	-6.34E+01	3.06E-28	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	7.64E-30
9	22.5	0.00625	-7.13E+01	1.11E-31	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-0.9999	2.78E-33
10	25	0.00625	-7.92E+01	4.04E-35	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-0.9998	1.01E-36
11	27.5	0.00625	-8.71E+01	1.47E-38	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-0.9996	3.67E-40
12	30	0.00625	-9.50E+01	5.35E-42	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	1.34E-43
13	32.5	0.00625	-1.03E+02	1.94E-45	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.9989	4.85E-47
14	35	0.00625	-1.11E+02	7.07E-49	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.9984	1.76E-50
15	37.5	0.00625	-1.19E+02	2.57E-52	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.9977	6.41E-54
16	40	0.00625	-1.27E+02	9.35E-56	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	2.33E-57
17	42.5	0.00625	-1.35E+02	3.40E-59	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.9958	8.46E-61
18	45	0.00625	-1.43E+02	1.24E-62	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.9946	3.07E-64
19	47.5	0.00625	-1.50E+02	4.49E-66	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.9932	1.12E-67
20	50	0.00625	-1.58E+02	1.63E-69	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	4.05E-71



Date:	11/12/2025
Version:	1

DOMENICO (TIME VARIANT)

Contaminant	**richloroethene**	
Input	**Value**	**Units**
C_T	0.01	mg/l
Co	2.50E-02	mg/l
λ	2.95E-04	$days^{-1}$
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	2.15E+03	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

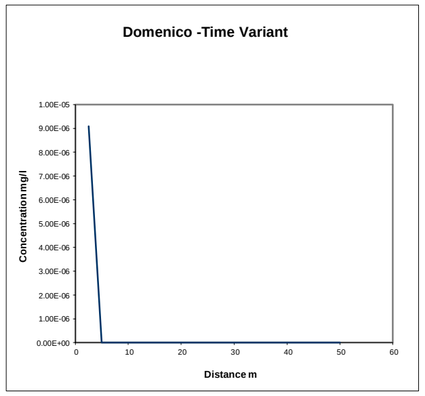
Vertical dispersion option: Simulate vertical dispersion in 1 direction

Calc	**Value**	
v	7.60E-02	m/d
Rc	1.38E+04	
u	5.53E-06	m/d

Date:	11/12/2025
Version:	1

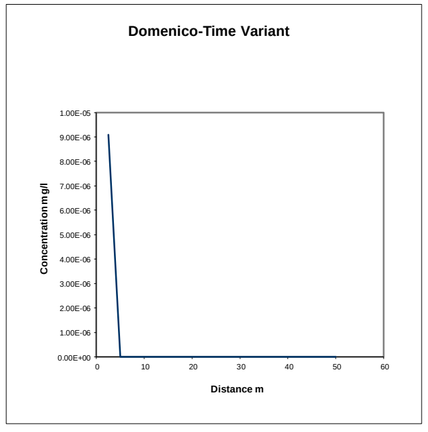
Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.00313	-7.92E+00	3.64E-04	-1.71E+48	2	1.68E+01	1	-1.68E+01	-1	4.17E+00	1	-4.17E+00	-1	9.09E-06
2	5	0.00313	-1.58E+01	1.32E-07	-1.71E+48	2	1.19E+01	1	-1.19E+01	-1	2.95E+00	1	-2.95E+00	-1	3.31E-09
3	7.5	0.00313	-2.38E+01	4.81E-11	-1.71E+48	2	9.68E+00	1	-9.68E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	1.20E-12
4	10	0.00313	-3.17E+01	1.75E-14	-1.71E+48	2	8.39E+00	1	-8.39E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	4.36E-16
5	12.5	0.00313	-3.96E+01	6.36E-18	-1.71E+48	2	7.50E+00	1	-7.50E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	1.58E-19
6	15	0.00313	-4.75E+01	2.31E-21	-1.71E+48	2	6.85E+00	1	-6.85E+00	-1	1.70E+00	0.984	-1.70E+00	-0.984	5.69E-23
7	17.5	0.00313	-5.54E+01	8.41E-25	-1.71E+48	2	6.34E+00	1	-6.34E+00	-1	1.58E+00	0.9743	-1.58E+00	-0.974	2.05E-26
8	20	0.00313	-6.34E+01	3.06E-28	-1.71E+48	2	5.93E+00	1	-5.93E+00	-1	1.48E+00	0.963	-1.48E+00	-0.963	7.36E-30
9	22.5	0.00313	-7.13E+01	1.11E-31	-1.71E+48	2	5.59E+00	1	-5.59E+00	-1	1.39E+00	0.9508	-1.39E+00	-0.951	2.64E-33
10	25	0.00313	-7.92E+01	4.04E-35	-1.71E+48	2	5.30E+00	1	-5.30E+00	-1	1.32E+00	0.9379	-1.32E+00	-0.938	9.48E-37
11	27.5	0.00313	-8.71E+01	1.47E-38	-1.71E+48	2	5.06E+00	1	-5.06E+00	-1	1.26E+00	0.9247	-1.26E+00	-0.925	3.40E-40
12	30	0.00313	-9.50E+01	5.35E-42	-1.71E+48	2	4.84E+00	1	-4.84E+00	-1	1.20E+00	0.9115	-1.20E+00	-0.911	1.22E-43
13	32.5	0.00313	-1.03E+02	1.94E-45	-1.71E+48	2	4.65E+00	1	-4.65E+00	-1	1.16E+00	0.8982	-1.16E+00	-0.898	4.37E-47
14	35	0.00313	-1.11E+02	7.07E-49	-1.71E+48	2	4.48E+00	1	-4.48E+00	-1	1.11E+00	0.8852	-1.11E+00	-0.885	1.56E-50
15	37.5	0.00313	-1.19E+02	2.57E-52	-1.71E+48	2	4.33E+00	1	-4.33E+00	-1	1.08E+00	0.8723	-1.08E+00	-0.872	5.61E-54
16	40	0.00313	-1.27E+02	9.35E-56	-1.71E+48	2	4.19E+00	1	-4.19E+00	-1	1.04E+00	0.8598	-1.04E+00	-0.86	2.01E-57
17	42.5	0.00313	-1.35E+02	3.40E-59	-1.71E+48	2	4.07E+00	1	-4.07E+00	-1	1.01E+00	0.8476	-1.01E+00	-0.848	7.20E-61
18	45	0.00313	-1.43E+02	1.24E-62	-1.71E+48	2	3.95E+00	1	-3.95E+00	-1	9.83E-01	0.8357	-9.83E-01	-0.836	2.58E-64
19	47.5	0.00313	-1.50E+02	4.49E-66	-1.71E+48	2	3.85E+00	1	-3.85E+00	-1	9.57E-01	0.8241	-9.57E-01	-0.824	9.26E-68
20	50	0.00313	-1.58E+02	1.63E-69	-1.71E+48	2	3.75E+00	1	-3.75E+00	-1	9.33E-01	0.8129	-9.33E-01	-0.813	3.32E-71



Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.00313	-7.92E+00	3.64E-04	-1.71E+48	2	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	9.09E-06
2	5	0.00313	-1.58E+01	1.32E-07	-1.71E+48	2	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	3.31E-09
3	7.5	0.00313	-2.38E+01	4.81E-11	-1.71E+48	2	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	1.20E-12
4	10	0.00313	-3.17E+01	1.75E-14	-1.71E+48	2	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	4.37E-16
5	12.5	0.00313	-3.96E+01	6.36E-18	-1.71E+48	2	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	1.59E-19
6	15	0.00313	-4.75E+01	2.31E-21	-1.71E+48	2	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	5.78E-23
7	17.5	0.00313	-5.54E+01	8.41E-25	-1.71E+48	2	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	2.10E-26
8	20	0.00313	-6.34E+01	3.06E-28	-1.71E+48	2	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	7.64E-30
9	22.5	0.00313	-7.13E+01	1.11E-31	-1.71E+48	2	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-1	2.78E-33
10	25	0.00313	-7.92E+01	4.04E-35	-1.71E+48	2	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-1	1.01E-36
11	27.5	0.00313	-8.71E+01	1.47E-38	-1.71E+48	2	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-1	3.67E-40
12	30	0.00313	-9.50E+01	5.35E-42	-1.71E+48	2	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	1.34E-43
13	32.5	0.00313	-1.03E+02	1.94E-45	-1.71E+48	2	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.999	4.85E-47
14	35	0.00313	-1.11E+02	7.07E-49	-1.71E+48	2	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.998	1.76E-50
15	37.5	0.00313	-1.19E+02	2.57E-52	-1.71E+48	2	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.998	6.41E-54
16	40	0.00313	-1.27E+02	9.35E-56	-1.71E+48	2	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	2.33E-57
17	42.5	0.00313	-1.35E+02	3.40E-59	-1.71E+48	2	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.996	8.46E-61
18	45	0.00313	-1.43E+02	1.24E-62	-1.71E+48	2	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.995	3.07E-64
19	47.5	0.00313	-1.50E+02	4.49E-66	-1.71E+48	2	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.993	1.12E-67
20	50	0.00313	-1.58E+02	1.63E-69	-1.71E+48	2	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	4.05E-71



ANNEX E
Sensitivity Analysis Remedial Target Worksheets

Hydrogeological risk assessment for land contamination

Remedial Targets Worksheet , Release 3.2

First released: 2006. Version 3.2: January 2013

This worksheet has been produced in combination with the document 'Remedial Targets Methodology: Hydrogeological risk assessment for land contamination (Environment Agency 2006).

Users of this worksheet should always refer to the User Manual to the Remedial Targets Methodology and to relevant guidance on UK legislation and policy, in order to understand how this procedure should be applied in an appropriate context.

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The calculation of equations in this worksheet has been independently checked by Entec (UK) Ltd on behalf of the Environment Agency.

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IMPORTANT: To enable MS Excel worksheet, click Tools, Add -Ins, Analysis Tool Pak and Analysis Tool Pak-VBA (to calculate error functions).

Details to be completed for each assessment				
Site Name:	Kelvedon Street			
Site Address:	Newport			
Completed by:	Michael Watkins			
Date:	20-May-26		Version:	1
Contaminant	cis 1,2-Dichloroethene			
Target Concentration (C_T)	0.001	mg/l	Origin of C_T:	Laboratory detection limit

This worksheet can be used to determine remedial targets for soils (Worksheets Level 1 Soil, Level 2 and Level 3 Soil) or to determine remedial targets for groundwater (Level 3 Groundwater). For Level 3, parameter values must be entered separately dependent on whether the assessment is for soil or groundwater. For soil, remedial targets are calculated as either mg/kg (for comparision with soil measurements) or mg/l (for comparison with leaching tests or pore water concentrations).
Site details entered on this page are automatically copied to Level 1, 2 and 3 Worksheets.
Worksheet options are identified by brown background and employ a pull-down menus. Data entry are identified as blue background.
Data origin / justification should be noted in cells coloured yellow and fully documented in subsequent reports.
Data carried forward from an earlier worksheet are identified by a light green background
It is recommended that a copy of the original worksheet is saved (all data fields in the original copy are blank).

The spreadsheet also includes a porosity calculation worksheet, a soil impact calculation worksheet and a worksheet that performs some simple hydrogeological calculations.

Remedial Targets Worksheet , Release 3.2

Level 1 - Soil

Select the method of calculating the soil water Partition Co-efficient by using the pull down menu below

User specified value for partition coefficient

Contaminant		**cis 1,2-Dichloroethene**		
Target concentration	**C_T**	**0.001**	**mg/l**	

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**
Standard entry				
Water filled soil porosity	θ_w	0.00E+00	fraction	
Air filled soil porosity	θa	0.00E+00	fraction	
Bulk density of soil zone material	ρ	0.00E+00	g/cm^3	
Henry's Law constant	H	0.00E+00	dimensionless	
Entry if specify partition coefficient (option)				
Soil water partition coefficient	Kd	0.00E+00	l/kg	
Entry for non-polar organic chemicals (option)				
Fraction of organic carbon (in soil)	foc		fraction	
Organic carbon partition coefficient	Koc		l/kg	
Entry for ionic organic chemicals (option)				
Sorption coefficient for neutral species	$K_{oc,n}$		l/kg	
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg	
pH value	pH		pH units	
Acid dissociation constant	pKa			
Fraction of organic carbon (in soil)	foc		fraction	

This sheet calculates the Level 1 remedial target for soils(mg/kg) based on a selected target concentration and theoretical calculation of soil water partitioning. Three options are included for determining the partition coefficient.

The measured soil concentration as mg/kg should be compared with the Level 1 remedial target to determine the need for further action.

Soil water partition coefficient used in Level Assessment	**Kd**	**0.00E+00**	**l/kg**	*Specified value*

Level 1 Remedial Target

Level 1 Remedial Target	**#DIV/0!**	**mg/kg**	**(for comparison with soil analyses)**
	or		
	0.001	**mg/l**	**(for comparison with leachate test results)**

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	20-May-26
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 2 - Soil

Contaminant		**cis 1,2-Dichloroethene**		from Level 1
Target concentration	C_T	**0.001**	**mg/l**	from Level 1

This sheet calculates the Level 2 remedial target for soils (mg/kg) or for pore water (mg/l).

The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 2 remedial target to determine the need for further action. Equations presented in 'Hydrogeological risk assessment for land contamiantion' (Environment Agency 2006)

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**	
Standard entry					
Infiltration	Inf	0.00E+00	m/d		
Area of contaminant source	A	0.00E+00	m^2		Not used in calculation
Entry for groundwater flow below site					
Length of contaminant source in direction of groundwater flow	L	0.00E+00	m		
Saturated aquifer thickness	da	0.00E+00	m		
Hydraulic Conductivity of aquifer in which dilution occurs	K	0.00E+00	m/d		
Hydraulic gradient of water table	i	0.00E+00	fraction		
Width of contaminant source perpendicular to groundwater flow	w	0.00E+00	m		Not used in calculation
Background concentration of contaminant in groundwater beneath site	Cu	0.00E+00	mg/l		
Define mixing zone depth by specifying or calculating depth (using pull down list)		**Specify**			
Enter mixing zone thickness	Mz	0.00E+00	m		
Calculated mixing zone thickness	Mz		m		

Calculated Parameters

Dilution Factor	**DF**	**#DIV/0!**		
Level 2 Remedial Target		**#DIV/0!**	**mg/l**	**For comparison with measured pore water concentration. This assumes Level 1 Remedial Target is based on Target Concentration.**
		or		
		#DIV/0!	**mg/kg**	**For comparison with measured soil concentration. This assumes Level 1 Remedial Target calculated from soil-water**

Additional option

Calculation of impact on receptor

Concentration of contaminant in contaminated discharge (entering receptor)	Cc	0.00E+00	mg/l	
Calculated concentration within receptor (dilution only)		#DIV/0!	mg/l	0

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	20-May-26
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 3 - Soil

See Note

Input Parameters	Variable	Value	Unit	Source
Contaminant		cis 1,2-Dichloroethene		from Level 1
Target Concentration	C_T	0.001	mg/l	from Level 1
Dilution Factor	DF	#DIV/0!		from Level 2

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value)

	Variable	Value	Unit	Source of parameter value
Enter source concentration		Soil concentration as mg/kg		
Enter soil concentration		0	mg/kg	
Half life for degradation of contaminant in water	$t_{1/2}$	1.00E+100	days	
Calculated decay rate	λ	6.93E-101	$days^{-1}$	calculated
Width of plume in aquifer at source	Sz	0.00E+00	m	from Level 2
Plume thickness in aquifer at source	Sy	0.00E+00	m	from Level 2
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Effective porosity of aquifer	n	0.00E+00	fraction	
Hydraulic gradient	i	#DIV/0!	fraction	from Level 2 (adjusted)
Hydraulic conductivity of saturated aquifer	K	0.00E+00	m/d	from Level 2
Distance to compliance point	x	0.00E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	1.00E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	0.00E+00	l/kg	*see options*
Longitudinal dispersivity	ax	0.000	m	*see options*
Transverse dispersivity	az	0.000	m	*see options*
Vertical dispersivity	ay	0.000	m	*see options*

Parameter values should be checked against Level 1 and 2

Calculated Parameters	Variable		
Groundwater flow velocity	v	#DIV/0!	m/d
Retardation factor	Rf	#DIV/0!	fraction
Decay rate used	λ	6.93E-101	d^{-1}
Hydraulic gradient used in aquifer flow down-gradient	i	#DIV/0!	fraction
Rate of contaminant flow due to retardation	u	#DIV/0!	m/d
Ratio of Compliance Point to Source Concentration	C_{cp}/C_0	#DIV/0!	fraction
Attenuation factor (C_o/C_{cp})	**AF**	**#DIV/0!**	**fraction**
Calculated soil leachate concentration	Co	#DIV/0!	mg/l

Remedial Targets

Level 3 Remedial Target		**#DIV/0!**	**mg/l**
Ogata Banks		**or**	
		#DIV/0!	**mg/kg**
Distance to compliance point		**0**	**m**
Ratio of Compliance Point to Source Concentration	**C_{cp}/C_0**	**#DIV/0!**	**fraction**

For comparison with measured pore water concentration.
This assumes Level 1 Remedial Target is based on Target Concentration.
For comparison with measured soil concentration. This assumes Level 1 Remedial Target calculated from soil-water partitioning equation.
Ogata Banks

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99

Enter method of defining partition co-efficient (using pull down list)

Calculate for ionic organic chemicals (acids)

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd		l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc		fraction
Organic carbon partition coefficient	Koc		l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{oc,n}$	0.00E+00	l/kg
Sorption coefficient for ionised species	$K_{oc,i}$	0.00E+00	l/kg
pH value	pH	0.00E+00	
Acid dissociation constant	pKa	0.00E+00	
Fraction of organic carbon in aquifer	foc	0.00E+00	fraction
Soil water partition coefficient	Kd	0.00E+00	l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

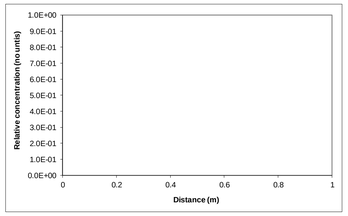
		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	0.00E+00	#NUM!	m
Transverse dispersivity	**az**	0.00E+00	0.00E+00	#NUM!	m
Vertical dispersivity	**ay**	0.00E+00	0.00E+00	#NUM!	m

Note values of dispersivity must be > 0

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed

Note
This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O_2, NO_3, SO_4 etc than an alternative solution should be used

Environment Agency



Note: 'Relative concentration' is the ratio of calculated concentation at a given position compared to the source concentration. The calculations assume plume disperses from the top of the aquifer. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

This sheet calculates the Level 3 remedial target for soils(mg/kg) or for pore water (mg/l), based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.By setting a long travel time (e.g. 9E99) it will give the steady state solution, which should always be used when calculating remedial targets.

The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 3 remedial target to determine the need for further action.

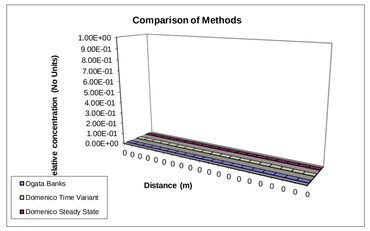
Note if contaminant is not subject to first order degradation, then set half life as 9.9E+99.

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Calculated (relative) concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Relative concentration (No units)	Concentration mg/l
0	1.0E+00	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!



Remedial Targets Worksheet , Release 3.2

Calculation of contaminant concentration in groundwater from a soil source

Only input required is Soil Contaminant Concentration

Input Parameters			
Soil contaminant concentration	C_0	0.00E+00	mg/kg

Level 1 Parameters

Water filled soil porosity	θ_W	0.00E+00	fraction
Air filled soil porosity	θa	0.00E+00	fraction
Bulk density	ρ	0.00E+00	g/cm^3
Henry's Law constant	H	0.00E+00	dimensionless
Soil water partition coefficient used in Level Assessment	Kd	0.00E+00	l/kg
Factor (partitioning between soil and water)		#DIV/0!	dimensionless

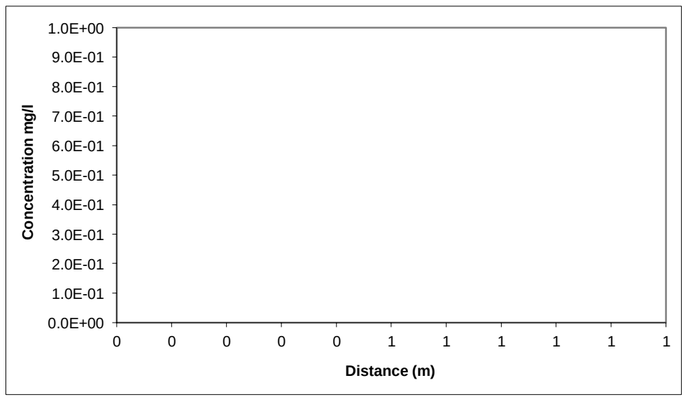
Level 2 Parameters **Dilution Factor** DF #DIV/0!

Level 3 Parameters **Attenuation factor (C_O/C_{ED})** AF #DIV/0!

Predicted concentrations at compliance point

Level 1	C	#DIV/0!	mg/l	No dilution or attenuation
Level 2	C	#DIV/0!	mg/l	Dilution taken into account
Level 3	C	#DIV/0!	mg/l	Dilution and attenuation taken into account

Predicted concentrations between source and compliance point - Level 3



Distance m	Concentration mg/l
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)	Variable	Value	Unit	Source
Contaminant		cis 1,2-Dichloroethene		from Level 1
Target Concentration	C_T	1.00E-03	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Domenico - Steady state — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived va

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	1.50E-02	mg/l	*Site investigation data*
Half life for degradation of contaminant in water	$t_{1/2}$	3.36E+02	days	*Agency for Toxic Substances and Disease*
Calculated decay rate	λ	2.06E-03	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	7.50E+01	m	*Length of site perpendicular to groundwater flow*
Plume thickness at source	Sy	5.90E+00	m	*Same as Mixing Zone Thickness. "For a thin aquifer (typically <10m), the mixing zone thickness can be taken as the acte*
Saturated aquifer thickness	da	6.00E+00	m	*Maximum thickness recorded in vicinity of*
Bulk density of aquifer materials	ρ	1.60E+00	g/cm^3	*Typical bulk density for river terrace deposits (conserv*
Effective porosity of aquifer	n	4.40E-01	fraction	*Maximum porosity for coarse Gravel (Lovanh et al 2000) - conservative estimate*
Hydraulic gradient	i	4.40E-02	fraction	*Borehole level data*
Hydraulic conductivity of aquifer	K	1.00E+02	m/d	*Maximum typical value for clayey sandy G*
Distance to compliance point	x	5.00E+01	m	*Default compliance distance*
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	1.00E+100	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	4.90E+01	l/kg	*see options*
Longitudinal dispersivity	ax	2.98E+00	m	*see options*
Transverse dispersivity	az	2.98E-01	m	*see options*
Vertical dispersivity	ay	2.98E-02	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd	4.90E+01	l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc		fraction
Organic carbon partition coefficient	Koc		l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{oc,n}$		l/kg
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	4.90E+01	l/kg

Define dispersivity (click brown cell and use pull down list)

Dispersivity based on Xu & Eckstein (1995)

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	5.00E+00	2.98E+00	m
Transverse dispersivity	**az**	0.00E+00	5.00E-01	2.98E-01	m
Vertical dispersivity	**ay**	0.00E+00	5.00E-02	2.98E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

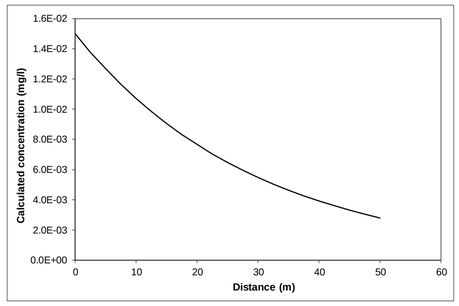
Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed

Calculated Parameters	Variable		
Groundwater flow velocity	v	1.00E+01	m/d
Retardation factor	Rf	1.79E+02	fraction
Decay rate used	λ	2.06E-03	d^{-1}
Rate of contaminant flow due to retardation	u	5.58E-02	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	2.79E-03	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**5.37E+00**	

Remedial Targets

Remedial Target		**5.37E-03**	**mg/l**	For comparison with measured groundwater concentration.
Domenico - Steady state				
Distance to compliance point		**50**	**m**	
Concentration of contaminant at compliance point	C_{ED}/C_0	**2.79E-03**	**mg/l**	Domenico - Steady state

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Calculated concentrations for distance-concentration graph

Domenico - Steady state
From calculation sheet

Distance	Concentration
	mg/l
0	1.5E-02
2.5	1.38E-02
5.0	1.27E-02
7.5	1.17E-02
10.0	1.07E-02
12.5	9.86E-03
15.0	9.06E-03
17.5	8.33E-03
20.0	7.66E-03
22.5	7.04E-03
25.0	6.48E-03
27.5	5.95E-03
30.0	5.47E-03
32.5	5.03E-03
35.0	4.63E-03
37.5	4.25E-03
40.0	3.91E-03
42.5	3.60E-03
45.0	3.31E-03
47.5	3.04E-03
50.0	2.79E-03

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared
with the Level 3 remedial target to determine the need for further action.
Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Porosity Calculator

These results are not carried through to any of the other worksheets

DRY BULK DENSITY DATA

Variable	Value	Unit	justification
Natural Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Dry Bulk Density	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
Initial Saturation	#DIV/0!	%	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	
Water Filled Porosity	**#DIV/0!**	**fraction**	

WET BULK DENSITY DATA

Variable	Value	Unit	
Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Actual (wet) Bulk Density (i.e. at natural MC)	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
dry bulk density	0.00	tonnes/m^3	
Initial Saturation	#DIV/0!	%	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	**#DIV/0!**
Water Filled Porosity	**#DIV/0!**	**fraction**	

Analytical solutions provided by David Hall, Golder Associates (UK) Ltd

Simple hydrogeological calculations

(These are not specific to, or required in, the Remedial Targets Methodology)

Parameter	symbol		unit	justification
Hydraulic conductivity	K	0.00E+00	m/d	
Hydraulic gradient	i	0.00E+00	unitless	
Effective porosity of aquifer	n	0.00E+00	fraction	
Thickness of saturated aquifer	b	0.00E+00	m	
Width of aquifer perpendicular to flow	w	0.00E+00	m	
Distance to receptor	x	0.00E+00	m	
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Soil-water partition co-efficient	Kd	0.00E+00	l/kg	
Retardation factor of pollutant	R	#DIV/0!		

Groundwater flow velocity	v(GW)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for groundwater to reach receptor	t(GW)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years
Rate of groundwater flow through aquifer	Q	0.00E+00	m^3/s	0.00E+00	m^3/day	0.00E+00	m^3/year

Contaminant flow velocity	v(contam)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for contaminant to reach receptor	t(contam)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years

Level 1 Calculation Sheet

Contaminant **1,2-Dichloroethene**

Parameter	Value	Units
(carried over from input sheet)		
C_T	1.00E-03	mg/l
Kd	0.00E+00	l/kg
foc		fraction
koc		l/kg
θ_W	0.00E+00	fraction
θa	0.00E+00	fraction
ρ	0.00E+00	g/cm3
H	0.00E+00	dimensionless
Koc,n		l/kg
Koc,i		l/kg
pH		pH units
pKa		
foc (ionic)		fraction

Calculations (Refer toTable 4.3, R&D Publication 20)

Selected option User specified value for partition coefficient

	calc	calc	Calc Kd	l/kg
Calculation of partition coefficient for ionic organic chemical				
Partition coefficient used in Level 1 Assessment			0.00E+00	l/kg

Calculated Remedial Target **#DIV/0!** **mg/kg** **for cis 1,2-Dichloroethene**

Factor (partitioning between soil and water) #DIV/0!

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	20/05/2026
Version:	1

Level 2 Calculation Sheet

Contaminant : 1,2-Dichloroethene

Site assessed:	Kelvedon Stre
Date:	20/05/2026
Version:	1

Parameter	Value	Units		
(carried over from input sheet)				
Mz	0.00E+00	m		
L	0.00E+00	m		
da	0.00E+00	m		Calculated
Inf	0.00E+00	m/d		Dilution Factor
K	0.00E+00	m/d		
i	0.00E+00		Calculation based on target concentration	#DIV/0!
A	0.00E+00	m3/d m2 m3/d	Calculation based on observed contaminant concentration	#DIV/0!
Cc	0.00E+00	mg/l		
C_T	1.00E-03	mg/l		
Cu	0.00E+00	mg/l		
w	0.00E+00	m		



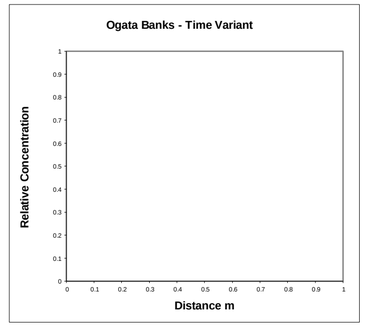
Contaminant **1,2-Dichloroethene**

OGATA BANKS SOLUTION

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-03	mg/l
DF	#DIV/0!	
λ	6.931E-101	days^{-1}
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Calc	Value	
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) -USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Date:	20/05/2026
Version:	1

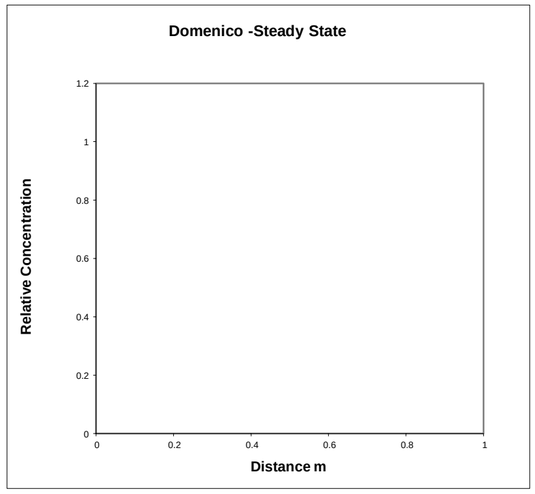
Contaminant **.,2-Dichloroethene**

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-03	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

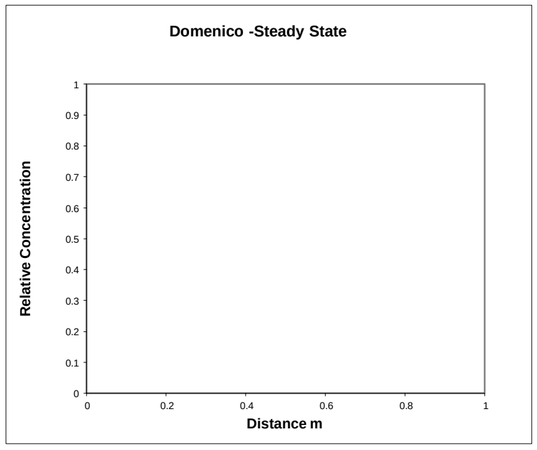


Calc	Value	Units
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Date:	20/05/2026
Version:	1

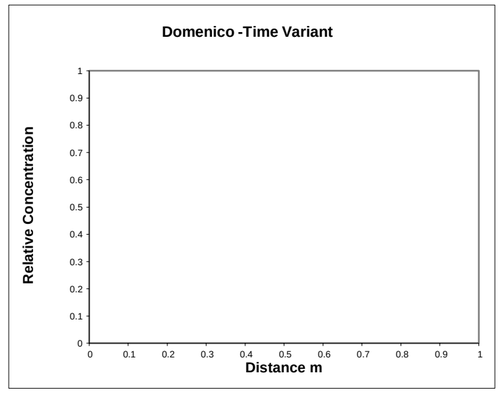
DOMENICO (TIME VARIANT)

Contaminant **l,2-Dichloroethene**

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	**Value**	**Units**
C_T	0.001	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

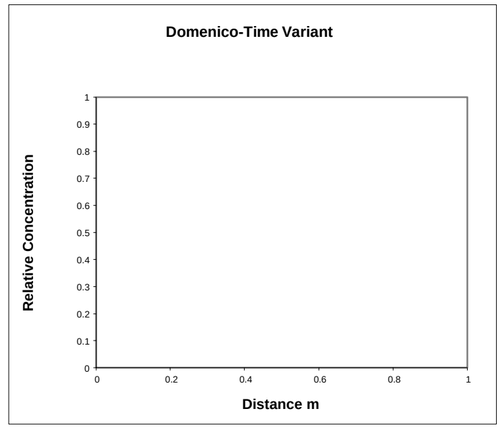


Calc **Value**

v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Date:	20/05/2026
Version:	1

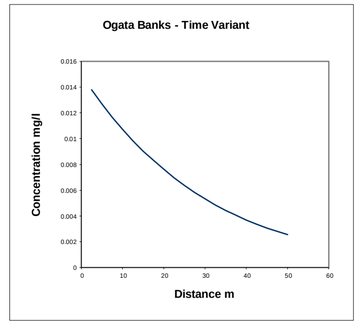
Contaminant **1,2-Dichloroethene**

OGATA BANKS SOLUTION

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.001	mg/l
Co	1.50E-02	mg/l
λ	2.06E-03	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	4.90E+01	l/kg
ρ	1.60E+00	g/cm3
n	4.40E-01	
i	4.40E-02	
K	1.00E+02	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	1.00E+100	days
ax	2.98E+00	m
az	2.98E-01	m
ay	2.98E-02	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.00188	-8.4E-02	9.2E-01	-8.2E+48	2.000	9.2E-01	2.5E+00	8.2E+48	0.000	2.2E+01	1	-2.2E+01	-1	5.4E+00	1	-5.4E+00	-1	1.38E-02
2	5	0.00188	-1.7E-01	8.5E-01	-8.2E+48	2.000	1.8E+00	6.3E+00	8.2E+48	0.000	1.5E+01	1	-1.5E+01	-1	3.8E+00	1	-3.8E+00	-1	1.27E-02
3	7.5	0.00188	-2.5E-01	7.8E-01	-8.2E+48	2.000	2.8E+00	1.6E+01	8.2E+48	0.000	1.3E+01	1	-1.3E+01	-1	3.1E+00	1	-3.1E+00	-0.99999	1.17E-02
4	10	0.00188	-3.4E-01	7.1E-01	-8.2E+48	2.000	3.7E+00	4.0E+01	8.2E+48	0.000	1.1E+01	1	-1.1E+01	-1	2.7E+00	0.9999	-2.7E+00	-0.99987	1.07E-02
5	12.5	0.00188	-4.2E-01	6.6E-01	-8.2E+48	2.000	4.6E+00	1.0E+02	8.2E+48	0.000	9.7E+00	1	-9.7E+00	-1	2.4E+00	0.9994	-2.4E+00	-0.99936	9.85E-03
6	15	0.00188	-5.0E-01	6.0E-01	-8.2E+48	2.000	5.5E+00	2.5E+02	8.2E+48	0.000	8.9E+00	1	-8.9E+00	-1	2.2E+00	0.9982	-2.2E+00	-0.99818	9.05E-03
7	17.5	0.00188	-5.9E-01	5.6E-01	-8.2E+48	2.000	6.5E+00	6.3E+02	8.2E+48	0.000	8.2E+00	1	-8.2E+00	-1	2.0E+00	0.9961	-2.0E+00	-0.99611	8.30E-03
8	20	0.00188	-6.7E-01	5.1E-01	-8.2E+48	2.000	7.4E+00	1.6E+03	8.2E+48	0.000	7.7E+00	1	-7.7E+00	-1	1.9E+00	0.9931	-1.9E+00	-0.99307	7.61E-03
9	22.5	0.00188	-7.6E-01	4.7E-01	-8.2E+48	2.000	8.3E+00	4.0E+03	8.2E+48	0.000	7.2E+00	1	-7.2E+00	-1	1.8E+00	0.9891	-1.8E+00	-0.9891	6.97E-03
10	25	0.00188	-8.4E-01	4.3E-01	-8.2E+48	2.000	9.2E+00	1.0E+04	8.2E+48	0.000	6.9E+00	1	-6.9E+00	-1	1.7E+00	0.9843	-1.7E+00	-0.98428	6.37E-03
11	27.5	0.00188	-9.2E-01	4.0E-01	-8.2E+48	2.000	1.0E+01	2.5E+04	8.2E+48	0.000	6.5E+00	1	-6.5E+00	-1	1.6E+00	0.9787	-1.6E+00	-0.97871	5.83E-03
12	30	0.00188	-1.0E+00	3.6E-01	-8.2E+48	2.000	1.1E+01	6.4E+04	8.2E+48	0.000	6.3E+00	1	-6.3E+00	-1	1.6E+00	0.9725	-1.6E+00	-0.97253	5.32E-03
13	32.5	0.00188	-1.1E+00	3.4E-01	-8.2E+48	2.000	1.2E+01	1.6E+05	8.2E+48	0.000	6.0E+00	1	-6.0E+00	-1	1.5E+00	0.9659	-1.5E+00	-0.96585	4.86E-03
14	35	0.00188	-1.2E+00	3.1E-01	-8.2E+48	2.000	1.3E+01	4.0E+05	8.2E+48	0.000	5.8E+00	1	-5.8E+00	-1	1.4E+00	0.9588	-1.4E+00	-0.95878	4.44E-03
15	37.5	0.00188	-1.3E+00	2.8E-01	-8.2E+48	2.000	1.4E+01	1.0E+06	8.2E+48	0.000	5.6E+00	1	-5.6E+00	-1	1.4E+00	0.9514	-1.4E+00	-0.9514	4.05E-03
16	40	0.00188	-1.3E+00	2.6E-01	-8.2E+48	2.000	1.5E+01	2.5E+06	8.2E+48	0.000	5.4E+00	1	-5.4E+00	-1	1.4E+00	0.9438	-1.4E+00	-0.94379	3.69E-03
17	42.5	0.00188	-1.4E+00	2.4E-01	-8.2E+48	2.000	1.6E+01	6.4E+06	8.2E+48	0.000	5.3E+00	1	-5.3E+00	-1	1.3E+00	0.936	-1.3E+00	-0.93603	3.37E-03
18	45	0.00188	-1.5E+00	2.2E-01	-8.2E+48	2.000	1.7E+01	1.6E+07	8.2E+48	0.000	5.1E+00	1	-5.1E+00	-1	1.3E+00	0.9282	-1.3E+00	-0.92818	3.07E-03
19	47.5	0.00188	-1.6E+00	2.0E-01	-8.2E+48	2.000	1.8E+01	4.0E+07	8.2E+48	0.000	5.0E+00	1	-5.0E+00	-1	1.2E+00	0.9203	-1.2E+00	-0.92026	2.80E-03
20	50	0.00188	-1.7E+00	1.9E-01	-8.2E+48	2.000	1.8E+01	1.0E+08	8.2E+48	0.000	4.9E+00	1	-4.9E+00	-1	1.2E+00	0.9123	-1.2E+00	-0.91234	2.55E-03



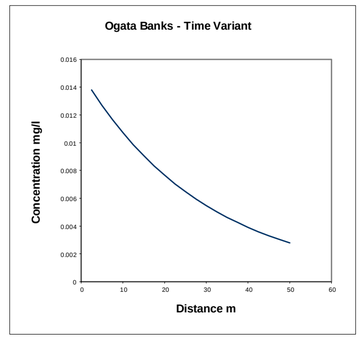
Vertical dispersion option Simulate vertical dispersion in 1 direction

Calc **Value**

v	1.00E+01 m/d
Rc	1.79E+02
u	5.58E-02 m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.00188	-8.4E-02	9.2E-01	-8.2E+48	2.000	9.2E-01	2.5E+00	8.2E+48	0.000	2.2E+01	1	-2.2E+01	-1	1.1E+01	1	-1.1E+01	-1	1.38E-02
2	5	0.00188	-1.7E-01	8.5E-01	-8.2E+48	2.000	1.8E+00	6.3E+00	8.2E+48	0.000	1.5E+01	1	-1.5E+01	-1	7.6E+00	1	-7.6E+00	-1	1.27E-02
3	7.5	0.00188	-2.5E-01	7.8E-01	-8.2E+48	2.000	2.8E+00	1.6E+01	8.2E+48	0.000	1.3E+01	1	-1.3E+01	-1	6.2E+00	1	-6.2E+00	-1	1.17E-02
4	10	0.00188	-3.4E-01	7.1E-01	-8.2E+48	2.000	3.7E+00	4.0E+01	8.2E+48	0.000	1.1E+01	1	-1.1E+01	-1	5.4E+00	1	-5.4E+00	-1	1.07E-02
5	12.5	0.00188	-4.2E-01	6.6E-01	-8.2E+48	2.000	4.6E+00	1.0E+02	8.2E+48	0.000	9.7E+00	1	-9.7E+00	-1	4.8E+00	1	-4.8E+00	-1	9.86E-03
6	15	0.00188	-5.0E-01	6.0E-01	-8.2E+48	2.000	5.5E+00	2.5E+02	8.2E+48	0.000	8.9E+00	1	-8.9E+00	-1	4.4E+00	1	-4.4E+00	-1	9.06E-03
7	17.5	0.00188	-5.9E-01	5.6E-01	-8.2E+48	2.000	6.5E+00	6.3E+02	8.2E+48	0.000	8.2E+00	1	-8.2E+00	-1	4.1E+00	1	-4.1E+00	-1	8.33E-03
8	20	0.00188	-6.7E-01	5.1E-01	-8.2E+48	2.000	7.4E+00	1.6E+03	8.2E+48	0.000	7.7E+00	1	-7.7E+00	-1	3.8E+00	1	-3.8E+00	-1	7.66E-03
9	22.5	0.00188	-7.6E-01	4.7E-01	-8.2E+48	2.000	8.3E+00	4.0E+03	8.2E+48	0.000	7.2E+00	1	-7.2E+00	-1	3.6E+00	1	-3.6E+00	-1	7.04E-03
10	25	0.00188	-8.4E-01	4.3E-01	-8.2E+48	2.000	9.2E+00	1.0E+04	8.2E+48	0.000	6.9E+00	1	-6.9E+00	-1	3.4E+00	1	-3.4E+00	-1	6.48E-03
11	27.5	0.00188	-9.2E-01	4.0E-01	-8.2E+48	2.000	1.0E+01	2.5E+04	8.2E+48	0.000	6.5E+00	1	-6.5E+00	-1	3.3E+00	1	-3.3E+00	-1	5.95E-03
12	30	0.00188	-1.0E+00	3.6E-01	-8.2E+48	2.000	1.1E+01	6.4E+04	8.2E+48	0.000	6.3E+00	1	-6.3E+00	-1	3.1E+00	1	-3.1E+00	-0.99999	5.47E-03
13	32.5	0.00188	-1.1E+00	3.4E-01	-8.2E+48	2.000	1.2E+01	1.6E+05	8.2E+48	0.000	6.0E+00	1	-6.0E+00	-1	3.0E+00	1	-3.0E+00	-0.99998	5.03E-03
14	35	0.00188	-1.2E+00	3.1E-01	-8.2E+48	2.000	1.3E+01	4.0E+05	8.2E+48	0.000	5.8E+00	1	-5.8E+00	-1	2.9E+00	1	-2.9E+00	-0.99996	4.63E-03
15	37.5	0.00188	-1.3E+00	2.8E-01	-8.2E+48	2.000	1.4E+01	1.0E+06	8.2E+48	0.000	5.6E+00	1	-5.6E+00	-1	2.8E+00	0.9999	-2.8E+00	-0.99992	4.25E-03
16	40	0.00188	-1.3E+00	2.6E-01	-8.2E+48	2.000	1.5E+01	2.5E+06	8.2E+48	0.000	5.4E+00	1	-5.4E+00	-1	2.7E+00	0.9999	-2.7E+00	-0.99987	3.91E-03
17	42.5	0.00188	-1.4E+00	2.4E-01	-8.2E+48	2.000	1.6E+01	6.4E+06	8.2E+48	0.000	5.3E+00	1	-5.3E+00	-1	2.6E+00	0.9998	-2.6E+00	-0.99979	3.60E-03
18	45	0.00188	-1.5E+00	2.2E-01	-8.2E+48	2.000	1.7E+01	1.6E+07	8.2E+48	0.000	5.1E+00	1	-5.1E+00	-1	2.5E+00	0.9997	-2.5E+00	-0.99968	3.31E-03
19	47.5	0.00188	-1.6E+00	2.0E-01	-8.2E+48	2.000	1.8E+01	4.0E+07	8.2E+48	0.000	5.0E+00	1	-5.0E+00	-1	2.5E+00	0.9995	-2.5E+00	-0.99954	3.04E-03
20	50	0.00188	-1.7E+00	1.9E-01	-8.2E+48	2.000	1.8E+01	1.0E+08	8.2E+48	0.000	4.9E+00	1	-4.9E+00	-1	2.4E+00	0.9994	-2.4E+00	-0.99936	2.79E-03



Date:	20/05/2026
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	1.38E-02
5.0	1.27E-02
7.5	1.17E-02
10.0	1.07E-02
12.5	9.86E-03
15.0	9.06E-03
17.5	8.33E-03
20.0	7.66E-03
22.5	7.04E-03
25.0	6.48E-03
27.5	5.95E-03
30.0	5.47E-03
32.5	5.03E-03
35.0	4.63E-03
37.5	4.25E-03
40.0	3.91E-03
42.5	3.60E-03
45.0	3.31E-03
47.5	3.04E-03
50.0	2.79E-03

Contaminant ,,2-Dichloroethene

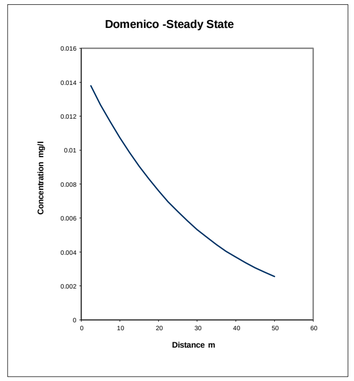
Input	Value	Units
C_T	0.001	mg/l
Co	1.50E-02	mg/l
λ	2.06E-03	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	4.90E+01	l/kg
ρ	1.60E+00	g/cm3
n	4.40E-01	
i	4.40E-02	
K	1.00E+02	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
ax	2.98E+00	m
az	2.98E-01	m
ay	2.98E-02	m

Vertical dispersion optio Simulate vertical dispersion in 1 direction

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.00375	-8.40E-02	9.19E-01	2.17E+01	1	-2.17E+01	-1	5.40E+00	1	-5.40E+00	-1	1.38E-02
2	5	0.00375	-1.68E-01	8.45E-01	1.54E+01	1	-1.54E+01	-1	3.82E+00	1	-3.82E+00	-1	1.27E-02
3	7.5	0.00375	-2.52E-01	7.77E-01	1.25E+01	1	-1.25E+01	-1	3.12E+00	1	-3.12E+00	-1	1.17E-02
4	10	0.00375	-3.36E-01	7.15E-01	1.09E+01	1	-1.09E+01	-1	2.70E+00	0.9999	-2.70E+00	-0.9999	1.07E-02
5	12.5	0.00375	-4.20E-01	6.57E-01	9.71E+00	1	-9.71E+00	-1	2.42E+00	0.9994	-2.42E+00	-0.9994	9.85E-03
6	15	0.00375	-5.04E-01	6.04E-01	8.86E+00	1	-8.86E+00	-1	2.20E+00	0.9982	-2.20E+00	-0.9982	9.05E-03
7	17.5	0.00375	-5.88E-01	5.55E-01	8.21E+00	1	-8.21E+00	-1	2.04E+00	0.9961	-2.04E+00	-0.9961	8.30E-03
8	20	0.00375	-6.72E-01	5.11E-01	7.68E+00	1	-7.68E+00	-1	1.91E+00	0.9931	-1.91E+00	-0.9931	7.61E-03
9	22.5	0.00375	-7.56E-01	4.70E-01	7.24E+00	1	-7.24E+00	-1	1.80E+00	0.9891	-1.80E+00	-0.9891	6.97E-03
10	25	0.00375	-8.40E-01	4.32E-01	6.87E+00	1	-6.87E+00	-1	1.71E+00	0.9843	-1.71E+00	-0.9843	6.37E-03
11	27.5	0.00375	-9.24E-01	3.97E-01	6.55E+00	1	-6.55E+00	-1	1.63E+00	0.9787	-1.63E+00	-0.9787	5.83E-03
12	30	0.00375	-1.01E+00	3.65E-01	6.27E+00	1	-6.27E+00	-1	1.56E+00	0.9725	-1.56E+00	-0.9725	5.32E-03
13	32.5	0.00375	-1.09E+00	3.36E-01	6.02E+00	1	-6.02E+00	-1	1.50E+00	0.9659	-1.50E+00	-0.9659	4.86E-03
14	35	0.00375	-1.18E+00	3.09E-01	5.80E+00	1	-5.80E+00	-1	1.44E+00	0.9588	-1.44E+00	-0.9588	4.44E-03
15	37.5	0.00375	-1.26E+00	2.84E-01	5.61E+00	1	-5.61E+00	-1	1.39E+00	0.9514	-1.39E+00	-0.9514	4.05E-03
16	40	0.00375	-1.34E+00	2.61E-01	5.43E+00	1	-5.43E+00	-1	1.35E+00	0.9438	-1.35E+00	-0.9438	3.69E-03
17	42.5	0.00375	-1.43E+00	2.40E-01	5.27E+00	1	-5.27E+00	-1	1.31E+00	0.936	-1.31E+00	-0.936	3.37E-03
18	45	0.00375	-1.51E+00	2.20E-01	5.12E+00	1	-5.12E+00	-1	1.27E+00	0.9282	-1.27E+00	-0.9282	3.07E-03
19	47.5	0.00375	-1.60E+00	2.03E-01	4.98E+00	1	-4.98E+00	-1	1.24E+00	0.9203	-1.24E+00	-0.9203	2.80E-03
20	50	0.00375	-1.68E+00	1.86E-01	4.85E+00	1	-4.85E+00	-1	1.21E+00	0.9123	-1.21E+00	-0.9123	2.55E-03



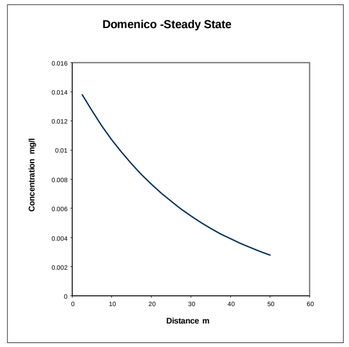
Calc

	Value	
v	1.00E+01	m/d
Rc	1.79E+02	
u	5.58E-02	m/d

DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.00375	-8.40E-02	9.19E-01	2.17E+01	1	-2.17E+01	-1	1.08E+01	1	-1.08E+01	-1	1.38E-02
2	5	0.00375	-1.68E-01	8.45E-01	1.54E+01	1	-1.54E+01	-1	7.64E+00	1	-7.64E+00	-1	1.27E-02
3	7.5	0.00375	-2.52E-01	7.77E-01	1.25E+01	1	-1.25E+01	-1	6.24E+00	1	-6.24E+00	-1	1.17E-02
4	10	0.00375	-3.36E-01	7.15E-01	1.09E+01	1	-1.09E+01	-1	5.40E+00	1	-5.40E+00	-1	1.07E-02
5	12.5	0.00375	-4.20E-01	6.57E-01	9.71E+00	1	-9.71E+00	-1	4.83E+00	1	-4.83E+00	-1	9.86E-03
6	15	0.00375	-5.04E-01	6.04E-01	8.86E+00	1	-8.86E+00	-1	4.41E+00	1	-4.41E+00	-1	9.06E-03
7	17.5	0.00375	-5.88E-01	5.55E-01	8.21E+00	1	-8.21E+00	-1	4.08E+00	1	-4.08E+00	-1	8.33E-03
8	20	0.00375	-6.72E-01	5.11E-01	7.68E+00	1	-7.68E+00	-1	3.82E+00	1	-3.82E+00	-1	7.66E-03
9	22.5	0.00375	-7.56E-01	4.70E-01	7.24E+00	1	-7.24E+00	-1	3.60E+00	1	-3.60E+00	-1	7.04E-03
10	25	0.00375	-8.40E-01	4.32E-01	6.87E+00	1	-6.87E+00	-1	3.42E+00	1	-3.42E+00	-1	6.48E-03
11	27.5	0.00375	-9.24E-01	3.97E-01	6.55E+00	1	-6.55E+00	-1	3.26E+00	1	-3.26E+00	-1	5.95E-03
12	30	0.00375	-1.01E+00	3.65E-01	6.27E+00	1	-6.27E+00	-1	3.12E+00	1	-3.12E+00	-1	5.47E-03
13	32.5	0.00375	-1.09E+00	3.36E-01	6.02E+00	1	-6.02E+00	-1	3.00E+00	1	-3.00E+00	-1	5.03E-03
14	35	0.00375	-1.18E+00	3.09E-01	5.80E+00	1	-5.80E+00	-1	2.89E+00	1	-2.89E+00	-1	4.63E-03
15	37.5	0.00375	-1.26E+00	2.84E-01	5.61E+00	1	-5.61E+00	-1	2.79E+00	0.9999	-2.79E+00	-0.9999	4.25E-03
16	40	0.00375	-1.34E+00	2.61E-01	5.43E+00	1	-5.43E+00	-1	2.70E+00	0.9999	-2.70E+00	-0.9999	3.91E-03
17	42.5	0.00375	-1.43E+00	2.40E-01	5.27E+00	1	-5.27E+00	-1	2.62E+00	0.9998	-2.62E+00	-0.9998	3.60E-03
18	45	0.00375	-1.51E+00	2.20E-01	5.12E+00	1	-5.12E+00	-1	2.55E+00	0.9997	-2.55E+00	-0.9997	3.31E-03
19	47.5	0.00375	-1.60E+00	2.03E-01	4.98E+00	1	-4.98E+00	-1	2.48E+00	0.9995	-2.48E+00	-0.9995	3.04E-03
20	50	0.00375	-1.68E+00	1.86E-01	4.85E+00	1	-4.85E+00	-1	2.42E+00	0.9994	-2.42E+00	-0.9994	2.79E-03



Date:	20/05/2026
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	1.38E-02
5.0	1.27E-02
7.5	1.17E-02
10.0	1.07E-02
12.5	9.86E-03
15.0	9.06E-03
17.5	8.33E-03
20.0	7.66E-03
22.5	7.04E-03
25.0	6.48E-03
27.5	5.95E-03
30.0	5.47E-03
32.5	5.03E-03
35.0	4.63E-03
37.5	4.25E-03
40.0	3.91E-03
42.5	3.60E-03
45.0	3.31E-03
47.5	3.04E-03
50.0	2.79E-03

DOMENICO (TIME VARIANT)

Contaminant 1,2-Dichloroethene

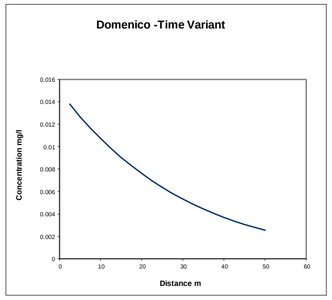
Input	Value	Units
C_T	0.001	mg/l
Co	1.50E-02	mg/l
λ	2.06E-03	$days^{-1}$
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	4.90E+01	l/kg
ρ	1.60E+00	g/cm3
n	4.40E-01	
i	4.40E-02	
K	1.00E+02	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	1.00E+100	days
ax	2.98E+00	m
az	2.98E-01	m
ay	2.98E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

Calc	Value	
v	1.00E+01	m/d
Rc	1.79E+02	
u	5.58E-02	m/d

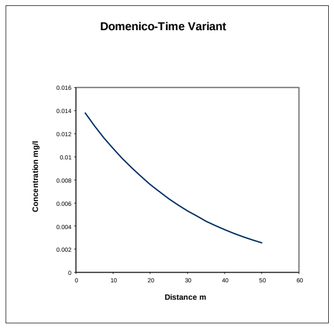
Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.00188	-8.40E-02	9.19E-01	-8.21E+48	2	2.17E+01	1	-2.17E+01	-1	5.40E+00	1	-5.40E+00	-1	1.38E-02
2	5	0.00188	-1.68E-01	8.45E-01	-8.21E+48	2	1.54E+01	1	-1.54E+01	-1	3.82E+00	1	-3.82E+00	-1	1.27E-02
3	7.5	0.00188	-2.52E-01	7.77E-01	-8.21E+48	2	1.25E+01	1	-1.25E+01	-1	3.12E+00	1	-3.12E+00	-1	1.17E-02
4	10	0.00188	-3.36E-01	7.15E-01	-8.21E+48	2	1.09E+01	1	-1.09E+01	-1	2.70E+00	0.9999	-2.70E+00	-1	1.07E-02
5	12.5	0.00188	-4.20E-01	6.57E-01	-8.21E+48	2	9.71E+00	1	-9.71E+00	-1	2.42E+00	0.9994	-2.42E+00	-0.999	9.85E-03
6	15	0.00188	-5.04E-01	6.04E-01	-8.21E+48	2	8.86E+00	1	-8.86E+00	-1	2.20E+00	0.9982	-2.20E+00	-0.998	9.05E-03
7	17.5	0.00188	-5.88E-01	5.55E-01	-8.21E+48	2	8.21E+00	1	-8.21E+00	-1	2.04E+00	0.9961	-2.04E+00	-0.996	8.30E-03
8	20	0.00188	-6.72E-01	5.11E-01	-8.21E+48	2	7.68E+00	1	-7.68E+00	-1	1.91E+00	0.9931	-1.91E+00	-0.993	7.61E-03
9	22.5	0.00188	-7.56E-01	4.70E-01	-8.21E+48	2	7.24E+00	1	-7.24E+00	-1	1.80E+00	0.9891	-1.80E+00	-0.989	6.97E-03
10	25	0.00188	-8.40E-01	4.32E-01	-8.21E+48	2	6.87E+00	1	-6.87E+00	-1	1.71E+00	0.9843	-1.71E+00	-0.984	6.37E-03
11	27.5	0.00188	-9.24E-01	3.97E-01	-8.21E+48	2	6.55E+00	1	-6.55E+00	-1	1.63E+00	0.9787	-1.63E+00	-0.979	5.83E-03
12	30	0.00188	-1.01E+00	3.65E-01	-8.21E+48	2	6.27E+00	1	-6.27E+00	-1	1.56E+00	0.9725	-1.56E+00	-0.973	5.32E-03
13	32.5	0.00188	-1.09E+00	3.36E-01	-8.21E+48	2	6.02E+00	1	-6.02E+00	-1	1.50E+00	0.9659	-1.50E+00	-0.966	4.86E-03
14	35	0.00188	-1.18E+00	3.09E-01	-8.21E+48	2	5.80E+00	1	-5.80E+00	-1	1.44E+00	0.9588	-1.44E+00	-0.959	4.44E-03
15	37.5	0.00188	-1.26E+00	2.84E-01	-8.21E+48	2	5.61E+00	1	-5.61E+00	-1	1.39E+00	0.9514	-1.39E+00	-0.951	4.05E-03
16	40	0.00188	-1.34E+00	2.61E-01	-8.21E+48	2	5.43E+00	1	-5.43E+00	-1	1.35E+00	0.9438	-1.35E+00	-0.944	3.69E-03
17	42.5	0.00188	-1.43E+00	2.40E-01	-8.21E+48	2	5.27E+00	1	-5.27E+00	-1	1.31E+00	0.936	-1.31E+00	-0.936	3.37E-03
18	45	0.00188	-1.51E+00	2.20E-01	-8.21E+48	2	5.12E+00	1	-5.12E+00	-1	1.27E+00	0.9282	-1.27E+00	-0.928	3.07E-03
19	47.5	0.00188	-1.60E+00	2.03E-01	-8.21E+48	2	4.98E+00	1	-4.98E+00	-1	1.24E+00	0.9203	-1.24E+00	-0.92	2.80E-03
20	50	0.00188	-1.68E+00	1.86E-01	-8.21E+48	2	4.85E+00	1	-4.85E+00	-1	1.21E+00	0.9123	-1.21E+00	-0.912	2.55E-03



Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.00188	-8.40E-02	9.19E-01	-8.21E+48	2	2.17E+01	1	-2.17E+01	-1	1.08E+01	1	-1.08E+01	-1	1.38E-02
2	5	0.00188	-1.68E-01	8.45E-01	-8.21E+48	2	1.54E+01	1	-1.54E+01	-1	7.64E+00	1	-7.64E+00	-1	1.27E-02
3	7.5	0.00188	-2.52E-01	7.77E-01	-8.21E+48	2	1.25E+01	1	-1.25E+01	-1	6.24E+00	1	-6.24E+00	-1	1.17E-02
4	10	0.00188	-3.36E-01	7.15E-01	-8.21E+48	2	1.09E+01	1	-1.09E+01	-1	5.40E+00	1	-5.40E+00	-1	1.07E-02
5	12.5	0.00188	-4.20E-01	6.57E-01	-8.21E+48	2	9.71E+00	1	-9.71E+00	-1	4.83E+00	1	-4.83E+00	-1	9.86E-03
6	15	0.00188	-5.04E-01	6.04E-01	-8.21E+48	2	8.86E+00	1	-8.86E+00	-1	4.41E+00	1	-4.41E+00	-1	9.06E-03
7	17.5	0.00188	-5.88E-01	5.55E-01	-8.21E+48	2	8.21E+00	1	-8.21E+00	-1	4.08E+00	1	-4.08E+00	-1	8.33E-03
8	20	0.00188	-6.72E-01	5.11E-01	-8.21E+48	2	7.68E+00	1	-7.68E+00	-1	3.82E+00	1	-3.82E+00	-1	7.66E-03
9	22.5	0.00188	-7.56E-01	4.70E-01	-8.21E+48	2	7.24E+00	1	-7.24E+00	-1	3.60E+00	1	-3.60E+00	-1	7.04E-03
10	25	0.00188	-8.40E-01	4.32E-01	-8.21E+48	2	6.87E+00	1	-6.87E+00	-1	3.42E+00	1	-3.42E+00	-1	6.48E-03
11	27.5	0.00188	-9.24E-01	3.97E-01	-8.21E+48	2	6.55E+00	1	-6.55E+00	-1	3.26E+00	1	-3.26E+00	-1	5.95E-03
12	30	0.00188	-1.01E+00	3.65E-01	-8.21E+48	2	6.27E+00	1	-6.27E+00	-1	3.12E+00	1	-3.12E+00	-1	5.47E-03
13	32.5	0.00188	-1.09E+00	3.36E-01	-8.21E+48	2	6.02E+00	1	-6.02E+00	-1	3.00E+00	1	-3.00E+00	-1	5.03E-03
14	35	0.00188	-1.18E+00	3.09E-01	-8.21E+48	2	5.80E+00	1	-5.80E+00	-1	2.89E+00	1	-2.89E+00	-1	4.63E-03
15	37.5	0.00188	-1.26E+00	2.84E-01	-8.21E+48	2	5.61E+00	1	-5.61E+00	-1	2.79E+00	0.9999	-2.79E+00	-1	4.25E-03
16	40	0.00188	-1.34E+00	2.61E-01	-8.21E+48	2	5.43E+00	1	-5.43E+00	-1	2.70E+00	0.9999	-2.70E+00	-1	3.91E-03
17	42.5	0.00188	-1.43E+00	2.40E-01	-8.21E+48	2	5.27E+00	1	-5.27E+00	-1	2.62E+00	0.9998	-2.62E+00	-1	3.60E-03
18	45	0.00188	-1.51E+00	2.20E-01	-8.21E+48	2	5.12E+00	1	-5.12E+00	-1	2.55E+00	0.9997	-2.55E+00	-1	3.31E-03
19	47.5	0.00188	-1.60E+00	2.03E-01	-8.21E+48	2	4.98E+00	1	-4.98E+00	-1	2.48E+00	0.9995	-2.48E+00	-1	3.04E-03
20	50	0.00188	-1.68E+00	1.86E-01	-8.21E+48	2	4.85E+00	1	-4.85E+00	-1	2.42E+00	0.9994	-2.42E+00	-0.999	2.79E-03



Date:	20/05/2026
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	1.38E-02
5.0	1.27E-02
7.5	1.17E-02
10.0	1.07E-02
12.5	9.86E-03
15.0	9.06E-03
17.5	8.33E-03
20.0	7.66E-03
22.5	7.04E-03
25.0	6.48E-03
27.5	5.95E-03
30.0	5.47E-03
32.5	5.03E-03
35.0	4.63E-03
37.5	4.25E-03
40.0	3.91E-03
42.5	3.60E-03
45.0	3.31E-03
47.5	3.04E-03
50.0	2.79E-03

Hydrogeological risk assessment for land contamination

Remedial Targets Worksheet , Release 3.2

First released: 2006. Version 3.2: January 2013

This worksheet has been produced in combination with the document 'Remedial Targets Methodology: Hydrogeological risk assessment for land contamination (Environment Agency 2006).

Users of this worksheet should always refer to the User Manual to the Remedial Targets Methodology and to relevant guidance on UK legislation and policy, in order to understand how this procedure should be applied in an appropriate context.

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The calculation of equations in this worksheet has been independently checked by Entec (UK) Ltd on behalf of the Environment Agency.

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IMPORTANT: To enable MS Excel worksheet, click Tools, Add -Ins, Analysis Tool Pak and Analysis Tool Pak-VBA (to calculate error functions)

Details to be completed for each assessment				
Site Name:	Kelvedon Street			
Site Address:	Newport			
Completed by:	Michael Watkins			
Date:	20-May-26		Version:	1
Contaminant	cis 1,2-Dichloroethene			
Target Concentration (C_T)	0.001	mg/l	Origin of C_T:	Laboratory detection limit

This worksheet can be used to determine remedial targets for soils (Worksheets Level 1 Soil, Level 2 and Level 3 Soil) or to determine remedial targets for groundwater (Level 3 Groundwater). For Level 3, parameter values must be entered separately dependent on whether the assessment is for soil or groundwater. For soil, remedial targets are calculated as either mg/kg (for comparision with soil measurements) or mg/l (for comparison with leaching tests or pore water concentrations).
Site details entered on this page are automatically copied to Level 1, 2 and 3 Worksheets.
Worksheet options are identified by brown background and employ a pull-down menus. Data entry are identified as blue background.
Data origin / justification should be noted in cells coloured yellow and fully documented in subsequent reports.
Data carried forward from an earlier worksheet are identified by a light green background
It is recommended that a copy of the original worksheet is saved (all data fields in the original copy are blank).

The spreadsheet also includes a porosity calculation worksheet, a soil impact calculation worksheet and a worksheet that performs some simple hydrogeological calculations.

Remedial Targets Worksheet , Release 3.2

Level 1 - Soil

Environment Agency

Select the method of calculating the soil water Partition Co-efficient by using the pull down menu below

User specified value for partition coefficient

Contaminant		**cis 1,2-Dichloroethene**		
Target concentration	**C_T**	**0.001**	**mg/l**	

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**
Standard entry				
Water filled soil porosity	θ_W	0.00E+00	fraction	
Air filled soil porosity	θa	0.00E+00	fraction	
Bulk density of soil zone material	ρ	0.00E+00	g/cm^3	
Henry's Law constant	H	0.00E+00	dimensionless	
Entry if specify partition coefficient (option)				
Soil water partition coefficient	Kd	0.00E+00	l/kg	
Entry for non-polar organic chemicals (option)				
Fraction of organic carbon (in soil)	foc		fraction	
Organic carbon partition coefficient	Koc		l/kg	
Entry for ionic organic chemicals (option)				
Sorption coefficient for neutral species	$K_{oc,n}$		l/kg	
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg	
pH value	pH		pH units	
Acid dissociation constant	pKa			
Fraction of organic carbon (in soil)	foc		fraction	

This sheet calculates the Level 1 remedial target for soils(mg/kg) based on a selected target concentration and theoretical calculation of soil water partitioning. Three options are included for determining the partition coefficient.

The measured soil concentration as mg/kg should be compared with the Level 1 remedial target to determine the need for further action.

Soil water partition coefficient used in Level Assessment	**Kd**	**0.00E+00**	**l/kg**	*Specified value*

Level 1 Remedial Target

Level 1 Remedial Target	**#DIV/0!**	**mg/kg**	**(for comparison with soil analyses)**
	or		
	0.001	**mg/l**	**(for comparison with leachate test results)**

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	20-May-26
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 2 - Soil

Contaminant		**cis 1,2-Dichloroethene**		from Level 1
Target concentration	**C_T**	**0.001**	**mg/l**	from Level 1

This sheet calculates the Level 2 remedial target for soils (mg/kg) or for pore water (mg/l).

The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 2 remedial target to determine the need for further action. Equations presented in 'Hydrogeological risk assessment for land contamiantion' (Environment Agency 2006)

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**	
Standard entry					
Infiltration	Inf	0.00E+00	m/d		
Area of contaminant source	A	0.00E+00	m^2		Not used in calculation
Entry for groundwater flow below site					
Length of contaminant source in direction of groundwater flow	L	0.00E+00	m		
Saturated aquifer thickness	da	0.00E+00	m		
Hydraulic Conductivity of aquifer in which dilution occurs	K	0.00E+00	m/d		
Hydraulic gradient of water table	i	0.00E+00	fraction		
Width of contaminant source perpendicular to groundwater flow	w	0.00E+00	m		Not used in calculation
Background concentration of contaminant in groundwater beneath site	Cu	0.00E+00	mg/l		
Define mixing zone depth by specifying or calculating depth (using pull down list)		**Specify**			
Enter mixing zone thickness	Mz	0.00E+00	m		
Calculated mixing zone thickness	Mz		m		

Calculated Parameters

Dilution Factor	**DF**	**#DIV/0!**		
Level 2 Remedial Target		**#DIV/0!**	**mg/l**	**For comparison with measured pore water concentration. This assumes Level 1 Remedial Target is based on Target Concentrati**
		or		
		#DIV/0!	**mg/kg**	**For comparison with measured soil concentration. This assumes Level 1 Remedial Target calculated from soil-water**

Additional option

Calculation of impact on receptor

Concentration of contaminant in contaminated discharge (entering receptor)	Cc	0.00E+00	mg/l	
Calculated concentration within receptor (dilution only)		#DIV/0!	mg/l	0

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	20-May-26
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 3 - Soil

See Note

Input Parameters	Variable	Value	Unit	Source
Contaminant		cis 1,2-Dichloroethene		from Level 1
Target Concentration	C_T	0.001	mg/l	from Level 1
Dilution Factor	DF	#DIV/0!		from Level 2

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value, l

	Variable	Value	Unit	Source of parameter value
Enter source concentration		Soil concentration as mg/kg		
Enter soil concentration		0	mg/kg	
Half life for degradation of contaminant in water	$t_{1/2}$	1.00E+100	days	
Calculated decay rate	λ	6.93E-101	$days^{-1}$	calculated
Width of plume in aquifer at source	Sz	0.00E+00	m	from Level 2
Plume thickness in aquifer at source	Sy	0.00E+00	m	from Level 2
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Effective porosity of aquifer	n	0.00E+00	fraction	
Hydraulic gradient	i	#DIV/0!	fraction	from Level 2 (adjusted)
Hydraulic conductivity of saturated aquifer	K	0.00E+00	m/d	from Level 2
Distance to compliance point	x	0.00E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	1.00E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	0.00E+00	l/kg	*see options*
Longitudinal dispersivity	ax	0.000	m	*see options*
Transverse dispersivity	az	0.000	m	*see options*
Vertical dispersivity	ay	0.000	m	*see options*

Parameter values should be checked against Level 1 and 2

Calculated Parameters	Variable		
Groundwater flow velocity	v	#DIV/0!	m/d
Retardation factor	Rf	#DIV/0!	fraction
Decay rate used	λ	6.93E-101	d^{-1}
Hydraulic gradient used in aquifer flow down-gradient	i	#DIV/0!	fraction
Rate of contaminant flow due to retardation	u	#DIV/0!	m/d
Ratio of Compliance Point to Source Concentration	C_{ED}/C_0	#DIV/0!	fraction
Attenuation factor (C_0/C_{ED})	**AF**	**#DIV/0!**	**fraction**
Calculated soil leachate concentration	Co	#DIV/0!	mg/l

Remedial Targets

Level 3 Remedial Target		**#DIV/0!**	**mg/l**	For comparison with measured pore water concentration.
Ogata Banks		**or**		This assumes Level 1 Remedial Target is based on Target Concentration.
		#DIV/0!	**mg/kg**	For comparison with measured soil concentration. This
Distance to compliance point		**0**	**m**	assumes Level 1 Remedial Target calculated from soil-water partitioning equation.
Ratio of Compliance Point to Source Concentration	**C_{ED}/C_0**	**#DIV/0!**	**fraction**	Ogata Banks

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99

Enter method of defining partition co-efficient (using pull down list)

Calculate for ionic organic chemicals (acids)

Entry if specify partition coefficient (option)

Soil water partition coefficient	Kd		l/kg

Entry for non-polar organic chemicals (option)

Fraction of organic carbon in aquifer	foc		fraction
Organic carbon partition coefficient	Koc		l/kg

Entry for ionic organic chemicals (option)

Sorption coefficient for related species	$K_{oc,n}$	0.00E+00	l/kg
Sorption coefficient for ionised species	$K_{oc,i}$	0.00E+00	l/kg
pH value	pH	0.00E+00	
Acid dissociation constant	pKa	0.00E+00	
Fraction of organic carbon in aquifer	foc	0.00E+00	fraction
Soil water partition coefficient	Kd	0.00E+00	l/kg

Define dispersivity (click brown cell and use pull down list)

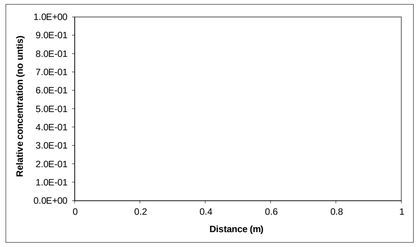
User defined values for dispersivity

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	0.00E+00	#NUM!	m
Transverse dispersivity	**az**	0.00E+00	0.00E+00	#NUM!	m
Vertical dispersivity	**ay**	0.00E+00	0.00E+00	#NUM!	m

Note values of dispersivity must be > 0

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed

Note
This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O_2, NO_3, SO_4 etc than an alternative solution should be used



Note: 'Relative concentration' is the ratio of calculated concentation at a given position compared to the source concentration. The calculations assume plume disperses from the top of the aquifer. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

This sheet calculates the Level 3 remedial target for soils(mg/kg) or for pore water (mg/l), based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.By setting a long travel time (e.g. 9E99) it will give the steady state solution, which should always be used when calculating remedial targets.

The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.9E+99.

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Calculated (relative) concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Relative concentration (No units)	Concentration mg/l
0	1.0E+00	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!

Remedial Targets Worksheet , Release 3.2

Calculation of contaminant concentration in groundwater from a soil source

Only input required is Soil Contaminant Concentration

Input Parameters			
Soil contaminant concentration	C_0	0.00E+00	mg/kg

Level 1 Parameters

Water filled soil porosity	θ_W	0.00E+00	fraction
Air filled soil porosity	θa	0.00E+00	fraction
Bulk density	ρ	0.00E+00	g/cm^3
Henry's Law constant	H	0.00E+00	dimensionless
Soil water partition coefficient used in Level Assessment	Kd	0.00E+00	l/kg
Factor (partitioning between soil and water)		#DIV/0!	dimensionless

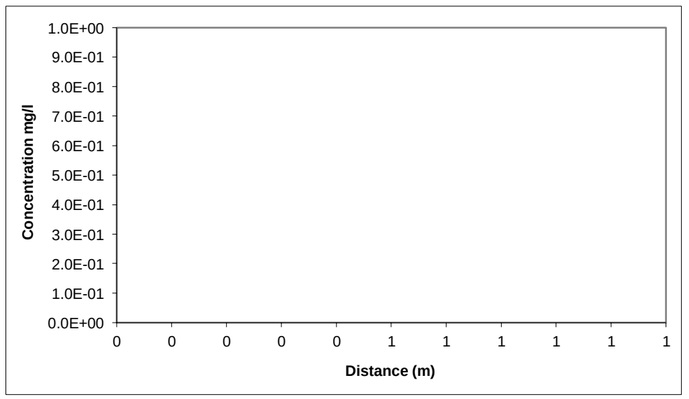
Level 2 Parameters **Dilution Factor** DF #DIV/0!

Level 3 Parameters **Attenuation factor (C_O/C_{ED})** AF #DIV/0!

Predicted concentrations at compliance point

Level 1	C	#DIV/0!	mg/l	No dilution or attenuation
Level 2	C	#DIV/0!	mg/l	Dilution taken into account
Level 3	C	#DIV/0!	mg/l	Dilution and attenuation taken into account

Predicted concentrations between source and compliance point - Level 3



Distance m	Concentration mg/l
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu) | **Variable** | **Value** | **Unit** | **Source**

Contaminant		cis 1,2-Dichloroethene		from Level 1
Target Concentration	C_T	1.00E-03	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Domenico - Steady state — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	1.50E-02	mg/l	*Site investigation data*
Half life for degradation of contaminant in water	$t_{1/2}$	3.36E+02	days	*Agency for Toxic Substances and Diseases*
Calculated decay rate	λ	2.06E-03	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	7.50E+01	m	*Length of site perpendicular to groundwater flow*
Plume thickness at source	Sy	5.90E+00	m	*Same as Mixing Zone Thickness. "For a thin aquifer (typically <10m), the mixing zone thickness can be taken as the ac*
Saturated aquifer thickness	da	6.00E+00	m	*Maximum thickness recorded in vicinity of*
Bulk density of aquifer materials	ρ	1.60E+00	g/cm^3	*Typical bulk density for river terrace deposits (conserv*
Effective porosity of aquifer	n	4.40E-01	fraction	*Maximum porosity for coarse Gravel (Lovanh et al 2000) - conservative estimate*
Hydraulic gradient	i	4.40E-02	fraction	*Borehole level data*
Hydraulic conductivity of aquifer	K	1.00E+02	m/d	*Maximum typical value for clayey sandy G*
Distance to compliance point	x	2.03E+02	m	*Default compliance distance*
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	1.00E+100	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	4.90E+01	l/kg	*see options*
Longitudinal dispersivity	ax	6.25E+00	m	*see options*
Transverse dispersivity	az	6.25E-01	m	*see options*
Vertical dispersivity	ay	6.25E-02	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)

Soil water partition coefficient — Kd — 4.90E+01 — l/kg

Entry for non-polar organic chemicals (option)

Fraction of organic carbon in aquifer — foc — fraction

Organic carbon partition coefficient — Koc — l/kg

Entry for ionic organic chemicals (option)

Sorption coefficient for related species — $K_{OC,n}$ — l/kg

Sorption coefficient for ionised species — $K_{OC,I}$ — l/kg

pH value — pH

acid dissociation constant — pKa

Fraction of organic carbon in aquifer — foc — fraction

Soil water partition coefficient	Kd	4.90E+01	l/kg

Define dispersivity (click brown cell and use pull down list)

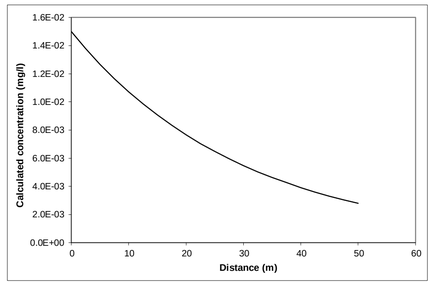
Dispersivity based on Xu & Eckstein (1995)

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	2.03E+01	6.25E+00	m
Transverse dispersivity	**az**	0.00E+00	2.03E+00	6.25E-01	m
Vertical dispersivity	**ay**	0.00E+00	2.03E-01	6.25E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Calculated concentrations for distance-concentration graph

Domenico - Steady state
From calculation sheet

Distance	Concentration
	mg/l
0	**1.5E-02**
10.2	**1.10E-02**
20.3	**8.00E-03**
30.5	**5.83E-03**
40.6	**4.23E-03**
50.8	**3.06E-03**
60.9	**2.20E-03**
71.1	**1.58E-03**
81.2	**1.14E-03**
91.4	**8.14E-04**
101.5	**5.83E-04**
111.7	**4.18E-04**
121.8	**2.99E-04**
132.0	**2.14E-04**
142.1	**1.53E-04**
152.3	**1.10E-04**
162.4	**7.88E-05**
172.6	**5.64E-05**
182.7	**4.04E-05**
192.9	**2.90E-05**
203.0	**2.08E-05**

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared

with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Calculated Parameters | **Variable**

Groundwater flow velocity	v	1.00E+01	m/d
Retardation factor	Rf	1.79E+02	fraction
Decay rate used	λ	2.06E-03	d^{-1}
Rate of contaminant flow due to retardation	u	5.58E-02	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	2.08E-05	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**7.22E+02**	

Remedial Targets

Remedial Target		**7.22E-01**	**mg/l**	For comparison with measured groundwater concentration.
Domenico - Steady state				
Distance to compliance point		**203**	**m**	
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**2.08E-05**	**mg/l**	Domenico - Steady state

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Porosity Calculator

These results are not carried through to any of the other worksheets

DRY BULK DENSITY DATA

Variable	Value	Unit	justification
Natural Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Dry Bulk Density	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
Initial Saturation	#DIV/0!	*%*	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	
Water Filled Porosity	**#DIV/0!**	**fraction**	

WET BULK DENSITY DATA

Variable	Value	Unit	
Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Actual (wet) Bulk Density (i.e. at natural MC)	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
dry bulk density	0.00	tonnes/m^3	
Initial Saturation	#DIV/0!	*%*	
Total porosity	**1.000**	**fraction**	**#DIV/0!**
Air Filled Porosity	**#DIV/0!**	**fraction**	
Water Filled Porosity	**#DIV/0!**	**fraction**	

Analytical solutions provided by David Hall, Golder Associates (UK) Ltd

Simple hydrogeological calculations

(These are not specific to, or required in, the Remedial Targets Methodology)

Parameter	symbol		unit	justification
Hydraulic conductivity	K	0.00E+00	m/d	
Hydraulic gradient	i	0.00E+00	unitless	
Effective porosity of aquifer	n	0.00E+00	fraction	
Thickness of saturated aquifer	b	0.00E+00	m	
Width of aquifer perpendicular to flow	w	0.00E+00	m	
Distance to receptor	x	0.00E+00	m	
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Soil-water partition co-efficient	Kd	0.00E+00	l/kg	
Retardation factor of pollutant	R	#DIV/0!		

Groundwater flow velocity	v(GW)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for groundwater to reach receptor	t(GW)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years
Rate of groundwater flow through aquifer	Q	0.00E+00	m^3/s	0.00E+00	m^3/day	0.00E+00	m^3/year

Contaminant flow velocity	v(contam)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for contaminant to reach receptor	t(contam)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years

Level 1 Calculation Sheet

Contaminant **1,2-Dichloroethene**

Parameter	Value	Units
(carried over from input sheet)		
C_T	1.00E-03	mg/l
Kd	0.00E+00	l/kg
foc		fraction
koc		l/kg
θ_W	0.00E+00	fraction
θa	0.00E+00	fraction
ρ	0.00E+00	g/cm3
H	0.00E+00	dimensionless
Koc,n		l/kg
Koc,i		l/kg
pH		pH units
pKa		
foc (ionic)		fraction

Calculations (Refer toTable 4.3, R&D Publication 20)

Selected option User specified value for partition coefficient

	calc	calc	Calc Kd	l/kg
Calculation of partition coefficient for ionic organic chemical				
Partition coefficient used in Level 1 Assessment			0.00E+00	l/kg

Calculated Remedial Target **#DIV/0!** **mg/kg** **for cis 1,2-Dichloroethene**

Factor (partitioning between soil and water) #DIV/0!

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	20/05/2026
Version:	1

Level 2 Calculation Sheet

Contaminant : 1,2-Dichloroethene

Site assessed:	Kelvedon Stre
Date:	20/05/2026
Version:	1

Parameter	Value	Units		
(carried over from input sheet)				
Mz	0.00E+00	m		
L	0.00E+00	m		
da	0.00E+00	m		Calculated
Inf	0.00E+00	m/d		Dilution Factor
K	0.00E+00	m/d		
i	0.00E+00		Calculation based on target concentration	#DIV/0!
A	0.00E+00	m3/d m2 m3/d	Calculation based on observed contaminant concentration	#DIV/0!
Cc	0.00E+00	mg/l		
C_T	1.00E-03	mg/l		
Cu	0.00E+00	mg/l		
w	0.00E+00	m		



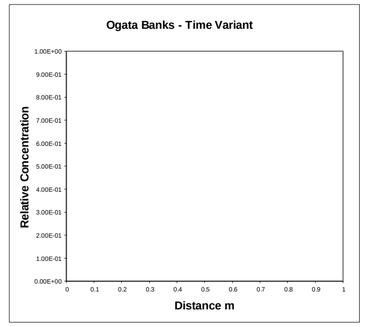
Contaminant **1,2-Dichloroethene**

OGATA BANKS SOLUTION

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-03	mg/l
DF	#DIV/0!	
λ	6.931E-101	days^{-1}
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Calc	Value	
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) -USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Date:	20/05/2026
Version:	1

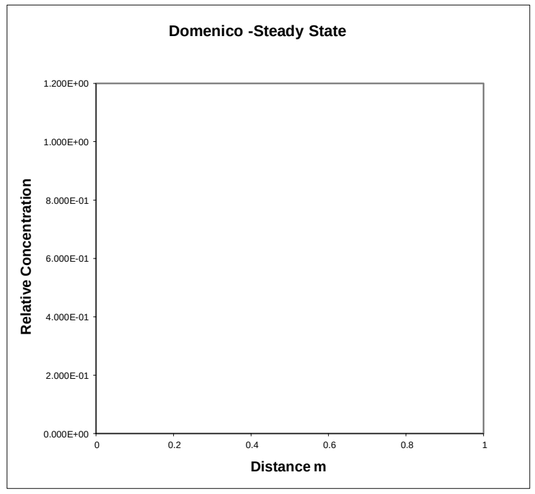
Contaminant **.,2-Dichloroethene**

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-03	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

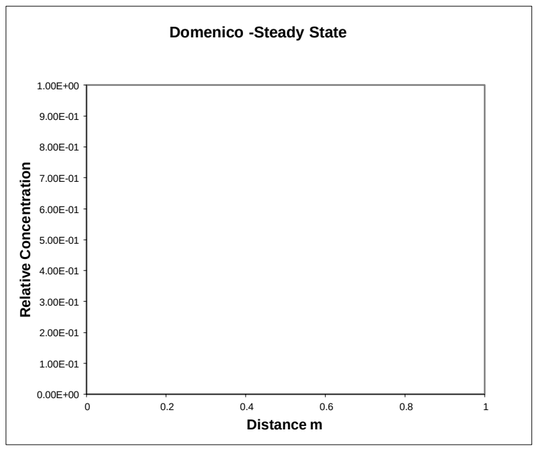


Calc	Value	Units
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Date:	20/05/2026
Version:	1

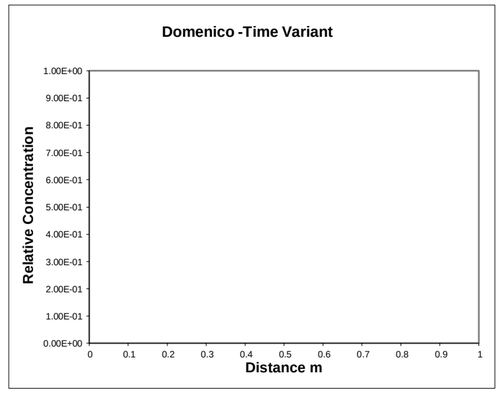
DOMENICO (TIME VARIANT)

Contaminant **l,2-Dichloroethene**

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.001	mg/l
DF	#DIV/0!	
λ	6.931E-101	days^{-1}
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

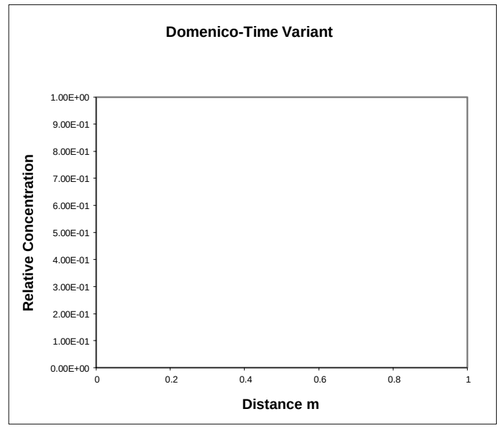


Calc **Value**

v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Date:	20/05/2026
Version:	1

OGATA BANKS SOLUTION

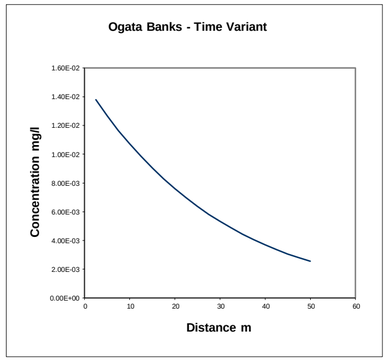
Contaminant **1,2-Dichloroethene**

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.001	mg/l
Co	1.50E-02	mg/l
λ	2.06E-03	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	4.90E+01	l/kg
ρ	1.60E+00	g/cm3
n	4.40E-01	
i	4.40E-02	
K	1.00E+02	m/d
x	2.03E+02	m
z	0.00E+00	m
y	0.00E+00	m
t	1.00E+100	days
ax	6.25E+00	m
az	6.25E-01	m
ay	6.25E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

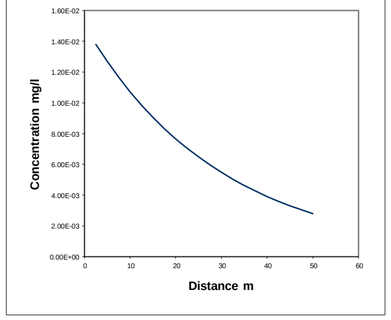
	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	10.15	0.00188	-3.1E-01	7.3E-01	-6.6E+48	2.000	1.9E+00	7.0E+00	6.6E+48	0.000	7.4E+00	1	-7.4E+00	-1	1.9E+00	0.9912	-1.9E+00	-0.99119	1.09E-02
2	20.3	0.00188	-6.3E-01	5.3E-01	-6.6E+48	2.000	3.9E+00	4.8E+01	6.6E+48	0.000	5.3E+00	1	-5.3E+00	-1	1.3E+00	0.936	-1.3E+00	-0.93602	7.49E-03
3	30.45	0.00188	-9.4E-01	3.9E-01	-6.6E+48	2.000	5.8E+00	3.4E+02	6.6E+48	0.000	4.3E+00	1	-4.3E+00	-1	1.1E+00	0.8696	-1.1E+00	-0.86956	5.08E-03
4	40.6	0.00188	-1.3E+00	2.8E-01	-6.6E+48	2.000	7.8E+00	2.3E+03	6.6E+48	0.000	3.7E+00	1	-3.7E+00	-1	9.3E-01	0.8097	-9.3E-01	-0.80973	3.45E-03
5	50.75	0.00188	-1.6E+00	2.1E-01	-6.6E+48	2.000	9.7E+00	1.6E+04	6.6E+48	0.000	3.3E+00	1	-3.3E+00	-1	8.3E-01	0.7586	-8.3E-01	-0.7586	2.36E-03
6	60.9	0.00188	-1.9E+00	1.5E-01	-6.6E+48	2.000	1.2E+01	1.1E+05	6.6E+48	0.000	3.0E+00	1	-3.0E+00	-0.99998	7.6E-01	0.7151	-7.6E-01	-0.71512	1.63E-03
7	71.05	0.00188	-2.2E+00	1.1E-01	-6.6E+48	2.000	1.4E+01	7.8E+05	6.6E+48	0.000	2.8E+00	0.9999	-2.8E+00	-0.99993	7.0E-01	0.6779	-7.0E-01	-0.67787	1.13E-03
8	81.2	0.00188	-2.5E+00	8.1E-02	-6.6E+48	2.000	1.6E+01	5.5E+06	6.6E+48	0.000	2.6E+00	0.9998	-2.6E+00	-0.9998	6.5E-01	0.6456	-6.5E-01	-0.64563	7.83E-04
9	91.35	0.00188	-2.8E+00	5.9E-02	-6.6E+48	2.000	1.7E+01	3.8E+07	6.6E+48	0.000	2.5E+00	0.9996	-2.5E+00	-0.99955	6.2E-01	0.6174	-6.2E-01	-0.61743	5.47E-04
10	101.5	0.00188	-3.1E+00	4.3E-02	-6.6E+48	2.000	1.9E+01	2.6E+08	6.6E+48	0.000	2.4E+00	0.9991	-2.4E+00	-0.99913	5.9E-01	0.5925	-5.9E-01	-0.59254	3.83E-04
11	111.65	0.00188	-3.5E+00	3.1E-02	-6.6E+48	2.000	2.1E+01	1.8E+09	6.6E+48	0.000	2.2E+00	0.9985	-2.2E+00	-0.9985	5.6E-01	0.5704	-5.6E-01	-0.57037	2.69E-04
12	121.8	0.00188	-3.8E+00	2.3E-02	-6.6E+48	2.000	2.3E+01	1.3E+10	6.6E+48	0.000	2.1E+00	0.9976	-2.1E+00	-0.99763	5.3E-01	0.5505	-5.3E-01	-0.55047	1.89E-04
13	131.95	0.00188	-4.1E+00	1.7E-02	-6.6E+48	2.000	2.5E+01	8.9E+10	6.6E+48	0.000	2.1E+00	0.9965	-2.1E+00	-0.99651	5.1E-01	0.5325	-5.1E-01	-0.53248	1.34E-04
14	142.1	0.00188	-4.4E+00	1.2E-02	-6.6E+48	2.000	2.7E+01	6.2E+11	6.6E+48	0.000	2.0E+00	0.9951	-2.0E+00	-0.99511	5.0E-01	0.5161	-5.0E-01	-0.51613	9.45E-05
15	152.25	0.00188	-4.7E+00	9.0E-03	-6.6E+48	2.000	2.9E+01	4.3E+12	6.6E+48	0.000	1.9E+00	0.9934	-1.9E+00	-0.99345	4.8E-01	0.5012	-4.8E-01	-0.50119	6.69E-05
16	162.4	0.00188	-5.0E+00	6.5E-03	-6.6E+48	2.000	3.1E+01	3.0E+13	6.6E+48	0.000	1.9E+00	0.9915	-1.9E+00	-0.99152	4.6E-01	0.4875	-4.6E-01	-0.48746	4.74E-05
17	172.55	0.00188	-5.3E+00	4.8E-03	-6.6E+48	2.000	3.3E+01	2.1E+14	6.6E+48	0.000	1.8E+00	0.9893	-1.8E+00	-0.98935	4.5E-01	0.4748	-4.5E-01	-0.47479	3.36E-05
18	182.7	0.00188	-5.7E+00	3.5E-03	-6.6E+48	2.000	3.5E+01	1.4E+15	6.6E+48	0.000	1.8E+00	0.9869	-1.8E+00	-0.98693	4.4E-01	0.463	-4.4E-01	-0.46305	2.39E-05
19	192.85	0.00188	-6.0E+00	2.5E-03	-6.6E+48	2.000	3.7E+01	1.0E+16	6.6E+48	0.000	1.7E+00	0.9843	-1.7E+00	-0.9843	4.2E-01	0.4521	-4.2E-01	-0.45213	1.70E-05
20	203	0.00188	-6.3E+00	1.9E-03	-6.6E+48	2.000	3.9E+01	7.0E+16	6.6E+48	0.000	1.7E+00	0.9815	-1.7E+00	-0.98146	4.1E-01	0.442	-4.1E-01	-0.44195	1.21E-05



Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

Calc	Value	
v	1.00E+01	m/d
Rc	1.79E+02	
u	5.58E-02	m/d

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	10.15	0.00188	-3.1E-01	7.3E-01	-6.6E+48	2.000	1.9E+00	7.0E+00	6.6E+48	0.000	7.4E+00	1	-7.4E+00	-1	3.7E+00	1	-3.7E+00	-1	1.10E-02
2	20.3	0.00188	-6.3E-01	5.3E-01	-6.6E+48	2.000	3.9E+00	4.8E+01	6.6E+48	0.000	5.3E+00	1	-5.3E+00	-1	2.6E+00	0.9998	-2.6E+00	-0.99979	8.00E-03
3	30.45	0.00188	-9.4E-01	3.9E-01	-6.6E+48	2.000	5.8E+00	3.4E+02	6.6E+48	0.000	4.3E+00	1	-4.3E+00	-1	2.1E+00	0.9975	-2.1E+00	-0.99751	5.83E-03
4	40.6	0.00188	-1.3E+00	2.8E-01	-6.6E+48	2.000	7.8E+00	2.3E+03	6.6E+48	0.000	3.7E+00	1	-3.7E+00	-1	1.9E+00	0.9912	-1.9E+00	-0.99119	4.23E-03
5	50.75	0.00188	-1.6E+00	2.1E-01	-6.6E+48	2.000	9.7E+00	1.6E+04	6.6E+48	0.000	3.3E+00	1	-3.3E+00	-1	1.7E+00	0.9809	-1.7E+00	-0.98087	3.06E-03
6	60.9	0.00188	-1.9E+00	1.5E-01	-6.6E+48	2.000	1.2E+01	1.1E+05	6.6E+48	0.000	3.0E+00	1	-3.0E+00	-0.99998	1.5E+00	0.9676	-1.5E+00	-0.96755	2.20E-03
7	71.05	0.00188	-2.2E+00	1.1E-01	-6.6E+48	2.000	1.4E+01	7.8E+05	6.6E+48	0.000	2.8E+00	0.9999	-2.8E+00	-0.99993	1.4E+00	0.9523	-1.4E+00	-0.95232	1.58E-03
8	81.2	0.00188	-2.5E+00	8.1E-02	-6.6E+48	2.000	1.6E+01	5.5E+06	6.6E+48	0.000	2.6E+00	0.9998	-2.6E+00	-0.9998	1.3E+00	0.936	-1.3E+00	-0.93602	1.14E-03
9	91.35	0.00188	-2.8E+00	5.9E-02	-6.6E+48	2.000	1.7E+01	3.8E+07	6.6E+48	0.000	2.5E+00	0.9996	-2.5E+00	-0.99955	1.2E+00	0.9193	-1.2E+00	-0.91925	8.14E-04
10	101.5	0.00188	-3.1E+00	4.3E-02	-6.6E+48	2.000	1.9E+01	2.6E+08	6.6E+48	0.000	2.4E+00	0.9991	-2.4E+00	-0.99913	1.2E+00	0.9024	-1.2E+00	-0.90243	5.83E-04
11	111.65	0.00188	-3.5E+00	3.1E-02	-6.6E+48	2.000	2.1E+01	1.8E+09	6.6E+48	0.000	2.2E+00	0.9985	-2.2E+00	-0.9985	1.1E+00	0.8858	-1.1E+00	-0.88581	4.18E-04
12	121.8	0.00188	-3.8E+00	2.3E-02	-6.6E+48	2.000	2.3E+01	1.3E+10	6.6E+48	0.000	2.1E+00	0.9976	-2.1E+00	-0.99763	1.1E+00	0.8696	-1.1E+00	-0.86956	2.99E-04
13	131.95	0.00188	-4.1E+00	1.7E-02	-6.6E+48	2.000	2.5E+01	8.9E+10	6.6E+48	0.000	2.1E+00	0.9965	-2.1E+00	-0.99651	1.0E+00	0.8538	-1.0E+00	-0.85379	2.14E-04
14	142.1	0.00188	-4.4E+00	1.2E-02	-6.6E+48	2.000	2.7E+01	6.2E+11	6.6E+48	0.000	2.0E+00	0.9951	-2.0E+00	-0.99511	9.9E-01	0.8385	-9.9E-01	-0.83855	1.53E-04
15	152.25	0.00188	-4.7E+00	9.0E-03	-6.6E+48	2.000	2.9E+01	4.3E+12	6.6E+48	0.000	1.9E+00	0.9934	-1.9E+00	-0.99345	9.6E-01	0.8239	-9.6E-01	-0.82386	1.10E-04
16	162.4	0.00188	-5.0E+00	6.5E-03	-6.6E+48	2.000	3.1E+01	3.0E+13	6.6E+48	0.000	1.9E+00	0.9915	-1.9E+00	-0.99152	9.3E-01	0.8097	-9.3E-01	-0.80973	7.88E-05
17	172.55	0.00188	-5.3E+00	4.8E-03	-6.6E+48	2.000	3.3E+01	2.1E+14	6.6E+48	0.000	1.8E+00	0.9893	-1.8E+00	-0.98935	9.0E-01	0.7962	-9.0E-01	-0.79615	5.64E-05
18	182.7	0.00188	-5.7E+00	3.5E-03	-6.6E+48	2.000	3.5E+01	1.4E+15	6.6E+48	0.000	1.8E+00	0.9869	-1.8E+00	-0.98693	8.7E-01	0.7831	-8.7E-01	-0.78312	4.04E-05
19	192.85	0.00188	-6.0E+00	2.5E-03	-6.6E+48	2.000	3.7E+01	1.0E+16	6.6E+48	0.000	1.7E+00	0.9843	-1.7E+00	-0.9843	8.5E-01	0.7706	-8.5E-01	-0.77061	2.90E-05
20	203	0.00188	-6.3E+00	1.9E-03	-6.6E+48	2.000	3.9E+01	7.0E+16	6.6E+48	0.000	1.7E+00	0.9815	-1.7E+00	-0.98146	8.3E-01	0.7586	-8.3E-01	-0.7586	2.08E-05



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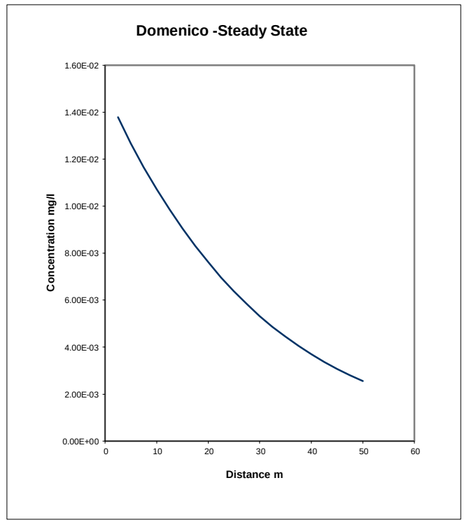
Contaminant „2-Dichloroethene

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.001	mg/l
Co	1.50E-02	mg/l
λ	2.06E-03	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	4.90E+01	l/kg
ρ	1.60E+00	g/cm3
n	4.40E-01	
i	4.40E-02	
K	1.00E+02	m/d
x	2.03E+02	m
z	0.00E+00	m
y	0.00E+00	m
ax	6.25E+00	m
az	6.25E-01	m
ay	6.25E-02	m

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	10.15	0.00375	-3.14E-01	7.30E-01	7.45E+00	1	-7.45E+00	-1	1.85E+00	0.9912	-1.85E+00	-0.9912	1.09E-02
2	20.3	0.00375	-6.29E-01	5.33E-01	5.27E+00	1	-5.27E+00	-1	1.31E+00	0.936	-1.31E+00	-0.936	7.49E-03
3	30.45	0.00375	-9.43E-01	3.89E-01	4.30E+00	1	-4.30E+00	-1	1.07E+00	0.8696	-1.07E+00	-0.8696	5.08E-03
4	40.6	0.00375	-1.26E+00	2.84E-01	3.72E+00	1	-3.72E+00	-1	9.26E-01	0.8097	-9.26E-01	-0.8097	3.45E-03
5	50.75	0.00375	-1.57E+00	2.08E-01	3.33E+00	1	-3.33E+00	-1	8.28E-01	0.7586	-8.28E-01	-0.7586	2.36E-03
6	60.9	0.00375	-1.89E+00	1.52E-01	3.04E+00	0.99998	-3.04E+00	-1	7.56E-01	0.7151	-7.56E-01	-0.7151	1.63E-03
7	71.05	0.00375	-2.20E+00	1.11E-01	2.81E+00	0.99993	-2.81E+00	-0.9999	7.00E-01	0.6779	-7.00E-01	-0.6779	1.13E-03
8	81.2	0.00375	-2.51E+00	8.09E-02	2.63E+00	0.9998	-2.63E+00	-0.9998	6.55E-01	0.6456	-6.55E-01	-0.6456	7.83E-04
9	91.35	0.00375	-2.83E+00	5.91E-02	2.48E+00	0.99955	-2.48E+00	-0.9996	6.17E-01	0.6174	-6.17E-01	-0.6174	5.47E-04
10	101.5	0.00375	-3.14E+00	4.31E-02	2.35E+00	0.99913	-2.35E+00	-0.9991	5.86E-01	0.5925	-5.86E-01	-0.5925	3.83E-04
11	111.65	0.00375	-3.46E+00	3.15E-02	2.25E+00	0.9985	-2.25E+00	-0.9985	5.58E-01	0.5704	-5.58E-01	-0.5704	2.69E-04
12	121.8	0.00375	-3.77E+00	2.30E-02	2.15E+00	0.99763	-2.15E+00	-0.9976	5.35E-01	0.5505	-5.35E-01	-0.5505	1.89E-04
13	131.95	0.00375	-4.09E+00	1.68E-02	2.07E+00	0.99651	-2.07E+00	-0.9965	5.14E-01	0.5325	-5.14E-01	-0.5325	1.34E-04
14	142.1	0.00375	-4.40E+00	1.23E-02	1.99E+00	0.99511	-1.99E+00	-0.9951	4.95E-01	0.5161	-4.95E-01	-0.5161	9.45E-05
15	152.25	0.00375	-4.72E+00	8.95E-03	1.92E+00	0.99345	-1.92E+00	-0.9934	4.78E-01	0.5012	-4.78E-01	-0.5012	6.69E-05
16	162.4	0.00375	-5.03E+00	6.54E-03	1.86E+00	0.99152	-1.86E+00	-0.9915	4.63E-01	0.4875	-4.63E-01	-0.4875	4.74E-05
17	172.55	0.00375	-5.34E+00	4.78E-03	1.81E+00	0.98935	-1.81E+00	-0.9893	4.49E-01	0.4748	-4.49E-01	-0.4748	3.36E-05
18	182.7	0.00375	-5.66E+00	3.49E-03	1.76E+00	0.98693	-1.76E+00	-0.9869	4.37E-01	0.463	-4.37E-01	-0.463	2.39E-05
19	192.85	0.00375	-5.97E+00	2.55E-03	1.71E+00	0.9843	-1.71E+00	-0.9843	4.25E-01	0.4521	-4.25E-01	-0.4521	1.70E-05
20	203	0.00375	-6.29E+00	1.86E-03	1.66E+00	0.98146	-1.66E+00	-0.9815	4.14E-01	0.442	-4.14E-01	-0.442	1.21E-05



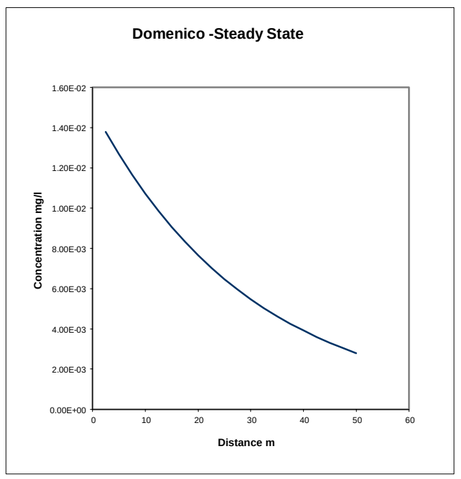
Vertical dispersion optio Simulate vertical dispersion in 1 direction

Calc	Value	
v	1.00E+01	m/d
Rc	1.79E+02	
u	5.58E-02	m/d

DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	10.15	0.00375	-3.14E-01	7.30E-01	7.45E+00	1	-7.45E+00	-1	3.70E+00	1	-3.70E+00	-1	1.10E-02
2	20.3	0.00375	-6.29E-01	5.33E-01	5.27E+00	1	-5.27E+00	-1	2.62E+00	0.9998	-2.62E+00	-0.9998	8.00E-03
3	30.45	0.00375	-9.43E-01	3.89E-01	4.30E+00	1	-4.30E+00	-1	2.14E+00	0.9975	-2.14E+00	-0.9975	5.83E-03
4	40.6	0.00375	-1.26E+00	2.84E-01	3.72E+00	1	-3.72E+00	-1	1.85E+00	0.9912	-1.85E+00	-0.9912	4.23E-03
5	50.75	0.00375	-1.57E+00	2.08E-01	3.33E+00	1	-3.33E+00	-1	1.66E+00	0.9809	-1.66E+00	-0.9809	3.06E-03
6	60.9	0.00375	-1.89E+00	1.52E-01	3.04E+00	0.99998	-3.04E+00	-1	1.51E+00	0.9676	-1.51E+00	-0.9676	2.20E-03
7	71.05	0.00375	-2.20E+00	1.11E-01	2.81E+00	0.99993	-2.81E+00	-0.9999	1.40E+00	0.9523	-1.40E+00	-0.9523	1.58E-03
8	81.2	0.00375	-2.51E+00	8.09E-02	2.63E+00	0.9998	-2.63E+00	-0.9998	1.31E+00	0.936	-1.31E+00	-0.936	1.14E-03
9	91.35	0.00375	-2.83E+00	5.91E-02	2.48E+00	0.99955	-2.48E+00	-0.9996	1.23E+00	0.9193	-1.23E+00	-0.9193	8.14E-04
10	101.5	0.00375	-3.14E+00	4.31E-02	2.35E+00	0.99913	-2.35E+00	-0.9991	1.17E+00	0.9024	-1.17E+00	-0.9024	5.83E-04
11	111.65	0.00375	-3.46E+00	3.15E-02	2.25E+00	0.9985	-2.25E+00	-0.9985	1.12E+00	0.8858	-1.12E+00	-0.8858	4.18E-04
12	121.8	0.00375	-3.77E+00	2.30E-02	2.15E+00	0.99763	-2.15E+00	-0.9976	1.07E+00	0.8696	-1.07E+00	-0.8696	2.99E-04
13	131.95	0.00375	-4.09E+00	1.68E-02	2.07E+00	0.99651	-2.07E+00	-0.9965	1.03E+00	0.8538	-1.03E+00	-0.8538	2.14E-04
14	142.1	0.00375	-4.40E+00	1.23E-02	1.99E+00	0.99511	-1.99E+00	-0.9951	9.90E-01	0.8385	-9.90E-01	-0.8385	1.53E-04
15	152.25	0.00375	-4.72E+00	8.95E-03	1.92E+00	0.99345	-1.92E+00	-0.9934	9.57E-01	0.8239	-9.57E-01	-0.8239	1.10E-04
16	162.4	0.00375	-5.03E+00	6.54E-03	1.86E+00	0.99152	-1.86E+00	-0.9915	9.26E-01	0.8097	-9.26E-01	-0.8097	7.88E-05
17	172.55	0.00375	-5.34E+00	4.78E-03	1.81E+00	0.98935	-1.81E+00	-0.9893	8.98E-01	0.7962	-8.98E-01	-0.7962	5.64E-05
18	182.7	0.00375	-5.66E+00	3.49E-03	1.76E+00	0.98693	-1.76E+00	-0.9869	8.73E-01	0.7831	-8.73E-01	-0.7831	4.04E-05
19	192.85	0.00375	-5.97E+00	2.55E-03	1.71E+00	0.9843	-1.71E+00	-0.9843	8.50E-01	0.7706	-8.50E-01	-0.7706	2.90E-05
20	203	0.00375	-6.29E+00	1.86E-03	1.66E+00	0.98146	-1.66E+00	-0.9815	8.28E-01	0.7586	-8.28E-01	-0.7586	2.08E-05



Date:	20/05/2026
Version:	1

DOMENICO (TIME VARIANT)

Contaminant ι,2-Dichloroethene

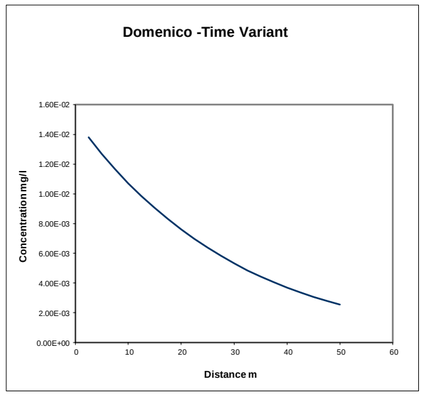
Input	Value	Units
C_T	0.001	mg/l
Co	1.50E-02	mg/l
λ	2.06E-03	$days^{-1}$
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	4.90E+01	l/kg
ρ	1.60E+00	g/cm3
n	4.40E-01	
i	4.40E-02	
K	1.00E+02	m/d
x	2.03E+02	m
z	0.00E+00	m
y	0.00E+00	m
t	1.00E+100	days
ax	6.25E+00	m
az	6.25E-01	m
ay	6.25E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

Calc	Value	
v	1.00E+01	m/d
Rc	1.79E+02	
u	5.58E-02	m/d

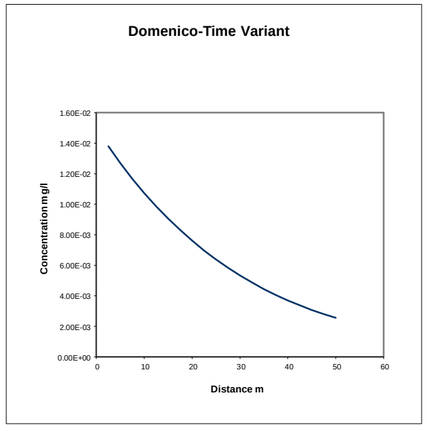
Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	10.15	0.00188	-3.14E-01	7.30E-01	-6.55E+48	2	7.45E+00	1	-7.45E+00	-1	1.85E+00	0.9912	-1.85E+00	-0.991	1.09E-02
2	20.3	0.00188	-6.29E-01	5.33E-01	-6.55E+48	2	5.27E+00	1	-5.27E+00	-1	1.31E+00	0.936	-1.31E+00	-0.936	7.49E-03
3	30.45	0.00188	-9.43E-01	3.89E-01	-6.55E+48	2	4.30E+00	1	-4.30E+00	-1	1.07E+00	0.8696	-1.07E+00	-0.87	5.08E-03
4	40.6	0.00188	-1.26E+00	2.84E-01	-6.55E+48	2	3.72E+00	1	-3.72E+00	-1	9.26E-01	0.8097	-9.26E-01	-0.81	3.45E-03
5	50.75	0.00188	-1.57E+00	2.08E-01	-6.55E+48	2	3.33E+00	1	-3.33E+00	-1	8.28E-01	0.7586	-8.28E-01	-0.759	2.36E-03
6	60.9	0.00188	-1.89E+00	1.52E-01	-6.55E+48	2	3.04E+00	1	-3.04E+00	-1	7.56E-01	0.7151	-7.56E-01	-0.715	1.63E-03
7	71.05	0.00188	-2.20E+00	1.11E-01	-6.55E+48	2	2.81E+00	0.9999	-2.81E+00	-1	7.00E-01	0.6779	-7.00E-01	-0.678	1.13E-03
8	81.2	0.00188	-2.51E+00	8.09E-02	-6.55E+48	2	2.63E+00	0.9998	-2.63E+00	-1	6.55E-01	0.6456	-6.55E-01	-0.646	7.83E-04
9	91.35	0.00188	-2.83E+00	5.91E-02	-6.55E+48	2	2.48E+00	0.9996	-2.48E+00	-1	6.17E-01	0.6174	-6.17E-01	-0.617	5.47E-04
10	101.5	0.00188	-3.14E+00	4.31E-02	-6.55E+48	2	2.35E+00	0.9991	-2.35E+00	-0.999	5.86E-01	0.5925	-5.86E-01	-0.593	3.83E-04
11	111.65	0.00188	-3.46E+00	3.15E-02	-6.55E+48	2	2.25E+00	0.9985	-2.25E+00	-0.999	5.58E-01	0.5704	-5.58E-01	-0.57	2.69E-04
12	121.8	0.00188	-3.77E+00	2.30E-02	-6.55E+48	2	2.15E+00	0.9976	-2.15E+00	-0.998	5.35E-01	0.5505	-5.35E-01	-0.55	1.89E-04
13	131.95	0.00188	-4.09E+00	1.68E-02	-6.55E+48	2	2.07E+00	0.9965	-2.07E+00	-0.997	5.14E-01	0.5325	-5.14E-01	-0.532	1.34E-04
14	142.1	0.00188	-4.40E+00	1.23E-02	-6.55E+48	2	1.99E+00	0.9951	-1.99E+00	-0.995	4.95E-01	0.5161	-4.95E-01	-0.516	9.45E-05
15	152.25	0.00188	-4.72E+00	8.95E-03	-6.55E+48	2	1.92E+00	0.9934	-1.92E+00	-0.993	4.78E-01	0.5012	-4.78E-01	-0.501	6.69E-05
16	162.4	0.00188	-5.03E+00	6.54E-03	-6.55E+48	2	1.86E+00	0.9915	-1.86E+00	-0.992	4.63E-01	0.4875	-4.63E-01	-0.487	4.74E-05
17	172.55	0.00188	-5.34E+00	4.78E-03	-6.55E+48	2	1.81E+00	0.9893	-1.81E+00	-0.989	4.49E-01	0.4748	-4.49E-01	-0.475	3.36E-05
18	182.7	0.00188	-5.66E+00	3.49E-03	-6.55E+48	2	1.76E+00	0.9869	-1.76E+00	-0.987	4.37E-01	0.463	-4.37E-01	-0.463	2.39E-05
19	192.85	0.00188	-5.97E+00	2.55E-03	-6.55E+48	2	1.71E+00	0.9843	-1.71E+00	-0.984	4.25E-01	0.4521	-4.25E-01	-0.452	1.70E-05
20	203	0.00188	-6.29E+00	1.86E-03	-6.55E+48	2	1.66E+00	0.9815	-1.66E+00	-0.981	4.14E-01	0.442	-4.14E-01	-0.442	1.21E-05



Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	10.15	0.00188	-3.14E-01	7.30E-01	-6.55E+48	2	7.45E+00	1	-7.45E+00	-1	3.70E+00	1	-3.70E+00	-1	1.10E-02
2	20.3	0.00188	-6.29E-01	5.33E-01	-6.55E+48	2	5.27E+00	1	-5.27E+00	-1	2.62E+00	0.9998	-2.62E+00	-1	8.00E-03
3	30.45	0.00188	-9.43E-01	3.89E-01	-6.55E+48	2	4.30E+00	1	-4.30E+00	-1	2.14E+00	0.9975	-2.14E+00	-0.998	5.83E-03
4	40.6	0.00188	-1.26E+00	2.84E-01	-6.55E+48	2	3.72E+00	1	-3.72E+00	-1	1.85E+00	0.9912	-1.85E+00	-0.991	4.23E-03
5	50.75	0.00188	-1.57E+00	2.08E-01	-6.55E+48	2	3.33E+00	1	-3.33E+00	-1	1.66E+00	0.9809	-1.66E+00	-0.981	3.06E-03
6	60.9	0.00188	-1.89E+00	1.52E-01	-6.55E+48	2	3.04E+00	1	-3.04E+00	-1	1.51E+00	0.9676	-1.51E+00	-0.968	2.20E-03
7	71.05	0.00188	-2.20E+00	1.11E-01	-6.55E+48	2	2.81E+00	0.9999	-2.81E+00	-1	1.40E+00	0.9523	-1.40E+00	-0.952	1.58E-03
8	81.2	0.00188	-2.51E+00	8.09E-02	-6.55E+48	2	2.63E+00	0.9998	-2.63E+00	-1	1.31E+00	0.936	-1.31E+00	-0.936	1.14E-03
9	91.35	0.00188	-2.83E+00	5.91E-02	-6.55E+48	2	2.48E+00	0.9996	-2.48E+00	-1	1.23E+00	0.9193	-1.23E+00	-0.919	8.14E-04
10	101.5	0.00188	-3.14E+00	4.31E-02	-6.55E+48	2	2.35E+00	0.9991	-2.35E+00	-0.999	1.17E+00	0.9024	-1.17E+00	-0.902	5.83E-04
11	111.65	0.00188	-3.46E+00	3.15E-02	-6.55E+48	2	2.25E+00	0.9985	-2.25E+00	-0.999	1.12E+00	0.8858	-1.12E+00	-0.886	4.18E-04
12	121.8	0.00188	-3.77E+00	2.30E-02	-6.55E+48	2	2.15E+00	0.9976	-2.15E+00	-0.998	1.07E+00	0.8696	-1.07E+00	-0.87	2.99E-04
13	131.95	0.00188	-4.09E+00	1.68E-02	-6.55E+48	2	2.07E+00	0.9965	-2.07E+00	-0.997	1.03E+00	0.8538	-1.03E+00	-0.854	2.14E-04
14	142.1	0.00188	-4.40E+00	1.23E-02	-6.55E+48	2	1.99E+00	0.9951	-1.99E+00	-0.995	9.90E-01	0.8385	-9.90E-01	-0.839	1.53E-04
15	152.25	0.00188	-4.72E+00	8.95E-03	-6.55E+48	2	1.92E+00	0.9934	-1.92E+00	-0.993	9.57E-01	0.8239	-9.57E-01	-0.824	1.10E-04
16	162.4	0.00188	-5.03E+00	6.54E-03	-6.55E+48	2	1.86E+00	0.9915	-1.86E+00	-0.992	9.26E-01	0.8097	-9.26E-01	-0.81	7.88E-05
17	172.55	0.00188	-5.34E+00	4.78E-03	-6.55E+48	2	1.81E+00	0.9893	-1.81E+00	-0.989	8.98E-01	0.7962	-8.98E-01	-0.796	5.64E-05
18	182.7	0.00188	-5.66E+00	3.49E-03	-6.55E+48	2	1.76E+00	0.9869	-1.76E+00	-0.987	8.73E-01	0.7831	-8.73E-01	-0.783	4.04E-05
19	192.85	0.00188	-5.97E+00	2.55E-03	-6.55E+48	2	1.71E+00	0.9843	-1.71E+00	-0.984	8.50E-01	0.7706	-8.50E-01	-0.771	2.90E-05
20	203	0.00188	-6.29E+00	1.86E-03	-6.55E+48	2	1.66E+00	0.9815	-1.66E+00	-0.981	8.28E-01	0.7586	-8.28E-01	-0.759	2.08E-05



Date:	20/05/2026
Version:	1

Hydrogeological risk assessment for land contamination

Remedial Targets Worksheet , Release 3.2

First released: 2006. Version 3.2: January 2013

This worksheet has been produced in combination with the document 'Remedial Targets Methodology: Hydrogeological risk assessment for land contamination (Environment Agency 2006).

Users of this worksheet should always refer to the User Manual to the Remedial Targets Methodology and to relevant guidance on UK legislation and policy, in order to understand how this procedure should be applied in an appropriate context.

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The calculation of equations in this worksheet has been independently checked by Entec (UK) Ltd on behalf of the Environment Agency.

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IMPORTANT: To enable MS Excel worksheet, click Tools, Add -Ins, Analysis Tool Pak and Analysis Tool Pak-VBA (to calculate error functions)

Details to be completed for each assessment				
Site Name:	Kelvedon Street			
Site Address:	Newport			
Completed by:	Michael Watkins			
Date:	11-Dec-25		Version:	1
Contaminant	cis 1,2-Dichloroethene			
Target Concentration (C_T)	0.001	mg/l	Origin of C_T:	Laboratory detection limit

This worksheet can be used to determine remedial targets for soils (Worksheets Level 1 Soil, Level 2 and Level 3 Soil) or to determine remedial targets for groundwater (Level 3 Groundwater). For Level 3, parameter values must be entered separately dependent on whether the assessment is for soil or groundwater. For soil, remedial targets are calculated as either mg/kg (for comparision with soil measurements) or mg/l (for comparison with leaching tests or pore water concentrations).
Site details entered on this page are automatically copied to Level 1, 2 and 3 Worksheets.
Worksheet options are identified by brown background and employ a pull-down menus. Data entry are identified as blue background.
Data origin / justification should be noted in cells coloured yellow and fully documented in subsequent reports.
Data carried forward from an earlier worksheet are identified by a light green background
It is recommended that a copy of the original worksheet is saved (all data fields in the original copy are blank).

The spreadsheet also includes a porosity calculation worksheet, a soil impact calculation worksheet and a worksheet that performs some simple hydrogeological calculations.

Remedial Targets Worksheet , Release 3.2

Level 1 - Soil

Environment Agency

Select the method of calculating the soil water Partition Co-efficient by using the pull down menu below

User specified value for partition coefficient

Contaminant		**cis 1,2-Dichloroethene**		
Target concentration	**C_T**	**0.001**	**mg/l**	

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**
Standard entry				
Water filled soil porosity	θ_W	0.00E+00	fraction	
Air filled soil porosity	θa	0.00E+00	fraction	
Bulk density of soil zone material	ρ	0.00E+00	g/cm^3	
Henry's Law constant	H	0.00E+00	dimensionless	
Entry if specify partition coefficient (option)				
Soil water partition coefficient	Kd	0.00E+00	l/kg	
Entry for non-polar organic chemicals (option)				
Fraction of organic carbon (in soil)	foc		fraction	
Organic carbon partition coefficient	Koc		l/kg	
Entry for ionic organic chemicals (option)				
Sorption coefficient for neutral species	$K_{oc,n}$		l/kg	
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg	
pH value	pH		pH units	
Acid dissociation constant	pKa			
Fraction of organic carbon (in soil)	foc		fraction	
Soil water partition coefficient used in Level Assessment	**Kd**	**0.00E+00**	**l/kg**	*Specified value*

This sheet calculates the Level 1 remedial target for soils(mg/kg) based on a selected target concentration and theoretical calculation of soil water partitioning. Three options are included for determining the partition coefficient.

The measured soil concentration as mg/kg should be compared with the Level 1 remedial target to determine the need for further action.

Level 1 Remedial Target

Level 1 Remedial Target	**#DIV/0!**	**mg/kg**	**(for comparison with soil analyses)**
	or		
	0.001	**mg/l**	**(for comparison with leachate test results)**

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

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Level 2 - Soil

Contaminant		**cis 1,2-Dichloroethene**	from Level 1	This sheet calculates the Level 2 remedial target for soils (mg/kg) or for pore water (mg/l).
Target concentration	**C_T**	**0.001** **mg/l**	from Level 1	

The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 2 remedial target to determine the need for further action. Equations presented in 'Hydrogeological risk assessment for land contamiantion' (Environment Agency 2006)

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**	
Standard entry					
Infiltration	Inf	0.00E+00	m/d		
Area of contaminant source	A	0.00E+00	m^2		Not used in calculation
Entry for groundwater flow below site					
Length of contaminant source in direction of groundwater flow	L	0.00E+00	m		
Saturated aquifer thickness	da	0.00E+00	m		
Hydraulic Conductivity of aquifer in which dilution occurs	K	0.00E+00	m/d		
Hydraulic gradient of water table	i	0.00E+00	fraction		
Width of contaminant source perpendicular to groundwater flow	w	0.00E+00	m		Not used in calculation
Background concentration of contaminant in groundwater beneath site	Cu	0.00E+00	mg/l		
Define mixing zone depth by specifying or calculating depth (using pull down list)		**Specify**			
Enter mixing zone thickness	Mz	0.00E+00	m		
Calculated mixing zone thickness	Mz		m		

Calculated Parameters

Dilution Factor	**DF**	**#DIV/0!**		
Level 2 Remedial Target		**#DIV/0!**	**mg/l**	**For comparison with measured pore water concentration. This assumes Level 1 Remedial Target is based on Target Concentrati**
		or		
		#DIV/0!	**mg/kg**	**For comparison with measured soil concentration. This assumes Level 1 Remedial Target calculated from soil-water**

Additional option

Calculation of impact on receptor

Concentration of contaminant in contaminated discharge (entering receptor)	Cc	0.00E+00	mg/l	
Calculated concentration within receptor (dilution only)		#DIV/0!	mg/l	0

Site being assessed:	Kelvedon Street
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Level 3 - Soil

See Note

Input Parameters	Variable	Value	Unit	Source
Contaminant		cis 1,2-Dichloroethene		from Level 1
Target Concentration	C_T	0.001	mg/l	from Level 1
Dilution Factor	DF	#DIV/0!		from Level 2

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value, l

	Variable	Value	Unit	Source of parameter value
Enter source concentration		Soil concentration as mg/kg		
Enter soil concentration		0	mg/kg	
Half life for degradation of contaminant in water	$t_{1/2}$	1.00E+100	days	
Calculated decay rate	λ	6.93E-101	$days^{-1}$	calculated
Width of plume in aquifer at source	Sz	0.00E+00	m	from Level 2
Plume thickness in aquifer at source	Sy	0.00E+00	m	from Level 2
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Effective porosity of aquifer	n	0.00E+00	fraction	
Hydraulic gradient	i	#DIV/0!	fraction	from Level 2 (adjusted)
Hydraulic conductivity of saturated aquifer	K	0.00E+00	m/d	from Level 2
Distance to compliance point	x	0.00E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	1.00E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	0.00E+00	l/kg	*see options*
Longitudinal dispersivity	ax	0.000	m	*see options*
Transverse dispersivity	az	0.000	m	*see options*
Vertical dispersivity	ay	0.000	m	*see options*

Parameter values should be checked against Level 1 and 2

Calculated Parameters	Variable		
Groundwater flow velocity	v	#DIV/0!	m/d
Retardation factor	Rf	#DIV/0!	fraction
Decay rate used	λ	6.93E-101	d^{-1}
Hydraulic gradient used in aquifer flow down-gradient	i	#DIV/0!	fraction
Rate of contaminant flow due to retardation	u	#DIV/0!	m/d
Ratio of Compliance Point to Source Concentration	C_{ED}/C_0	#DIV/0!	fraction
Attenuation factor (C_0/C_{ED})	**AF**	**#DIV/0!**	**fraction**
Calculated soil leachate concentration	Co	#DIV/0!	mg/l

Remedial Targets

Level 3 Remedial Target		**#DIV/0!**	**mg/l**	For comparison with measured pore water concentration.
Ogata Banks		**or**		This assumes Level 1 Remedial Target is based on Target Concentration.
		#DIV/0!	**mg/kg**	For comparison with measured soil concentration. This
Distance to compliance point		**0**	**m**	assumes Level 1 Remedial Target calculated from soil-water partitioning equation.
Ratio of Compliance Point to Source Concentration	**C_{ED}/C_0**	**#DIV/0!**	**fraction**	Ogata Banks

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99

Enter method of defining partition co-efficient (using pull down list)

Calculate for ionic organic chemicals (acids)

Entry if specify partition coefficient (option)

Soil water partition coefficient — Kd — l/kg

Entry for non-polar organic chemicals (option)

Fraction of organic carbon in aquifer — foc — fraction
Organic carbon partition coefficient — Koc — l/kg

Entry for ionic organic chemicals (option)

Sorption coefficient for related species	$K_{OC,n}$	0.00E+00	l/kg
Sorption coefficient for ionised species	$K_{OC,I}$	0.00E+00	l/kg
pH value	pH	0.00E+00	
Acid dissociation constant	pKa	0.00E+00	
Fraction of organic carbon in aquifer	foc	0.00E+00	fraction
Soil water partition coefficient	Kd	0.00E+00	l/kg

Define dispersivity (click brown cell and use pull down list)

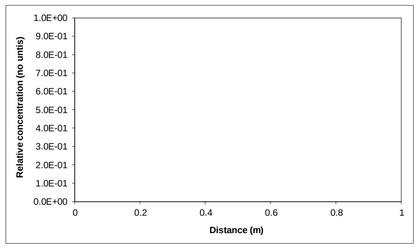
User defined values for dispersivity

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	0.00E+00	#NUM!	m
Transverse dispersivity	**az**	0.00E+00	0.00E+00	#NUM!	m
Vertical dispersivity	**ay**	0.00E+00	0.00E+00	#NUM!	m

Note values of dispersivity must be > 0

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed

Note
This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O_2, NO_3, SO_4 etc than an alternative solution should be used



Note: 'Relative concentration' is the ratio of calculated concentation at a given position compared to the source concentration. The calculations assume plume disperses from the top of the aquifer. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

This sheet calculates the Level 3 remedial target for soils(mg/kg) or for pore water (mg/l), based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.By setting a long travel time (e.g. 9E99) it will give the steady state solution, which should always be used when calculating remedial targets.

The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.9E+99.

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Calculated (relative) concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Relative concentration (No units)	Concentration mg/l
0	1.0E+00	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!

Remedial Targets Worksheet , Release 3.2

Calculation of contaminant concentration in groundwater from a soil source

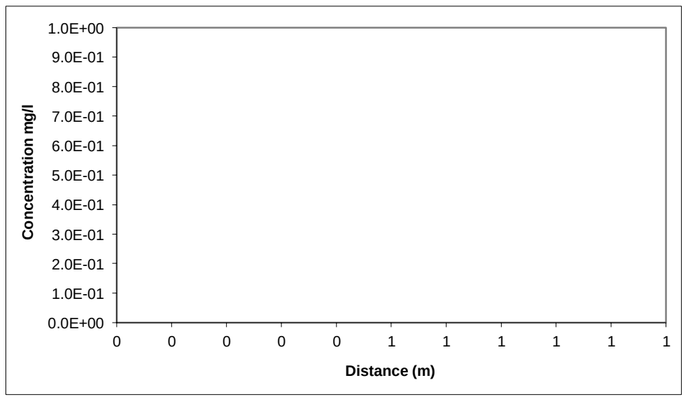
Only input required is Soil Contaminant Concentration

	Input Parameters			
	Soil contaminant concentration	C_0	0.00E+00	mg/kg
Level 1 Parameters				
	Water filled soil porosity	θ_W	0.00E+00	fraction
	Air filled soil porosity	θa	0.00E+00	fraction
	Bulk density	ρ	0.00E+00	g/cm^3
	Henry's Law constant	H	0.00E+00	dimensionless
	Soil water partition coefficient used in Level Assessment	Kd	0.00E+00	l/kg
	Factor (partitioning between soil and water)		#DIV/0!	dimensionless
Level 2 Parameters	**Dilution Factor**	DF	#DIV/0!	
Level 3 Parameters	**Attenuation factor (C_O/C_{ED})**	AF	#DIV/0!	

Predicted concentrations at compliance point

Level 1	C	#DIV/0!	mg/l	No dilution or attenuation
Level 2	C	#DIV/0!	mg/l	Dilution taken into account
Level 3	C	#DIV/0!	mg/l	Dilution and attenuation taken into account

Predicted concentrations between source and compliance point - Level 3



Distance m	Concentration mg/l
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!

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Level 3 - Groundwater

See Note

Input Parameters (using pull down menu) | **Variable** | **Value** | **Unit** | **Source**

Contaminant		cis 1,2-Dichloroethene		from Level 1
Target Concentration	C_T	1.00E-03	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Domenico - Steady state — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	1.50E-02	mg/l	*Site investigation data*
Half life for degradation of contaminant in water	$t_{1/2}$	3.36E+02	days	*Agency for Toxic Substances and Diseases*
Calculated decay rate	λ	2.06E-03	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	7.50E+01	m	*Length of site perpendicular to groundwater flow*
Plume thickness at source	Sy	5.90E+00	m	*Same as Mixing Zone Thickness. "For a thin aquifer (typically <10m), the mixing zone thickness can be taken as the ac*
Saturated aquifer thickness	da	6.00E+00	m	*Maximum thickness recorded in vicinity of*
Bulk density of aquifer materials	ρ	1.60E+00	g/cm^3	*Typical bulk density for river terrace deposits (conserv*
Effective porosity of aquifer	n	2.50E-01	fraction	*Maximum porosity for coarse Gravel (Lovanh et al 2000) - conservative estimate*
Hydraulic gradient	i	4.40E-02	fraction	*Borehole level data*
Hydraulic conductivity of aquifer	K	4.32E-01	m/d	*Maximum typical value for clayey sandy G*
Distance to compliance point	x	5.00E+01	m	*Default compliance distance*
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	9.90E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	4.90E+01	l/kg	*see options*
Longitudinal dispersivity	ax	5.00E+00	m	*see options*
Transverse dispersivity	az	5.00E-01	m	*see options*
Vertical dispersivity	ay	5.00E-02	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)

Soil water partition coefficient — Kd — 4.90E+01 — l/kg

Entry for non-polar organic chemicals (option)

Fraction of organic carbon in aquifer — foc — fraction

Organic carbon partition coefficient — Koc — l/kg

Entry for ionic organic chemicals (option)

Sorption coefficient for related species — $K_{OC,n}$ — l/kg

Sorption coefficient for ionised species — $K_{OC,I}$ — l/kg

pH value — pH

acid dissociation constant — pKa

Fraction of organic carbon in aquifer — foc — fraction

Soil water partition coefficient	Kd	4.90E+01	l/kg

Define dispersivity (click brown cell and use pull down list)

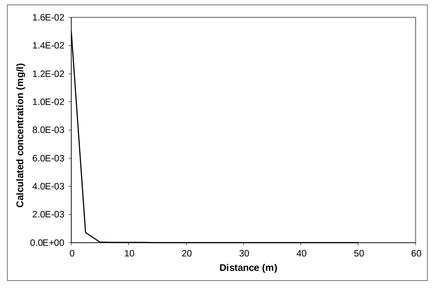
Dispersivities 10%, 1%, 0.1% of pathway length

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	5.00E+00	2.98E+00	m
Transverse dispersivity	**az**	0.00E+00	5.00E-01	2.98E-01	m
Vertical dispersivity	**ay**	0.00E+00	5.00E-02	2.98E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Calculated concentrations for distance-concentration graph

Domenico - Steady state
From calculation sheet

Distance	Concentration
	mg/l
0	1.5E-02
2.5	7.28E-04
5.0	3.53E-05
7.5	1.71E-06
10.0	8.30E-08
12.5	4.03E-09
15.0	1.95E-10
17.5	9.48E-12
20.0	4.60E-13
22.5	2.23E-14
25.0	1.08E-15
27.5	5.24E-17
30.0	2.54E-18
32.5	1.23E-19
35.0	5.98E-21
37.5	2.90E-22
40.0	1.40E-23
42.5	6.80E-25
45.0	3.30E-26
47.5	1.60E-27
50.0	7.73E-29

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Calculated Parameters | **Variable**

Groundwater flow velocity	v	7.60E-02	m/d
Retardation factor	Rf	3.15E+02	fraction
Decay rate used	λ	2.06E-03	d^{-1}
Rate of contaminant flow due to retardation	u	2.42E-04	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	7.73E-29	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**1.94E+26**	

Remedial Targets

Remedial Target		**1.94E+23**	**mg/l**	For comparison with measured groundwater concentration.
Domenico - Steady state				
Distance to compliance point		**50**	**m**	
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**7.73E-29**	**mg/l**	Domenico - Steady state

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Porosity Calculator

These results are not carried through to any of the other worksheets

DRY BULK DENSITY DATA

Variable	Value	Unit	justification
Natural Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Dry Bulk Density	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
Initial Saturation	#DIV/0!	*%*	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	
Water Filled Porosity	**#DIV/0!**	**fraction**	

WET BULK DENSITY DATA

Variable	Value	Unit	
Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Actual (wet) Bulk Density (i.e. at natural MC)	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
dry bulk density	0.00	tonnes/m^3	
Initial Saturation	#DIV/0!	*%*	
Total porosity	**1.000**	**fraction**	**#DIV/0!**
Air Filled Porosity	**#DIV/0!**	**fraction**	
Water Filled Porosity	**#DIV/0!**	**fraction**	

Analytical solutions provided by David Hall, Golder Associates (UK) Ltd

Simple hydrogeological calculations

(These are not specific to, or required in, the Remedial Targets Methodology)

Parameter	symbol		unit	justification
Hydraulic conductivity	K	0.00E+00	m/d	
Hydraulic gradient	i	0.00E+00	unitless	
Effective porosity of aquifer	n	0.00E+00	fraction	
Thickness of saturated aquifer	b	0.00E+00	m	
Width of aquifer perpendicular to flow	w	0.00E+00	m	
Distance to receptor	x	0.00E+00	m	
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Soil-water partition co-efficient	Kd	0.00E+00	l/kg	
Retardation factor of pollutant	R	#DIV/0!		

Groundwater flow velocity	v(GW)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for groundwater to reach receptor	t(GW)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years
Rate of groundwater flow through aquifer	Q	0.00E+00	m^3/s	0.00E+00	m^3/day	0.00E+00	m^3/year

Contaminant flow velocity	v(contam)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for contaminant to reach receptor	t(contam)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years

Level 1 Calculation Sheet

Contaminant **1,2-Dichloroethene**

Parameter	Value	Units
(carried over from input sheet)		
C_T	1.00E-03	mg/l
Kd	0.00E+00	l/kg
foc		fraction
koc		l/kg
θ_w	0.00E+00	fraction
θa	0.00E+00	fraction
ρ	0.00E+00	g/cm3
H	0.00E+00	dimensionless
Koc,n		l/kg
Koc,i		l/kg
pH		pH units
pKa		
foc (ionic)		fraction

Calculations (Refer toTable 4.3, R&D Publication 20)

Selected option User specified value for partition coefficient

	calc	calc	Calc Kd	l/kg
Calculation of partition coefficient for ionic organic chemical				
Partition coefficient used in Level 1 Assessment			0.00E+00	l/kg

Calculated Remedial Target **#DIV/0!** **mg/kg** **for** **cis 1,2-Dichloroethene**

Factor (partitioning between soil and water) #DIV/0!

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11/12/2025
Version:	1

Level 2 Calculation Sheet

Contaminant : 1,2-Dichloroethene

Site assessed:	Kelvedon Stre
Date:	11/12/2025
Version:	1

Parameter	Value	Units		
(carried over from input sheet)				
Mz	0.00E+00	m		
L	0.00E+00	m		
da	0.00E+00	m		Calculated
Inf	0.00E+00	m/d		Dilution Factor
K	0.00E+00	m/d		
i	0.00E+00		Calculation based on target concentration	#DIV/0!
A	0.00E+00	m3/d m2 m3/d	Calculation based on observed contaminant concentration	#DIV/0!
Cc	0.00E+00	mg/l		
C_T	1.00E-03	mg/l		
Cu	0.00E+00	mg/l		
w	0.00E+00	m		



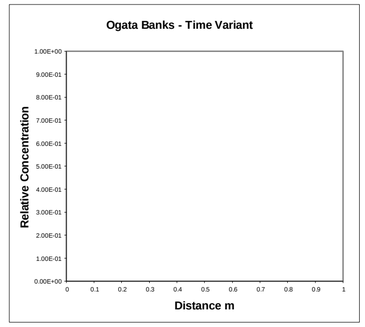
Contaminant **1,2-Dichloroethene**

OGATA BANKS SOLUTION

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-03	mg/l
DF	#DIV/0!	
λ	6.931E-101	days^{-1}
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Calc	Value	
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) -USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Date:	11/12/2025
Version:	1

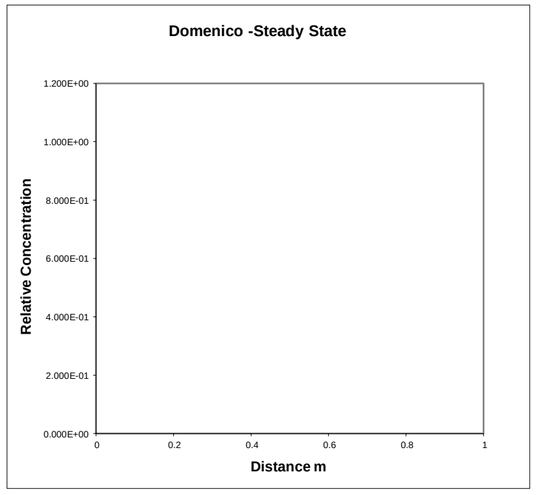
Contaminant **.,2-Dichloroethene**

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-03	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

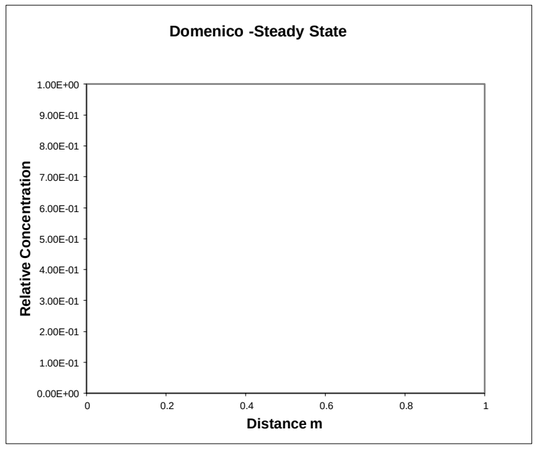


Calc	Value	Units
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Date:	11/12/2025
Version:	1

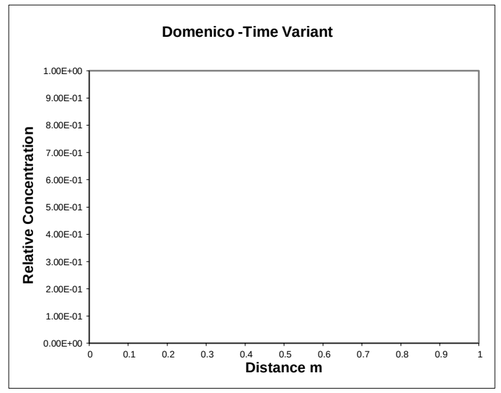
DOMENICO (TIME VARIANT)

Contaminant **l,2-Dichloroethene**

Input	Value	Units
C_T	0.001	mg/l
DF	#DIV/0!	
λ	6.931E-101	days^{-1}
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

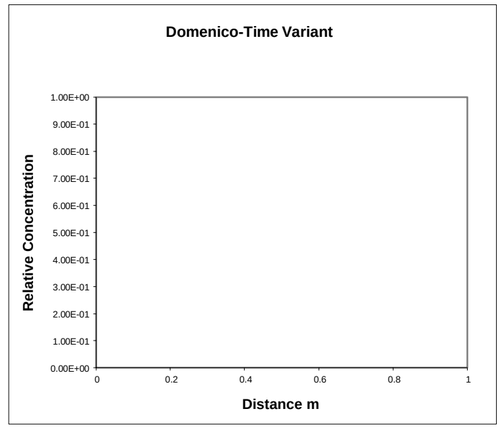
	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Calc	Value	
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Date:	11/12/2025
Version:	1

OGATA BANKS SOLUTION

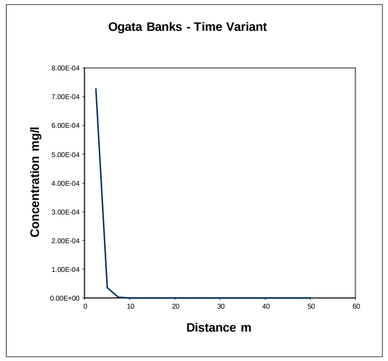
Contaminant **1,2-Dichloroethene**

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.001	mg/l
Co	1.50E-02	mg/l
λ	2.06E-03	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	4.90E+01	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.00188	-3.0E+00	4.9E-02	-4.5E+48	2.000	3.5E+00	3.4E+01	4.5E+48	0.000	1.7E+01	1	-1.7E+01	-1	4.2E+00	1	-4.2E+00	-1	7.28E-04
2	5	0.00188	-6.1E+00	2.4E-03	-4.5E+48	2.000	7.1E+00	1.2E+03	4.5E+48	0.000	1.2E+01	1	-1.2E+01	-1	3.0E+00	1	-3.0E+00	-0.99997	3.53E-05
3	7.5	0.00188	-9.1E+00	1.1E-04	-4.5E+48	2.000	1.1E+01	3.9E+04	4.5E+48	0.000	9.7E+00	1	-9.7E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	1.71E-06
4	10	0.00188	-1.2E+01	5.5E-06	-4.5E+48	2.000	1.4E+01	1.3E+06	4.5E+48	0.000	8.4E+00	1	-8.4E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	8.28E-08
5	12.5	0.00188	-1.5E+01	2.7E-07	-4.5E+48	2.000	1.8E+01	4.5E+07	4.5E+48	0.000	7.5E+00	1	-7.5E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	3.99E-09
6	15	0.00188	-1.8E+01	1.3E-08	-4.5E+48	2.000	2.1E+01	1.5E+09	4.5E+48	0.000	6.8E+00	1	-6.8E+00	-1	1.7E+00	0.984	-1.7E+00	-0.98399	1.92E-10
7	17.5	0.00188	-2.1E+01	6.3E-10	-4.5E+48	2.000	2.5E+01	5.2E+10	4.5E+48	0.000	6.3E+00	1	-6.3E+00	-1	1.6E+00	0.9743	-1.6E+00	-0.97425	9.23E-12
8	20	0.00188	-2.4E+01	3.1E-11	-4.5E+48	2.000	2.8E+01	1.8E+12	4.5E+48	0.000	5.9E+00	1	-5.9E+00	-1	1.5E+00	0.963	-1.5E+00	-0.96302	4.43E-13
9	22.5	0.00188	-2.7E+01	1.5E-12	-4.5E+48	2.000	3.2E+01	6.1E+13	4.5E+48	0.000	5.6E+00	1	-5.6E+00	-1	1.4E+00	0.9508	-1.4E+00	-0.95078	2.12E-14
10	25	0.00188	-3.0E+01	7.2E-14	-4.5E+48	2.000	3.5E+01	2.1E+15	4.5E+48	0.000	5.3E+00	1	-5.3E+00	-1	1.3E+00	0.9379	-1.3E+00	-0.93792	1.01E-15
11	27.5	0.00188	-3.3E+01	3.5E-15	-4.5E+48	2.000	3.9E+01	7.0E+16	4.5E+48	0.000	5.1E+00	1	-5.1E+00	-1	1.3E+00	0.9247	-1.3E+00	-0.92475	4.85E-17
12	30	0.00188	-3.6E+01	1.7E-16	-4.5E+48	2.000	4.2E+01	2.4E+18	4.5E+48	0.000	4.8E+00	1	-4.8E+00	-1	1.2E+00	0.9115	-1.2E+00	-0.91147	2.32E-18
13	32.5	0.00188	-3.9E+01	8.2E-18	-4.5E+48	2.000	4.6E+01	8.1E+19	4.5E+48	0.000	4.7E+00	1	-4.7E+00	-1	1.2E+00	0.8982	-1.2E+00	-0.89824	1.11E-19
14	35	0.00188	-4.2E+01	4.0E-19	-4.5E+48	2.000	4.9E+01	2.7E+21	4.5E+48	0.000	4.5E+00	1	-4.5E+00	-1	1.1E+00	0.8852	-1.1E+00	-0.88517	5.30E-21
15	37.5	0.00188	-4.5E+01	1.9E-20	-4.5E+48	2.000	5.3E+01	9.3E+22	4.5E+48	0.000	4.3E+00	1	-4.3E+00	-1	1.1E+00	0.8723	-1.1E+00	-0.87233	2.53E-22
16	40	0.00188	-4.8E+01	9.4E-22	-4.5E+48	2.000	5.6E+01	3.2E+24	4.5E+48	0.000	4.2E+00	1	-4.2E+00	-1	1.0E+00	0.8598	-1.0E+00	-0.85979	1.21E-23
17	42.5	0.00188	-5.1E+01	4.6E-23	-4.5E+48	2.000	6.0E+01	1.1E+26	4.5E+48	0.000	4.1E+00	1	-4.1E+00	-1	1.0E+00	0.8476	-1.0E+00	-0.84756	5.79E-25
18	45	0.00188	-5.4E+01	2.2E-24	-4.5E+48	2.000	6.3E+01	3.7E+27	4.5E+48	0.000	4.0E+00	1	-4.0E+00	-1	9.8E-01	0.8357	-9.8E-01	-0.83567	2.77E-26
19	47.5	0.00188	-5.7E+01	1.1E-25	-4.5E+48	2.000	6.7E+01	1.2E+29	4.5E+48	0.000	3.8E+00	1	-3.8E+00	-1	9.6E-01	0.8241	-9.6E-01	-0.82412	1.32E-27
20	50	0.00188	-6.1E+01	5.2E-27	-4.5E+48	2.000	7.1E+01	4.2E+30	4.5E+48	0.000	3.8E+00	1	-3.8E+00	-1	9.3E-01	0.8129	-9.3E-01	-0.81292	6.34E-29



Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

Calc	Value	
v	7.60E-02	m/d
Rc	3.15E+02	
u	2.42E-04	m/d

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.00188	-3.0E+00	4.9E-02	-4.5E+48	2.000	3.5E+00	3.4E+01	4.5E+48	0.000	1.7E+01	1	-1.7E+01	-1	8.3E+00	1	-8.3E+00	-1	7.28E-04
2	5	0.00188	-6.1E+00	2.4E-03	-4.5E+48	2.000	7.1E+00	1.2E+03	4.5E+48	0.000	1.2E+01	1	-1.2E+01	-1	5.9E+00	1	-5.9E+00	-1	3.53E-05
3	7.5	0.00188	-9.1E+00	1.1E-04	-4.5E+48	2.000	1.1E+01	3.9E+04	4.5E+48	0.000	9.7E+00	1	-9.7E+00	-1	4.8E+00	1	-4.8E+00	-1	1.71E-06
4	10	0.00188	-1.2E+01	5.5E-06	-4.5E+48	2.000	1.4E+01	1.3E+06	4.5E+48	0.000	8.4E+00	1	-8.4E+00	-1	4.2E+00	1	-4.2E+00	-1	8.30E-08
5	12.5	0.00188	-1.5E+01	2.7E-07	-4.5E+48	2.000	1.8E+01	4.5E+07	4.5E+48	0.000	7.5E+00	1	-7.5E+00	-1	3.7E+00	1	-3.7E+00	-1	4.03E-09
6	15	0.00188	-1.8E+01	1.3E-08	-4.5E+48	2.000	2.1E+01	1.5E+09	4.5E+48	0.000	6.8E+00	1	-6.8E+00	-1	3.4E+00	1	-3.4E+00	-1	1.95E-10
7	17.5	0.00188	-2.1E+01	6.3E-10	-4.5E+48	2.000	2.5E+01	5.2E+10	4.5E+48	0.000	6.3E+00	1	-6.3E+00	-1	3.2E+00	1	-3.2E+00	-0.99999	9.48E-12
8	20	0.00188	-2.4E+01	3.1E-11	-4.5E+48	2.000	2.8E+01	1.8E+12	4.5E+48	0.000	5.9E+00	1	-5.9E+00	-1	3.0E+00	1	-3.0E+00	-0.99997	4.60E-13
9	22.5	0.00188	-2.7E+01	1.5E-12	-4.5E+48	2.000	3.2E+01	6.1E+13	4.5E+48	0.000	5.6E+00	1	-5.6E+00	-1	2.8E+00	0.9999	-2.8E+00	-0.99992	2.23E-14
10	25	0.00188	-3.0E+01	7.2E-14	-4.5E+48	2.000	3.5E+01	2.1E+15	4.5E+48	0.000	5.3E+00	1	-5.3E+00	-1	2.6E+00	0.9998	-2.6E+00	-0.99981	1.08E-15
11	27.5	0.00188	-3.3E+01	3.5E-15	-4.5E+48	2.000	3.9E+01	7.0E+16	4.5E+48	0.000	5.1E+00	1	-5.1E+00	-1	2.5E+00	0.9996	-2.5E+00	-0.99963	5.24E-17
12	30	0.00188	-3.6E+01	1.7E-16	-4.5E+48	2.000	4.2E+01	2.4E+18	4.5E+48	0.000	4.8E+00	1	-4.8E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	2.54E-18
13	32.5	0.00188	-3.9E+01	8.2E-18	-4.5E+48	2.000	4.6E+01	8.1E+19	4.5E+48	0.000	4.7E+00	1	-4.7E+00	-1	2.3E+00	0.9989	-2.3E+00	-0.99893	1.23E-19
14	35	0.00188	-4.2E+01	4.0E-19	-4.5E+48	2.000	4.9E+01	2.7E+21	4.5E+48	0.000	4.5E+00	1	-4.5E+00	-1	2.2E+00	0.9984	-2.2E+00	-0.99839	5.98E-21
15	37.5	0.00188	-4.5E+01	1.9E-20	-4.5E+48	2.000	5.3E+01	9.3E+22	4.5E+48	0.000	4.3E+00	1	-4.3E+00	-1	2.2E+00	0.9977	-2.2E+00	-0.99769	2.90E-22
16	40	0.00188	-4.8E+01	9.4E-22	-4.5E+48	2.000	5.6E+01	3.2E+24	4.5E+48	0.000	4.2E+00	1	-4.2E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	1.40E-23
17	42.5	0.00188	-5.1E+01	4.6E-23	-4.5E+48	2.000	6.0E+01	1.1E+26	4.5E+48	0.000	4.1E+00	1	-4.1E+00	-1	2.0E+00	0.9958	-2.0E+00	-0.99579	6.80E-25
18	45	0.00188	-5.4E+01	2.2E-24	-4.5E+48	2.000	6.3E+01	3.7E+27	4.5E+48	0.000	4.0E+00	1	-4.0E+00	-1	2.0E+00	0.9946	-2.0E+00	-0.99459	3.30E-26
19	47.5	0.00188	-5.7E+01	1.1E-25	-4.5E+48	2.000	6.7E+01	1.2E+29	4.5E+48	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9932	-1.9E+00	-0.99321	1.60E-27
20	50	0.00188	-6.1E+01	5.2E-27	-4.5E+48	2.000	7.1E+01	4.2E+30	4.5E+48	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	7.73E-29

Date:	11/12/2025
Version:	1

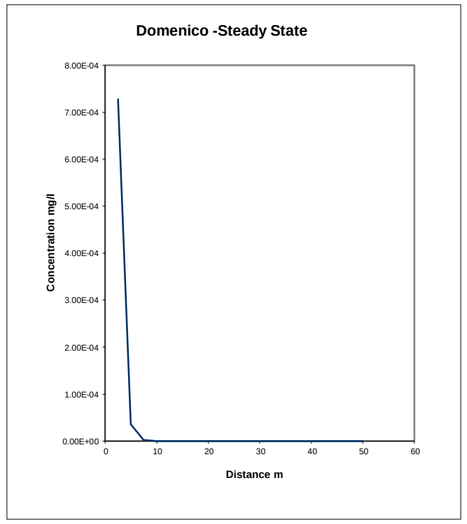
Contaminant „2-Dichloroethene

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.001	mg/l
Co	1.50E-02	mg/l
λ	2.06E-03	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	4.90E+01	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.00375	-3.03E+00	4.85E-02	1.68E+01	1	-1.68E+01	-1	4.17E+00	1	-4.17E+00	-1	7.28E-04
2	5	0.00375	-6.05E+00	2.35E-03	1.19E+01	1	-1.19E+01	-1	2.95E+00	1	-2.95E+00	-1	3.53E-05
3	7.5	0.00375	-9.08E+00	1.14E-04	9.68E+00	1	-9.68E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	1.71E-06
4	10	0.00375	-1.21E+01	5.54E-06	8.39E+00	1	-8.39E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	8.28E-08
5	12.5	0.00375	-1.51E+01	2.68E-07	7.50E+00	1	-7.50E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	3.99E-09
6	15	0.00375	-1.82E+01	1.30E-08	6.85E+00	1	-6.85E+00	-1	1.70E+00	0.984	-1.70E+00	-0.984	1.92E-10
7	17.5	0.00375	-2.12E+01	6.32E-10	6.34E+00	1	-6.34E+00	-1	1.58E+00	0.9743	-1.58E+00	-0.9743	9.23E-12
8	20	0.00375	-2.42E+01	3.06E-11	5.93E+00	1	-5.93E+00	-1	1.48E+00	0.963	-1.48E+00	-0.963	4.43E-13
9	22.5	0.00375	-2.72E+01	1.49E-12	5.59E+00	1	-5.59E+00	-1	1.39E+00	0.9508	-1.39E+00	-0.9508	2.12E-14
10	25	0.00375	-3.03E+01	7.21E-14	5.30E+00	1	-5.30E+00	-1	1.32E+00	0.9379	-1.32E+00	-0.9379	1.01E-15
11	27.5	0.00375	-3.33E+01	3.50E-15	5.06E+00	1	-5.06E+00	-1	1.26E+00	0.9247	-1.26E+00	-0.9247	4.85E-17
12	30	0.00375	-3.63E+01	1.70E-16	4.84E+00	1	-4.84E+00	-1	1.20E+00	0.9115	-1.20E+00	-0.9115	2.32E-18
13	32.5	0.00375	-3.93E+01	8.23E-18	4.65E+00	1	-4.65E+00	-1	1.16E+00	0.8982	-1.16E+00	-0.8982	1.11E-19
14	35	0.00375	-4.24E+01	3.99E-19	4.48E+00	1	-4.48E+00	-1	1.11E+00	0.8852	-1.11E+00	-0.8852	5.30E-21
15	37.5	0.00375	-4.54E+01	1.94E-20	4.33E+00	1	-4.33E+00	-1	1.08E+00	0.8723	-1.08E+00	-0.8723	2.53E-22
16	40	0.00375	-4.84E+01	9.39E-22	4.19E+00	1	-4.19E+00	-1	1.04E+00	0.8598	-1.04E+00	-0.8598	1.21E-23
17	42.5	0.00375	-5.14E+01	4.55E-23	4.07E+00	1	-4.07E+00	-1	1.01E+00	0.8476	-1.01E+00	-0.8476	5.79E-25
18	45	0.00375	-5.45E+01	2.21E-24	3.95E+00	1	-3.95E+00	-1	9.83E-01	0.8357	-9.83E-01	-0.8357	2.77E-26
19	47.5	0.00375	-5.75E+01	1.07E-25	3.85E+00	1	-3.85E+00	-1	9.57E-01	0.8241	-9.57E-01	-0.8241	1.32E-27
20	50	0.00375	-6.05E+01	5.20E-27	3.75E+00	1	-3.75E+00	-1	9.33E-01	0.8129	-9.33E-01	-0.8129	6.34E-29



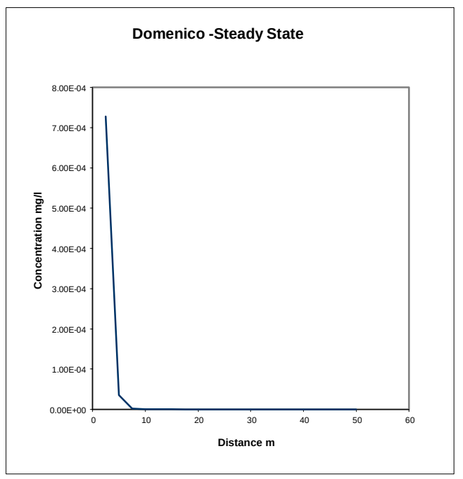
Vertical dispersion optio Simulate vertical dispersion in 1 direction

Calc	Value	
v	7.60E-02	m/d
Rc	3.15E+02	
u	2.42E-04	m/d

DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.00375	-3.03E+00	4.85E-02	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	7.28E-04
2	5	0.00375	-6.05E+00	2.35E-03	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	3.53E-05
3	7.5	0.00375	-9.08E+00	1.14E-04	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	1.71E-06
4	10	0.00375	-1.21E+01	5.54E-06	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	8.30E-08
5	12.5	0.00375	-1.51E+01	2.68E-07	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	4.03E-09
6	15	0.00375	-1.82E+01	1.30E-08	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	1.95E-10
7	17.5	0.00375	-2.12E+01	6.32E-10	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	9.48E-12
8	20	0.00375	-2.42E+01	3.06E-11	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	4.60E-13
9	22.5	0.00375	-2.72E+01	1.49E-12	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-0.9999	2.23E-14
10	25	0.00375	-3.03E+01	7.21E-14	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-0.9998	1.08E-15
11	27.5	0.00375	-3.33E+01	3.50E-15	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-0.9996	5.24E-17
12	30	0.00375	-3.63E+01	1.70E-16	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	2.54E-18
13	32.5	0.00375	-3.93E+01	8.23E-18	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.9989	1.23E-19
14	35	0.00375	-4.24E+01	3.99E-19	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.9984	5.98E-21
15	37.5	0.00375	-4.54E+01	1.94E-20	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.9977	2.90E-22
16	40	0.00375	-4.84E+01	9.39E-22	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	1.40E-23
17	42.5	0.00375	-5.14E+01	4.55E-23	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.9958	6.80E-25
18	45	0.00375	-5.45E+01	2.21E-24	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.9946	3.30E-26
19	47.5	0.00375	-5.75E+01	1.07E-25	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.9932	1.60E-27
20	50	0.00375	-6.05E+01	5.20E-27	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	7.73E-29



Date:	11/12/2025
Version:	1

DOMENICO (TIME VARIANT)

Contaminant ι,2-Dichloroethene

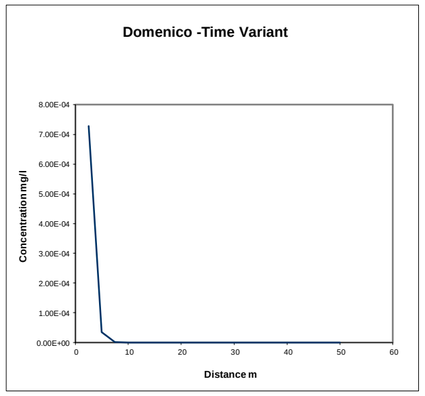
Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.001	mg/l
Co	1.50E-02	mg/l
λ	2.06E-03	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	4.90E+01	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

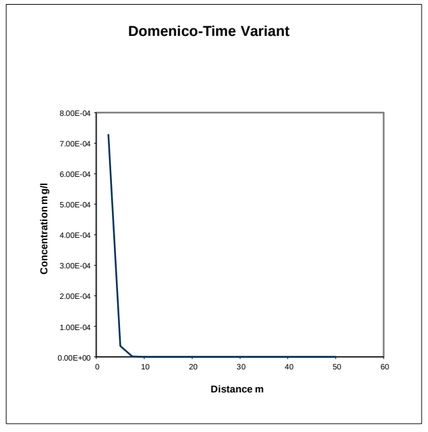
Calc	Value	
v	7.60E-02	m/d
Rc	3.15E+02	
u	2.42E-04	m/d

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.00188	-3.03E+00	4.85E-02	-4.53E+48	2	1.68E+01	1	-1.68E+01	-1	4.17E+00	1	-4.17E+00	-1	7.28E-04
2	5	0.00188	-6.05E+00	2.35E-03	-4.53E+48	2	1.19E+01	1	-1.19E+01	-1	2.95E+00	1	-2.95E+00	-1	3.53E-05
3	7.5	0.00188	-9.08E+00	1.14E-04	-4.53E+48	2	9.68E+00	1	-9.68E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	1.71E-06
4	10	0.00188	-1.21E+01	5.54E-06	-4.53E+48	2	8.39E+00	1	-8.39E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	8.28E-08
5	12.5	0.00188	-1.51E+01	2.68E-07	-4.53E+48	2	7.50E+00	1	-7.50E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	3.99E-09
6	15	0.00188	-1.82E+01	1.30E-08	-4.53E+48	2	6.85E+00	1	-6.85E+00	-1	1.70E+00	0.984	-1.70E+00	-0.984	1.92E-10
7	17.5	0.00188	-2.12E+01	6.32E-10	-4.53E+48	2	6.34E+00	1	-6.34E+00	-1	1.58E+00	0.9743	-1.58E+00	-0.974	9.23E-12
8	20	0.00188	-2.42E+01	3.06E-11	-4.53E+48	2	5.93E+00	1	-5.93E+00	-1	1.48E+00	0.963	-1.48E+00	-0.963	4.43E-13
9	22.5	0.00188	-2.72E+01	1.49E-12	-4.53E+48	2	5.59E+00	1	-5.59E+00	-1	1.39E+00	0.9508	-1.39E+00	-0.951	2.12E-14
10	25	0.00188	-3.03E+01	7.21E-14	-4.53E+48	2	5.30E+00	1	-5.30E+00	-1	1.32E+00	0.9379	-1.32E+00	-0.938	1.01E-15
11	27.5	0.00188	-3.33E+01	3.50E-15	-4.53E+48	2	5.06E+00	1	-5.06E+00	-1	1.26E+00	0.9247	-1.26E+00	-0.925	4.85E-17
12	30	0.00188	-3.63E+01	1.70E-16	-4.53E+48	2	4.84E+00	1	-4.84E+00	-1	1.20E+00	0.9115	-1.20E+00	-0.911	2.32E-18
13	32.5	0.00188	-3.93E+01	8.23E-18	-4.53E+48	2	4.65E+00	1	-4.65E+00	-1	1.16E+00	0.8982	-1.16E+00	-0.898	1.11E-19
14	35	0.00188	-4.24E+01	3.99E-19	-4.53E+48	2	4.48E+00	1	-4.48E+00	-1	1.11E+00	0.8852	-1.11E+00	-0.885	5.30E-21
15	37.5	0.00188	-4.54E+01	1.94E-20	-4.53E+48	2	4.33E+00	1	-4.33E+00	-1	1.08E+00	0.8723	-1.08E+00	-0.872	2.53E-22
16	40	0.00188	-4.84E+01	9.39E-22	-4.53E+48	2	4.19E+00	1	-4.19E+00	-1	1.04E+00	0.8598	-1.04E+00	-0.86	1.21E-23
17	42.5	0.00188	-5.14E+01	4.55E-23	-4.53E+48	2	4.07E+00	1	-4.07E+00	-1	1.01E+00	0.8476	-1.01E+00	-0.848	5.79E-25
18	45	0.00188	-5.45E+01	2.21E-24	-4.53E+48	2	3.95E+00	1	-3.95E+00	-1	9.83E-01	0.8357	-9.83E-01	-0.836	2.77E-26
19	47.5	0.00188	-5.75E+01	1.07E-25	-4.53E+48	2	3.85E+00	1	-3.85E+00	-1	9.57E-01	0.8241	-9.57E-01	-0.824	1.32E-27
20	50	0.00188	-6.05E+01	5.20E-27	-4.53E+48	2	3.75E+00	1	-3.75E+00	-1	9.33E-01	0.8129	-9.33E-01	-0.813	6.34E-29



Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.00188	-3.03E+00	4.85E-02	-4.53E+48	2	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	7.28E-04
2	5	0.00188	-6.05E+00	2.35E-03	-4.53E+48	2	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	3.53E-05
3	7.5	0.00188	-9.08E+00	1.14E-04	-4.53E+48	2	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	1.71E-06
4	10	0.00188	-1.21E+01	5.54E-06	-4.53E+48	2	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	8.30E-08
5	12.5	0.00188	-1.51E+01	2.68E-07	-4.53E+48	2	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	4.03E-09
6	15	0.00188	-1.82E+01	1.30E-08	-4.53E+48	2	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	1.95E-10
7	17.5	0.00188	-2.12E+01	6.32E-10	-4.53E+48	2	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	9.48E-12
8	20	0.00188	-2.42E+01	3.06E-11	-4.53E+48	2	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	4.60E-13
9	22.5	0.00188	-2.72E+01	1.49E-12	-4.53E+48	2	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-1	2.23E-14
10	25	0.00188	-3.03E+01	7.21E-14	-4.53E+48	2	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-1	1.08E-15
11	27.5	0.00188	-3.33E+01	3.50E-15	-4.53E+48	2	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-1	5.24E-17
12	30	0.00188	-3.63E+01	1.70E-16	-4.53E+48	2	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	2.54E-18
13	32.5	0.00188	-3.93E+01	8.23E-18	-4.53E+48	2	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.999	1.23E-19
14	35	0.00188	-4.24E+01	3.99E-19	-4.53E+48	2	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.998	5.98E-21
15	37.5	0.00188	-4.54E+01	1.94E-20	-4.53E+48	2	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.998	2.90E-22
16	40	0.00188	-4.84E+01	9.39E-22	-4.53E+48	2	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	1.40E-23
17	42.5	0.00188	-5.14E+01	4.55E-23	-4.53E+48	2	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.996	6.80E-25
18	45	0.00188	-5.45E+01	2.21E-24	-4.53E+48	2	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.995	3.30E-26
19	47.5	0.00188	-5.75E+01	1.07E-25	-4.53E+48	2	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.993	1.60E-27
20	50	0.00188	-6.05E+01	5.20E-27	-4.53E+48	2	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	7.73E-29



Date:	11/12/2025
Version:	1

Hydrogeological risk assessment for land contamination

Remedial Targets Worksheet , Release 3.2

First released: 2006. Version 3.2: January 2013

This worksheet has been produced in combination with the document 'Remedial Targets Methodology: Hydrogeological risk assessment for land contamination (Environment Agency 2006).

Users of this worksheet should always refer to the User Manual to the Remedial Targets Methodology and to relevant guidance on UK legislation and policy, in order to understand how this procedure should be applied in an appropriate context.

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The calculation of equations in this worksheet has been independently checked by Entec (UK) Ltd on behalf of the Environment Agency.

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IMPORTANT: To enable MS Excel worksheet, click Tools, Add -Ins, Analysis Tool Pak and Analysis Tool Pak-VBA (to calculate error functions)

Details to be completed for each assessment				
Site Name:	Kelvedon Street			
Site Address:	Newport			
Completed by:	Michael Watkins			
Date:	11-Dec-25		Version:	1
Contaminant	cis 1,2-Dichloroethene			
Target Concentration (C_T)	0.001	mg/l	Origin of C_T:	Laboratory detection limit

This worksheet can be used to determine remedial targets for soils (Worksheets Level 1 Soil, Level 2 and Level 3 Soil) or to determine remedial targets for groundwater (Level 3 Groundwater). For Level 3, parameter values must be entered separately dependent on whether the assessment is for soil or groundwater. For soil, remedial targets are calculated as either mg/kg (for comparision with soil measurements) or mg/l (for comparison with leaching tests or pore water concentrations).
Site details entered on this page are automatically copied to Level 1, 2 and 3 Worksheets.
Worksheet options are identified by brown background and employ a pull-down menus. Data entry are identified as blue background.
Data origin / justification should be noted in cells coloured yellow and fully documented in subsequent reports.
Data carried forward from an earlier worksheet are identified by a light green background
It is recommended that a copy of the original worksheet is saved (all data fields in the original copy are blank).

The spreadsheet also includes a porosity calculation worksheet, a soil impact calculation worksheet and a worksheet that performs some simple hydrogeological calculations.

Remedial Targets Worksheet , Release 3.2

Level 1 - Soil

Environment Agency

Select the method of calculating the soil water Partition Co-efficient by using the pull down menu below

User specified value for partition coefficient

Contaminant		**cis 1,2-Dichloroethene**		
Target concentration	**C_T**	**0.001**	**mg/l**	

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**
Standard entry				
Water filled soil porosity	θ_W	0.00E+00	fraction	
Air filled soil porosity	θa	0.00E+00	fraction	
Bulk density of soil zone material	ρ	0.00E+00	g/cm^3	
Henry's Law constant	H	0.00E+00	dimensionless	
Entry if specify partition coefficient (option)				
Soil water partition coefficient	Kd	0.00E+00	l/kg	
Entry for non-polar organic chemicals (option)				
Fraction of organic carbon (in soil)	foc		fraction	
Organic carbon partition coefficient	Koc		l/kg	
Entry for ionic organic chemicals (option)				
Sorption coefficient for neutral species	$K_{oc,n}$		l/kg	
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg	
pH value	pH		pH units	
Acid dissociation constant	pKa			
Fraction of organic carbon (in soil)	foc		fraction	

This sheet calculates the Level 1 remedial target for soils(mg/kg) based on a selected target concentration and theoretical calculation of soil water partitioning. Three options are included for determining the partition coefficient.

The measured soil concentration as mg/kg should be compared with the Level 1 remedial target to determine the need for further action.

Soil water partition coefficient used in Level Assessment	**Kd**	**0.00E+00**	**l/kg**	*Specified value*

Level 1 Remedial Target

Level 1 Remedial Target	**#DIV/0!**	**mg/kg**	**(for comparison with soil analyses)**
	or		
	0.001	**mg/l**	**(for comparison with leachate test results)**

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 2 - Soil

Contaminant		**cis 1,2-Dichloroethene**	from Level 1	This sheet calculates the Level 2 remedial target for soils (mg/kg) or for pore water (mg/l).
Target concentration	**C_T**	**0.001** **mg/l**	from Level 1	

The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 2 remedial target to determine the need for further action. Equations presented in 'Hydrogeological risk assessment for land contamiantion' (Environment Agency 2006)

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**	
Standard entry					
Infiltration	Inf	0.00E+00	m/d		
Area of contaminant source	A	0.00E+00	m^2		Not used in calculation
Entry for groundwater flow below site					
Length of contaminant source in direction of groundwater flow	L	0.00E+00	m		
Saturated aquifer thickness	da	0.00E+00	m		
Hydraulic Conductivity of aquifer in which dilution occurs	K	0.00E+00	m/d		
Hydraulic gradient of water table	i	0.00E+00	fraction		
Width of contaminant source perpendicular to groundwater flow	w	0.00E+00	m		Not used in calculation
Background concentration of contaminant in groundwater beneath site	Cu	0.00E+00	mg/l		
Define mixing zone depth by specifying or calculating depth (using pull down list)		**Specify**			
Enter mixing zone thickness	Mz	0.00E+00	m		
Calculated mixing zone thickness	Mz		m		

Calculated Parameters

Dilution Factor	**DF**	**#DIV/0!**		
Level 2 Remedial Target		**#DIV/0!**	**mg/l**	**For comparison with measured pore water concentration. This assumes Level 1 Remedial Target is based on Target Concentrati**
		or		
		#DIV/0!	**mg/kg**	**For comparison with measured soil concentration. This assumes Level 1 Remedial Target calculated from soil-water**

Additional option

Calculation of impact on receptor

Concentration of contaminant in contaminated discharge (entering receptor)	Cc	0.00E+00	mg/l	
Calculated concentration within receptor (dilution only)		#DIV/0!	mg/l	0

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 3 - Soil

See Note

Input Parameters	Variable	Value	Unit	Source
Contaminant		cis 1,2-Dichloroethene		from Level 1
Target Concentration	C_T	0.001	mg/l	from Level 1
Dilution Factor	DF	#DIV/0!		from Level 2

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value, l

	Variable	Value	Unit	Source of parameter value
Enter source concentration		Soil concentration as mg/kg		
Enter soil concentration		0	mg/kg	
Half life for degradation of contaminant in water	$t_{1/2}$	1.00E+100	days	
Calculated decay rate	λ	6.93E-101	$days^{-1}$	calculated
Width of plume in aquifer at source	Sz	0.00E+00	m	from Level 2
Plume thickness in aquifer at source	Sy	0.00E+00	m	from Level 2
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Effective porosity of aquifer	n	0.00E+00	fraction	
Hydraulic gradient	i	#DIV/0!	fraction	from Level 2 (adjusted)
Hydraulic conductivity of saturated aquifer	K	0.00E+00	m/d	from Level 2
Distance to compliance point	x	0.00E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	1.00E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	0.00E+00	l/kg	*see options*
Longitudinal dispersivity	ax	0.000	m	*see options*
Transverse dispersivity	az	0.000	m	*see options*
Vertical dispersivity	ay	0.000	m	*see options*

Parameter values should be checked against Level 1 and 2

Calculated Parameters	Variable		
Groundwater flow velocity	v	#DIV/0!	m/d
Retardation factor	Rf	#DIV/0!	fraction
Decay rate used	λ	6.93E-101	d^{-1}
Hydraulic gradient used in aquifer flow down-gradient	i	#DIV/0!	fraction
Rate of contaminant flow due to retardation	u	#DIV/0!	m/d
Ratio of Compliance Point to Source Concentration	C_{ED}/C_0	#DIV/0!	fraction
Attenuation factor (C_0/C_{ED})	**AF**	**#DIV/0!**	**fraction**
Calculated soil leachate concentration	Co	#DIV/0!	mg/l

Remedial Targets

Level 3 Remedial Target		**#DIV/0!**	**mg/l**	For comparison with measured pore water concentration.
Ogata Banks		**or**		This assumes Level 1 Remedial Target is based on Target Concentration.
		#DIV/0!	**mg/kg**	For comparison with measured soil concentration. This
Distance to compliance point		**0**	**m**	assumes Level 1 Remedial Target calculated from soil-water partitioning equation.
Ratio of Compliance Point to Source Concentration	**C_{ED}/C_0**	**#DIV/0!**	**fraction**	Ogata Banks

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99

Enter method of defining partition co-efficient (using pull down list)

Calculate for ionic organic chemicals (acids)

Entry if specify partition coefficient (option)

Soil water partition coefficient	Kd		l/kg

Entry for non-polar organic chemicals (option)

Fraction of organic carbon in aquifer	foc		fraction
Organic carbon partition coefficient	Koc		l/kg

Entry for ionic organic chemicals (option)

Sorption coefficient for related species	$K_{OC,n}$	0.00E+00	l/kg
Sorption coefficient for ionised species	$K_{OC,I}$	0.00E+00	l/kg
pH value	pH	0.00E+00	
Acid dissociation constant	pKa	0.00E+00	
Fraction of organic carbon in aquifer	foc	0.00E+00	fraction
Soil water partition coefficient	Kd	0.00E+00	l/kg

Define dispersivity (click brown cell and use pull down list)

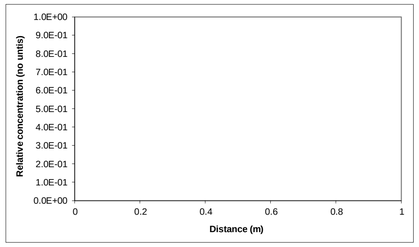
User defined values for dispersivity

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	0.00E+00	#NUM!	m
Transverse dispersivity	**az**	0.00E+00	0.00E+00	#NUM!	m
Vertical dispersivity	**ay**	0.00E+00	0.00E+00	#NUM!	m

Note values of dispersivity must be > 0

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed

Note
This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O_2, NO_3, SO_4 etc than an alternative solution should be used



Note: 'Relative concentration' is the ratio of calculated concentation at a given position compared to the source concentration. The calculations assume plume disperses from the top of the aquifer. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

This sheet calculates the Level 3 remedial target for soils(mg/kg) or for pore water (mg/l), based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.By setting a long travel time (e.g. 9E99) it will give the steady state solution, which should always be used when calculating remedial targets.

The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.9E+99.

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Calculated (relative) concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Relative concentration (No units)	Concentration mg/l
0	1.0E+00	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!

Remedial Targets Worksheet , Release 3.2

Calculation of contaminant concentration in groundwater from a soil source

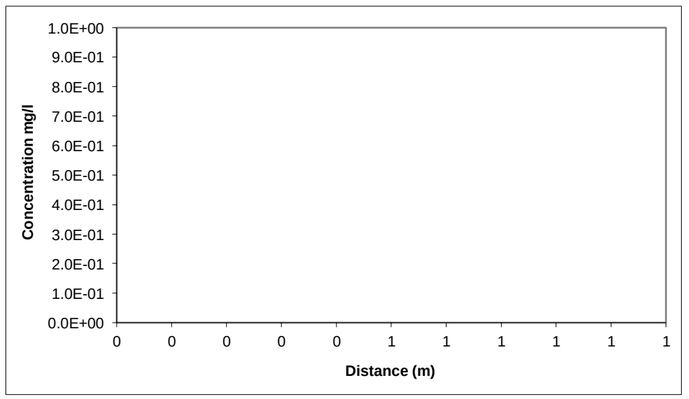
Only input required is Soil Contaminant Concentration

Input Parameters			
Soil contaminant concentration	C_0	0.00E+00	mg/kg
Level 1 Parameters			
Water filled soil porosity	θ_W	0.00E+00	fraction
Air filled soil porosity	θa	0.00E+00	fraction
Bulk density	ρ	0.00E+00	g/cm^3
Henry's Law constant	H	0.00E+00	dimensionless
Soil water partition coefficient used in Level Assessment	Kd	0.00E+00	l/kg
Factor (partitioning between soil and water)		#DIV/0!	dimensionless
Level 2 Parameters **Dilution Factor**	DF	#DIV/0!	
Level 3 Parameters **Attenuation factor (C_O/C_{ED})**	AF	#DIV/0!	

Predicted concentrations at compliance point

Level 1	C	#DIV/0!	mg/l	No dilution or attenuation
Level 2	C	#DIV/0!	mg/l	Dilution taken into account
Level 3	C	#DIV/0!	mg/l	Dilution and attenuation taken into account

Predicted concentrations between source and compliance point - Level 3



Distance m	Concentration mg/l
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

	Variable	Value	Unit	Source
Contaminant		cis 1,2-Dichloroethene		from Level 1
Target Concentration	C_T	1.00E-03	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Domenico - Steady state — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	1.50E+01	mg/l	*Site investigation data*
Half life for degradation of contaminant in water	$t_{1/2}$	3.36E+02	days	*Agency for Toxic Substances and Diseases*
Calculated decay rate	λ	2.06E-03	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	7.50E+01	m	*Length of site perpendicular to groundwater flow*
Plume thickness at source	Sy	5.90E+00	m	*Same as Mixing Zone Thickness. "For a thin aquifer (typically <10m), the mixing zone thickness can be taken as the ac*
Saturated aquifer thickness	da	6.00E+00	m	*Maximum thickness recorded in vicinity of*
Bulk density of aquifer materials	ρ	1.60E+00	g/cm^3	*Typical bulk density for river terrace deposits (conserv*
Effective porosity of aquifer	n	2.50E-01	fraction	*Maximum porosity for coarse Gravel (Lovanh et al 2000) - conservative estimate*
Hydraulic gradient	i	4.40E-02	fraction	*Borehole level data*
Hydraulic conductivity of aquifer	K	4.32E-01	m/d	*Maximum typical value for clayey sandy G*
Distance to compliance point	x	5.00E+01	m	*Default compliance distance*
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	9.90E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	4.90E+01	l/kg	*see options*
Longitudinal dispersivity	ax	5.00E+00	m	*see options*
Transverse dispersivity	az	5.00E-01	m	*see options*
Vertical dispersivity	ay	5.00E-02	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)

Soil water partition coefficient — Kd — 4.90E+01 — l/kg

Entry for non-polar organic chemicals (option)

Fraction of organic carbon in aquifer — foc — fraction

Organic carbon partition coefficient — Koc — l/kg

Entry for ionic organic chemicals (option)

Sorption coefficient for related species — $K_{OC,n}$ — l/kg

Sorption coefficient for ionised species — $K_{OC,I}$ — l/kg

pH value — pH

acid dissociation constant — pKa

Fraction of organic carbon in aquifer — foc — fraction

Soil water partition coefficient — Kd — 4.90E+01 — l/kg

Define dispersivity (click brown cell and use pull down list)

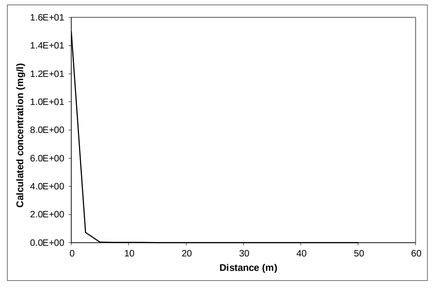
Dispersivities 10%, 1%, 0.1% of pathway length

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	5.00E+00	2.98E+00	m
Transverse dispersivity	**az**	0.00E+00	5.00E-01	2.98E-01	m
Vertical dispersivity	**ay**	0.00E+00	5.00E-02	2.98E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Calculated concentrations for distance-concentration graph

Domenico - Steady state
From calculation sheet

Distance	Concentration
	mg/l
0	1.5E+01
2.5	7.28E-01
5.0	3.53E-02
7.5	1.71E-03
10.0	8.30E-05
12.5	4.03E-06
15.0	1.95E-07
17.5	9.48E-09
20.0	4.60E-10
22.5	2.23E-11
25.0	1.08E-12
27.5	5.24E-14
30.0	2.54E-15
32.5	1.23E-16
35.0	5.98E-18
37.5	2.90E-19
40.0	1.40E-20
42.5	6.80E-22
45.0	3.30E-23
47.5	1.60E-24
50.0	7.73E-26

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Calculated Parameters

	Variable		
Groundwater flow velocity	v	7.60E-02	m/d
Retardation factor	Rf	3.15E+02	fraction
Decay rate used	λ	2.06E-03	d^{-1}
Rate of contaminant flow due to retardation	u	2.42E-04	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	7.73E-26	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**1.94E+26**	

Remedial Targets

Remedial Target		**1.94E+23**	**mg/l**	For comparison with measured groundwater concentration.
Domenico - Steady state				
Distance to compliance point		**50**	**m**	
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**7.73E-26**	**mg/l**	Domenico - Steady state

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Porosity Calculator

These results are not carried through to any of the other worksheets

DRY BULK DENSITY DATA

Variable	Value	Unit	justification
Natural Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Dry Bulk Density	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
Initial Saturation	#DIV/0!	*%*	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	
Water Filled Porosity	**#DIV/0!**	**fraction**	

WET BULK DENSITY DATA

Variable	Value	Unit	
Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Actual (wet) Bulk Density (i.e. at natural MC)	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
dry bulk density	0.00	tonnes/m^3	
Initial Saturation	#DIV/0!	*%*	
Total porosity	**1.000**	**fraction**	**#DIV/0!**
Air Filled Porosity	**#DIV/0!**	**fraction**	
Water Filled Porosity	**#DIV/0!**	**fraction**	

Analytical solutions provided by David Hall, Golder Associates (UK) Ltd

Simple hydrogeological calculations

(These are not specific to, or required in, the Remedial Targets Methodology)

Parameter	symbol		unit	justification
Hydraulic conductivity	K	0.00E+00	m/d	
Hydraulic gradient	i	0.00E+00	unitless	
Effective porosity of aquifer	n	0.00E+00	fraction	
Thickness of saturated aquifer	b	0.00E+00	m	
Width of aquifer perpendicular to flow	w	0.00E+00	m	
Distance to receptor	x	0.00E+00	m	
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Soil-water partition co-efficient	Kd	0.00E+00	l/kg	
Retardation factor of pollutant	R	#DIV/0!		

Groundwater flow velocity	v(GW)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for groundwater to reach receptor	t(GW)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years
Rate of groundwater flow through aquifer	Q	0.00E+00	m^3/s	0.00E+00	m^3/day	0.00E+00	m^3/year

Contaminant flow velocity	v(contam)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for contaminant to reach receptor	t(contam)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years

Level 1 Calculation Sheet

Contaminant **1,2-Dichloroethene**

Parameter	Value	Units
(carried over from input sheet)		
C_T	1.00E-03	mg/l
Kd	0.00E+00	l/kg
foc		fraction
koc		l/kg
θ_W	0.00E+00	fraction
θa	0.00E+00	fraction
ρ	0.00E+00	g/cm3
H	0.00E+00	dimensionless
Koc,n		l/kg
Koc,i		l/kg
pH		pH units
pKa		
foc (ionic)		fraction

Calculations (Refer toTable 4.3, R&D Publication 20)

Selected option User specified value for partition coefficient

	calc	calc	Calc Kd	l/kg
Calculation of partition coefficient for ionic organic chemical				
Partition coefficient used in Level 1 Assessment			0.00E+00	l/kg

Calculated Remedial Target **#DIV/0!** **mg/kg** **for cis 1,2-Dichloroethene**

Factor (partitioning between soil and water) #DIV/0!

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11/12/2025
Version:	1

Level 2 Calculation Sheet

Contaminant : 1,2-Dichloroethene

Site assessed:	Kelvedon Stre
Date:	11/12/2025
Version:	1

Parameter	Value	Units		
(carried over from input sheet)				
Mz	0.00E+00	m		
L	0.00E+00	m		
da	0.00E+00	m		Calculated
Inf	0.00E+00	m/d		Dilution Factor
K	0.00E+00	m/d		
i	0.00E+00		Calculation based on target concentration	#DIV/0!
A	0.00E+00	m3/d m2 m3/d	Calculation based on observed contaminant concentration	#DIV/0!
Cc	0.00E+00	mg/l		
C_T	1.00E-03	mg/l		
Cu	0.00E+00	mg/l		
w	0.00E+00	m		



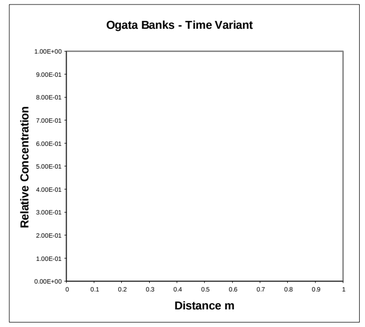
Contaminant **1,2-Dichloroethene**

OGATA BANKS SOLUTION

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-03	mg/l
DF	#DIV/0!	
λ	6.931E-101	days^{-1}
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Calc	Value	
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) -USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Date:	11/12/2025
Version:	1

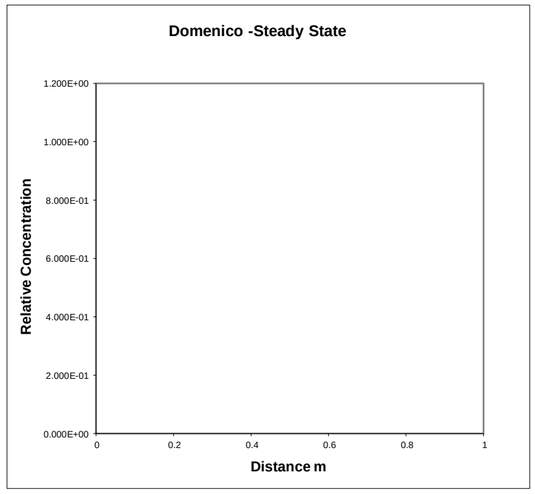
Contaminant **.,2-Dichloroethene**

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-03	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

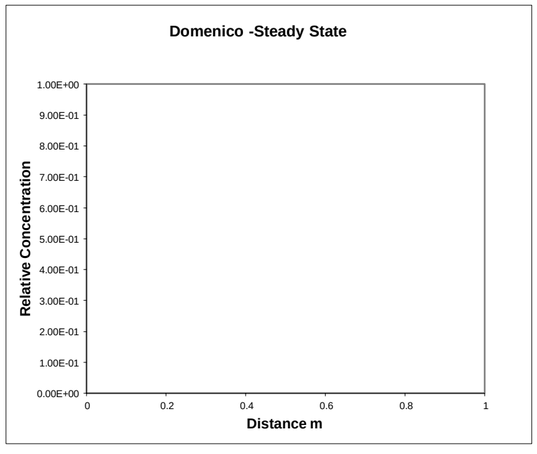


Calc	Value	Units
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Date:	11/12/2025
Version:	1

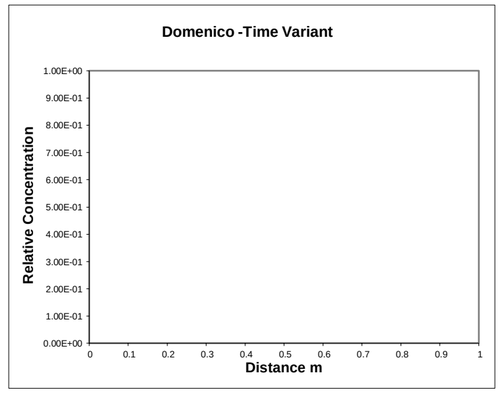
DOMENICO (TIME VARIANT)

Contaminant **l,2-Dichloroethene**

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.001	mg/l
DF	#DIV/0!	
λ	6.931E-101	days^{-1}
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

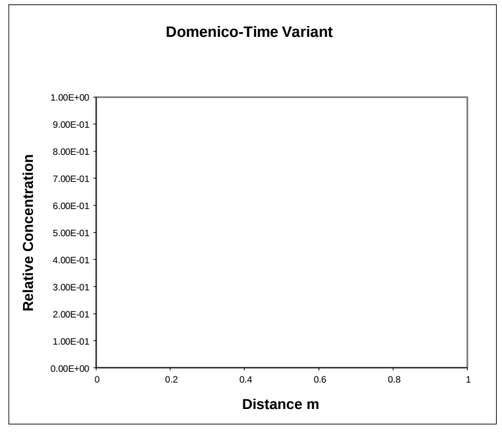
	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Calc	Value	Units
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Date:	11/12/2025
Version:	1

OGATA BANKS SOLUTION

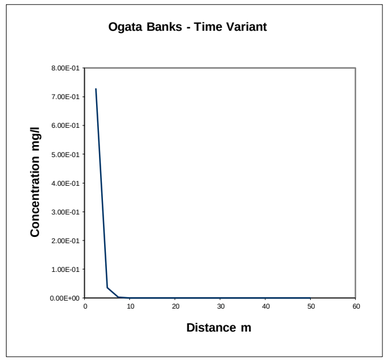
Contaminant **1,2-Dichloroethene**

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.001	mg/l
Co	1.50E+01	mg/l
λ	2.06E-03	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	4.90E+01	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	1.875	-3.0E+00	4.9E-02	-4.5E+48	2.000	3.5E+00	3.4E+01	4.5E+48	0.000	1.7E+01	1	-1.7E+01	-1	4.2E+00	1	-4.2E+00	-1	7.28E-01
2	5	1.875	-6.1E+00	2.4E-03	-4.5E+48	2.000	7.1E+00	1.2E+03	4.5E+48	0.000	1.2E+01	1	-1.2E+01	-1	3.0E+00	1	-3.0E+00	-0.99997	3.53E-02
3	7.5	1.875	-9.1E+00	1.1E-04	-4.5E+48	2.000	1.1E+01	3.9E+04	4.5E+48	0.000	9.7E+00	1	-9.7E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	1.71E-03
4	10	1.875	-1.2E+01	5.5E-06	-4.5E+48	2.000	1.4E+01	1.3E+06	4.5E+48	0.000	8.4E+00	1	-8.4E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	8.28E-05
5	12.5	1.875	-1.5E+01	2.7E-07	-4.5E+48	2.000	1.8E+01	4.5E+07	4.5E+48	0.000	7.5E+00	1	-7.5E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	3.99E-06
6	15	1.875	-1.8E+01	1.3E-08	-4.5E+48	2.000	2.1E+01	1.5E+09	4.5E+48	0.000	6.8E+00	1	-6.8E+00	-1	1.7E+00	0.984	-1.7E+00	-0.98399	1.92E-07
7	17.5	1.875	-2.1E+01	6.3E-10	-4.5E+48	2.000	2.5E+01	5.2E+10	4.5E+48	0.000	6.3E+00	1	-6.3E+00	-1	1.6E+00	0.9743	-1.6E+00	-0.97425	9.23E-09
8	20	1.875	-2.4E+01	3.1E-11	-4.5E+48	2.000	2.8E+01	1.8E+12	4.5E+48	0.000	5.9E+00	1	-5.9E+00	-1	1.5E+00	0.963	-1.5E+00	-0.96302	4.43E-10
9	22.5	1.875	-2.7E+01	1.5E-12	-4.5E+48	2.000	3.2E+01	6.1E+13	4.5E+48	0.000	5.6E+00	1	-5.6E+00	-1	1.4E+00	0.9508	-1.4E+00	-0.95078	2.12E-11
10	25	1.875	-3.0E+01	7.2E-14	-4.5E+48	2.000	3.5E+01	2.1E+15	4.5E+48	0.000	5.3E+00	1	-5.3E+00	-1	1.3E+00	0.9379	-1.3E+00	-0.93792	1.01E-12
11	27.5	1.875	-3.3E+01	3.5E-15	-4.5E+48	2.000	3.9E+01	7.0E+16	4.5E+48	0.000	5.1E+00	1	-5.1E+00	-1	1.3E+00	0.9247	-1.3E+00	-0.92475	4.85E-14
12	30	1.875	-3.6E+01	1.7E-16	-4.5E+48	2.000	4.2E+01	2.4E+18	4.5E+48	0.000	4.8E+00	1	-4.8E+00	-1	1.2E+00	0.9115	-1.2E+00	-0.91147	2.32E-15
13	32.5	1.875	-3.9E+01	8.2E-18	-4.5E+48	2.000	4.6E+01	8.1E+19	4.5E+48	0.000	4.7E+00	1	-4.7E+00	-1	1.2E+00	0.8982	-1.2E+00	-0.89824	1.11E-16
14	35	1.875	-4.2E+01	4.0E-19	-4.5E+48	2.000	4.9E+01	2.7E+21	4.5E+48	0.000	4.5E+00	1	-4.5E+00	-1	1.1E+00	0.8852	-1.1E+00	-0.88517	5.30E-18
15	37.5	1.875	-4.5E+01	1.9E-20	-4.5E+48	2.000	5.3E+01	9.3E+22	4.5E+48	0.000	4.3E+00	1	-4.3E+00	-1	1.1E+00	0.8723	-1.1E+00	-0.87233	2.53E-19
16	40	1.875	-4.8E+01	9.4E-22	-4.5E+48	2.000	5.6E+01	3.2E+24	4.5E+48	0.000	4.2E+00	1	-4.2E+00	-1	1.0E+00	0.8598	-1.0E+00	-0.85979	1.21E-20
17	42.5	1.875	-5.1E+01	4.6E-23	-4.5E+48	2.000	6.0E+01	1.1E+26	4.5E+48	0.000	4.1E+00	1	-4.1E+00	-1	1.0E+00	0.8476	-1.0E+00	-0.84756	5.79E-22
18	45	1.875	-5.4E+01	2.2E-24	-4.5E+48	2.000	6.3E+01	3.7E+27	4.5E+48	0.000	4.0E+00	1	-4.0E+00	-1	9.8E-01	0.8357	-9.8E-01	-0.83567	2.77E-23
19	47.5	1.875	-5.7E+01	1.1E-25	-4.5E+48	2.000	6.7E+01	1.2E+29	4.5E+48	0.000	3.8E+00	1	-3.8E+00	-1	9.6E-01	0.8241	-9.6E-01	-0.82412	1.32E-24
20	50	1.875	-6.1E+01	5.2E-27	-4.5E+48	2.000	7.1E+01	4.2E+30	4.5E+48	0.000	3.8E+00	1	-3.8E+00	-1	9.3E-01	0.8129	-9.3E-01	-0.81292	6.34E-26



Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

Calc	Value	
v	7.60E-02	m/d
Rc	3.15E+02	
u	2.42E-04	m/d

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	1.875	-3.0E+00	4.9E-02	-4.5E+48	2.000	3.5E+00	3.4E+01	4.5E+48	0.000	1.7E+01	1	-1.7E+01	-1	8.3E+00	1	-8.3E+00	-1	7.28E-01
2	5	1.875	-6.1E+00	2.4E-03	-4.5E+48	2.000	7.1E+00	1.2E+03	4.5E+48	0.000	1.2E+01	1	-1.2E+01	-1	5.9E+00	1	-5.9E+00	-1	3.53E-02
3	7.5	1.875	-9.1E+00	1.1E-04	-4.5E+48	2.000	1.1E+01	3.9E+04	4.5E+48	0.000	9.7E+00	1	-9.7E+00	-1	4.8E+00	1	-4.8E+00	-1	1.71E-03
4	10	1.875	-1.2E+01	5.5E-06	-4.5E+48	2.000	1.4E+01	1.3E+06	4.5E+48	0.000	8.4E+00	1	-8.4E+00	-1	4.2E+00	1	-4.2E+00	-1	8.30E-05
5	12.5	1.875	-1.5E+01	2.7E-07	-4.5E+48	2.000	1.8E+01	4.5E+07	4.5E+48	0.000	7.5E+00	1	-7.5E+00	-1	3.7E+00	1	-3.7E+00	-1	4.03E-06
6	15	1.875	-1.8E+01	1.3E-08	-4.5E+48	2.000	2.1E+01	1.5E+09	4.5E+48	0.000	6.8E+00	1	-6.8E+00	-1	3.4E+00	1	-3.4E+00	-1	1.95E-07
7	17.5	1.875	-2.1E+01	6.3E-10	-4.5E+48	2.000	2.5E+01	5.2E+10	4.5E+48	0.000	6.3E+00	1	-6.3E+00	-1	3.2E+00	1	-3.2E+00	-0.99999	9.48E-09
8	20	1.875	-2.4E+01	3.1E-11	-4.5E+48	2.000	2.8E+01	1.8E+12	4.5E+48	0.000	5.9E+00	1	-5.9E+00	-1	3.0E+00	1	-3.0E+00	-0.99997	4.60E-10
9	22.5	1.875	-2.7E+01	1.5E-12	-4.5E+48	2.000	3.2E+01	6.1E+13	4.5E+48	0.000	5.6E+00	1	-5.6E+00	-1	2.8E+00	0.9999	-2.8E+00	-0.99992	2.23E-11
10	25	1.875	-3.0E+01	7.2E-14	-4.5E+48	2.000	3.5E+01	2.1E+15	4.5E+48	0.000	5.3E+00	1	-5.3E+00	-1	2.6E+00	0.9998	-2.6E+00	-0.99981	1.08E-12
11	27.5	1.875	-3.3E+01	3.5E-15	-4.5E+48	2.000	3.9E+01	7.0E+16	4.5E+48	0.000	5.1E+00	1	-5.1E+00	-1	2.5E+00	0.9996	-2.5E+00	-0.99963	5.24E-14
12	30	1.875	-3.6E+01	1.7E-16	-4.5E+48	2.000	4.2E+01	2.4E+18	4.5E+48	0.000	4.8E+00	1	-4.8E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	2.54E-15
13	32.5	1.875	-3.9E+01	8.2E-18	-4.5E+48	2.000	4.6E+01	8.1E+19	4.5E+48	0.000	4.7E+00	1	-4.7E+00	-1	2.3E+00	0.9989	-2.3E+00	-0.99893	1.23E-16
14	35	1.875	-4.2E+01	4.0E-19	-4.5E+48	2.000	4.9E+01	2.7E+21	4.5E+48	0.000	4.5E+00	1	-4.5E+00	-1	2.2E+00	0.9984	-2.2E+00	-0.99839	5.98E-18
15	37.5	1.875	-4.5E+01	1.9E-20	-4.5E+48	2.000	5.3E+01	9.3E+22	4.5E+48	0.000	4.3E+00	1	-4.3E+00	-1	2.2E+00	0.9977	-2.2E+00	-0.99769	2.90E-19
16	40	1.875	-4.8E+01	9.4E-22	-4.5E+48	2.000	5.6E+01	3.2E+24	4.5E+48	0.000	4.2E+00	1	-4.2E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	1.40E-20
17	42.5	1.875	-5.1E+01	4.6E-23	-4.5E+48	2.000	6.0E+01	1.1E+26	4.5E+48	0.000	4.1E+00	1	-4.1E+00	-1	2.0E+00	0.9958	-2.0E+00	-0.99579	6.80E-22
18	45	1.875	-5.4E+01	2.2E-24	-4.5E+48	2.000	6.3E+01	3.7E+27	4.5E+48	0.000	4.0E+00	1	-4.0E+00	-1	2.0E+00	0.9946	-2.0E+00	-0.99459	3.30E-23
19	47.5	1.875	-5.7E+01	1.1E-25	-4.5E+48	2.000	6.7E+01	1.2E+29	4.5E+48	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9932	-1.9E+00	-0.99321	1.60E-24
20	50	1.875	-6.1E+01	5.2E-27	-4.5E+48	2.000	7.1E+01	4.2E+30	4.5E+48	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	7.73E-26

Date:	11/12/2025
Version:	1

Contaminant „2-Dichloroethene

DOMENICO (STEADY STATE)

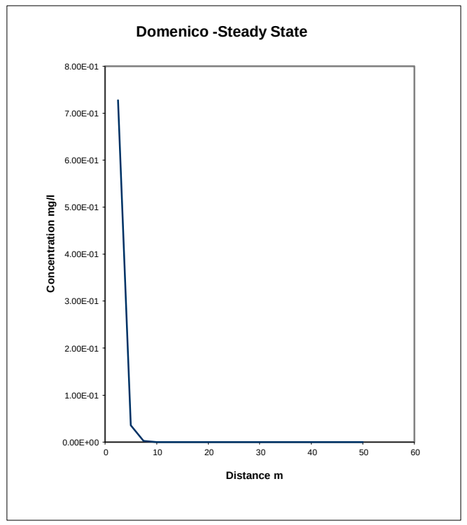
Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.001	mg/l
Co	1.50E+01	mg/l
λ	2.06E-03	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	4.90E+01	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion optio Simulate vertical dispersion in 1 direction

Calc	Value	
v	7.60E-02	m/d
Rc	3.15E+02	
u	2.42E-04	m/d

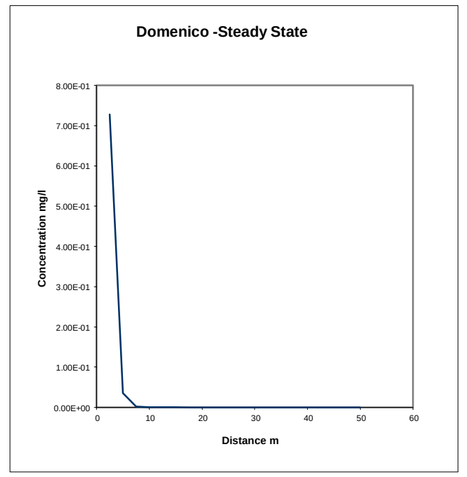
	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	3.75	-3.03E+00	4.85E-02	1.68E+01	1	-1.68E+01	-1	4.17E+00	1	-4.17E+00	-1	7.28E-01
2	5	3.75	-6.05E+00	2.35E-03	1.19E+01	1	-1.19E+01	-1	2.95E+00	1	-2.95E+00	-1	3.53E-02
3	7.5	3.75	-9.08E+00	1.14E-04	9.68E+00	1	-9.68E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	1.71E-03
4	10	3.75	-1.21E+01	5.54E-06	8.39E+00	1	-8.39E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	8.28E-05
5	12.5	3.75	-1.51E+01	2.68E-07	7.50E+00	1	-7.50E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	3.99E-06
6	15	3.75	-1.82E+01	1.30E-08	6.85E+00	1	-6.85E+00	-1	1.70E+00	0.984	-1.70E+00	-0.984	1.92E-07
7	17.5	3.75	-2.12E+01	6.32E-10	6.34E+00	1	-6.34E+00	-1	1.58E+00	0.9743	-1.58E+00	-0.9743	9.23E-09
8	20	3.75	-2.42E+01	3.06E-11	5.93E+00	1	-5.93E+00	-1	1.48E+00	0.963	-1.48E+00	-0.963	4.43E-10
9	22.5	3.75	-2.72E+01	1.49E-12	5.59E+00	1	-5.59E+00	-1	1.39E+00	0.9508	-1.39E+00	-0.9508	2.12E-11
10	25	3.75	-3.03E+01	7.21E-14	5.30E+00	1	-5.30E+00	-1	1.32E+00	0.9379	-1.32E+00	-0.9379	1.01E-12
11	27.5	3.75	-3.33E+01	3.50E-15	5.06E+00	1	-5.06E+00	-1	1.26E+00	0.9247	-1.26E+00	-0.9247	4.85E-14
12	30	3.75	-3.63E+01	1.70E-16	4.84E+00	1	-4.84E+00	-1	1.20E+00	0.9115	-1.20E+00	-0.9115	2.32E-15
13	32.5	3.75	-3.93E+01	8.23E-18	4.65E+00	1	-4.65E+00	-1	1.16E+00	0.8982	-1.16E+00	-0.8982	1.11E-16
14	35	3.75	-4.24E+01	3.99E-19	4.48E+00	1	-4.48E+00	-1	1.11E+00	0.8852	-1.11E+00	-0.8852	5.30E-18
15	37.5	3.75	-4.54E+01	1.94E-20	4.33E+00	1	-4.33E+00	-1	1.08E+00	0.8723	-1.08E+00	-0.8723	2.53E-19
16	40	3.75	-4.84E+01	9.39E-22	4.19E+00	1	-4.19E+00	-1	1.04E+00	0.8598	-1.04E+00	-0.8598	1.21E-20
17	42.5	3.75	-5.14E+01	4.55E-23	4.07E+00	1	-4.07E+00	-1	1.01E+00	0.8476	-1.01E+00	-0.8476	5.79E-22
18	45	3.75	-5.45E+01	2.21E-24	3.95E+00	1	-3.95E+00	-1	9.83E-01	0.8357	-9.83E-01	-0.8357	2.77E-23
19	47.5	3.75	-5.75E+01	1.07E-25	3.85E+00	1	-3.85E+00	-1	9.57E-01	0.8241	-9.57E-01	-0.8241	1.32E-24
20	50	3.75	-6.05E+01	5.20E-27	3.75E+00	1	-3.75E+00	-1	9.33E-01	0.8129	-9.33E-01	-0.8129	6.34E-26



DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	3.75	-3.03E+00	4.85E-02	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	7.28E-01
2	5	3.75	-6.05E+00	2.35E-03	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	3.53E-02
3	7.5	3.75	-9.08E+00	1.14E-04	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	1.71E-03
4	10	3.75	-1.21E+01	5.54E-06	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	8.30E-05
5	12.5	3.75	-1.51E+01	2.68E-07	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	4.03E-06
6	15	3.75	-1.82E+01	1.30E-08	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	1.95E-07
7	17.5	3.75	-2.12E+01	6.32E-10	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	9.48E-09
8	20	3.75	-2.42E+01	3.06E-11	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	4.60E-10
9	22.5	3.75	-2.72E+01	1.49E-12	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-0.9999	2.23E-11
10	25	3.75	-3.03E+01	7.21E-14	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-0.9998	1.08E-12
11	27.5	3.75	-3.33E+01	3.50E-15	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-0.9996	5.24E-14
12	30	3.75	-3.63E+01	1.70E-16	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	2.54E-15
13	32.5	3.75	-3.93E+01	8.23E-18	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.9989	1.23E-16
14	35	3.75	-4.24E+01	3.99E-19	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.9984	5.98E-18
15	37.5	3.75	-4.54E+01	1.94E-20	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.9977	2.90E-19
16	40	3.75	-4.84E+01	9.39E-22	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	1.40E-20
17	42.5	3.75	-5.14E+01	4.55E-23	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.9958	6.80E-22
18	45	3.75	-5.45E+01	2.21E-24	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.9946	3.30E-23
19	47.5	3.75	-5.75E+01	1.07E-25	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.9932	1.60E-24
20	50	3.75	-6.05E+01	5.20E-27	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	7.73E-26



Date:	11/12/2025
Version:	1

DOMENICO (TIME VARIANT)

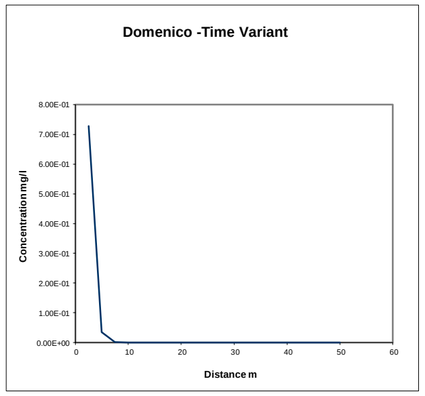
Contaminant ι,2-Dichloroethene

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.001	mg/l
Co	1.50E+01	mg/l
λ	2.06E-03	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	4.90E+01	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	1.875	-3.03E+00	4.85E-02	-4.53E+48	2	1.68E+01	1	-1.68E+01	-1	4.17E+00	1	-4.17E+00	-1	7.28E-01
2	5	1.875	-6.05E+00	2.35E-03	-4.53E+48	2	1.19E+01	1	-1.19E+01	-1	2.95E+00	1	-2.95E+00	-1	3.53E-02
3	7.5	1.875	-9.08E+00	1.14E-04	-4.53E+48	2	9.68E+00	1	-9.68E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	1.71E-03
4	10	1.875	-1.21E+01	5.54E-06	-4.53E+48	2	8.39E+00	1	-8.39E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	8.28E-05
5	12.5	1.875	-1.51E+01	2.68E-07	-4.53E+48	2	7.50E+00	1	-7.50E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	3.99E-06
6	15	1.875	-1.82E+01	1.30E-08	-4.53E+48	2	6.85E+00	1	-6.85E+00	-1	1.70E+00	0.984	-1.70E+00	-0.984	1.92E-07
7	17.5	1.875	-2.12E+01	6.32E-10	-4.53E+48	2	6.34E+00	1	-6.34E+00	-1	1.58E+00	0.9743	-1.58E+00	-0.974	9.23E-09
8	20	1.875	-2.42E+01	3.06E-11	-4.53E+48	2	5.93E+00	1	-5.93E+00	-1	1.48E+00	0.963	-1.48E+00	-0.963	4.43E-10
9	22.5	1.875	-2.72E+01	1.49E-12	-4.53E+48	2	5.59E+00	1	-5.59E+00	-1	1.39E+00	0.9508	-1.39E+00	-0.951	2.12E-11
10	25	1.875	-3.03E+01	7.21E-14	-4.53E+48	2	5.30E+00	1	-5.30E+00	-1	1.32E+00	0.9379	-1.32E+00	-0.938	1.01E-12
11	27.5	1.875	-3.33E+01	3.50E-15	-4.53E+48	2	5.06E+00	1	-5.06E+00	-1	1.26E+00	0.9247	-1.26E+00	-0.925	4.85E-14
12	30	1.875	-3.63E+01	1.70E-16	-4.53E+48	2	4.84E+00	1	-4.84E+00	-1	1.20E+00	0.9115	-1.20E+00	-0.911	2.32E-15
13	32.5	1.875	-3.93E+01	8.23E-18	-4.53E+48	2	4.65E+00	1	-4.65E+00	-1	1.16E+00	0.8982	-1.16E+00	-0.898	1.11E-16
14	35	1.875	-4.24E+01	3.99E-19	-4.53E+48	2	4.48E+00	1	-4.48E+00	-1	1.11E+00	0.8852	-1.11E+00	-0.885	5.30E-18
15	37.5	1.875	-4.54E+01	1.94E-20	-4.53E+48	2	4.33E+00	1	-4.33E+00	-1	1.08E+00	0.8723	-1.08E+00	-0.872	2.53E-19
16	40	1.875	-4.84E+01	9.39E-22	-4.53E+48	2	4.19E+00	1	-4.19E+00	-1	1.04E+00	0.8598	-1.04E+00	-0.86	1.21E-20
17	42.5	1.875	-5.14E+01	4.55E-23	-4.53E+48	2	4.07E+00	1	-4.07E+00	-1	1.01E+00	0.8476	-1.01E+00	-0.848	5.79E-22
18	45	1.875	-5.45E+01	2.21E-24	-4.53E+48	2	3.95E+00	1	-3.95E+00	-1	9.83E-01	0.8357	-9.83E-01	-0.836	2.77E-23
19	47.5	1.875	-5.75E+01	1.07E-25	-4.53E+48	2	3.85E+00	1	-3.85E+00	-1	9.57E-01	0.8241	-9.57E-01	-0.824	1.32E-24
20	50	1.875	-6.05E+01	5.20E-27	-4.53E+48	2	3.75E+00	1	-3.75E+00	-1	9.33E-01	0.8129	-9.33E-01	-0.813	6.34E-26

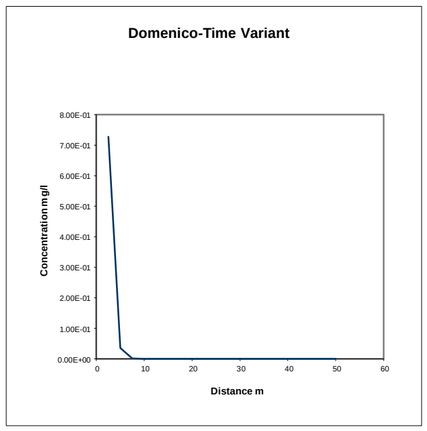


Calc **Value**

Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

v	7.60E-02	m/d
Rc	3.15E+02	
u	2.42E-04	m/d

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	1.875	-3.03E+00	4.85E-02	-4.53E+48	2	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	7.28E-01
2	5	1.875	-6.05E+00	2.35E-03	-4.53E+48	2	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	3.53E-02
3	7.5	1.875	-9.08E+00	1.14E-04	-4.53E+48	2	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	1.71E-03
4	10	1.875	-1.21E+01	5.54E-06	-4.53E+48	2	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	8.30E-05
5	12.5	1.875	-1.51E+01	2.68E-07	-4.53E+48	2	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	4.03E-06
6	15	1.875	-1.82E+01	1.30E-08	-4.53E+48	2	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	1.95E-07
7	17.5	1.875	-2.12E+01	6.32E-10	-4.53E+48	2	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	9.48E-09
8	20	1.875	-2.42E+01	3.06E-11	-4.53E+48	2	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	4.60E-10
9	22.5	1.875	-2.72E+01	1.49E-12	-4.53E+48	2	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-1	2.23E-11
10	25	1.875	-3.03E+01	7.21E-14	-4.53E+48	2	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-1	1.08E-12
11	27.5	1.875	-3.33E+01	3.50E-15	-4.53E+48	2	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-1	5.24E-14
12	30	1.875	-3.63E+01	1.70E-16	-4.53E+48	2	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	2.54E-15
13	32.5	1.875	-3.93E+01	8.23E-18	-4.53E+48	2	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.999	1.23E-16
14	35	1.875	-4.24E+01	3.99E-19	-4.53E+48	2	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.998	5.98E-18
15	37.5	1.875	-4.54E+01	1.94E-20	-4.53E+48	2	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.998	2.90E-19
16	40	1.875	-4.84E+01	9.39E-22	-4.53E+48	2	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	1.40E-20
17	42.5	1.875	-5.14E+01	4.55E-23	-4.53E+48	2	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.996	6.80E-22
18	45	1.875	-5.45E+01	2.21E-24	-4.53E+48	2	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.995	3.30E-23
19	47.5	1.875	-5.75E+01	1.07E-25	-4.53E+48	2	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.993	1.60E-24
20	50	1.875	-6.05E+01	5.20E-27	-4.53E+48	2	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	7.73E-26



Date:	11/12/2025
Version:	1

Hydrogeological risk assessment for land contamination

Remedial Targets Worksheet , Release 3.2

First released: 2006. Version 3.2: January 2013

This worksheet has been produced in combination with the document 'Remedial Targets Methodology: Hydrogeological risk assessment for land contamination (Environment Agency 2006).

Users of this worksheet should always refer to the User Manual to the Remedial Targets Methodology and to relevant guidance on UK legislation and policy, in order to understand how this procedure should be applied in an appropriate context.

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The calculation of equations in this worksheet has been independently checked by Entec (UK) Ltd on behalf of the Environment Agency.

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IMPORTANT: To enable MS Excel worksheet, click Tools, Add -Ins, Analysis Tool Pak and Analysis Tool Pak-VBA (to calculate error functions).

Details to be completed for each assessment				
Site Name:	Kelvedon Street			
Site Address:	Newport			
Completed by:	Michael Watkins			
Date:	11-Dec-25		Version:	1
Contaminant	cis 1,2-Dichloroethene			
Target Concentration (C_T)	0.001	mg/l	Origin of C_T:	Laboratory detection limit

This worksheet can be used to determine remedial targets for soils (Worksheets Level 1 Soil, Level 2 and Level 3 Soil) or to determine remedial targets for groundwater (Level 3 Groundwater). For Level 3, parameter values must be entered separately dependent on whether the assessment is for soil or groundwater. For soil, remedial targets are calculated as either mg/kg (for comparision with soil measurements) or mg/l (for comparison with leaching tests or pore water concentrations).
Site details entered on this page are automatically copied to Level 1, 2 and 3 Worksheets.
Worksheet options are identified by brown background and employ a pull-down menus. Data entry are identified as blue background.
Data origin / justification should be noted in cells coloured yellow and fully documented in subsequent reports.
Data carried forward from an earlier worksheet are identified by a light green background
It is recommended that a copy of the original worksheet is saved (all data fields in the original copy are blank).

The spreadsheet also includes a porosity calculation worksheet, a soil impact calculation worksheet and a worksheet that performs some simple hydrogeological calculations.

Remedial Targets Worksheet , Release 3.2

Level 1 - Soil

Select the method of calculating the soil water Partition Co-efficient by using the pull down menu below

User specified value for partition coefficient

Contaminant		**cis 1,2-Dichloroethene**		
Target concentration	**C_T**	**0.001**	**mg/l**	

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**
Standard entry				
Water filled soil porosity	θ_w	0.00E+00	fraction	
Air filled soil porosity	θa	0.00E+00	fraction	
Bulk density of soil zone material	ρ	0.00E+00	g/cm^3	
Henry's Law constant	H	0.00E+00	dimensionless	
Entry if specify partition coefficient (option)				
Soil water partition coefficient	Kd	0.00E+00	l/kg	
Entry for non-polar organic chemicals (option)				
Fraction of organic carbon (in soil)	foc		fraction	
Organic carbon partition coefficient	Koc		l/kg	
Entry for ionic organic chemicals (option)				
Sorption coefficient for neutral species	$K_{oc,n}$		l/kg	
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg	
pH value	pH		pH units	
Acid dissociation constant	pKa			
Fraction of organic carbon (in soil)	foc		fraction	

This sheet calculates the Level 1 remedial target for soils(mg/kg) based on a selected target concentration and theoretical calculation of soil water partitioning. Three options are included for determining the partition coefficient.

The measured soil concentration as mg/kg should be compared with the Level 1 remedial target to determine the need for further action.

Soil water partition coefficient used in Level Assessment	**Kd**	**0.00E+00**	**l/kg**	*Specified value*

Level 1 Remedial Target

Level 1 Remedial Target	**#DIV/0!**	**mg/kg**	**(for comparison with soil analyses)**
	or		
	0.001	**mg/l**	**(for comparison with leachate test results)**

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 2 - Soil

Contaminant		**cis 1,2-Dichloroethene**		from Level 1
Target concentration	C_T	**0.001**	**mg/l**	from Level 1

This sheet calculates the Level 2 remedial target for soils (mg/kg) or for pore water (mg/l).

The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 2 remedial target to determine the need for further action. Equations presented in 'Hydrogeological risk assessment for land contamiantion' (Environment Agency 2006)

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**	
Standard entry					
Infiltration	Inf	0.00E+00	m/d		
Area of contaminant source	A	0.00E+00	m^2		Not used in calculation
Entry for groundwater flow below site					
Length of contaminant source in direction of groundwater flow	L	0.00E+00	m		
Saturated aquifer thickness	da	0.00E+00	m		
Hydraulic Conductivity of aquifer in which dilution occurs	K	0.00E+00	m/d		
Hydraulic gradient of water table	i	0.00E+00	fraction		
Width of contaminant source perpendicular to groundwater flow	w	0.00E+00	m		Not used in calculation
Background concentration of contaminant in groundwater beneath site	Cu	0.00E+00	mg/l		
Define mixing zone depth by specifying or calculating depth (using pull down list)		**Specify**			
Enter mixing zone thickness	Mz	0.00E+00	m		
Calculated mixing zone thickness	Mz		m		

Calculated Parameters

Dilution Factor	**DF**	**#DIV/0!**		
Level 2 Remedial Target		**#DIV/0!**	**mg/l**	**For comparison with measured pore water concentration. This assumes Level 1 Remedial Target is based on Target Concentration.**
		or		
		#DIV/0!	**mg/kg**	**For comparison with measured soil concentration. This assumes Level 1 Remedial Target calculated from soil-water**

Additional option

Calculation of impact on receptor

Concentration of contaminant in contaminated discharge (entering receptor)	Cc	0.00E+00	mg/l	
Calculated concentration within receptor (dilution only)		#DIV/0!	mg/l	0

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 3 - Soil

See Note

Input Parameters	Variable	Value	Unit	Source
Contaminant		cis 1,2-Dichloroethene		from Level 1
Target Concentration	C_T	0.001	mg/l	from Level 1
Dilution Factor	DF	#DIV/0!		from Level 2

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value)

	Variable	Value	Unit	Source of parameter value
Enter source concentration		Soil concentration as mg/kg		
Enter soil concentration		0	mg/kg	
Half life for degradation of contaminant in water	$t_{1/2}$	1.00E+100	days	
Calculated decay rate	λ	6.93E-101	$days^{-1}$	calculated
Width of plume in aquifer at source	Sz	0.00E+00	m	from Level 2
Plume thickness in aquifer at source	Sy	0.00E+00	m	from Level 2
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Effective porosity of aquifer	n	0.00E+00	fraction	
Hydraulic gradient	i	#DIV/0!	fraction	from Level 2 (adjusted)
Hydraulic conductivity of saturated aquifer	K	0.00E+00	m/d	from Level 2
Distance to compliance point	x	0.00E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	1.00E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	0.00E+00	l/kg	*see options*
Longitudinal dispersivity	ax	0.000	m	*see options*
Transverse dispersivity	az	0.000	m	*see options*
Vertical dispersivity	ay	0.000	m	*see options*

Parameter values should be checked against Level 1 and 2

Calculated Parameters	Variable		
Groundwater flow velocity	v	#DIV/0!	m/d
Retardation factor	Rf	#DIV/0!	fraction
Decay rate used	λ	6.93E-101	d^{-1}
Hydraulic gradient used in aquifer flow down-gradient	i	#DIV/0!	fraction
Rate of contaminant flow due to retardation	u	#DIV/0!	m/d
Ratio of Compliance Point to Source Concentration	C_{EG}/C_0	#DIV/0!	fraction
Attenuation factor (C_0/C_{EG})	**AF**	**#DIV/0!**	**fraction**
Calculated soil leachate concentration	Co	#DIV/0!	mg/l

Remedial Targets

Level 3 Remedial Target	**#DIV/0!**	**mg/l**	For comparison with measured pore water concentration.
Ogata Banks	**or**		This assumes Level 1 Remedial Target is based on Target Concentration.
	#DIV/0!	**mg/kg**	For comparison with measured soil concentration. This
Distance to compliance point	**0**	**m**	assumes Level 1 Remedial Target calculated from soil-water partitioning equation.
Ratio of Compliance Point to Source Concentration	**#DIV/0!**	**fraction**	Ogata Banks

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99

Enter method of defining partition co-efficient (using pull down list)

Calculate for ionic organic chemicals (acids)

Entry if specify partition coefficient (option)

Soil water partition coefficient	Kd		l/kg

Entry for non-polar organic chemicals (option)

Fraction of organic carbon in aquifer	foc		fraction
Organic carbon partition coefficient	Koc		l/kg

Entry for ionic organic chemicals (option)

Sorption coefficient for related species	$K_{oc,n}$	0.00E+00	l/kg
Sorption coefficient for ionised species	$K_{oc,i}$	0.00E+00	l/kg
pH value	pH	0.00E+00	
Acid dissociation constant	pKa	0.00E+00	
Fraction of organic carbon in aquifer	foc	0.00E+00	fraction
Soil water partition coefficient	Kd	0.00E+00	l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

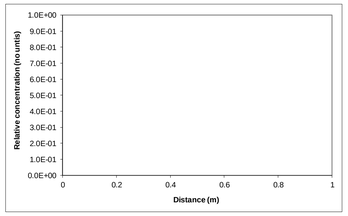
		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	0.00E+00	#NUM!	m
Transverse dispersivity	**az**	0.00E+00	0.00E+00	#NUM!	m
Vertical dispersivity	**ay**	0.00E+00	0.00E+00	#NUM!	m

Note values of dispersivity must be > 0

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed

Note
This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O_2, NO_3, SO_4 etc than an alternative solution should be used

Environment Agency



Note: 'Relative concentration' is the ratio of calculated concentation at a given position compared to the source concentration. The calculations assume plume disperses from the top of the aquifer. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

This sheet calculates the Level 3 remedial target for soils(mg/kg) or for pore water (mg/l), based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.By setting a long travel time (e.g. 9E99) it will give the steady state solution, which should always be used when calculating remedial targets.

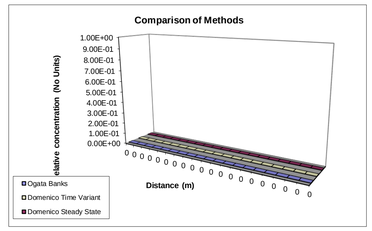
The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.9E+99.

Calculated (relative) concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Relative concentration (No units)	Concentration mg/l
0	1.0E+00	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!



Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Remedial Targets Worksheet , Release 3.2

Calculation of contaminant concentration in groundwater from a soil source

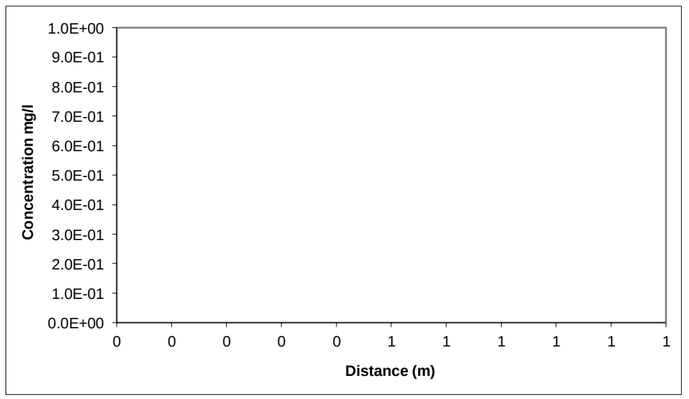
Only input required is Soil Contaminant Concentration

	Input Parameters			
	Soil contaminant concentration	C_0	0.00E+00	mg/kg
Level 1 Parameters				
	Water filled soil porosity	θ_W	0.00E+00	fraction
	Air filled soil porosity	θa	0.00E+00	fraction
	Bulk density	ρ	0.00E+00	g/cm^3
	Henry's Law constant	H	0.00E+00	dimensionless
	Soil water partition coefficient used in Level Assessment	Kd	0.00E+00	l/kg
	Factor (partitioning between soil and water)		#DIV/0!	dimensionless
Level 2 Parameters	**Dilution Factor**	DF	#DIV/0!	
Level 3 Parameters	**Attenuation factor (C_O/C_{ED})**	AF	#DIV/0!	

Predicted concentrations at compliance point

Level 1	C	#DIV/0!	mg/l	No dilution or attenuation
Level 2	C	#DIV/0!	mg/l	Dilution taken into account
Level 3	C	#DIV/0!	mg/l	Dilution and attenuation taken into account

Predicted concentrations between source and compliance point - Level 3



Distance m	Concentration mg/l
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)	Variable	Value	Unit	Source
Contaminant		cis 1,2-Dichloroethene		from Level 1
Target Concentration	C_T	1.00E-03	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Domenico - Steady state — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived va

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	1.50E-02	mg/l	*Site investigation data*
Half life for degradation of contaminant in water	$t_{1/2}$	3.36E+03	days	*Agency for Toxic Substances and Disease*
Calculated decay rate	λ	2.06E-04	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	7.50E+01	m	*Length of site perpendicular to groundwater flow*
Plume thickness at source	Sy	5.90E+00	m	*Same as Mixing Zone Thickness. "For a thin aquifer (typically <10m), the mixing zone thickness can be taken as the acte*
Saturated aquifer thickness	da	6.00E+00	m	*Maximum thickness recorded in vicinity of*
Bulk density of aquifer materials	ρ	1.60E+00	g/cm^3	*Typical bulk density for river terrace deposits (conserv*
Effective porosity of aquifer	n	2.50E-01	fraction	*Maximum porosity for coarse Gravel (Lovanh et al 2000) - conservative estimate*
Hydraulic gradient	i	4.40E-02	fraction	*Borehole level data*
Hydraulic conductivity of aquifer	K	4.32E-01	m/d	*Maximum typical value for clayey sandy G*
Distance to compliance point	x	5.00E+01	m	*Default compliance distance*
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	9.90E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	4.90E+01	l/kg	*see options*
Longitudinal dispersivity	ax	5.00E+00	m	*see options*
Transverse dispersivity	az	5.00E-01	m	*see options*
Vertical dispersivity	ay	5.00E-02	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)

Soil water partition coefficient — Kd — 4.90E+01 l/kg

Entry for non-polar organic chemicals (option)

Fraction of organic carbon in aquifer — foc — fraction

Organic carbon partition coefficient — Koc — l/kg

Entry for ionic organic chemicals (option)

Sorption coefficient for related species — $K_{oc,n}$ — l/kg

Sorption coefficient for ionised species — $K_{oc,i}$ — l/kg

pH value — pH

acid dissociation constant — pKa

Fraction of organic carbon in aquifer — foc — fraction

Soil water partition coefficient — Kd — 4.90E+01 — l/kg

Define dispersivity (click brown cell and use pull down list)

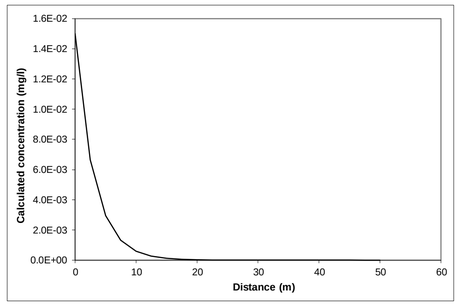
Dispersivities 10%, 1%, 0.1% of pathway length

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	5.00E+00	2.98E+00	m
Transverse dispersivity	**az**	0.00E+00	5.00E-01	2.98E-01	m
Vertical dispersivity	**ay**	0.00E+00	5.00E-02	2.98E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Calculated concentrations for distance-concentration graph

Domenico - Steady state
From calculation sheet

Distance	Concentration
	mg/l
0	1.5E-02
2.5	6.65E-03
5.0	2.95E-03
7.5	1.31E-03
10.0	5.81E-04
12.5	2.58E-04
15.0	1.14E-04
17.5	5.07E-05
20.0	2.25E-05
22.5	9.98E-06
25.0	4.43E-06
27.5	1.96E-06
30.0	8.71E-07
32.5	3.86E-07
35.0	1.71E-07
37.5	7.59E-08
40.0	3.36E-08
42.5	1.49E-08
45.0	6.61E-09
47.5	2.93E-09
50.0	1.30E-09

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Calculated Parameters	Variable		
Groundwater flow velocity	v	7.60E-02	m/d
Retardation factor	Rf	3.15E+02	fraction
Decay rate used	λ	2.06E-04	d^{-1}
Rate of contaminant flow due to retardation	u	2.42E-04	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	1.30E-09	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**1.16E+07**	

Remedial Targets

Remedial Target		**1.16E+04**	**mg/l**	For comparison with measured groundwater concentration.
Domenico - Steady state				
Distance to compliance point		**50**	**m**	
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**1.30E-09**	**mg/l**	Domenico - Steady state

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.

Porosity Calculator

These results are not carried through to any of the other worksheets

DRY BULK DENSITY DATA

Variable	Value	Unit	justification
Natural Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Dry Bulk Density	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
Initial Saturation	#DIV/0!	%	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	
Water Filled Porosity	**#DIV/0!**	**fraction**	

WET BULK DENSITY DATA

Variable	Value	Unit	
Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Actual (wet) Bulk Density (i.e. at natural MC)	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
dry bulk density	0.00	tonnes/m^3	
Initial Saturation	#DIV/0!	%	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	**#DIV/0!**
Water Filled Porosity	**#DIV/0!**	**fraction**	

Analytical solutions provided by David Hall, Golder Associates (UK) Ltd

Simple hydrogeological calculations

(These are not specific to, or required in, the Remedial Targets Methodology)

Parameter	symbol		unit	justification
Hydraulic conductivity	K	0.00E+00	m/d	
Hydraulic gradient	i	0.00E+00	unitless	
Effective porosity of aquifer	n	0.00E+00	fraction	
Thickness of saturated aquifer	b	0.00E+00	m	
Width of aquifer perpendicular to flow	w	0.00E+00	m	
Distance to receptor	x	0.00E+00	m	
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Soil-water partition co-efficient	Kd	0.00E+00	l/kg	
Retardation factor of pollutant	R	#DIV/0!		

Groundwater flow velocity	v(GW)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for groundwater to reach receptor	t(GW)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years
Rate of groundwater flow through aquifer	Q	0.00E+00	m^3/s	0.00E+00	m^3/day	0.00E+00	m^3/year

Contaminant flow velocity	v(contam)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for contaminant to reach receptor	t(contam)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years

Level 1 Calculation Sheet

Contaminant **1,2-Dichloroethene**

Parameter	Value	Units
(carried over from input sheet)		
C_T	1.00E-03	mg/l
Kd	0.00E+00	l/kg
foc		fraction
koc		l/kg
θ_W	0.00E+00	fraction
θa	0.00E+00	fraction
ρ	0.00E+00	g/cm3
H	0.00E+00	dimensionless
Koc,n		l/kg
Koc,i		l/kg
pH		pH units
pKa		
foc (ionic)		fraction

Calculations (Refer toTable 4.3, R&D Publication 20)

Selected option User specified value for partition coefficient

	calc	calc	Calc Kd	l/kg
Calculation of partition coefficient for ionic organic chemical				
Partition coefficient used in Level 1 Assessment			0.00E+00	l/kg

Calculated Remedial Target **#DIV/0!** **mg/kg** **for cis 1,2-Dichloroethene**

Factor (partitioning between soil and water) #DIV/0!

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11/12/2025
Version:	1

Level 2 Calculation Sheet

Contaminant : 1,2-Dichloroethene

Site assessed:	Kelvedon Stre
Date:	11/12/2025
Version:	1

Parameter	Value	Units		
(carried over from input sheet)				
Mz	0.00E+00	m		
L	0.00E+00	m		
da	0.00E+00	m		Calculated
Inf	0.00E+00	m/d		Dilution Factor
K	0.00E+00	m/d		
i	0.00E+00		Calculation based on target concentration	#DIV/0!
A	0.00E+00	m3/d m2 m3/d	Calculation based on observed contaminant concentration	#DIV/0!
Cc	0.00E+00	mg/l		
C_T	1.00E-03	mg/l		
Cu	0.00E+00	mg/l		
w	0.00E+00	m		



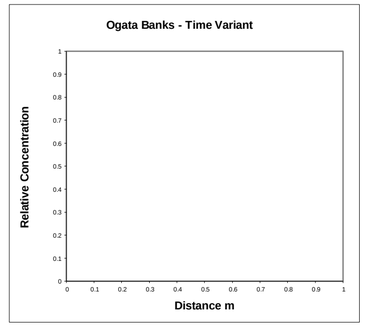
Contaminant **1,2-Dichloroethene**

OGATA BANKS SOLUTION

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-03	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Calc	Value	
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) -USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

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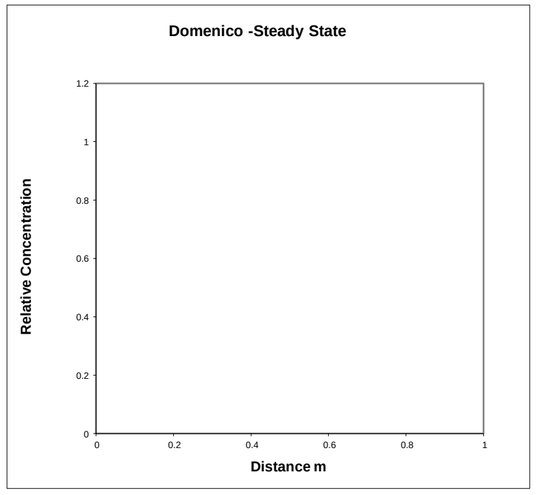
Contaminant **.,2-Dichloroethene**

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-03	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

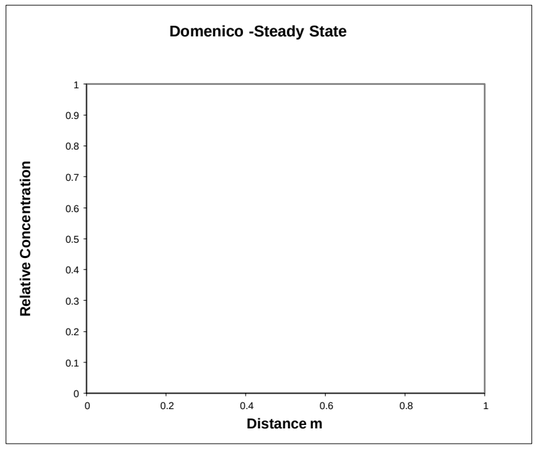


Calc	Value	Units
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



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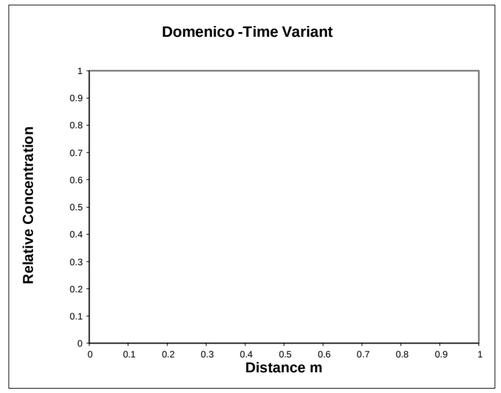
DOMENICO (TIME VARIANT)

Contaminant **l,2-Dichloroethene**

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.001	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

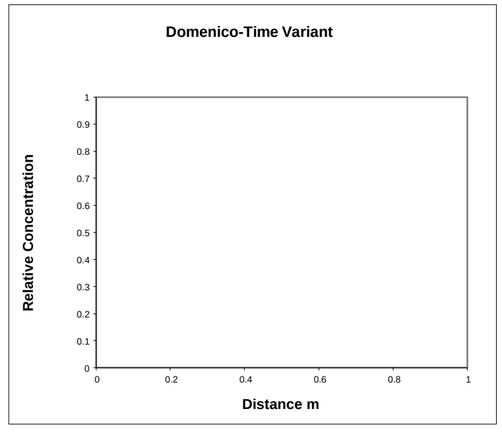


Calc **Value**

Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Date:	11/12/2025
Version:	1

OGATA BANKS SOLUTION

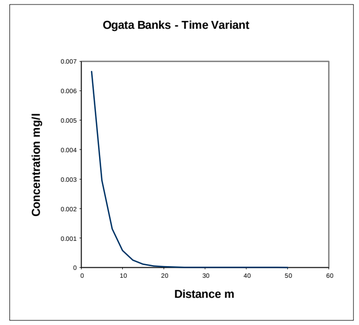
Contaminant **1,2-Dichloroethene**

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.001	mg/l
Co	1.50E-02	mg/l
λ	2.06E-04	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	4.90E+01	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.00188	-8.1E-01	4.4E-01	-1.5E+48	2.000	1.3E+00	3.7E+00	1.5E+48	0.000	1.7E+01	1	-1.7E+01	-1	4.2E+00	1	-4.2E+00	-1	6.65E-03
2	5	0.00188	-1.6E+00	2.0E-01	-1.5E+48	2.000	2.6E+00	1.4E+01	1.5E+48	0.000	1.2E+01	1	-1.2E+01	-1	3.0E+00	1	-3.0E+00	-0.99997	2.95E-03
3	7.5	0.00188	-2.4E+00	8.7E-02	-1.5E+48	2.000	3.9E+00	5.1E+01	1.5E+48	0.000	9.7E+00	1	-9.7E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	1.31E-03
4	10	0.00188	-3.3E+00	3.9E-02	-1.5E+48	2.000	5.3E+00	1.9E+02	1.5E+48	0.000	8.4E+00	1	-8.4E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	5.79E-04
5	12.5	0.00188	-4.1E+00	1.7E-02	-1.5E+48	2.000	6.6E+00	7.1E+02	1.5E+48	0.000	7.5E+00	1	-7.5E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	2.56E-04
6	15	0.00188	-4.9E+00	7.6E-03	-1.5E+48	2.000	7.9E+00	2.6E+03	1.5E+48	0.000	6.8E+00	1	-6.8E+00	-1	1.7E+00	0.984	-1.7E+00	-0.98399	1.12E-04
7	17.5	0.00188	-5.7E+00	3.4E-03	-1.5E+48	2.000	9.2E+00	9.8E+03	1.5E+48	0.000	6.3E+00	1	-6.3E+00	-1	1.6E+00	0.9743	-1.6E+00	-0.97425	4.94E-05
8	20	0.00188	-6.5E+00	1.5E-03	-1.5E+48	2.000	1.1E+01	3.6E+04	1.5E+48	0.000	5.9E+00	1	-5.9E+00	-1	1.5E+00	0.963	-1.5E+00	-0.96302	2.17E-05
9	22.5	0.00188	-7.3E+00	6.7E-04	-1.5E+48	2.000	1.2E+01	1.4E+05	1.5E+48	0.000	5.6E+00	1	-5.6E+00	-1	1.4E+00	0.9508	-1.4E+00	-0.95078	9.49E-06
10	25	0.00188	-8.1E+00	3.0E-04	-1.5E+48	2.000	1.3E+01	5.0E+05	1.5E+48	0.000	5.3E+00	1	-5.3E+00	-1	1.3E+00	0.9379	-1.3E+00	-0.93792	4.15E-06
11	27.5	0.00188	-8.9E+00	1.3E-04	-1.5E+48	2.000	1.4E+01	1.9E+06	1.5E+48	0.000	5.1E+00	1	-5.1E+00	-1	1.3E+00	0.9247	-1.3E+00	-0.92475	1.82E-06
12	30	0.00188	-9.8E+00	5.8E-05	-1.5E+48	2.000	1.6E+01	6.9E+06	1.5E+48	0.000	4.8E+00	1	-4.8E+00	-1	1.2E+00	0.9115	-1.2E+00	-0.91147	7.94E-07
13	32.5	0.00188	-1.1E+01	2.6E-05	-1.5E+48	2.000	1.7E+01	2.6E+07	1.5E+48	0.000	4.7E+00	1	-4.7E+00	-1	1.2E+00	0.8982	-1.2E+00	-0.89824	3.47E-07
14	35	0.00188	-1.1E+01	1.1E-05	-1.5E+48	2.000	1.8E+01	9.6E+07	1.5E+48	0.000	4.5E+00	1	-4.5E+00	-1	1.1E+00	0.8852	-1.1E+00	-0.88517	1.52E-07
15	37.5	0.00188	-1.2E+01	5.1E-06	-1.5E+48	2.000	2.0E+01	3.6E+08	1.5E+48	0.000	4.3E+00	1	-4.3E+00	-1	1.1E+00	0.8723	-1.1E+00	-0.87233	6.64E-08
16	40	0.00188	-1.3E+01	2.2E-06	-1.5E+48	2.000	2.1E+01	1.3E+09	1.5E+48	0.000	4.2E+00	1	-4.2E+00	-1	1.0E+00	0.8598	-1.0E+00	-0.85979	2.90E-08
17	42.5	0.00188	-1.4E+01	1.0E-06	-1.5E+48	2.000	2.2E+01	4.9E+09	1.5E+48	0.000	4.1E+00	1	-4.1E+00	-1	1.0E+00	0.8476	-1.0E+00	-0.84756	1.27E-08
18	45	0.00188	-1.5E+01	4.4E-07	-1.5E+48	2.000	2.4E+01	1.8E+10	1.5E+48	0.000	4.0E+00	1	-4.0E+00	-1	9.8E-01	0.8357	-9.8E-01	-0.83567	5.55E-09
19	47.5	0.00188	-1.5E+01	2.0E-07	-1.5E+48	2.000	2.5E+01	6.8E+10	1.5E+48	0.000	3.8E+00	1	-3.8E+00	-1	9.6E-01	0.8241	-9.6E-01	-0.82412	2.43E-09
20	50	0.00188	-1.6E+01	8.7E-08	-1.5E+48	2.000	2.6E+01	2.5E+11	1.5E+48	0.000	3.8E+00	1	-3.8E+00	-1	9.3E-01	0.8129	-9.3E-01	-0.81292	1.06E-09

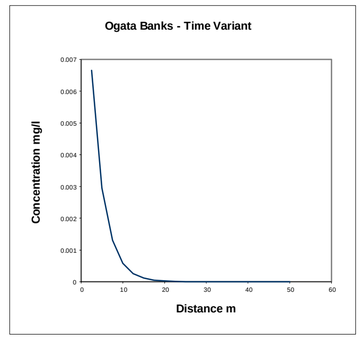


Calc **Value**

v	7.60E-02 m/d
Rc	3.15E+02
u	2.42E-04 m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.00188	-8.1E-01	4.4E-01	-1.5E+48	2.000	1.3E+00	3.7E+00	1.5E+48	0.000	1.7E+01	1	-1.7E+01	-1	8.3E+00	1	-8.3E+00	-1	6.65E-03
2	5	0.00188	-1.6E+00	2.0E-01	-1.5E+48	2.000	2.6E+00	1.4E+01	1.5E+48	0.000	1.2E+01	1	-1.2E+01	-1	5.9E+00	1	-5.9E+00	-1	2.95E-03
3	7.5	0.00188	-2.4E+00	8.7E-02	-1.5E+48	2.000	3.9E+00	5.1E+01	1.5E+48	0.000	9.7E+00	1	-9.7E+00	-1	4.8E+00	1	-4.8E+00	-1	1.31E-03
4	10	0.00188	-3.3E+00	3.9E-02	-1.5E+48	2.000	5.3E+00	1.9E+02	1.5E+48	0.000	8.4E+00	1	-8.4E+00	-1	4.2E+00	1	-4.2E+00	-1	5.81E-04
5	12.5	0.00188	-4.1E+00	1.7E-02	-1.5E+48	2.000	6.6E+00	7.1E+02	1.5E+48	0.000	7.5E+00	1	-7.5E+00	-1	3.7E+00	1	-3.7E+00	-1	2.58E-04
6	15	0.00188	-4.9E+00	7.6E-03	-1.5E+48	2.000	7.9E+00	2.6E+03	1.5E+48	0.000	6.8E+00	1	-6.8E+00	-1	3.4E+00	1	-3.4E+00	-1	1.14E-04
7	17.5	0.00188	-5.7E+00	3.4E-03	-1.5E+48	2.000	9.2E+00	9.8E+03	1.5E+48	0.000	6.3E+00	1	-6.3E+00	-1	3.2E+00	1	-3.2E+00	-0.99999	5.07E-05
8	20	0.00188	-6.5E+00	1.5E-03	-1.5E+48	2.000	1.1E+01	3.6E+04	1.5E+48	0.000	5.9E+00	1	-5.9E+00	-1	3.0E+00	1	-3.0E+00	-0.99997	2.25E-05
9	22.5	0.00188	-7.3E+00	6.7E-04	-1.5E+48	2.000	1.2E+01	1.4E+05	1.5E+48	0.000	5.6E+00	1	-5.6E+00	-1	2.8E+00	0.9999	-2.8E+00	-0.99992	9.98E-06
10	25	0.00188	-8.1E+00	3.0E-04	-1.5E+48	2.000	1.3E+01	5.0E+05	1.5E+48	0.000	5.3E+00	1	-5.3E+00	-1	2.6E+00	0.9998	-2.6E+00	-0.99981	4.43E-06
11	27.5	0.00188	-8.9E+00	1.3E-04	-1.5E+48	2.000	1.4E+01	1.9E+06	1.5E+48	0.000	5.1E+00	1	-5.1E+00	-1	2.5E+00	0.9996	-2.5E+00	-0.99963	1.96E-06
12	30	0.00188	-9.8E+00	5.8E-05	-1.5E+48	2.000	1.6E+01	6.9E+06	1.5E+48	0.000	4.8E+00	1	-4.8E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	8.71E-07
13	32.5	0.00188	-1.1E+01	2.6E-05	-1.5E+48	2.000	1.7E+01	2.6E+07	1.5E+48	0.000	4.7E+00	1	-4.7E+00	-1	2.3E+00	0.9989	-2.3E+00	-0.99893	3.86E-07
14	35	0.00188	-1.1E+01	1.1E-05	-1.5E+48	2.000	1.8E+01	9.6E+07	1.5E+48	0.000	4.5E+00	1	-4.5E+00	-1	2.2E+00	0.9984	-2.2E+00	-0.99839	1.71E-07
15	37.5	0.00188	-1.2E+01	5.1E-06	-1.5E+48	2.000	2.0E+01	3.6E+08	1.5E+48	0.000	4.3E+00	1	-4.3E+00	-1	2.2E+00	0.9977	-2.2E+00	-0.99769	7.59E-08
16	40	0.00188	-1.3E+01	2.2E-06	-1.5E+48	2.000	2.1E+01	1.3E+09	1.5E+48	0.000	4.2E+00	1	-4.2E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	3.36E-08
17	42.5	0.00188	-1.4E+01	1.0E-06	-1.5E+48	2.000	2.2E+01	4.9E+09	1.5E+48	0.000	4.1E+00	1	-4.1E+00	-1	2.0E+00	0.9958	-2.0E+00	-0.99579	1.49E-08
18	45	0.00188	-1.5E+01	4.4E-07	-1.5E+48	2.000	2.4E+01	1.8E+10	1.5E+48	0.000	4.0E+00	1	-4.0E+00	-1	2.0E+00	0.9946	-2.0E+00	-0.99459	6.61E-09
19	47.5	0.00188	-1.5E+01	2.0E-07	-1.5E+48	2.000	2.5E+01	6.8E+10	1.5E+48	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9932	-1.9E+00	-0.99321	2.93E-09
20	50	0.00188	-1.6E+01	8.7E-08	-1.5E+48	2.000	2.6E+01	2.5E+11	1.5E+48	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	1.30E-09



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	6.65E-03
5.0	2.95E-03
7.5	1.31E-03
10.0	5.81E-04
12.5	2.58E-04
15.0	1.14E-04
17.5	5.07E-05
20.0	2.25E-05
22.5	9.98E-06
25.0	4.43E-06
27.5	1.96E-06
30.0	8.71E-07
32.5	3.86E-07
35.0	1.71E-07
37.5	7.59E-08
40.0	3.36E-08
42.5	1.49E-08
45.0	6.61E-09
47.5	2.93E-09
50.0	1.30E-09

Contaminant ,,2-Dichloroethene

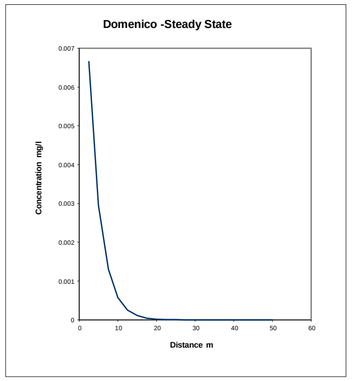
Input	Value	Units
C_T	0.001	mg/l
Co	1.50E-02	mg/l
λ	2.06E-04	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	4.90E+01	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion optio Simulate vertical dispersion in 1 direction

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.00375	-8.13E-01	4.44E-01	1.68E+01	1	-1.68E+01	-1	4.17E+00	1	-4.17E+00	-1	6.65E-03
2	5	0.00375	-1.63E+00	1.97E-01	1.19E+01	1	-1.19E+01	-1	2.95E+00	1	-2.95E+00	-1	2.95E-03
3	7.5	0.00375	-2.44E+00	8.73E-02	9.68E+00	1	-9.68E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	1.31E-03
4	10	0.00375	-3.25E+00	3.87E-02	8.39E+00	1	-8.39E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	5.79E-04
5	12.5	0.00375	-4.06E+00	1.72E-02	7.50E+00	1	-7.50E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	2.56E-04
6	15	0.00375	-4.88E+00	7.62E-03	6.85E+00	1	-6.85E+00	-1	1.70E+00	0.984	-1.70E+00	-0.984	1.12E-04
7	17.5	0.00375	-5.69E+00	3.38E-03	6.34E+00	1	-6.34E+00	-1	1.58E+00	0.9743	-1.58E+00	-0.9743	4.94E-05
8	20	0.00375	-6.50E+00	1.50E-03	5.93E+00	1	-5.93E+00	-1	1.48E+00	0.963	-1.48E+00	-0.963	2.17E-05
9	22.5	0.00375	-7.32E+00	6.65E-04	5.59E+00	1	-5.59E+00	-1	1.39E+00	0.9508	-1.39E+00	-0.9508	9.49E-06
10	25	0.00375	-8.13E+00	2.95E-04	5.30E+00	1	-5.30E+00	-1	1.32E+00	0.9379	-1.32E+00	-0.9379	4.15E-06
11	27.5	0.00375	-8.94E+00	1.31E-04	5.06E+00	1	-5.06E+00	-1	1.26E+00	0.9247	-1.26E+00	-0.9247	1.82E-06
12	30	0.00375	-9.75E+00	5.81E-05	4.84E+00	1	-4.84E+00	-1	1.20E+00	0.9115	-1.20E+00	-0.9115	7.94E-07
13	32.5	0.00375	-1.06E+01	2.58E-05	4.65E+00	1	-4.65E+00	-1	1.16E+00	0.8982	-1.16E+00	-0.8982	3.47E-07
14	35	0.00375	-1.14E+01	1.14E-05	4.48E+00	1	-4.48E+00	-1	1.11E+00	0.8852	-1.11E+00	-0.8852	1.52E-07
15	37.5	0.00375	-1.22E+01	5.07E-06	4.33E+00	1	-4.33E+00	-1	1.08E+00	0.8723	-1.08E+00	-0.8723	6.64E-08
16	40	0.00375	-1.30E+01	2.25E-06	4.19E+00	1	-4.19E+00	-1	1.04E+00	0.8598	-1.04E+00	-0.8598	2.90E-08
17	42.5	0.00375	-1.38E+01	9.98E-07	4.07E+00	1	-4.07E+00	-1	1.01E+00	0.8476	-1.01E+00	-0.8476	1.27E-08
18	45	0.00375	-1.46E+01	4.43E-07	3.95E+00	1	-3.95E+00	-1	9.83E-01	0.8357	-9.83E-01	-0.8357	5.55E-09
19	47.5	0.00375	-1.54E+01	1.96E-07	3.85E+00	1	-3.85E+00	-1	9.57E-01	0.8241	-9.57E-01	-0.8241	2.43E-09
20	50	0.00375	-1.63E+01	8.71E-08	3.75E+00	1	-3.75E+00	-1	9.33E-01	0.8129	-9.33E-01	-0.8129	1.06E-09



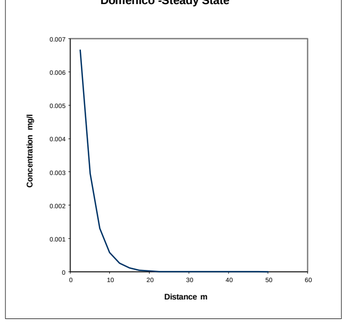
Calc

	Value	
v	7.60E-02	m/d
Rc	3.15E+02	
u	2.42E-04	m/d

DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.00375	-8.13E-01	4.44E-01	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	6.65E-03
2	5	0.00375	-1.63E+00	1.97E-01	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	2.95E-03
3	7.5	0.00375	-2.44E+00	8.73E-02	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	1.31E-03
4	10	0.00375	-3.25E+00	3.87E-02	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	5.81E-04
5	12.5	0.00375	-4.06E+00	1.72E-02	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	2.58E-04
6	15	0.00375	-4.88E+00	7.62E-03	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	1.14E-04
7	17.5	0.00375	-5.69E+00	3.38E-03	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	5.07E-05
8	20	0.00375	-6.50E+00	1.50E-03	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	2.25E-05
9	22.5	0.00375	-7.32E+00	6.65E-04	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-0.9999	9.98E-06
10	25	0.00375	-8.13E+00	2.95E-04	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-0.9998	4.43E-06
11	27.5	0.00375	-8.94E+00	1.31E-04	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-0.9996	1.96E-06
12	30	0.00375	-9.75E+00	5.81E-05	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	8.71E-07
13	32.5	0.00375	-1.06E+01	2.58E-05	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.9989	3.86E-07
14	35	0.00375	-1.14E+01	1.14E-05	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.9984	1.71E-07
15	37.5	0.00375	-1.22E+01	5.07E-06	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.9977	7.59E-08
16	40	0.00375	-1.30E+01	2.25E-06	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	3.36E-08
17	42.5	0.00375	-1.38E+01	9.98E-07	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.9958	1.49E-08
18	45	0.00375	-1.46E+01	4.43E-07	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.9946	6.61E-09
19	47.5	0.00375	-1.54E+01	1.96E-07	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.9932	2.93E-09
20	50	0.00375	-1.63E+01	8.71E-08	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	1.30E-09



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	6.65E-03
5.0	2.95E-03
7.5	1.31E-03
10.0	5.81E-04
12.5	2.58E-04
15.0	1.14E-04
17.5	5.07E-05
20.0	2.25E-05
22.5	9.98E-06
25.0	4.43E-06
27.5	1.96E-06
30.0	8.71E-07
32.5	3.86E-07
35.0	1.71E-07
37.5	7.59E-08
40.0	3.36E-08
42.5	1.49E-08
45.0	6.61E-09
47.5	2.93E-09
50.0	1.30E-09

DOMENICO (TIME VARIANT)

Contaminant 1,2-Dichloroethene

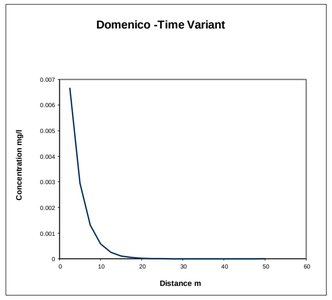
Input	Value	Units
C_T	0.001	mg/l
Co	1.50E-02	mg/l
λ	2.06E-04	$days^{-1}$
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	4.90E+01	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

Calc	Value	
v	7.60E-02	m/d
Rc	3.15E+02	
u	2.42E-04	m/d

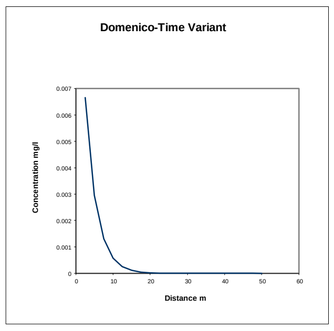
Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.00188	-8.13E-01	4.44E-01	-1.47E+48	2	1.68E+01	1	-1.68E+01	-1	4.17E+00	1	-4.17E+00	-1	6.65E-03
2	5	0.00188	-1.63E+00	1.97E-01	-1.47E+48	2	1.19E+01	1	-1.19E+01	-1	2.95E+00	1	-2.95E+00	-1	2.95E-03
3	7.5	0.00188	-2.44E+00	8.73E-02	-1.47E+48	2	9.68E+00	1	-9.68E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	1.31E-03
4	10	0.00188	-3.25E+00	3.87E-02	-1.47E+48	2	8.39E+00	1	-8.39E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	5.79E-04
5	12.5	0.00188	-4.06E+00	1.72E-02	-1.47E+48	2	7.50E+00	1	-7.50E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	2.56E-04
6	15	0.00188	-4.88E+00	7.62E-03	-1.47E+48	2	6.85E+00	1	-6.85E+00	-1	1.70E+00	0.984	-1.70E+00	-0.984	1.12E-04
7	17.5	0.00188	-5.69E+00	3.38E-03	-1.47E+48	2	6.34E+00	1	-6.34E+00	-1	1.58E+00	0.9743	-1.58E+00	-0.974	4.94E-05
8	20	0.00188	-6.50E+00	1.50E-03	-1.47E+48	2	5.93E+00	1	-5.93E+00	-1	1.48E+00	0.963	-1.48E+00	-0.963	2.17E-05
9	22.5	0.00188	-7.32E+00	6.65E-04	-1.47E+48	2	5.59E+00	1	-5.59E+00	-1	1.39E+00	0.9508	-1.39E+00	-0.951	9.49E-06
10	25	0.00188	-8.13E+00	2.95E-04	-1.47E+48	2	5.30E+00	1	-5.30E+00	-1	1.32E+00	0.9379	-1.32E+00	-0.938	4.15E-06
11	27.5	0.00188	-8.94E+00	1.31E-04	-1.47E+48	2	5.06E+00	1	-5.06E+00	-1	1.26E+00	0.9247	-1.26E+00	-0.925	1.82E-06
12	30	0.00188	-9.75E+00	5.81E-05	-1.47E+48	2	4.84E+00	1	-4.84E+00	-1	1.20E+00	0.9115	-1.20E+00	-0.911	7.94E-07
13	32.5	0.00188	-1.06E+01	2.58E-05	-1.47E+48	2	4.65E+00	1	-4.65E+00	-1	1.16E+00	0.8982	-1.16E+00	-0.898	3.47E-07
14	35	0.00188	-1.14E+01	1.14E-05	-1.47E+48	2	4.48E+00	1	-4.48E+00	-1	1.11E+00	0.8852	-1.11E+00	-0.885	1.52E-07
15	37.5	0.00188	-1.22E+01	5.07E-06	-1.47E+48	2	4.33E+00	1	-4.33E+00	-1	1.08E+00	0.8723	-1.08E+00	-0.872	6.64E-08
16	40	0.00188	-1.30E+01	2.25E-06	-1.47E+48	2	4.19E+00	1	-4.19E+00	-1	1.04E+00	0.8598	-1.04E+00	-0.86	2.90E-08
17	42.5	0.00188	-1.38E+01	9.98E-07	-1.47E+48	2	4.07E+00	1	-4.07E+00	-1	1.01E+00	0.8476	-1.01E+00	-0.848	1.27E-08
18	45	0.00188	-1.46E+01	4.43E-07	-1.47E+48	2	3.95E+00	1	-3.95E+00	-1	9.83E-01	0.8357	-9.83E-01	-0.836	5.55E-09
19	47.5	0.00188	-1.54E+01	1.96E-07	-1.47E+48	2	3.85E+00	1	-3.85E+00	-1	9.57E-01	0.8241	-9.57E-01	-0.824	2.43E-09
20	50	0.00188	-1.63E+01	8.71E-08	-1.47E+48	2	3.75E+00	1	-3.75E+00	-1	9.33E-01	0.8129	-9.33E-01	-0.813	1.06E-09



Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.00188	-8.13E-01	4.44E-01	-1.47E+48	2	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	6.65E-03
2	5	0.00188	-1.63E+00	1.97E-01	-1.47E+48	2	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	2.95E-03
3	7.5	0.00188	-2.44E+00	8.73E-02	-1.47E+48	2	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	1.31E-03
4	10	0.00188	-3.25E+00	3.87E-02	-1.47E+48	2	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	5.81E-04
5	12.5	0.00188	-4.06E+00	1.72E-02	-1.47E+48	2	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	2.58E-04
6	15	0.00188	-4.88E+00	7.62E-03	-1.47E+48	2	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	1.14E-04
7	17.5	0.00188	-5.69E+00	3.38E-03	-1.47E+48	2	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	5.07E-05
8	20	0.00188	-6.50E+00	1.50E-03	-1.47E+48	2	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	2.25E-05
9	22.5	0.00188	-7.32E+00	6.65E-04	-1.47E+48	2	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-1	9.98E-06
10	25	0.00188	-8.13E+00	2.95E-04	-1.47E+48	2	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-1	4.43E-06
11	27.5	0.00188	-8.94E+00	1.31E-04	-1.47E+48	2	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-1	1.96E-06
12	30	0.00188	-9.75E+00	5.81E-05	-1.47E+48	2	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	8.71E-07
13	32.5	0.00188	-1.06E+01	2.58E-05	-1.47E+48	2	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.999	3.86E-07
14	35	0.00188	-1.14E+01	1.14E-05	-1.47E+48	2	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.998	1.71E-07
15	37.5	0.00188	-1.22E+01	5.07E-06	-1.47E+48	2	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.998	7.59E-08
16	40	0.00188	-1.30E+01	2.25E-06	-1.47E+48	2	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	3.36E-08
17	42.5	0.00188	-1.38E+01	9.98E-07	-1.47E+48	2	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.996	1.49E-08
18	45	0.00188	-1.46E+01	4.43E-07	-1.47E+48	2	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.995	6.61E-09
19	47.5	0.00188	-1.54E+01	1.96E-07	-1.47E+48	2	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.993	2.93E-09
20	50	0.00188	-1.63E+01	8.71E-08	-1.47E+48	2	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	1.30E-09



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	6.65E-03
5.0	2.95E-03
7.5	1.31E-03
10.0	5.81E-04
12.5	2.58E-04
15.0	1.14E-04
17.5	5.07E-05
20.0	2.25E-05
22.5	9.98E-06
25.0	4.43E-06
27.5	1.96E-06
30.0	8.71E-07
32.5	3.86E-07
35.0	1.71E-07
37.5	7.59E-08
40.0	3.36E-08
42.5	1.49E-08
45.0	6.61E-09
47.5	2.93E-09
50.0	1.30E-09

Hydrogeological risk assessment for land contamination

Remedial Targets Worksheet , Release 3.2

First released: 2006. Version 3.2: January 2013

This worksheet has been produced in combination with the document 'Remedial Targets Methodology: Hydrogeological risk assessment for land contamination (Environment Agency 2006).

Users of this worksheet should always refer to the User Manual to the Remedial Targets Methodology and to relevant guidance on UK legislation and policy, in order to understand how this procedure should be applied in an appropriate context.

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The calculation of equations in this worksheet has been independently checked by Entec (UK) Ltd on behalf of the Environment Agency.

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IMPORTANT: To enable MS Excel worksheet, click Tools, Add -Ins, Analysis Tool Pak and Analysis Tool Pak-VBA (to calculate error functions).

Details to be completed for each assessment				
Site Name:	Kelvedon Street			
Site Address:	Newport			
Completed by:	Michael Watkins			
Date:	11-Dec-25		Version:	1
Contaminant	cis 1,2-Dichloroethene			
Target Concentration (C_T)	0.001	mg/l	Origin of C_T:	Laboratory detection limit

This worksheet can be used to determine remedial targets for soils (Worksheets Level 1 Soil, Level 2 and Level 3 Soil) or to determine remedial targets for groundwater (Level 3 Groundwater). For Level 3, parameter values must be entered separately dependent on whether the assessment is for soil or groundwater. For soil, remedial targets are calculated as either mg/kg (for comparision with soil measurements) or mg/l (for comparison with leaching tests or pore water concentrations).
Site details entered on this page are automatically copied to Level 1, 2 and 3 Worksheets.
Worksheet options are identified by brown background and employ a pull-down menus. Data entry are identified as blue background.
Data origin / justification should be noted in cells coloured yellow and fully documented in subsequent reports.
Data carried forward from an earlier worksheet are identified by a light green background
It is recommended that a copy of the original worksheet is saved (all data fields in the original copy are blank).

The spreadsheet also includes a porosity calculation worksheet, a soil impact calculation worksheet and a worksheet that performs some simple hydrogeological calculations.

Remedial Targets Worksheet , Release 3.2

Level 1 - Soil

Select the method of calculating the soil water Partition Co-efficient by using the pull down menu below

User specified value for partition coefficient

Contaminant		**cis 1,2-Dichloroethene**		
Target concentration	**C_T**	**0.001**	**mg/l**	

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**
Standard entry				
Water filled soil porosity	θ_w	0.00E+00	fraction	
Air filled soil porosity	θa	0.00E+00	fraction	
Bulk density of soil zone material	ρ	0.00E+00	g/cm^3	
Henry's Law constant	H	0.00E+00	dimensionless	
Entry if specify partition coefficient (option)				
Soil water partition coefficient	Kd	0.00E+00	l/kg	
Entry for non-polar organic chemicals (option)				
Fraction of organic carbon (in soil)	foc		fraction	
Organic carbon partition coefficient	Koc		l/kg	
Entry for ionic organic chemicals (option)				
Sorption coefficient for neutral species	$K_{oc,n}$		l/kg	
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg	
pH value	pH		pH units	
Acid dissociation constant	pKa			
Fraction of organic carbon (in soil)	foc		fraction	

This sheet calculates the Level 1 remedial target for soils(mg/kg) based on a selected target concentration and theoretical calculation of soil water partitioning. Three options are included for determining the partition coefficient.

The measured soil concentration as mg/kg should be compared with the Level 1 remedial target to determine the need for further action.

Soil water partition coefficient used in Level Assessment	**Kd**	**0.00E+00**	**l/kg**	*Specified value*

Level 1 Remedial Target

Level 1 Remedial Target	**#DIV/0!**	**mg/kg**	**(for comparison with soil analyses)**
	or		
	0.001	**mg/l**	**(for comparison with leachate test results)**

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 2 - Soil

Contaminant		**cis 1,2-Dichloroethene**		from Level 1
Target concentration	C_T	**0.001**	**mg/l**	from Level 1

This sheet calculates the Level 2 remedial target for soils (mg/kg) or for pore water (mg/l).

The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 2 remedial target to determine the need for further action. Equations presented in 'Hydrogeological risk assessment for land contamiantion' (Environment Agency 2006)

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**	
Standard entry					
Infiltration	Inf	0.00E+00	m/d		
Area of contaminant source	A	0.00E+00	m^2		Not used in calculation
Entry for groundwater flow below site					
Length of contaminant source in direction of groundwater flow	L	0.00E+00	m		
Saturated aquifer thickness	da	0.00E+00	m		
Hydraulic Conductivity of aquifer in which dilution occurs	K	0.00E+00	m/d		
Hydraulic gradient of water table	i	0.00E+00	fraction		
Width of contaminant source perpendicular to groundwater flow	w	0.00E+00	m		Not used in calculation
Background concentration of contaminant in groundwater beneath site	Cu	0.00E+00	mg/l		
Define mixing zone depth by specifying or calculating depth (using pull down list)		**Specify**			
Enter mixing zone thickness	Mz	0.00E+00	m		
Calculated mixing zone thickness	Mz		m		

Calculated Parameters

Dilution Factor	**DF**	**#DIV/0!**		
Level 2 Remedial Target		**#DIV/0!**	**mg/l**	**For comparison with measured pore water concentration. This assumes Level 1 Remedial Target is based on Target Concentration.**
		or		
		#DIV/0!	**mg/kg**	**For comparison with measured soil concentration. This assumes Level 1 Remedial Target calculated from soil-water**

Additional option

Calculation of impact on receptor

Concentration of contaminant in contaminated discharge (entering receptor)	Cc	0.00E+00	mg/l	
Calculated concentration within receptor (dilution only)		#DIV/0!	mg/l	0

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Level 3 - Soil

See Note

Input Parameters	Variable	Value	Unit	Source
Contaminant		cis 1,2-Dichloroethene		from Level 1
Target Concentration	C_T	0.001	mg/l	from Level 1
Dilution Factor	DF	#DIV/0!		from Level 2

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value)

	Variable	Value	Unit	Source of parameter value
Enter source concentration		Soil concentration as mg/kg		
Enter soil concentration		0	mg/kg	
Half life for degradation of contaminant in water	$t_{1/2}$	1.00E+100	days	
Calculated decay rate	λ	6.93E-101	$days^{-1}$	calculated
Width of plume in aquifer at source	Sz	0.00E+00	m	from Level 2
Plume thickness in aquifer at source	Sy	0.00E+00	m	from Level 2
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Effective porosity of aquifer	n	0.00E+00	fraction	
Hydraulic gradient	i	#DIV/0!	fraction	from Level 2 (adjusted)
Hydraulic conductivity of saturated aquifer	K	0.00E+00	m/d	from Level 2
Distance to compliance point	x	0.00E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	1.00E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	0.00E+00	l/kg	*see options*
Longitudinal dispersivity	ax	0.000	m	*see options*
Transverse dispersivity	az	0.000	m	*see options*
Vertical dispersivity	ay	0.000	m	*see options*

Parameter values should be checked against Level 1 and 2

Calculated Parameters	Variable		
Groundwater flow velocity	v	#DIV/0!	m/d
Retardation factor	Rf	#DIV/0!	fraction
Decay rate used	λ	6.93E-101	d^{-1}
Hydraulic gradient used in aquifer flow down-gradient	i	#DIV/0!	fraction
Rate of contaminant flow due to retardation	u	#DIV/0!	m/d
Ratio of Compliance Point to Source Concentration	C_{cp}/C_0	#DIV/0!	fraction
Attenuation factor (C_o/C_{cp})	**AF**	**#DIV/0!**	**fraction**
Calculated soil leachate concentration	Co	#DIV/0!	mg/l

Remedial Targets

Level 3 Remedial Target	**#DIV/0!**	**mg/l**	For comparison with measured pore water concentration.
Ogata Banks	**or**		This assumes Level 1 Remedial Target is based on Target Concentration.
	#DIV/0!	**mg/kg**	For comparison with measured soil concentration. This
Distance to compliance point	**0**	**m**	assumes Level 1 Remedial Target calculated from soil-water partitioning equation.
Ratio of Compliance Point to Source Concentration	**#DIV/0!**	**fraction**	Ogata Banks

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99

Enter method of defining partition co-efficient (using pull down list)

Calculate for ionic organic chemicals (acids)

Entry if specify partition coefficient (option)

Soil water partition coefficient	Kd		l/kg

Entry for non-polar organic chemicals (option)

Fraction of organic carbon in aquifer	foc		fraction
Organic carbon partition coefficient	Koc		l/kg

Entry for ionic organic chemicals (option)

Sorption coefficient for related species	$K_{oc,n}$	0.00E+00	l/kg
Sorption coefficient for ionised species	$K_{oc,i}$	0.00E+00	l/kg
pH value	pH	0.00E+00	
Acid dissociation constant	pKa	0.00E+00	
Fraction of organic carbon in aquifer	foc	0.00E+00	fraction
Soil water partition coefficient	Kd	0.00E+00	l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

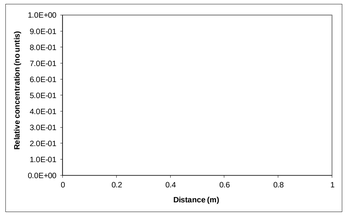
		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	0.00E+00	#NUM!	m
Transverse dispersivity	**az**	0.00E+00	0.00E+00	#NUM!	m
Vertical dispersivity	**ay**	0.00E+00	0.00E+00	#NUM!	m

Note values of dispersivity must be > 0

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed

Note
This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O_2, NO_3, SO_4 etc than an alternative solution should be used

Environment Agency



Note: 'Relative concentration' is the ratio of calculated concentation at a given position compared to the source concentration. The calculations assume plume disperses from the top of the aquifer. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

This sheet calculates the Level 3 remedial target for soils(mg/kg) or for pore water (mg/l), based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.By setting a long travel time (e.g. 9E99) it will give the steady state solution, which should always be used when calculating remedial targets.

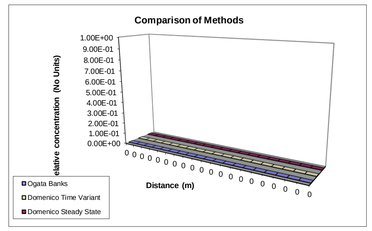
The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.9E+99.

Calculated (relative) concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Relative concentration (No units)	Concentration mg/l
0	1.0E+00	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!



Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Remedial Targets Worksheet , Release 3.2

Calculation of contaminant concentration in groundwater from a soil source

Only input required is Soil Contaminant Concentration

Input Parameters			
Soil contaminant concentration	C_0	0.00E+00	mg/kg

Level 1 Parameters

Water filled soil porosity	θ_W	0.00E+00	fraction
Air filled soil porosity	θa	0.00E+00	fraction
Bulk density	ρ	0.00E+00	g/cm^3
Henry's Law constant	H	0.00E+00	dimensionless
Soil water partition coefficient used in Level Assessment	Kd	0.00E+00	l/kg
Factor (partitioning between soil and water)		#DIV/0!	dimensionless

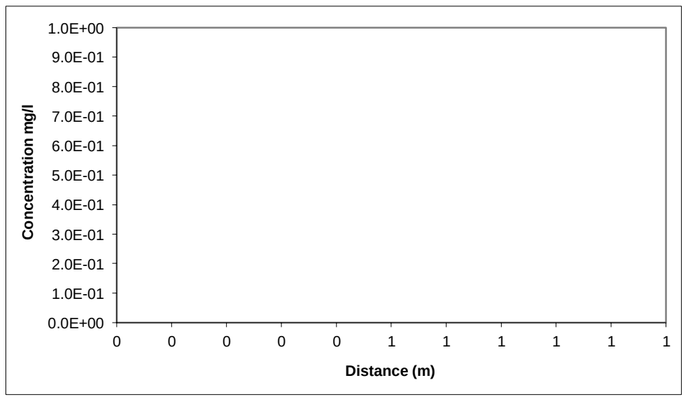
Level 2 Parameters **Dilution Factor** DF #DIV/0!

Level 3 Parameters **Attenuation factor (C_O/C_{ED})** AF #DIV/0!

Predicted concentrations at compliance point

Level 1	C	#DIV/0!	mg/l	No dilution or attenuation
Level 2	C	#DIV/0!	mg/l	Dilution taken into account
Level 3	C	#DIV/0!	mg/l	Dilution and attenuation taken into account

Predicted concentrations between source and compliance point - Level 3



Distance m	Concentration mg/l
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)	Variable	Value	Unit	Source
Contaminant		cis 1,2-Dichloroethene		from Level 1
Target Concentration	C_T	1.00E-03	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Domenico - Steady state — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived va

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	1.50E-02	mg/l	*Site investigation data*
Half life for degradation of contaminant in water	$t_{1/2}$	3.36E+02	days	*Agency for Toxic Substances and Disease*
Calculated decay rate	λ	2.06E-03	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	1.50E+02	m	*Length of site perpendicular to groundwater flow*
Plume thickness at source	Sy	5.90E+00	m	*Same as Mixing Zone Thickness. "For a thin aquifer (typically <10m), the mixing zone thickness can be taken as the acte*
Saturated aquifer thickness	da	6.00E+00	m	*Maximum thickness recorded in vicinity of*
Bulk density of aquifer materials	ρ	1.60E+00	g/cm^3	*Typical bulk density for river terrace deposits (conserv*
Effective porosity of aquifer	n	2.50E-01	fraction	*Maximum porosity for coarse Gravel (Lovanh et al 2000) - conservative estimate*
Hydraulic gradient	i	4.40E-02	fraction	*Borehole level data*
Hydraulic conductivity of aquifer	K	4.32E-01	m/d	*Maximum typical value for clayey sandy G*
Distance to compliance point	x	5.00E+01	m	*Default compliance distance*
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	9.90E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	4.90E+01	l/kg	*see options*
Longitudinal dispersivity	ax	5.00E+00	m	*see options*
Transverse dispersivity	az	5.00E-01	m	*see options*
Vertical dispersivity	ay	5.00E-02	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd	4.90E+01	l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc		fraction
Organic carbon partition coefficient	Koc		l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{oc,n}$		l/kg
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction

Soil water partition coefficient	Kd	4.90E+01	l/kg

Define dispersivity (click brown cell and use pull down list)

Dispersivities 10%, 1%, 0.1% of pathway length

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	5.00E+00	2.98E+00	m
Transverse dispersivity	**az**	0.00E+00	5.00E-01	2.98E-01	m
Vertical dispersivity	**ay**	0.00E+00	5.00E-02	2.98E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

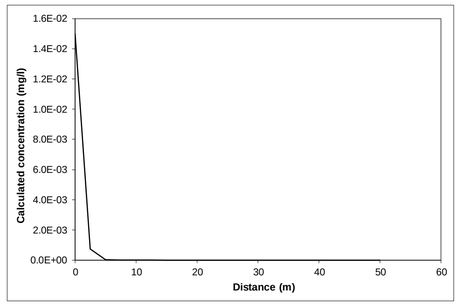
Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed

Calculated Parameters	Variable		
Groundwater flow velocity	v	7.60E-02	m/d
Retardation factor	Rf	3.15E+02	fraction
Decay rate used	λ	2.06E-03	d^{-1}
Rate of contaminant flow due to retardation	u	2.42E-04	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	7.73E-29	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**1.94E+26**	

Remedial Targets

Remedial Target		**1.94E+23**	**mg/l**	For comparison with measured groundwater concentration.
Domenico - Steady state				
Distance to compliance point		**50**	**m**	
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**7.73E-29**	**mg/l**	Domenico - Steady state

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Calculated concentrations for distance-concentration graph

Domenico - Steady state
From calculation sheet

Distance	Concentration
	mg/l
0	1.5E-02
2.5	7.28E-04
5.0	3.53E-05
7.5	1.71E-06
10.0	8.30E-08
12.5	4.03E-09
15.0	1.95E-10
17.5	9.48E-12
20.0	4.60E-13
22.5	2.23E-14
25.0	1.08E-15
27.5	5.24E-17
30.0	2.54E-18
32.5	1.23E-19
35.0	5.98E-21
37.5	2.90E-22
40.0	1.40E-23
42.5	6.80E-25
45.0	3.30E-26
47.5	1.60E-27
50.0	7.73E-29

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared
with the Level 3 remedial target to determine the need for further action.
Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Porosity Calculator

These results are not carried through to any of the other worksheets

DRY BULK DENSITY DATA

Variable	Value	Unit	justification
Natural Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Dry Bulk Density	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
Initial Saturation	#DIV/0!	%	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	
Water Filled Porosity	**#DIV/0!**	**fraction**	

WET BULK DENSITY DATA

Variable	Value	Unit	
Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Actual (wet) Bulk Density (i.e. at natural MC)	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
dry bulk density	0.00	tonnes/m^3	
Initial Saturation	#DIV/0!	%	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	**#DIV/0!**
Water Filled Porosity	**#DIV/0!**	**fraction**	

Analytical solutions provided by David Hall, Golder Associates (UK) Ltd

Simple hydrogeological calculations

(These are not specific to, or required in, the Remedial Targets Methodology)

Parameter	symbol		unit	justification
Hydraulic conductivity	K	0.00E+00	m/d	
Hydraulic gradient	i	0.00E+00	unitless	
Effective porosity of aquifer	n	0.00E+00	fraction	
Thickness of saturated aquifer	b	0.00E+00	m	
Width of aquifer perpendicular to flow	w	0.00E+00	m	
Distance to receptor	x	0.00E+00	m	
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Soil-water partition co-efficient	Kd	0.00E+00	l/kg	
Retardation factor of pollutant	R	#DIV/0!		

Groundwater flow velocity	v(GW)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for groundwater to reach receptor	t(GW)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years
Rate of groundwater flow through aquifer	Q	0.00E+00	m^3/s	0.00E+00	m^3/day	0.00E+00	m^3/year

Contaminant flow velocity	v(contam)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for contaminant to reach receptor	t(contam)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years

Level 1 Calculation Sheet

Contaminant **1,2-Dichloroethene**

Parameter	Value	Units
(carried over from input sheet)		
C_T	1.00E-03	mg/l
Kd	0.00E+00	l/kg
foc		fraction
koc		l/kg
θ_W	0.00E+00	fraction
θa	0.00E+00	fraction
ρ	0.00E+00	g/cm3
H	0.00E+00	dimensionless
Koc,n		l/kg
Koc,i		l/kg
pH		pH units
pKa		
foc (ionic)		fraction

Calculations (Refer toTable 4.3, R&D Publication 20)

Selected option User specified value for partition coefficient

	calc	calc	Calc Kd	l/kg
Calculation of partition coefficient for ionic organic chemical				
Partition coefficient used in Level 1 Assessment			0.00E+00	l/kg

Calculated Remedial Target **#DIV/0!** **mg/kg** **for cis 1,2-Dichloroethene**

Factor (partitioning between soil and water) #DIV/0!

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11/12/2025
Version:	1

Level 2 Calculation Sheet

Contaminant : 1,2-Dichloroethene

Site assessed:	Kelvedon Stre
Date:	11/12/2025
Version:	1

Parameter	Value	Units		
(carried over from input sheet)				
Mz	0.00E+00	m		
L	0.00E+00	m		
da	0.00E+00	m		Calculated
Inf	0.00E+00	m/d		Dilution Factor
K	0.00E+00	m/d		
i	0.00E+00		Calculation based on target concentration	#DIV/0!
A	0.00E+00	m3/d m2 m3/d	Calculation based on observed contaminant concentration	#DIV/0!
Cc	0.00E+00	mg/l		
C_T	1.00E-03	mg/l		
Cu	0.00E+00	mg/l		
w	0.00E+00	m		



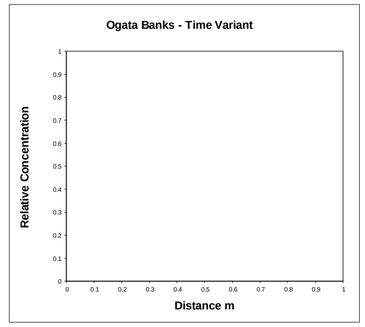
Contaminant **1,2-Dichloroethene**

OGATA BANKS SOLUTION

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-03	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Calc	Value	
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) -USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Date:	11/12/2025
Version:	1

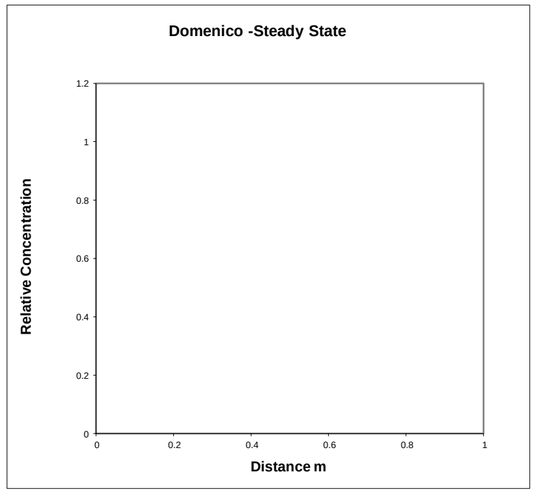
Contaminant **.,2-Dichloroethene**

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-03	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

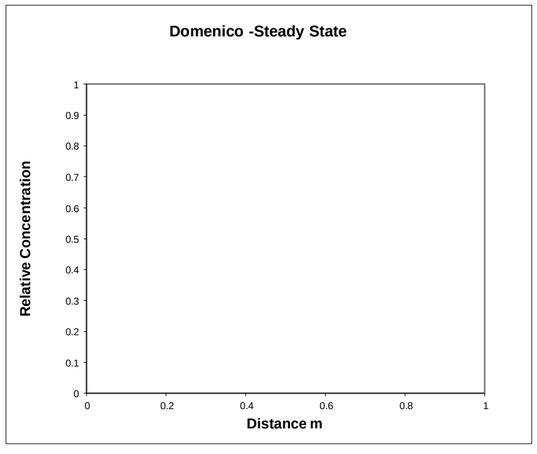


Calc	Value	Units
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



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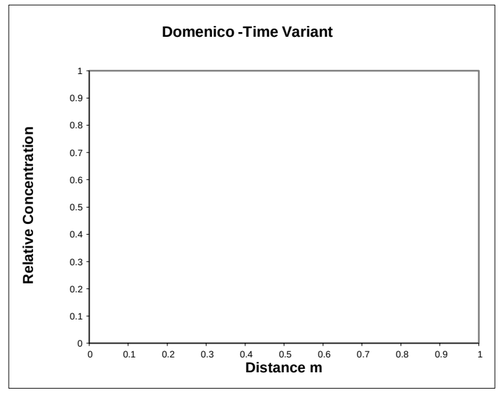
DOMENICO (TIME VARIANT)

Contaminant **l,2-Dichloroethene**

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	**Value**	**Units**
C_T	0.001	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

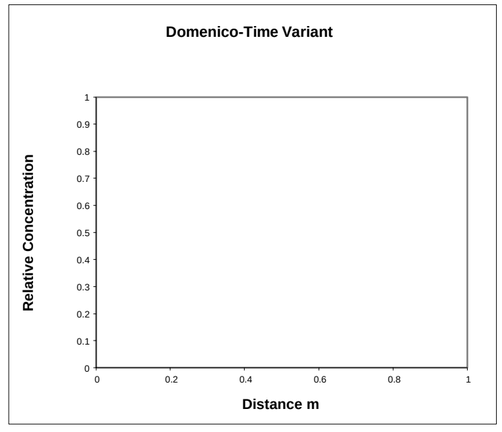


Calc **Value**

Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

v	#DIV/0! m/d
Rc	#DIV/0!
u	#DIV/0! m/d

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



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OGATA BANKS SOLUTION

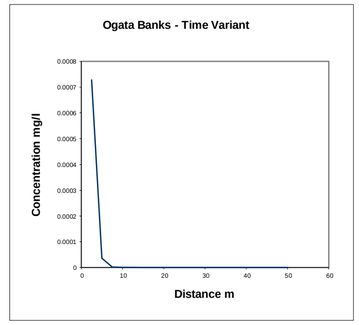
Contaminant **1,2-Dichloroethene**

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.001	mg/l
Co	1.50E-02	mg/l
λ	2.06E-03	days^{-1}
Sz	1.50E+02	m
Sy	5.90E+00	m
Kd	4.90E+01	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

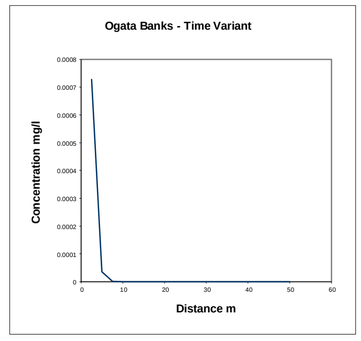
	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.00188	-3.0E+00	4.9E-02	-4.5E+48	2.000	3.5E+00	3.4E+01	4.5E+48	0.000	3.4E+01	1	-3.4E+01	-1	4.2E+00	1	-4.2E+00	-1	7.28E-04
2	5	0.00188	-6.1E+00	2.4E-03	-4.5E+48	2.000	7.1E+00	1.2E+03	4.5E+48	0.000	2.4E+01	1	-2.4E+01	-1	3.0E+00	1	-3.0E+00	-0.99997	3.53E-05
3	7.5	0.00188	-9.1E+00	1.1E-04	-4.5E+48	2.000	1.1E+01	3.9E+04	4.5E+48	0.000	1.9E+01	1	-1.9E+01	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	1.71E-06
4	10	0.00188	-1.2E+01	5.5E-06	-4.5E+48	2.000	1.4E+01	1.3E+06	4.5E+48	0.000	1.7E+01	1	-1.7E+01	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	8.28E-08
5	12.5	0.00188	-1.5E+01	2.7E-07	-4.5E+48	2.000	1.8E+01	4.5E+07	4.5E+48	0.000	1.5E+01	1	-1.5E+01	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	3.99E-09
6	15	0.00188	-1.8E+01	1.3E-08	-4.5E+48	2.000	2.1E+01	1.5E+09	4.5E+48	0.000	1.4E+01	1	-1.4E+01	-1	1.7E+00	0.984	-1.7E+00	-0.98399	1.92E-10
7	17.5	0.00188	-2.1E+01	6.3E-10	-4.5E+48	2.000	2.5E+01	5.2E+10	4.5E+48	0.000	1.3E+01	1	-1.3E+01	-1	1.6E+00	0.9743	-1.6E+00	-0.97425	9.23E-12
8	20	0.00188	-2.4E+01	3.1E-11	-4.5E+48	2.000	2.8E+01	1.8E+12	4.5E+48	0.000	1.2E+01	1	-1.2E+01	-1	1.5E+00	0.963	-1.5E+00	-0.96302	4.43E-13
9	22.5	0.00188	-2.7E+01	1.5E-12	-4.5E+48	2.000	3.2E+01	6.1E+13	4.5E+48	0.000	1.1E+01	1	-1.1E+01	-1	1.4E+00	0.9508	-1.4E+00	-0.95078	2.12E-14
10	25	0.00188	-3.0E+01	7.2E-14	-4.5E+48	2.000	3.5E+01	2.1E+15	4.5E+48	0.000	1.1E+01	1	-1.1E+01	-1	1.3E+00	0.9379	-1.3E+00	-0.93792	1.01E-15
11	27.5	0.00188	-3.3E+01	3.5E-15	-4.5E+48	2.000	3.9E+01	7.0E+16	4.5E+48	0.000	1.0E+01	1	-1.0E+01	-1	1.3E+00	0.9247	-1.3E+00	-0.92475	4.85E-17
12	30	0.00188	-3.6E+01	1.7E-16	-4.5E+48	2.000	4.2E+01	2.4E+18	4.5E+48	0.000	9.7E+00	1	-9.7E+00	-1	1.2E+00	0.9115	-1.2E+00	-0.91147	2.32E-18
13	32.5	0.00188	-3.9E+01	8.2E-18	-4.5E+48	2.000	4.6E+01	8.1E+19	4.5E+48	0.000	9.3E+00	1	-9.3E+00	-1	1.2E+00	0.8982	-1.2E+00	-0.89824	1.11E-19
14	35	0.00188	-4.2E+01	4.0E-19	-4.5E+48	2.000	4.9E+01	2.7E+21	4.5E+48	0.000	9.0E+00	1	-9.0E+00	-1	1.1E+00	0.8852	-1.1E+00	-0.88517	5.30E-21
15	37.5	0.00188	-4.5E+01	1.9E-20	-4.5E+48	2.000	5.3E+01	9.3E+22	4.5E+48	0.000	8.7E+00	1	-8.7E+00	-1	1.1E+00	0.8723	-1.1E+00	-0.87233	2.53E-22
16	40	0.00188	-4.8E+01	9.4E-22	-4.5E+48	2.000	5.6E+01	3.2E+24	4.5E+48	0.000	8.4E+00	1	-8.4E+00	-1	1.0E+00	0.8598	-1.0E+00	-0.85979	1.21E-23
17	42.5	0.00188	-5.1E+01	4.6E-23	-4.5E+48	2.000	6.0E+01	1.1E+26	4.5E+48	0.000	8.1E+00	1	-8.1E+00	-1	1.0E+00	0.8476	-1.0E+00	-0.84756	5.79E-25
18	45	0.00188	-5.4E+01	2.2E-24	-4.5E+48	2.000	6.3E+01	3.7E+27	4.5E+48	0.000	7.9E+00	1	-7.9E+00	-1	9.8E-01	0.8357	-9.8E-01	-0.83567	2.77E-26
19	47.5	0.00188	-5.7E+01	1.1E-25	-4.5E+48	2.000	6.7E+01	1.2E+29	4.5E+48	0.000	7.7E+00	1	-7.7E+00	-1	9.6E-01	0.8241	-9.6E-01	-0.82412	1.32E-27
20	50	0.00188	-6.1E+01	5.2E-27	-4.5E+48	2.000	7.1E+01	4.2E+30	4.5E+48	0.000	7.5E+00	1	-7.5E+00	-1	9.3E-01	0.8129	-9.3E-01	-0.81292	6.34E-29



Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

Calc	Value	
v	7.60E-02	m/d
Rc	3.15E+02	
u	2.42E-04	m/d

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.00188	-3.0E+00	4.9E-02	-4.5E+48	2.000	3.5E+00	3.4E+01	4.5E+48	0.000	3.4E+01	1	-3.4E+01	-1	8.3E+00	1	-8.3E+00	-1	7.28E-04
2	5	0.00188	-6.1E+00	2.4E-03	-4.5E+48	2.000	7.1E+00	1.2E+03	4.5E+48	0.000	2.4E+01	1	-2.4E+01	-1	5.9E+00	1	-5.9E+00	-1	3.53E-05
3	7.5	0.00188	-9.1E+00	1.1E-04	-4.5E+48	2.000	1.1E+01	3.9E+04	4.5E+48	0.000	1.9E+01	1	-1.9E+01	-1	4.8E+00	1	-4.8E+00	-1	1.71E-06
4	10	0.00188	-1.2E+01	5.5E-06	-4.5E+48	2.000	1.4E+01	1.3E+06	4.5E+48	0.000	1.7E+01	1	-1.7E+01	-1	4.2E+00	1	-4.2E+00	-1	8.30E-08
5	12.5	0.00188	-1.5E+01	2.7E-07	-4.5E+48	2.000	1.8E+01	4.5E+07	4.5E+48	0.000	1.5E+01	1	-1.5E+01	-1	3.7E+00	1	-3.7E+00	-1	4.03E-09
6	15	0.00188	-1.8E+01	1.3E-08	-4.5E+48	2.000	2.1E+01	1.5E+09	4.5E+48	0.000	1.4E+01	1	-1.4E+01	-1	3.4E+00	1	-3.4E+00	-1	1.95E-10
7	17.5	0.00188	-2.1E+01	6.3E-10	-4.5E+48	2.000	2.5E+01	5.2E+10	4.5E+48	0.000	1.3E+01	1	-1.3E+01	-1	3.2E+00	1	-3.2E+00	-0.99999	9.48E-12
8	20	0.00188	-2.4E+01	3.1E-11	-4.5E+48	2.000	2.8E+01	1.8E+12	4.5E+48	0.000	1.2E+01	1	-1.2E+01	-1	3.0E+00	1	-3.0E+00	-0.99997	4.60E-13
9	22.5	0.00188	-2.7E+01	1.5E-12	-4.5E+48	2.000	3.2E+01	6.1E+13	4.5E+48	0.000	1.1E+01	1	-1.1E+01	-1	2.8E+00	0.9999	-2.8E+00	-0.99992	2.23E-14
10	25	0.00188	-3.0E+01	7.2E-14	-4.5E+48	2.000	3.5E+01	2.1E+15	4.5E+48	0.000	1.1E+01	1	-1.1E+01	-1	2.6E+00	0.9998	-2.6E+00	-0.99981	1.08E-15
11	27.5	0.00188	-3.3E+01	3.5E-15	-4.5E+48	2.000	3.9E+01	7.0E+16	4.5E+48	0.000	1.0E+01	1	-1.0E+01	-1	2.5E+00	0.9996	-2.5E+00	-0.99963	5.24E-17
12	30	0.00188	-3.6E+01	1.7E-16	-4.5E+48	2.000	4.2E+01	2.4E+18	4.5E+48	0.000	9.7E+00	1	-9.7E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	2.54E-18
13	32.5	0.00188	-3.9E+01	8.2E-18	-4.5E+48	2.000	4.6E+01	8.1E+19	4.5E+48	0.000	9.3E+00	1	-9.3E+00	-1	2.3E+00	0.9989	-2.3E+00	-0.99893	1.23E-19
14	35	0.00188	-4.2E+01	4.0E-19	-4.5E+48	2.000	4.9E+01	2.7E+21	4.5E+48	0.000	9.0E+00	1	-9.0E+00	-1	2.2E+00	0.9984	-2.2E+00	-0.99839	5.98E-21
15	37.5	0.00188	-4.5E+01	1.9E-20	-4.5E+48	2.000	5.3E+01	9.3E+22	4.5E+48	0.000	8.7E+00	1	-8.7E+00	-1	2.2E+00	0.9977	-2.2E+00	-0.99769	2.90E-22
16	40	0.00188	-4.8E+01	9.4E-22	-4.5E+48	2.000	5.6E+01	3.2E+24	4.5E+48	0.000	8.4E+00	1	-8.4E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	1.40E-23
17	42.5	0.00188	-5.1E+01	4.6E-23	-4.5E+48	2.000	6.0E+01	1.1E+26	4.5E+48	0.000	8.1E+00	1	-8.1E+00	-1	2.0E+00	0.9958	-2.0E+00	-0.99579	6.80E-25
18	45	0.00188	-5.4E+01	2.2E-24	-4.5E+48	2.000	6.3E+01	3.7E+27	4.5E+48	0.000	7.9E+00	1	-7.9E+00	-1	2.0E+00	0.9946	-2.0E+00	-0.99459	3.30E-26
19	47.5	0.00188	-5.7E+01	1.1E-25	-4.5E+48	2.000	6.7E+01	1.2E+29	4.5E+48	0.000	7.7E+00	1	-7.7E+00	-1	1.9E+00	0.9932	-1.9E+00	-0.99321	1.60E-27
20	50	0.00188	-6.1E+01	5.2E-27	-4.5E+48	2.000	7.1E+01	4.2E+30	4.5E+48	0.000	7.5E+00	1	-7.5E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	7.73E-29



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	7.28E-04
5.0	3.53E-05
7.5	1.71E-06
10.0	8.30E-08
12.5	4.03E-09
15.0	1.95E-10
17.5	9.48E-12
20.0	4.60E-13
22.5	2.23E-14
25.0	1.08E-15
27.5	5.24E-17
30.0	2.54E-18
32.5	1.23E-19
35.0	5.98E-21
37.5	2.90E-22
40.0	1.40E-23
42.5	6.80E-25
45.0	3.30E-26
47.5	1.60E-27
50.0	7.73E-29

Contaminant ,,2-Dichloroethene

Input	Value	Units
C_T	0.001	mg/l
Co	1.50E-02	mg/l
λ	2.06E-03	days^{-1}
Sz	1.50E+02	m
Sy	5.90E+00	m
Kd	4.90E+01	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

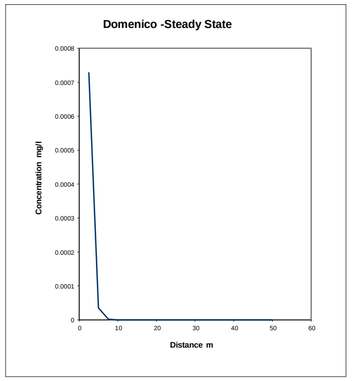
Vertical dispersion optio Simulate vertical dispersion in 1 direction

Calc	Value	
v	7.60E-02	m/d
Rc	3.15E+02	
u	2.42E-04	m/d

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

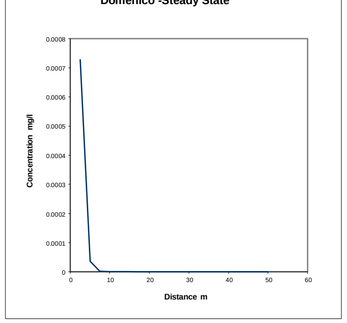
	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.00375	-3.03E+00	4.85E-02	3.35E+01	1	-3.35E+01	-1	4.17E+00	1	-4.17E+00	-1	7.28E-04
2	5	0.00375	-6.05E+00	2.35E-03	2.37E+01	1	-2.37E+01	-1	2.95E+00	1	-2.95E+00	-1	3.53E-05
3	7.5	0.00375	-9.08E+00	1.14E-04	1.94E+01	1	-1.94E+01	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	1.71E-06
4	10	0.00375	-1.21E+01	5.54E-06	1.68E+01	1	-1.68E+01	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	8.28E-08
5	12.5	0.00375	-1.51E+01	2.68E-07	1.50E+01	1	-1.50E+01	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	3.99E-09
6	15	0.00375	-1.82E+01	1.30E-08	1.37E+01	1	-1.37E+01	-1	1.70E+00	0.984	-1.70E+00	-0.984	1.92E-10
7	17.5	0.00375	-2.12E+01	6.32E-10	1.27E+01	1	-1.27E+01	-1	1.58E+00	0.9743	-1.58E+00	-0.9743	9.23E-12
8	20	0.00375	-2.42E+01	3.06E-11	1.19E+01	1	-1.19E+01	-1	1.48E+00	0.963	-1.48E+00	-0.963	4.43E-13
9	22.5	0.00375	-2.72E+01	1.49E-12	1.12E+01	1	-1.12E+01	-1	1.39E+00	0.9508	-1.39E+00	-0.9508	2.12E-14
10	25	0.00375	-3.03E+01	7.21E-14	1.06E+01	1	-1.06E+01	-1	1.32E+00	0.9379	-1.32E+00	-0.9379	1.01E-15
11	27.5	0.00375	-3.33E+01	3.50E-15	1.01E+01	1	-1.01E+01	-1	1.26E+00	0.9247	-1.26E+00	-0.9247	4.85E-17
12	30	0.00375	-3.63E+01	1.70E-16	9.68E+00	1	-9.68E+00	-1	1.20E+00	0.9115	-1.20E+00	-0.9115	2.32E-18
13	32.5	0.00375	-3.93E+01	8.23E-18	9.30E+00	1	-9.30E+00	-1	1.16E+00	0.8982	-1.16E+00	-0.8982	1.11E-19
14	35	0.00375	-4.24E+01	3.99E-19	8.96E+00	1	-8.96E+00	-1	1.11E+00	0.8852	-1.11E+00	-0.8852	5.30E-21
15	37.5	0.00375	-4.54E+01	1.94E-20	8.66E+00	1	-8.66E+00	-1	1.08E+00	0.8723	-1.08E+00	-0.8723	2.53E-22
16	40	0.00375	-4.84E+01	9.39E-22	8.39E+00	1	-8.39E+00	-1	1.04E+00	0.8598	-1.04E+00	-0.8598	1.21E-23
17	42.5	0.00375	-5.14E+01	4.55E-23	8.13E+00	1	-8.13E+00	-1	1.01E+00	0.8476	-1.01E+00	-0.8476	5.79E-25
18	45	0.00375	-5.45E+01	2.21E-24	7.91E+00	1	-7.91E+00	-1	9.83E-01	0.8357	-9.83E-01	-0.8357	2.77E-26
19	47.5	0.00375	-5.75E+01	1.07E-25	7.69E+00	1	-7.69E+00	-1	9.57E-01	0.8241	-9.57E-01	-0.8241	1.32E-27
20	50	0.00375	-6.05E+01	5.20E-27	7.50E+00	1	-7.50E+00	-1	9.33E-01	0.8129	-9.33E-01	-0.8129	6.34E-29



DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.00375	-3.03E+00	4.85E-02	3.35E+01	1	-3.35E+01	-1	8.34E+00	1	-8.34E+00	-1	7.28E-04
2	5	0.00375	-6.05E+00	2.35E-03	2.37E+01	1	-2.37E+01	-1	5.90E+00	1	-5.90E+00	-1	3.53E-05
3	7.5	0.00375	-9.08E+00	1.14E-04	1.94E+01	1	-1.94E+01	-1	4.82E+00	1	-4.82E+00	-1	1.71E-06
4	10	0.00375	-1.21E+01	5.54E-06	1.68E+01	1	-1.68E+01	-1	4.17E+00	1	-4.17E+00	-1	8.30E-08
5	12.5	0.00375	-1.51E+01	2.68E-07	1.50E+01	1	-1.50E+01	-1	3.73E+00	1	-3.73E+00	-1	4.03E-09
6	15	0.00375	-1.82E+01	1.30E-08	1.37E+01	1	-1.37E+01	-1	3.41E+00	1	-3.41E+00	-1	1.95E-10
7	17.5	0.00375	-2.12E+01	6.32E-10	1.27E+01	1	-1.27E+01	-1	3.15E+00	1	-3.15E+00	-1	9.48E-12
8	20	0.00375	-2.42E+01	3.06E-11	1.19E+01	1	-1.19E+01	-1	2.95E+00	1	-2.95E+00	-1	4.60E-13
9	22.5	0.00375	-2.72E+01	1.49E-12	1.12E+01	1	-1.12E+01	-1	2.78E+00	0.9999	-2.78E+00	-0.9999	2.23E-14
10	25	0.00375	-3.03E+01	7.21E-14	1.06E+01	1	-1.06E+01	-1	2.64E+00	0.9998	-2.64E+00	-0.9998	1.08E-15
11	27.5	0.00375	-3.33E+01	3.50E-15	1.01E+01	1	-1.01E+01	-1	2.52E+00	0.9996	-2.52E+00	-0.9996	5.24E-17
12	30	0.00375	-3.63E+01	1.70E-16	9.68E+00	1	-9.68E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	2.54E-18
13	32.5	0.00375	-3.93E+01	8.23E-18	9.30E+00	1	-9.30E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.9989	1.23E-19
14	35	0.00375	-4.24E+01	3.99E-19	8.96E+00	1	-8.96E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.9984	5.98E-21
15	37.5	0.00375	-4.54E+01	1.94E-20	8.66E+00	1	-8.66E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.9977	2.90E-22
16	40	0.00375	-4.84E+01	9.39E-22	8.39E+00	1	-8.39E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	1.40E-23
17	42.5	0.00375	-5.14E+01	4.55E-23	8.13E+00	1	-8.13E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.9958	6.80E-25
18	45	0.00375	-5.45E+01	2.21E-24	7.91E+00	1	-7.91E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.9946	3.30E-26
19	47.5	0.00375	-5.75E+01	1.07E-25	7.69E+00	1	-7.69E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.9932	1.60E-27
20	50	0.00375	-6.05E+01	5.20E-27	7.50E+00	1	-7.50E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	7.73E-29



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	7.28E-04
5.0	3.53E-05
7.5	1.71E-06
10.0	8.30E-08
12.5	4.03E-09
15.0	1.95E-10
17.5	9.48E-12
20.0	4.60E-13
22.5	2.23E-14
25.0	1.08E-15
27.5	5.24E-17
30.0	2.54E-18
32.5	1.23E-19
35.0	5.98E-21
37.5	2.90E-22
40.0	1.40E-23
42.5	6.80E-25
45.0	3.30E-26
47.5	1.60E-27
50.0	7.73E-29

DOMENICO (TIME VARIANT)

Contaminant 1,2-Dichloroethene

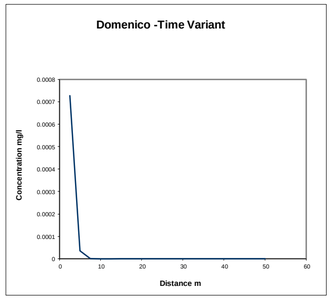
Input	Value	Units
C_T	0.001	mg/l
Co	1.50E-02	mg/l
λ	2.06E-03	days^{-1}
Sz	1.50E+02	m
Sy	5.90E+00	m
Kd	4.90E+01	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

Calc	Value	
v	7.60E-02	m/d
Rc	3.15E+02	
u	2.42E-04	m/d

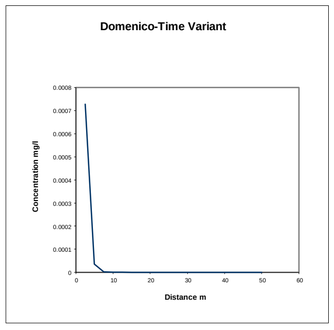
Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.00188	-3.03E+00	4.85E-02	-4.53E+48	2	3.35E+01	1	-3.35E+01	-1	4.17E+00	1	-4.17E+00	-1	7.28E-04
2	5	0.00188	-6.05E+00	2.35E-03	-4.53E+48	2	2.37E+01	1	-2.37E+01	-1	2.95E+00	1	-2.95E+00	-1	3.53E-05
3	7.5	0.00188	-9.08E+00	1.14E-04	-4.53E+48	2	1.94E+01	1	-1.94E+01	-1	2.41E+00	0.9993	-2.41E+00	-0.999	1.71E-06
4	10	0.00188	-1.21E+01	5.54E-06	-4.53E+48	2	1.68E+01	1	-1.68E+01	-1	2.09E+00	0.9968	-2.09E+00	-0.997	8.28E-08
5	12.5	0.00188	-1.51E+01	2.68E-07	-4.53E+48	2	1.50E+01	1	-1.50E+01	-1	1.87E+00	0.9917	-1.87E+00	-0.992	3.99E-09
6	15	0.00188	-1.82E+01	1.30E-08	-4.53E+48	2	1.37E+01	1	-1.37E+01	-1	1.70E+00	0.984	-1.70E+00	-0.984	1.92E-10
7	17.5	0.00188	-2.12E+01	6.32E-10	-4.53E+48	2	1.27E+01	1	-1.27E+01	-1	1.58E+00	0.9743	-1.58E+00	-0.974	9.23E-12
8	20	0.00188	-2.42E+01	3.06E-11	-4.53E+48	2	1.19E+01	1	-1.19E+01	-1	1.48E+00	0.963	-1.48E+00	-0.963	4.43E-13
9	22.5	0.00188	-2.72E+01	1.49E-12	-4.53E+48	2	1.12E+01	1	-1.12E+01	-1	1.39E+00	0.9508	-1.39E+00	-0.951	2.12E-14
10	25	0.00188	-3.03E+01	7.21E-14	-4.53E+48	2	1.06E+01	1	-1.06E+01	-1	1.32E+00	0.9379	-1.32E+00	-0.938	1.01E-15
11	27.5	0.00188	-3.33E+01	3.50E-15	-4.53E+48	2	1.01E+01	1	-1.01E+01	-1	1.26E+00	0.9247	-1.26E+00	-0.925	4.85E-17
12	30	0.00188	-3.63E+01	1.70E-16	-4.53E+48	2	9.68E+00	1	-9.68E+00	-1	1.20E+00	0.9115	-1.20E+00	-0.911	2.32E-18
13	32.5	0.00188	-3.93E+01	8.23E-18	-4.53E+48	2	9.30E+00	1	-9.30E+00	-1	1.16E+00	0.8982	-1.16E+00	-0.898	1.11E-19
14	35	0.00188	-4.24E+01	3.99E-19	-4.53E+48	2	8.96E+00	1	-8.96E+00	-1	1.11E+00	0.8852	-1.11E+00	-0.885	5.30E-21
15	37.5	0.00188	-4.54E+01	1.94E-20	-4.53E+48	2	8.66E+00	1	-8.66E+00	-1	1.08E+00	0.8723	-1.08E+00	-0.872	2.53E-22
16	40	0.00188	-4.84E+01	9.39E-22	-4.53E+48	2	8.39E+00	1	-8.39E+00	-1	1.04E+00	0.8598	-1.04E+00	-0.86	1.21E-23
17	42.5	0.00188	-5.14E+01	4.55E-23	-4.53E+48	2	8.13E+00	1	-8.13E+00	-1	1.01E+00	0.8476	-1.01E+00	-0.848	5.79E-25
18	45	0.00188	-5.45E+01	2.21E-24	-4.53E+48	2	7.91E+00	1	-7.91E+00	-1	9.83E-01	0.8357	-9.83E-01	-0.836	2.77E-26
19	47.5	0.00188	-5.75E+01	1.07E-25	-4.53E+48	2	7.69E+00	1	-7.69E+00	-1	9.57E-01	0.8241	-9.57E-01	-0.824	1.32E-27
20	50	0.00188	-6.05E+01	5.20E-27	-4.53E+48	2	7.50E+00	1	-7.50E+00	-1	9.33E-01	0.8129	-9.33E-01	-0.813	6.34E-29



Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.00188	-3.03E+00	4.85E-02	-4.53E+48	2	3.35E+01	1	-3.35E+01	-1	8.34E+00	1	-8.34E+00	-1	7.28E-04
2	5	0.00188	-6.05E+00	2.35E-03	-4.53E+48	2	2.37E+01	1	-2.37E+01	-1	5.90E+00	1	-5.90E+00	-1	3.53E-05
3	7.5	0.00188	-9.08E+00	1.14E-04	-4.53E+48	2	1.94E+01	1	-1.94E+01	-1	4.82E+00	1	-4.82E+00	-1	1.71E-06
4	10	0.00188	-1.21E+01	5.54E-06	-4.53E+48	2	1.68E+01	1	-1.68E+01	-1	4.17E+00	1	-4.17E+00	-1	8.30E-08
5	12.5	0.00188	-1.51E+01	2.68E-07	-4.53E+48	2	1.50E+01	1	-1.50E+01	-1	3.73E+00	1	-3.73E+00	-1	4.03E-09
6	15	0.00188	-1.82E+01	1.30E-08	-4.53E+48	2	1.37E+01	1	-1.37E+01	-1	3.41E+00	1	-3.41E+00	-1	1.95E-10
7	17.5	0.00188	-2.12E+01	6.32E-10	-4.53E+48	2	1.27E+01	1	-1.27E+01	-1	3.15E+00	1	-3.15E+00	-1	9.48E-12
8	20	0.00188	-2.42E+01	3.06E-11	-4.53E+48	2	1.19E+01	1	-1.19E+01	-1	2.95E+00	1	-2.95E+00	-1	4.60E-13
9	22.5	0.00188	-2.72E+01	1.49E-12	-4.53E+48	2	1.12E+01	1	-1.12E+01	-1	2.78E+00	0.9999	-2.78E+00	-1	2.23E-14
10	25	0.00188	-3.03E+01	7.21E-14	-4.53E+48	2	1.06E+01	1	-1.06E+01	-1	2.64E+00	0.9998	-2.64E+00	-1	1.08E-15
11	27.5	0.00188	-3.33E+01	3.50E-15	-4.53E+48	2	1.01E+01	1	-1.01E+01	-1	2.52E+00	0.9996	-2.52E+00	-1	5.24E-17
12	30	0.00188	-3.63E+01	1.70E-16	-4.53E+48	2	9.68E+00	1	-9.68E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	2.54E-18
13	32.5	0.00188	-3.93E+01	8.23E-18	-4.53E+48	2	9.30E+00	1	-9.30E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.999	1.23E-19
14	35	0.00188	-4.24E+01	3.99E-19	-4.53E+48	2	8.96E+00	1	-8.96E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.998	5.98E-21
15	37.5	0.00188	-4.54E+01	1.94E-20	-4.53E+48	2	8.66E+00	1	-8.66E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.998	2.90E-22
16	40	0.00188	-4.84E+01	9.39E-22	-4.53E+48	2	8.39E+00	1	-8.39E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	1.40E-23
17	42.5	0.00188	-5.14E+01	4.55E-23	-4.53E+48	2	8.13E+00	1	-8.13E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.996	6.80E-25
18	45	0.00188	-5.45E+01	2.21E-24	-4.53E+48	2	7.91E+00	1	-7.91E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.995	3.30E-26
19	47.5	0.00188	-5.75E+01	1.07E-25	-4.53E+48	2	7.69E+00	1	-7.69E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.993	1.60E-27
20	50	0.00188	-6.05E+01	5.20E-27	-4.53E+48	2	7.50E+00	1	-7.50E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	7.73E-29



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	7.28E-04
5.0	3.53E-05
7.5	1.71E-06
10.0	8.30E-08
12.5	4.03E-09
15.0	1.95E-10
17.5	9.48E-12
20.0	4.60E-13
22.5	2.23E-14
25.0	1.08E-15
27.5	5.24E-17
30.0	2.54E-18
32.5	1.23E-19
35.0	5.98E-21
37.5	2.90E-22
40.0	1.40E-23
42.5	6.80E-25
45.0	3.30E-26
47.5	1.60E-27
50.0	7.73E-29

Hydrogeological risk assessment for land contamination

Remedial Targets Worksheet , Release 3.2

First released: 2006. Version 3.2: January 2013

This worksheet has been produced in combination with the document 'Remedial Targets Methodology: Hydrogeological risk assessment for land contamination (Environment Agency 2006).

Users of this worksheet should always refer to the User Manual to the Remedial Targets Methodology and to relevant guidance on UK legislation and policy, in order to understand how this procedure should be applied in an appropriate context.

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The calculation of equations in this worksheet has been independently checked by Entec (UK) Ltd on behalf of the Environment Agency.

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IMPORTANT: To enable MS Excel worksheet, click Tools, Add -Ins, Analysis Tool Pak and Analysis Tool Pak-VBA (to calculate error functions).

Details to be completed for each assessment				
Site Name:	Kelvedon Street			
Site Address:	Newport			
Completed by:	Michael Watkins			
Date:	11-Dec-25		Version:	1
Contaminant	cis 1,2-Dichloroethene			
Target Concentration (C_T)	0.001	mg/l	Origin of C_T:	Laboratory detection limit

This worksheet can be used to determine remedial targets for soils (Worksheets Level 1 Soil, Level 2 and Level 3 Soil) or to determine remedial targets for groundwater (Level 3 Groundwater). For Level 3, parameter values must be entered separately dependent on whether the assessment is for soil or groundwater. For soil, remedial targets are calculated as either mg/kg (for comparision with soil measurements) or mg/l (for comparison with leaching tests or pore water concentrations).
Site details entered on this page are automatically copied to Level 1, 2 and 3 Worksheets.
Worksheet options are identified by brown background and employ a pull-down menus. Data entry are identified as blue background.
Data origin / justification should be noted in cells coloured yellow and fully documented in subsequent reports.
Data carried forward from an earlier worksheet are identified by a light green background
It is recommended that a copy of the original worksheet is saved (all data fields in the original copy are blank).

The spreadsheet also includes a porosity calculation worksheet, a soil impact calculation worksheet and a worksheet that performs some simple hydrogeological calculations.

Remedial Targets Worksheet , Release 3.2

Level 1 - Soil

Select the method of calculating the soil water Partition Co-efficient by using the pull down menu below

User specified value for partition coefficient

Contaminant		**cis 1,2-Dichloroethene**		
Target concentration	**C_T**	**0.001**	**mg/l**	

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**
Standard entry				
Water filled soil porosity	θ_w	0.00E+00	fraction	
Air filled soil porosity	θa	0.00E+00	fraction	
Bulk density of soil zone material	ρ	0.00E+00	g/cm^3	
Henry's Law constant	H	0.00E+00	dimensionless	
Entry if specify partition coefficient (option)				
Soil water partition coefficient	Kd	0.00E+00	l/kg	
Entry for non-polar organic chemicals (option)				
Fraction of organic carbon (in soil)	foc		fraction	
Organic carbon partition coefficient	Koc		l/kg	
Entry for ionic organic chemicals (option)				
Sorption coefficient for neutral species	$K_{oc,n}$		l/kg	
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg	
pH value	pH		pH units	
Acid dissociation constant	pKa			
Fraction of organic carbon (in soil)	foc		fraction	

This sheet calculates the Level 1 remedial target for soils(mg/kg) based on a selected target concentration and theoretical calculation of soil water partitioning. Three options are included for determining the partition coefficient.

The measured soil concentration as mg/kg should be compared with the Level 1 remedial target to determine the need for further action.

Soil water partition coefficient used in Level Assessment	**Kd**	**0.00E+00**	**l/kg**	*Specified value*

Level 1 Remedial Target

Level 1 Remedial Target	**#DIV/0!**	**mg/kg**	**(for comparison with soil analyses)**
	or		
	0.001	**mg/l**	**(for comparison with leachate test results)**

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 2 - Soil

Contaminant		**cis 1,2-Dichloroethene**		from Level 1
Target concentration	C_T	**0.001**	**mg/l**	from Level 1

This sheet calculates the Level 2 remedial target for soils (mg/kg) or for pore water (mg/l).

The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 2 remedial target to determine the need for further action. Equations presented in 'Hydrogeological risk assessment for land contamiantion' (Environment Agency 2006)

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**	
Standard entry					
Infiltration	Inf	0.00E+00	m/d		
Area of contaminant source	A	0.00E+00	m^2		Not used in calculation
Entry for groundwater flow below site					
Length of contaminant source in direction of groundwater flow	L	0.00E+00	m		
Saturated aquifer thickness	da	0.00E+00	m		
Hydraulic Conductivity of aquifer in which dilution occurs	K	0.00E+00	m/d		
Hydraulic gradient of water table	i	0.00E+00	fraction		
Width of contaminant source perpendicular to groundwater flow	w	0.00E+00	m		Not used in calculation
Background concentration of contaminant in groundwater beneath site	Cu	0.00E+00	mg/l		
Define mixing zone depth by specifying or calculating depth (using pull down list)		**Specify**			
Enter mixing zone thickness	Mz	0.00E+00	m		
Calculated mixing zone thickness	Mz		m		

Calculated Parameters

Dilution Factor	**DF**	**#DIV/0!**		
Level 2 Remedial Target		**#DIV/0!**	**mg/l**	**For comparison with measured pore water concentration. This assumes Level 1 Remedial Target is based on Target Concentration.**
		or		
		#DIV/0!	**mg/kg**	**For comparison with measured soil concentration. This assumes Level 1 Remedial Target calculated from soil-water**

Additional option

Calculation of impact on receptor

Concentration of contaminant in contaminated discharge (entering receptor)	Cc	0.00E+00	mg/l	
Calculated concentration within receptor (dilution only)		#DIV/0!	mg/l	0

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 3 - Soil

See Note

Input Parameters	Variable	Value	Unit	Source
Contaminant		cis 1,2-Dichloroethene		from Level 1
Target Concentration	C_T	0.001	mg/l	from Level 1
Dilution Factor	DF	#DIV/0!		from Level 2

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value)

	Variable	Value	Unit	Source of parameter value
Enter source concentration		Soil concentration as mg/kg		
Enter soil concentration		0	mg/kg	
Half life for degradation of contaminant in water	$t_{1/2}$	1.00E+100	days	
Calculated decay rate	λ	6.93E-101	$days^{-1}$	calculated
Width of plume in aquifer at source	Sz	0.00E+00	m	from Level 2
Plume thickness in aquifer at source	Sy	0.00E+00	m	from Level 2
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Effective porosity of aquifer	n	0.00E+00	fraction	
Hydraulic gradient	i	#DIV/0!	fraction	from Level 2 (adjusted)
Hydraulic conductivity of saturated aquifer	K	0.00E+00	m/d	from Level 2
Distance to compliance point	x	0.00E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	1.00E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	0.00E+00	l/kg	*see options*
Longitudinal dispersivity	ax	0.000	m	*see options*
Transverse dispersivity	az	0.000	m	*see options*
Vertical dispersivity	ay	0.000	m	*see options*

Parameter values should be checked against Level 1 and 2

Calculated Parameters	Variable		
Groundwater flow velocity	v	#DIV/0!	m/d
Retardation factor	Rf	#DIV/0!	fraction
Decay rate used	λ	6.93E-101	d^{-1}
Hydraulic gradient used in aquifer flow down-gradient	i	#DIV/0!	fraction
Rate of contaminant flow due to retardation	u	#DIV/0!	m/d
Ratio of Compliance Point to Source Concentration	C_{cp}/C_0	#DIV/0!	fraction
Attenuation factor (C_o/C_{cp})	**AF**	**#DIV/0!**	**fraction**
Calculated soil leachate concentration	Co	#DIV/0!	mg/l

Remedial Targets

Level 3 Remedial Target	**#DIV/0!**	**mg/l**	For comparison with measured pore water concentration.
Ogata Banks	**or**		This assumes Level 1 Remedial Target is based on Target Concentration.
	#DIV/0!	**mg/kg**	For comparison with measured soil concentration. This
Distance to compliance point	**0**	**m**	assumes Level 1 Remedial Target calculated from soil-water partitioning equation.
Ratio of Compliance Point to Source Concentration	**#DIV/0!**	**fraction**	Ogata Banks

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99

Enter method of defining partition co-efficient (using pull down list)

Calculate for ionic organic chemicals (acids)

Entry if specify partition coefficient (option)

Soil water partition coefficient	Kd		l/kg

Entry for non-polar organic chemicals (option)

Fraction of organic carbon in aquifer	foc		fraction
Organic carbon partition coefficient	Koc		l/kg

Entry for ionic organic chemicals (option)

Sorption coefficient for related species	$K_{oc,n}$	0.00E+00	l/kg
Sorption coefficient for ionised species	$K_{oc,i}$	0.00E+00	l/kg
pH value	pH	0.00E+00	
Acid dissociation constant	pKa	0.00E+00	
Fraction of organic carbon in aquifer	foc	0.00E+00	fraction
Soil water partition coefficient	Kd	0.00E+00	l/kg

Define dispersivity (click brown cell and use pull down list)

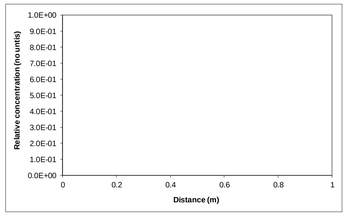
User defined values for dispersivity

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	0.00E+00	#NUM!	m
Transverse dispersivity	**az**	0.00E+00	0.00E+00	#NUM!	m
Vertical dispersivity	**ay**	0.00E+00	0.00E+00	#NUM!	m

Note values of dispersivity must be > 0

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed

Note
This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O_2, NO_3, SO_4 etc than an alternative solution should be used



Note: 'Relative concentration' is the ratio of calculated concentation at a given position compared to the source concentration. The calculations assume plume disperses from the top of the aquifer. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

This sheet calculates the Level 3 remedial target for soils(mg/kg) or for pore water (mg/l), based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.By setting a long travel time (e.g. 9E99) it will give the steady state solution, which should always be used when calculating remedial targets.

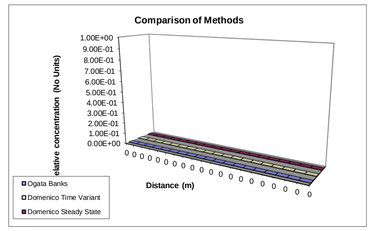
The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.9E+99.

Calculated (relative) concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Relative concentration (No units)	Concentration mg/l
0	1.0E+00	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!



Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Remedial Targets Worksheet , Release 3.2

Calculation of contaminant concentration in groundwater from a soil source

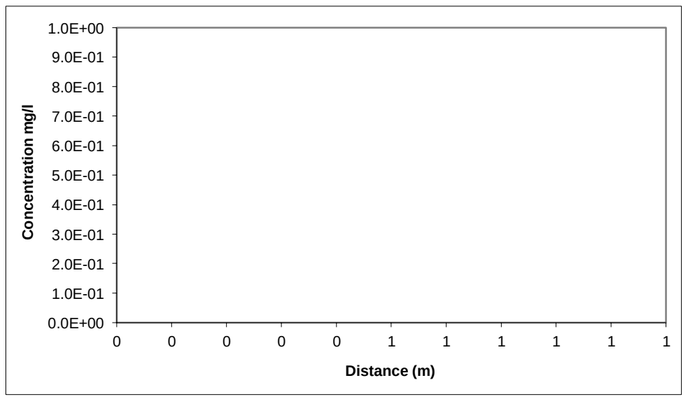
Only input required is Soil Contaminant Concentration

Input Parameters			
Soil contaminant concentration	C_0	0.00E+00	mg/kg
Level 1 Parameters			
Water filled soil porosity	θ_W	0.00E+00	fraction
Air filled soil porosity	θa	0.00E+00	fraction
Bulk density	ρ	0.00E+00	g/cm^3
Henry's Law constant	H	0.00E+00	dimensionless
Soil water partition coefficient used in Level Assessment	Kd	0.00E+00	l/kg
Factor (partitioning between soil and water)		#DIV/0!	dimensionless
Level 2 Parameters **Dilution Factor**	DF	#DIV/0!	
Level 3 Parameters **Attenuation factor (C_O/C_{ED})**	AF	#DIV/0!	

Predicted concentrations at compliance point

Level 1	C	#DIV/0!	mg/l	No dilution or attenuation
Level 2	C	#DIV/0!	mg/l	Dilution taken into account
Level 3	C	#DIV/0!	mg/l	Dilution and attenuation taken into account

Predicted concentrations between source and compliance point - Level 3



Distance m	Concentration mg/l
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu) | **Variable** | **Value** | **Unit** | **Source**

Contaminant		cis 1,2-Dichloroethene		from Level 1
Target Concentration	C_T	1.00E-03	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Domenico - Steady state — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived va

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	1.50E-02	mg/l	*Site investigation data*
Half life for degradation of contaminant in water	$t_{1/2}$	3.36E+02	days	*Agency for Toxic Substances and Disease*
Calculated decay rate	λ	2.06E-03	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	7.50E+01	m	*Length of site perpendicular to groundwater flow*
Plume thickness at source	Sy	5.90E+00	m	*Same as Mixing Zone Thickness. "For a thin aquifer (typically <10m), the mixing zone thickness can be taken as the acte*
Saturated aquifer thickness	da	6.00E+00	m	*Maximum thickness recorded in vicinity of*
Bulk density of aquifer materials	ρ	1.60E+00	g/cm^3	*Typical bulk density for river terrace deposits (conserv*
Effective porosity of aquifer	n	4.40E-01	fraction	*Maximum porosity for coarse Gravel (Lovanh et al 2000) - conservative estimate*
Hydraulic gradient	i	4.40E-02	fraction	*Borehole level data*
Hydraulic conductivity of aquifer	K	2.59E+03	m/d	*Maximum typical value for clayey sandy G*
Distance to compliance point	x	5.00E+01	m	*Default compliance distance*
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	9.90E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	4.90E+01	l/kg	*see options*
Longitudinal dispersivity	ax	5.00E+00	m	*see options*
Transverse dispersivity	az	5.00E-01	m	*see options*
Vertical dispersivity	ay	5.00E-02	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd	4.90E+01	l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc		fraction
Organic carbon partition coefficient	Koc		l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{oc,n}$		l/kg
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	4.90E+01	l/kg

Define dispersivity (click brown cell and use pull down list)

Dispersivities 10%, 1%, 0.1% of pathway length

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	5.00E+00	2.98E+00	m
Transverse dispersivity	**az**	0.00E+00	5.00E-01	2.98E-01	m
Vertical dispersivity	**ay**	0.00E+00	5.00E-02	2.98E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed

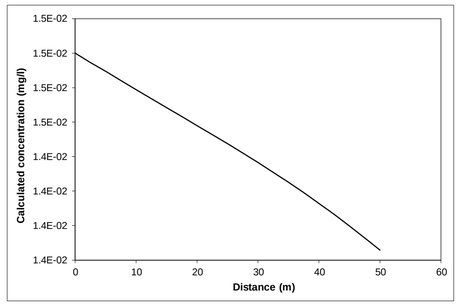
Calculated Parameters | **Variable**

Groundwater flow velocity	v	2.59E+02	m/d
Retardation factor	Rf	1.79E+02	fraction
Decay rate used	λ	2.06E-03	d^{-1}
Rate of contaminant flow due to retardation	u	1.45E+00	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	1.39E-02	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**1.08E+00**	

Remedial Targets

Remedial Target		**1.08E-03**	**mg/l**	For comparison with measured groundwater concentration.
Domenico - Steady state				
Distance to compliance point		**50**	**m**	
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**1.39E-02**	**mg/l**	Domenico - Steady state

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Calculated concentrations for distance-concentration graph

Domenico - Steady state
From calculation sheet

Distance	Concentration
	mg/l
0	1.5E-02
2.5	1.49E-02
5.0	1.49E-02
7.5	1.48E-02
10.0	1.48E-02
12.5	1.47E-02
15.0	1.47E-02
17.5	1.46E-02
20.0	1.46E-02
22.5	1.45E-02
25.0	1.45E-02
27.5	1.44E-02
30.0	1.44E-02
32.5	1.43E-02
35.0	1.43E-02
37.5	1.42E-02
40.0	1.41E-02
42.5	1.41E-02
45.0	1.40E-02
47.5	1.39E-02
50.0	1.39E-02

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared
with the Level 3 remedial target to determine the need for further action.
Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Porosity Calculator

These results are not carried through to any of the other worksheets

DRY BULK DENSITY DATA

Variable	Value	Unit	justification
Natural Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Dry Bulk Density	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
Initial Saturation	#DIV/0!	%	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	
Water Filled Porosity	**#DIV/0!**	**fraction**	

WET BULK DENSITY DATA

Variable	Value	Unit	
Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Actual (wet) Bulk Density (i.e. at natural MC)	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
dry bulk density	0.00	tonnes/m^3	
Initial Saturation	#DIV/0!	%	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	**#DIV/0!**
Water Filled Porosity	**#DIV/0!**	**fraction**	

Analytical solutions provided by David Hall, Golder Associates (UK) Ltd

Simple hydrogeological calculations

(These are not specific to, or required in, the Remedial Targets Methodology)

Parameter	symbol		unit	justification
Hydraulic conductivity	K	0.00E+00	m/d	
Hydraulic gradient	i	0.00E+00	unitless	
Effective porosity of aquifer	n	0.00E+00	fraction	
Thickness of saturated aquifer	b	0.00E+00	m	
Width of aquifer perpendicular to flow	w	0.00E+00	m	
Distance to receptor	x	0.00E+00	m	
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Soil-water partition co-efficient	Kd	0.00E+00	l/kg	
Retardation factor of pollutant	R	#DIV/0!		

Groundwater flow velocity	v(GW)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for groundwater to reach receptor	t(GW)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years
Rate of groundwater flow through aquifer	Q	0.00E+00	m^3/s	0.00E+00	m^3/day	0.00E+00	m^3/year

Contaminant flow velocity	v(contam)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for contaminant to reach receptor	t(contam)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years

Level 1 Calculation Sheet

Contaminant **1,2-Dichloroethene**

Parameter	Value	Units
(carried over from input sheet)		
C_T	1.00E-03	mg/l
Kd	0.00E+00	l/kg
foc		fraction
koc		l/kg
θ_W	0.00E+00	fraction
θa	0.00E+00	fraction
ρ	0.00E+00	g/cm3
H	0.00E+00	dimensionless
Koc,n		l/kg
Koc,i		l/kg
pH		pH units
pKa		
foc (ionic)		fraction

Calculations (Refer toTable 4.3, R&D Publication 20)

Selected option User specified value for partition coefficient

	calc	calc	Calc Kd	l/kg
Calculation of partition coefficient for ionic organic chemical				
Partition coefficient used in Level 1 Assessment			0.00E+00	l/kg

Calculated Remedial Target **#DIV/0!** **mg/kg** **for cis 1,2-Dichloroethene**

Factor (partitioning between soil and water) #DIV/0!

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11/12/2025
Version:	1

Level 2 Calculation Sheet

Contaminant : 1,2-Dichloroethene

Site assessed:	Kelvedon Stre
Date:	11/12/2025
Version:	1

Parameter	Value	Units		
(carried over from input sheet)				
Mz	0.00E+00	m		
L	0.00E+00	m		
da	0.00E+00	m		Calculated
Inf	0.00E+00	m/d		Dilution Factor
K	0.00E+00	m/d		
i	0.00E+00		Calculation based on target concentration	#DIV/0!
A	0.00E+00	m3/d m2 m3/d	Calculation based on observed contaminant concentration	#DIV/0!
Cc	0.00E+00	mg/l		
C_T	1.00E-03	mg/l		
Cu	0.00E+00	mg/l		
w	0.00E+00	m		



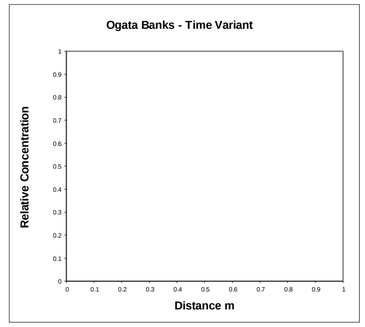
Contaminant **1,2-Dichloroethene**

OGATA BANKS SOLUTION

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-03	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

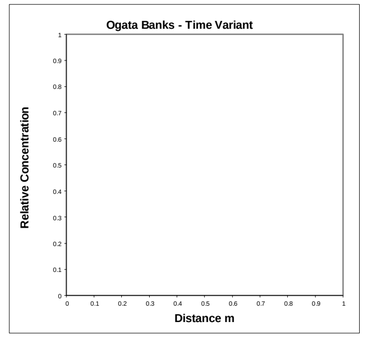
	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Calc	Value	
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) -USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Date:	11/12/2025
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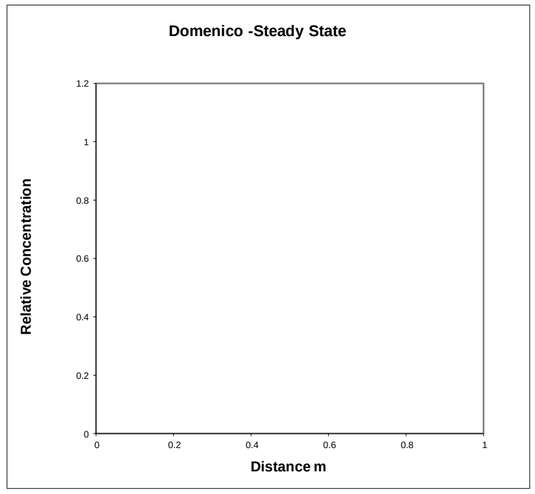
Contaminant **.,2-Dichloroethene**

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-03	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

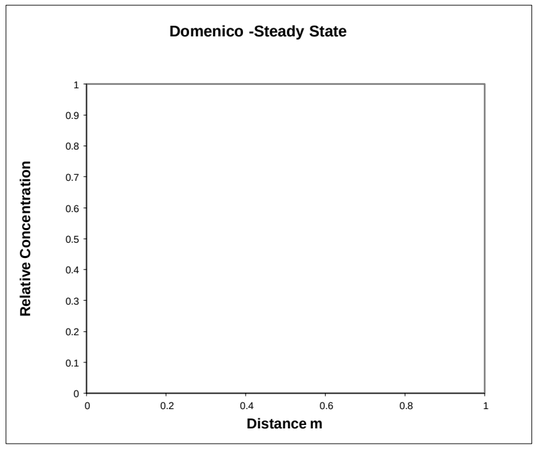


Calc	Value	Units
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Date:	11/12/2025
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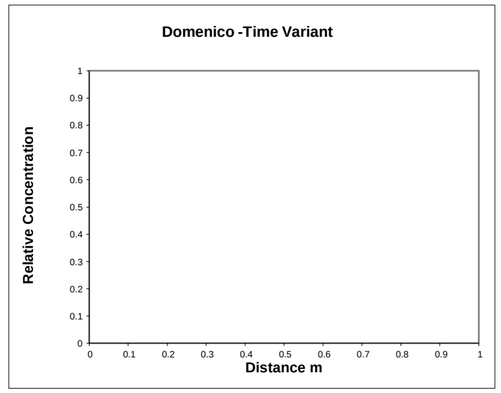
DOMENICO (TIME VARIANT)

Contaminant **l,2-Dichloroethene**

Input	Value	Units
C_T	0.001	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

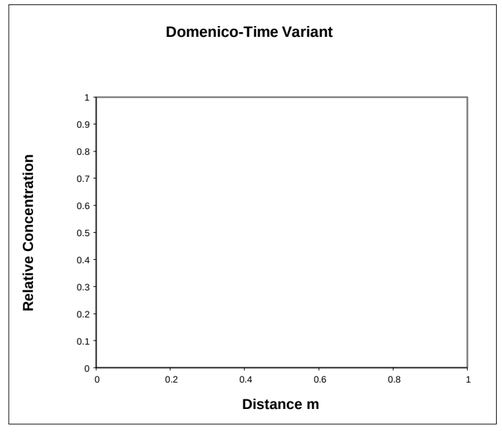
	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Calc	Value	
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Date:	11/12/2025
Version:	1

Contaminant **1,2-Dichloroethene**

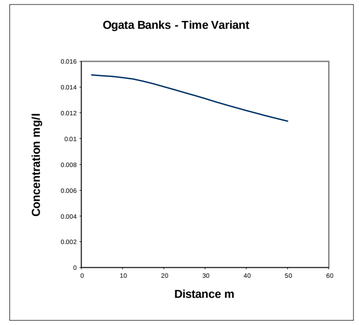
OGATA BANKS SOLUTION

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.001	mg/l
Co	1.50E-02	mg/l
λ	2.06E-03	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	4.90E+01	l/kg
ρ	1.60E+00	g/cm3
n	4.40E-01	
i	4.40E-02	
K	2.59E+03	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.00188	-3.5E-03	1.0E+00	-2.7E+49	2.000	5.0E-01	1.7E+00	2.7E+49	0.000	1.7E+01	1	-1.7E+01	-1	4.2E+00	1	-4.2E+00	-1	1.49E-02
2	5	0.00188	-7.1E-03	9.9E-01	-2.7E+49	2.000	1.0E+00	2.7E+00	2.7E+49	0.000	1.2E+01	1	-1.2E+01	-1	3.0E+00	1	-3.0E+00	-0.99997	1.49E-02
3	7.5	0.00188	-1.1E-02	9.9E-01	-2.7E+49	2.000	1.5E+00	4.5E+00	2.7E+49	0.000	9.7E+00	1	-9.7E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	1.48E-02
4	10	0.00188	-1.4E-02	9.9E-01	-2.7E+49	2.000	2.0E+00	7.5E+00	2.7E+49	0.000	8.4E+00	1	-8.4E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	1.47E-02
5	12.5	0.00188	-1.8E-02	9.8E-01	-2.7E+49	2.000	2.5E+00	1.2E+01	2.7E+49	0.000	7.5E+00	1	-7.5E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	1.46E-02
6	15	0.00188	-2.1E-02	9.8E-01	-2.7E+49	2.000	3.0E+00	2.1E+01	2.7E+49	0.000	6.8E+00	1	-6.8E+00	-1	1.7E+00	0.984	-1.7E+00	-0.98399	1.44E-02
7	17.5	0.00188	-2.5E-02	9.8E-01	-2.7E+49	2.000	3.5E+00	3.4E+01	2.7E+49	0.000	6.3E+00	1	-6.3E+00	-1	1.6E+00	0.9743	-1.6E+00	-0.97425	1.43E-02
8	20	0.00188	-2.8E-02	9.7E-01	-2.7E+49	2.000	4.0E+00	5.6E+01	2.7E+49	0.000	5.9E+00	1	-5.9E+00	-1	1.5E+00	0.963	-1.5E+00	-0.96302	1.40E-02
9	22.5	0.00188	-3.2E-02	9.7E-01	-2.7E+49	2.000	4.5E+00	9.3E+01	2.7E+49	0.000	5.6E+00	1	-5.6E+00	-1	1.4E+00	0.9508	-1.4E+00	-0.95078	1.38E-02
10	25	0.00188	-3.5E-02	9.7E-01	-2.7E+49	2.000	5.0E+00	1.5E+02	2.7E+49	0.000	5.3E+00	1	-5.3E+00	-1	1.3E+00	0.9379	-1.3E+00	-0.93792	1.36E-02
11	27.5	0.00188	-3.9E-02	9.6E-01	-2.7E+49	2.000	5.5E+00	2.5E+02	2.7E+49	0.000	5.1E+00	1	-5.1E+00	-1	1.3E+00	0.9247	-1.3E+00	-0.92475	1.33E-02
12	30	0.00188	-4.2E-02	9.6E-01	-2.7E+49	2.000	6.0E+00	4.2E+02	2.7E+49	0.000	4.8E+00	1	-4.8E+00	-1	1.2E+00	0.9115	-1.2E+00	-0.91147	1.31E-02
13	32.5	0.00188	-4.6E-02	9.6E-01	-2.7E+49	2.000	6.5E+00	7.0E+02	2.7E+49	0.000	4.7E+00	1	-4.7E+00	-1	1.2E+00	0.8982	-1.2E+00	-0.89824	1.29E-02
14	35	0.00188	-5.0E-02	9.5E-01	-2.7E+49	2.000	7.0E+00	1.2E+03	2.7E+49	0.000	4.5E+00	1	-4.5E+00	-1	1.1E+00	0.8852	-1.1E+00	-0.88517	1.26E-02
15	37.5	0.00188	-5.3E-02	9.5E-01	-2.7E+49	2.000	7.6E+00	1.9E+03	2.7E+49	0.000	4.3E+00	1	-4.3E+00	-1	1.1E+00	0.8723	-1.1E+00	-0.87233	1.24E-02
16	40	0.00188	-5.7E-02	9.4E-01	-2.7E+49	2.000	8.1E+00	3.2E+03	2.7E+49	0.000	4.2E+00	1	-4.2E+00	-1	1.0E+00	0.8598	-1.0E+00	-0.85979	1.22E-02
17	42.5	0.00188	-6.0E-02	9.4E-01	-2.7E+49	2.000	8.6E+00	5.2E+03	2.7E+49	0.000	4.1E+00	1	-4.1E+00	-1	1.0E+00	0.8476	-1.0E+00	-0.84756	1.20E-02
18	45	0.00188	-6.4E-02	9.4E-01	-2.7E+49	2.000	9.1E+00	8.6E+03	2.7E+49	0.000	4.0E+00	1	-4.0E+00	-1	9.8E-01	0.8357	-9.8E-01	-0.83567	1.18E-02
19	47.5	0.00188	-6.7E-02	9.3E-01	-2.7E+49	2.000	9.6E+00	1.4E+04	2.7E+49	0.000	3.8E+00	1	-3.8E+00	-1	9.6E-01	0.8241	-9.6E-01	-0.82412	1.16E-02
20	50	0.00188	-7.1E-02	9.3E-01	-2.7E+49	2.000	1.0E+01	2.4E+04	2.7E+49	0.000	3.8E+00	1	-3.8E+00	-1	9.3E-01	0.8129	-9.3E-01	-0.81292	1.14E-02

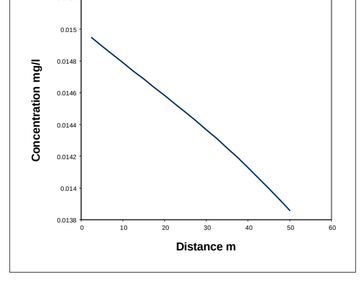


Calc **Value**

v	2.59E+02 m/d
Rc	1.79E+02
u	1.45E+00 m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.00188	-3.5E-03	1.0E+00	-2.7E+49	2.000	5.0E-01	1.7E+00	2.7E+49	0.000	1.7E+01	1	-1.7E+01	-1	8.3E+00	1	-8.3E+00	-1	1.49E-02
2	5	0.00188	-7.1E-03	9.9E-01	-2.7E+49	2.000	1.0E+00	2.7E+00	2.7E+49	0.000	1.2E+01	1	-1.2E+01	-1	5.9E+00	1	-5.9E+00	-1	1.49E-02
3	7.5	0.00188	-1.1E-02	9.9E-01	-2.7E+49	2.000	1.5E+00	4.5E+00	2.7E+49	0.000	9.7E+00	1	-9.7E+00	-1	4.8E+00	1	-4.8E+00	-1	1.48E-02
4	10	0.00188	-1.4E-02	9.9E-01	-2.7E+49	2.000	2.0E+00	7.5E+00	2.7E+49	0.000	8.4E+00	1	-8.4E+00	-1	4.2E+00	1	-4.2E+00	-1	1.48E-02
5	12.5	0.00188	-1.8E-02	9.8E-01	-2.7E+49	2.000	2.5E+00	1.2E+01	2.7E+49	0.000	7.5E+00	1	-7.5E+00	-1	3.7E+00	1	-3.7E+00	-1	1.47E-02
6	15	0.00188	-2.1E-02	9.8E-01	-2.7E+49	2.000	3.0E+00	2.1E+01	2.7E+49	0.000	6.8E+00	1	-6.8E+00	-1	3.4E+00	1	-3.4E+00	-1	1.47E-02
7	17.5	0.00188	-2.5E-02	9.8E-01	-2.7E+49	2.000	3.5E+00	3.4E+01	2.7E+49	0.000	6.3E+00	1	-6.3E+00	-1	3.2E+00	1	-3.2E+00	-0.99999	1.46E-02
8	20	0.00188	-2.8E-02	9.7E-01	-2.7E+49	2.000	4.0E+00	5.6E+01	2.7E+49	0.000	5.9E+00	1	-5.9E+00	-1	3.0E+00	1	-3.0E+00	-0.99997	1.46E-02
9	22.5	0.00188	-3.2E-02	9.7E-01	-2.7E+49	2.000	4.5E+00	9.3E+01	2.7E+49	0.000	5.6E+00	1	-5.6E+00	-1	2.8E+00	0.9999	-2.8E+00	-0.99992	1.45E-02
10	25	0.00188	-3.5E-02	9.7E-01	-2.7E+49	2.000	5.0E+00	1.5E+02	2.7E+49	0.000	5.3E+00	1	-5.3E+00	-1	2.6E+00	0.9998	-2.6E+00	-0.99981	1.45E-02
11	27.5	0.00188	-3.9E-02	9.6E-01	-2.7E+49	2.000	5.5E+00	2.5E+02	2.7E+49	0.000	5.1E+00	1	-5.1E+00	-1	2.5E+00	0.9996	-2.5E+00	-0.99963	1.44E-02
12	30	0.00188	-4.2E-02	9.6E-01	-2.7E+49	2.000	6.0E+00	4.2E+02	2.7E+49	0.000	4.8E+00	1	-4.8E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	1.44E-02
13	32.5	0.00188	-4.6E-02	9.6E-01	-2.7E+49	2.000	6.5E+00	7.0E+02	2.7E+49	0.000	4.7E+00	1	-4.7E+00	-1	2.3E+00	0.9989	-2.3E+00	-0.99893	1.43E-02
14	35	0.00188	-5.0E-02	9.5E-01	-2.7E+49	2.000	7.0E+00	1.2E+03	2.7E+49	0.000	4.5E+00	1	-4.5E+00	-1	2.2E+00	0.9984	-2.2E+00	-0.99839	1.43E-02
15	37.5	0.00188	-5.3E-02	9.5E-01	-2.7E+49	2.000	7.6E+00	1.9E+03	2.7E+49	0.000	4.3E+00	1	-4.3E+00	-1	2.2E+00	0.9977	-2.2E+00	-0.99769	1.42E-02
16	40	0.00188	-5.7E-02	9.4E-01	-2.7E+49	2.000	8.1E+00	3.2E+03	2.7E+49	0.000	4.2E+00	1	-4.2E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	1.41E-02
17	42.5	0.00188	-6.0E-02	9.4E-01	-2.7E+49	2.000	8.6E+00	5.2E+03	2.7E+49	0.000	4.1E+00	1	-4.1E+00	-1	2.0E+00	0.9958	-2.0E+00	-0.99579	1.41E-02
18	45	0.00188	-6.4E-02	9.4E-01	-2.7E+49	2.000	9.1E+00	8.6E+03	2.7E+49	0.000	4.0E+00	1	-4.0E+00	-1	2.0E+00	0.9946	-2.0E+00	-0.99459	1.40E-02
19	47.5	0.00188	-6.7E-02	9.3E-01	-2.7E+49	2.000	9.6E+00	1.4E+04	2.7E+49	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9932	-1.9E+00	-0.99321	1.39E-02
20	50	0.00188	-7.1E-02	9.3E-01	-2.7E+49	2.000	1.0E+01	2.4E+04	2.7E+49	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	1.39E-02



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	1.49E-02
5.0	1.49E-02
7.5	1.48E-02
10.0	1.48E-02
12.5	1.47E-02
15.0	1.47E-02
17.5	1.46E-02
20.0	1.46E-02
22.5	1.45E-02
25.0	1.45E-02
27.5	1.44E-02
30.0	1.44E-02
32.5	1.43E-02
35.0	1.43E-02
37.5	1.42E-02
40.0	1.41E-02
42.5	1.41E-02
45.0	1.40E-02
47.5	1.39E-02
50.0	1.39E-02

Contaminant ,,2-Dichloroethene

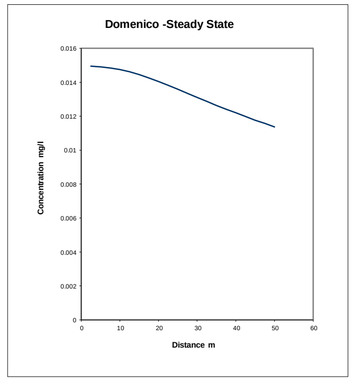
Input	Value	Units
C_T	0.001	mg/l
Co	1.50E-02	mg/l
λ	2.06E-03	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	4.90E+01	l/kg
ρ	1.60E+00	g/cm3
n	4.40E-01	
i	4.40E-02	
K	2.59E+03	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion optio Simulate vertical dispersion in 1 direction

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.00375	-3.54E-03	9.96E-01	1.68E+01	1	-1.68E+01	-1	4.17E+00	1	-4.17E+00	-1	1.49E-02
2	5	0.00375	-7.08E-03	9.93E-01	1.19E+01	1	-1.19E+01	-1	2.95E+00	1	-2.95E+00	-1	1.49E-02
3	7.5	0.00375	-1.06E-02	9.89E-01	9.68E+00	1	-9.68E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	1.48E-02
4	10	0.00375	-1.42E-02	9.86E-01	8.39E+00	1	-8.39E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	1.47E-02
5	12.5	0.00375	-1.77E-02	9.82E-01	7.50E+00	1	-7.50E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	1.46E-02
6	15	0.00375	-2.12E-02	9.79E-01	6.85E+00	1	-6.85E+00	-1	1.70E+00	0.984	-1.70E+00	-0.984	1.44E-02
7	17.5	0.00375	-2.48E-02	9.76E-01	6.34E+00	1	-6.34E+00	-1	1.58E+00	0.9743	-1.58E+00	-0.9743	1.43E-02
8	20	0.00375	-2.83E-02	9.72E-01	5.93E+00	1	-5.93E+00	-1	1.48E+00	0.963	-1.48E+00	-0.963	1.40E-02
9	22.5	0.00375	-3.19E-02	9.69E-01	5.59E+00	1	-5.59E+00	-1	1.39E+00	0.9508	-1.39E+00	-0.9508	1.38E-02
10	25	0.00375	-3.54E-02	9.65E-01	5.30E+00	1	-5.30E+00	-1	1.32E+00	0.9379	-1.32E+00	-0.9379	1.36E-02
11	27.5	0.00375	-3.89E-02	9.62E-01	5.06E+00	1	-5.06E+00	-1	1.26E+00	0.9247	-1.26E+00	-0.9247	1.33E-02
12	30	0.00375	-4.25E-02	9.58E-01	4.84E+00	1	-4.84E+00	-1	1.20E+00	0.9115	-1.20E+00	-0.9115	1.31E-02
13	32.5	0.00375	-4.60E-02	9.55E-01	4.65E+00	1	-4.65E+00	-1	1.16E+00	0.8982	-1.16E+00	-0.8982	1.29E-02
14	35	0.00375	-4.96E-02	9.52E-01	4.48E+00	1	-4.48E+00	-1	1.11E+00	0.8852	-1.11E+00	-0.8852	1.26E-02
15	37.5	0.00375	-5.31E-02	9.48E-01	4.33E+00	1	-4.33E+00	-1	1.08E+00	0.8723	-1.08E+00	-0.8723	1.24E-02
16	40	0.00375	-5.66E-02	9.45E-01	4.19E+00	1	-4.19E+00	-1	1.04E+00	0.8598	-1.04E+00	-0.8598	1.22E-02
17	42.5	0.00375	-6.02E-02	9.42E-01	4.07E+00	1	-4.07E+00	-1	1.01E+00	0.8476	-1.01E+00	-0.8476	1.20E-02
18	45	0.00375	-6.37E-02	9.38E-01	3.95E+00	1	-3.95E+00	-1	9.83E-01	0.8357	-9.83E-01	-0.8357	1.18E-02
19	47.5	0.00375	-6.73E-02	9.35E-01	3.85E+00	1	-3.85E+00	-1	9.57E-01	0.8241	-9.57E-01	-0.8241	1.16E-02
20	50	0.00375	-7.08E-02	9.32E-01	3.75E+00	1	-3.75E+00	-1	9.33E-01	0.8129	-9.33E-01	-0.8129	1.14E-02



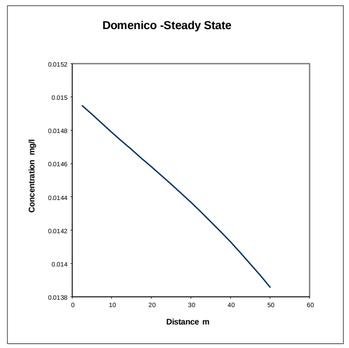
Calc | **Value**

v	2.59E+02	m/d
Rc	1.79E+02	
u	1.45E+00	m/d

DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.00375	-3.54E-03	9.96E-01	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	1.49E-02
2	5	0.00375	-7.08E-03	9.93E-01	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	1.49E-02
3	7.5	0.00375	-1.06E-02	9.89E-01	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	1.48E-02
4	10	0.00375	-1.42E-02	9.86E-01	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	1.48E-02
5	12.5	0.00375	-1.77E-02	9.82E-01	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	1.47E-02
6	15	0.00375	-2.12E-02	9.79E-01	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	1.47E-02
7	17.5	0.00375	-2.48E-02	9.76E-01	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	1.46E-02
8	20	0.00375	-2.83E-02	9.72E-01	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	1.46E-02
9	22.5	0.00375	-3.19E-02	9.69E-01	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-0.9999	1.45E-02
10	25	0.00375	-3.54E-02	9.65E-01	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-0.9998	1.45E-02
11	27.5	0.00375	-3.89E-02	9.62E-01	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-0.9996	1.44E-02
12	30	0.00375	-4.25E-02	9.58E-01	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	1.44E-02
13	32.5	0.00375	-4.60E-02	9.55E-01	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.9989	1.43E-02
14	35	0.00375	-4.96E-02	9.52E-01	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.9984	1.43E-02
15	37.5	0.00375	-5.31E-02	9.48E-01	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.9977	1.42E-02
16	40	0.00375	-5.66E-02	9.45E-01	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	1.41E-02
17	42.5	0.00375	-6.02E-02	9.42E-01	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.9958	1.41E-02
18	45	0.00375	-6.37E-02	9.38E-01	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.9946	1.40E-02
19	47.5	0.00375	-6.73E-02	9.35E-01	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.9932	1.39E-02
20	50	0.00375	-7.08E-02	9.32E-01	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	1.39E-02



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	1.49E-02
5.0	1.49E-02
7.5	1.48E-02
10.0	1.48E-02
12.5	1.47E-02
15.0	1.47E-02
17.5	1.46E-02
20.0	1.46E-02
22.5	1.45E-02
25.0	1.45E-02
27.5	1.44E-02
30.0	1.44E-02
32.5	1.43E-02
35.0	1.43E-02
37.5	1.42E-02
40.0	1.41E-02
42.5	1.41E-02
45.0	1.40E-02
47.5	1.39E-02
50.0	1.39E-02

DOMENICO (TIME VARIANT)

Contaminant 1,2-Dichloroethene

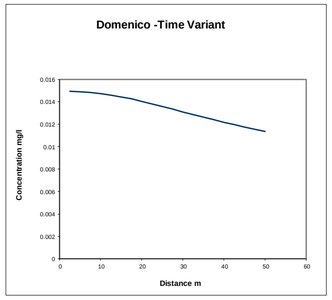
Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.001	mg/l
Co	1.50E-02	mg/l
λ	2.06E-03	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	4.90E+01	l/kg
ρ	1.60E+00	g/cm3
n	4.40E-01	
i	4.40E-02	
K	2.59E+03	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

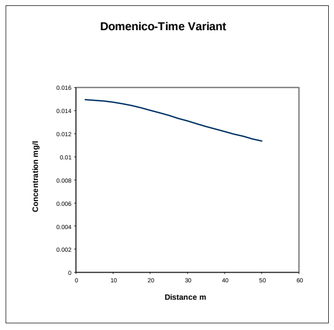
Calc	Value	
v	2.59E+02	m/d
Rc	1.79E+02	
u	1.45E+00	m/d

	X m	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
1	2.5	0.00188	-3.54E-03	9.96E-01	-2.71E+49	2	1.68E+01	1	-1.68E+01	-1	4.17E+00	1	-4.17E+00	-1	1.49E-02
2	5	0.00188	-7.08E-03	9.93E-01	-2.71E+49	2	1.19E+01	1	-1.19E+01	-1	2.95E+00	1	-2.95E+00	-1	1.49E-02
3	7.5	0.00188	-1.06E-02	9.89E-01	-2.71E+49	2	9.68E+00	1	-9.68E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	1.48E-02
4	10	0.00188	-1.42E-02	9.86E-01	-2.71E+49	2	8.39E+00	1	-8.39E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	1.47E-02
5	12.5	0.00188	-1.77E-02	9.82E-01	-2.71E+49	2	7.50E+00	1	-7.50E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	1.46E-02
6	15	0.00188	-2.12E-02	9.79E-01	-2.71E+49	2	6.85E+00	1	-6.85E+00	-1	1.70E+00	0.984	-1.70E+00	-0.984	1.44E-02
7	17.5	0.00188	-2.48E-02	9.76E-01	-2.71E+49	2	6.34E+00	1	-6.34E+00	-1	1.58E+00	0.9743	-1.58E+00	-0.974	1.43E-02
8	20	0.00188	-2.83E-02	9.72E-01	-2.71E+49	2	5.93E+00	1	-5.93E+00	-1	1.48E+00	0.963	-1.48E+00	-0.963	1.40E-02
9	22.5	0.00188	-3.19E-02	9.69E-01	-2.71E+49	2	5.59E+00	1	-5.59E+00	-1	1.39E+00	0.9508	-1.39E+00	-0.951	1.38E-02
10	25	0.00188	-3.54E-02	9.65E-01	-2.71E+49	2	5.30E+00	1	-5.30E+00	-1	1.32E+00	0.9379	-1.32E+00	-0.938	1.36E-02
11	27.5	0.00188	-3.89E-02	9.62E-01	-2.71E+49	2	5.06E+00	1	-5.06E+00	-1	1.26E+00	0.9247	-1.26E+00	-0.925	1.33E-02
12	30	0.00188	-4.25E-02	9.58E-01	-2.71E+49	2	4.84E+00	1	-4.84E+00	-1	1.20E+00	0.9115	-1.20E+00	-0.911	1.31E-02
13	32.5	0.00188	-4.60E-02	9.55E-01	-2.71E+49	2	4.65E+00	1	-4.65E+00	-1	1.16E+00	0.8982	-1.16E+00	-0.898	1.29E-02
14	35	0.00188	-4.96E-02	9.52E-01	-2.71E+49	2	4.48E+00	1	-4.48E+00	-1	1.11E+00	0.8852	-1.11E+00	-0.885	1.26E-02
15	37.5	0.00188	-5.31E-02	9.48E-01	-2.71E+49	2	4.33E+00	1	-4.33E+00	-1	1.08E+00	0.8723	-1.08E+00	-0.872	1.24E-02
16	40	0.00188	-5.66E-02	9.45E-01	-2.71E+49	2	4.19E+00	1	-4.19E+00	-1	1.04E+00	0.8598	-1.04E+00	-0.86	1.22E-02
17	42.5	0.00188	-6.02E-02	9.42E-01	-2.71E+49	2	4.07E+00	1	-4.07E+00	-1	1.01E+00	0.8476	-1.01E+00	-0.848	1.20E-02
18	45	0.00188	-6.37E-02	9.38E-01	-2.71E+49	2	3.95E+00	1	-3.95E+00	-1	9.83E-01	0.8357	-9.83E-01	-0.836	1.18E-02
19	47.5	0.00188	-6.73E-02	9.35E-01	-2.71E+49	2	3.85E+00	1	-3.85E+00	-1	9.57E-01	0.8241	-9.57E-01	-0.824	1.16E-02
20	50	0.00188	-7.08E-02	9.32E-01	-2.71E+49	2	3.75E+00	1	-3.75E+00	-1	9.33E-01	0.8129	-9.33E-01	-0.813	1.14E-02



Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

	X m	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
1	2.5	0.00188	-3.54E-03	9.96E-01	-2.71E+49	2	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	1.49E-02
2	5	0.00188	-7.08E-03	9.93E-01	-2.71E+49	2	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	1.49E-02
3	7.5	0.00188	-1.06E-02	9.89E-01	-2.71E+49	2	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	1.48E-02
4	10	0.00188	-1.42E-02	9.86E-01	-2.71E+49	2	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	1.48E-02
5	12.5	0.00188	-1.77E-02	9.82E-01	-2.71E+49	2	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	1.47E-02
6	15	0.00188	-2.12E-02	9.79E-01	-2.71E+49	2	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	1.47E-02
7	17.5	0.00188	-2.48E-02	9.76E-01	-2.71E+49	2	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	1.46E-02
8	20	0.00188	-2.83E-02	9.72E-01	-2.71E+49	2	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	1.46E-02
9	22.5	0.00188	-3.19E-02	9.69E-01	-2.71E+49	2	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-1	1.45E-02
10	25	0.00188	-3.54E-02	9.65E-01	-2.71E+49	2	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-1	1.45E-02
11	27.5	0.00188	-3.89E-02	9.62E-01	-2.71E+49	2	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-1	1.44E-02
12	30	0.00188	-4.25E-02	9.58E-01	-2.71E+49	2	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	1.44E-02
13	32.5	0.00188	-4.60E-02	9.55E-01	-2.71E+49	2	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.999	1.43E-02
14	35	0.00188	-4.96E-02	9.52E-01	-2.71E+49	2	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.998	1.43E-02
15	37.5	0.00188	-5.31E-02	9.48E-01	-2.71E+49	2	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.998	1.42E-02
16	40	0.00188	-5.66E-02	9.45E-01	-2.71E+49	2	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	1.41E-02
17	42.5	0.00188	-6.02E-02	9.42E-01	-2.71E+49	2	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.996	1.41E-02
18	45	0.00188	-6.37E-02	9.38E-01	-2.71E+49	2	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.995	1.40E-02
19	47.5	0.00188	-6.73E-02	9.35E-01	-2.71E+49	2	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.993	1.39E-02
20	50	0.00188	-7.08E-02	9.32E-01	-2.71E+49	2	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	1.39E-02



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	1.49E-02
5.0	1.49E-02
7.5	1.48E-02
10.0	1.48E-02
12.5	1.47E-02
15.0	1.47E-02
17.5	1.46E-02
20.0	1.46E-02
22.5	1.45E-02
25.0	1.45E-02
27.5	1.44E-02
30.0	1.44E-02
32.5	1.43E-02
35.0	1.43E-02
37.5	1.42E-02
40.0	1.41E-02
42.5	1.41E-02
45.0	1.40E-02
47.5	1.39E-02
50.0	1.39E-02

Hydrogeological risk assessment for land contamination

Remedial Targets Worksheet , Release 3.2

First released: 2006. Version 3.2: January 2013

This worksheet has been produced in combination with the document 'Remedial Targets Methodology: Hydrogeological risk assessment for land contamination (Environment Agency 2006).

Users of this worksheet should always refer to the User Manual to the Remedial Targets Methodology and to relevant guidance on UK legislation and policy, in order to understand how this procedure should be applied in an appropriate context.

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The calculation of equations in this worksheet has been independently checked by Entec (UK) Ltd on behalf of the Environment Agency.

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IMPORTANT: To enable MS Excel worksheet, click Tools, Add -Ins, Analysis Tool Pak and Analysis Tool Pak-VBA (to calculate error functions).

Details to be completed for each assessment				
Site Name:	Kelvedon Street			
Site Address:	Newport			
Completed by:	Michael Watkins			
Date:	11-Dec-25		Version:	1
Contaminant	cis 1,2-Dichloroethene			
Target Concentration (C_T)	0.001	mg/l	Origin of C_T:	Laboratory detection limit

This worksheet can be used to determine remedial targets for soils (Worksheets Level 1 Soil, Level 2 and Level 3 Soil) or to determine remedial targets for groundwater (Level 3 Groundwater). For Level 3, parameter values must be entered separately dependent on whether the assessment is for soil or groundwater. For soil, remedial targets are calculated as either mg/kg (for comparision with soil measurements) or mg/l (for comparison with leaching tests or pore water concentrations).
Site details entered on this page are automatically copied to Level 1, 2 and 3 Worksheets.
Worksheet options are identified by brown background and employ a pull-down menus. Data entry are identified as blue background.
Data origin / justification should be noted in cells coloured yellow and fully documented in subsequent reports.
Data carried forward from an earlier worksheet are identified by a light green background
It is recommended that a copy of the original worksheet is saved (all data fields in the original copy are blank).

The spreadsheet also includes a porosity calculation worksheet, a soil impact calculation worksheet and a worksheet that performs some simple hydrogeological calculations.

Remedial Targets Worksheet , Release 3.2

Level 1 - Soil

Select the method of calculating the soil water Partition Co-efficient by using the pull down menu below

User specified value for partition coefficient

Contaminant		**cis 1,2-Dichloroethene**	
Target concentration	C_T	**0.001**	**mg/l**

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**
Standard entry				
Water filled soil porosity	θ_w	0.00E+00	fraction	
Air filled soil porosity	θa	0.00E+00	fraction	
Bulk density of soil zone material	ρ	0.00E+00	g/cm^3	
Henry's Law constant	H	0.00E+00	dimensionless	
Entry if specify partition coefficient (option)				
Soil water partition coefficient	Kd	0.00E+00	l/kg	
Entry for non-polar organic chemicals (option)				
Fraction of organic carbon (in soil)	foc		fraction	
Organic carbon partition coefficient	Koc		l/kg	
Entry for ionic organic chemicals (option)				
Sorption coefficient for neutral species	$K_{oc,n}$		l/kg	
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg	
pH value	pH		pH units	
Acid dissociation constant	pKa			
Fraction of organic carbon (in soil)	foc		fraction	

This sheet calculates the Level 1 remedial target for soils(mg/kg) based on a selected target concentration and theoretical calculation of soil water partitioning. Three options are included for determining the partition coefficient.

The measured soil concentration as mg/kg should be compared with the Level 1 remedial target to determine the need for further action.

Soil water partition coefficient used in Level Assessment	**Kd**	**0.00E+00**	**l/kg**	*Specified value*

Level 1 Remedial Target

Level 1 Remedial Target	**#DIV/0!**	**mg/kg**	**(for comparison with soil analyses)**
	or		
	0.001	**mg/l**	**(for comparison with leachate test results)**

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 2 - Soil

Contaminant		**cis 1,2-Dichloroethene**		from Level 1
Target concentration	C_T	**0.001**	**mg/l**	from Level 1

This sheet calculates the Level 2 remedial target for soils (mg/kg) or for pore water (mg/l).

The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 2 remedial target to determine the need for further action. Equations presented in 'Hydrogeological risk assessment for land contamiantion' (Environment Agency 2006)

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**	
Standard entry					
Infiltration	Inf	0.00E+00	m/d		
Area of contaminant source	A	0.00E+00	m^2		Not used in calculation
Entry for groundwater flow below site					
Length of contaminant source in direction of groundwater flow	L	0.00E+00	m		
Saturated aquifer thickness	da	0.00E+00	m		
Hydraulic Conductivity of aquifer in which dilution occurs	K	0.00E+00	m/d		
Hydraulic gradient of water table	i	0.00E+00	fraction		
Width of contaminant source perpendicular to groundwater flow	w	0.00E+00	m		Not used in calculation
Background concentration of contaminant in groundwater beneath site	Cu	0.00E+00	mg/l		
Define mixing zone depth by specifying or calculating depth (using pull down list)		**Specify**			
Enter mixing zone thickness	Mz	0.00E+00	m		
Calculated mixing zone thickness	Mz		m		

Calculated Parameters

Dilution Factor	**DF**	**#DIV/0!**		
Level 2 Remedial Target		**#DIV/0!**	**mg/l**	**For comparison with measured pore water concentration. This assumes Level 1 Remedial Target is based on Target Concentration.**
		or		
		#DIV/0!	**mg/kg**	**For comparison with measured soil concentration. This assumes Level 1 Remedial Target calculated from soil-water**

Additional option

Calculation of impact on receptor

Concentration of contaminant in contaminated discharge (entering receptor)	Cc	0.00E+00	mg/l	
Calculated concentration within receptor (dilution only)		#DIV/0!	mg/l	0

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 3 - Soil

See Note

Input Parameters	Variable	Value	Unit	Source
Contaminant		cis 1,2-Dichloroethene		from Level 1
Target Concentration	C_T	0.001	mg/l	from Level 1
Dilution Factor	DF	#DIV/0!		from Level 2

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value)

	Variable	Value	Unit	Source of parameter value
Enter source concentration		Soil concentration as mg/kg		
Enter soil concentration		0	mg/kg	
Half life for degradation of contaminant in water	$t_{1/2}$	1.00E+100	days	
Calculated decay rate	λ	6.93E-101	$days^{-1}$	calculated
Width of plume in aquifer at source	Sz	0.00E+00	m	from Level 2
Plume thickness in aquifer at source	Sy	0.00E+00	m	from Level 2
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Effective porosity of aquifer	n	0.00E+00	fraction	
Hydraulic gradient	i	#DIV/0!	fraction	from Level 2 (adjusted)
Hydraulic conductivity of saturated aquifer	K	0.00E+00	m/d	from Level 2
Distance to compliance point	x	0.00E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	1.00E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	0.00E+00	l/kg	*see options*
Longitudinal dispersivity	ax	0.000	m	*see options*
Transverse dispersivity	az	0.000	m	*see options*
Vertical dispersivity	ay	0.000	m	*see options*

Parameter values should be checked against Level 1 and 2

Calculated Parameters	Variable		
Groundwater flow velocity	v	#DIV/0!	m/d
Retardation factor	Rf	#DIV/0!	fraction
Decay rate used	λ	6.93E-101	d^{-1}
Hydraulic gradient used in aquifer flow down-gradient	i	#DIV/0!	fraction
Rate of contaminant flow due to retardation	u	#DIV/0!	m/d
Ratio of Compliance Point to Source Concentration	C_{cp}/C_0	#DIV/0!	fraction
Attenuation factor (C_o/C_{cp})	**AF**	**#DIV/0!**	**fraction**
Calculated soil leachate concentration	Co	#DIV/0!	mg/l

Remedial Targets

Level 3 Remedial Target	**#DIV/0!**	**mg/l**	For comparison with measured pore water concentration.
Ogata Banks	**or**		This assumes Level 1 Remedial Target is based on Target Concentration.
	#DIV/0!	**mg/kg**	For comparison with measured soil concentration. This
Distance to compliance point	**0**	**m**	assumes Level 1 Remedial Target calculated from soil-water partitioning equation.
Ratio of Compliance Point to Source Concentration	**#DIV/0!**	**fraction**	Ogata Banks

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99

Enter method of defining partition co-efficient (using pull down list)

Calculate for ionic organic chemicals (acids)

Entry if specify partition coefficient (option)

Soil water partition coefficient	Kd		l/kg

Entry for non-polar organic chemicals (option)

Fraction of organic carbon in aquifer	foc		fraction
Organic carbon partition coefficient	Koc		l/kg

Entry for ionic organic chemicals (option)

Sorption coefficient for related species	$K_{oc,n}$	0.00E+00	l/kg
Sorption coefficient for ionised species	$K_{oc,i}$	0.00E+00	l/kg
pH value	pH	0.00E+00	
Acid dissociation constant	pKa	0.00E+00	
Fraction of organic carbon in aquifer	foc	0.00E+00	fraction
Soil water partition coefficient	Kd	0.00E+00	l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

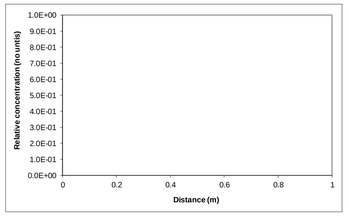
		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	0.00E+00	#NUM!	m
Transverse dispersivity	**az**	0.00E+00	0.00E+00	#NUM!	m
Vertical dispersivity	**ay**	0.00E+00	0.00E+00	#NUM!	m

Note values of dispersivity must be > 0

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed

Note
This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O_2, NO_3, SO_4 etc than an alternative solution should be used

Environment Agency



Note: 'Relative concentration' is the ratio of calculated concentation at a given position compared to the source concentration. The calculations assume plume disperses from the top of the aquifer. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

This sheet calculates the Level 3 remedial target for soils(mg/kg) or for pore water (mg/l), based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.By setting a long travel time (e.g. 9E99) it will give the steady state solution, which should always be used when calculating remedial targets.

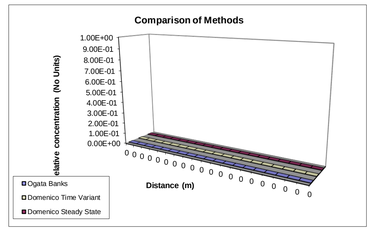
The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.9E+99.

Calculated (relative) concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Relative concentration (No units)	Concentration mg/l
0	1.0E+00	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!



Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Remedial Targets Worksheet , Release 3.2

Calculation of contaminant concentration in groundwater from a soil source

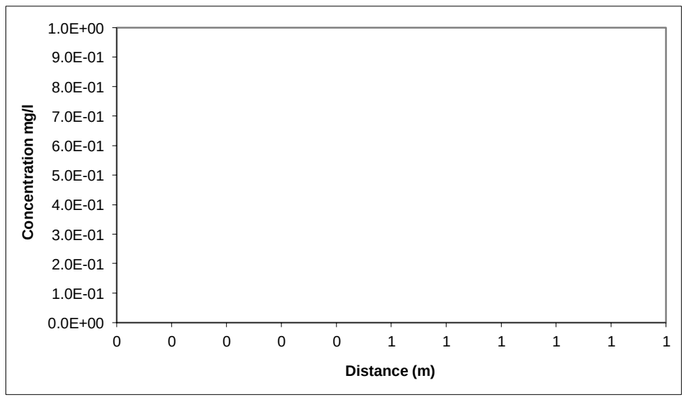
Only input required is Soil Contaminant Concentration

	Input Parameters			
	Soil contaminant concentration	C_0	0.00E+00	mg/kg
Level 1 Parameters				
	Water filled soil porosity	θ_W	0.00E+00	fraction
	Air filled soil porosity	θa	0.00E+00	fraction
	Bulk density	ρ	0.00E+00	g/cm^3
	Henry's Law constant	H	0.00E+00	dimensionless
	Soil water partition coefficient used in Level Assessment	Kd	0.00E+00	l/kg
	Factor (partitioning between soil and water)		#DIV/0!	dimensionless
Level 2 Parameters	**Dilution Factor**	DF	#DIV/0!	
Level 3 Parameters	**Attenuation factor (C_O/C_{ED})**	AF	#DIV/0!	

Predicted concentrations at compliance point

Level 1	C	#DIV/0!	mg/l	No dilution or attenuation
Level 2	C	#DIV/0!	mg/l	Dilution taken into account
Level 3	C	#DIV/0!	mg/l	Dilution and attenuation taken into account

Predicted concentrations between source and compliance point - Level 3



Distance m	Concentration mg/l
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)	Variable	Value	Unit	Source
Contaminant		cis 1,2-Dichloroethene		from Level 1
Target Concentration	C_T	1.00E-03	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Domenico - Steady state — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived va

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	1.50E-02	mg/l	*Site investigation data*
Half life for degradation of contaminant in water	$t_{1/2}$	3.36E+02	days	*Agency for Toxic Substances and Disease*
Calculated decay rate	λ	2.06E-03	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	7.50E+01	m	*Length of site perpendicular to groundwater flow*
Plume thickness at source	Sy	5.90E+00	m	*Same as Mixing Zone Thickness. "For a thin aquifer (typically <10m), the mixing zone thickness can be taken as the acte*
Saturated aquifer thickness	da	6.00E+00	m	*Maximum thickness recorded in vicinity of*
Bulk density of aquifer materials	ρ	1.60E+00	g/cm^3	*Typical bulk density for river terrace deposits (conserv*
Effective porosity of aquifer	n	2.50E-01	fraction	*Maximum porosity for coarse Gravel (Lovanh et al 2000) - conservative estimate*
Hydraulic gradient	i	4.40E-02	fraction	*Borehole level data*
Hydraulic conductivity of aquifer	K	4.32E-01	m/d	*Maximum typical value for clayey sandy G*
Distance to compliance point	x	5.00E+01	m	*Default compliance distance*
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	9.90E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	4.90E+00	l/kg	*see options*
Longitudinal dispersivity	ax	5.00E+00	m	*see options*
Transverse dispersivity	az	5.00E-01	m	*see options*
Vertical dispersivity	ay	5.00E-02	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd	4.90E+00	l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc		fraction
Organic carbon partition coefficient	Koc		l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{oc,n}$		l/kg
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	4.90E+00	l/kg

Define dispersivity (click brown cell and use pull down list)

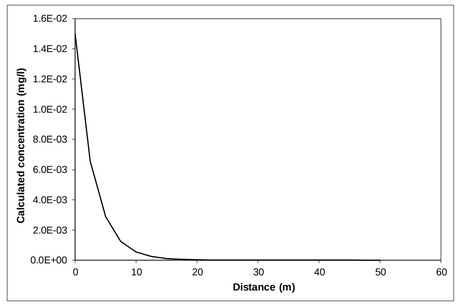
Dispersivities 10%, 1%, 0.1% of pathway length

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	5.00E+00	2.98E+00	m
Transverse dispersivity	**az**	0.00E+00	5.00E-01	2.98E-01	m
Vertical dispersivity	**ay**	0.00E+00	5.00E-02	2.98E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed



Calculated concentrations for distance-concentration graph

Domenico - Steady state
From calculation sheet

Distance	Concentration
	mg/l
0	1.5E-02
2.5	6.56E-03
5.0	2.87E-03
7.5	1.25E-03
10.0	5.49E-04
12.5	2.40E-04
15.0	1.05E-04
17.5	4.59E-05
20.0	2.01E-05
22.5	8.78E-06
25.0	3.84E-06
27.5	1.68E-06
30.0	7.34E-07
32.5	3.21E-07
35.0	1.40E-07
37.5	6.13E-08
40.0	2.68E-08
42.5	1.17E-08
45.0	5.11E-09
47.5	2.23E-09
50.0	9.74E-10

Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared
with the Level 3 remedial target to determine the need for further action.
Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Calculated Parameters	Variable		
Groundwater flow velocity	v	7.60E-02	m/d
Retardation factor	Rf	3.24E+01	fraction
Decay rate used	λ	2.06E-03	d^{-1}
Rate of contaminant flow due to retardation	u	2.35E-03	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	9.74E-10	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**1.54E+07**	

Remedial Targets

Remedial Target		**1.54E+04**	**mg/l**	For comparison with measured groundwater concentration.
Domenico - Steady state				
Distance to compliance point		**50**	**m**	
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**9.74E-10**	**mg/l**	Domenico - Steady state

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Porosity Calculator

These results are not carried through to any of the other worksheets

DRY BULK DENSITY DATA

Variable	Value	Unit	justification
Natural Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Dry Bulk Density	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
Initial Saturation	#DIV/0!	%	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	
Water Filled Porosity	**#DIV/0!**	**fraction**	

WET BULK DENSITY DATA

Variable	Value	Unit	
Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Actual (wet) Bulk Density (i.e. at natural MC)	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
dry bulk density	0.00	tonnes/m^3	
Initial Saturation	#DIV/0!	%	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	**#DIV/0!**
Water Filled Porosity	**#DIV/0!**	**fraction**	

Analytical solutions provided by David Hall, Golder Associates (UK) Ltd

Simple hydrogeological calculations

(These are not specific to, or required in, the Remedial Targets Methodology)

Parameter	symbol		unit	justification
Hydraulic conductivity	K	0.00E+00	m/d	
Hydraulic gradient	i	0.00E+00	unitless	
Effective porosity of aquifer	n	0.00E+00	fraction	
Thickness of saturated aquifer	b	0.00E+00	m	
Width of aquifer perpendicular to flow	w	0.00E+00	m	
Distance to receptor	x	0.00E+00	m	
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Soil-water partition co-efficient	Kd	0.00E+00	l/kg	
Retardation factor of pollutant	R	#DIV/0!		

Groundwater flow velocity	v(GW)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for groundwater to reach receptor	t(GW)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years
Rate of groundwater flow through aquifer	Q	0.00E+00	m^3/s	0.00E+00	m^3/day	0.00E+00	m^3/year

Contaminant flow velocity	v(contam)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for contaminant to reach receptor	t(contam)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years

Level 1 Calculation Sheet

Contaminant **1,2-Dichloroethene**

Parameter	Value	Units
(carried over from input sheet)		
C_T	1.00E-03	mg/l
Kd	0.00E+00	l/kg
foc		fraction
koc		l/kg
θ_W	0.00E+00	fraction
θa	0.00E+00	fraction
ρ	0.00E+00	g/cm3
H	0.00E+00	dimensionless
Koc,n		l/kg
Koc,i		l/kg
pH		pH units
pKa		
foc (ionic)		fraction

Calculations (Refer toTable 4.3, R&D Publication 20)

Selected option User specified value for partition coefficient

	calc	calc	Calc Kd	l/kg
Calculation of partition coefficient for ionic organic chemical				
Partition coefficient used in Level 1 Assessment			0.00E+00	l/kg

Calculated Remedial Target **#DIV/0!** **mg/kg** **for cis 1,2-Dichloroethene**

Factor (partitioning between soil and water) #DIV/0!

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11/12/2025
Version:	1

Level 2 Calculation Sheet

Contaminant : 1,2-Dichloroethene

Site assessed:	Kelvedon Stre
Date:	11/12/2025
Version:	1

Parameter	Value	Units		
(carried over from input sheet)				
Mz	0.00E+00	m		
L	0.00E+00	m		
da	0.00E+00	m		Calculated
Inf	0.00E+00	m/d		Dilution Factor
K	0.00E+00	m/d		
i	0.00E+00		Calculation based on target concentration	#DIV/0!
A	0.00E+00	m3/d m2 m3/d	Calculation based on observed contaminant concentration	#DIV/0!
Cc	0.00E+00	mg/l		
C_T	1.00E-03	mg/l		
Cu	0.00E+00	mg/l		
w	0.00E+00	m		



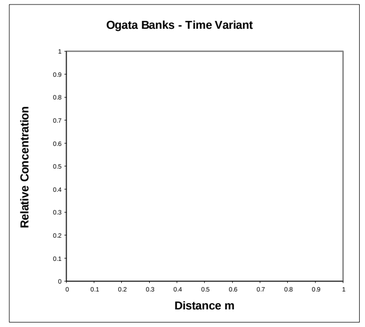
Contaminant **1,2-Dichloroethene**

OGATA BANKS SOLUTION

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-03	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

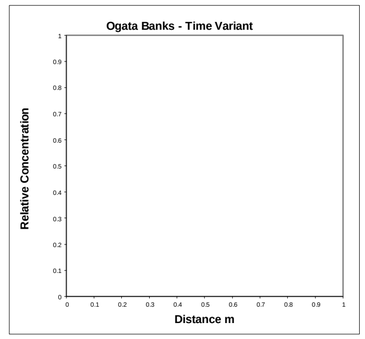
	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Calc	Value	
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) -USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Date:	11/12/2025
Version:	1

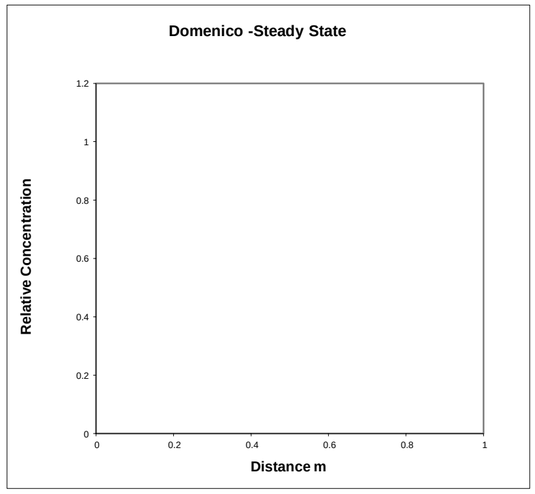
Contaminant **.,2-Dichloroethene**

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-03	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

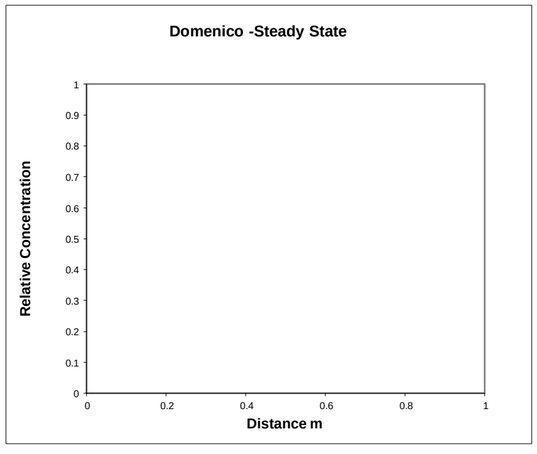


Calc	Value	Units
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Date:	11/12/2025
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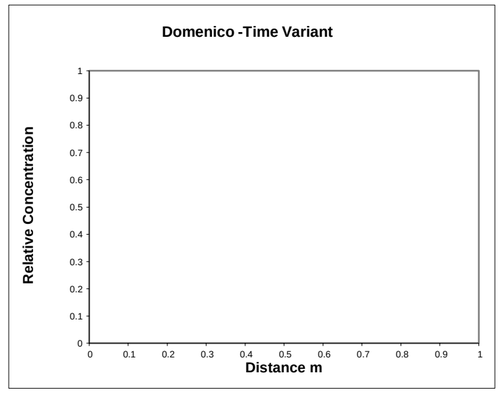
DOMENICO (TIME VARIANT)

Contaminant **l,2-Dichloroethene**

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	**Value**	**Units**
C_T	0.001	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

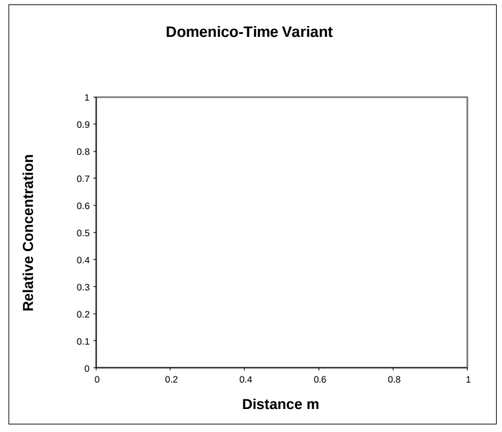


Calc **Value**

v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Date:	11/12/2025
Version:	1

OGATA BANKS SOLUTION

Contaminant **1,2-Dichloroethene**

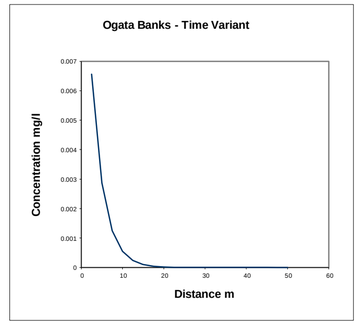
Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.001	mg/l
Co	1.50E-02	mg/l
λ	2.06E-03	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	4.90E+00	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

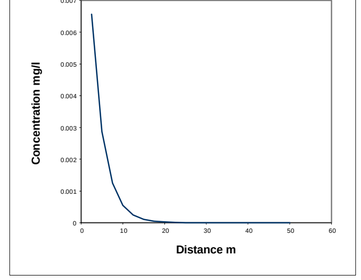
Calc	Value	
v	7.60E-02	m/d
Rc	3.24E+01	
u	2.35E-03	m/d

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.00188	-8.3E-01	4.4E-01	-4.6E+48	2.000	1.3E+00	3.8E+00	4.6E+48	0.000	1.7E+01	1	-1.7E+01	-1	4.2E+00	1	-4.2E+00	-1	6.56E-03
2	5	0.00188	-1.7E+00	1.9E-01	-4.6E+48	2.000	2.7E+00	1.4E+01	4.6E+48	0.000	1.2E+01	1	-1.2E+01	-1	3.0E+00	1	-3.0E+00	-0.99997	2.87E-03
3	7.5	0.00188	-2.5E+00	8.4E-02	-4.6E+48	2.000	4.0E+00	5.4E+01	4.6E+48	0.000	9.7E+00	1	-9.7E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	1.25E-03
4	10	0.00188	-3.3E+00	3.7E-02	-4.6E+48	2.000	5.3E+00	2.0E+02	4.6E+48	0.000	8.4E+00	1	-8.4E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	5.47E-04
5	12.5	0.00188	-4.1E+00	1.6E-02	-4.6E+48	2.000	6.6E+00	7.6E+02	4.6E+48	0.000	7.5E+00	1	-7.5E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	2.38E-04
6	15	0.00188	-5.0E+00	7.0E-03	-4.6E+48	2.000	8.0E+00	2.9E+03	4.6E+48	0.000	6.8E+00	1	-6.8E+00	-1	1.7E+00	0.984	-1.7E+00	-0.98399	1.03E-04
7	17.5	0.00188	-5.8E+00	3.1E-03	-4.6E+48	2.000	9.3E+00	1.1E+04	4.6E+48	0.000	6.3E+00	1	-6.3E+00	-1	1.6E+00	0.9743	-1.6E+00	-0.97425	4.47E-05
8	20	0.00188	-6.6E+00	1.3E-03	-4.6E+48	2.000	1.1E+01	4.1E+04	4.6E+48	0.000	5.9E+00	1	-5.9E+00	-1	1.5E+00	0.963	-1.5E+00	-0.96302	1.93E-05
9	22.5	0.00188	-7.4E+00	5.9E-04	-4.6E+48	2.000	1.2E+01	1.5E+05	4.6E+48	0.000	5.6E+00	1	-5.6E+00	-1	1.4E+00	0.9508	-1.4E+00	-0.95078	8.35E-06
10	25	0.00188	-8.3E+00	2.6E-04	-4.6E+48	2.000	1.3E+01	5.8E+05	4.6E+48	0.000	5.3E+00	1	-5.3E+00	-1	1.3E+00	0.9379	-1.3E+00	-0.93792	3.60E-06
11	27.5	0.00188	-9.1E+00	1.1E-04	-4.6E+48	2.000	1.5E+01	2.2E+06	4.6E+48	0.000	5.1E+00	1	-5.1E+00	-1	1.3E+00	0.9247	-1.3E+00	-0.92475	1.55E-06
12	30	0.00188	-9.9E+00	4.9E-05	-4.6E+48	2.000	1.6E+01	8.2E+06	4.6E+48	0.000	4.8E+00	1	-4.8E+00	-1	1.2E+00	0.9115	-1.2E+00	-0.91147	6.69E-07
13	32.5	0.00188	-1.1E+01	2.1E-05	-4.6E+48	2.000	1.7E+01	3.1E+07	4.6E+48	0.000	4.7E+00	1	-4.7E+00	-1	1.2E+00	0.8982	-1.2E+00	-0.89824	2.88E-07
14	35	0.00188	-1.2E+01	9.4E-06	-4.6E+48	2.000	1.9E+01	1.2E+08	4.6E+48	0.000	4.5E+00	1	-4.5E+00	-1	1.1E+00	0.8852	-1.1E+00	-0.88517	1.24E-07
15	37.5	0.00188	-1.2E+01	4.1E-06	-4.6E+48	2.000	2.0E+01	4.4E+08	4.6E+48	0.000	4.3E+00	1	-4.3E+00	-1	1.1E+00	0.8723	-1.1E+00	-0.87233	5.36E-08
16	40	0.00188	-1.3E+01	1.8E-06	-4.6E+48	2.000	2.1E+01	1.7E+09	4.6E+48	0.000	4.2E+00	1	-4.2E+00	-1	1.0E+00	0.8598	-1.0E+00	-0.85979	2.31E-08
17	42.5	0.00188	-1.4E+01	7.8E-07	-4.6E+48	2.000	2.3E+01	6.3E+09	4.6E+48	0.000	4.1E+00	1	-4.1E+00	-1	1.0E+00	0.8476	-1.0E+00	-0.84756	9.96E-09
18	45	0.00188	-1.5E+01	3.4E-07	-4.6E+48	2.000	2.4E+01	2.4E+10	4.6E+48	0.000	4.0E+00	1	-4.0E+00	-1	9.8E-01	0.8357	-9.8E-01	-0.83567	4.29E-09
19	47.5	0.00188	-1.6E+01	1.5E-07	-4.6E+48	2.000	2.5E+01	8.9E+10	4.6E+48	0.000	3.8E+00	1	-3.8E+00	-1	9.6E-01	0.8241	-9.6E-01	-0.82412	1.85E-09
20	50	0.00188	-1.7E+01	6.6E-08	-4.6E+48	2.000	2.7E+01	3.4E+11	4.6E+48	0.000	3.8E+00	1	-3.8E+00	-1	9.3E-01	0.8129	-9.3E-01	-0.81292	7.99E-10



Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.00188	-8.3E-01	4.4E-01	-4.6E+48	2.000	1.3E+00	3.8E+00	4.6E+48	0.000	1.7E+01	1	-1.7E+01	-1	8.3E+00	1	-8.3E+00	-1	6.56E-03
2	5	0.00188	-1.7E+00	1.9E-01	-4.6E+48	2.000	2.7E+00	1.4E+01	4.6E+48	0.000	1.2E+01	1	-1.2E+01	-1	5.9E+00	1	-5.9E+00	-1	2.87E-03
3	7.5	0.00188	-2.5E+00	8.4E-02	-4.6E+48	2.000	4.0E+00	5.4E+01	4.6E+48	0.000	9.7E+00	1	-9.7E+00	-1	4.8E+00	1	-4.8E+00	-1	1.25E-03
4	10	0.00188	-3.3E+00	3.7E-02	-4.6E+48	2.000	5.3E+00	2.0E+02	4.6E+48	0.000	8.4E+00	1	-8.4E+00	-1	4.2E+00	1	-4.2E+00	-1	5.49E-04
5	12.5	0.00188	-4.1E+00	1.6E-02	-4.6E+48	2.000	6.6E+00	7.6E+02	4.6E+48	0.000	7.5E+00	1	-7.5E+00	-1	3.7E+00	1	-3.7E+00	-1	2.40E-04
6	15	0.00188	-5.0E+00	7.0E-03	-4.6E+48	2.000	8.0E+00	2.9E+03	4.6E+48	0.000	6.8E+00	1	-6.8E+00	-1	3.4E+00	1	-3.4E+00	-1	1.05E-04
7	17.5	0.00188	-5.8E+00	3.1E-03	-4.6E+48	2.000	9.3E+00	1.1E+04	4.6E+48	0.000	6.3E+00	1	-6.3E+00	-1	3.2E+00	1	-3.2E+00	-0.99999	4.59E-05
8	20	0.00188	-6.6E+00	1.3E-03	-4.6E+48	2.000	1.1E+01	4.1E+04	4.6E+48	0.000	5.9E+00	1	-5.9E+00	-1	3.0E+00	1	-3.0E+00	-0.99997	2.01E-05
9	22.5	0.00188	-7.4E+00	5.9E-04	-4.6E+48	2.000	1.2E+01	1.5E+05	4.6E+48	0.000	5.6E+00	1	-5.6E+00	-1	2.8E+00	0.9999	-2.8E+00	-0.99992	8.78E-06
10	25	0.00188	-8.3E+00	2.6E-04	-4.6E+48	2.000	1.3E+01	5.8E+05	4.6E+48	0.000	5.3E+00	1	-5.3E+00	-1	2.6E+00	0.9998	-2.6E+00	-0.99981	3.84E-06
11	27.5	0.00188	-9.1E+00	1.1E-04	-4.6E+48	2.000	1.5E+01	2.2E+06	4.6E+48	0.000	5.1E+00	1	-5.1E+00	-1	2.5E+00	0.9996	-2.5E+00	-0.99963	1.68E-06
12	30	0.00188	-9.9E+00	4.9E-05	-4.6E+48	2.000	1.6E+01	8.2E+06	4.6E+48	0.000	4.8E+00	1	-4.8E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	7.34E-07
13	32.5	0.00188	-1.1E+01	2.1E-05	-4.6E+48	2.000	1.7E+01	3.1E+07	4.6E+48	0.000	4.7E+00	1	-4.7E+00	-1	2.3E+00	0.9989	-2.3E+00	-0.99893	3.21E-07
14	35	0.00188	-1.2E+01	9.4E-06	-4.6E+48	2.000	1.9E+01	1.2E+08	4.6E+48	0.000	4.5E+00	1	-4.5E+00	-1	2.2E+00	0.9984	-2.2E+00	-0.99839	1.40E-07
15	37.5	0.00188	-1.2E+01	4.1E-06	-4.6E+48	2.000	2.0E+01	4.4E+08	4.6E+48	0.000	4.3E+00	1	-4.3E+00	-1	2.2E+00	0.9977	-2.2E+00	-0.99769	6.13E-08
16	40	0.00188	-1.3E+01	1.8E-06	-4.6E+48	2.000	2.1E+01	1.7E+09	4.6E+48	0.000	4.2E+00	1	-4.2E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	2.68E-08
17	42.5	0.00188	-1.4E+01	7.8E-07	-4.6E+48	2.000	2.3E+01	6.3E+09	4.6E+48	0.000	4.1E+00	1	-4.1E+00	-1	2.0E+00	0.9958	-2.0E+00	-0.99579	1.17E-08
18	45	0.00188	-1.5E+01	3.4E-07	-4.6E+48	2.000	2.4E+01	2.4E+10	4.6E+48	0.000	4.0E+00	1	-4.0E+00	-1	2.0E+00	0.9946	-2.0E+00	-0.99459	5.11E-09
19	47.5	0.00188	-1.6E+01	1.5E-07	-4.6E+48	2.000	2.5E+01	8.9E+10	4.6E+48	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9932	-1.9E+00	-0.99321	2.23E-09
20	50	0.00188	-1.7E+01	6.6E-08	-4.6E+48	2.000	2.7E+01	3.4E+11	4.6E+48	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	9.74E-10



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	6.56E-03
5.0	2.87E-03
7.5	1.25E-03
10.0	5.49E-04
12.5	2.40E-04
15.0	1.05E-04
17.5	4.59E-05
20.0	2.01E-05
22.5	8.78E-06
25.0	3.84E-06
27.5	1.68E-06
30.0	7.34E-07
32.5	3.21E-07
35.0	1.40E-07
37.5	6.13E-08
40.0	2.68E-08
42.5	1.17E-08
45.0	5.11E-09
47.5	2.23E-09
50.0	9.74E-10

Contaminant ,,2-Dichloroethene

Input	Value	Units
C_T	0.001	mg/l
Co	1.50E-02	mg/l
λ	2.06E-03	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	4.90E+00	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

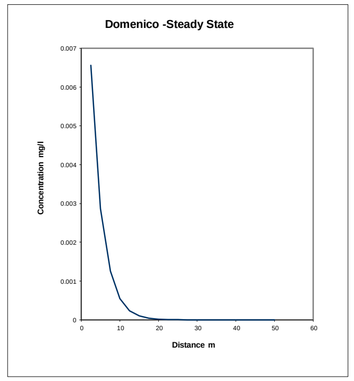
Vertical dispersion optio Simulate vertical dispersion in 1 direction

Calc	Value	
v	7.60E-02	m/d
Rc	3.24E+01	
u	2.35E-03	m/d

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

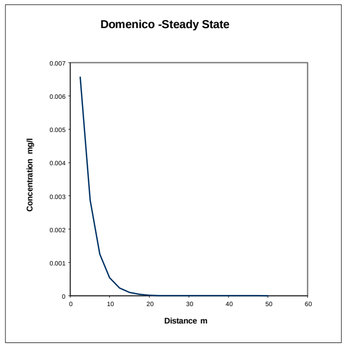
	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.00375	-8.27E-01	4.37E-01	1.68E+01	1	-1.68E+01	-1	4.17E+00	1	-4.17E+00	-1	6.56E-03
2	5	0.00375	-1.65E+00	1.91E-01	1.19E+01	1	-1.19E+01	-1	2.95E+00	1	-2.95E+00	-1	2.87E-03
3	7.5	0.00375	-2.48E+00	8.36E-02	9.68E+00	1	-9.68E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	1.25E-03
4	10	0.00375	-3.31E+00	3.66E-02	8.39E+00	1	-8.39E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	5.47E-04
5	12.5	0.00375	-4.14E+00	1.60E-02	7.50E+00	1	-7.50E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	2.38E-04
6	15	0.00375	-4.96E+00	7.00E-03	6.85E+00	1	-6.85E+00	-1	1.70E+00	0.984	-1.70E+00	-0.984	1.03E-04
7	17.5	0.00375	-5.79E+00	3.06E-03	6.34E+00	1	-6.34E+00	-1	1.58E+00	0.9743	-1.58E+00	-0.9743	4.47E-05
8	20	0.00375	-6.62E+00	1.34E-03	5.93E+00	1	-5.93E+00	-1	1.48E+00	0.963	-1.48E+00	-0.963	1.93E-05
9	22.5	0.00375	-7.44E+00	5.85E-04	5.59E+00	1	-5.59E+00	-1	1.39E+00	0.9508	-1.39E+00	-0.9508	8.35E-06
10	25	0.00375	-8.27E+00	2.56E-04	5.30E+00	1	-5.30E+00	-1	1.32E+00	0.9379	-1.32E+00	-0.9379	3.60E-06
11	27.5	0.00375	-9.10E+00	1.12E-04	5.06E+00	1	-5.06E+00	-1	1.26E+00	0.9247	-1.26E+00	-0.9247	1.55E-06
12	30	0.00375	-9.92E+00	4.90E-05	4.84E+00	1	-4.84E+00	-1	1.20E+00	0.9115	-1.20E+00	-0.9115	6.69E-07
13	32.5	0.00375	-1.08E+01	2.14E-05	4.65E+00	1	-4.65E+00	-1	1.16E+00	0.8982	-1.16E+00	-0.8982	2.88E-07
14	35	0.00375	-1.16E+01	9.36E-06	4.48E+00	1	-4.48E+00	-1	1.11E+00	0.8852	-1.11E+00	-0.8852	1.24E-07
15	37.5	0.00375	-1.24E+01	4.09E-06	4.33E+00	1	-4.33E+00	-1	1.08E+00	0.8723	-1.08E+00	-0.8723	5.36E-08
16	40	0.00375	-1.32E+01	1.79E-06	4.19E+00	1	-4.19E+00	-1	1.04E+00	0.8598	-1.04E+00	-0.8598	2.31E-08
17	42.5	0.00375	-1.41E+01	7.83E-07	4.07E+00	1	-4.07E+00	-1	1.01E+00	0.8476	-1.01E+00	-0.8476	9.96E-09
18	45	0.00375	-1.49E+01	3.42E-07	3.95E+00	1	-3.95E+00	-1	9.83E-01	0.8357	-9.83E-01	-0.8357	4.29E-09
19	47.5	0.00375	-1.57E+01	1.50E-07	3.85E+00	1	-3.85E+00	-1	9.57E-01	0.8241	-9.57E-01	-0.8241	1.85E-09
20	50	0.00375	-1.65E+01	6.55E-08	3.75E+00	1	-3.75E+00	-1	9.33E-01	0.8129	-9.33E-01	-0.8129	7.99E-10



DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.00375	-8.27E-01	4.37E-01	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	6.56E-03
2	5	0.00375	-1.65E+00	1.91E-01	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	2.87E-03
3	7.5	0.00375	-2.48E+00	8.36E-02	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	1.25E-03
4	10	0.00375	-3.31E+00	3.66E-02	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	5.49E-04
5	12.5	0.00375	-4.14E+00	1.60E-02	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	2.40E-04
6	15	0.00375	-4.96E+00	7.00E-03	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	1.05E-04
7	17.5	0.00375	-5.79E+00	3.06E-03	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	4.59E-05
8	20	0.00375	-6.62E+00	1.34E-03	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	2.01E-05
9	22.5	0.00375	-7.44E+00	5.85E-04	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-0.9999	8.78E-06
10	25	0.00375	-8.27E+00	2.56E-04	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-0.9998	3.84E-06
11	27.5	0.00375	-9.10E+00	1.12E-04	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-0.9996	1.68E-06
12	30	0.00375	-9.92E+00	4.90E-05	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	7.34E-07
13	32.5	0.00375	-1.08E+01	2.14E-05	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.9989	3.21E-07
14	35	0.00375	-1.16E+01	9.36E-06	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.9984	1.40E-07
15	37.5	0.00375	-1.24E+01	4.09E-06	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.9977	6.13E-08
16	40	0.00375	-1.32E+01	1.79E-06	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	2.68E-08
17	42.5	0.00375	-1.41E+01	7.83E-07	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.9958	1.17E-08
18	45	0.00375	-1.49E+01	3.42E-07	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.9946	5.11E-09
19	47.5	0.00375	-1.57E+01	1.50E-07	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.9932	2.23E-09
20	50	0.00375	-1.65E+01	6.55E-08	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	9.74E-10



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	6.56E-03
5.0	2.87E-03
7.5	1.25E-03
10.0	5.49E-04
12.5	2.40E-04
15.0	1.05E-04
17.5	4.59E-05
20.0	2.01E-05
22.5	8.78E-06
25.0	3.84E-06
27.5	1.68E-06
30.0	7.34E-07
32.5	3.21E-07
35.0	1.40E-07
37.5	6.13E-08
40.0	2.68E-08
42.5	1.17E-08
45.0	5.11E-09
47.5	2.23E-09
50.0	9.74E-10

DOMENICO (TIME VARIANT)

Contaminant 1,2-Dichloroethene

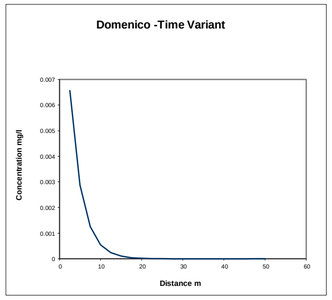
Input	Value	Units
C_T	0.001	mg/l
Co	1.50E-02	mg/l
λ	2.06E-03	$days^{-1}$
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	4.90E+00	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

Calc	Value	
v	7.60E-02	m/d
Rc	3.24E+01	
u	2.35E-03	m/d

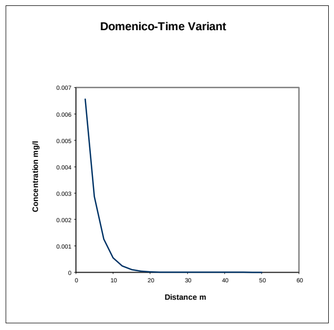
Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.00188	-8.27E-01	4.37E-01	-4.65E+48	2	1.68E+01	1	-1.68E+01	-1	4.17E+00	1	-4.17E+00	-1	6.56E-03
2	5	0.00188	-1.65E+00	1.91E-01	-4.65E+48	2	1.19E+01	1	-1.19E+01	-1	2.95E+00	1	-2.95E+00	-1	2.87E-03
3	7.5	0.00188	-2.48E+00	8.36E-02	-4.65E+48	2	9.68E+00	1	-9.68E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	1.25E-03
4	10	0.00188	-3.31E+00	3.66E-02	-4.65E+48	2	8.39E+00	1	-8.39E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	5.47E-04
5	12.5	0.00188	-4.14E+00	1.60E-02	-4.65E+48	2	7.50E+00	1	-7.50E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	2.38E-04
6	15	0.00188	-4.96E+00	7.00E-03	-4.65E+48	2	6.85E+00	1	-6.85E+00	-1	1.70E+00	0.984	-1.70E+00	-0.984	1.03E-04
7	17.5	0.00188	-5.79E+00	3.06E-03	-4.65E+48	2	6.34E+00	1	-6.34E+00	-1	1.58E+00	0.9743	-1.58E+00	-0.974	4.47E-05
8	20	0.00188	-6.62E+00	1.34E-03	-4.65E+48	2	5.93E+00	1	-5.93E+00	-1	1.48E+00	0.963	-1.48E+00	-0.963	1.93E-05
9	22.5	0.00188	-7.44E+00	5.85E-04	-4.65E+48	2	5.59E+00	1	-5.59E+00	-1	1.39E+00	0.9508	-1.39E+00	-0.951	8.35E-06
10	25	0.00188	-8.27E+00	2.56E-04	-4.65E+48	2	5.30E+00	1	-5.30E+00	-1	1.32E+00	0.9379	-1.32E+00	-0.938	3.60E-06
11	27.5	0.00188	-9.10E+00	1.12E-04	-4.65E+48	2	5.06E+00	1	-5.06E+00	-1	1.26E+00	0.9247	-1.26E+00	-0.925	1.55E-06
12	30	0.00188	-9.92E+00	4.90E-05	-4.65E+48	2	4.84E+00	1	-4.84E+00	-1	1.20E+00	0.9115	-1.20E+00	-0.911	6.69E-07
13	32.5	0.00188	-1.08E+01	2.14E-05	-4.65E+48	2	4.65E+00	1	-4.65E+00	-1	1.16E+00	0.8982	-1.16E+00	-0.898	2.88E-07
14	35	0.00188	-1.16E+01	9.36E-06	-4.65E+48	2	4.48E+00	1	-4.48E+00	-1	1.11E+00	0.8852	-1.11E+00	-0.885	1.24E-07
15	37.5	0.00188	-1.24E+01	4.09E-06	-4.65E+48	2	4.33E+00	1	-4.33E+00	-1	1.08E+00	0.8723	-1.08E+00	-0.872	5.36E-08
16	40	0.00188	-1.32E+01	1.79E-06	-4.65E+48	2	4.19E+00	1	-4.19E+00	-1	1.04E+00	0.8598	-1.04E+00	-0.86	2.31E-08
17	42.5	0.00188	-1.41E+01	7.83E-07	-4.65E+48	2	4.07E+00	1	-4.07E+00	-1	1.01E+00	0.8476	-1.01E+00	-0.848	9.96E-09
18	45	0.00188	-1.49E+01	3.42E-07	-4.65E+48	2	3.95E+00	1	-3.95E+00	-1	9.83E-01	0.8357	-9.83E-01	-0.836	4.29E-09
19	47.5	0.00188	-1.57E+01	1.50E-07	-4.65E+48	2	3.85E+00	1	-3.85E+00	-1	9.57E-01	0.8241	-9.57E-01	-0.824	1.85E-09
20	50	0.00188	-1.65E+01	6.55E-08	-4.65E+48	2	3.75E+00	1	-3.75E+00	-1	9.33E-01	0.8129	-9.33E-01	-0.813	7.99E-10



Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.00188	-8.27E-01	4.37E-01	-4.65E+48	2	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	6.56E-03
2	5	0.00188	-1.65E+00	1.91E-01	-4.65E+48	2	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	2.87E-03
3	7.5	0.00188	-2.48E+00	8.36E-02	-4.65E+48	2	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	1.25E-03
4	10	0.00188	-3.31E+00	3.66E-02	-4.65E+48	2	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	5.49E-04
5	12.5	0.00188	-4.14E+00	1.60E-02	-4.65E+48	2	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	2.40E-04
6	15	0.00188	-4.96E+00	7.00E-03	-4.65E+48	2	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	1.05E-04
7	17.5	0.00188	-5.79E+00	3.06E-03	-4.65E+48	2	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	4.59E-05
8	20	0.00188	-6.62E+00	1.34E-03	-4.65E+48	2	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	2.01E-05
9	22.5	0.00188	-7.44E+00	5.85E-04	-4.65E+48	2	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-1	8.78E-06
10	25	0.00188	-8.27E+00	2.56E-04	-4.65E+48	2	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-1	3.84E-06
11	27.5	0.00188	-9.10E+00	1.12E-04	-4.65E+48	2	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-1	1.68E-06
12	30	0.00188	-9.92E+00	4.90E-05	-4.65E+48	2	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	7.34E-07
13	32.5	0.00188	-1.08E+01	2.14E-05	-4.65E+48	2	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.999	3.21E-07
14	35	0.00188	-1.16E+01	9.36E-06	-4.65E+48	2	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.998	1.40E-07
15	37.5	0.00188	-1.24E+01	4.09E-06	-4.65E+48	2	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.998	6.13E-08
16	40	0.00188	-1.32E+01	1.79E-06	-4.65E+48	2	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	2.68E-08
17	42.5	0.00188	-1.41E+01	7.83E-07	-4.65E+48	2	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.996	1.17E-08
18	45	0.00188	-1.49E+01	3.42E-07	-4.65E+48	2	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.995	5.11E-09
19	47.5	0.00188	-1.57E+01	1.50E-07	-4.65E+48	2	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.993	2.23E-09
20	50	0.00188	-1.65E+01	6.55E-08	-4.65E+48	2	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	9.74E-10



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	6.56E-03
5.0	2.87E-03
7.5	1.25E-03
10.0	5.49E-04
12.5	2.40E-04
15.0	1.05E-04
17.5	4.59E-05
20.0	2.01E-05
22.5	8.78E-06
25.0	3.84E-06
27.5	1.68E-06
30.0	7.34E-07
32.5	3.21E-07
35.0	1.40E-07
37.5	6.13E-08
40.0	2.68E-08
42.5	1.17E-08
45.0	5.11E-09
47.5	2.23E-09
50.0	9.74E-10

Hydrogeological risk assessment for land contamination

Remedial Targets Worksheet , Release 3.2

First released: 2006. Version 3.2: January 2013

This worksheet has been produced in combination with the document 'Remedial Targets Methodology: Hydrogeological risk assessment for land contamination (Environment Agency 2006).

Users of this worksheet should always refer to the User Manual to the Remedial Targets Methodology and to relevant guidance on UK legislation and policy, in order to understand how this procedure should be applied in an appropriate context.

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The calculation of equations in this worksheet has been independently checked by Entec (UK) Ltd on behalf of the Environment Agency.

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IMPORTANT: To enable MS Excel worksheet, click Tools, Add -Ins, Analysis Tool Pak and Analysis Tool Pak-VBA (to calculate error functions)

Details to be completed for each assessment				
Site Name:	Kelvedon Street			
Site Address:	Newport			
Completed by:	Michael Watkins			
Date:	11-Dec-25		Version:	1
Contaminant	Trichloroethene			
Target Concentration (C_T)	0.01	mg/l	Origin of C_T:	WFD for inland surface waters (annual average)

This worksheet can be used to determine remedial targets for soils (Worksheets Level 1 Soil, Level 2 and Level 3 Soil) or to determine remedial targets for groundwater (Level 3 Groundwater). For Level 3, parameter values must be entered separately dependent on whether the assessment is for soil or groundwater. For soil, remedial targets are calculated as either mg/kg (for comparision with soil measurements) or mg/l (for comparison with leaching tests or pore water concentrations).
Site details entered on this page are automatically copied to Level 1, 2 and 3 Worksheets.
Worksheet options are identified by brown background and employ a pull-down menus. Data entry are identified as blue background.
Data origin / justification should be noted in cells coloured yellow and fully documented in subsequent reports.
Data carried forward from an earlier worksheet are identified by a light green background
It is recommended that a copy of the original worksheet is saved (all data fields in the original copy are blank).

The spreadsheet also includes a porosity calculation worksheet, a soil impact calculation worksheet and a worksheet that performs some simple hydrogeological calculations.

Remedial Targets Worksheet , Release 3.2

Level 1 - Soil

Environment Agency

Select the method of calculating the soil water Partition Co-efficient by using the pull down menu below

User specified value for partition coefficient

Contaminant		**Trichloroethene**		
Target concentration	**C_T**	**0.01**	**mg/l**	

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**
Standard entry				
Water filled soil porosity	θ_W	0.00E+00	fraction	
Air filled soil porosity	θa	0.00E+00	fraction	
Bulk density of soil zone material	ρ	0.00E+00	g/cm^3	
Henry's Law constant	H	0.00E+00	dimensionless	
Entry if specify partition coefficient (option)				
Soil water partition coefficient	Kd	0.00E+00	l/kg	
Entry for non-polar organic chemicals (option)				
Fraction of organic carbon (in soil)	foc		fraction	
Organic carbon partition coefficient	Koc		l/kg	
Entry for ionic organic chemicals (option)				
Sorption coefficient for neutral species	$K_{oc,n}$		l/kg	
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg	
pH value	pH		pH units	
Acid dissociation constant	pKa			
Fraction of organic carbon (in soil)	foc		fraction	

This sheet calculates the Level 1 remedial target for soils(mg/kg) based on a selected target concentration and theoretical calculation of soil water partitioning. Three options are included for determining the partition coefficient.

The measured soil concentration as mg/kg should be compared with the Level 1 remedial target to determine the need for further action.

Soil water partition coefficient used in Level Assessment	**Kd**	**0.00E+00**	**l/kg**	*Specified value*

Level 1 Remedial Target

Level 1 Remedial Target	**#DIV/0!**	**mg/kg**	**(for comparison with soil analyses)**
	or		
	0.01	**mg/l**	**(for comparison with leachate test results)**

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 2 - Soil

Contaminant		**Trichloroethene**		from Level 1
Target concentration	**C_T**	**0.01**	**mg/l**	from Level 1

This sheet calculates the Level 2 remedial target for soils (mg/kg) or for pore water (mg/l).

The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 2 remedial target to determine the need for further action. Equations presented in 'Hydrogeological risk assessment for land contamiantion' (Environment Agency 2006)

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**	
Standard entry					
Infiltration	Inf	0.00E+00	m/d		
Area of contaminant source	A	0.00E+00	m^2		Not used in calculation
Entry for groundwater flow below site					
Length of contaminant source in direction of groundwater flow	L	0.00E+00	m		
Saturated aquifer thickness	da	0.00E+00	m		
Hydraulic Conductivity of aquifer in which dilution occurs	K	0.00E+00	m/d		
Hydraulic gradient of water table	i	0.00E+00	fraction		
Width of contaminant source perpendicular to groundwater flow	w	0.00E+00	m		Not used in calculation
Background concentration of contaminant in groundwater beneath site	Cu	0.00E+00	mg/l		
Define mixing zone depth by specifying or calculating depth (using pull down list)		**Specify**			
Enter mixing zone thickness	Mz	0.00E+00	m		
Calculated mixing zone thickness	Mz		m		

Calculated Parameters

Dilution Factor	**DF**	**#DIV/0!**		
Level 2 Remedial Target		**#DIV/0!**	**mg/l**	**For comparison with measured pore water concentration. This assumes Level 1 Remedial Target is based on Target Concentrati**
		or		
		#DIV/0!	**mg/kg**	**For comparison with measured soil concentration. This assumes Level 1 Remedial Target calculated from soil-water**

Additional option

Calculation of impact on receptor

Concentration of contaminant in contaminated discharge (entering receptor)	Cc	0.00E+00	mg/l	
Calculated concentration within receptor (dilution only)		#DIV/0!	mg/l	0

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 3 - Soil

See Note

Input Parameters	Variable	Value	Unit	Source
Contaminant		Trichloroethene		from Level 1
Target Concentration	C_T	0.01	mg/l	from Level 1
Dilution Factor	DF	#DIV/0!		from Level 2

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value, l

	Variable	Value	Unit	Source of parameter value
Enter source concentration		Soil concentration as mg/kg		
Enter soil concentration		0	mg/kg	
Half life for degradation of contaminant in water	$t_{1/2}$	1.00E+100	days	
Calculated decay rate	λ	6.93E-101	$days^{-1}$	calculated
Width of plume in aquifer at source	Sz	0.00E+00	m	from Level 2
Plume thickness in aquifer at source	Sy	0.00E+00	m	from Level 2
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Effective porosity of aquifer	n	0.00E+00	fraction	
Hydraulic gradient	i	#DIV/0!	fraction	from Level 2 (adjusted)
Hydraulic conductivity of saturated aquifer	K	0.00E+00	m/d	from Level 2
Distance to compliance point	x	0.00E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	1.00E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	0.00E+00	l/kg	*see options*
Longitudinal dispersivity	ax	0.000	m	*see options*
Transverse dispersivity	az	0.000	m	*see options*
Vertical dispersivity	ay	0.000	m	*see options*

Parameter values should be checked against Level 1 and 2

Calculated Parameters	Variable		
Groundwater flow velocity	v	#DIV/0!	m/d
Retardation factor	Rf	#DIV/0!	fraction
Decay rate used	λ	6.93E-101	d^{-1}
Hydraulic gradient used in aquifer flow down-gradient	i	#DIV/0!	fraction
Rate of contaminant flow due to retardation	u	#DIV/0!	m/d
Ratio of Compliance Point to Source Concentration	C_{ED}/C_0	#DIV/0!	fraction
Attenuation factor (C_0/C_{ED})	**AF**	**#DIV/0!**	**fraction**
Calculated soil leachate concentration	Co	#DIV/0!	mg/l

Remedial Targets

Level 3 Remedial Target		**#DIV/0!**	**mg/l**	For comparison with measured pore water concentration.
Ogata Banks		**or**		This assumes Level 1 Remedial Target is based on Target Concentration.
		#DIV/0!	**mg/kg**	For comparison with measured soil concentration. This
Distance to compliance point		**0**	**m**	assumes Level 1 Remedial Target calculated from soil-water partitioning equation.
Ratio of Compliance Point to Source Concentration	**C_{ED}/C_0**	**#DIV/0!**	**fraction**	Ogata Banks

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99

Enter method of defining partition co-efficient (using pull down list)

Calculate for ionic organic chemicals (acids)

Entry if specify partition coefficient (option)

Soil water partition coefficient — Kd — l/kg

Entry for non-polar organic chemicals (option)

Fraction of organic carbon in aquifer — foc — fraction
Organic carbon partition coefficient — Koc — l/kg

Entry for ionic organic chemicals (option)

Sorption coefficient for related species	$K_{OC,n}$	0.00E+00	l/kg
Sorption coefficient for ionised species	$K_{OC,I}$	0.00E+00	l/kg
pH value	pH	0.00E+00	
Acid dissociation constant	pKa	0.00E+00	
Fraction of organic carbon in aquifer	foc	0.00E+00	fraction
Soil water partition coefficient	Kd	0.00E+00	l/kg

Define dispersivity (click brown cell and use pull down list)

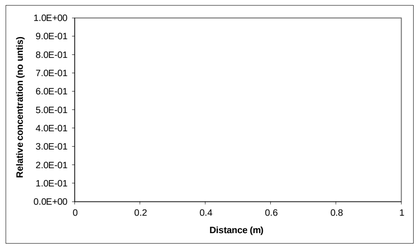
User defined values for dispersivity

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	0.00E+00	#NUM!	m
Transverse dispersivity	**az**	0.00E+00	0.00E+00	#NUM!	m
Vertical dispersivity	**ay**	0.00E+00	0.00E+00	#NUM!	m

Note values of dispersivity must be > 0

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed

Note
This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O_2, NO_3, SO_4 etc than an alternative solution should be used



Note: 'Relative concentration' is the ratio of calculated concentation at a given position compared to the source concentration. The calculations assume plume disperses from the top of the aquifer. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

This sheet calculates the Level 3 remedial target for soils(mg/kg) or for pore water (mg/l), based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.By setting a long travel time (e.g. 9E99) it will give the steady state solution, which should always be used when calculating remedial targets.

The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.9E+99.

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Calculated (relative) concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Relative concentration (No units)	Concentration mg/l
0	1.0E+00	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!

Remedial Targets Worksheet , Release 3.2

Calculation of contaminant concentration in groundwater from a soil source

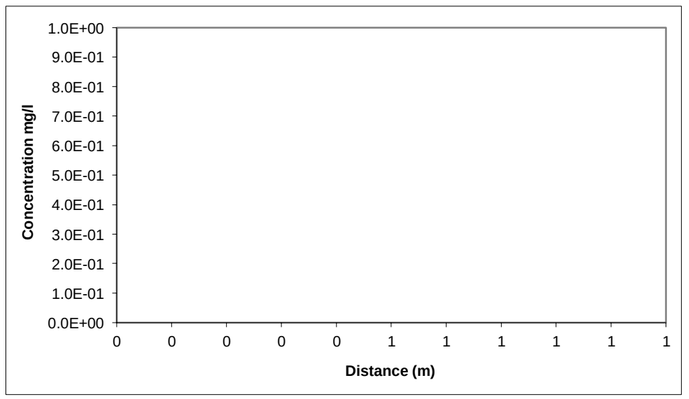
Only input required is Soil Contaminant Concentration

Input Parameters			
Soil contaminant concentration	C_0	0.00E+00	mg/kg
Level 1 Parameters			
Water filled soil porosity	θ_W	0.00E+00	fraction
Air filled soil porosity	θa	0.00E+00	fraction
Bulk density	ρ	0.00E+00	g/cm^3
Henry's Law constant	H	0.00E+00	dimensionless
Soil water partition coefficient used in Level Assessment	Kd	0.00E+00	l/kg
Factor (partitioning between soil and water)		#DIV/0!	dimensionless
Level 2 Parameters **Dilution Factor**	DF	#DIV/0!	
Level 3 Parameters **Attenuation factor (C_O/C_{ED})**	AF	#DIV/0!	

Predicted concentrations at compliance point

Level 1	C	#DIV/0!	mg/l	No dilution or attenuation
Level 2	C	#DIV/0!	mg/l	Dilution taken into account
Level 3	C	#DIV/0!	mg/l	Dilution and attenuation taken into account

Predicted concentrations between source and compliance point - Level 3



Distance m	Concentration mg/l
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu) | **Variable** | **Value** | **Unit** | **Source**

Contaminant		Trichloroethene		from Level 1
Target Concentration	C_T	1.00E-02	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Domenico - Steady state — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	2.50E-02	mg/l	*Site investigation data*
Half life for degradation of contaminant in water	$t_{1/2}$	2.35E+03	days	*Howard et al (1991) Low anaerobic biodeg*
Calculated decay rate	λ	2.95E-04	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	7.50E+01	m	*Length of site perpendicular to groundwater flow*
Plume thickness at source	Sy	5.90E+00	m	*Same as Mixing Zone Thickness. "For a thin aquifer (typically <10m), the mixing zone thickness can be taken as the ac*
Saturated aquifer thickness	da	6.00E+00	m	*Maximum thickness recorded in vicinity of*
Bulk density of aquifer materials	ρ	1.60E+00	g/cm^3	*Typical bulk density for river terrace deposits*
Effective porosity of aquifer	n	2.50E-01	fraction	*Maximum porosity for coarse Gravel (Lovanh et al 2000) - conservative estimate*
Hydraulic gradient	i	4.40E-02	fraction	*Borehole level data*
Hydraulic conductivity of aquifer	K	4.32E-01	m/d	*Maximum typical value for clayey sandy G*
Distance to compliance point	x	5.00E+01	m	*Default compliance distance*
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	9.90E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	2.15E+03	l/kg	*see options*
Longitudinal dispersivity	ax	5.00E+00	m	*see options*
Transverse dispersivity	az	5.00E-01	m	*see options*
Vertical dispersivity	ay	5.00E-02	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)

Soil water partition coefficient — Kd — 2.15E+03 — l/kg

Entry for non-polar organic chemicals (option)

Fraction of organic carbon in aquifer — foc — fraction

Organic carbon partition coefficient — Koc — l/kg

Entry for ionic organic chemicals (option)

Sorption coefficient for related species — $K_{OC,n}$ — l/kg

Sorption coefficient for ionised species — $K_{OC,I}$ — l/kg

pH value — pH

acid dissociation constant — pKa

Fraction of organic carbon in aquifer — foc — fraction

Soil water partition coefficient — Kd — 2.15E+03 — l/kg

Define dispersivity (click brown cell and use pull down list)

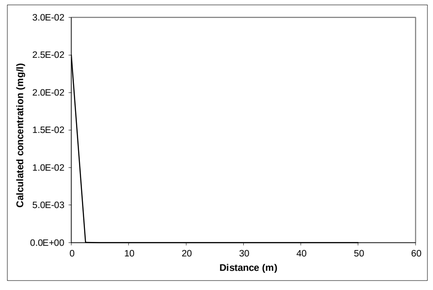
Dispersivities 10%, 1%, 0.1% of pathway length

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	5.00E+00	2.98E+00	m
Transverse dispersivity	**az**	0.00E+00	5.00E-01	2.98E-01	m
Vertical dispersivity	**ay**	0.00E+00	5.00E-02	2.98E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Calculated concentrations for distance-concentration graph

Domenico - Steady state
From calculation sheet

Distance	Concentration
	mg/l
0	2.5E-02
2.5	9.09E-06
5.0	3.31E-09
7.5	1.20E-12
10.0	4.37E-16
12.5	1.59E-19
15.0	5.78E-23
17.5	2.10E-26
20.0	7.64E-30
22.5	2.78E-33
25.0	1.01E-36
27.5	3.67E-40
30.0	1.34E-43
32.5	4.85E-47
35.0	1.76E-50
37.5	6.41E-54
40.0	2.33E-57
42.5	8.46E-61
45.0	3.07E-64
47.5	1.12E-67
50.0	4.05E-71

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Calculated Parameters | **Variable**

Groundwater flow velocity	v	7.60E-02	m/d
Retardation factor	Rf	1.38E+04	fraction
Decay rate used	λ	2.95E-04	d^{-1}
Rate of contaminant flow due to retardation	u	5.53E-06	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	4.05E-71	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**6.17E+68**	

Remedial Targets

Remedial Target		**6.17E+66**	**mg/l**	For comparison with measured groundwater concentration.
Domenico - Steady state				
Distance to compliance point		**50**	**m**	
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**4.05E-71**	**mg/l**	Domenico - Steady state

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Porosity Calculator

These results are not carried through to any of the other worksheets

DRY BULK DENSITY DATA

Variable	Value	Unit	justification
Natural Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Dry Bulk Density	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
Initial Saturation	#DIV/0!	*%*	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	
Water Filled Porosity	**#DIV/0!**	**fraction**	

WET BULK DENSITY DATA

Variable	Value	Unit	
Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Actual (wet) Bulk Density (i.e. at natural MC)	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
dry bulk density	0.00	tonnes/m^3	
Initial Saturation	#DIV/0!	*%*	
Total porosity	**1.000**	**fraction**	**#DIV/0!**
Air Filled Porosity	**#DIV/0!**	**fraction**	
Water Filled Porosity	**#DIV/0!**	**fraction**	

Analytical solutions provided by David Hall, Golder Associates (UK) Ltd

Simple hydrogeological calculations

(These are not specific to, or required in, the Remedial Targets Methodology)

Parameter	symbol		unit	justification
Hydraulic conductivity	K	0.00E+00	m/d	
Hydraulic gradient	i	0.00E+00	unitless	
Effective porosity of aquifer	n	0.00E+00	fraction	
Thickness of saturated aquifer	b	0.00E+00	m	
Width of aquifer perpendicular to flow	w	0.00E+00	m	
Distance to receptor	x	0.00E+00	m	
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Soil-water partition co-efficient	Kd	0.00E+00	l/kg	
Retardation factor of pollutant	R	#DIV/0!		

Groundwater flow velocity	v(GW)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for groundwater to reach receptor	t(GW)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years
Rate of groundwater flow through aquifer	Q	0.00E+00	m^3/s	0.00E+00	m^3/day	0.00E+00	m^3/year

Contaminant flow velocity	v(contam)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for contaminant to reach receptor	t(contam)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years

Level 1 Calculation Sheet

Contaminant **Trichloroethene**

Parameter	Value	Units
(carried over from input sheet)		
C_T	1.00E-02	mg/l
Kd	0.00E+00	l/kg
foc		fraction
koc		l/kg
θ_W	0.00E+00	fraction
θa	0.00E+00	fraction
ρ	0.00E+00	g/cm3
H	0.00E+00	dimensionless
Koc,n		l/kg
Koc,i		l/kg
pH		pH units
pKa		
foc (ionic)		fraction

Calculations (Refer toTable 4.3, R&D Publication 20)

Selected option User specified value for partition coefficient

calc calc Calc Kd l/kg

Calculation of partition coefficient for ionic organic chemical

Partition coefficient used in Level 1 Assessment 0.00E+00 l/kg

Calculated Remedial Target **#DIV/0!** **mg/kg** **for Trichloroethene**

Factor (partitioning between soil and water) #DIV/0!

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11/12/2025
Version:	1

Level 2 Calculation Sheet

Contaminant **Trichloroethene**

Site assessed:	Kelvedon Stre
Date:	11/12/2025
Version:	1

Parameter	Value	Units		
(carried over from input sheet)				
Mz	0.00E+00	m		
L	0.00E+00	m		
da	0.00E+00	m		Calculated Dilution Factor
Inf	0.00E+00	m/d		
K	0.00E+00	m/d		
i	0.00E+00		Calculation based on target concentration	#DIV/0!
A	0.00E+00	m3/d m2 m3/d	Calculation based on observed contaminant concentration	#DIV/0!
Cc	0.00E+00	mg/l		
C_T	1.00E-02	mg/l		
Cu	0.00E+00	mg/l		
w	0.00E+00	m		



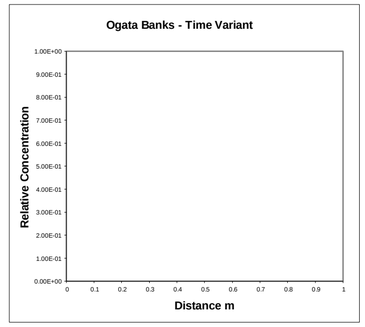
Contaminant **Trichloroethene**

OGATA BANKS SOLUTION

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-02	mg/l
DF	#DIV/0!	
λ	6.931E-101	days^{-1}
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Calc	Value	
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) -USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

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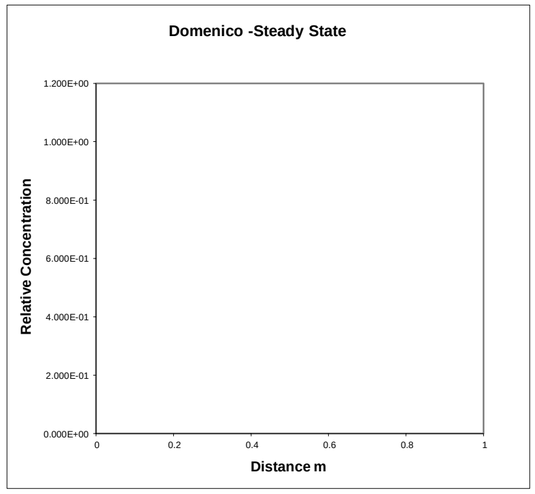
Contaminant 'richloroethene

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-02	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

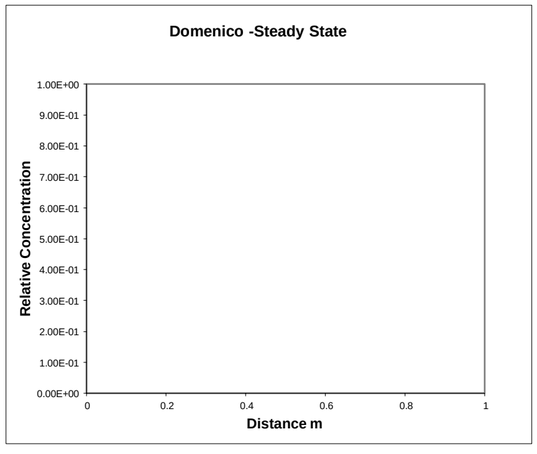


Calc	Value	Units
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



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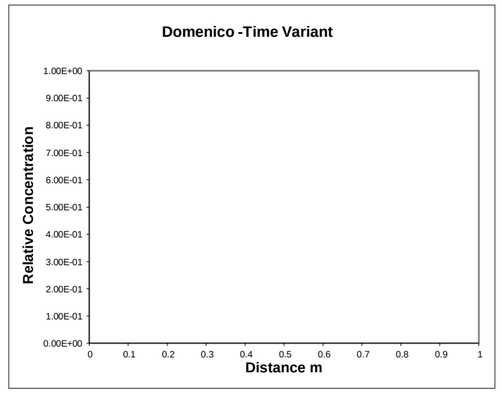
DOMENICO (TIME VARIANT)

Contaminant trichloroethene

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.01	mg/l
DF	#DIV/0!	
λ	6.931E-101	days^{-1}
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

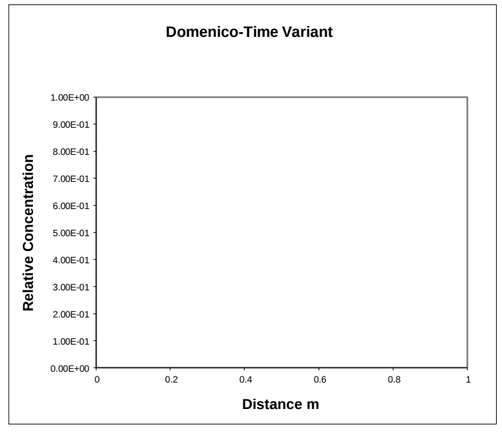
	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Calc	Value	Units
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



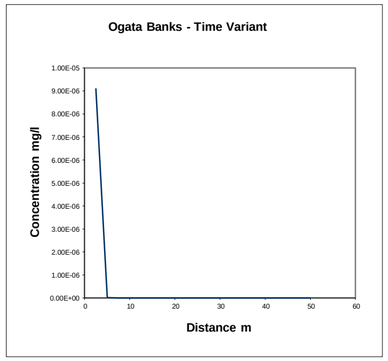
Date:	11/12/2025
Version:	1

OGATA BANKS SOLUTION

Contaminant	**Trichloroethene**	
Input	**Value**	**Units**
C_T	0.01	mg/l
Co	2.50E-02	mg/l
λ	2.95E-04	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	2.15E+03	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.00313	-7.9E+00	3.6E-04	-1.7E+48	2.000	8.4E+00	4.5E+03	1.7E+48	0.000	1.7E+01	1	-1.7E+01	-1	4.2E+00	1	-4.2E+00	-1	9.09E-06
2	5	0.00313	-1.6E+01	1.3E-07	-1.7E+48	2.000	1.7E+01	2.1E+07	1.7E+48	0.000	1.2E+01	1	-1.2E+01	-1	3.0E+00	1	-3.0E+00	-0.99997	3.31E-09
3	7.5	0.00313	-2.4E+01	4.8E-11	-1.7E+48	2.000	2.5E+01	9.3E+10	1.7E+48	0.000	9.7E+00	1	-9.7E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	1.20E-12
4	10	0.00313	-3.2E+01	1.7E-14	-1.7E+48	2.000	3.4E+01	4.2E+14	1.7E+48	0.000	8.4E+00	1	-8.4E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	4.36E-16
5	12.5	0.00313	-4.0E+01	6.4E-18	-1.7E+48	2.000	4.2E+01	1.9E+18	1.7E+48	0.000	7.5E+00	1	-7.5E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	1.58E-19
6	15	0.00313	-4.8E+01	2.3E-21	-1.7E+48	2.000	5.1E+01	8.7E+21	1.7E+48	0.000	6.8E+00	1	-6.8E+00	-1	1.7E+00	0.984	-1.7E+00	-0.98399	5.69E-23
7	17.5	0.00313	-5.5E+01	8.4E-25	-1.7E+48	2.000	5.9E+01	3.9E+25	1.7E+48	0.000	6.3E+00	1	-6.3E+00	-1	1.6E+00	0.9743	-1.6E+00	-0.97425	2.05E-26
8	20	0.00313	-6.3E+01	3.1E-28	-1.7E+48	2.000	6.7E+01	1.8E+29	1.7E+48	0.000	5.9E+00	1	-5.9E+00	-1	1.5E+00	0.963	-1.5E+00	-0.96302	7.36E-30
9	22.5	0.00313	-7.1E+01	1.1E-31	-1.7E+48	2.000	7.6E+01	8.1E+32	1.7E+48	0.000	5.6E+00	1	-5.6E+00	-1	1.4E+00	0.9508	-1.4E+00	-0.95078	2.64E-33
10	25	0.00313	-7.9E+01	4.0E-35	-1.7E+48	2.000	8.4E+01	3.7E+36	1.7E+48	0.000	5.3E+00	1	-5.3E+00	-1	1.3E+00	0.9379	-1.3E+00	-0.93792	9.48E-37
11	27.5	0.00313	-8.7E+01	1.5E-38	-1.7E+48	2.000	9.3E+01	1.7E+40	1.7E+48	0.000	5.1E+00	1	-5.1E+00	-1	1.3E+00	0.9247	-1.3E+00	-0.92475	3.40E-40
12	30	0.00313	-9.5E+01	5.3E-42	-1.7E+48	2.000	1.0E+02	7.5E+43	1.7E+48	0.000	4.8E+00	1	-4.8E+00	-1	1.2E+00	0.9115	-1.2E+00	-0.91147	1.22E-43
13	32.5	0.00313	-1.0E+02	1.9E-45	-1.7E+48	2.000	1.1E+02	3.4E+47	1.7E+48	0.000	4.7E+00	1	-4.7E+00	-1	1.2E+00	0.8982	-1.2E+00	-0.89824	4.37E-47
14	35	0.00313	-1.1E+02	7.1E-49	-1.7E+48	2.000	1.2E+02	1.6E+51	1.7E+48	0.000	4.5E+00	1	-4.5E+00	-1	1.1E+00	0.8852	-1.1E+00	-0.88517	1.56E-50
15	37.5	0.00313	-1.2E+02	2.6E-52	-1.7E+48	2.000	1.3E+02	7.0E+54	1.7E+48	0.000	4.3E+00	1	-4.3E+00	-1	1.1E+00	0.8723	-1.1E+00	-0.87233	5.61E-54
16	40	0.00313	-1.3E+02	9.3E-56	-1.7E+48	2.000	1.3E+02	3.2E+58	1.7E+48	0.000	4.2E+00	1	-4.2E+00	-1	1.0E+00	0.8598	-1.0E+00	-0.85979	2.01E-57
17	42.5	0.00313	-1.3E+02	3.4E-59	-1.7E+48	2.000	1.4E+02	1.4E+62	1.7E+48	0.000	4.1E+00	1	-4.1E+00	-1	1.0E+00	0.8476	-1.0E+00	-0.84756	7.20E-61
18	45	0.00313	-1.4E+02	1.2E-62	-1.7E+48	2.000	1.5E+02	6.6E+65	1.7E+48	0.000	4.0E+00	1	-4.0E+00	-1	9.8E-01	0.8357	-9.8E-01	-0.83567	2.58E-64
19	47.5	0.00313	-1.5E+02	4.5E-66	-1.7E+48	2.000	1.6E+02	3.0E+69	1.7E+48	0.000	3.8E+00	1	-3.8E+00	-1	9.6E-01	0.8241	-9.6E-01	-0.82412	9.26E-68
20	50	0.00313	-1.6E+02	1.6E-69	-1.7E+48	2.000	1.7E+02	1.3E+73	1.7E+48	0.000	3.8E+00	1	-3.8E+00	-1	9.3E-01	0.8129	-9.3E-01	-0.81292	3.32E-71



Vertical dispersion option Simulate vertical dispersion in 1 direction

Calc	**Value**	
v	7.60E-02	m/d
Rc	1.38E+04	
u	5.53E-06	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.00313	-7.9E+00	3.6E-04	-1.7E+48	2.000	8.4E+00	4.5E+03	1.7E+48	0.000	1.7E+01	1	-1.7E+01	-1	8.3E+00	1	-8.3E+00	-1	9.09E-06
2	5	0.00313	-1.6E+01	1.3E-07	-1.7E+48	2.000	1.7E+01	2.1E+07	1.7E+48	0.000	1.2E+01	1	-1.2E+01	-1	5.9E+00	1	-5.9E+00	-1	3.31E-09
3	7.5	0.00313	-2.4E+01	4.8E-11	-1.7E+48	2.000	2.5E+01	9.3E+10	1.7E+48	0.000	9.7E+00	1	-9.7E+00	-1	4.8E+00	1	-4.8E+00	-1	1.20E-12
4	10	0.00313	-3.2E+01	1.7E-14	-1.7E+48	2.000	3.4E+01	4.2E+14	1.7E+48	0.000	8.4E+00	1	-8.4E+00	-1	4.2E+00	1	-4.2E+00	-1	4.37E-16
5	12.5	0.00313	-4.0E+01	6.4E-18	-1.7E+48	2.000	4.2E+01	1.9E+18	1.7E+48	0.000	7.5E+00	1	-7.5E+00	-1	3.7E+00	1	-3.7E+00	-1	1.59E-19
6	15	0.00313	-4.8E+01	2.3E-21	-1.7E+48	2.000	5.1E+01	8.7E+21	1.7E+48	0.000	6.8E+00	1	-6.8E+00	-1	3.4E+00	1	-3.4E+00	-1	5.78E-23
7	17.5	0.00313	-5.5E+01	8.4E-25	-1.7E+48	2.000	5.9E+01	3.9E+25	1.7E+48	0.000	6.3E+00	1	-6.3E+00	-1	3.2E+00	1	-3.2E+00	-0.99999	2.10E-26
8	20	0.00313	-6.3E+01	3.1E-28	-1.7E+48	2.000	6.7E+01	1.8E+29	1.7E+48	0.000	5.9E+00	1	-5.9E+00	-1	3.0E+00	1	-3.0E+00	-0.99997	7.64E-30
9	22.5	0.00313	-7.1E+01	1.1E-31	-1.7E+48	2.000	7.6E+01	8.1E+32	1.7E+48	0.000	5.6E+00	1	-5.6E+00	-1	2.8E+00	0.9999	-2.8E+00	-0.99992	2.78E-33
10	25	0.00313	-7.9E+01	4.0E-35	-1.7E+48	2.000	8.4E+01	3.7E+36	1.7E+48	0.000	5.3E+00	1	-5.3E+00	-1	2.6E+00	0.9998	-2.6E+00	-0.99981	1.01E-36
11	27.5	0.00313	-8.7E+01	1.5E-38	-1.7E+48	2.000	9.3E+01	1.7E+40	1.7E+48	0.000	5.1E+00	1	-5.1E+00	-1	2.5E+00	0.9996	-2.5E+00	-0.99963	3.67E-40
12	30	0.00313	-9.5E+01	5.3E-42	-1.7E+48	2.000	1.0E+02	7.5E+43	1.7E+48	0.000	4.8E+00	1	-4.8E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	1.34E-43
13	32.5	0.00313	-1.0E+02	1.9E-45	-1.7E+48	2.000	1.1E+02	3.4E+47	1.7E+48	0.000	4.7E+00	1	-4.7E+00	-1	2.3E+00	0.9989	-2.3E+00	-0.99893	4.85E-47
14	35	0.00313	-1.1E+02	7.1E-49	-1.7E+48	2.000	1.2E+02	1.6E+51	1.7E+48	0.000	4.5E+00	1	-4.5E+00	-1	2.2E+00	0.9984	-2.2E+00	-0.99839	1.76E-50
15	37.5	0.00313	-1.2E+02	2.6E-52	-1.7E+48	2.000	1.3E+02	7.0E+54	1.7E+48	0.000	4.3E+00	1	-4.3E+00	-1	2.2E+00	0.9977	-2.2E+00	-0.99769	6.41E-54
16	40	0.00313	-1.3E+02	9.3E-56	-1.7E+48	2.000	1.3E+02	3.2E+58	1.7E+48	0.000	4.2E+00	1	-4.2E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	2.33E-57
17	42.5	0.00313	-1.3E+02	3.4E-59	-1.7E+48	2.000	1.4E+02	1.4E+62	1.7E+48	0.000	4.1E+00	1	-4.1E+00	-1	2.0E+00	0.9958	-2.0E+00	-0.99579	8.46E-61
18	45	0.00313	-1.4E+02	1.2E-62	-1.7E+48	2.000	1.5E+02	6.6E+65	1.7E+48	0.000	4.0E+00	1	-4.0E+00	-1	2.0E+00	0.9946	-2.0E+00	-0.99459	3.07E-64
19	47.5	0.00313	-1.5E+02	4.5E-66	-1.7E+48	2.000	1.6E+02	3.0E+69	1.7E+48	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9932	-1.9E+00	-0.99321	1.12E-67
20	50	0.00313	-1.6E+02	1.6E-69	-1.7E+48	2.000	1.7E+02	1.3E+73	1.7E+48	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	4.05E-71

Date:	11/12/2025
Version:	1

Contaminant **richloroethene**

DOMENICO (STEADY STATE)

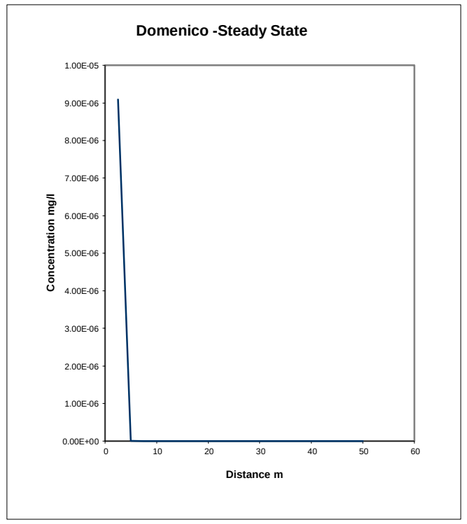
Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.01	mg/l
Co	2.50E-02	mg/l
λ	2.95E-04	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	2.15E+03	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion optio Simulate vertical dispersion in 1 direction

Calc	Value	
v	7.60E-02	m/d
Rc	1.38E+04	
u	5.53E-06	m/d

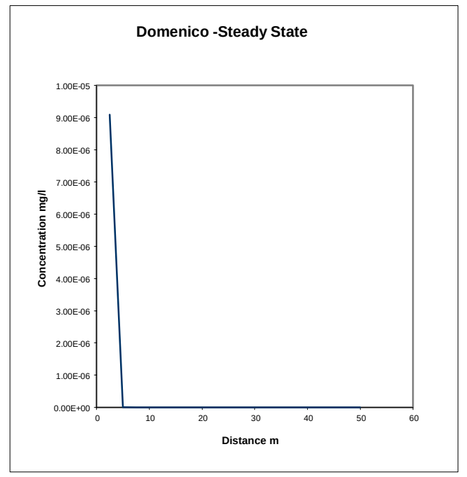
	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.00625	-7.92E+00	3.64E-04	1.68E+01	1	-1.68E+01	-1	4.17E+00	1	-4.17E+00	-1	9.09E-06
2	5	0.00625	-1.58E+01	1.32E-07	1.19E+01	1	-1.19E+01	-1	2.95E+00	1	-2.95E+00	-1	3.31E-09
3	7.5	0.00625	-2.38E+01	4.81E-11	9.68E+00	1	-9.68E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	1.20E-12
4	10	0.00625	-3.17E+01	1.75E-14	8.39E+00	1	-8.39E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	4.36E-16
5	12.5	0.00625	-3.96E+01	6.36E-18	7.50E+00	1	-7.50E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	1.58E-19
6	15	0.00625	-4.75E+01	2.31E-21	6.85E+00	1	-6.85E+00	-1	1.70E+00	0.984	-1.70E+00	-0.984	5.69E-23
7	17.5	0.00625	-5.54E+01	8.41E-25	6.34E+00	1	-6.34E+00	-1	1.58E+00	0.9743	-1.58E+00	-0.9743	2.05E-26
8	20	0.00625	-6.34E+01	3.06E-28	5.93E+00	1	-5.93E+00	-1	1.48E+00	0.963	-1.48E+00	-0.963	7.36E-30
9	22.5	0.00625	-7.13E+01	1.11E-31	5.59E+00	1	-5.59E+00	-1	1.39E+00	0.9508	-1.39E+00	-0.9508	2.64E-33
10	25	0.00625	-7.92E+01	4.04E-35	5.30E+00	1	-5.30E+00	-1	1.32E+00	0.9379	-1.32E+00	-0.9379	9.48E-37
11	27.5	0.00625	-8.71E+01	1.47E-38	5.06E+00	1	-5.06E+00	-1	1.26E+00	0.9247	-1.26E+00	-0.9247	3.40E-40
12	30	0.00625	-9.50E+01	5.35E-42	4.84E+00	1	-4.84E+00	-1	1.20E+00	0.9115	-1.20E+00	-0.9115	1.22E-43
13	32.5	0.00625	-1.03E+02	1.94E-45	4.65E+00	1	-4.65E+00	-1	1.16E+00	0.8982	-1.16E+00	-0.8982	4.37E-47
14	35	0.00625	-1.11E+02	7.07E-49	4.48E+00	1	-4.48E+00	-1	1.11E+00	0.8852	-1.11E+00	-0.8852	1.56E-50
15	37.5	0.00625	-1.19E+02	2.57E-52	4.33E+00	1	-4.33E+00	-1	1.08E+00	0.8723	-1.08E+00	-0.8723	5.61E-54
16	40	0.00625	-1.27E+02	9.35E-56	4.19E+00	1	-4.19E+00	-1	1.04E+00	0.8598	-1.04E+00	-0.8598	2.01E-57
17	42.5	0.00625	-1.35E+02	3.40E-59	4.07E+00	1	-4.07E+00	-1	1.01E+00	0.8476	-1.01E+00	-0.8476	7.20E-61
18	45	0.00625	-1.43E+02	1.24E-62	3.95E+00	1	-3.95E+00	-1	9.83E-01	0.8357	-9.83E-01	-0.8357	2.58E-64
19	47.5	0.00625	-1.50E+02	4.49E-66	3.85E+00	1	-3.85E+00	-1	9.57E-01	0.8241	-9.57E-01	-0.8241	9.26E-68
20	50	0.00625	-1.58E+02	1.63E-69	3.75E+00	1	-3.75E+00	-1	9.33E-01	0.8129	-9.33E-01	-0.8129	3.32E-71



DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.00625	-7.92E+00	3.64E-04	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	9.09E-06
2	5	0.00625	-1.58E+01	1.32E-07	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	3.31E-09
3	7.5	0.00625	-2.38E+01	4.81E-11	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	1.20E-12
4	10	0.00625	-3.17E+01	1.75E-14	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	4.37E-16
5	12.5	0.00625	-3.96E+01	6.36E-18	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	1.59E-19
6	15	0.00625	-4.75E+01	2.31E-21	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	5.78E-23
7	17.5	0.00625	-5.54E+01	8.41E-25	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	2.10E-26
8	20	0.00625	-6.34E+01	3.06E-28	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	7.64E-30
9	22.5	0.00625	-7.13E+01	1.11E-31	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-0.9999	2.78E-33
10	25	0.00625	-7.92E+01	4.04E-35	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-0.9998	1.01E-36
11	27.5	0.00625	-8.71E+01	1.47E-38	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-0.9996	3.67E-40
12	30	0.00625	-9.50E+01	5.35E-42	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	1.34E-43
13	32.5	0.00625	-1.03E+02	1.94E-45	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.9989	4.85E-47
14	35	0.00625	-1.11E+02	7.07E-49	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.9984	1.76E-50
15	37.5	0.00625	-1.19E+02	2.57E-52	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.9977	6.41E-54
16	40	0.00625	-1.27E+02	9.35E-56	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	2.33E-57
17	42.5	0.00625	-1.35E+02	3.40E-59	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.9958	8.46E-61
18	45	0.00625	-1.43E+02	1.24E-62	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.9946	3.07E-64
19	47.5	0.00625	-1.50E+02	4.49E-66	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.9932	1.12E-67
20	50	0.00625	-1.58E+02	1.63E-69	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	4.05E-71



Date:	11/12/2025
Version:	1

DOMENICO (TIME VARIANT)

Contaminant	**richloroethene**	
Input	**Value**	**Units**
C_T	0.01	mg/l
Co	2.50E-02	mg/l
λ	2.95E-04	$days^{-1}$
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	2.15E+03	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

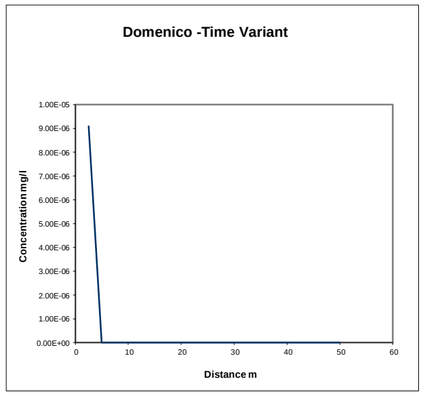
Vertical dispersion option: Simulate vertical dispersion in 1 direction

Calc	**Value**	
v	7.60E-02	m/d
Rc	1.38E+04	
u	5.53E-06	m/d

Date:	11/12/2025
Version:	1

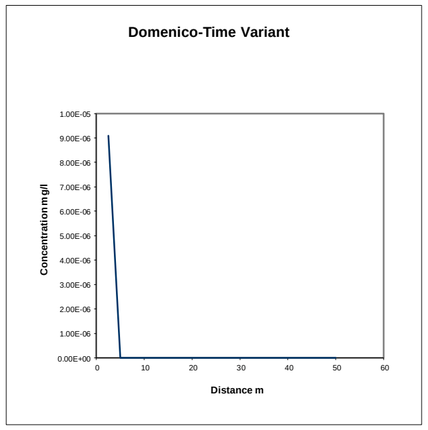
Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.00313	-7.92E+00	3.64E-04	-1.71E+48	2	1.68E+01	1	-1.68E+01	-1	4.17E+00	1	-4.17E+00	-1	9.09E-06
2	5	0.00313	-1.58E+01	1.32E-07	-1.71E+48	2	1.19E+01	1	-1.19E+01	-1	2.95E+00	1	-2.95E+00	-1	3.31E-09
3	7.5	0.00313	-2.38E+01	4.81E-11	-1.71E+48	2	9.68E+00	1	-9.68E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	1.20E-12
4	10	0.00313	-3.17E+01	1.75E-14	-1.71E+48	2	8.39E+00	1	-8.39E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	4.36E-16
5	12.5	0.00313	-3.96E+01	6.36E-18	-1.71E+48	2	7.50E+00	1	-7.50E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	1.58E-19
6	15	0.00313	-4.75E+01	2.31E-21	-1.71E+48	2	6.85E+00	1	-6.85E+00	-1	1.70E+00	0.984	-1.70E+00	-0.984	5.69E-23
7	17.5	0.00313	-5.54E+01	8.41E-25	-1.71E+48	2	6.34E+00	1	-6.34E+00	-1	1.58E+00	0.9743	-1.58E+00	-0.974	2.05E-26
8	20	0.00313	-6.34E+01	3.06E-28	-1.71E+48	2	5.93E+00	1	-5.93E+00	-1	1.48E+00	0.963	-1.48E+00	-0.963	7.36E-30
9	22.5	0.00313	-7.13E+01	1.11E-31	-1.71E+48	2	5.59E+00	1	-5.59E+00	-1	1.39E+00	0.9508	-1.39E+00	-0.951	2.64E-33
10	25	0.00313	-7.92E+01	4.04E-35	-1.71E+48	2	5.30E+00	1	-5.30E+00	-1	1.32E+00	0.9379	-1.32E+00	-0.938	9.48E-37
11	27.5	0.00313	-8.71E+01	1.47E-38	-1.71E+48	2	5.06E+00	1	-5.06E+00	-1	1.26E+00	0.9247	-1.26E+00	-0.925	3.40E-40
12	30	0.00313	-9.50E+01	5.35E-42	-1.71E+48	2	4.84E+00	1	-4.84E+00	-1	1.20E+00	0.9115	-1.20E+00	-0.911	1.22E-43
13	32.5	0.00313	-1.03E+02	1.94E-45	-1.71E+48	2	4.65E+00	1	-4.65E+00	-1	1.16E+00	0.8982	-1.16E+00	-0.898	4.37E-47
14	35	0.00313	-1.11E+02	7.07E-49	-1.71E+48	2	4.48E+00	1	-4.48E+00	-1	1.11E+00	0.8852	-1.11E+00	-0.885	1.56E-50
15	37.5	0.00313	-1.19E+02	2.57E-52	-1.71E+48	2	4.33E+00	1	-4.33E+00	-1	1.08E+00	0.8723	-1.08E+00	-0.872	5.61E-54
16	40	0.00313	-1.27E+02	9.35E-56	-1.71E+48	2	4.19E+00	1	-4.19E+00	-1	1.04E+00	0.8598	-1.04E+00	-0.86	2.01E-57
17	42.5	0.00313	-1.35E+02	3.40E-59	-1.71E+48	2	4.07E+00	1	-4.07E+00	-1	1.01E+00	0.8476	-1.01E+00	-0.848	7.20E-61
18	45	0.00313	-1.43E+02	1.24E-62	-1.71E+48	2	3.95E+00	1	-3.95E+00	-1	9.83E-01	0.8357	-9.83E-01	-0.836	2.58E-64
19	47.5	0.00313	-1.50E+02	4.49E-66	-1.71E+48	2	3.85E+00	1	-3.85E+00	-1	9.57E-01	0.8241	-9.57E-01	-0.824	9.26E-68
20	50	0.00313	-1.58E+02	1.63E-69	-1.71E+48	2	3.75E+00	1	-3.75E+00	-1	9.33E-01	0.8129	-9.33E-01	-0.813	3.32E-71



Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.00313	-7.92E+00	3.64E-04	-1.71E+48	2	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	9.09E-06
2	5	0.00313	-1.58E+01	1.32E-07	-1.71E+48	2	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	3.31E-09
3	7.5	0.00313	-2.38E+01	4.81E-11	-1.71E+48	2	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	1.20E-12
4	10	0.00313	-3.17E+01	1.75E-14	-1.71E+48	2	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	4.37E-16
5	12.5	0.00313	-3.96E+01	6.36E-18	-1.71E+48	2	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	1.59E-19
6	15	0.00313	-4.75E+01	2.31E-21	-1.71E+48	2	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	5.78E-23
7	17.5	0.00313	-5.54E+01	8.41E-25	-1.71E+48	2	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	2.10E-26
8	20	0.00313	-6.34E+01	3.06E-28	-1.71E+48	2	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	7.64E-30
9	22.5	0.00313	-7.13E+01	1.11E-31	-1.71E+48	2	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-1	2.78E-33
10	25	0.00313	-7.92E+01	4.04E-35	-1.71E+48	2	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-1	1.01E-36
11	27.5	0.00313	-8.71E+01	1.47E-38	-1.71E+48	2	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-1	3.67E-40
12	30	0.00313	-9.50E+01	5.35E-42	-1.71E+48	2	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	1.34E-43
13	32.5	0.00313	-1.03E+02	1.94E-45	-1.71E+48	2	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.999	4.85E-47
14	35	0.00313	-1.11E+02	7.07E-49	-1.71E+48	2	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.998	1.76E-50
15	37.5	0.00313	-1.19E+02	2.57E-52	-1.71E+48	2	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.998	6.41E-54
16	40	0.00313	-1.27E+02	9.35E-56	-1.71E+48	2	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	2.33E-57
17	42.5	0.00313	-1.35E+02	3.40E-59	-1.71E+48	2	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.996	8.46E-61
18	45	0.00313	-1.43E+02	1.24E-62	-1.71E+48	2	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.995	3.07E-64
19	47.5	0.00313	-1.50E+02	4.49E-66	-1.71E+48	2	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.993	1.12E-67
20	50	0.00313	-1.58E+02	1.63E-69	-1.71E+48	2	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	4.05E-71



Hydrogeological risk assessment for land contamination

Remedial Targets Worksheet , Release 3.2

First released: 2006. Version 3.2: January 2013

This worksheet has been produced in combination with the document 'Remedial Targets Methodology: Hydrogeological risk assessment for land contamination (Environment Agency 2006).

Users of this worksheet should always refer to the User Manual to the Remedial Targets Methodology and to relevant guidance on UK legislation and policy, in order to understand how this procedure should be applied in an appropriate context.

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The calculation of equations in this worksheet has been independently checked by Entec (UK) Ltd on behalf of the Environment Agency.

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IMPORTANT: To enable MS Excel worksheet, click Tools, Add -Ins, Analysis Tool Pak and Analysis Tool Pak-VBA (to calculate error functions)

Details to be completed for each assessment				
Site Name:	Kelvedon Street			
Site Address:	Newport			
Completed by:	Michael Watkins			
Date:	11-Dec-25		Version:	1
Contaminant	Trichloroethene			
Target Concentration (C_T)	0.01	mg/l	Origin of C_T:	WFD for inland surface waters (annual average)

This worksheet can be used to determine remedial targets for soils (Worksheets Level 1 Soil, Level 2 and Level 3 Soil) or to determine remedial targets for groundwater (Level 3 Groundwater). For Level 3, parameter values must be entered separately dependent on whether the assessment is for soil or groundwater. For soil, remedial targets are calculated as either mg/kg (for comparision with soil measurements) or mg/l (for comparison with leaching tests or pore water concentrations).
Site details entered on this page are automatically copied to Level 1, 2 and 3 Worksheets.
Worksheet options are identified by brown background and employ a pull-down menus. Data entry are identified as blue background.
Data origin / justification should be noted in cells coloured yellow and fully documented in subsequent reports.
Data carried forward from an earlier worksheet are identified by a light green background
It is recommended that a copy of the original worksheet is saved (all data fields in the original copy are blank).

The spreadsheet also includes a porosity calculation worksheet, a soil impact calculation worksheet and a worksheet that performs some simple hydrogeological calculations.

Remedial Targets Worksheet , Release 3.2

Level 1 - Soil

Environment Agency

Select the method of calculating the soil water Partition Co-efficient by using the pull down menu below

User specified value for partition coefficient

Contaminant		**Trichloroethene**		
Target concentration	**C_T**	**0.01**	**mg/l**	

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**
Standard entry				
Water filled soil porosity	θ_W	0.00E+00	fraction	
Air filled soil porosity	θa	0.00E+00	fraction	
Bulk density of soil zone material	ρ	0.00E+00	g/cm^3	
Henry's Law constant	H	0.00E+00	dimensionless	
Entry if specify partition coefficient (option)				
Soil water partition coefficient	Kd	0.00E+00	l/kg	
Entry for non-polar organic chemicals (option)				
Fraction of organic carbon (in soil)	foc		fraction	
Organic carbon partition coefficient	Koc		l/kg	
Entry for ionic organic chemicals (option)				
Sorption coefficient for neutral species	$K_{oc,n}$		l/kg	
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg	
pH value	pH		pH units	
Acid dissociation constant	pKa			
Fraction of organic carbon (in soil)	foc		fraction	

This sheet calculates the Level 1 remedial target for soils(mg/kg) based on a selected target concentration and theoretical calculation of soil water partitioning. Three options are included for determining the partition coefficient.

The measured soil concentration as mg/kg should be compared with the Level 1 remedial target to determine the need for further action.

Soil water partition coefficient used in Level Assessment	**Kd**	**0.00E+00**	**l/kg**	*Specified value*

Level 1 Remedial Target

Level 1 Remedial Target	**#DIV/0!**	**mg/kg**	**(for comparison with soil analyses)**
	or		
	0.01	**mg/l**	**(for comparison with leachate test results)**

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 2 - Soil

Contaminant		**Trichloroethene**		from Level 1
Target concentration	**C_T**	**0.01**	**mg/l**	from Level 1

This sheet calculates the Level 2 remedial target for soils (mg/kg) or for pore water (mg/l).

The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 2 remedial target to determine the need for further action. Equations presented in 'Hydrogeological risk assessment for land contamiantion' (Environment Agency 2006)

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**	
Standard entry					
Infiltration	Inf	0.00E+00	m/d		
Area of contaminant source	A	0.00E+00	m^2		Not used in calculation
Entry for groundwater flow below site					
Length of contaminant source in direction of groundwater flow	L	0.00E+00	m		
Saturated aquifer thickness	da	0.00E+00	m		
Hydraulic Conductivity of aquifer in which dilution occurs	K	0.00E+00	m/d		
Hydraulic gradient of water table	i	0.00E+00	fraction		
Width of contaminant source perpendicular to groundwater flow	w	0.00E+00	m		Not used in calculation
Background concentration of contaminant in groundwater beneath site	Cu	0.00E+00	mg/l		
Define mixing zone depth by specifying or calculating depth (using pull down list)		**Specify**			
Enter mixing zone thickness	Mz	0.00E+00	m		
Calculated mixing zone thickness	Mz		m		

Calculated Parameters

Dilution Factor	**DF**	**#DIV/0!**		
Level 2 Remedial Target		**#DIV/0!**	**mg/l**	**For comparison with measured pore water concentration. This assumes Level 1 Remedial Target is based on Target Concentrati**
		or		
		#DIV/0!	**mg/kg**	**For comparison with measured soil concentration. This assumes Level 1 Remedial Target calculated from soil-water**

Additional option

Calculation of impact on receptor

Concentration of contaminant in contaminated discharge (entering receptor)	Cc	0.00E+00	mg/l	
Calculated concentration within receptor (dilution only)		#DIV/0!	mg/l	0

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 3 - Soil

See Note

Input Parameters	Variable	Value	Unit	Source
Contaminant		Trichloroethene		from Level 1
Target Concentration	C_T	0.01	mg/l	from Level 1
Dilution Factor	DF	#DIV/0!		from Level 2

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value, l

	Variable	Value	Unit	Source of parameter value
Enter source concentration		Soil concentration as mg/kg		
Enter soil concentration		0	mg/kg	
Half life for degradation of contaminant in water	$t_{1/2}$	1.00E+100	days	
Calculated decay rate	λ	6.93E-101	$days^{-1}$	calculated
Width of plume in aquifer at source	Sz	0.00E+00	m	from Level 2
Plume thickness in aquifer at source	Sy	0.00E+00	m	from Level 2
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Effective porosity of aquifer	n	0.00E+00	fraction	
Hydraulic gradient	i	#DIV/0!	fraction	from Level 2 (adjusted)
Hydraulic conductivity of saturated aquifer	K	0.00E+00	m/d	from Level 2
Distance to compliance point	x	0.00E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	1.00E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	0.00E+00	l/kg	*see options*
Longitudinal dispersivity	ax	0.000	m	*see options*
Transverse dispersivity	az	0.000	m	*see options*
Vertical dispersivity	ay	0.000	m	*see options*

Parameter values should be checked against Level 1 and 2

Calculated Parameters	Variable		
Groundwater flow velocity	v	#DIV/0!	m/d
Retardation factor	Rf	#DIV/0!	fraction
Decay rate used	λ	6.93E-101	d^{-1}
Hydraulic gradient used in aquifer flow down-gradient	i	#DIV/0!	fraction
Rate of contaminant flow due to retardation	u	#DIV/0!	m/d
Ratio of Compliance Point to Source Concentration	C_{ED}/C_0	#DIV/0!	fraction
Attenuation factor (C_0/C_{ED})	**AF**	**#DIV/0!**	**fraction**
Calculated soil leachate concentration	Co	#DIV/0!	mg/l

Remedial Targets

Level 3 Remedial Target		**#DIV/0!**	**mg/l**	For comparison with measured pore water concentration.
Ogata Banks		**or**		This assumes Level 1 Remedial Target is based on Target Concentration.
		#DIV/0!	**mg/kg**	For comparison with measured soil concentration. This
Distance to compliance point		**0**	**m**	assumes Level 1 Remedial Target calculated from soil-water partitioning equation.
Ratio of Compliance Point to Source Concentration	**C_{ED}/C_0**	**#DIV/0!**	**fraction**	Ogata Banks

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99

Enter method of defining partition co-efficient (using pull down list)

Calculate for ionic organic chemicals (acids)

Entry if specify partition coefficient (option)

Soil water partition coefficient — Kd — l/kg

Entry for non-polar organic chemicals (option)

Fraction of organic carbon in aquifer — foc — fraction
Organic carbon partition coefficient — Koc — l/kg

Entry for ionic organic chemicals (option)

Sorption coefficient for related species	$K_{OC,n}$	0.00E+00	l/kg
Sorption coefficient for ionised species	$K_{OC,I}$	0.00E+00	l/kg
pH value	pH	0.00E+00	
Acid dissociation constant	pKa	0.00E+00	
Fraction of organic carbon in aquifer	foc	0.00E+00	fraction
Soil water partition coefficient	Kd	0.00E+00	l/kg

Define dispersivity (click brown cell and use pull down list)

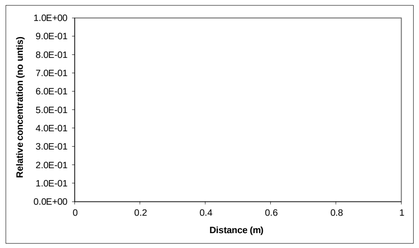
User defined values for dispersivity

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	0.00E+00	#NUM!	m
Transverse dispersivity	**az**	0.00E+00	0.00E+00	#NUM!	m
Vertical dispersivity	**ay**	0.00E+00	0.00E+00	#NUM!	m

Note values of dispersivity must be > 0

Xu & Eckstein (1995) report $ax = 0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed

Note
This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O_2, NO_3, SO_4 etc than an alternative solution should be used



Note: 'Relative concentration' is the ratio of calculated concentation at a given position compared to the source concentration. The calculations assume plume disperses from the top of the aquifer. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

This sheet calculates the Level 3 remedial target for soils(mg/kg) or for pore water (mg/l), based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.By setting a long travel time (e.g. 9E99) it will give the steady state solution, which should always be used when calculating remedial targets.

The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.9E+99.

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Calculated (relative) concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Relative concentration (No units)	Concentration mg/l
0	1.0E+00	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!

Remedial Targets Worksheet , Release 3.2

Calculation of contaminant concentration in groundwater from a soil source

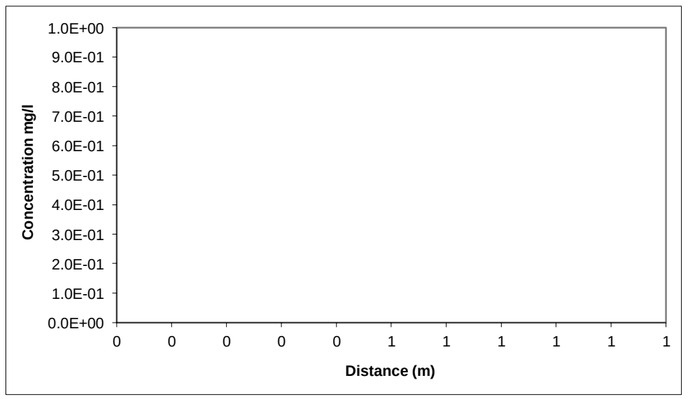
Only input required is Soil Contaminant Concentration

	Input Parameters			
	Soil contaminant concentration	C_0	0.00E+00	mg/kg
Level 1 Parameters				
	Water filled soil porosity	θ_W	0.00E+00	fraction
	Air filled soil porosity	θa	0.00E+00	fraction
	Bulk density	ρ	0.00E+00	g/cm^3
	Henry's Law constant	H	0.00E+00	dimensionless
	Soil water partition coefficient used in Level Assessment	Kd	0.00E+00	l/kg
	Factor (partitioning between soil and water)		#DIV/0!	dimensionless
Level 2 Parameters	**Dilution Factor**	DF	#DIV/0!	
Level 3 Parameters	**Attenuation factor (C_O/C_{ED})**	AF	#DIV/0!	

Predicted concentrations at compliance point

Level 1	C	#DIV/0!	mg/l	No dilution or attenuation
Level 2	C	#DIV/0!	mg/l	Dilution taken into account
Level 3	C	#DIV/0!	mg/l	Dilution and attenuation taken into account

Predicted concentrations between source and compliance point - Level 3



Distance m	Concentration mg/l
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu) | **Variable** | **Value** | **Unit** | **Source**

Contaminant		Trichloroethene		from Level 1
Target Concentration	C_T	1.00E-02	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Domenico - Steady state — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	2.50E-02	mg/l	*Site investigation data*
Half life for degradation of contaminant in water	$t_{1/2}$	2.35E+04	days	*Howard et al (1991) Low anaerobic biodeg*
Calculated decay rate	λ	2.95E-05	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	7.50E+01	m	*Length of site perpendicular to groundwater flow*
Plume thickness at source	Sy	5.90E+00	m	*Same as Mixing Zone Thickness. "For a thin aquifer (typically <10m), the mixing zone thickness can be taken as the ac*
Saturated aquifer thickness	da	6.00E+00	m	*Maximum thickness recorded in vicinity of*
Bulk density of aquifer materials	ρ	1.60E+00	g/cm^3	*Typical bulk density for river terrace deposits*
Effective porosity of aquifer	n	2.50E-01	fraction	*Maximum porosity for coarse Gravel (Lovanh et al 2000) - conservative estimate*
Hydraulic gradient	i	4.40E-02	fraction	*Borehole level data*
Hydraulic conductivity of aquifer	K	4.32E-01	m/d	*Maximum typical value for clayey sandy G*
Distance to compliance point	x	5.00E+01	m	*Default compliance distance*
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	9.90E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	2.15E+03	l/kg	*see options*
Longitudinal dispersivity	ax	5.00E+00	m	*see options*
Transverse dispersivity	az	5.00E-01	m	*see options*
Vertical dispersivity	ay	5.00E-02	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)

Soil water partition coefficient — Kd — 2.15E+03 l/kg

Entry for non-polar organic chemicals (option)

Fraction of organic carbon in aquifer — foc — fraction

Organic carbon partition coefficient — Koc — l/kg

Entry for ionic organic chemicals (option)

Sorption coefficient for related species — $K_{OC,n}$ — l/kg

Sorption coefficient for ionised species — $K_{OC,I}$ — l/kg

pH value — pH

acid dissociation constant — pKa

Fraction of organic carbon in aquifer — foc — fraction

Soil water partition coefficient — Kd — 2.15E+03 — l/kg

Define dispersivity (click brown cell and use pull down list)

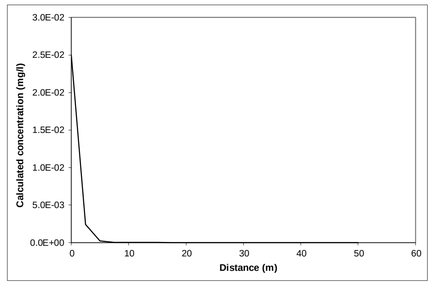
Dispersivities 10%, 1%, 0.1% of pathway length

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	5.00E+00	2.98E+00	m
Transverse dispersivity	**az**	0.00E+00	5.00E-01	2.98E-01	m
Vertical dispersivity	**ay**	0.00E+00	5.00E-02	2.98E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Calculated concentrations for distance-concentration graph

Domenico - Steady state
From calculation sheet

Distance	Concentration
	mg/l
0	2.5E-02
2.5	2.40E-03
5.0	2.30E-04
7.5	2.21E-05
10.0	2.12E-06
12.5	2.03E-07
15.0	1.95E-08
17.5	1.87E-09
20.0	1.79E-10
22.5	1.72E-11
25.0	1.65E-12
27.5	1.58E-13
30.0	1.52E-14
32.5	1.45E-15
35.0	1.39E-16
37.5	1.34E-17
40.0	1.28E-18
42.5	1.23E-19
45.0	1.17E-20
47.5	1.13E-21
50.0	1.08E-22

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared
with the Level 3 remedial target to determine the need for further action.
Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Calculated Parameters | **Variable**

Groundwater flow velocity	v	7.60E-02	m/d
Retardation factor	Rf	1.38E+04	fraction
Decay rate used	λ	2.95E-05	d^{-1}
Rate of contaminant flow due to retardation	u	5.53E-06	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	1.08E-22	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**2.32E+20**	

Remedial Targets

Remedial Target		**2.32E+18**	**mg/l**	For comparison with measured groundwater concentration.
Domenico - Steady state				
Distance to compliance point		**50**	**m**	
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**1.08E-22**	**mg/l**	Domenico - Steady state

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Porosity Calculator

These results are not carried through to any of the other worksheets

DRY BULK DENSITY DATA

Variable	Value	Unit	justification
Natural Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Dry Bulk Density	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
Initial Saturation	#DIV/0!	*%*	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	
Water Filled Porosity	**#DIV/0!**	**fraction**	

WET BULK DENSITY DATA

Variable	Value	Unit	
Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Actual (wet) Bulk Density (i.e. at natural MC)	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
dry bulk density	0.00	tonnes/m^3	
Initial Saturation	#DIV/0!	*%*	
Total porosity	**1.000**	**fraction**	**#DIV/0!**
Air Filled Porosity	**#DIV/0!**	**fraction**	
Water Filled Porosity	**#DIV/0!**	**fraction**	

Analytical solutions provided by David Hall, Golder Associates (UK) Ltd

Simple hydrogeological calculations

(These are not specific to, or required in, the Remedial Targets Methodology)

Parameter	symbol		unit	justification
Hydraulic conductivity	K	0.00E+00	m/d	
Hydraulic gradient	i	0.00E+00	unitless	
Effective porosity of aquifer	n	0.00E+00	fraction	
Thickness of saturated aquifer	b	0.00E+00	m	
Width of aquifer perpendicular to flow	w	0.00E+00	m	
Distance to receptor	x	0.00E+00	m	
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Soil-water partition co-efficient	Kd	0.00E+00	l/kg	
Retardation factor of pollutant	R	#DIV/0!		

Groundwater flow velocity	v(GW)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for groundwater to reach receptor	t(GW)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years
Rate of groundwater flow through aquifer	Q	0.00E+00	m^3/s	0.00E+00	m^3/day	0.00E+00	m^3/year

Contaminant flow velocity	v(contam)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for contaminant to reach receptor	t(contam)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years

Level 1 Calculation Sheet

Contaminant **Trichloroethene**

Parameter	Value	Units
(carried over from input sheet)		
C_T	1.00E-02	mg/l
Kd	0.00E+00	l/kg
foc		fraction
koc		l/kg
θ_W	0.00E+00	fraction
θa	0.00E+00	fraction
ρ	0.00E+00	g/cm3
H	0.00E+00	dimensionless
Koc,n		l/kg
Koc,i		l/kg
pH		pH units
pKa		
foc (ionic)		fraction

Calculations (Refer toTable 4.3, R&D Publication 20)

Selected option User specified value for partition coefficient

calc calc Calc Kd l/kg

Calculation of partition coefficient for ionic organic chemical

Partition coefficient used in Level 1 Assessment 0.00E+00 l/kg

Calculated Remedial Target **#DIV/0!** **mg/kg** **for Trichloroethene**

Factor (partitioning between soil and water) #DIV/0!

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11/12/2025
Version:	1

Level 2 Calculation Sheet

Contaminant **Trichloroethene**

Site assessed:	Kelvedon Stre
Date:	11/12/2025
Version:	1

Parameter	Value	Units		
(carried over from input sheet)				
Mz	0.00E+00	m		
L	0.00E+00	m		
da	0.00E+00	m		Calculated
Inf	0.00E+00	m/d		Dilution Factor
K	0.00E+00	m/d		
i	0.00E+00		Calculation based on target concentration	#DIV/0!
A	0.00E+00	m3/d m2 m3/d	Calculation based on observed contaminant concentration	#DIV/0!
Cc	0.00E+00	mg/l		
C_T	1.00E-02	mg/l		
Cu	0.00E+00	mg/l		
w	0.00E+00	m		



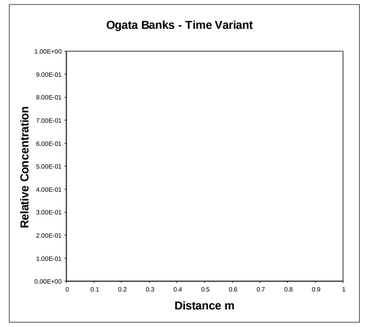
Contaminant **Trichloroethene**

OGATA BANKS SOLUTION

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-02	mg/l
DF	#DIV/0!	
λ	6.931E-101	days^{-1}
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

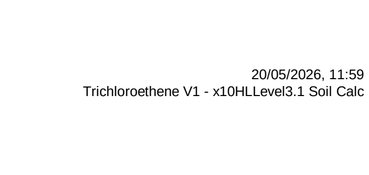
	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Calc	Value	
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) -USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



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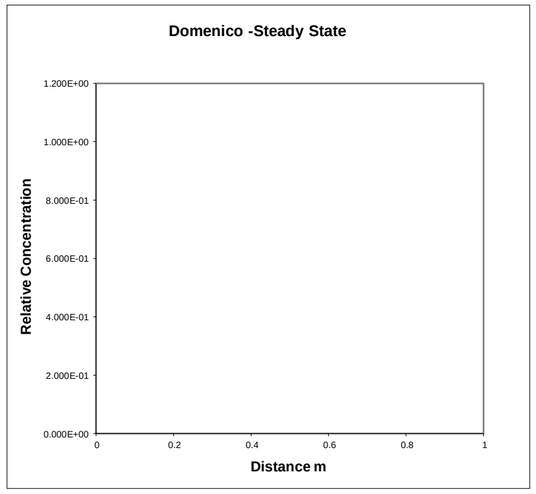
Contaminant 'richloroethene

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-02	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

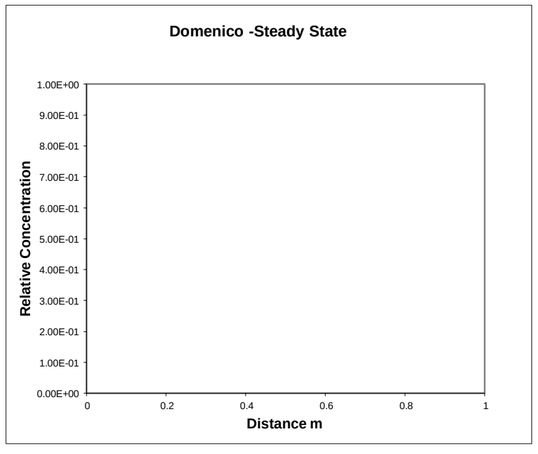


Calc	Value	Units
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



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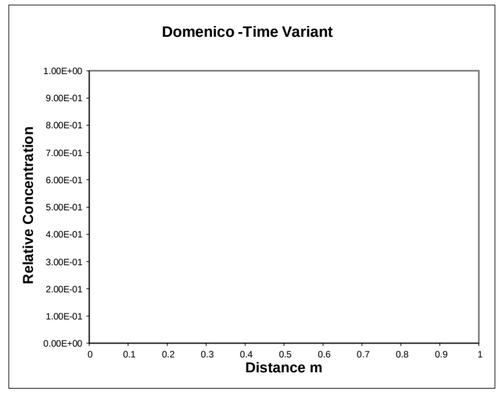
DOMENICO (TIME VARIANT)

Contaminant trichloroethene

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.01	mg/l
DF	#DIV/0!	
λ	6.931E-101	days^{-1}
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

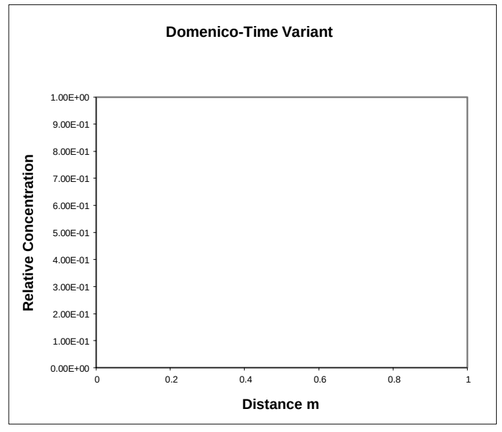


Calc **Value**

v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



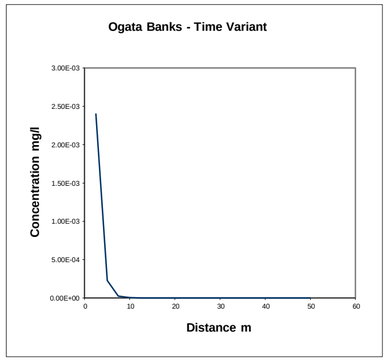
Date:	11/12/2025
Version:	1

OGATA BANKS SOLUTION

Contaminant	**Trichloroethene**	
Input	**Value**	**Units**
C_T	0.01	mg/l
Co	2.50E-02	mg/l
λ	2.95E-05	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	2.15E+03	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.00313	-2.3E+00	9.6E-02	-5.4E+47	2.000	2.8E+00	1.7E+01	5.4E+47	0.000	1.7E+01	1	-1.7E+01	-1	4.2E+00	1	-4.2E+00	-1	2.40E-03
2	5	0.00313	-4.7E+00	9.2E-03	-5.4E+47	2.000	5.7E+00	3.0E+02	5.4E+47	0.000	1.2E+01	1	-1.2E+01	-1	3.0E+00	1	-3.0E+00	-0.99997	2.30E-04
3	7.5	0.00313	-7.0E+00	8.8E-04	-5.4E+47	2.000	8.5E+00	5.1E+03	5.4E+47	0.000	9.7E+00	1	-9.7E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	2.20E-05
4	10	0.00313	-9.4E+00	8.5E-05	-5.4E+47	2.000	1.1E+01	8.7E+04	5.4E+47	0.000	8.4E+00	1	-8.4E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	2.11E-06
5	12.5	0.00313	-1.2E+01	8.1E-06	-5.4E+47	2.000	1.4E+01	1.5E+06	5.4E+47	0.000	7.5E+00	1	-7.5E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	2.01E-07
6	15	0.00313	-1.4E+01	7.8E-07	-5.4E+47	2.000	1.7E+01	2.6E+07	5.4E+47	0.000	6.8E+00	1	-6.8E+00	-1	1.7E+00	0.984	-1.7E+00	-0.98399	1.92E-08
7	17.5	0.00313	-1.6E+01	7.5E-08	-5.4E+47	2.000	2.0E+01	4.4E+08	5.4E+47	0.000	6.3E+00	1	-6.3E+00	-1	1.6E+00	0.9743	-1.6E+00	-0.97425	1.82E-09
8	20	0.00313	-1.9E+01	7.2E-09	-5.4E+47	2.000	2.3E+01	7.6E+09	5.4E+47	0.000	5.9E+00	1	-5.9E+00	-1	1.5E+00	0.963	-1.5E+00	-0.96302	1.73E-10
9	22.5	0.00313	-2.1E+01	6.9E-10	-5.4E+47	2.000	2.6E+01	1.3E+11	5.4E+47	0.000	5.6E+00	1	-5.6E+00	-1	1.4E+00	0.9508	-1.4E+00	-0.95078	1.63E-11
10	25	0.00313	-2.3E+01	6.6E-11	-5.4E+47	2.000	2.8E+01	2.3E+12	5.4E+47	0.000	5.3E+00	1	-5.3E+00	-1	1.3E+00	0.9379	-1.3E+00	-0.93792	1.55E-12
11	27.5	0.00313	-2.6E+01	6.3E-12	-5.4E+47	2.000	3.1E+01	3.9E+13	5.4E+47	0.000	5.1E+00	1	-5.1E+00	-1	1.3E+00	0.9247	-1.3E+00	-0.92475	1.46E-13
12	30	0.00313	-2.8E+01	6.1E-13	-5.4E+47	2.000	3.4E+01	6.7E+14	5.4E+47	0.000	4.8E+00	1	-4.8E+00	-1	1.2E+00	0.9115	-1.2E+00	-0.91147	1.38E-14
13	32.5	0.00313	-3.0E+01	5.8E-14	-5.4E+47	2.000	3.7E+01	1.1E+16	5.4E+47	0.000	4.7E+00	1	-4.7E+00	-1	1.2E+00	0.8982	-1.2E+00	-0.89824	1.31E-15
14	35	0.00313	-3.3E+01	5.6E-15	-5.4E+47	2.000	4.0E+01	2.0E+17	5.4E+47	0.000	4.5E+00	1	-4.5E+00	-1	1.1E+00	0.8852	-1.1E+00	-0.88517	1.24E-16
15	37.5	0.00313	-3.5E+01	5.4E-16	-5.4E+47	2.000	4.3E+01	3.4E+18	5.4E+47	0.000	4.3E+00	1	-4.3E+00	-1	1.1E+00	0.8723	-1.1E+00	-0.87233	1.17E-17
16	40	0.00313	-3.8E+01	5.1E-17	-5.4E+47	2.000	4.6E+01	5.8E+19	5.4E+47	0.000	4.2E+00	1	-4.2E+00	-1	1.0E+00	0.8598	-1.0E+00	-0.85979	1.10E-18
17	42.5	0.00313	-4.0E+01	4.9E-18	-5.4E+47	2.000	4.8E+01	1.0E+21	5.4E+47	0.000	4.1E+00	1	-4.1E+00	-1	1.0E+00	0.8476	-1.0E+00	-0.84756	1.04E-19
18	45	0.00313	-4.2E+01	4.7E-19	-5.4E+47	2.000	5.1E+01	1.7E+22	5.4E+47	0.000	4.0E+00	1	-4.0E+00	-1	9.8E-01	0.8357	-9.8E-01	-0.83567	9.87E-21
19	47.5	0.00313	-4.5E+01	4.5E-20	-5.4E+47	2.000	5.4E+01	2.9E+23	5.4E+47	0.000	3.8E+00	1	-3.8E+00	-1	9.6E-01	0.8241	-9.6E-01	-0.82412	9.34E-22
20	50	0.00313	-4.7E+01	4.3E-21	-5.4E+47	2.000	5.7E+01	5.1E+24	5.4E+47	0.000	3.8E+00	1	-3.8E+00	-1	9.3E-01	0.8129	-9.3E-01	-0.81292	8.83E-23



Vertical dispersion option Simulate vertical dispersion in 1 direction

Calc	**Value**	
v	7.60E-02	m/d
Rc	1.38E+04	
u	5.53E-06	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.00313	-2.3E+00	9.6E-02	-5.4E+47	2.000	2.8E+00	1.7E+01	5.4E+47	0.000	1.7E+01	1	-1.7E+01	-1	8.3E+00	1	-8.3E+00	-1	2.40E-03
2	5	0.00313	-4.7E+00	9.2E-03	-5.4E+47	2.000	5.7E+00	3.0E+02	5.4E+47	0.000	1.2E+01	1	-1.2E+01	-1	5.9E+00	1	-5.9E+00	-1	2.30E-04
3	7.5	0.00313	-7.0E+00	8.8E-04	-5.4E+47	2.000	8.5E+00	5.1E+03	5.4E+47	0.000	9.7E+00	1	-9.7E+00	-1	4.8E+00	1	-4.8E+00	-1	2.21E-05
4	10	0.00313	-9.4E+00	8.5E-05	-5.4E+47	2.000	1.1E+01	8.7E+04	5.4E+47	0.000	8.4E+00	1	-8.4E+00	-1	4.2E+00	1	-4.2E+00	-1	2.12E-06
5	12.5	0.00313	-1.2E+01	8.1E-06	-5.4E+47	2.000	1.4E+01	1.5E+06	5.4E+47	0.000	7.5E+00	1	-7.5E+00	-1	3.7E+00	1	-3.7E+00	-1	2.03E-07
6	15	0.00313	-1.4E+01	7.8E-07	-5.4E+47	2.000	1.7E+01	2.6E+07	5.4E+47	0.000	6.8E+00	1	-6.8E+00	-1	3.4E+00	1	-3.4E+00	-1	1.95E-08
7	17.5	0.00313	-1.6E+01	7.5E-08	-5.4E+47	2.000	2.0E+01	4.4E+08	5.4E+47	0.000	6.3E+00	1	-6.3E+00	-1	3.2E+00	1	-3.2E+00	-0.99999	1.87E-09
8	20	0.00313	-1.9E+01	7.2E-09	-5.4E+47	2.000	2.3E+01	7.6E+09	5.4E+47	0.000	5.9E+00	1	-5.9E+00	-1	3.0E+00	1	-3.0E+00	-0.99997	1.79E-10
9	22.5	0.00313	-2.1E+01	6.9E-10	-5.4E+47	2.000	2.6E+01	1.3E+11	5.4E+47	0.000	5.6E+00	1	-5.6E+00	-1	2.8E+00	0.9999	-2.8E+00	-0.99992	1.72E-11
10	25	0.00313	-2.3E+01	6.6E-11	-5.4E+47	2.000	2.8E+01	2.3E+12	5.4E+47	0.000	5.3E+00	1	-5.3E+00	-1	2.6E+00	0.9998	-2.6E+00	-0.99981	1.65E-12
11	27.5	0.00313	-2.6E+01	6.3E-12	-5.4E+47	2.000	3.1E+01	3.9E+13	5.4E+47	0.000	5.1E+00	1	-5.1E+00	-1	2.5E+00	0.9996	-2.5E+00	-0.99963	1.58E-13
12	30	0.00313	-2.8E+01	6.1E-13	-5.4E+47	2.000	3.4E+01	6.7E+14	5.4E+47	0.000	4.8E+00	1	-4.8E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	1.52E-14
13	32.5	0.00313	-3.0E+01	5.8E-14	-5.4E+47	2.000	3.7E+01	1.1E+16	5.4E+47	0.000	4.7E+00	1	-4.7E+00	-1	2.3E+00	0.9989	-2.3E+00	-0.99893	1.45E-15
14	35	0.00313	-3.3E+01	5.6E-15	-5.4E+47	2.000	4.0E+01	2.0E+17	5.4E+47	0.000	4.5E+00	1	-4.5E+00	-1	2.2E+00	0.9984	-2.2E+00	-0.99839	1.39E-16
15	37.5	0.00313	-3.5E+01	5.4E-16	-5.4E+47	2.000	4.3E+01	3.4E+18	5.4E+47	0.000	4.3E+00	1	-4.3E+00	-1	2.2E+00	0.9977	-2.2E+00	-0.99769	1.34E-17
16	40	0.00313	-3.8E+01	5.1E-17	-5.4E+47	2.000	4.6E+01	5.8E+19	5.4E+47	0.000	4.2E+00	1	-4.2E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	1.28E-18
17	42.5	0.00313	-4.0E+01	4.9E-18	-5.4E+47	2.000	4.8E+01	1.0E+21	5.4E+47	0.000	4.1E+00	1	-4.1E+00	-1	2.0E+00	0.9958	-2.0E+00	-0.99579	1.23E-19
18	45	0.00313	-4.2E+01	4.7E-19	-5.4E+47	2.000	5.1E+01	1.7E+22	5.4E+47	0.000	4.0E+00	1	-4.0E+00	-1	2.0E+00	0.9946	-2.0E+00	-0.99459	1.17E-20
19	47.5	0.00313	-4.5E+01	4.5E-20	-5.4E+47	2.000	5.4E+01	2.9E+23	5.4E+47	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9932	-1.9E+00	-0.99321	1.13E-21
20	50	0.00313	-4.7E+01	4.3E-21	-5.4E+47	2.000	5.7E+01	5.1E+24	5.4E+47	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	1.08E-22

Date:	11/12/2025
Version:	1

Contaminant **richloroethene**

DOMENICO (STEADY STATE)

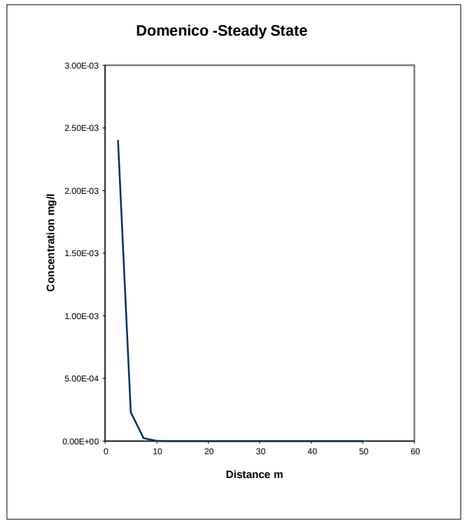
Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.01	mg/l
Co	2.50E-02	mg/l
λ	2.95E-05	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	2.15E+03	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion optio Simulate vertical dispersion in 1 direction

Calc	Value	
v	7.60E-02	m/d
Rc	1.38E+04	
u	5.53E-06	m/d

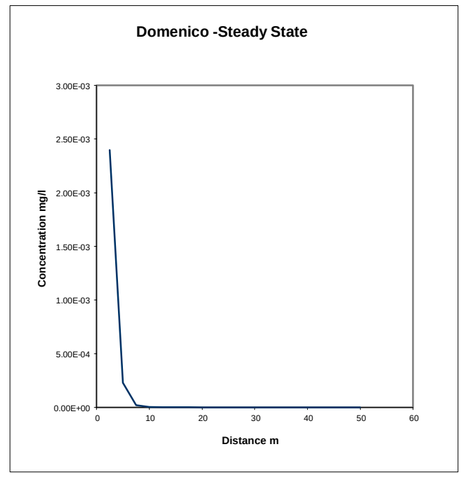
	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.00625	-2.34E+00	9.59E-02	1.68E+01	1	-1.68E+01	-1	4.17E+00	1	-4.17E+00	-1	2.40E-03
2	5	0.00625	-4.69E+00	9.20E-03	1.19E+01	1	-1.19E+01	-1	2.95E+00	1	-2.95E+00	-1	2.30E-04
3	7.5	0.00625	-7.03E+00	8.83E-04	9.68E+00	1	-9.68E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	2.20E-05
4	10	0.00625	-9.38E+00	8.47E-05	8.39E+00	1	-8.39E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	2.11E-06
5	12.5	0.00625	-1.17E+01	8.12E-06	7.50E+00	1	-7.50E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	2.01E-07
6	15	0.00625	-1.41E+01	7.79E-07	6.85E+00	1	-6.85E+00	-1	1.70E+00	0.984	-1.70E+00	-0.984	1.92E-08
7	17.5	0.00625	-1.64E+01	7.47E-08	6.34E+00	1	-6.34E+00	-1	1.58E+00	0.9743	-1.58E+00	-0.9743	1.82E-09
8	20	0.00625	-1.88E+01	7.17E-09	5.93E+00	1	-5.93E+00	-1	1.48E+00	0.963	-1.48E+00	-0.963	1.73E-10
9	22.5	0.00625	-2.11E+01	6.87E-10	5.59E+00	1	-5.59E+00	-1	1.39E+00	0.9508	-1.39E+00	-0.9508	1.63E-11
10	25	0.00625	-2.34E+01	6.59E-11	5.30E+00	1	-5.30E+00	-1	1.32E+00	0.9379	-1.32E+00	-0.9379	1.55E-12
11	27.5	0.00625	-2.58E+01	6.32E-12	5.06E+00	1	-5.06E+00	-1	1.26E+00	0.9247	-1.26E+00	-0.9247	1.46E-13
12	30	0.00625	-2.81E+01	6.07E-13	4.84E+00	1	-4.84E+00	-1	1.20E+00	0.9115	-1.20E+00	-0.9115	1.38E-14
13	32.5	0.00625	-3.05E+01	5.82E-14	4.65E+00	1	-4.65E+00	-1	1.16E+00	0.8982	-1.16E+00	-0.8982	1.31E-15
14	35	0.00625	-3.28E+01	5.58E-15	4.48E+00	1	-4.48E+00	-1	1.11E+00	0.8852	-1.11E+00	-0.8852	1.24E-16
15	37.5	0.00625	-3.52E+01	5.35E-16	4.33E+00	1	-4.33E+00	-1	1.08E+00	0.8723	-1.08E+00	-0.8723	1.17E-17
16	40	0.00625	-3.75E+01	5.14E-17	4.19E+00	1	-4.19E+00	-1	1.04E+00	0.8598	-1.04E+00	-0.8598	1.10E-18
17	42.5	0.00625	-3.99E+01	4.93E-18	4.07E+00	1	-4.07E+00	-1	1.01E+00	0.8476	-1.01E+00	-0.8476	1.04E-19
18	45	0.00625	-4.22E+01	4.72E-19	3.95E+00	1	-3.95E+00	-1	9.83E-01	0.8357	-9.83E-01	-0.8357	9.87E-21
19	47.5	0.00625	-4.45E+01	4.53E-20	3.85E+00	1	-3.85E+00	-1	9.57E-01	0.8241	-9.57E-01	-0.8241	9.34E-22
20	50	0.00625	-4.69E+01	4.35E-21	3.75E+00	1	-3.75E+00	-1	9.33E-01	0.8129	-9.33E-01	-0.8129	8.83E-23



DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.00625	-2.34E+00	9.59E-02	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	2.40E-03
2	5	0.00625	-4.69E+00	9.20E-03	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	2.30E-04
3	7.5	0.00625	-7.03E+00	8.83E-04	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	2.21E-05
4	10	0.00625	-9.38E+00	8.47E-05	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	2.12E-06
5	12.5	0.00625	-1.17E+01	8.12E-06	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	2.03E-07
6	15	0.00625	-1.41E+01	7.79E-07	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	1.95E-08
7	17.5	0.00625	-1.64E+01	7.47E-08	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	1.87E-09
8	20	0.00625	-1.88E+01	7.17E-09	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	1.79E-10
9	22.5	0.00625	-2.11E+01	6.87E-10	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-0.9999	1.72E-11
10	25	0.00625	-2.34E+01	6.59E-11	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-0.9998	1.65E-12
11	27.5	0.00625	-2.58E+01	6.32E-12	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-0.9996	1.58E-13
12	30	0.00625	-2.81E+01	6.07E-13	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	1.52E-14
13	32.5	0.00625	-3.05E+01	5.82E-14	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.9989	1.45E-15
14	35	0.00625	-3.28E+01	5.58E-15	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.9984	1.39E-16
15	37.5	0.00625	-3.52E+01	5.35E-16	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.9977	1.34E-17
16	40	0.00625	-3.75E+01	5.14E-17	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	1.28E-18
17	42.5	0.00625	-3.99E+01	4.93E-18	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.9958	1.23E-19
18	45	0.00625	-4.22E+01	4.72E-19	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.9946	1.17E-20
19	47.5	0.00625	-4.45E+01	4.53E-20	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.9932	1.13E-21
20	50	0.00625	-4.69E+01	4.35E-21	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	1.08E-22



Date:	11/12/2025
Version:	1

DOMENICO (TIME VARIANT)

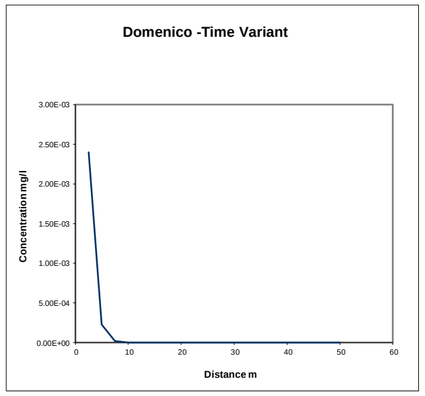
Contaminant	**richloroethene**	
Input	**Value**	**Units**
C_T	0.01	mg/l
Co	2.50E-02	mg/l
λ	2.95E-05	$days^{-1}$
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	2.15E+03	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option: Simulate vertical dispersion in 1 direction

Calc	**Value**	
v	7.60E-02	m/d
Rc	1.38E+04	
u	5.53E-06	m/d

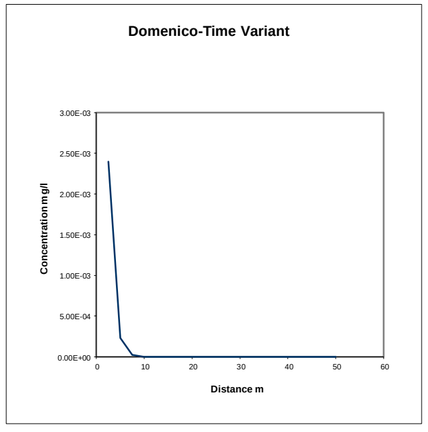
Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.00313	-2.34E+00	9.59E-02	-5.43E+47	2	1.68E+01	1	-1.68E+01	-1	4.17E+00	1	-4.17E+00	-1	2.40E-03
2	5	0.00313	-4.69E+00	9.20E-03	-5.43E+47	2	1.19E+01	1	-1.19E+01	-1	2.95E+00	1	-2.95E+00	-1	2.30E-04
3	7.5	0.00313	-7.03E+00	8.83E-04	-5.43E+47	2	9.68E+00	1	-9.68E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	2.20E-05
4	10	0.00313	-9.38E+00	8.47E-05	-5.43E+47	2	8.39E+00	1	-8.39E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	2.11E-06
5	12.5	0.00313	-1.17E+01	8.12E-06	-5.43E+47	2	7.50E+00	1	-7.50E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	2.01E-07
6	15	0.00313	-1.41E+01	7.79E-07	-5.43E+47	2	6.85E+00	1	-6.85E+00	-1	1.70E+00	0.984	-1.70E+00	-0.984	1.92E-08
7	17.5	0.00313	-1.64E+01	7.47E-08	-5.43E+47	2	6.34E+00	1	-6.34E+00	-1	1.58E+00	0.9743	-1.58E+00	-0.974	1.82E-09
8	20	0.00313	-1.88E+01	7.17E-09	-5.43E+47	2	5.93E+00	1	-5.93E+00	-1	1.48E+00	0.963	-1.48E+00	-0.963	1.73E-10
9	22.5	0.00313	-2.11E+01	6.87E-10	-5.43E+47	2	5.59E+00	1	-5.59E+00	-1	1.39E+00	0.9508	-1.39E+00	-0.951	1.63E-11
10	25	0.00313	-2.34E+01	6.59E-11	-5.43E+47	2	5.30E+00	1	-5.30E+00	-1	1.32E+00	0.9379	-1.32E+00	-0.938	1.55E-12
11	27.5	0.00313	-2.58E+01	6.32E-12	-5.43E+47	2	5.06E+00	1	-5.06E+00	-1	1.26E+00	0.9247	-1.26E+00	-0.925	1.46E-13
12	30	0.00313	-2.81E+01	6.07E-13	-5.43E+47	2	4.84E+00	1	-4.84E+00	-1	1.20E+00	0.9115	-1.20E+00	-0.911	1.38E-14
13	32.5	0.00313	-3.05E+01	5.82E-14	-5.43E+47	2	4.65E+00	1	-4.65E+00	-1	1.16E+00	0.8982	-1.16E+00	-0.898	1.31E-15
14	35	0.00313	-3.28E+01	5.58E-15	-5.43E+47	2	4.48E+00	1	-4.48E+00	-1	1.11E+00	0.8852	-1.11E+00	-0.885	1.24E-16
15	37.5	0.00313	-3.52E+01	5.35E-16	-5.43E+47	2	4.33E+00	1	-4.33E+00	-1	1.08E+00	0.8723	-1.08E+00	-0.872	1.17E-17
16	40	0.00313	-3.75E+01	5.14E-17	-5.43E+47	2	4.19E+00	1	-4.19E+00	-1	1.04E+00	0.8598	-1.04E+00	-0.86	1.10E-18
17	42.5	0.00313	-3.99E+01	4.93E-18	-5.43E+47	2	4.07E+00	1	-4.07E+00	-1	1.01E+00	0.8476	-1.01E+00	-0.848	1.04E-19
18	45	0.00313	-4.22E+01	4.72E-19	-5.43E+47	2	3.95E+00	1	-3.95E+00	-1	9.83E-01	0.8357	-9.83E-01	-0.836	9.87E-21
19	47.5	0.00313	-4.45E+01	4.53E-20	-5.43E+47	2	3.85E+00	1	-3.85E+00	-1	9.57E-01	0.8241	-9.57E-01	-0.824	9.34E-22
20	50	0.00313	-4.69E+01	4.35E-21	-5.43E+47	2	3.75E+00	1	-3.75E+00	-1	9.33E-01	0.8129	-9.33E-01	-0.813	8.83E-23



Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.00313	-2.34E+00	9.59E-02	-5.43E+47	2	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	2.40E-03
2	5	0.00313	-4.69E+00	9.20E-03	-5.43E+47	2	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	2.30E-04
3	7.5	0.00313	-7.03E+00	8.83E-04	-5.43E+47	2	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	2.21E-05
4	10	0.00313	-9.38E+00	8.47E-05	-5.43E+47	2	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	2.12E-06
5	12.5	0.00313	-1.17E+01	8.12E-06	-5.43E+47	2	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	2.03E-07
6	15	0.00313	-1.41E+01	7.79E-07	-5.43E+47	2	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	1.95E-08
7	17.5	0.00313	-1.64E+01	7.47E-08	-5.43E+47	2	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	1.87E-09
8	20	0.00313	-1.88E+01	7.17E-09	-5.43E+47	2	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	1.79E-10
9	22.5	0.00313	-2.11E+01	6.87E-10	-5.43E+47	2	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-1	1.72E-11
10	25	0.00313	-2.34E+01	6.59E-11	-5.43E+47	2	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-1	1.65E-12
11	27.5	0.00313	-2.58E+01	6.32E-12	-5.43E+47	2	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-1	1.58E-13
12	30	0.00313	-2.81E+01	6.07E-13	-5.43E+47	2	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	1.52E-14
13	32.5	0.00313	-3.05E+01	5.82E-14	-5.43E+47	2	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.999	1.45E-15
14	35	0.00313	-3.28E+01	5.58E-15	-5.43E+47	2	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.998	1.39E-16
15	37.5	0.00313	-3.52E+01	5.35E-16	-5.43E+47	2	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.998	1.34E-17
16	40	0.00313	-3.75E+01	5.14E-17	-5.43E+47	2	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	1.28E-18
17	42.5	0.00313	-3.99E+01	4.93E-18	-5.43E+47	2	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.996	1.23E-19
18	45	0.00313	-4.22E+01	4.72E-19	-5.43E+47	2	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.995	1.17E-20
19	47.5	0.00313	-4.45E+01	4.53E-20	-5.43E+47	2	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.993	1.13E-21
20	50	0.00313	-4.69E+01	4.35E-21	-5.43E+47	2	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	1.08E-22



Date:	11/12/2025
Version:	1

Hydrogeological risk assessment for land contamination

Remedial Targets Worksheet , Release 3.2

First released: 2006. Version 3.2: January 2013

This worksheet has been produced in combination with the document 'Remedial Targets Methodology: Hydrogeological risk assessment for land contamination (Environment Agency 2006).

Users of this worksheet should always refer to the User Manual to the Remedial Targets Methodology and to relevant guidance on UK legislation and policy, in order to understand how this procedure should be applied in an appropriate context.

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The calculation of equations in this worksheet has been independently checked by Entec (UK) Ltd on behalf of the Environment Agency.

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IMPORTANT: To enable MS Excel worksheet, click Tools, Add -Ins, Analysis Tool Pak and Analysis Tool Pak-VBA (to calculate error functions).

Details to be completed for each assessment				
Site Name:	Kelvedon Street			
Site Address:	Newport			
Completed by:	Michael Watkins			
Date:	11-Dec-25		Version:	1
Contaminant	Trichloroethene			
Target Concentration (C_T)	0.01	mg/l	Origin of C_T:	WFD for inland surface waters (annual average)

This worksheet can be used to determine remedial targets for soils (Worksheets Level 1 Soil, Level 2 and Level 3 Soil) or to determine remedial targets for groundwater (Level 3 Groundwater). For Level 3, parameter values must be entered separately dependent on whether the assessment is for soil or groundwater. For soil, remedial targets are calculated as either mg/kg (for comparision with soil measurements) or mg/l (for comparison with leaching tests or pore water concentrations).
Site details entered on this page are automatically copied to Level 1, 2 and 3 Worksheets.
Worksheet options are identified by brown background and employ a pull-down menus. Data entry are identified as blue background.
Data origin / justification should be noted in cells coloured yellow and fully documented in subsequent reports.
Data carried forward from an earlier worksheet are identified by a light green background
It is recommended that a copy of the original worksheet is saved (all data fields in the original copy are blank).

The spreadsheet also includes a porosity calculation worksheet, a soil impact calculation worksheet and a worksheet that performs some simple hydrogeological calculations.

Remedial Targets Worksheet , Release 3.2

Level 1 - Soil

Environment Agency

Select the method of calculating the soil water Partition Co-efficient by using the pull down menu below

User specified value for partition coefficient

Contaminant		**Trichloroethene**		
Target concentration	C_T	**0.01**	**mg/l**	

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**
Standard entry				
Water filled soil porosity	θ_w	0.00E+00	fraction	
Air filled soil porosity	θa	0.00E+00	fraction	
Bulk density of soil zone material	ρ	0.00E+00	g/cm^3	
Henry's Law constant	H	0.00E+00	dimensionless	
Entry if specify partition coefficient (option)				
Soil water partition coefficient	Kd	0.00E+00	l/kg	
Entry for non-polar organic chemicals (option)				
Fraction of organic carbon (in soil)	foc		fraction	
Organic carbon partition coefficient	Koc		l/kg	
Entry for ionic organic chemicals (option)				
Sorption coefficient for neutral species	$K_{oc,n}$		l/kg	
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg	
pH value	pH		pH units	
Acid dissociation constant	pKa			
Fraction of organic carbon (in soil)	foc		fraction	

This sheet calculates the Level 1 remedial target for soils(mg/kg) based on a selected target concentration and theoretical calculation of soil water partitioning. Three options are included for determining the partition coefficient.

The measured soil concentration as mg/kg should be compared with the Level 1 remedial target to determine the need for further action.

Soil water partition coefficient used in Level Assessment	**Kd**	**0.00E+00**	**l/kg**	*Specified value*

Level 1 Remedial Target

Level 1 Remedial Target	**#DIV/0!**	**mg/kg**	**(for comparison with soil analyses)**
	or		
	0.01	**mg/l**	**(for comparison with leachate test results)**

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 2 - Soil

Contaminant		**Trichloroethene**		from Level 1
Target concentration	C_T	**0.01**	**mg/l**	from Level 1

This sheet calculates the Level 2 remedial target for soils (mg/kg) or for pore water (mg/l).

The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 2 remedial target to determine the need for further action. Equations presented in 'Hydrogeological risk assessment for land contamiantion' (Environment Agency 2006)

Input Parameters	Variable	Value	Unit	Source of parameter value	
Standard entry					
Infiltration	Inf	0.00E+00	m/d		
Area of contaminant source	A	0.00E+00	m^2		Not used in calculation
Entry for groundwater flow below site					
Length of contaminant source in direction of groundwater flow	L	0.00E+00	m		
Saturated aquifer thickness	da	0.00E+00	m		
Hydraulic Conductivity of aquifer in which dilution occurs	K	0.00E+00	m/d		
Hydraulic gradient of water table	i	0.00E+00	fraction		
Width of contaminant source perpendicular to groundwater flow	w	0.00E+00	m		Not used in calculation
Background concentration of contaminant in groundwater beneath site	Cu	0.00E+00	mg/l		
Define mixing zone depth by specifying or calculating depth (using pull down list)		**Specify**			
Enter mixing zone thickness	Mz	0.00E+00	m		
Calculated mixing zone thickness	Mz		m		

Calculated Parameters

Dilution Factor	**DF**	**#DIV/0!**		
Level 2 Remedial Target		**#DIV/0!**	**mg/l**	**For comparison with measured pore water concentration. This assumes Level 1 Remedial Target is based on Target Concentration.**
		or		
		#DIV/0!	**mg/kg**	**For comparison with measured soil concentration. This assumes Level 1 Remedial Target calculated from soil-water**

Additional option

Calculation of impact on receptor

Concentration of contaminant in contaminated discharge (entering receptor)	Cc	0.00E+00	mg/l	
Calculated concentration within receptor (dilution only)		#DIV/0!	mg/l	0

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Level 3 - Soil

See Note

Input Parameters	Variable	Value	Unit	Source
Contaminant		Trichloroethene		from Level 1
Target Concentration	C_T	0.01	mg/l	from Level 1
Dilution Factor	DF	#DIV/0!		from Level 2

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value)

	Variable	Value	Unit	Source of parameter value
Enter source concentration		Soil concentration as mg/kg		
Enter soil concentration		0	mg/kg	
Half life for degradation of contaminant in water	$t_{1/2}$	1.00E+100	days	
Calculated decay rate	λ	6.93E-101	$days^{-1}$	calculated
Width of plume in aquifer at source	Sz	0.00E+00	m	from Level 2
Plume thickness in aquifer at source	Sy	0.00E+00	m	from Level 2
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Effective porosity of aquifer	n	0.00E+00	fraction	
Hydraulic gradient	i	#DIV/0!	fraction	from Level 2 (adjusted)
Hydraulic conductivity of saturated aquifer	K	0.00E+00	m/d	from Level 2
Distance to compliance point	x	0.00E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	1.00E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	0.00E+00	l/kg	*see options*
Longitudinal dispersivity	ax	0.000	m	*see options*
Transverse dispersivity	az	0.000	m	*see options*
Vertical dispersivity	ay	0.000	m	*see options*

Parameter values should be checked against Level 1 and 2

Calculated Parameters	Variable		
Groundwater flow velocity	v	#DIV/0!	m/d
Retardation factor	Rf	#DIV/0!	fraction
Decay rate used	λ	6.93E-101	d^{-1}
Hydraulic gradient used in aquifer flow down-gradient	i	#DIV/0!	fraction
Rate of contaminant flow due to retardation	u	#DIV/0!	m/d
Ratio of Compliance Point to Source Concentration	C_{cp}/C_0	#DIV/0!	fraction
Attenuation factor (C_0/C_{cp})	**AF**	**#DIV/0!**	**fraction**
Calculated soil leachate concentration	Co	#DIV/0!	mg/l

Remedial Targets

Level 3 Remedial Target	**#DIV/0!**	**mg/l**	For comparison with measured pore water concentration.
Ogata Banks	**or**		This assumes Level 1 Remedial Target is based on Target Concentration.
	#DIV/0!	**mg/kg**	For comparison with measured soil concentration. This
Distance to compliance point	**0**	**m**	assumes Level 1 Remedial Target calculated from soil-water partitioning equation.
Ratio of Compliance Point to Source Concentration	**#DIV/0!**	**fraction**	Ogata Banks

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99

Enter method of defining partition co-efficient (using pull down list)

Calculate for ionic organic chemicals (acids)

Entry if specify partition coefficient (option)

Soil water partition coefficient	Kd		l/kg

Entry for non-polar organic chemicals (option)

Fraction of organic carbon in aquifer	foc		fraction
Organic carbon partition coefficient	Koc		l/kg

Entry for ionic organic chemicals (option)

Sorption coefficient for related species	$K_{oc,n}$	0.00E+00	l/kg
Sorption coefficient for ionised species	$K_{oc,i}$	0.00E+00	l/kg
pH value	pH	0.00E+00	
Acid dissociation constant	pKa	0.00E+00	
Fraction of organic carbon in aquifer	foc	0.00E+00	fraction
Soil water partition coefficient	Kd	0.00E+00	l/kg

Define dispersivity (click brown cell and use pull down list)

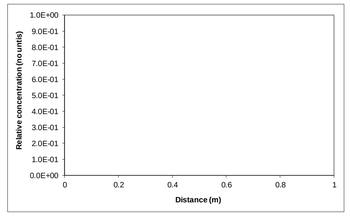
User defined values for dispersivity

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	0.00E+00	#NUM!	m
Transverse dispersivity	**az**	0.00E+00	0.00E+00	#NUM!	m
Vertical dispersivity	**ay**	0.00E+00	0.00E+00	#NUM!	m

Note values of dispersivity must be > 0

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed

Note
This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O_2, NO_3, SO_4 etc than an alternative solution should be used



Note: 'Relative concentration' is the ratio of calculated concentation at a given position compared to the source concentration. The calculations assume plume disperses from the top of the aquifer. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

This sheet calculates the Level 3 remedial target for soils(mg/kg) or for pore water (mg/l), based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.By setting a long travel time (e.g. 9E99) it will give the steady state solution, which should always be used when calculating remedial targets.

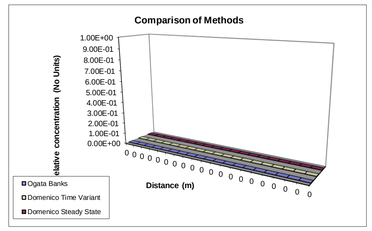
The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.9E+99.

Calculated (relative) concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Relative concentration (No units)	Concentration mg/l
0	1.0E+00	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!



Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Remedial Targets Worksheet , Release 3.2

Calculation of contaminant concentration in groundwater from a soil source

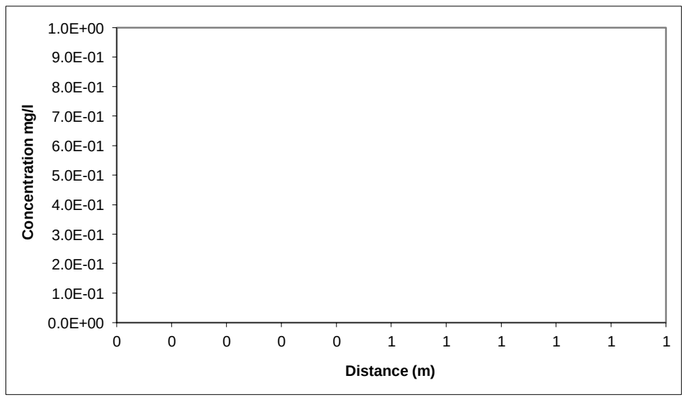
Only input required is Soil Contaminant Concentration

	Input Parameters			
	Soil contaminant concentration	C_0	0.00E+00	mg/kg
Level 1 Parameters				
	Water filled soil porosity	θ_W	0.00E+00	fraction
	Air filled soil porosity	θa	0.00E+00	fraction
	Bulk density	ρ	0.00E+00	g/cm^3
	Henry's Law constant	H	0.00E+00	dimensionless
	Soil water partition coefficient used in Level Assessment	Kd	0.00E+00	l/kg
	Factor (partitioning between soil and water)		#DIV/0!	dimensionless
Level 2 Parameters	**Dilution Factor**	DF	#DIV/0!	
Level 3 Parameters	**Attenuation factor (C_O/C_{ED})**	AF	#DIV/0!	

Predicted concentrations at compliance point

Level 1	C	#DIV/0!	mg/l	No dilution or attenuation
Level 2	C	#DIV/0!	mg/l	Dilution taken into account
Level 3	C	#DIV/0!	mg/l	Dilution and attenuation taken into account

Predicted concentrations between source and compliance point - Level 3



Distance m	Concentration mg/l
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu) | **Variable** | **Value** | **Unit** | **Source**

Contaminant		Trichloroethene		from Level 1
Target Concentration	C_T	1.00E-02	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Domenico - Steady state — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived va

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	2.50E-02	mg/l	*Site investigation data*
Half life for degradation of contaminant in water	$t_{1/2}$	2.35E+03	days	*Howard et al (1991) Low anaerobic biodeg*
Calculated decay rate	λ	2.95E-04	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	1.50E+02	m	*Length of site perpendicular to groundwater flow*
Plume thickness at source	Sy	5.90E+00	m	*Same as Mixing Zone Thickness. "For a thin aquifer (typically <10m), the mixing zone thickness can be taken as the actu*
Saturated aquifer thickness	da	6.00E+00	m	*Maximum thickness recorded in vicinity of*
Bulk density of aquifer materials	ρ	1.60E+00	g/cm^3	*Typical bulk density for river terrace deposits*
Effective porosity of aquifer	n	2.50E-01	fraction	*Maximum porosity for coarse Gravel (Lovanh et al 2000) - conservative estimate*
Hydraulic gradient	i	4.40E-02	fraction	*Borehole level data*
Hydraulic conductivity of aquifer	K	4.32E-01	m/d	*Maximum typical value for clayey sandy G*
Distance to compliance point	x	5.00E+01	m	*Default compliance distance*
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	9.90E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	2.15E+03	l/kg	*see options*
Longitudinal dispersivity	ax	5.00E+00	m	*see options*
Transverse dispersivity	az	5.00E-01	m	*see options*
Vertical dispersivity	ay	5.00E-02	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd	2.15E+03	l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc		fraction
Organic carbon partition coefficient	Koc		l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{oc,n}$		l/kg
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	2.15E+03	l/kg

Define dispersivity (click brown cell and use pull down list)

Dispersivities 10%, 1%, 0.1% of pathway length

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	5.00E+00	2.98E+00	m
Transverse dispersivity	**az**	0.00E+00	5.00E-01	2.98E-01	m
Vertical dispersivity	**ay**	0.00E+00	5.00E-02	2.98E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed

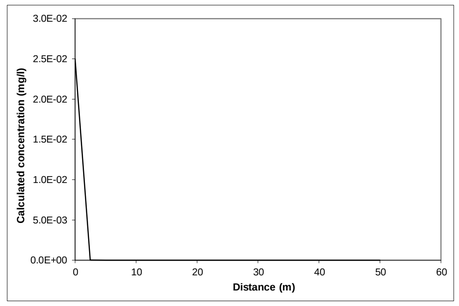
Calculated Parameters | **Variable**

Groundwater flow velocity	v	7.60E-02	m/d
Retardation factor	Rf	1.38E+04	fraction
Decay rate used	λ	2.95E-04	d^{-1}
Rate of contaminant flow due to retardation	u	5.53E-06	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	4.05E-71	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**6.17E+68**	

Remedial Targets

Remedial Target		**6.17E+66**	**mg/l**	For comparison with measured groundwater concentration.
Domenico - Steady state				
Distance to compliance point		**50**	**m**	
Concentration of contaminant at compliance point	C_{ED}/C_0	**4.05E-71**	**mg/l**	Domenico - Steady state

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Calculated concentrations for distance-concentration graph

Domenico - Steady state
From calculation sheet

Distance	Concentration
	mg/l
0	2.5E-02
2.5	9.09E-06
5.0	3.31E-09
7.5	1.20E-12
10.0	4.37E-16
12.5	1.59E-19
15.0	5.78E-23
17.5	2.10E-26
20.0	7.64E-30
22.5	2.78E-33
25.0	1.01E-36
27.5	3.67E-40
30.0	1.34E-43
32.5	4.85E-47
35.0	1.76E-50
37.5	6.41E-54
40.0	2.33E-57
42.5	8.46E-61
45.0	3.07E-64
47.5	1.12E-67
50.0	4.05E-71

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared
with the Level 3 remedial target to determine the need for further action.
Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Site being assessed:	Kelvedon Street
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Version:	1

Porosity Calculator

These results are not carried through to any of the other worksheets

DRY BULK DENSITY DATA

Variable	Value	Unit	justification
Natural Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Dry Bulk Density	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
Initial Saturation	#DIV/0!	%	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	
Water Filled Porosity	**#DIV/0!**	**fraction**	

WET BULK DENSITY DATA

Variable	Value	Unit	
Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Actual (wet) Bulk Density (i.e. at natural MC)	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
dry bulk density	0.00	tonnes/m^3	
Initial Saturation	#DIV/0!	%	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	**#DIV/0!**
Water Filled Porosity	**#DIV/0!**	**fraction**	

Analytical solutions provided by David Hall, Golder Associates (UK) Ltd

Simple hydrogeological calculations

(These are not specific to, or required in, the Remedial Targets Methodology)

Parameter	symbol		unit	justification
Hydraulic conductivity	K	0.00E+00	m/d	
Hydraulic gradient	i	0.00E+00	unitless	
Effective porosity of aquifer	n	0.00E+00	fraction	
Thickness of saturated aquifer	b	0.00E+00	m	
Width of aquifer perpendicular to flow	w	0.00E+00	m	
Distance to receptor	x	0.00E+00	m	
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Soil-water partition co-efficient	Kd	0.00E+00	l/kg	
Retardation factor of pollutant	R	#DIV/0!		

Groundwater flow velocity	v(GW)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for groundwater to reach receptor	t(GW)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years
Rate of groundwater flow through aquifer	Q	0.00E+00	m^3/s	0.00E+00	m^3/day	0.00E+00	m^3/year

Contaminant flow velocity	v(contam)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for contaminant to reach receptor	t(contam)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years

Level 1 Calculation Sheet

Contaminant **Trichloroethene**

Parameter	Value	Units
(carried over from input sheet)		
C_T	1.00E-02	mg/l
Kd	0.00E+00	l/kg
foc		fraction
koc		l/kg
θ_W	0.00E+00	fraction
θa	0.00E+00	fraction
ρ	0.00E+00	g/cm3
H	0.00E+00	dimensionless
Koc,n		l/kg
Koc,i		l/kg
pH		pH units
pKa		
foc (ionic)		fraction

Calculations (Refer toTable 4.3, R&D Publication 20)

Selected option User specified value for partition coefficient

calc calc Calc Kd l/kg

Calculation of partition coefficient for ionic organic chemical

Partition coefficient used in Level 1 Assessment 0.00E+00 l/kg

Calculated Remedial Target #DIV/0! mg/kg for Trichloroethene

Factor (partitioning between soil and water) #DIV/0!

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11/12/2025
Version:	1

Level 2 Calculation Sheet

Contaminant **Trichloroethene**

Site assessed:	Kelvedon Stre
Date:	11/12/2025
Version:	1

Parameter	Value	Units		
(carried over from input sheet)				
Mz	0.00E+00	m		
L	0.00E+00	m		
da	0.00E+00	m		Calculated Dilution Factor
Inf	0.00E+00	m/d		
K	0.00E+00	m/d		
i	0.00E+00		Calculation based on target concentration	#DIV/0!
A	0.00E+00	m3/d m2 m3/d	Calculation based on observed contaminant concentration	#DIV/0!
Cc	0.00E+00	mg/l		
C_T	1.00E-02	mg/l		
Cu	0.00E+00	mg/l		
w	0.00E+00	m		

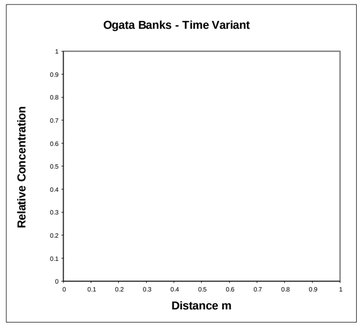


OGATA BANKS SOLUTION

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Contaminant	Trichloroethene	
Input	**Value**	**Units**
C_T	1.000E-02	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Calculations for source located at top of aquifer (ie vertical dispersion in one direction) -USED FOR LEVEL ASSESSMENT

Calc	Value	
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Date:	11/12/2025
Version:	1

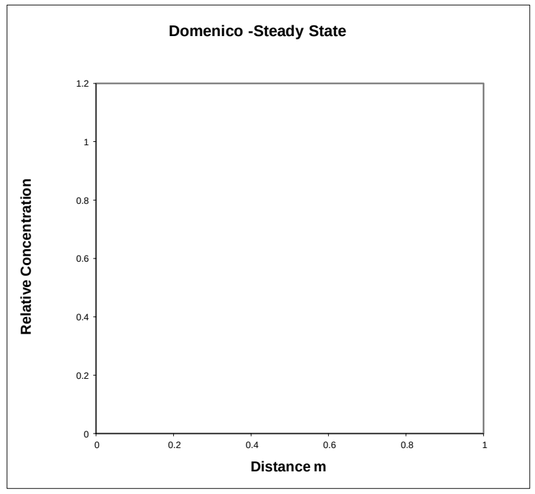
Contaminant 'richloroethene

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-02	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

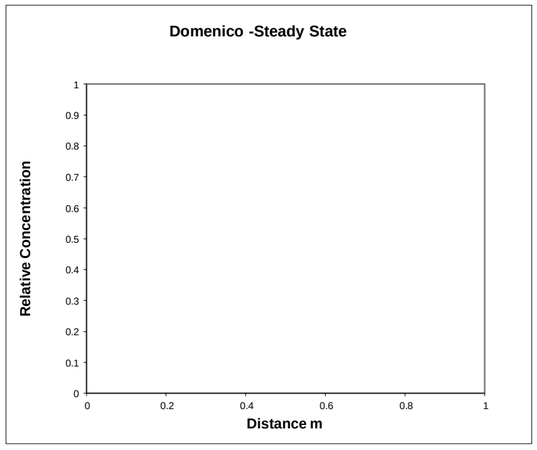


Calc	Value	Units
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



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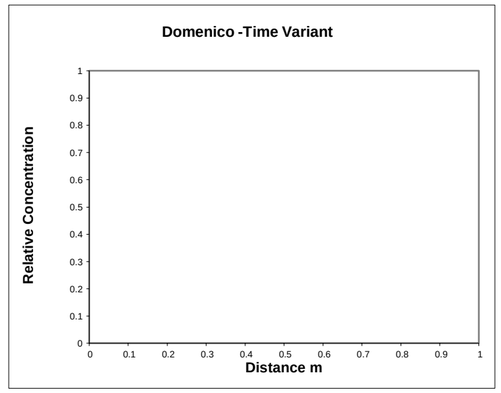
DOMENICO (TIME VARIANT)

Contaminant trichloroethene

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.01	mg/l
DF	#DIV/0!	
λ	6.931E-101	days^{-1}
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

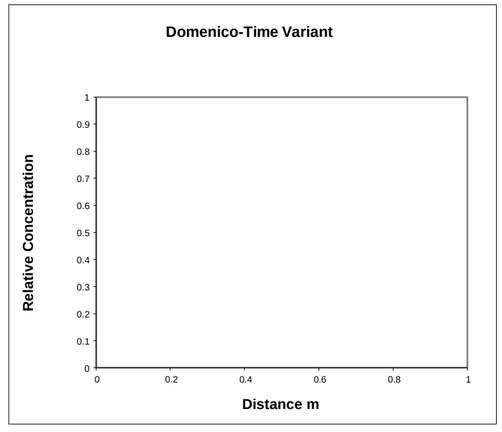


Calc **Value**

Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Date:	11/12/2025
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OGATA BANKS SOLUTION

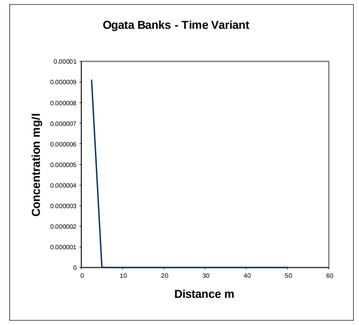
Contaminant **Trichloroethene**

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.01	mg/l
Co	2.50E-02	mg/l
λ	2.95E-04	days^{-1}
Sz	1.50E+02	m
Sy	5.90E+00	m
Kd	2.15E+03	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.00313	-7.9E+00	3.6E-04	-1.7E+48	2.000	8.4E+00	4.5E+03	1.7E+48	0.000	3.4E+01	1	-3.4E+01	-1	4.2E+00	1	-4.2E+00	-1	9.09E-06
2	5	0.00313	-1.6E+01	1.3E-07	-1.7E+48	2.000	1.7E+01	2.1E+07	1.7E+48	0.000	2.4E+01	1	-2.4E+01	-1	3.0E+00	1	-3.0E+00	-0.99997	3.31E-09
3	7.5	0.00313	-2.4E+01	4.8E-11	-1.7E+48	2.000	2.5E+01	9.3E+10	1.7E+48	0.000	1.9E+01	1	-1.9E+01	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	1.20E-12
4	10	0.00313	-3.2E+01	1.7E-14	-1.7E+48	2.000	3.4E+01	4.2E+14	1.7E+48	0.000	1.7E+01	1	-1.7E+01	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	4.36E-16
5	12.5	0.00313	-4.0E+01	6.4E-18	-1.7E+48	2.000	4.2E+01	1.9E+18	1.7E+48	0.000	1.5E+01	1	-1.5E+01	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	1.58E-19
6	15	0.00313	-4.8E+01	2.3E-21	-1.7E+48	2.000	5.1E+01	8.7E+21	1.7E+48	0.000	1.4E+01	1	-1.4E+01	-1	1.7E+00	0.984	-1.7E+00	-0.98399	5.69E-23
7	17.5	0.00313	-5.5E+01	8.4E-25	-1.7E+48	2.000	5.9E+01	3.9E+25	1.7E+48	0.000	1.3E+01	1	-1.3E+01	-1	1.6E+00	0.9743	-1.6E+00	-0.97425	2.05E-26
8	20	0.00313	-6.3E+01	3.1E-28	-1.7E+48	2.000	6.7E+01	1.8E+29	1.7E+48	0.000	1.2E+01	1	-1.2E+01	-1	1.5E+00	0.963	-1.5E+00	-0.96302	7.36E-30
9	22.5	0.00313	-7.1E+01	1.1E-31	-1.7E+48	2.000	7.6E+01	8.1E+32	1.7E+48	0.000	1.1E+01	1	-1.1E+01	-1	1.4E+00	0.9508	-1.4E+00	-0.95078	2.64E-33
10	25	0.00313	-7.9E+01	4.0E-35	-1.7E+48	2.000	8.4E+01	3.7E+36	1.7E+48	0.000	1.1E+01	1	-1.1E+01	-1	1.3E+00	0.9379	-1.3E+00	-0.93792	9.48E-37
11	27.5	0.00313	-8.7E+01	1.5E-38	-1.7E+48	2.000	9.3E+01	1.7E+40	1.7E+48	0.000	1.0E+01	1	-1.0E+01	-1	1.3E+00	0.9247	-1.3E+00	-0.92475	3.40E-40
12	30	0.00313	-9.5E+01	5.3E-42	-1.7E+48	2.000	1.0E+02	7.5E+43	1.7E+48	0.000	9.7E+00	1	-9.7E+00	-1	1.2E+00	0.9115	-1.2E+00	-0.91147	1.22E-43
13	32.5	0.00313	-1.0E+02	1.9E-45	-1.7E+48	2.000	1.1E+02	3.4E+47	1.7E+48	0.000	9.3E+00	1	-9.3E+00	-1	1.2E+00	0.8982	-1.2E+00	-0.89824	4.37E-47
14	35	0.00313	-1.1E+02	7.1E-49	-1.7E+48	2.000	1.2E+02	1.6E+51	1.7E+48	0.000	9.0E+00	1	-9.0E+00	-1	1.1E+00	0.8852	-1.1E+00	-0.88517	1.56E-50
15	37.5	0.00313	-1.2E+02	2.6E-52	-1.7E+48	2.000	1.3E+02	7.0E+54	1.7E+48	0.000	8.7E+00	1	-8.7E+00	-1	1.1E+00	0.8723	-1.1E+00	-0.87233	5.61E-54
16	40	0.00313	-1.3E+02	9.3E-56	-1.7E+48	2.000	1.3E+02	3.2E+58	1.7E+48	0.000	8.4E+00	1	-8.4E+00	-1	1.0E+00	0.8598	-1.0E+00	-0.85979	2.01E-57
17	42.5	0.00313	-1.3E+02	3.4E-59	-1.7E+48	2.000	1.4E+02	1.4E+62	1.7E+48	0.000	8.1E+00	1	-8.1E+00	-1	1.0E+00	0.8476	-1.0E+00	-0.84756	7.20E-61
18	45	0.00313	-1.4E+02	1.2E-62	-1.7E+48	2.000	1.5E+02	6.6E+65	1.7E+48	0.000	7.9E+00	1	-7.9E+00	-1	9.8E-01	0.8357	-9.8E-01	-0.83567	2.58E-64
19	47.5	0.00313	-1.5E+02	4.5E-66	-1.7E+48	2.000	1.6E+02	3.0E+69	1.7E+48	0.000	7.7E+00	1	-7.7E+00	-1	9.6E-01	0.8241	-9.6E-01	-0.82412	9.26E-68
20	50	0.00313	-1.6E+02	1.6E-69	-1.7E+48	2.000	1.7E+02	1.3E+73	1.7E+48	0.000	7.5E+00	1	-7.5E+00	-1	9.3E-01	0.8129	-9.3E-01	-0.81292	3.32E-71

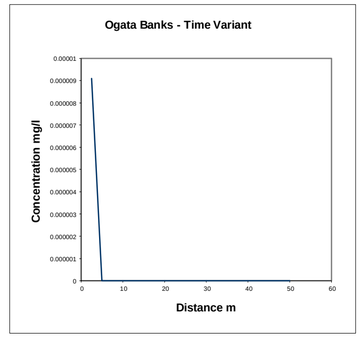


Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

Calc

	Value	
v	7.60E-02	m/d
Rc	1.38E+04	
u	5.53E-06	m/d

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.00313	-7.9E+00	3.6E-04	-1.7E+48	2.000	8.4E+00	4.5E+03	1.7E+48	0.000	3.4E+01	1	-3.4E+01	-1	8.3E+00	1	-8.3E+00	-1	9.09E-06
2	5	0.00313	-1.6E+01	1.3E-07	-1.7E+48	2.000	1.7E+01	2.1E+07	1.7E+48	0.000	2.4E+01	1	-2.4E+01	-1	5.9E+00	1	-5.9E+00	-1	3.31E-09
3	7.5	0.00313	-2.4E+01	4.8E-11	-1.7E+48	2.000	2.5E+01	9.3E+10	1.7E+48	0.000	1.9E+01	1	-1.9E+01	-1	4.8E+00	1	-4.8E+00	-1	1.20E-12
4	10	0.00313	-3.2E+01	1.7E-14	-1.7E+48	2.000	3.4E+01	4.2E+14	1.7E+48	0.000	1.7E+01	1	-1.7E+01	-1	4.2E+00	1	-4.2E+00	-1	4.37E-16
5	12.5	0.00313	-4.0E+01	6.4E-18	-1.7E+48	2.000	4.2E+01	1.9E+18	1.7E+48	0.000	1.5E+01	1	-1.5E+01	-1	3.7E+00	1	-3.7E+00	-1	1.59E-19
6	15	0.00313	-4.8E+01	2.3E-21	-1.7E+48	2.000	5.1E+01	8.7E+21	1.7E+48	0.000	1.4E+01	1	-1.4E+01	-1	3.4E+00	1	-3.4E+00	-1	5.78E-23
7	17.5	0.00313	-5.5E+01	8.4E-25	-1.7E+48	2.000	5.9E+01	3.9E+25	1.7E+48	0.000	1.3E+01	1	-1.3E+01	-1	3.2E+00	1	-3.2E+00	-0.99999	2.10E-26
8	20	0.00313	-6.3E+01	3.1E-28	-1.7E+48	2.000	6.7E+01	1.8E+29	1.7E+48	0.000	1.2E+01	1	-1.2E+01	-1	3.0E+00	1	-3.0E+00	-0.99997	7.64E-30
9	22.5	0.00313	-7.1E+01	1.1E-31	-1.7E+48	2.000	7.6E+01	8.1E+32	1.7E+48	0.000	1.1E+01	1	-1.1E+01	-1	2.8E+00	0.9999	-2.8E+00	-0.99992	2.78E-33
10	25	0.00313	-7.9E+01	4.0E-35	-1.7E+48	2.000	8.4E+01	3.7E+36	1.7E+48	0.000	1.1E+01	1	-1.1E+01	-1	2.6E+00	0.9998	-2.6E+00	-0.99981	1.01E-36
11	27.5	0.00313	-8.7E+01	1.5E-38	-1.7E+48	2.000	9.3E+01	1.7E+40	1.7E+48	0.000	1.0E+01	1	-1.0E+01	-1	2.5E+00	0.9996	-2.5E+00	-0.99963	3.67E-40
12	30	0.00313	-9.5E+01	5.3E-42	-1.7E+48	2.000	1.0E+02	7.5E+43	1.7E+48	0.000	9.7E+00	1	-9.7E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	1.34E-43
13	32.5	0.00313	-1.0E+02	1.9E-45	-1.7E+48	2.000	1.1E+02	3.4E+47	1.7E+48	0.000	9.3E+00	1	-9.3E+00	-1	2.3E+00	0.9989	-2.3E+00	-0.99893	4.85E-47
14	35	0.00313	-1.1E+02	7.1E-49	-1.7E+48	2.000	1.2E+02	1.6E+51	1.7E+48	0.000	9.0E+00	1	-9.0E+00	-1	2.2E+00	0.9984	-2.2E+00	-0.99839	1.76E-50
15	37.5	0.00313	-1.2E+02	2.6E-52	-1.7E+48	2.000	1.3E+02	7.0E+54	1.7E+48	0.000	8.7E+00	1	-8.7E+00	-1	2.2E+00	0.9977	-2.2E+00	-0.99769	6.41E-54
16	40	0.00313	-1.3E+02	9.3E-56	-1.7E+48	2.000	1.3E+02	3.2E+58	1.7E+48	0.000	8.4E+00	1	-8.4E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	2.33E-57
17	42.5	0.00313	-1.3E+02	3.4E-59	-1.7E+48	2.000	1.4E+02	1.4E+62	1.7E+48	0.000	8.1E+00	1	-8.1E+00	-1	2.0E+00	0.9958	-2.0E+00	-0.99579	8.46E-61
18	45	0.00313	-1.4E+02	1.2E-62	-1.7E+48	2.000	1.5E+02	6.6E+65	1.7E+48	0.000	7.9E+00	1	-7.9E+00	-1	2.0E+00	0.9946	-2.0E+00	-0.99459	3.07E-64
19	47.5	0.00313	-1.5E+02	4.5E-66	-1.7E+48	2.000	1.6E+02	3.0E+69	1.7E+48	0.000	7.7E+00	1	-7.7E+00	-1	1.9E+00	0.9932	-1.9E+00	-0.99321	1.12E-67
20	50	0.00313	-1.6E+02	1.6E-69	-1.7E+48	2.000	1.7E+02	1.3E+73	1.7E+48	0.000	7.5E+00	1	-7.5E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	4.05E-71



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	9.09E-06
5.0	3.31E-09
7.5	1.20E-12
10.0	4.37E-16
12.5	1.59E-19
15.0	5.78E-23
17.5	2.10E-26
20.0	7.64E-30
22.5	2.78E-33
25.0	1.01E-36
27.5	3.67E-40
30.0	1.34E-43
32.5	4.85E-47
35.0	1.76E-50
37.5	6.41E-54
40.0	2.33E-57
42.5	8.46E-61
45.0	3.07E-64
47.5	1.12E-67
50.0	4.05E-71

Contaminant **richloroethene**

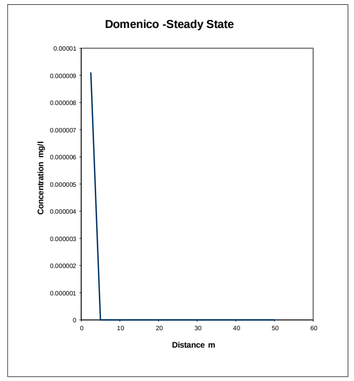
DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.01	mg/l
Co	2.50E-02	mg/l
λ	2.95E-04	days^{-1}
Sz	1.50E+02	m
Sy	5.90E+00	m
Kd	2.15E+03	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion optio Simulate vertical dispersion in 1 direction

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.00625	-7.92E+00	3.64E-04	3.35E+01	1	-3.35E+01	-1	4.17E+00	1	-4.17E+00	-1	9.09E-06
2	5	0.00625	-1.58E+01	1.32E-07	2.37E+01	1	-2.37E+01	-1	2.95E+00	1	-2.95E+00	-1	3.31E-09
3	7.5	0.00625	-2.38E+01	4.81E-11	1.94E+01	1	-1.94E+01	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	1.20E-12
4	10	0.00625	-3.17E+01	1.75E-14	1.68E+01	1	-1.68E+01	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	4.36E-16
5	12.5	0.00625	-3.96E+01	6.36E-18	1.50E+01	1	-1.50E+01	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	1.58E-19
6	15	0.00625	-4.75E+01	2.31E-21	1.37E+01	1	-1.37E+01	-1	1.70E+00	0.984	-1.70E+00	-0.984	5.69E-23
7	17.5	0.00625	-5.54E+01	8.41E-25	1.27E+01	1	-1.27E+01	-1	1.58E+00	0.9743	-1.58E+00	-0.9743	2.05E-26
8	20	0.00625	-6.34E+01	3.06E-28	1.19E+01	1	-1.19E+01	-1	1.48E+00	0.963	-1.48E+00	-0.963	7.36E-30
9	22.5	0.00625	-7.13E+01	1.11E-31	1.12E+01	1	-1.12E+01	-1	1.39E+00	0.9508	-1.39E+00	-0.9508	2.64E-33
10	25	0.00625	-7.92E+01	4.04E-35	1.06E+01	1	-1.06E+01	-1	1.32E+00	0.9379	-1.32E+00	-0.9379	9.48E-37
11	27.5	0.00625	-8.71E+01	1.47E-38	1.01E+01	1	-1.01E+01	-1	1.26E+00	0.9247	-1.26E+00	-0.9247	3.40E-40
12	30	0.00625	-9.50E+01	5.35E-42	9.68E+00	1	-9.68E+00	-1	1.20E+00	0.9115	-1.20E+00	-0.9115	1.22E-43
13	32.5	0.00625	-1.03E+02	1.94E-45	9.30E+00	1	-9.30E+00	-1	1.16E+00	0.8982	-1.16E+00	-0.8982	4.37E-47
14	35	0.00625	-1.11E+02	7.07E-49	8.96E+00	1	-8.96E+00	-1	1.11E+00	0.8852	-1.11E+00	-0.8852	1.56E-50
15	37.5	0.00625	-1.19E+02	2.57E-52	8.66E+00	1	-8.66E+00	-1	1.08E+00	0.8723	-1.08E+00	-0.8723	5.61E-54
16	40	0.00625	-1.27E+02	9.35E-56	8.39E+00	1	-8.39E+00	-1	1.04E+00	0.8598	-1.04E+00	-0.8598	2.01E-57
17	42.5	0.00625	-1.35E+02	3.40E-59	8.13E+00	1	-8.13E+00	-1	1.01E+00	0.8476	-1.01E+00	-0.8476	7.20E-61
18	45	0.00625	-1.43E+02	1.24E-62	7.91E+00	1	-7.91E+00	-1	9.83E-01	0.8357	-9.83E-01	-0.8357	2.58E-64
19	47.5	0.00625	-1.50E+02	4.49E-66	7.69E+00	1	-7.69E+00	-1	9.57E-01	0.8241	-9.57E-01	-0.8241	9.26E-68
20	50	0.00625	-1.58E+02	1.63E-69	7.50E+00	1	-7.50E+00	-1	9.33E-01	0.8129	-9.33E-01	-0.8129	3.32E-71



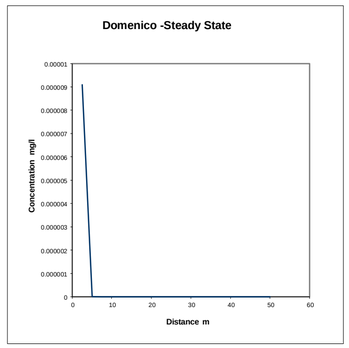
Calc **Value**

v	7.60E-02	m/d
Rc	1.38E+04	
u	5.53E-06	m/d

DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.00625	-7.92E+00	3.64E-04	3.35E+01	1	-3.35E+01	-1	8.34E+00	1	-8.34E+00	-1	9.09E-06
2	5	0.00625	-1.58E+01	1.32E-07	2.37E+01	1	-2.37E+01	-1	5.90E+00	1	-5.90E+00	-1	3.31E-09
3	7.5	0.00625	-2.38E+01	4.81E-11	1.94E+01	1	-1.94E+01	-1	4.82E+00	1	-4.82E+00	-1	1.20E-12
4	10	0.00625	-3.17E+01	1.75E-14	1.68E+01	1	-1.68E+01	-1	4.17E+00	1	-4.17E+00	-1	4.37E-16
5	12.5	0.00625	-3.96E+01	6.36E-18	1.50E+01	1	-1.50E+01	-1	3.73E+00	1	-3.73E+00	-1	1.59E-19
6	15	0.00625	-4.75E+01	2.31E-21	1.37E+01	1	-1.37E+01	-1	3.41E+00	1	-3.41E+00	-1	5.78E-23
7	17.5	0.00625	-5.54E+01	8.41E-25	1.27E+01	1	-1.27E+01	-1	3.15E+00	1	-3.15E+00	-1	2.10E-26
8	20	0.00625	-6.34E+01	3.06E-28	1.19E+01	1	-1.19E+01	-1	2.95E+00	1	-2.95E+00	-1	7.64E-30
9	22.5	0.00625	-7.13E+01	1.11E-31	1.12E+01	1	-1.12E+01	-1	2.78E+00	0.9999	-2.78E+00	-0.9999	2.78E-33
10	25	0.00625	-7.92E+01	4.04E-35	1.06E+01	1	-1.06E+01	-1	2.64E+00	0.9998	-2.64E+00	-0.9998	1.01E-36
11	27.5	0.00625	-8.71E+01	1.47E-38	1.01E+01	1	-1.01E+01	-1	2.52E+00	0.9996	-2.52E+00	-0.9996	3.67E-40
12	30	0.00625	-9.50E+01	5.35E-42	9.68E+00	1	-9.68E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	1.34E-43
13	32.5	0.00625	-1.03E+02	1.94E-45	9.30E+00	1	-9.30E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.9989	4.85E-47
14	35	0.00625	-1.11E+02	7.07E-49	8.96E+00	1	-8.96E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.9984	1.76E-50
15	37.5	0.00625	-1.19E+02	2.57E-52	8.66E+00	1	-8.66E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.9977	6.41E-54
16	40	0.00625	-1.27E+02	9.35E-56	8.39E+00	1	-8.39E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	2.33E-57
17	42.5	0.00625	-1.35E+02	3.40E-59	8.13E+00	1	-8.13E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.9958	8.46E-61
18	45	0.00625	-1.43E+02	1.24E-62	7.91E+00	1	-7.91E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.9946	3.07E-64
19	47.5	0.00625	-1.50E+02	4.49E-66	7.69E+00	1	-7.69E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.9932	1.12E-67
20	50	0.00625	-1.58E+02	1.63E-69	7.50E+00	1	-7.50E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	4.05E-71



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	9.09E-06
5.0	3.31E-09
7.5	1.20E-12
10.0	4.37E-16
12.5	1.59E-19
15.0	5.78E-23
17.5	2.10E-26
20.0	7.64E-30
22.5	2.78E-33
25.0	1.01E-36
27.5	3.67E-40
30.0	1.34E-43
32.5	4.85E-47
35.0	1.76E-50
37.5	6.41E-54
40.0	2.33E-57
42.5	8.46E-61
45.0	3.07E-64
47.5	1.12E-67
50.0	4.05E-71

DOMENICO (TIME VARIANT)

Contaminant Trichloroethene

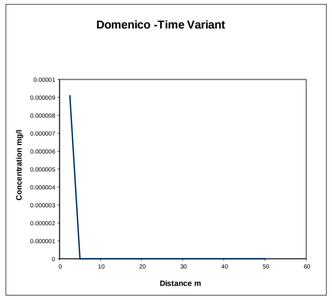
Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.01	mg/l
Co	2.50E-02	mg/l
λ	2.95E-04	days^{-1}
Sz	1.50E+02	m
Sy	5.90E+00	m
Kd	2.15E+03	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

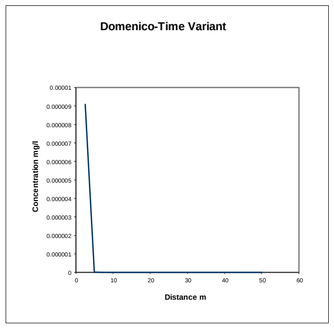
Calc	Value	
v	7.60E-02	m/d
Rc	1.38E+04	
u	5.53E-06	m/d

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.00313	-7.92E+00	3.64E-04	-1.71E+48	2	3.35E+01	1	-3.35E+01	-1	4.17E+00	1	-4.17E+00	-1	9.09E-06
2	5	0.00313	-1.58E+01	1.32E-07	-1.71E+48	2	2.37E+01	1	-2.37E+01	-1	2.95E+00	1	-2.95E+00	-1	3.31E-09
3	7.5	0.00313	-2.38E+01	4.81E-11	-1.71E+48	2	1.94E+01	1	-1.94E+01	-1	2.41E+00	0.9993	-2.41E+00	-0.999	1.20E-12
4	10	0.00313	-3.17E+01	1.75E-14	-1.71E+48	2	1.68E+01	1	-1.68E+01	-1	2.09E+00	0.9968	-2.09E+00	-0.997	4.36E-16
5	12.5	0.00313	-3.96E+01	6.36E-18	-1.71E+48	2	1.50E+01	1	-1.50E+01	-1	1.87E+00	0.9917	-1.87E+00	-0.992	1.58E-19
6	15	0.00313	-4.75E+01	2.31E-21	-1.71E+48	2	1.37E+01	1	-1.37E+01	-1	1.70E+00	0.984	-1.70E+00	-0.984	5.69E-23
7	17.5	0.00313	-5.54E+01	8.41E-25	-1.71E+48	2	1.27E+01	1	-1.27E+01	-1	1.58E+00	0.9743	-1.58E+00	-0.974	2.05E-26
8	20	0.00313	-6.34E+01	3.06E-28	-1.71E+48	2	1.19E+01	1	-1.19E+01	-1	1.48E+00	0.963	-1.48E+00	-0.963	7.36E-30
9	22.5	0.00313	-7.13E+01	1.11E-31	-1.71E+48	2	1.12E+01	1	-1.12E+01	-1	1.39E+00	0.9508	-1.39E+00	-0.951	2.64E-33
10	25	0.00313	-7.92E+01	4.04E-35	-1.71E+48	2	1.06E+01	1	-1.06E+01	-1	1.32E+00	0.9379	-1.32E+00	-0.938	9.48E-37
11	27.5	0.00313	-8.71E+01	1.47E-38	-1.71E+48	2	1.01E+01	1	-1.01E+01	-1	1.26E+00	0.9247	-1.26E+00	-0.925	3.40E-40
12	30	0.00313	-9.50E+01	5.35E-42	-1.71E+48	2	9.68E+00	1	-9.68E+00	-1	1.20E+00	0.9115	-1.20E+00	-0.911	1.22E-43
13	32.5	0.00313	-1.03E+02	1.94E-45	-1.71E+48	2	9.30E+00	1	-9.30E+00	-1	1.16E+00	0.8982	-1.16E+00	-0.898	4.37E-47
14	35	0.00313	-1.11E+02	7.07E-49	-1.71E+48	2	8.96E+00	1	-8.96E+00	-1	1.11E+00	0.8852	-1.11E+00	-0.885	1.56E-50
15	37.5	0.00313	-1.19E+02	2.57E-52	-1.71E+48	2	8.66E+00	1	-8.66E+00	-1	1.08E+00	0.8723	-1.08E+00	-0.872	5.61E-54
16	40	0.00313	-1.27E+02	9.35E-56	-1.71E+48	2	8.39E+00	1	-8.39E+00	-1	1.04E+00	0.8598	-1.04E+00	-0.86	2.01E-57
17	42.5	0.00313	-1.35E+02	3.40E-59	-1.71E+48	2	8.13E+00	1	-8.13E+00	-1	1.01E+00	0.8476	-1.01E+00	-0.848	7.20E-61
18	45	0.00313	-1.43E+02	1.24E-62	-1.71E+48	2	7.91E+00	1	-7.91E+00	-1	9.83E-01	0.8357	-9.83E-01	-0.836	2.58E-64
19	47.5	0.00313	-1.50E+02	4.49E-66	-1.71E+48	2	7.69E+00	1	-7.69E+00	-1	9.57E-01	0.8241	-9.57E-01	-0.824	9.26E-68
20	50	0.00313	-1.58E+02	1.63E-69	-1.71E+48	2	7.50E+00	1	-7.50E+00	-1	9.33E-01	0.8129	-9.33E-01	-0.813	3.32E-71



Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.00313	-7.92E+00	3.64E-04	-1.71E+48	2	3.35E+01	1	-3.35E+01	-1	8.34E+00	1	-8.34E+00	-1	9.09E-06
2	5	0.00313	-1.58E+01	1.32E-07	-1.71E+48	2	2.37E+01	1	-2.37E+01	-1	5.90E+00	1	-5.90E+00	-1	3.31E-09
3	7.5	0.00313	-2.38E+01	4.81E-11	-1.71E+48	2	1.94E+01	1	-1.94E+01	-1	4.82E+00	1	-4.82E+00	-1	1.20E-12
4	10	0.00313	-3.17E+01	1.75E-14	-1.71E+48	2	1.68E+01	1	-1.68E+01	-1	4.17E+00	1	-4.17E+00	-1	4.37E-16
5	12.5	0.00313	-3.96E+01	6.36E-18	-1.71E+48	2	1.50E+01	1	-1.50E+01	-1	3.73E+00	1	-3.73E+00	-1	1.59E-19
6	15	0.00313	-4.75E+01	2.31E-21	-1.71E+48	2	1.37E+01	1	-1.37E+01	-1	3.41E+00	1	-3.41E+00	-1	5.78E-23
7	17.5	0.00313	-5.54E+01	8.41E-25	-1.71E+48	2	1.27E+01	1	-1.27E+01	-1	3.15E+00	1	-3.15E+00	-1	2.10E-26
8	20	0.00313	-6.34E+01	3.06E-28	-1.71E+48	2	1.19E+01	1	-1.19E+01	-1	2.95E+00	1	-2.95E+00	-1	7.64E-30
9	22.5	0.00313	-7.13E+01	1.11E-31	-1.71E+48	2	1.12E+01	1	-1.12E+01	-1	2.78E+00	0.9999	-2.78E+00	-1	2.78E-33
10	25	0.00313	-7.92E+01	4.04E-35	-1.71E+48	2	1.06E+01	1	-1.06E+01	-1	2.64E+00	0.9998	-2.64E+00	-1	1.01E-36
11	27.5	0.00313	-8.71E+01	1.47E-38	-1.71E+48	2	1.01E+01	1	-1.01E+01	-1	2.52E+00	0.9996	-2.52E+00	-1	3.67E-40
12	30	0.00313	-9.50E+01	5.35E-42	-1.71E+48	2	9.68E+00	1	-9.68E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	1.34E-43
13	32.5	0.00313	-1.03E+02	1.94E-45	-1.71E+48	2	9.30E+00	1	-9.30E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.999	4.85E-47
14	35	0.00313	-1.11E+02	7.07E-49	-1.71E+48	2	8.96E+00	1	-8.96E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.998	1.76E-50
15	37.5	0.00313	-1.19E+02	2.57E-52	-1.71E+48	2	8.66E+00	1	-8.66E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.998	6.41E-54
16	40	0.00313	-1.27E+02	9.35E-56	-1.71E+48	2	8.39E+00	1	-8.39E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	2.33E-57
17	42.5	0.00313	-1.35E+02	3.40E-59	-1.71E+48	2	8.13E+00	1	-8.13E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.996	8.46E-61
18	45	0.00313	-1.43E+02	1.24E-62	-1.71E+48	2	7.91E+00	1	-7.91E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.995	3.07E-64
19	47.5	0.00313	-1.50E+02	4.49E-66	-1.71E+48	2	7.69E+00	1	-7.69E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.993	1.12E-67
20	50	0.00313	-1.58E+02	1.63E-69	-1.71E+48	2	7.50E+00	1	-7.50E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	4.05E-71



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	9.09E-06
5.0	3.31E-09
7.5	1.20E-12
10.0	4.37E-16
12.5	1.59E-19
15.0	5.78E-23
17.5	2.10E-26
20.0	7.64E-30
22.5	2.78E-33
25.0	1.01E-36
27.5	3.67E-40
30.0	1.34E-43
32.5	4.85E-47
35.0	1.76E-50
37.5	6.41E-54
40.0	2.33E-57
42.5	8.46E-61
45.0	3.07E-64
47.5	1.12E-67
50.0	4.05E-71

Hydrogeological risk assessment for land contamination

Remedial Targets Worksheet , Release 3.2

First released: 2006. Version 3.2: January 2013

This worksheet has been produced in combination with the document 'Remedial Targets Methodology: Hydrogeological risk assessment for land contamination (Environment Agency 2006).

Users of this worksheet should always refer to the User Manual to the Remedial Targets Methodology and to relevant guidance on UK legislation and policy, in order to understand how this procedure should be applied in an appropriate context.

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The calculation of equations in this worksheet has been independently checked by Entec (UK) Ltd on behalf of the Environment Agency.

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IMPORTANT: To enable MS Excel worksheet, click Tools, Add -Ins, Analysis Tool Pak and Analysis Tool Pak-VBA (to calculate error functions).

Details to be completed for each assessment				
Site Name:	Kelvedon Street			
Site Address:	Newport			
Completed by:	Michael Watkins			
Date:	11-Dec-25		Version:	1
Contaminant	Trichloroethene			
Target Concentration (C_T)	0.01	mg/l	Origin of C_T:	WFD for inland surface waters (annual average)

This worksheet can be used to determine remedial targets for soils (Worksheets Level 1 Soil, Level 2 and Level 3 Soil) or to determine remedial targets for groundwater (Level 3 Groundwater). For Level 3, parameter values must be entered separately dependent on whether the assessment is for soil or groundwater. For soil, remedial targets are calculated as either mg/kg (for comparision with soil measurements) or mg/l (for comparison with leaching tests or pore water concentrations).
Site details entered on this page are automatically copied to Level 1, 2 and 3 Worksheets.
Worksheet options are identified by brown background and employ a pull-down menus. Data entry are identified as blue background.
Data origin / justification should be noted in cells coloured yellow and fully documented in subsequent reports.
Data carried forward from an earlier worksheet are identified by a light green background
It is recommended that a copy of the original worksheet is saved (all data fields in the original copy are blank).

The spreadsheet also includes a porosity calculation worksheet, a soil impact calculation worksheet and a worksheet that performs some simple hydrogeological calculations.

Remedial Targets Worksheet , Release 3.2

Level 1 - Soil

Select the method of calculating the soil water Partition Co-efficient by using the pull down menu below

User specified value for partition coefficient

Contaminant		**Trichloroethene**		
Target concentration	C_T	**0.01**	**mg/l**	

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**
Standard entry				
Water filled soil porosity	θ_w	0.00E+00	fraction	
Air filled soil porosity	θa	0.00E+00	fraction	
Bulk density of soil zone material	ρ	0.00E+00	g/cm^3	
Henry's Law constant	H	0.00E+00	dimensionless	
Entry if specify partition coefficient (option)				
Soil water partition coefficient	Kd	0.00E+00	l/kg	
Entry for non-polar organic chemicals (option)				
Fraction of organic carbon (in soil)	foc		fraction	
Organic carbon partition coefficient	Koc		l/kg	
Entry for ionic organic chemicals (option)				
Sorption coefficient for neutral species	$K_{oc,n}$		l/kg	
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg	
pH value	pH		pH units	
Acid dissociation constant	pKa			
Fraction of organic carbon (in soil)	foc		fraction	

This sheet calculates the Level 1 remedial target for soils(mg/kg) based on a selected target concentration and theoretical calculation of soil water partitioning. Three options are included for determining the partition coefficient.

The measured soil concentration as mg/kg should be compared with the Level 1 remedial target to determine the need for further action.

Soil water partition coefficient used in Level Assessment	**Kd**	**0.00E+00**	**l/kg**	*Specified value*

Level 1 Remedial Target

Level 1 Remedial Target	**#DIV/0!**	**mg/kg**	**(for comparison with soil analyses)**
	or		
	0.01	**mg/l**	**(for comparison with leachate test results)**

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 2 - Soil

Contaminant		**Trichloroethene**		from Level 1
Target concentration	C_T	**0.01**	**mg/l**	from Level 1

This sheet calculates the Level 2 remedial target for soils (mg/kg) or for pore water (mg/l).

The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 2 remedial target to determine the need for further action. Equations presented in 'Hydrogeological risk assessment for land contamiantion' (Environment Agency 2006)

Input Parameters	Variable	Value	Unit	Source of parameter value	
Standard entry					
Infiltration	Inf	0.00E+00	m/d		
Area of contaminant source	A	0.00E+00	m^2		Not used in calculation
Entry for groundwater flow below site					
Length of contaminant source in direction of groundwater flow	L	0.00E+00	m		
Saturated aquifer thickness	da	0.00E+00	m		
Hydraulic Conductivity of aquifer in which dilution occurs	K	0.00E+00	m/d		
Hydraulic gradient of water table	i	0.00E+00	fraction		
Width of contaminant source perpendicular to groundwater flow	w	0.00E+00	m		Not used in calculation
Background concentration of contaminant in groundwater beneath site	Cu	0.00E+00	mg/l		
Define mixing zone depth by specifying or calculating depth (using pull down list)		**Specify**			
Enter mixing zone thickness	Mz	0.00E+00	m		
Calculated mixing zone thickness	Mz		m		

Calculated Parameters

Dilution Factor	**DF**	**#DIV/0!**		
Level 2 Remedial Target		**#DIV/0!**	**mg/l**	**For comparison with measured pore water concentration. This assumes Level 1 Remedial Target is based on Target Concentration.**
		or		
		#DIV/0!	**mg/kg**	**For comparison with measured soil concentration. This assumes Level 1 Remedial Target calculated from soil-water**

Additional option

Calculation of impact on receptor

Concentration of contaminant in contaminated discharge (entering receptor)	Cc	0.00E+00	mg/l	
Calculated concentration within receptor (dilution only)		#DIV/0!	mg/l	0

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 3 - Soil

See Note

Input Parameters	Variable	Value	Unit	Source
Contaminant		Trichloroethene		from Level 1
Target Concentration	C_T	0.01	mg/l	from Level 1
Dilution Factor	DF	#DIV/0!		from Level 2

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value)

	Variable	Value	Unit	Source of parameter value
Enter source concentration		Soil concentration as mg/kg		
Enter soil concentration		0	mg/kg	
Half life for degradation of contaminant in water	$t_{1/2}$	1.00E+100	days	
Calculated decay rate	λ	6.93E-101	$days^{-1}$	calculated
Width of plume in aquifer at source	Sz	0.00E+00	m	from Level 2
Plume thickness in aquifer at source	Sy	0.00E+00	m	from Level 2
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Effective porosity of aquifer	n	0.00E+00	fraction	
Hydraulic gradient	i	#DIV/0!	fraction	from Level 2 (adjusted)
Hydraulic conductivity of saturated aquifer	K	0.00E+00	m/d	from Level 2
Distance to compliance point	x	0.00E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	1.00E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	0.00E+00	l/kg	*see options*
Longitudinal dispersivity	ax	0.000	m	*see options*
Transverse dispersivity	az	0.000	m	*see options*
Vertical dispersivity	ay	0.000	m	*see options*

Parameter values should be checked against Level 1 and 2

Calculated Parameters	Variable		
Groundwater flow velocity	v	#DIV/0!	m/d
Retardation factor	Rf	#DIV/0!	fraction
Decay rate used	λ	6.93E-101	d^{-1}
Hydraulic gradient used in aquifer flow down-gradient	i	#DIV/0!	fraction
Rate of contaminant flow due to retardation	u	#DIV/0!	m/d
Ratio of Compliance Point to Source Concentration	C_{ED}/C_0	#DIV/0!	fraction
Attenuation factor (C_0/C_{ED})	**AF**	**#DIV/0!**	**fraction**
Calculated soil leachate concentration	Co	#DIV/0!	mg/l

Remedial Targets

Level 3 Remedial Target	**#DIV/0!**	**mg/l**	For comparison with measured pore water concentration.
Ogata Banks	**or**		This assumes Level 1 Remedial Target is based on Target Concentration.
	#DIV/0!	**mg/kg**	For comparison with measured soil concentration. This
Distance to compliance point	**0**	**m**	assumes Level 1 Remedial Target calculated from soil-water partitioning equation.
Ratio of Compliance Point to Source Concentration	**#DIV/0!**	**fraction**	Ogata Banks

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99

Enter method of defining partition co-efficient (using pull down list)

Calculate for ionic organic chemicals (acids)

Entry if specify partition coefficient (option)

Soil water partition coefficient	Kd		l/kg

Entry for non-polar organic chemicals (option)

Fraction of organic carbon in aquifer	foc		fraction
Organic carbon partition coefficient	Koc		l/kg

Entry for ionic organic chemicals (option)

Sorption coefficient for related species	$K_{oc,n}$	0.00E+00	l/kg
Sorption coefficient for ionised species	$K_{oc,i}$	0.00E+00	l/kg
pH value	pH	0.00E+00	
Acid dissociation constant	pKa	0.00E+00	
Fraction of organic carbon in aquifer	foc	0.00E+00	fraction
Soil water partition coefficient	Kd	0.00E+00	l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

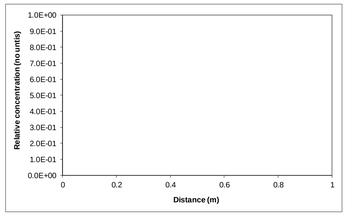
		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	0.00E+00	#NUM!	m
Transverse dispersivity	**az**	0.00E+00	0.00E+00	#NUM!	m
Vertical dispersivity	**ay**	0.00E+00	0.00E+00	#NUM!	m

Note values of dispersivity must be > 0

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed

Note
This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O_2, NO_3, SO_4 etc than an alternative solution should be used

Environment Agency



Note: 'Relative concentration' is the ratio of calculated concentation at a given position compared to the source concentration. The calculations assume plume disperses from the top of the aquifer. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

This sheet calculates the Level 3 remedial target for soils(mg/kg) or for pore water (mg/l), based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.By setting a long travel time (e.g. 9E99) it will give the steady state solution, which should always be used when calculating remedial targets.

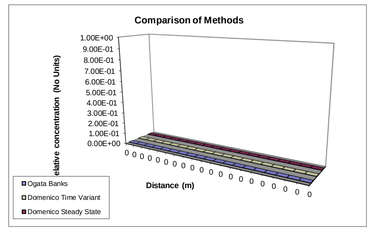
The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.9E+99.

Calculated (relative) concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Relative concentration (No units)	Concentration mg/l
0	1.0E+00	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!



Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Remedial Targets Worksheet , Release 3.2

Calculation of contaminant concentration in groundwater from a soil source

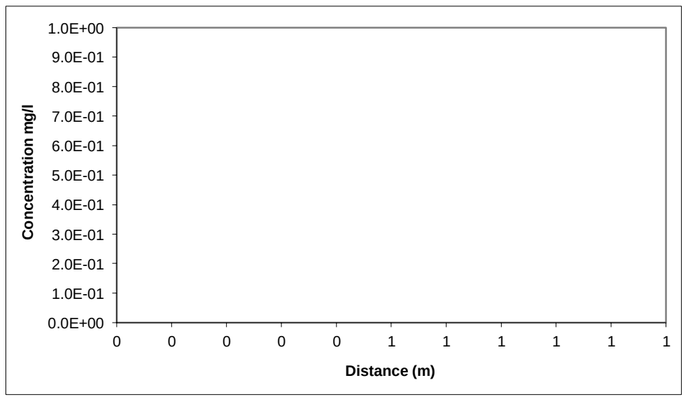
Only input required is Soil Contaminant Concentration

	Input Parameters			
	Soil contaminant concentration	C_0	0.00E+00	mg/kg
Level 1 Parameters				
	Water filled soil porosity	θ_W	0.00E+00	fraction
	Air filled soil porosity	θa	0.00E+00	fraction
	Bulk density	ρ	0.00E+00	g/cm^3
	Henry's Law constant	H	0.00E+00	dimensionless
	Soil water partition coefficient used in Level Assessment	Kd	0.00E+00	l/kg
	Factor (partitioning between soil and water)		#DIV/0!	dimensionless
Level 2 Parameters	**Dilution Factor**	DF	#DIV/0!	
Level 3 Parameters	**Attenuation factor (C_O/C_{ED})**	AF	#DIV/0!	

Predicted concentrations at compliance point

Level 1	C	#DIV/0!	mg/l	No dilution or attenuation
Level 2	C	#DIV/0!	mg/l	Dilution taken into account
Level 3	C	#DIV/0!	mg/l	Dilution and attenuation taken into account

Predicted concentrations between source and compliance point - Level 3



Distance m	Concentration mg/l
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
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R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)	Variable	Value	Unit	Source
Contaminant		Trichloroethene		from Level 1
Target Concentration	C_T	1.00E-02	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Domenico - Steady state — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived va

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	2.50E-02	mg/l	*Site investigation data*
Half life for degradation of contaminant in water	$t_{1/2}$	2.35E+03	days	*Howard et al (1991) Low anaerobic biodeg*
Calculated decay rate	λ	2.95E-04	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	7.50E+01	m	*Length of site perpendicular to groundwater flow*
Plume thickness at source	Sy	1.18E+01	m	*Same as Mixing Zone Thickness. "For a thin aquifer (typically <10m), the mixing zone thickness can be taken as the actu*
Saturated aquifer thickness	da	1.20E+01	m	*Maximum thickness recorded in vicinity of*
Bulk density of aquifer materials	ρ	1.60E+00	g/cm^3	*Typical bulk density for river terrace deposits*
Effective porosity of aquifer	n	2.50E-01	fraction	*Maximum porosity for coarse Gravel (Lovanh et al 2000) - conservative estimate*
Hydraulic gradient	i	4.40E-02	fraction	*Borehole level data*
Hydraulic conductivity of aquifer	K	4.32E-01	m/d	*Maximum typical value for clayey sandy G*
Distance to compliance point	x	5.00E+01	m	*Default compliance distance*
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	9.90E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	2.15E+03	l/kg	*see options*
Longitudinal dispersivity	ax	5.00E+00	m	*see options*
Transverse dispersivity	az	5.00E-01	m	*see options*
Vertical dispersivity	ay	5.00E-02	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd	2.15E+03	l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc		fraction
Organic carbon partition coefficient	Koc		l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{oc,n}$		l/kg
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	2.15E+03	l/kg

Define dispersivity (click brown cell and use pull down list)

Dispersivities 10%, 1%, 0.1% of pathway length

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	5.00E+00	2.98E+00	m
Transverse dispersivity	**az**	0.00E+00	5.00E-01	2.98E-01	m
Vertical dispersivity	**ay**	0.00E+00	5.00E-02	2.98E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

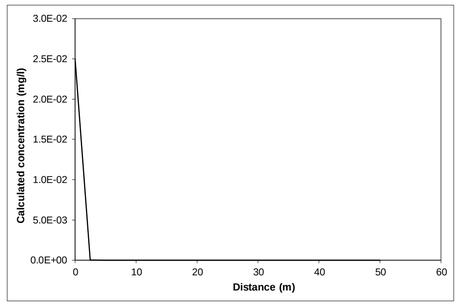
Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed

Calculated Parameters	Variable		
Groundwater flow velocity	v	7.60E-02	m/d
Retardation factor	Rf	1.38E+04	fraction
Decay rate used	λ	2.95E-04	d^{-1}
Rate of contaminant flow due to retardation	u	5.53E-06	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	4.09E-71	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**6.12E+68**	

Remedial Targets

Remedial Target		**6.12E+66**	**mg/l**	For comparison with measured groundwater concentration.
Domenico - Steady state				
Distance to compliance point		**50**	**m**	
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**4.09E-71**	**mg/l**	Domenico - Steady state

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Calculated concentrations for distance-concentration graph

Domenico - Steady state
From calculation sheet

Distance	Concentration
	mg/l
0	2.5E-02
2.5	9.09E-06
5.0	3.31E-09
7.5	1.20E-12
10.0	4.37E-16
12.5	1.59E-19
15.0	5.78E-23
17.5	2.10E-26
20.0	7.64E-30
22.5	2.78E-33
25.0	1.01E-36
27.5	3.68E-40
30.0	1.34E-43
32.5	4.86E-47
35.0	1.77E-50
37.5	6.43E-54
40.0	2.34E-57
42.5	8.50E-61
45.0	3.09E-64
47.5	1.12E-67
50.0	4.09E-71

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared
with the Level 3 remedial target to determine the need for further action.
Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Porosity Calculator

These results are not carried through to any of the other worksheets

DRY BULK DENSITY DATA

Variable	Value	Unit	justification
Natural Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Dry Bulk Density	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
Initial Saturation	#DIV/0!	%	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	
Water Filled Porosity	**#DIV/0!**	**fraction**	

WET BULK DENSITY DATA

Variable	Value	Unit	
Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Actual (wet) Bulk Density (i.e. at natural MC)	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
dry bulk density	0.00	tonnes/m^3	
Initial Saturation	#DIV/0!	%	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	**#DIV/0!**
Water Filled Porosity	**#DIV/0!**	**fraction**	

Analytical solutions provided by David Hall, Golder Associates (UK) Ltd

Simple hydrogeological calculations

(These are not specific to, or required in, the Remedial Targets Methodology)

Parameter	symbol		unit	justification
Hydraulic conductivity	K	0.00E+00	m/d	
Hydraulic gradient	i	0.00E+00	unitless	
Effective porosity of aquifer	n	0.00E+00	fraction	
Thickness of saturated aquifer	b	0.00E+00	m	
Width of aquifer perpendicular to flow	w	0.00E+00	m	
Distance to receptor	x	0.00E+00	m	
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Soil-water partition co-efficient	Kd	0.00E+00	l/kg	
Retardation factor of pollutant	R	#DIV/0!		

Groundwater flow velocity	v(GW)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for groundwater to reach receptor	t(GW)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years
Rate of groundwater flow through aquifer	Q	0.00E+00	m^3/s	0.00E+00	m^3/day	0.00E+00	m^3/year

Contaminant flow velocity	v(contam)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for contaminant to reach receptor	t(contam)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years

Level 1 Calculation Sheet

Contaminant **Trichloroethene**

Parameter	Value	Units
(carried over from input sheet)		
C_T	1.00E-02	mg/l
Kd	0.00E+00	l/kg
foc		fraction
koc		l/kg
θ_W	0.00E+00	fraction
θa	0.00E+00	fraction
ρ	0.00E+00	g/cm3
H	0.00E+00	dimensionless
Koc,n		l/kg
Koc,i		l/kg
pH		pH units
pKa		
foc (ionic)		fraction

Calculations (Refer toTable 4.3, R&D Publication 20)

Selected option User specified value for partition coefficient

calc calc Calc Kd l/kg

Calculation of partition coefficient for ionic organic chemical

Partition coefficient used in Level 1 Assessment 0.00E+00 l/kg

Calculated Remedial Target #DIV/0! mg/kg for Trichloroethene

Factor (partitioning between soil and water) #DIV/0!

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11/12/2025
Version:	1

Level 2 Calculation Sheet

Contaminant **Trichloroethene**

Site assessed:	Kelvedon Stre
Date:	11/12/2025
Version:	1

Parameter	Value	Units		
(carried over from input sheet)				
Mz	0.00E+00	m		
L	0.00E+00	m		
da	0.00E+00	m		Calculated Dilution Factor
Inf	0.00E+00	m/d		
K	0.00E+00	m/d		
i	0.00E+00		Calculation based on target concentration	#DIV/0!
A	0.00E+00	m3/d m2 m3/d	Calculation based on observed contaminant concentration	#DIV/0!
Cc	0.00E+00	mg/l		
C_T	1.00E-02	mg/l		
Cu	0.00E+00	mg/l		
w	0.00E+00	m		



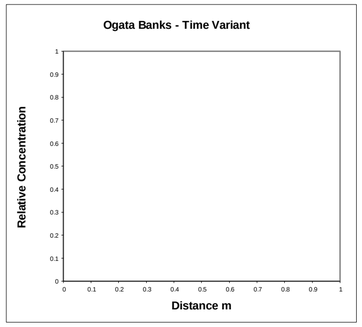
OGATA BANKS SOLUTION

Contaminant **Trichloroethene**

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-02	mg/l
DF	#DIV/0!	
λ	6.931E-101	days^{-1}
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Calc	Value	
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) -USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

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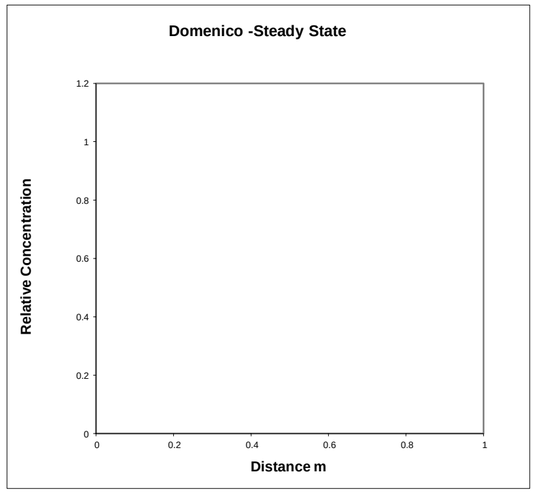
Contaminant **richloroethene**

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-02	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

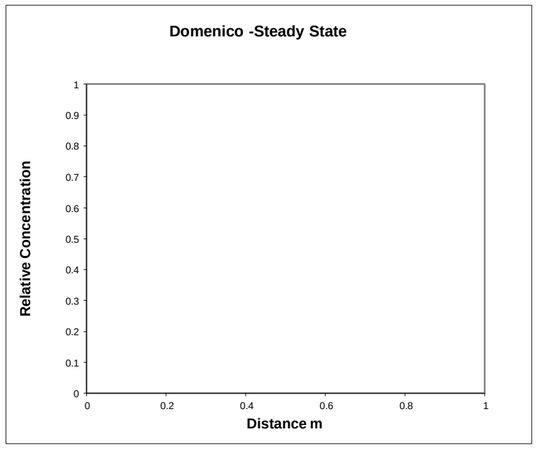


Calc	Value	Units
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



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Version:	1

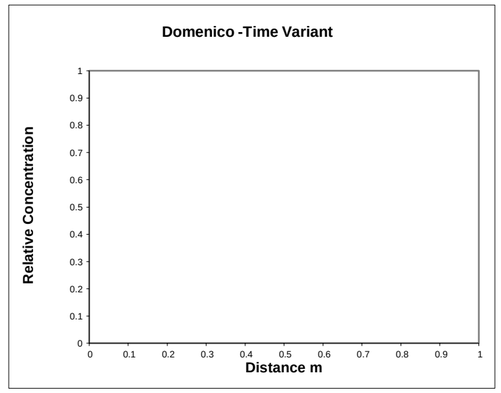
DOMENICO (TIME VARIANT)

Contaminant trichloroethene

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.01	mg/l
DF	#DIV/0!	
λ	6.931E-101	days^{-1}
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

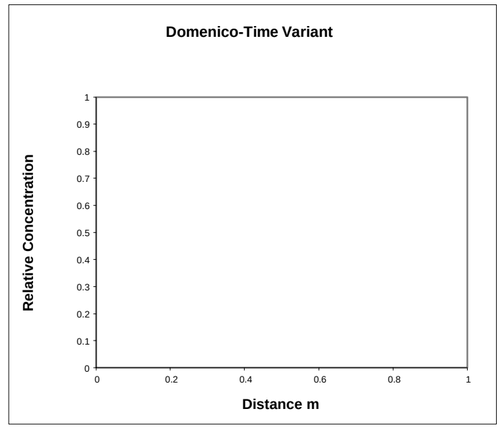


Calc **Value**

Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Date:	11/12/2025
Version:	1

OGATA BANKS SOLUTION

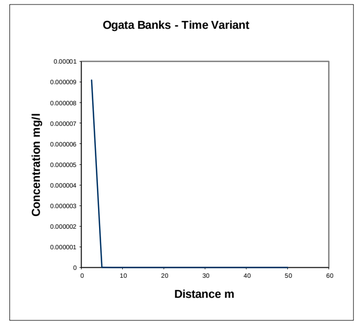
Contaminant **Trichloroethene**

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.01	mg/l
Co	2.50E-02	mg/l
λ	2.95E-04	days^{-1}
Sz	7.50E+01	m
Sy	1.18E+01	m
Kd	2.15E+03	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.00313	-7.9E+00	3.6E-04	-1.7E+48	2.000	8.4E+00	4.5E+03	1.7E+48	0.000	1.7E+01	1	-1.7E+01	-1	8.3E+00	1	-8.3E+00	-1	9.09E-06
2	5	0.00313	-1.6E+01	1.3E-07	-1.7E+48	2.000	1.7E+01	2.1E+07	1.7E+48	0.000	1.2E+01	1	-1.2E+01	-1	5.9E+00	1	-5.9E+00	-1	3.31E-09
3	7.5	0.00313	-2.4E+01	4.8E-11	-1.7E+48	2.000	2.5E+01	9.3E+10	1.7E+48	0.000	9.7E+00	1	-9.7E+00	-1	4.8E+00	1	-4.8E+00	-1	1.20E-12
4	10	0.00313	-3.2E+01	1.7E-14	-1.7E+48	2.000	3.4E+01	4.2E+14	1.7E+48	0.000	8.4E+00	1	-8.4E+00	-1	4.2E+00	1	-4.2E+00	-1	4.37E-16
5	12.5	0.00313	-4.0E+01	6.4E-18	-1.7E+48	2.000	4.2E+01	1.9E+18	1.7E+48	0.000	7.5E+00	1	-7.5E+00	-1	3.7E+00	1	-3.7E+00	-1	1.59E-19
6	15	0.00313	-4.8E+01	2.3E-21	-1.7E+48	2.000	5.1E+01	8.7E+21	1.7E+48	0.000	6.8E+00	1	-6.8E+00	-1	3.4E+00	1	-3.4E+00	-1	5.78E-23
7	17.5	0.00313	-5.5E+01	8.4E-25	-1.7E+48	2.000	5.9E+01	3.9E+25	1.7E+48	0.000	6.3E+00	1	-6.3E+00	-1	3.2E+00	1	-3.2E+00	-0.99999	2.10E-26
8	20	0.00313	-6.3E+01	3.1E-28	-1.7E+48	2.000	6.7E+01	1.8E+29	1.7E+48	0.000	5.9E+00	1	-5.9E+00	-1	3.0E+00	1	-3.0E+00	-0.99997	7.64E-30
9	22.5	0.00313	-7.1E+01	1.1E-31	-1.7E+48	2.000	7.6E+01	8.1E+32	1.7E+48	0.000	5.6E+00	1	-5.6E+00	-1	2.8E+00	0.9999	-2.8E+00	-0.99992	2.78E-33
10	25	0.00313	-7.9E+01	4.0E-35	-1.7E+48	2.000	8.4E+01	3.7E+36	1.7E+48	0.000	5.3E+00	1	-5.3E+00	-1	2.6E+00	0.9998	-2.6E+00	-0.99981	1.01E-36
11	27.5	0.00313	-8.7E+01	1.5E-38	-1.7E+48	2.000	9.3E+01	1.7E+40	1.7E+48	0.000	5.1E+00	1	-5.1E+00	-1	2.5E+00	0.9996	-2.5E+00	-0.99963	3.67E-40
12	30	0.00313	-9.5E+01	5.3E-42	-1.7E+48	2.000	1.0E+02	7.5E+43	1.7E+48	0.000	4.8E+00	1	-4.8E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	1.34E-43
13	32.5	0.00313	-1.0E+02	1.9E-45	-1.7E+48	2.000	1.1E+02	3.4E+47	1.7E+48	0.000	4.7E+00	1	-4.7E+00	-1	2.3E+00	0.9989	-2.3E+00	-0.99893	4.85E-47
14	35	0.00313	-1.1E+02	7.1E-49	-1.7E+48	2.000	1.2E+02	1.6E+51	1.7E+48	0.000	4.5E+00	1	-4.5E+00	-1	2.2E+00	0.9984	-2.2E+00	-0.99839	1.76E-50
15	37.5	0.00313	-1.2E+02	2.6E-52	-1.7E+48	2.000	1.3E+02	7.0E+54	1.7E+48	0.000	4.3E+00	1	-4.3E+00	-1	2.2E+00	0.9977	-2.2E+00	-0.99769	6.41E-54
16	40	0.00313	-1.3E+02	9.3E-56	-1.7E+48	2.000	1.3E+02	3.2E+58	1.7E+48	0.000	4.2E+00	1	-4.2E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	2.33E-57
17	42.5	0.00313	-1.3E+02	3.4E-59	-1.7E+48	2.000	1.4E+02	1.4E+62	1.7E+48	0.000	4.1E+00	1	-4.1E+00	-1	2.0E+00	0.9958	-2.0E+00	-0.99579	8.46E-61
18	45	0.00313	-1.4E+02	1.2E-62	-1.7E+48	2.000	1.5E+02	6.6E+65	1.7E+48	0.000	4.0E+00	1	-4.0E+00	-1	2.0E+00	0.9946	-2.0E+00	-0.99459	3.07E-64
19	47.5	0.00313	-1.5E+02	4.5E-66	-1.7E+48	2.000	1.6E+02	3.0E+69	1.7E+48	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9932	-1.9E+00	-0.99321	1.12E-67
20	50	0.00313	-1.6E+02	1.6E-69	-1.7E+48	2.000	1.7E+02	1.3E+73	1.7E+48	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	4.05E-71

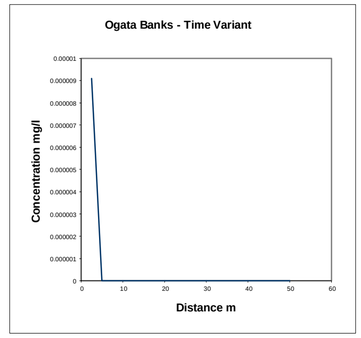


Calc **Value**

v	7.60E-02	m/d
Rc	1.38E+04	
u	5.53E-06	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.00313	-7.9E+00	3.6E-04	-1.7E+48	2.000	8.4E+00	4.5E+03	1.7E+48	0.000	1.7E+01	1	-1.7E+01	-1	1.7E+01	1	-1.7E+01	-1	9.09E-06
2	5	0.00313	-1.6E+01	1.3E-07	-1.7E+48	2.000	1.7E+01	2.1E+07	1.7E+48	0.000	1.2E+01	1	-1.2E+01	-1	1.2E+01	1	-1.2E+01	-1	3.31E-09
3	7.5	0.00313	-2.4E+01	4.8E-11	-1.7E+48	2.000	2.5E+01	9.3E+10	1.7E+48	0.000	9.7E+00	1	-9.7E+00	-1	9.6E+00	1	-9.6E+00	-1	1.20E-12
4	10	0.00313	-3.2E+01	1.7E-14	-1.7E+48	2.000	3.4E+01	4.2E+14	1.7E+48	0.000	8.4E+00	1	-8.4E+00	-1	8.3E+00	1	-8.3E+00	-1	4.37E-16
5	12.5	0.00313	-4.0E+01	6.4E-18	-1.7E+48	2.000	4.2E+01	1.9E+18	1.7E+48	0.000	7.5E+00	1	-7.5E+00	-1	7.5E+00	1	-7.5E+00	-1	1.59E-19
6	15	0.00313	-4.8E+01	2.3E-21	-1.7E+48	2.000	5.1E+01	8.7E+21	1.7E+48	0.000	6.8E+00	1	-6.8E+00	-1	6.8E+00	1	-6.8E+00	-1	5.78E-23
7	17.5	0.00313	-5.5E+01	8.4E-25	-1.7E+48	2.000	5.9E+01	3.9E+25	1.7E+48	0.000	6.3E+00	1	-6.3E+00	-1	6.3E+00	1	-6.3E+00	-1	2.10E-26
8	20	0.00313	-6.3E+01	3.1E-28	-1.7E+48	2.000	6.7E+01	1.8E+29	1.7E+48	0.000	5.9E+00	1	-5.9E+00	-1	5.9E+00	1	-5.9E+00	-1	7.64E-30
9	22.5	0.00313	-7.1E+01	1.1E-31	-1.7E+48	2.000	7.6E+01	8.1E+32	1.7E+48	0.000	5.6E+00	1	-5.6E+00	-1	5.6E+00	1	-5.6E+00	-1	2.78E-33
10	25	0.00313	-7.9E+01	4.0E-35	-1.7E+48	2.000	8.4E+01	3.7E+36	1.7E+48	0.000	5.3E+00	1	-5.3E+00	-1	5.3E+00	1	-5.3E+00	-1	1.01E-36
11	27.5	0.00313	-8.7E+01	1.5E-38	-1.7E+48	2.000	9.3E+01	1.7E+40	1.7E+48	0.000	5.1E+00	1	-5.1E+00	-1	5.0E+00	1	-5.0E+00	-1	3.68E-40
12	30	0.00313	-9.5E+01	5.3E-42	-1.7E+48	2.000	1.0E+02	7.5E+43	1.7E+48	0.000	4.8E+00	1	-4.8E+00	-1	4.8E+00	1	-4.8E+00	-1	1.34E-43
13	32.5	0.00313	-1.0E+02	1.9E-45	-1.7E+48	2.000	1.1E+02	3.4E+47	1.7E+48	0.000	4.7E+00	1	-4.7E+00	-1	4.6E+00	1	-4.6E+00	-1	4.86E-47
14	35	0.00313	-1.1E+02	7.1E-49	-1.7E+48	2.000	1.2E+02	1.6E+51	1.7E+48	0.000	4.5E+00	1	-4.5E+00	-1	4.5E+00	1	-4.5E+00	-1	1.77E-50
15	37.5	0.00313	-1.2E+02	2.6E-52	-1.7E+48	2.000	1.3E+02	7.0E+54	1.7E+48	0.000	4.3E+00	1	-4.3E+00	-1	4.3E+00	1	-4.3E+00	-1	6.43E-54
16	40	0.00313	-1.3E+02	9.3E-56	-1.7E+48	2.000	1.3E+02	3.2E+58	1.7E+48	0.000	4.2E+00	1	-4.2E+00	-1	4.2E+00	1	-4.2E+00	-1	2.34E-57
17	42.5	0.00313	-1.3E+02	3.4E-59	-1.7E+48	2.000	1.4E+02	1.4E+62	1.7E+48	0.000	4.1E+00	1	-4.1E+00	-1	4.0E+00	1	-4.0E+00	-1	8.50E-61
18	45	0.00313	-1.4E+02	1.2E-62	-1.7E+48	2.000	1.5E+02	6.6E+65	1.7E+48	0.000	4.0E+00	1	-4.0E+00	-1	3.9E+00	1	-3.9E+00	-1	3.09E-64
19	47.5	0.00313	-1.5E+02	4.5E-66	-1.7E+48	2.000	1.6E+02	3.0E+69	1.7E+48	0.000	3.8E+00	1	-3.8E+00	-1	3.8E+00	1	-3.8E+00	-1	1.12E-67
20	50	0.00313	-1.6E+02	1.6E-69	-1.7E+48	2.000	1.7E+02	1.3E+73	1.7E+48	0.000	3.8E+00	1	-3.8E+00	-1	3.7E+00	1	-3.7E+00	-1	4.09E-71



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	9.09E-06
5.0	3.31E-09
7.5	1.20E-12
10.0	4.37E-16
12.5	1.59E-19
15.0	5.78E-23
17.5	2.10E-26
20.0	7.64E-30
22.5	2.78E-33
25.0	1.01E-36
27.5	3.68E-40
30.0	1.34E-43
32.5	4.86E-47
35.0	1.77E-50
37.5	6.43E-54
40.0	2.34E-57
42.5	8.50E-61
45.0	3.09E-64
47.5	1.12E-67
50.0	4.09E-71

Contaminant **richloroethene**

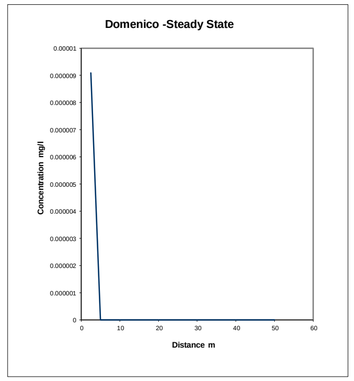
DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.01	mg/l
Co	2.50E-02	mg/l
λ	2.95E-04	days^{-1}
Sz	7.50E+01	m
Sy	1.18E+01	m
Kd	2.15E+03	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion optio Simulate vertical dispersion in 1 direction

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.00625	-7.92E+00	3.64E-04	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	9.09E-06
2	5	0.00625	-1.58E+01	1.32E-07	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	3.31E-09
3	7.5	0.00625	-2.38E+01	4.81E-11	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	1.20E-12
4	10	0.00625	-3.17E+01	1.75E-14	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	4.37E-16
5	12.5	0.00625	-3.96E+01	6.36E-18	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	1.59E-19
6	15	0.00625	-4.75E+01	2.31E-21	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	5.78E-23
7	17.5	0.00625	-5.54E+01	8.41E-25	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	2.10E-26
8	20	0.00625	-6.34E+01	3.06E-28	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	7.64E-30
9	22.5	0.00625	-7.13E+01	1.11E-31	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-0.9999	2.78E-33
10	25	0.00625	-7.92E+01	4.04E-35	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-0.9998	1.01E-36
11	27.5	0.00625	-8.71E+01	1.47E-38	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-0.9996	3.67E-40
12	30	0.00625	-9.50E+01	5.35E-42	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	1.34E-43
13	32.5	0.00625	-1.03E+02	1.94E-45	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.9989	4.85E-47
14	35	0.00625	-1.11E+02	7.07E-49	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.9984	1.76E-50
15	37.5	0.00625	-1.19E+02	2.57E-52	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.9977	6.41E-54
16	40	0.00625	-1.27E+02	9.35E-56	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	2.33E-57
17	42.5	0.00625	-1.35E+02	3.40E-59	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.9958	8.46E-61
18	45	0.00625	-1.43E+02	1.24E-62	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.9946	3.07E-64
19	47.5	0.00625	-1.50E+02	4.49E-66	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.9932	1.12E-67
20	50	0.00625	-1.58E+02	1.63E-69	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	4.05E-71



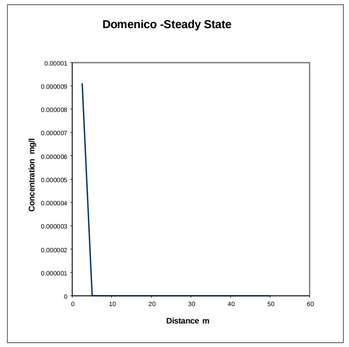
Calc **Value**

v	7.60E-02	m/d
Rc	1.38E+04	
u	5.53E-06	m/d

DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.00625	-7.92E+00	3.64E-04	1.68E+01	1	-1.68E+01	-1	1.67E+01	1	-1.67E+01	-1	9.09E-06
2	5	0.00625	-1.58E+01	1.32E-07	1.19E+01	1	-1.19E+01	-1	1.18E+01	1	-1.18E+01	-1	3.31E-09
3	7.5	0.00625	-2.38E+01	4.81E-11	9.68E+00	1	-9.68E+00	-1	9.63E+00	1	-9.63E+00	-1	1.20E-12
4	10	0.00625	-3.17E+01	1.75E-14	8.39E+00	1	-8.39E+00	-1	8.34E+00	1	-8.34E+00	-1	4.37E-16
5	12.5	0.00625	-3.96E+01	6.36E-18	7.50E+00	1	-7.50E+00	-1	7.46E+00	1	-7.46E+00	-1	1.59E-19
6	15	0.00625	-4.75E+01	2.31E-21	6.85E+00	1	-6.85E+00	-1	6.81E+00	1	-6.81E+00	-1	5.78E-23
7	17.5	0.00625	-5.54E+01	8.41E-25	6.34E+00	1	-6.34E+00	-1	6.31E+00	1	-6.31E+00	-1	2.10E-26
8	20	0.00625	-6.34E+01	3.06E-28	5.93E+00	1	-5.93E+00	-1	5.90E+00	1	-5.90E+00	-1	7.64E-30
9	22.5	0.00625	-7.13E+01	1.11E-31	5.59E+00	1	-5.59E+00	-1	5.56E+00	1	-5.56E+00	-1	2.78E-33
10	25	0.00625	-7.92E+01	4.04E-35	5.30E+00	1	-5.30E+00	-1	5.28E+00	1	-5.28E+00	-1	1.01E-36
11	27.5	0.00625	-8.71E+01	1.47E-38	5.06E+00	1	-5.06E+00	-1	5.03E+00	1	-5.03E+00	-1	3.68E-40
12	30	0.00625	-9.50E+01	5.35E-42	4.84E+00	1	-4.84E+00	-1	4.82E+00	1	-4.82E+00	-1	1.34E-43
13	32.5	0.00625	-1.03E+02	1.94E-45	4.65E+00	1	-4.65E+00	-1	4.63E+00	1	-4.63E+00	-1	4.86E-47
14	35	0.00625	-1.11E+02	7.07E-49	4.48E+00	1	-4.48E+00	-1	4.46E+00	1	-4.46E+00	-1	1.77E-50
15	37.5	0.00625	-1.19E+02	2.57E-52	4.33E+00	1	-4.33E+00	-1	4.31E+00	1	-4.31E+00	-1	6.43E-54
16	40	0.00625	-1.27E+02	9.35E-56	4.19E+00	1	-4.19E+00	-1	4.17E+00	1	-4.17E+00	-1	2.34E-57
17	42.5	0.00625	-1.35E+02	3.40E-59	4.07E+00	1	-4.07E+00	-1	4.05E+00	1	-4.05E+00	-1	8.50E-61
18	45	0.00625	-1.43E+02	1.24E-62	3.95E+00	1	-3.95E+00	-1	3.93E+00	1	-3.93E+00	-1	3.09E-64
19	47.5	0.00625	-1.50E+02	4.49E-66	3.85E+00	1	-3.85E+00	-1	3.83E+00	1	-3.83E+00	-1	1.12E-67
20	50	0.00625	-1.58E+02	1.63E-69	3.75E+00	1	-3.75E+00	-1	3.73E+00	1	-3.73E+00	-1	4.09E-71



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	9.09E-06
5.0	3.31E-09
7.5	1.20E-12
10.0	4.37E-16
12.5	1.59E-19
15.0	5.78E-23
17.5	2.10E-26
20.0	7.64E-30
22.5	2.78E-33
25.0	1.01E-36
27.5	3.68E-40
30.0	1.34E-43
32.5	4.86E-47
35.0	1.77E-50
37.5	6.43E-54
40.0	2.34E-57
42.5	8.50E-61
45.0	3.09E-64
47.5	1.12E-67
50.0	4.09E-71

DOMENICO (TIME VARIANT)

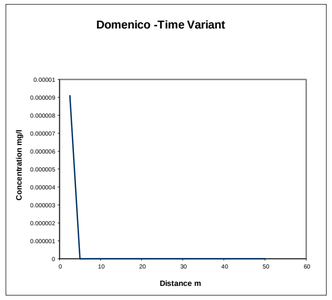
Contaminant	Trichloroethene	
Input	**Value**	**Units**
C_T	0.01	mg/l
Co	2.50E-02	mg/l
λ	2.95E-04	days^{-1}
Sz	7.50E+01	m
Sy	1.18E+01	m
Kd	2.15E+03	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option: Simulate vertical dispersion in 1 direction

Calc	Value	
v	7.60E-02	m/d
Rc	1.38E+04	
u	5.53E-06	m/d

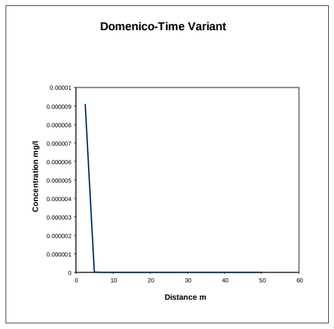
Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.00313	-7.92E+00	3.64E-04	-1.71E+48	2	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	9.09E-06
2	5	0.00313	-1.58E+01	1.32E-07	-1.71E+48	2	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	3.31E-09
3	7.5	0.00313	-2.38E+01	4.81E-11	-1.71E+48	2	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	1.20E-12
4	10	0.00313	-3.17E+01	1.75E-14	-1.71E+48	2	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	4.37E-16
5	12.5	0.00313	-3.96E+01	6.36E-18	-1.71E+48	2	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	1.59E-19
6	15	0.00313	-4.75E+01	2.31E-21	-1.71E+48	2	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	5.78E-23
7	17.5	0.00313	-5.54E+01	8.41E-25	-1.71E+48	2	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	2.10E-26
8	20	0.00313	-6.34E+01	3.06E-28	-1.71E+48	2	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	7.64E-30
9	22.5	0.00313	-7.13E+01	1.11E-31	-1.71E+48	2	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-1	2.78E-33
10	25	0.00313	-7.92E+01	4.04E-35	-1.71E+48	2	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-1	1.01E-36
11	27.5	0.00313	-8.71E+01	1.47E-38	-1.71E+48	2	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-1	3.67E-40
12	30	0.00313	-9.50E+01	5.35E-42	-1.71E+48	2	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	1.34E-43
13	32.5	0.00313	-1.03E+02	1.94E-45	-1.71E+48	2	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.999	4.85E-47
14	35	0.00313	-1.11E+02	7.07E-49	-1.71E+48	2	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.998	1.76E-50
15	37.5	0.00313	-1.19E+02	2.57E-52	-1.71E+48	2	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.998	6.41E-54
16	40	0.00313	-1.27E+02	9.35E-56	-1.71E+48	2	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	2.33E-57
17	42.5	0.00313	-1.35E+02	3.40E-59	-1.71E+48	2	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.996	8.46E-61
18	45	0.00313	-1.43E+02	1.24E-62	-1.71E+48	2	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.995	3.07E-64
19	47.5	0.00313	-1.50E+02	4.49E-66	-1.71E+48	2	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.993	1.12E-67
20	50	0.00313	-1.58E+02	1.63E-69	-1.71E+48	2	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	4.05E-71



Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.00313	-7.92E+00	3.64E-04	-1.71E+48	2	1.68E+01	1	-1.68E+01	-1	1.67E+01	1	-1.67E+01	-1	9.09E-06
2	5	0.00313	-1.58E+01	1.32E-07	-1.71E+48	2	1.19E+01	1	-1.19E+01	-1	1.18E+01	1	-1.18E+01	-1	3.31E-09
3	7.5	0.00313	-2.38E+01	4.81E-11	-1.71E+48	2	9.68E+00	1	-9.68E+00	-1	9.63E+00	1	-9.63E+00	-1	1.20E-12
4	10	0.00313	-3.17E+01	1.75E-14	-1.71E+48	2	8.39E+00	1	-8.39E+00	-1	8.34E+00	1	-8.34E+00	-1	4.37E-16
5	12.5	0.00313	-3.96E+01	6.36E-18	-1.71E+48	2	7.50E+00	1	-7.50E+00	-1	7.46E+00	1	-7.46E+00	-1	1.59E-19
6	15	0.00313	-4.75E+01	2.31E-21	-1.71E+48	2	6.85E+00	1	-6.85E+00	-1	6.81E+00	1	-6.81E+00	-1	5.78E-23
7	17.5	0.00313	-5.54E+01	8.41E-25	-1.71E+48	2	6.34E+00	1	-6.34E+00	-1	6.31E+00	1	-6.31E+00	-1	2.10E-26
8	20	0.00313	-6.34E+01	3.06E-28	-1.71E+48	2	5.93E+00	1	-5.93E+00	-1	5.90E+00	1	-5.90E+00	-1	7.64E-30
9	22.5	0.00313	-7.13E+01	1.11E-31	-1.71E+48	2	5.59E+00	1	-5.59E+00	-1	5.56E+00	1	-5.56E+00	-1	2.78E-33
10	25	0.00313	-7.92E+01	4.04E-35	-1.71E+48	2	5.30E+00	1	-5.30E+00	-1	5.28E+00	1	-5.28E+00	-1	1.01E-36
11	27.5	0.00313	-8.71E+01	1.47E-38	-1.71E+48	2	5.06E+00	1	-5.06E+00	-1	5.03E+00	1	-5.03E+00	-1	3.68E-40
12	30	0.00313	-9.50E+01	5.35E-42	-1.71E+48	2	4.84E+00	1	-4.84E+00	-1	4.82E+00	1	-4.82E+00	-1	1.34E-43
13	32.5	0.00313	-1.03E+02	1.94E-45	-1.71E+48	2	4.65E+00	1	-4.65E+00	-1	4.63E+00	1	-4.63E+00	-1	4.86E-47
14	35	0.00313	-1.11E+02	7.07E-49	-1.71E+48	2	4.48E+00	1	-4.48E+00	-1	4.46E+00	1	-4.46E+00	-1	1.77E-50
15	37.5	0.00313	-1.19E+02	2.57E-52	-1.71E+48	2	4.33E+00	1	-4.33E+00	-1	4.31E+00	1	-4.31E+00	-1	6.43E-54
16	40	0.00313	-1.27E+02	9.35E-56	-1.71E+48	2	4.19E+00	1	-4.19E+00	-1	4.17E+00	1	-4.17E+00	-1	2.34E-57
17	42.5	0.00313	-1.35E+02	3.40E-59	-1.71E+48	2	4.07E+00	1	-4.07E+00	-1	4.05E+00	1	-4.05E+00	-1	8.50E-61
18	45	0.00313	-1.43E+02	1.24E-62	-1.71E+48	2	3.95E+00	1	-3.95E+00	-1	3.93E+00	1	-3.93E+00	-1	3.09E-64
19	47.5	0.00313	-1.50E+02	4.49E-66	-1.71E+48	2	3.85E+00	1	-3.85E+00	-1	3.83E+00	1	-3.83E+00	-1	1.12E-67
20	50	0.00313	-1.58E+02	1.63E-69	-1.71E+48	2	3.75E+00	1	-3.75E+00	-1	3.73E+00	1	-3.73E+00	-1	4.09E-71



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	9.09E-06
5.0	3.31E-09
7.5	1.20E-12
10.0	4.37E-16
12.5	1.59E-19
15.0	5.78E-23
17.5	2.10E-26
20.0	7.64E-30
22.5	2.78E-33
25.0	1.01E-36
27.5	3.68E-40
30.0	1.34E-43
32.5	4.86E-47
35.0	1.77E-50
37.5	6.43E-54
40.0	2.34E-57
42.5	8.50E-61
45.0	3.09E-64
47.5	1.12E-67
50.0	4.09E-71

Hydrogeological risk assessment for land contamination

Remedial Targets Worksheet , Release 3.2

First released: 2006. Version 3.2: January 2013

This worksheet has been produced in combination with the document 'Remedial Targets Methodology: Hydrogeological risk assessment for land contamination (Environment Agency 2006).

Users of this worksheet should always refer to the User Manual to the Remedial Targets Methodology and to relevant guidance on UK legislation and policy, in order to understand how this procedure should be applied in an appropriate context.

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The calculation of equations in this worksheet has been independently checked by Entec (UK) Ltd on behalf of the Environment Agency.

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IMPORTANT: To enable MS Excel worksheet, click Tools, Add -Ins, Analysis Tool Pak and Analysis Tool Pak-VBA (to calculate error functions)

Details to be completed for each assessment				
Site Name:	Kelvedon Street			
Site Address:	Newport			
Completed by:	Michael Watkins			
Date:	11-Dec-25		Version:	1
Contaminant	Trichloroethene			
Target Concentration (C_T)	0.01	mg/l	Origin of C_T:	WFD for inland surface waters (annual average)

This worksheet can be used to determine remedial targets for soils (Worksheets Level 1 Soil, Level 2 and Level 3 Soil) or to determine remedial targets for groundwater (Level 3 Groundwater). For Level 3, parameter values must be entered separately dependent on whether the assessment is for soil or groundwater. For soil, remedial targets are calculated as either mg/kg (for comparision with soil measurements) or mg/l (for comparison with leaching tests or pore water concentrations).
Site details entered on this page are automatically copied to Level 1, 2 and 3 Worksheets.
Worksheet options are identified by brown background and employ a pull-down menus. Data entry are identified as blue background.
Data origin / justification should be noted in cells coloured yellow and fully documented in subsequent reports.
Data carried forward from an earlier worksheet are identified by a light green background
It is recommended that a copy of the original worksheet is saved (all data fields in the original copy are blank).

The spreadsheet also includes a porosity calculation worksheet, a soil impact calculation worksheet and a worksheet that performs some simple hydrogeological calculations.

Remedial Targets Worksheet , Release 3.2

Level 1 - Soil

Select the method of calculating the soil water Partition Co-efficient by using the pull down menu below

User specified value for partition coefficient

Contaminant		**Trichloroethene**		
Target concentration	**C_T**	**0.01**	**mg/l**	

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**
Standard entry				
Water filled soil porosity	θ_W	0.00E+00	fraction	
Air filled soil porosity	θa	0.00E+00	fraction	
Bulk density of soil zone material	ρ	0.00E+00	g/cm^3	
Henry's Law constant	H	0.00E+00	dimensionless	
Entry if specify partition coefficient (option)				
Soil water partition coefficient	Kd	0.00E+00	l/kg	
Entry for non-polar organic chemicals (option)				
Fraction of organic carbon (in soil)	foc		fraction	
Organic carbon partition coefficient	Koc		l/kg	
Entry for ionic organic chemicals (option)				
Sorption coefficient for neutral species	$K_{oc,n}$		l/kg	
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg	
pH value	pH		pH units	
Acid dissociation constant	pKa			
Fraction of organic carbon (in soil)	foc		fraction	

This sheet calculates the Level 1 remedial target for soils(mg/kg) based on a selected target concentration and theoretical calculation of soil water partitioning. Three options are included for determining the partition coefficient.

The measured soil concentration as mg/kg should be compared with the Level 1 remedial target to determine the need for further action.

Soil water partition coefficient used in Level Assessment	**Kd**	**0.00E+00**	**l/kg**	*Specified value*

Level 1 Remedial Target

Level 1 Remedial Target	**#DIV/0!**	**mg/kg**	**(for comparison with soil analyses)**
	or		
	0.01	**mg/l**	**(for comparison with leachate test results)**

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 2 - Soil

Contaminant		**Trichloroethene**	from Level 1	This sheet calculates the Level 2 remedial target for soils (mg/kg) or for pore water (mg/l).
Target concentration	**C_T**	**0.01** **mg/l**	from Level 1	

The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 2 remedial target to determine the need for further action. Equations presented in 'Hydrogeological risk assessment for land contamiantion' (Environment Agency 2006)

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**	
Standard entry					
Infiltration	Inf	0.00E+00	m/d		
Area of contaminant source	A	0.00E+00	m^2		Not used in calculation
Entry for groundwater flow below site					
Length of contaminant source in direction of groundwater flow	L	0.00E+00	m		
Saturated aquifer thickness	da	0.00E+00	m		
Hydraulic Conductivity of aquifer in which dilution occurs	K	0.00E+00	m/d		
Hydraulic gradient of water table	i	0.00E+00	fraction		
Width of contaminant source perpendicular to groundwater flow	w	0.00E+00	m		Not used in calculation
Background concentration of contaminant in groundwater beneath site	Cu	0.00E+00	mg/l		
Define mixing zone depth by specifying or calculating depth (using pull down list)		**Specify**			
Enter mixing zone thickness	Mz	0.00E+00	m		
Calculated mixing zone thickness	Mz		m		

Calculated Parameters

Dilution Factor	**DF**	**#DIV/0!**		
Level 2 Remedial Target		**#DIV/0!**	**mg/l**	**For comparison with measured pore water concentration. This assumes Level 1 Remedial Target is based on Target Concentrati**
		or		
		#DIV/0!	**mg/kg**	**For comparison with measured soil concentration. This assumes Level 1 Remedial Target calculated from soil-water**

Additional option

Calculation of impact on receptor

Concentration of contaminant in contaminated discharge (entering receptor)	Cc	0.00E+00	mg/l	
Calculated concentration within receptor (dilution only)		#DIV/0!	mg/l	0

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 3 - Soil

See Note

Input Parameters	Variable	Value	Unit	Source
Contaminant		Trichloroethene		from Level 1
Target Concentration	C_T	0.01	mg/l	from Level 1
Dilution Factor	DF	#DIV/0!		from Level 2

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value, l

	Variable	Value	Unit	Source of parameter value
Enter source concentration		Soil concentration as mg/kg		
Enter soil concentration		0	mg/kg	
Half life for degradation of contaminant in water	$t_{1/2}$	1.00E+100	days	
Calculated decay rate	λ	6.93E-101	$days^{-1}$	calculated
Width of plume in aquifer at source	Sz	0.00E+00	m	from Level 2
Plume thickness in aquifer at source	Sy	0.00E+00	m	from Level 2
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Effective porosity of aquifer	n	0.00E+00	fraction	
Hydraulic gradient	i	#DIV/0!	fraction	from Level 2 (adjusted)
Hydraulic conductivity of saturated aquifer	K	0.00E+00	m/d	from Level 2
Distance to compliance point	x	0.00E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	1.00E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	0.00E+00	l/kg	*see options*
Longitudinal dispersivity	ax	0.000	m	*see options*
Transverse dispersivity	az	0.000	m	*see options*
Vertical dispersivity	ay	0.000	m	*see options*

Parameter values should be checked against Level 1 and 2

Calculated Parameters	Variable		
Groundwater flow velocity	v	#DIV/0!	m/d
Retardation factor	Rf	#DIV/0!	fraction
Decay rate used	λ	6.93E-101	d^{-1}
Hydraulic gradient used in aquifer flow down-gradient	i	#DIV/0!	fraction
Rate of contaminant flow due to retardation	u	#DIV/0!	m/d
Ratio of Compliance Point to Source Concentration	C_{ED}/C_0	#DIV/0!	fraction
Attenuation factor (C_0/C_{ED})	**AF**	**#DIV/0!**	**fraction**
Calculated soil leachate concentration	Co	#DIV/0!	mg/l

Remedial Targets

Level 3 Remedial Target		**#DIV/0!**	**mg/l**	For comparison with measured pore water concentration.
Ogata Banks		**or**		This assumes Level 1 Remedial Target is based on Target Concentration.
		#DIV/0!	**mg/kg**	For comparison with measured soil concentration. This
Distance to compliance point		**0**	**m**	assumes Level 1 Remedial Target calculated from soil-water partitioning equation.
Ratio of Compliance Point to Source Concentration	C_{ED}/C_0	**#DIV/0!**	**fraction**	Ogata Banks

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99

Enter method of defining partition co-efficient (using pull down list)

Calculate for ionic organic chemicals (acids)

Entry if specify partition coefficient (option)

Soil water partition coefficient	Kd		l/kg

Entry for non-polar organic chemicals (option)

Fraction of organic carbon in aquifer	foc		fraction
Organic carbon partition coefficient	Koc		l/kg

Entry for ionic organic chemicals (option)

Sorption coefficient for related species	$K_{OC,n}$	0.00E+00	l/kg
Sorption coefficient for ionised species	$K_{OC,I}$	0.00E+00	l/kg
pH value	pH	0.00E+00	
Acid dissociation constant	pKa	0.00E+00	
Fraction of organic carbon in aquifer	foc	0.00E+00	fraction
Soil water partition coefficient	Kd	0.00E+00	l/kg

Define dispersivity (click brown cell and use pull down list)

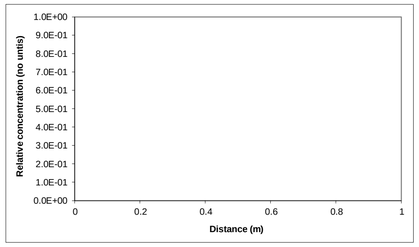
User defined values for dispersivity

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	0.00E+00	#NUM!	m
Transverse dispersivity	**az**	0.00E+00	0.00E+00	#NUM!	m
Vertical dispersivity	**ay**	0.00E+00	0.00E+00	#NUM!	m

Note values of dispersivity must be > 0

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed

Note
This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O_2, NO_3, SO_4 etc than an alternative solution should be used



Note: 'Relative concentration' is the ratio of calculated concentation at a given position compared to the source concentration. The calculations assume plume disperses from the top of the aquifer. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

This sheet calculates the Level 3 remedial target for soils(mg/kg) or for pore water (mg/l), based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.By setting a long travel time (e.g. 9E99) it will give the steady state solution, which should always be used when calculating remedial targets.

The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.9E+99.

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Calculated (relative) concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Relative concentration (No units)	Concentration mg/l
0	1.0E+00	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!

Remedial Targets Worksheet , Release 3.2

Calculation of contaminant concentration in groundwater from a soil source

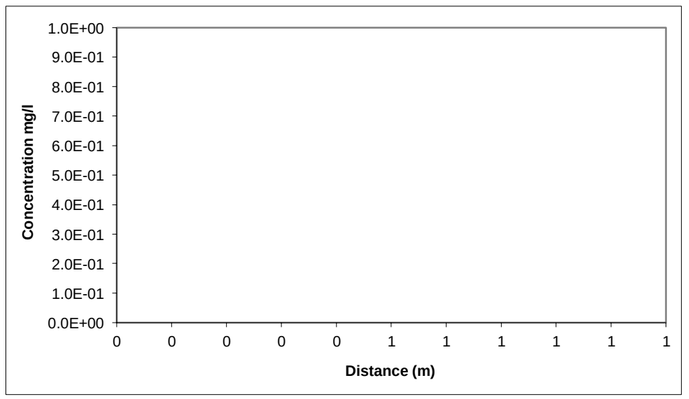
Only input required is Soil Contaminant Concentration

	Input Parameters			
	Soil contaminant concentration	C_0	0.00E+00	mg/kg
Level 1 Parameters				
	Water filled soil porosity	θ_W	0.00E+00	fraction
	Air filled soil porosity	θa	0.00E+00	fraction
	Bulk density	ρ	0.00E+00	g/cm^3
	Henry's Law constant	H	0.00E+00	dimensionless
	Soil water partition coefficient used in Level Assessment	Kd	0.00E+00	l/kg
	Factor (partitioning between soil and water)		#DIV/0!	dimensionless
Level 2 Parameters	**Dilution Factor**	DF	#DIV/0!	
Level 3 Parameters	**Attenuation factor (C_O/C_{ED})**	AF	#DIV/0!	

Predicted concentrations at compliance point

Level 1	C	#DIV/0!	mg/l	No dilution or attenuation
Level 2	C	#DIV/0!	mg/l	Dilution taken into account
Level 3	C	#DIV/0!	mg/l	Dilution and attenuation taken into account

Predicted concentrations between source and compliance point - Level 3



Distance m	Concentration mg/l
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

	Variable	Value	Unit	Source
Contaminant		Trichloroethene		from Level 1
Target Concentration	C_T	1.00E-02	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Domenico - Steady state — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	2.50E-02	mg/l	*Site investigation data*
Half life for degradation of contaminant in water	$t_{1/2}$	2.35E+03	days	*Howard et al (1991) Low anaerobic biodeg*
Calculated decay rate	λ	2.95E-04	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	7.50E+01	m	*Length of site perpendicular to groundwater flow*
Plume thickness at source	Sy	1.18E+01	m	*Same as Mixing Zone Thickness. "For a thin aquifer (typically <10m), the mixing zone thickness can be taken as the ac*
Saturated aquifer thickness	da	1.20E+01	m	*Maximum thickness recorded in vicinity of*
Bulk density of aquifer materials	ρ	1.60E+00	g/cm^3	*Typical bulk density for river terrace deposits*
Effective porosity of aquifer	n	4.40E-01	fraction	*Maximum porosity for coarse Gravel (Lovanh et al 2000) - conservative estimate*
Hydraulic gradient	i	4.40E-02	fraction	*Borehole level data*
Hydraulic conductivity of aquifer	K	1.00E+02	m/d	*Maximum typical value for clayey sandy G*
Distance to compliance point	x	5.00E+01	m	*Default compliance distance*
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	9.90E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	2.15E+03	l/kg	*see options*
Longitudinal dispersivity	ax	5.00E+00	m	*see options*
Transverse dispersivity	az	5.00E-01	m	*see options*
Vertical dispersivity	ay	5.00E-02	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)

Soil water partition coefficient — Kd — 2.15E+03 — l/kg

Entry for non-polar organic chemicals (option)

Fraction of organic carbon in aquifer — foc — fraction

Organic carbon partition coefficient — Koc — l/kg

Entry for ionic organic chemicals (option)

Sorption coefficient for related species — $K_{OC,n}$ — l/kg

Sorption coefficient for ionised species — $K_{OC,I}$ — l/kg

pH value — pH

acid dissociation constant — pKa

Fraction of organic carbon in aquifer — foc — fraction

Soil water partition coefficient	Kd	2.15E+03	l/kg

Define dispersivity (click brown cell and use pull down list)

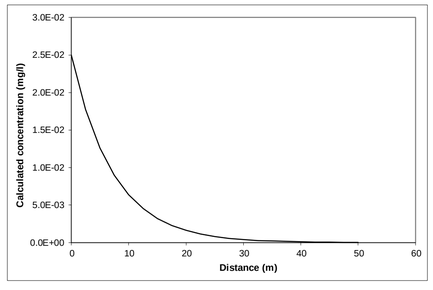
Dispersivities 10%, 1%, 0.1% of pathway length

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	5.00E+00	2.98E+00	m
Transverse dispersivity	**az**	0.00E+00	5.00E-01	2.98E-01	m
Vertical dispersivity	**ay**	0.00E+00	5.00E-02	2.98E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Calculated concentrations for distance-concentration graph

Domenico - Steady state
From calculation sheet

Distance	Concentration
	mg/l
0	2.5E-02
2.5	1.78E-02
5.0	1.26E-02
7.5	8.96E-03
10.0	6.36E-03
12.5	4.52E-03
15.0	3.21E-03
17.5	2.28E-03
20.0	1.62E-03
22.5	1.15E-03
25.0	8.17E-04
27.5	5.80E-04
30.0	4.12E-04
32.5	2.93E-04
35.0	2.08E-04
37.5	1.48E-04
40.0	1.05E-04
42.5	7.45E-05
45.0	5.29E-05
47.5	3.76E-05
50.0	2.67E-05

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared

with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Calculated Parameters

	Variable		
Groundwater flow velocity	v	1.00E+01	m/d
Retardation factor	Rf	7.82E+03	fraction
Decay rate used	λ	2.95E-04	d^{-1}
Rate of contaminant flow due to retardation	u	1.28E-03	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	2.67E-05	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**9.36E+02**	

Remedial Targets

Remedial Target		**9.36E+00**	**mg/l**	For comparison with measured groundwater concentration.
Domenico - Steady state				
Distance to compliance point		**50**	**m**	
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**2.67E-05**	**mg/l**	Domenico - Steady state

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Porosity Calculator

These results are not carried through to any of the other worksheets

DRY BULK DENSITY DATA

Variable	Value	Unit	justification
Natural Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Dry Bulk Density	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
Initial Saturation	#DIV/0!	*%*	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	
Water Filled Porosity	**#DIV/0!**	**fraction**	

WET BULK DENSITY DATA

Variable	Value	Unit	
Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Actual (wet) Bulk Density (i.e. at natural MC)	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
dry bulk density	0.00	tonnes/m^3	
Initial Saturation	#DIV/0!	*%*	
Total porosity	**1.000**	**fraction**	**#DIV/0!**
Air Filled Porosity	**#DIV/0!**	**fraction**	
Water Filled Porosity	**#DIV/0!**	**fraction**	

Analytical solutions provided by David Hall, Golder Associates (UK) Ltd

Simple hydrogeological calculations

(These are not specific to, or required in, the Remedial Targets Methodology)

Parameter	symbol		unit	justification
Hydraulic conductivity	K	0.00E+00	m/d	
Hydraulic gradient	i	0.00E+00	unitless	
Effective porosity of aquifer	n	0.00E+00	fraction	
Thickness of saturated aquifer	b	0.00E+00	m	
Width of aquifer perpendicular to flow	w	0.00E+00	m	
Distance to receptor	x	0.00E+00	m	
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Soil-water partition co-efficient	Kd	0.00E+00	l/kg	
Retardation factor of pollutant	R	#DIV/0!		

Groundwater flow velocity	v(GW)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for groundwater to reach receptor	t(GW)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years
Rate of groundwater flow through aquifer	Q	0.00E+00	m^3/s	0.00E+00	m^3/day	0.00E+00	m^3/year

Contaminant flow velocity	v(contam)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for contaminant to reach receptor	t(contam)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years

Level 1 Calculation Sheet

Contaminant **Trichloroethene**

Parameter	Value	Units
(carried over from input sheet)		
C_T	1.00E-02	mg/l
Kd	0.00E+00	l/kg
foc		fraction
koc		l/kg
θ_W	0.00E+00	fraction
θa	0.00E+00	fraction
ρ	0.00E+00	g/cm3
H	0.00E+00	dimensionless
Koc,n		l/kg
Koc,i		l/kg
pH		pH units
pKa		
foc (ionic)		fraction

Calculations (Refer toTable 4.3, R&D Publication 20)

Selected option User specified value for partition coefficient

calc calc Calc Kd l/kg

Calculation of partition coefficient for ionic organic chemical

Partition coefficient used in Level 1 Assessment 0.00E+00 l/kg

Calculated Remedial Target **#DIV/0!** **mg/kg** **for Trichloroethene**

Factor (partitioning between soil and water) #DIV/0!

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11/12/2025
Version:	1

Level 2 Calculation Sheet

Contaminant **Trichloroethene**

Site assessed:	Kelvedon Stre
Date:	11/12/2025
Version:	1

Parameter	Value	Units		
(carried over from input sheet)				
Mz	0.00E+00	m		
L	0.00E+00	m		
da	0.00E+00	m		Calculated
Inf	0.00E+00	m/d		Dilution Factor
K	0.00E+00	m/d		
i	0.00E+00		Calculation based on target concentration	#DIV/0!
A	0.00E+00	m3/d m2 m3/d	Calculation based on observed contaminant concentration	#DIV/0!
Cc	0.00E+00	mg/l		
C_T	1.00E-02	mg/l		
Cu	0.00E+00	mg/l		
w	0.00E+00	m		



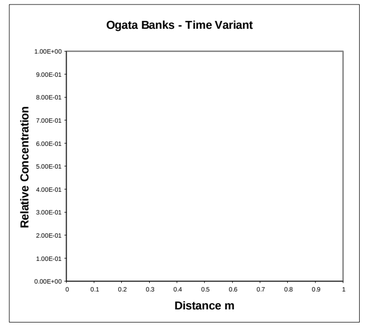
Contaminant **Trichloroethene**

OGATA BANKS SOLUTION

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-02	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Calc	Value	
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) -USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

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Version:	1

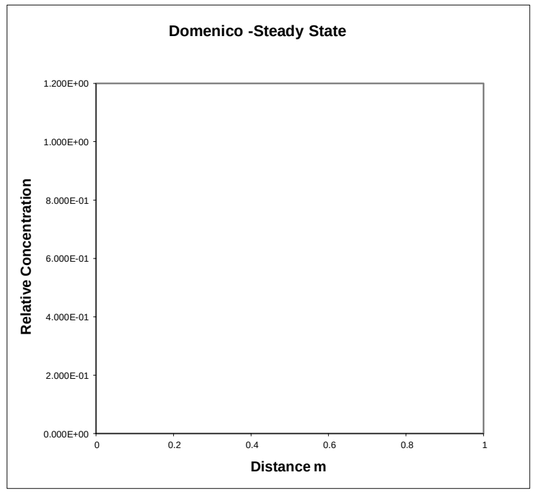
Contaminant **richloroethene**

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-02	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

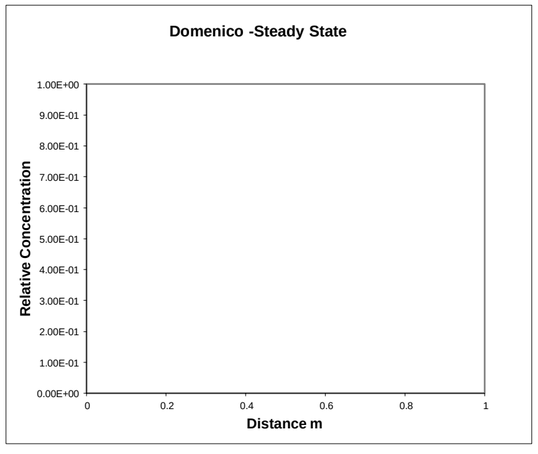


Calc	Value	Units
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



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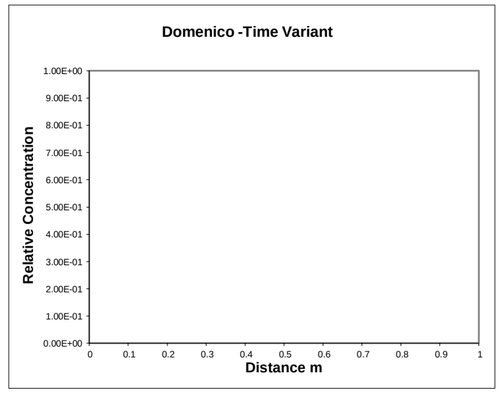
DOMENICO (TIME VARIANT)

Contaminant trichloroethene

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.01	mg/l
DF	#DIV/0!	
λ	6.931E-101	days^{-1}
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

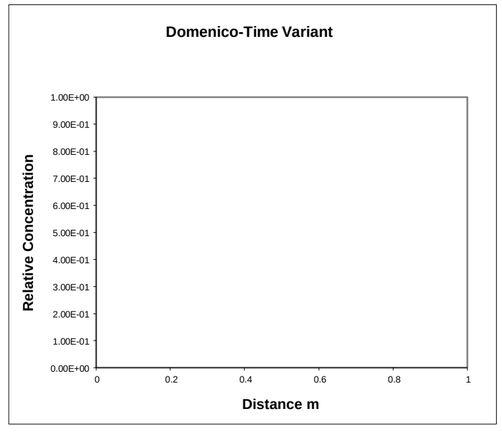


Calc **Value**

v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Date:	11/12/2025
Version:	1

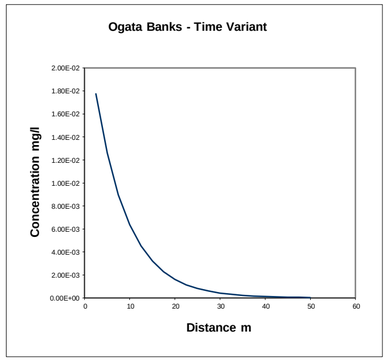
OGATA BANKS SOLUTION

Contaminant **Trichloroethene**

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.01	mg/l
Co	2.50E-02	mg/l
λ	2.95E-04	days^{-1}
Sz	7.50E+01	m
Sy	1.18E+01	m
Kd	2.15E+03	l/kg
ρ	1.60E+00	g/cm3
n	4.40E-01	
i	4.40E-02	
K	1.00E+02	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.00313	-3.4E-01	7.1E-01	-1.9E+48	2.000	8.4E-01	2.3E+00	1.9E+48	0.000	1.7E+01	1	-1.7E+01	-1	8.3E+00	1	-8.3E+00	-1	1.78E-02
2	5	0.00313	-6.8E-01	5.0E-01	-1.9E+48	2.000	1.7E+00	5.4E+00	1.9E+48	0.000	1.2E+01	1	-1.2E+01	-1	5.9E+00	1	-5.9E+00	-1	1.26E-02
3	7.5	0.00313	-1.0E+00	3.6E-01	-1.9E+48	2.000	2.5E+00	1.3E+01	1.9E+48	0.000	9.7E+00	1	-9.7E+00	-1	4.8E+00	1	-4.8E+00	-1	8.96E-03
4	10	0.00313	-1.4E+00	2.5E-01	-1.9E+48	2.000	3.4E+00	2.9E+01	1.9E+48	0.000	8.4E+00	1	-8.4E+00	-1	4.2E+00	1	-4.2E+00	-1	6.36E-03
5	12.5	0.00313	-1.7E+00	1.8E-01	-1.9E+48	2.000	4.2E+00	6.7E+01	1.9E+48	0.000	7.5E+00	1	-7.5E+00	-1	3.7E+00	1	-3.7E+00	-1	4.52E-03
6	15	0.00313	-2.1E+00	1.3E-01	-1.9E+48	2.000	5.1E+00	1.6E+02	1.9E+48	0.000	6.8E+00	1	-6.8E+00	-1	3.4E+00	1	-3.4E+00	-1	3.21E-03
7	17.5	0.00313	-2.4E+00	9.1E-02	-1.9E+48	2.000	5.9E+00	3.6E+02	1.9E+48	0.000	6.3E+00	1	-6.3E+00	-1	3.2E+00	1	-3.2E+00	-0.99999	2.28E-03
8	20	0.00313	-2.7E+00	6.5E-02	-1.9E+48	2.000	6.7E+00	8.4E+02	1.9E+48	0.000	5.9E+00	1	-5.9E+00	-1	3.0E+00	1	-3.0E+00	-0.99997	1.62E-03
9	22.5	0.00313	-3.1E+00	4.6E-02	-1.9E+48	2.000	7.6E+00	2.0E+03	1.9E+48	0.000	5.6E+00	1	-5.6E+00	-1	2.8E+00	0.9999	-2.8E+00	-0.99992	1.15E-03
10	25	0.00313	-3.4E+00	3.3E-02	-1.9E+48	2.000	8.4E+00	4.5E+03	1.9E+48	0.000	5.3E+00	1	-5.3E+00	-1	2.6E+00	0.9998	-2.6E+00	-0.99981	8.17E-04
11	27.5	0.00313	-3.8E+00	2.3E-02	-1.9E+48	2.000	9.3E+00	1.1E+04	1.9E+48	0.000	5.1E+00	1	-5.1E+00	-1	2.5E+00	0.9996	-2.5E+00	-0.99963	5.80E-04
12	30	0.00313	-4.1E+00	1.6E-02	-1.9E+48	2.000	1.0E+01	2.4E+04	1.9E+48	0.000	4.8E+00	1	-4.8E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	4.12E-04
13	32.5	0.00313	-4.4E+00	1.2E-02	-1.9E+48	2.000	1.1E+01	5.7E+04	1.9E+48	0.000	4.7E+00	1	-4.7E+00	-1	2.3E+00	0.9989	-2.3E+00	-0.99893	2.93E-04
14	35	0.00313	-4.8E+00	8.3E-03	-1.9E+48	2.000	1.2E+01	1.3E+05	1.9E+48	0.000	4.5E+00	1	-4.5E+00	-1	2.2E+00	0.9984	-2.2E+00	-0.99839	2.08E-04
15	37.5	0.00313	-5.1E+00	5.9E-03	-1.9E+48	2.000	1.3E+01	3.1E+05	1.9E+48	0.000	4.3E+00	1	-4.3E+00	-1	2.2E+00	0.9977	-2.2E+00	-0.99769	1.47E-04
16	40	0.00313	-5.5E+00	4.2E-03	-1.9E+48	2.000	1.3E+01	7.1E+05	1.9E+48	0.000	4.2E+00	1	-4.2E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	1.05E-04
17	42.5	0.00313	-5.8E+00	3.0E-03	-1.9E+48	2.000	1.4E+01	1.6E+06	1.9E+48	0.000	4.1E+00	1	-4.1E+00	-1	2.0E+00	0.9958	-2.0E+00	-0.99579	7.42E-05
18	45	0.00313	-6.2E+00	2.1E-03	-1.9E+48	2.000	1.5E+01	3.8E+06	1.9E+48	0.000	4.0E+00	1	-4.0E+00	-1	2.0E+00	0.9946	-2.0E+00	-0.99459	5.27E-05
19	47.5	0.00313	-6.5E+00	1.5E-03	-1.9E+48	2.000	1.6E+01	8.9E+06	1.9E+48	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9932	-1.9E+00	-0.99321	3.74E-05
20	50	0.00313	-6.8E+00	1.1E-03	-1.9E+48	2.000	1.7E+01	2.1E+07	1.9E+48	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	2.65E-05



Vertical dispersion option Simulate vertical dispersion in 1 direction

Calc **Value**

v	1.00E+01	m/d
Rc	7.82E+03	
u	1.28E-03	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.00313	-3.4E-01	7.1E-01	-1.9E+48	2.000	8.4E-01	2.3E+00	1.9E+48	0.000	1.7E+01	1	-1.7E+01	-1	1.7E+01	1	-1.7E+01	-1	1.78E-02
2	5	0.00313	-6.8E-01	5.0E-01	-1.9E+48	2.000	1.7E+00	5.4E+00	1.9E+48	0.000	1.2E+01	1	-1.2E+01	-1	1.2E+01	1	-1.2E+01	-1	1.26E-02
3	7.5	0.00313	-1.0E+00	3.6E-01	-1.9E+48	2.000	2.5E+00	1.3E+01	1.9E+48	0.000	9.7E+00	1	-9.7E+00	-1	9.6E+00	1	-9.6E+00	-1	8.96E-03
4	10	0.00313	-1.4E+00	2.5E-01	-1.9E+48	2.000	3.4E+00	2.9E+01	1.9E+48	0.000	8.4E+00	1	-8.4E+00	-1	8.3E+00	1	-8.3E+00	-1	6.36E-03
5	12.5	0.00313	-1.7E+00	1.8E-01	-1.9E+48	2.000	4.2E+00	6.7E+01	1.9E+48	0.000	7.5E+00	1	-7.5E+00	-1	7.5E+00	1	-7.5E+00	-1	4.52E-03
6	15	0.00313	-2.1E+00	1.3E-01	-1.9E+48	2.000	5.1E+00	1.6E+02	1.9E+48	0.000	6.8E+00	1	-6.8E+00	-1	6.8E+00	1	-6.8E+00	-1	3.21E-03
7	17.5	0.00313	-2.4E+00	9.1E-02	-1.9E+48	2.000	5.9E+00	3.6E+02	1.9E+48	0.000	6.3E+00	1	-6.3E+00	-1	6.3E+00	1	-6.3E+00	-1	2.28E-03
8	20	0.00313	-2.7E+00	6.5E-02	-1.9E+48	2.000	6.7E+00	8.4E+02	1.9E+48	0.000	5.9E+00	1	-5.9E+00	-1	5.9E+00	1	-5.9E+00	-1	1.62E-03
9	22.5	0.00313	-3.1E+00	4.6E-02	-1.9E+48	2.000	7.6E+00	2.0E+03	1.9E+48	0.000	5.6E+00	1	-5.6E+00	-1	5.6E+00	1	-5.6E+00	-1	1.15E-03
10	25	0.00313	-3.4E+00	3.3E-02	-1.9E+48	2.000	8.4E+00	4.5E+03	1.9E+48	0.000	5.3E+00	1	-5.3E+00	-1	5.3E+00	1	-5.3E+00	-1	8.17E-04
11	27.5	0.00313	-3.8E+00	2.3E-02	-1.9E+48	2.000	9.3E+00	1.1E+04	1.9E+48	0.000	5.1E+00	1	-5.1E+00	-1	5.0E+00	1	-5.0E+00	-1	5.80E-04
12	30	0.00313	-4.1E+00	1.6E-02	-1.9E+48	2.000	1.0E+01	2.4E+04	1.9E+48	0.000	4.8E+00	1	-4.8E+00	-1	4.8E+00	1	-4.8E+00	-1	4.12E-04
13	32.5	0.00313	-4.4E+00	1.2E-02	-1.9E+48	2.000	1.1E+01	5.7E+04	1.9E+48	0.000	4.7E+00	1	-4.7E+00	-1	4.6E+00	1	-4.6E+00	-1	2.93E-04
14	35	0.00313	-4.8E+00	8.3E-03	-1.9E+48	2.000	1.2E+01	1.3E+05	1.9E+48	0.000	4.5E+00	1	-4.5E+00	-1	4.5E+00	1	-4.5E+00	-1	2.08E-04
15	37.5	0.00313	-5.1E+00	5.9E-03	-1.9E+48	2.000	1.3E+01	3.1E+05	1.9E+48	0.000	4.3E+00	1	-4.3E+00	-1	4.3E+00	1	-4.3E+00	-1	1.48E-04
16	40	0.00313	-5.5E+00	4.2E-03	-1.9E+48	2.000	1.3E+01	7.1E+05	1.9E+48	0.000	4.2E+00	1	-4.2E+00	-1	4.2E+00	1	-4.2E+00	-1	1.05E-04
17	42.5	0.00313	-5.8E+00	3.0E-03	-1.9E+48	2.000	1.4E+01	1.6E+06	1.9E+48	0.000	4.1E+00	1	-4.1E+00	-1	4.0E+00	1	-4.0E+00	-1	7.45E-05
18	45	0.00313	-6.2E+00	2.1E-03	-1.9E+48	2.000	1.5E+01	3.8E+06	1.9E+48	0.000	4.0E+00	1	-4.0E+00	-1	3.9E+00	1	-3.9E+00	-1	5.29E-05
19	47.5	0.00313	-6.5E+00	1.5E-03	-1.9E+48	2.000	1.6E+01	8.9E+06	1.9E+48	0.000	3.8E+00	1	-3.8E+00	-1	3.8E+00	1	-3.8E+00	-1	3.76E-05
20	50	0.00313	-6.8E+00	1.1E-03	-1.9E+48	2.000	1.7E+01	2.1E+07	1.9E+48	0.000	3.8E+00	1	-3.8E+00	-1	3.7E+00	1	-3.7E+00	-1	2.67E-05

Date:	11/12/2025
Version:	1

Contaminant **richloroethene**

DOMENICO (STEADY STATE)

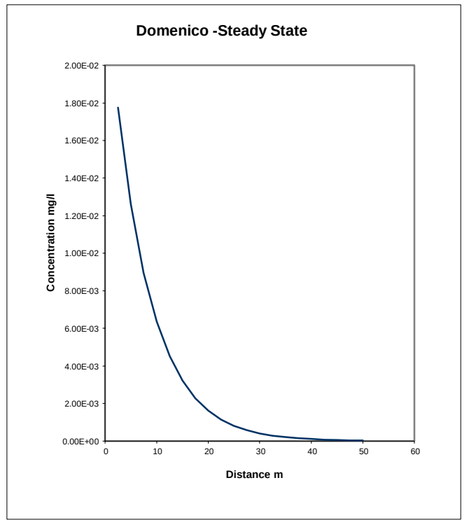
Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.01	mg/l
Co	2.50E-02	mg/l
λ	2.95E-04	days^{-1}
Sz	7.50E+01	m
Sy	1.18E+01	m
Kd	2.15E+03	l/kg
ρ	1.60E+00	g/cm3
n	4.40E-01	
i	4.40E-02	
K	1.00E+02	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion optio Simulate vertical dispersion in 1 direction

Calc	Value	
v	1.00E+01	m/d
Rc	7.82E+03	
u	1.28E-03	m/d

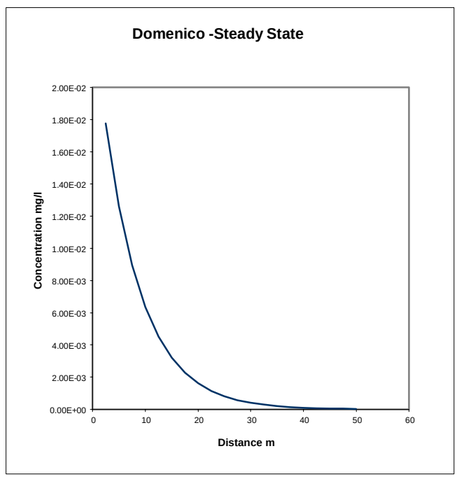
	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.00625	-3.42E-01	7.10E-01	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	1.78E-02
2	5	0.00625	-6.84E-01	5.05E-01	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	1.26E-02
3	7.5	0.00625	-1.03E+00	3.58E-01	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	8.96E-03
4	10	0.00625	-1.37E+00	2.55E-01	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	6.36E-03
5	12.5	0.00625	-1.71E+00	1.81E-01	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	4.52E-03
6	15	0.00625	-2.05E+00	1.28E-01	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	3.21E-03
7	17.5	0.00625	-2.39E+00	9.12E-02	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	2.28E-03
8	20	0.00625	-2.74E+00	6.48E-02	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	1.62E-03
9	22.5	0.00625	-3.08E+00	4.60E-02	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-0.9999	1.15E-03
10	25	0.00625	-3.42E+00	3.27E-02	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-0.9998	8.17E-04
11	27.5	0.00625	-3.76E+00	2.32E-02	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-0.9996	5.80E-04
12	30	0.00625	-4.10E+00	1.65E-02	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	4.12E-04
13	32.5	0.00625	-4.45E+00	1.17E-02	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.9989	2.93E-04
14	35	0.00625	-4.79E+00	8.32E-03	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.9984	2.08E-04
15	37.5	0.00625	-5.13E+00	5.91E-03	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.9977	1.47E-04
16	40	0.00625	-5.47E+00	4.20E-03	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	1.05E-04
17	42.5	0.00625	-5.82E+00	2.98E-03	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.9958	7.42E-05
18	45	0.00625	-6.16E+00	2.12E-03	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.9946	5.27E-05
19	47.5	0.00625	-6.50E+00	1.50E-03	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.9932	3.74E-05
20	50	0.00625	-6.84E+00	1.07E-03	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	2.65E-05



DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.00625	-3.42E-01	7.10E-01	1.68E+01	1	-1.68E+01	-1	1.67E+01	1	-1.67E+01	-1	1.78E-02
2	5	0.00625	-6.84E-01	5.05E-01	1.19E+01	1	-1.19E+01	-1	1.18E+01	1	-1.18E+01	-1	1.26E-02
3	7.5	0.00625	-1.03E+00	3.58E-01	9.68E+00	1	-9.68E+00	-1	9.63E+00	1	-9.63E+00	-1	8.96E-03
4	10	0.00625	-1.37E+00	2.55E-01	8.39E+00	1	-8.39E+00	-1	8.34E+00	1	-8.34E+00	-1	6.36E-03
5	12.5	0.00625	-1.71E+00	1.81E-01	7.50E+00	1	-7.50E+00	-1	7.46E+00	1	-7.46E+00	-1	4.52E-03
6	15	0.00625	-2.05E+00	1.28E-01	6.85E+00	1	-6.85E+00	-1	6.81E+00	1	-6.81E+00	-1	3.21E-03
7	17.5	0.00625	-2.39E+00	9.12E-02	6.34E+00	1	-6.34E+00	-1	6.31E+00	1	-6.31E+00	-1	2.28E-03
8	20	0.00625	-2.74E+00	6.48E-02	5.93E+00	1	-5.93E+00	-1	5.90E+00	1	-5.90E+00	-1	1.62E-03
9	22.5	0.00625	-3.08E+00	4.60E-02	5.59E+00	1	-5.59E+00	-1	5.56E+00	1	-5.56E+00	-1	1.15E-03
10	25	0.00625	-3.42E+00	3.27E-02	5.30E+00	1	-5.30E+00	-1	5.28E+00	1	-5.28E+00	-1	8.17E-04
11	27.5	0.00625	-3.76E+00	2.32E-02	5.06E+00	1	-5.06E+00	-1	5.03E+00	1	-5.03E+00	-1	5.80E-04
12	30	0.00625	-4.10E+00	1.65E-02	4.84E+00	1	-4.84E+00	-1	4.82E+00	1	-4.82E+00	-1	4.12E-04
13	32.5	0.00625	-4.45E+00	1.17E-02	4.65E+00	1	-4.65E+00	-1	4.63E+00	1	-4.63E+00	-1	2.93E-04
14	35	0.00625	-4.79E+00	8.32E-03	4.48E+00	1	-4.48E+00	-1	4.46E+00	1	-4.46E+00	-1	2.08E-04
15	37.5	0.00625	-5.13E+00	5.91E-03	4.33E+00	1	-4.33E+00	-1	4.31E+00	1	-4.31E+00	-1	1.48E-04
16	40	0.00625	-5.47E+00	4.20E-03	4.19E+00	1	-4.19E+00	-1	4.17E+00	1	-4.17E+00	-1	1.05E-04
17	42.5	0.00625	-5.82E+00	2.98E-03	4.07E+00	1	-4.07E+00	-1	4.05E+00	1	-4.05E+00	-1	7.45E-05
18	45	0.00625	-6.16E+00	2.12E-03	3.95E+00	1	-3.95E+00	-1	3.93E+00	1	-3.93E+00	-1	5.29E-05
19	47.5	0.00625	-6.50E+00	1.50E-03	3.85E+00	1	-3.85E+00	-1	3.83E+00	1	-3.83E+00	-1	3.76E-05
20	50	0.00625	-6.84E+00	1.07E-03	3.75E+00	1	-3.75E+00	-1	3.73E+00	1	-3.73E+00	-1	2.67E-05



Date:	11/12/2025
Version:	1

DOMENICO (TIME VARIANT)

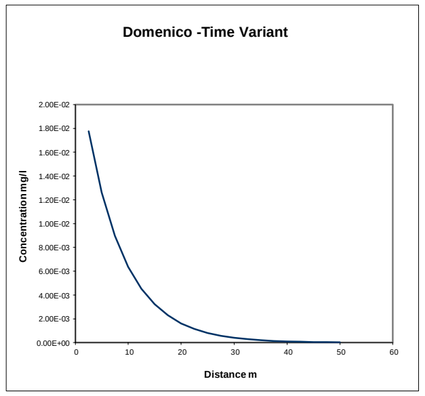
Contaminant Trichloroethene

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.01	mg/l
Co	2.50E-02	mg/l
λ	2.95E-04	days^{-1}
Sz	7.50E+01	m
Sy	1.18E+01	m
Kd	2.15E+03	l/kg
ρ	1.60E+00	g/cm3
n	4.40E-01	
i	4.40E-02	
K	1.00E+02	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

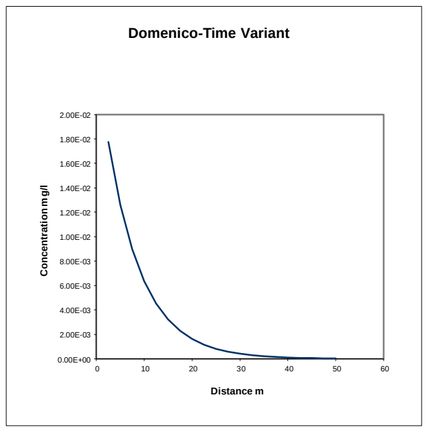
	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.00313	-3.42E-01	7.10E-01	-1.88E+48	2	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	1.78E-02
2	5	0.00313	-6.84E-01	5.05E-01	-1.88E+48	2	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	1.26E-02
3	7.5	0.00313	-1.03E+00	3.58E-01	-1.88E+48	2	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	8.96E-03
4	10	0.00313	-1.37E+00	2.55E-01	-1.88E+48	2	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	6.36E-03
5	12.5	0.00313	-1.71E+00	1.81E-01	-1.88E+48	2	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	4.52E-03
6	15	0.00313	-2.05E+00	1.28E-01	-1.88E+48	2	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	3.21E-03
7	17.5	0.00313	-2.39E+00	9.12E-02	-1.88E+48	2	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	2.28E-03
8	20	0.00313	-2.74E+00	6.48E-02	-1.88E+48	2	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	1.62E-03
9	22.5	0.00313	-3.08E+00	4.60E-02	-1.88E+48	2	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-1	1.15E-03
10	25	0.00313	-3.42E+00	3.27E-02	-1.88E+48	2	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-1	8.17E-04
11	27.5	0.00313	-3.76E+00	2.32E-02	-1.88E+48	2	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-1	5.80E-04
12	30	0.00313	-4.10E+00	1.65E-02	-1.88E+48	2	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	4.12E-04
13	32.5	0.00313	-4.45E+00	1.17E-02	-1.88E+48	2	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.999	2.93E-04
14	35	0.00313	-4.79E+00	8.32E-03	-1.88E+48	2	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.998	2.08E-04
15	37.5	0.00313	-5.13E+00	5.91E-03	-1.88E+48	2	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.998	1.47E-04
16	40	0.00313	-5.47E+00	4.20E-03	-1.88E+48	2	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	1.05E-04
17	42.5	0.00313	-5.82E+00	2.98E-03	-1.88E+48	2	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.996	7.42E-05
18	45	0.00313	-6.16E+00	2.12E-03	-1.88E+48	2	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.995	5.27E-05
19	47.5	0.00313	-6.50E+00	1.50E-03	-1.88E+48	2	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.993	3.74E-05
20	50	0.00313	-6.84E+00	1.07E-03	-1.88E+48	2	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	2.65E-05



Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

Calc	Value	
v	1.00E+01	m/d
Rc	7.82E+03	
u	1.28E-03	m/d

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.00313	-3.42E-01	7.10E-01	-1.88E+48	2	1.68E+01	1	-1.68E+01	-1	1.67E+01	1	-1.67E+01	-1	1.78E-02
2	5	0.00313	-6.84E-01	5.05E-01	-1.88E+48	2	1.19E+01	1	-1.19E+01	-1	1.18E+01	1	-1.18E+01	-1	1.26E-02
3	7.5	0.00313	-1.03E+00	3.58E-01	-1.88E+48	2	9.68E+00	1	-9.68E+00	-1	9.63E+00	1	-9.63E+00	-1	8.96E-03
4	10	0.00313	-1.37E+00	2.55E-01	-1.88E+48	2	8.39E+00	1	-8.39E+00	-1	8.34E+00	1	-8.34E+00	-1	6.36E-03
5	12.5	0.00313	-1.71E+00	1.81E-01	-1.88E+48	2	7.50E+00	1	-7.50E+00	-1	7.46E+00	1	-7.46E+00	-1	4.52E-03
6	15	0.00313	-2.05E+00	1.28E-01	-1.88E+48	2	6.85E+00	1	-6.85E+00	-1	6.81E+00	1	-6.81E+00	-1	3.21E-03
7	17.5	0.00313	-2.39E+00	9.12E-02	-1.88E+48	2	6.34E+00	1	-6.34E+00	-1	6.31E+00	1	-6.31E+00	-1	2.28E-03
8	20	0.00313	-2.74E+00	6.48E-02	-1.88E+48	2	5.93E+00	1	-5.93E+00	-1	5.90E+00	1	-5.90E+00	-1	1.62E-03
9	22.5	0.00313	-3.08E+00	4.60E-02	-1.88E+48	2	5.59E+00	1	-5.59E+00	-1	5.56E+00	1	-5.56E+00	-1	1.15E-03
10	25	0.00313	-3.42E+00	3.27E-02	-1.88E+48	2	5.30E+00	1	-5.30E+00	-1	5.28E+00	1	-5.28E+00	-1	8.17E-04
11	27.5	0.00313	-3.76E+00	2.32E-02	-1.88E+48	2	5.06E+00	1	-5.06E+00	-1	5.03E+00	1	-5.03E+00	-1	5.80E-04
12	30	0.00313	-4.10E+00	1.65E-02	-1.88E+48	2	4.84E+00	1	-4.84E+00	-1	4.82E+00	1	-4.82E+00	-1	4.12E-04
13	32.5	0.00313	-4.45E+00	1.17E-02	-1.88E+48	2	4.65E+00	1	-4.65E+00	-1	4.63E+00	1	-4.63E+00	-1	2.93E-04
14	35	0.00313	-4.79E+00	8.32E-03	-1.88E+48	2	4.48E+00	1	-4.48E+00	-1	4.46E+00	1	-4.46E+00	-1	2.08E-04
15	37.5	0.00313	-5.13E+00	5.91E-03	-1.88E+48	2	4.33E+00	1	-4.33E+00	-1	4.31E+00	1	-4.31E+00	-1	1.48E-04
16	40	0.00313	-5.47E+00	4.20E-03	-1.88E+48	2	4.19E+00	1	-4.19E+00	-1	4.17E+00	1	-4.17E+00	-1	1.05E-04
17	42.5	0.00313	-5.82E+00	2.98E-03	-1.88E+48	2	4.07E+00	1	-4.07E+00	-1	4.05E+00	1	-4.05E+00	-1	7.45E-05
18	45	0.00313	-6.16E+00	2.12E-03	-1.88E+48	2	3.95E+00	1	-3.95E+00	-1	3.93E+00	1	-3.93E+00	-1	5.29E-05
19	47.5	0.00313	-6.50E+00	1.50E-03	-1.88E+48	2	3.85E+00	1	-3.85E+00	-1	3.83E+00	1	-3.83E+00	-1	3.76E-05
20	50	0.00313	-6.84E+00	1.07E-03	-1.88E+48	2	3.75E+00	1	-3.75E+00	-1	3.73E+00	1	-3.73E+00	-1	2.67E-05



Date:	11/12/2025
Version:	1

Hydrogeological risk assessment for land contamination

Remedial Targets Worksheet , Release 3.2

First released: 2006. Version 3.2: January 2013

This worksheet has been produced in combination with the document 'Remedial Targets Methodology: Hydrogeological risk assessment for land contamination (Environment Agency 2006).

Users of this worksheet should always refer to the User Manual to the Remedial Targets Methodology and to relevant guidance on UK legislation and policy, in order to understand how this procedure should be applied in an appropriate context.

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The calculation of equations in this worksheet has been independently checked by Entec (UK) Ltd on behalf of the Environment Agency.

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IMPORTANT: To enable MS Excel worksheet, click Tools, Add -Ins, Analysis Tool Pak and Analysis Tool Pak-VBA (to calculate error functions).

Details to be completed for each assessment				
Site Name:	Kelvedon Street			
Site Address:	Newport			
Completed by:	Michael Watkins			
Date:	11-Dec-25		Version:	1
Contaminant	Trichloroethene			
Target Concentration (C_T)	0.01	mg/l	Origin of C_T:	WFD for inland surface waters (annual average)

This worksheet can be used to determine remedial targets for soils (Worksheets Level 1 Soil, Level 2 and Level 3 Soil) or to determine remedial targets for groundwater (Level 3 Groundwater). For Level 3, parameter values must be entered separately dependent on whether the assessment is for soil or groundwater. For soil, remedial targets are calculated as either mg/kg (for comparision with soil measurements) or mg/l (for comparison with leaching tests or pore water concentrations).
Site details entered on this page are automatically copied to Level 1, 2 and 3 Worksheets.
Worksheet options are identified by brown background and employ a pull-down menus. Data entry are identified as blue background.
Data origin / justification should be noted in cells coloured yellow and fully documented in subsequent reports.
Data carried forward from an earlier worksheet are identified by a light green background
It is recommended that a copy of the original worksheet is saved (all data fields in the original copy are blank).

The spreadsheet also includes a porosity calculation worksheet, a soil impact calculation worksheet and a worksheet that performs some simple hydrogeological calculations.

Remedial Targets Worksheet , Release 3.2

Level 1 - Soil

Select the method of calculating the soil water Partition Co-efficient by using the pull down menu below

User specified value for partition coefficient

Contaminant		**Trichloroethene**		
Target concentration	C_T	**0.01**	**mg/l**	

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**
Standard entry				
Water filled soil porosity	θ_w	0.00E+00	fraction	
Air filled soil porosity	θa	0.00E+00	fraction	
Bulk density of soil zone material	ρ	0.00E+00	g/cm^3	
Henry's Law constant	H	0.00E+00	dimensionless	
Entry if specify partition coefficient (option)				
Soil water partition coefficient	Kd	0.00E+00	l/kg	
Entry for non-polar organic chemicals (option)				
Fraction of organic carbon (in soil)	foc		fraction	
Organic carbon partition coefficient	Koc		l/kg	
Entry for ionic organic chemicals (option)				
Sorption coefficient for neutral species	$K_{oc,n}$		l/kg	
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg	
pH value	pH		pH units	
Acid dissociation constant	pKa			
Fraction of organic carbon (in soil)	foc		fraction	

Soil water partition coefficient used in Level Assessment	**Kd**	**0.00E+00**	**l/kg**	*Specified value*

This sheet calculates the Level 1 remedial target for soils(mg/kg) based on a selected target concentration and theoretical calculation of soil water partitioning. Three options are included for determining the partition coefficient.

The measured soil concentration as mg/kg should be compared with the Level 1 remedial target to determine the need for further action.

Level 1 Remedial Target

Level 1 Remedial Target	**#DIV/0!**	**mg/kg**	**(for comparison with soil analyses)**
	or		
	0.01	**mg/l**	**(for comparison with leachate test results)**

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 2 - Soil

Contaminant		**Trichloroethene**		from Level 1
Target concentration	C_T	**0.01**	**mg/l**	from Level 1

This sheet calculates the Level 2 remedial target for soils (mg/kg) or for pore water (mg/l).

The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 2 remedial target to determine the need for further action. Equations presented in 'Hydrogeological risk assessment for land contamiantion' (Environment Agency 2006)

Input Parameters	Variable	Value	Unit	Source of parameter value	
Standard entry					
Infiltration	Inf	0.00E+00	m/d		
Area of contaminant source	A	0.00E+00	m^2		Not used in calculation
Entry for groundwater flow below site					
Length of contaminant source in direction of groundwater flow	L	0.00E+00	m		
Saturated aquifer thickness	da	0.00E+00	m		
Hydraulic Conductivity of aquifer in which dilution occurs	K	0.00E+00	m/d		
Hydraulic gradient of water table	i	0.00E+00	fraction		
Width of contaminant source perpendicular to groundwater flow	w	0.00E+00	m		Not used in calculation
Background concentration of contaminant in groundwater beneath site	Cu	0.00E+00	mg/l		
Define mixing zone depth by specifying or calculating depth (using pull down list)		**Specify**			
Enter mixing zone thickness	Mz	0.00E+00	m		
Calculated mixing zone thickness	Mz		m		

Calculated Parameters

Dilution Factor	**DF**	**#DIV/0!**		
Level 2 Remedial Target		**#DIV/0!**	**mg/l**	**For comparison with measured pore water concentration. This assumes Level 1 Remedial Target is based on Target Concentration.**
		or		
		#DIV/0!	**mg/kg**	**For comparison with measured soil concentration. This assumes Level 1 Remedial Target calculated from soil-water**

Additional option

Calculation of impact on receptor

Concentration of contaminant in contaminated discharge (entering receptor)	Cc	0.00E+00	mg/l	
Calculated concentration within receptor (dilution only)		#DIV/0!	mg/l	0

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 3 - Soil

See Note

Input Parameters	Variable	Value	Unit	Source
Contaminant		Trichloroethene		from Level 1
Target Concentration	C_T	0.01	mg/l	from Level 1
Dilution Factor	DF	#DIV/0!		from Level 2

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value)

	Variable	Value	Unit	Source of parameter value
Enter source concentration		Soil concentration as mg/kg		
Enter soil concentration		0	mg/kg	
Half life for degradation of contaminant in water	$t_{1/2}$	1.00E+100	days	
Calculated decay rate	λ	6.93E-101	$days^{-1}$	calculated
Width of plume in aquifer at source	Sz	0.00E+00	m	from Level 2
Plume thickness in aquifer at source	Sy	0.00E+00	m	from Level 2
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Effective porosity of aquifer	n	0.00E+00	fraction	
Hydraulic gradient	i	#DIV/0!	fraction	from Level 2 (adjusted)
Hydraulic conductivity of saturated aquifer	K	0.00E+00	m/d	from Level 2
Distance to compliance point	x	0.00E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	1.00E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	0.00E+00	l/kg	*see options*
Longitudinal dispersivity	ax	0.000	m	*see options*
Transverse dispersivity	az	0.000	m	*see options*
Vertical dispersivity	ay	0.000	m	*see options*

Parameter values should be checked against Level 1 and 2

Calculated Parameters	Variable		
Groundwater flow velocity	v	#DIV/0!	m/d
Retardation factor	Rf	#DIV/0!	fraction
Decay rate used	λ	6.93E-101	d^{-1}
Hydraulic gradient used in aquifer flow down-gradient	i	#DIV/0!	fraction
Rate of contaminant flow due to retardation	u	#DIV/0!	m/d
Ratio of Compliance Point to Source Concentration	C_{cp}/C_0	#DIV/0!	fraction
Attenuation factor (C_o/C_{cp})	**AF**	**#DIV/0!**	**fraction**
Calculated soil leachate concentration	Co	#DIV/0!	mg/l

Remedial Targets

Level 3 Remedial Target	**#DIV/0!**	**mg/l**	For comparison with measured pore water concentration.
Ogata Banks	**or**		This assumes Level 1 Remedial Target is based on Target Concentration.
	#DIV/0!	**mg/kg**	For comparison with measured soil concentration. This
Distance to compliance point	**0**	**m**	assumes Level 1 Remedial Target calculated from soil-water partitioning equation.
Ratio of Compliance Point to Source Concentration	**#DIV/0!**	**fraction**	Ogata Banks

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99

Enter method of defining partition co-efficient (using pull down list)

Calculate for ionic organic chemicals (acids)

Entry if specify partition coefficient (option)

Soil water partition coefficient — Kd — l/kg

Entry for non-polar organic chemicals (option)

Fraction of organic carbon in aquifer — foc — fraction

Organic carbon partition coefficient — Koc — l/kg

Entry for ionic organic chemicals (option)

Sorption coefficient for related species	$K_{oc,n}$	0.00E+00	l/kg
Sorption coefficient for ionised species	$K_{oc,i}$	0.00E+00	l/kg
pH value	pH	0.00E+00	
Acid dissociation constant	pKa	0.00E+00	
Fraction of organic carbon in aquifer	foc	0.00E+00	fraction
Soil water partition coefficient	Kd	0.00E+00	l/kg

Define dispersivity (click brown cell and use pull down list)

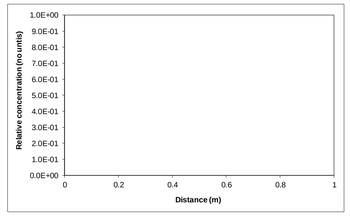
User defined values for dispersivity

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	0.00E+00	#NUM!	m
Transverse dispersivity	**az**	0.00E+00	0.00E+00	#NUM!	m
Vertical dispersivity	**ay**	0.00E+00	0.00E+00	#NUM!	m

Note values of dispersivity must be > 0

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed

Note
This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O_2, NO_3, SO_4 etc than an alternative solution should be used



Note: 'Relative concentration' is the ratio of calculated concentation at a given position compared to the source concentration. The calculations assume plume disperses from the top of the aquifer. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

This sheet calculates the Level 3 remedial target for soils(mg/kg) or for pore water (mg/l), based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.By setting a long travel time (e.g. 9E99) it will give the steady state solution, which should always be used when calculating remedial targets.

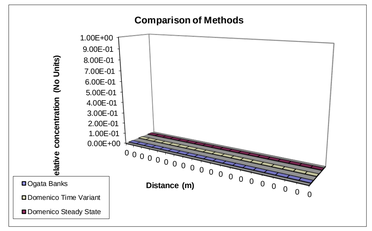
The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.9E+99.

Calculated (relative) concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Relative concentration (No units)	Concentration mg/l
0	1.0E+00	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!



Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Remedial Targets Worksheet , Release 3.2

Calculation of contaminant concentration in groundwater from a soil source

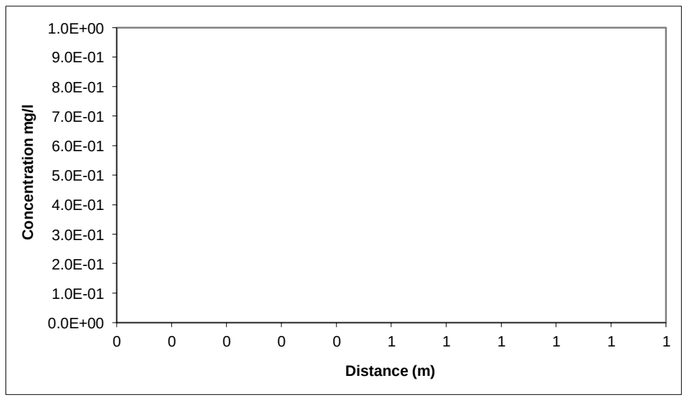
Only input required is Soil Contaminant Concentration

	Input Parameters			
	Soil contaminant concentration	C_0	0.00E+00	mg/kg
Level 1 Parameters				
	Water filled soil porosity	θ_W	0.00E+00	fraction
	Air filled soil porosity	θa	0.00E+00	fraction
	Bulk density	ρ	0.00E+00	g/cm^3
	Henry's Law constant	H	0.00E+00	dimensionless
	Soil water partition coefficient used in Level Assessment	Kd	0.00E+00	l/kg
	Factor (partitioning between soil and water)		#DIV/0!	dimensionless
Level 2 Parameters	**Dilution Factor**	DF	#DIV/0!	
Level 3 Parameters	**Attenuation factor (C_O/C_{ED})**	AF	#DIV/0!	

Predicted concentrations at compliance point

Level 1	C	#DIV/0!	mg/l	No dilution or attenuation
Level 2	C	#DIV/0!	mg/l	Dilution taken into account
Level 3	C	#DIV/0!	mg/l	Dilution and attenuation taken into account

Predicted concentrations between source and compliance point - Level 3



Distance m	Concentration mg/l
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

	Variable	Value	Unit	Source
Contaminant		Trichloroethene		from Level 1
Target Concentration	C_T	1.00E-02	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Domenico - Steady state — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived va

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	2.50E-02	mg/l	*Site investigation data*
Half life for degradation of contaminant in water	$t_{1/2}$	2.35E+03	days	*Howard et al (1991) Low anaerobic biodeg*
Calculated decay rate	λ	2.95E-04	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	7.50E+01	m	*Length of site perpendicular to groundwater flow*
Plume thickness at source	Sy	1.18E+01	m	*Same as Mixing Zone Thickness. "For a thin aquifer (typically <10m), the mixing zone thickness can be taken as the actu*
Saturated aquifer thickness	da	1.20E+01	m	*Maximum thickness recorded in vicinity of*
Bulk density of aquifer materials	ρ	1.60E+00	g/cm^3	*Typical bulk density for river terrace deposits*
Effective porosity of aquifer	n	4.40E-01	fraction	*Maximum porosity for coarse Gravel (Lovanh et al 2000) - conservative estimate*
Hydraulic gradient	i	4.40E-02	fraction	*Borehole level data*
Hydraulic conductivity of aquifer	K	2.59E+03	m/d	*Maximum typical value for clayey sandy G*
Distance to compliance point	x	5.00E+01	m	*Default compliance distance*
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	9.90E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	2.15E+03	l/kg	*see options*
Longitudinal dispersivity	ax	5.00E+00	m	*see options*
Transverse dispersivity	az	5.00E-01	m	*see options*
Vertical dispersivity	ay	5.00E-02	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd	2.15E+03	l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc		fraction
Organic carbon partition coefficient	Koc		l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{oc,n}$		l/kg
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	2.15E+03	l/kg

Define dispersivity (click brown cell and use pull down list)

Dispersivities 10%, 1%, 0.1% of pathway length

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	5.00E+00	2.98E+00	m
Transverse dispersivity	**az**	0.00E+00	5.00E-01	2.98E-01	m
Vertical dispersivity	**ay**	0.00E+00	5.00E-02	2.98E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed

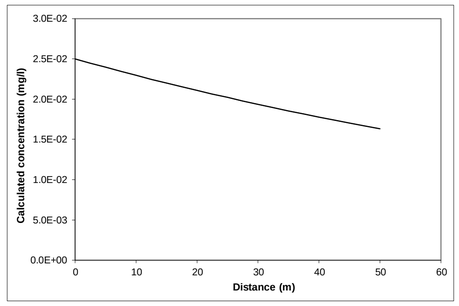
Calculated Parameters

	Variable		
Groundwater flow velocity	v	2.59E+02	m/d
Retardation factor	Rf	7.82E+03	fraction
Decay rate used	λ	2.95E-04	d^{-1}
Rate of contaminant flow due to retardation	u	3.31E-02	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	1.63E-02	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**1.53E+00**	

Remedial Targets

Remedial Target		**1.53E-02**	**mg/l**	For comparison with measured groundwater concentration.
Domenico - Steady state				
Distance to compliance point		**50**	**m**	
Concentration of contaminant at compliance point	C_{ED}/C_0	**1.63E-02**	**mg/l**	Domenico - Steady state

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Calculated concentrations for distance-concentration graph

Domenico - Steady state
From calculation sheet

Distance	Concentration
	mg/l
0	2.5E-02
2.5	2.45E-02
5.0	2.40E-02
7.5	2.35E-02
10.0	2.30E-02
12.5	2.25E-02
15.0	2.20E-02
17.5	2.15E-02
20.0	2.11E-02
22.5	2.06E-02
25.0	2.02E-02
27.5	1.98E-02
30.0	1.94E-02
32.5	1.89E-02
35.0	1.85E-02
37.5	1.82E-02
40.0	1.78E-02
42.5	1.74E-02
45.0	1.70E-02
47.5	1.67E-02
50.0	1.63E-02

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared
with the Level 3 remedial target to determine the need for further action.
Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Porosity Calculator

These results are not carried through to any of the other worksheets

DRY BULK DENSITY DATA

Variable	Value	Unit	justification
Natural Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Dry Bulk Density	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
Initial Saturation	#DIV/0!	%	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	
Water Filled Porosity	**#DIV/0!**	**fraction**	

WET BULK DENSITY DATA

Variable	Value	Unit	
Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Actual (wet) Bulk Density (i.e. at natural MC)	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
dry bulk density	0.00	tonnes/m^3	
Initial Saturation	#DIV/0!	%	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	**#DIV/0!**
Water Filled Porosity	**#DIV/0!**	**fraction**	

Analytical solutions provided by David Hall, Golder Associates (UK) Ltd

Simple hydrogeological calculations

(These are not specific to, or required in, the Remedial Targets Methodology)

Parameter	symbol		unit	justification
Hydraulic conductivity	K	0.00E+00	m/d	
Hydraulic gradient	i	0.00E+00	unitless	
Effective porosity of aquifer	n	0.00E+00	fraction	
Thickness of saturated aquifer	b	0.00E+00	m	
Width of aquifer perpendicular to flow	w	0.00E+00	m	
Distance to receptor	x	0.00E+00	m	
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Soil-water partition co-efficient	Kd	0.00E+00	l/kg	
Retardation factor of pollutant	R	#DIV/0!		

Groundwater flow velocity	v(GW)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for groundwater to reach receptor	t(GW)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years
Rate of groundwater flow through aquifer	Q	0.00E+00	m^3/s	0.00E+00	m^3/day	0.00E+00	m^3/year

Contaminant flow velocity	v(contam)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for contaminant to reach receptor	t(contam)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years

Level 1 Calculation Sheet

Contaminant **Trichloroethene**

Parameter	Value	Units
(carried over from input sheet)		
C_T	1.00E-02	mg/l
Kd	0.00E+00	l/kg
foc		fraction
koc		l/kg
θ_W	0.00E+00	fraction
θa	0.00E+00	fraction
ρ	0.00E+00	g/cm3
H	0.00E+00	dimensionless
Koc,n		l/kg
Koc,i		l/kg
pH		pH units
pKa		
foc (ionic)		fraction

Calculations (Refer toTable 4.3, R&D Publication 20)

Selected option User specified value for partition coefficient

calc calc Calc Kd l/kg

Calculation of partition coefficient for ionic organic chemical

Partition coefficient used in Level 1 Assessment 0.00E+00 l/kg

Calculated Remedial Target #DIV/0! mg/kg for Trichloroethene

Factor (partitioning between soil and water) #DIV/0!

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11/12/2025
Version:	1

Level 2 Calculation Sheet

Contaminant **Trichloroethene**

Site assessed:	Kelvedon Stre
Date:	11/12/2025
Version:	1

Parameter	Value	Units		
(carried over from input sheet)				
Mz	0.00E+00	m		
L	0.00E+00	m		
da	0.00E+00	m		Calculated
Inf	0.00E+00	m/d		Dilution Factor
K	0.00E+00	m/d		
i	0.00E+00		Calculation based on target concentration	#DIV/0!
A	0.00E+00	m3/d m2 m3/d	Calculation based on observed contaminant concentration	#DIV/0!
Cc	0.00E+00	mg/l		
C_T	1.00E-02	mg/l		
Cu	0.00E+00	mg/l		
w	0.00E+00	m		



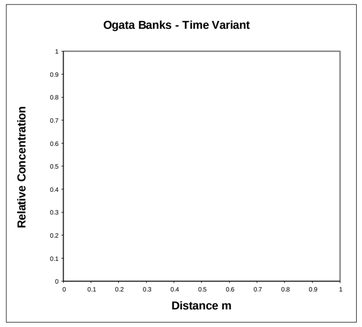
Contaminant **Trichloroethene**

OGATA BANKS SOLUTION

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-02	mg/l
DF	#DIV/0!	
λ	6.931E-101	days^{-1}
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Calc	Value	
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) -USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Date:	11/12/2025
Version:	1

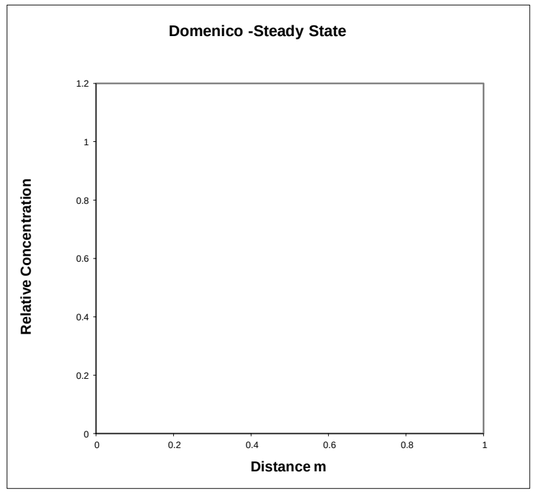
Contaminant **richloroethene**

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-02	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

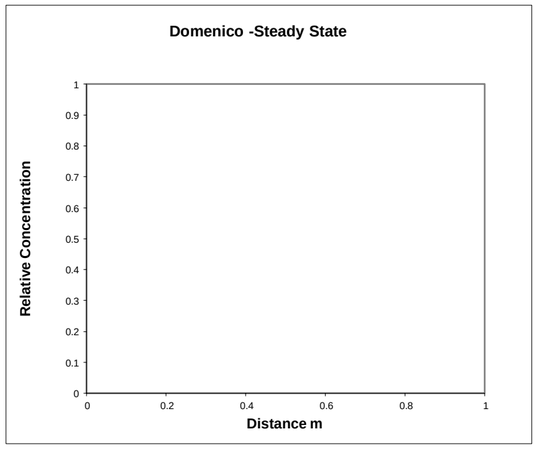


Calc	Value	Units
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



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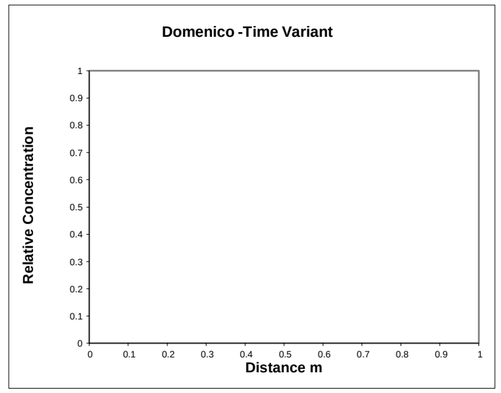
DOMENICO (TIME VARIANT)

Contaminant trichloroethene

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.01	mg/l
DF	#DIV/0!	
λ	6.931E-101	days^{-1}
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

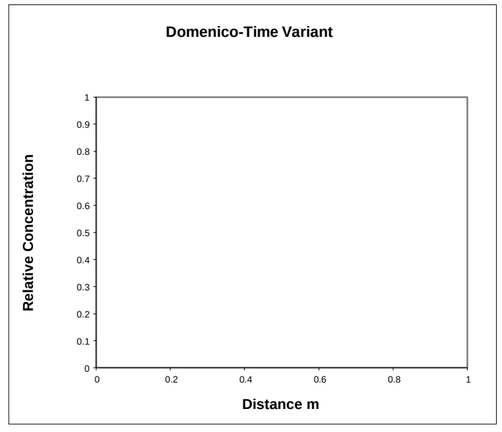


Calc **Value**

Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Date:	11/12/2025
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OGATA BANKS SOLUTION

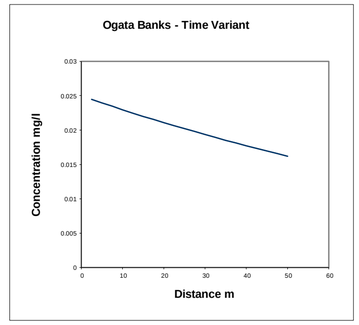
Contaminant **Trichloroethene**

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.01	mg/l
Co	2.50E-02	mg/l
λ	2.95E-04	days^{-1}
Sz	7.50E+01	m
Sy	1.18E+01	m
Kd	2.15E+03	l/kg
ρ	1.60E+00	g/cm3
n	4.40E-01	
i	4.40E-02	
K	2.59E+03	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.00313	-2.1E-02	9.8E-01	-4.4E+48	2.000	5.2E-01	1.7E+00	4.4E+48	0.000	1.7E+01	1	-1.7E+01	-1	8.3E+00	1	-8.3E+00	-1	2.45E-02
2	5	0.00313	-4.3E-02	9.6E-01	-4.4E+48	2.000	1.0E+00	2.8E+00	4.4E+48	0.000	1.2E+01	1	-1.2E+01	-1	5.9E+00	1	-5.9E+00	-1	2.40E-02
3	7.5	0.00313	-6.4E-02	9.4E-01	-4.4E+48	2.000	1.6E+00	4.8E+00	4.4E+48	0.000	9.7E+00	1	-9.7E+00	-1	4.8E+00	1	-4.8E+00	-1	2.35E-02
4	10	0.00313	-8.5E-02	9.2E-01	-4.4E+48	2.000	2.1E+00	8.0E+00	4.4E+48	0.000	8.4E+00	1	-8.4E+00	-1	4.2E+00	1	-4.2E+00	-1	2.30E-02
5	12.5	0.00313	-1.1E-01	9.0E-01	-4.4E+48	2.000	2.6E+00	1.4E+01	4.4E+48	0.000	7.5E+00	1	-7.5E+00	-1	3.7E+00	1	-3.7E+00	-1	2.25E-02
6	15	0.00313	-1.3E-01	8.8E-01	-4.4E+48	2.000	3.1E+00	2.3E+01	4.4E+48	0.000	6.8E+00	1	-6.8E+00	-1	3.4E+00	1	-3.4E+00	-1	2.20E-02
7	17.5	0.00313	-1.5E-01	8.6E-01	-4.4E+48	2.000	3.6E+00	3.8E+01	4.4E+48	0.000	6.3E+00	1	-6.3E+00	-1	3.2E+00	1	-3.2E+00	-0.99999	2.15E-02
8	20	0.00313	-1.7E-01	8.4E-01	-4.4E+48	2.000	4.2E+00	6.5E+01	4.4E+48	0.000	5.9E+00	1	-5.9E+00	-1	3.0E+00	1	-3.0E+00	-0.99997	2.11E-02
9	22.5	0.00313	-1.9E-01	8.3E-01	-4.4E+48	2.000	4.7E+00	1.1E+02	4.4E+48	0.000	5.6E+00	1	-5.6E+00	-1	2.8E+00	0.9999	-2.8E+00	-0.99992	2.06E-02
10	25	0.00313	-2.1E-01	8.1E-01	-4.4E+48	2.000	5.2E+00	1.8E+02	4.4E+48	0.000	5.3E+00	1	-5.3E+00	-1	2.6E+00	0.9998	-2.6E+00	-0.99981	2.02E-02
11	27.5	0.00313	-2.3E-01	7.9E-01	-4.4E+48	2.000	5.7E+00	3.1E+02	4.4E+48	0.000	5.1E+00	1	-5.1E+00	-1	2.5E+00	0.9996	-2.5E+00	-0.99963	1.98E-02
12	30	0.00313	-2.6E-01	7.7E-01	-4.4E+48	2.000	6.3E+00	5.2E+02	4.4E+48	0.000	4.8E+00	1	-4.8E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	1.93E-02
13	32.5	0.00313	-2.8E-01	7.6E-01	-4.4E+48	2.000	6.8E+00	8.8E+02	4.4E+48	0.000	4.7E+00	1	-4.7E+00	-1	2.3E+00	0.9989	-2.3E+00	-0.99893	1.89E-02
14	35	0.00313	-3.0E-01	7.4E-01	-4.4E+48	2.000	7.3E+00	1.5E+03	4.4E+48	0.000	4.5E+00	1	-4.5E+00	-1	2.2E+00	0.9984	-2.2E+00	-0.99839	1.85E-02
15	37.5	0.00313	-3.2E-01	7.3E-01	-4.4E+48	2.000	7.8E+00	2.5E+03	4.4E+48	0.000	4.3E+00	1	-4.3E+00	-1	2.2E+00	0.9977	-2.2E+00	-0.99769	1.81E-02
16	40	0.00313	-3.4E-01	7.1E-01	-4.4E+48	2.000	8.3E+00	4.2E+03	4.4E+48	0.000	4.2E+00	1	-4.2E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	1.77E-02
17	42.5	0.00313	-3.6E-01	7.0E-01	-4.4E+48	2.000	8.9E+00	7.1E+03	4.4E+48	0.000	4.1E+00	1	-4.1E+00	-1	2.0E+00	0.9958	-2.0E+00	-0.99579	1.73E-02
18	45	0.00313	-3.8E-01	6.8E-01	-4.4E+48	2.000	9.4E+00	1.2E+04	4.4E+48	0.000	4.0E+00	1	-4.0E+00	-1	2.0E+00	0.9946	-2.0E+00	-0.99459	1.69E-02
19	47.5	0.00313	-4.1E-01	6.7E-01	-4.4E+48	2.000	9.9E+00	2.0E+04	4.4E+48	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9932	-1.9E+00	-0.99321	1.66E-02
20	50	0.00313	-4.3E-01	6.5E-01	-4.4E+48	2.000	1.0E+01	3.4E+04	4.4E+48	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	1.62E-02

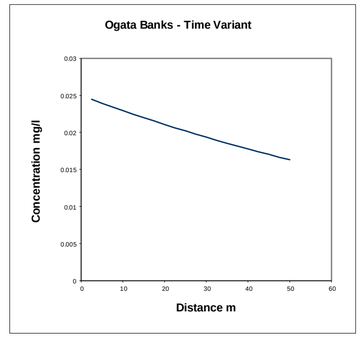


Calc **Value**

v	2.59E+02	m/d
Rc	7.82E+03	
u	3.31E-02	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.00313	-2.1E-02	9.8E-01	-4.4E+48	2.000	5.2E-01	1.7E+00	4.4E+48	0.000	1.7E+01	1	-1.7E+01	-1	1.7E+01	1	-1.7E+01	-1	2.45E-02
2	5	0.00313	-4.3E-02	9.6E-01	-4.4E+48	2.000	1.0E+00	2.8E+00	4.4E+48	0.000	1.2E+01	1	-1.2E+01	-1	1.2E+01	1	-1.2E+01	-1	2.40E-02
3	7.5	0.00313	-6.4E-02	9.4E-01	-4.4E+48	2.000	1.6E+00	4.8E+00	4.4E+48	0.000	9.7E+00	1	-9.7E+00	-1	9.6E+00	1	-9.6E+00	-1	2.35E-02
4	10	0.00313	-8.5E-02	9.2E-01	-4.4E+48	2.000	2.1E+00	8.0E+00	4.4E+48	0.000	8.4E+00	1	-8.4E+00	-1	8.3E+00	1	-8.3E+00	-1	2.30E-02
5	12.5	0.00313	-1.1E-01	9.0E-01	-4.4E+48	2.000	2.6E+00	1.4E+01	4.4E+48	0.000	7.5E+00	1	-7.5E+00	-1	7.5E+00	1	-7.5E+00	-1	2.25E-02
6	15	0.00313	-1.3E-01	8.8E-01	-4.4E+48	2.000	3.1E+00	2.3E+01	4.4E+48	0.000	6.8E+00	1	-6.8E+00	-1	6.8E+00	1	-6.8E+00	-1	2.20E-02
7	17.5	0.00313	-1.5E-01	8.6E-01	-4.4E+48	2.000	3.6E+00	3.8E+01	4.4E+48	0.000	6.3E+00	1	-6.3E+00	-1	6.3E+00	1	-6.3E+00	-1	2.15E-02
8	20	0.00313	-1.7E-01	8.4E-01	-4.4E+48	2.000	4.2E+00	6.5E+01	4.4E+48	0.000	5.9E+00	1	-5.9E+00	-1	5.9E+00	1	-5.9E+00	-1	2.11E-02
9	22.5	0.00313	-1.9E-01	8.3E-01	-4.4E+48	2.000	4.7E+00	1.1E+02	4.4E+48	0.000	5.6E+00	1	-5.6E+00	-1	5.6E+00	1	-5.6E+00	-1	2.06E-02
10	25	0.00313	-2.1E-01	8.1E-01	-4.4E+48	2.000	5.2E+00	1.8E+02	4.4E+48	0.000	5.3E+00	1	-5.3E+00	-1	5.3E+00	1	-5.3E+00	-1	2.02E-02
11	27.5	0.00313	-2.3E-01	7.9E-01	-4.4E+48	2.000	5.7E+00	3.1E+02	4.4E+48	0.000	5.1E+00	1	-5.1E+00	-1	5.0E+00	1	-5.0E+00	-1	1.98E-02
12	30	0.00313	-2.6E-01	7.7E-01	-4.4E+48	2.000	6.3E+00	5.2E+02	4.4E+48	0.000	4.8E+00	1	-4.8E+00	-1	4.8E+00	1	-4.8E+00	-1	1.94E-02
13	32.5	0.00313	-2.8E-01	7.6E-01	-4.4E+48	2.000	6.8E+00	8.8E+02	4.4E+48	0.000	4.7E+00	1	-4.7E+00	-1	4.6E+00	1	-4.6E+00	-1	1.89E-02
14	35	0.00313	-3.0E-01	7.4E-01	-4.4E+48	2.000	7.3E+00	1.5E+03	4.4E+48	0.000	4.5E+00	1	-4.5E+00	-1	4.5E+00	1	-4.5E+00	-1	1.85E-02
15	37.5	0.00313	-3.2E-01	7.3E-01	-4.4E+48	2.000	7.8E+00	2.5E+03	4.4E+48	0.000	4.3E+00	1	-4.3E+00	-1	4.3E+00	1	-4.3E+00	-1	1.82E-02
16	40	0.00313	-3.4E-01	7.1E-01	-4.4E+48	2.000	8.3E+00	4.2E+03	4.4E+48	0.000	4.2E+00	1	-4.2E+00	-1	4.2E+00	1	-4.2E+00	-1	1.78E-02
17	42.5	0.00313	-3.6E-01	7.0E-01	-4.4E+48	2.000	8.9E+00	7.1E+03	4.4E+48	0.000	4.1E+00	1	-4.1E+00	-1	4.0E+00	1	-4.0E+00	-1	1.74E-02
18	45	0.00313	-3.8E-01	6.8E-01	-4.4E+48	2.000	9.4E+00	1.2E+04	4.4E+48	0.000	4.0E+00	1	-4.0E+00	-1	3.9E+00	1	-3.9E+00	-1	1.70E-02
19	47.5	0.00313	-4.1E-01	6.7E-01	-4.4E+48	2.000	9.9E+00	2.0E+04	4.4E+48	0.000	3.8E+00	1	-3.8E+00	-1	3.8E+00	1	-3.8E+00	-1	1.67E-02
20	50	0.00313	-4.3E-01	6.5E-01	-4.4E+48	2.000	1.0E+01	3.4E+04	4.4E+48	0.000	3.8E+00	1	-3.8E+00	-1	3.7E+00	1	-3.7E+00	-1	1.63E-02



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	2.45E-02
5.0	2.40E-02
7.5	2.35E-02
10.0	2.30E-02
12.5	2.25E-02
15.0	2.20E-02
17.5	2.15E-02
20.0	2.11E-02
22.5	2.06E-02
25.0	2.02E-02
27.5	1.98E-02
30.0	1.94E-02
32.5	1.89E-02
35.0	1.85E-02
37.5	1.82E-02
40.0	1.78E-02
42.5	1.74E-02
45.0	1.70E-02
47.5	1.67E-02
50.0	1.63E-02

Contaminant **richloroethene**

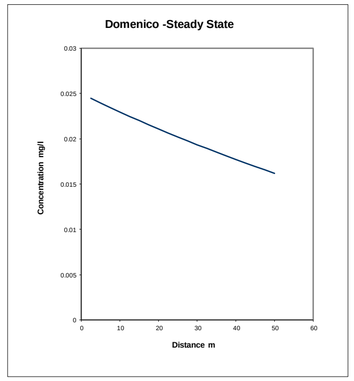
Input	Value	Units
C_T	0.01	mg/l
Co	2.50E-02	mg/l
λ	2.95E-04	days^{-1}
Sz	7.50E+01	m
Sy	1.18E+01	m
Kd	2.15E+03	l/kg
ρ	1.60E+00	g/cm3
n	4.40E-01	
i	4.40E-02	
K	2.59E+03	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion optio Simulate vertical dispersion in 1 direction

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.00625	-2.13E-02	9.79E-01	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	2.45E-02
2	5	0.00625	-4.26E-02	9.58E-01	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	2.40E-02
3	7.5	0.00625	-6.40E-02	9.38E-01	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	2.35E-02
4	10	0.00625	-8.53E-02	9.18E-01	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	2.30E-02
5	12.5	0.00625	-1.07E-01	8.99E-01	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	2.25E-02
6	15	0.00625	-1.28E-01	8.80E-01	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	2.20E-02
7	17.5	0.00625	-1.49E-01	8.61E-01	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	2.15E-02
8	20	0.00625	-1.71E-01	8.43E-01	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	2.11E-02
9	22.5	0.00625	-1.92E-01	8.25E-01	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-0.9999	2.06E-02
10	25	0.00625	-2.13E-01	8.08E-01	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-0.9998	2.02E-02
11	27.5	0.00625	-2.34E-01	7.91E-01	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-0.9996	1.98E-02
12	30	0.00625	-2.56E-01	7.74E-01	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	1.93E-02
13	32.5	0.00625	-2.77E-01	7.58E-01	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.9989	1.89E-02
14	35	0.00625	-2.98E-01	7.42E-01	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.9984	1.85E-02
15	37.5	0.00625	-3.20E-01	7.26E-01	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.9977	1.81E-02
16	40	0.00625	-3.41E-01	7.11E-01	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	1.77E-02
17	42.5	0.00625	-3.62E-01	6.96E-01	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.9958	1.73E-02
18	45	0.00625	-3.84E-01	6.81E-01	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.9946	1.69E-02
19	47.5	0.00625	-4.05E-01	6.67E-01	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.9932	1.66E-02
20	50	0.00625	-4.26E-01	6.53E-01	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	1.62E-02



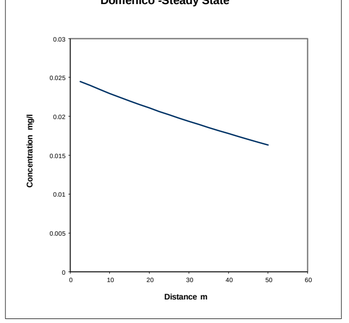
Calc **Value**

v	2.59E+02	m/d
Rc	7.82E+03	
u	3.31E-02	m/d

DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.00625	-2.13E-02	9.79E-01	1.68E+01	1	-1.68E+01	-1	1.67E+01	1	-1.67E+01	-1	2.45E-02
2	5	0.00625	-4.26E-02	9.58E-01	1.19E+01	1	-1.19E+01	-1	1.18E+01	1	-1.18E+01	-1	2.40E-02
3	7.5	0.00625	-6.40E-02	9.38E-01	9.68E+00	1	-9.68E+00	-1	9.63E+00	1	-9.63E+00	-1	2.35E-02
4	10	0.00625	-8.53E-02	9.18E-01	8.39E+00	1	-8.39E+00	-1	8.34E+00	1	-8.34E+00	-1	2.30E-02
5	12.5	0.00625	-1.07E-01	8.99E-01	7.50E+00	1	-7.50E+00	-1	7.46E+00	1	-7.46E+00	-1	2.25E-02
6	15	0.00625	-1.28E-01	8.80E-01	6.85E+00	1	-6.85E+00	-1	6.81E+00	1	-6.81E+00	-1	2.20E-02
7	17.5	0.00625	-1.49E-01	8.61E-01	6.34E+00	1	-6.34E+00	-1	6.31E+00	1	-6.31E+00	-1	2.15E-02
8	20	0.00625	-1.71E-01	8.43E-01	5.93E+00	1	-5.93E+00	-1	5.90E+00	1	-5.90E+00	-1	2.11E-02
9	22.5	0.00625	-1.92E-01	8.25E-01	5.59E+00	1	-5.59E+00	-1	5.56E+00	1	-5.56E+00	-1	2.06E-02
10	25	0.00625	-2.13E-01	8.08E-01	5.30E+00	1	-5.30E+00	-1	5.28E+00	1	-5.28E+00	-1	2.02E-02
11	27.5	0.00625	-2.34E-01	7.91E-01	5.06E+00	1	-5.06E+00	-1	5.03E+00	1	-5.03E+00	-1	1.98E-02
12	30	0.00625	-2.56E-01	7.74E-01	4.84E+00	1	-4.84E+00	-1	4.82E+00	1	-4.82E+00	-1	1.94E-02
13	32.5	0.00625	-2.77E-01	7.58E-01	4.65E+00	1	-4.65E+00	-1	4.63E+00	1	-4.63E+00	-1	1.89E-02
14	35	0.00625	-2.98E-01	7.42E-01	4.48E+00	1	-4.48E+00	-1	4.46E+00	1	-4.46E+00	-1	1.85E-02
15	37.5	0.00625	-3.20E-01	7.26E-01	4.33E+00	1	-4.33E+00	-1	4.31E+00	1	-4.31E+00	-1	1.82E-02
16	40	0.00625	-3.41E-01	7.11E-01	4.19E+00	1	-4.19E+00	-1	4.17E+00	1	-4.17E+00	-1	1.78E-02
17	42.5	0.00625	-3.62E-01	6.96E-01	4.07E+00	1	-4.07E+00	-1	4.05E+00	1	-4.05E+00	-1	1.74E-02
18	45	0.00625	-3.84E-01	6.81E-01	3.95E+00	1	-3.95E+00	-1	3.93E+00	1	-3.93E+00	-1	1.70E-02
19	47.5	0.00625	-4.05E-01	6.67E-01	3.85E+00	1	-3.85E+00	-1	3.83E+00	1	-3.83E+00	-1	1.67E-02
20	50	0.00625	-4.26E-01	6.53E-01	3.75E+00	1	-3.75E+00	-1	3.73E+00	1	-3.73E+00	-1	1.63E-02



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	2.45E-02
5.0	2.40E-02
7.5	2.35E-02
10.0	2.30E-02
12.5	2.25E-02
15.0	2.20E-02
17.5	2.15E-02
20.0	2.11E-02
22.5	2.06E-02
25.0	2.02E-02
27.5	1.98E-02
30.0	1.94E-02
32.5	1.89E-02
35.0	1.85E-02
37.5	1.82E-02
40.0	1.78E-02
42.5	1.74E-02
45.0	1.70E-02
47.5	1.67E-02
50.0	1.63E-02

DOMENICO (TIME VARIANT)

Contaminant Trichloroethene

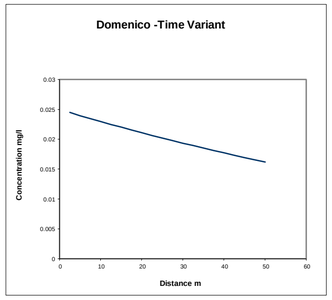
Input	Value	Units
C_T	0.01	mg/l
Co	2.50E-02	mg/l
λ	2.95E-04	days^{-1}
Sz	7.50E+01	m
Sy	1.18E+01	m
Kd	2.15E+03	l/kg
ρ	1.60E+00	g/cm3
n	4.40E-01	
i	4.40E-02	
K	2.59E+03	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

Calc	Value	
v	2.59E+02	m/d
Rc	7.82E+03	
u	3.31E-02	m/d

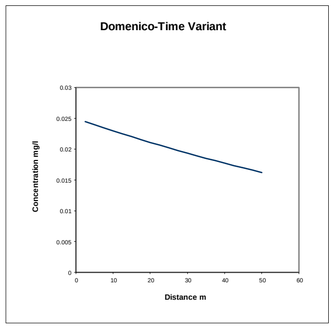
Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.00313	-2.13E-02	9.79E-01	-4.40E+48	2	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	2.45E-02
2	5	0.00313	-4.26E-02	9.58E-01	-4.40E+48	2	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	2.40E-02
3	7.5	0.00313	-6.40E-02	9.38E-01	-4.40E+48	2	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	2.35E-02
4	10	0.00313	-8.53E-02	9.18E-01	-4.40E+48	2	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	2.30E-02
5	12.5	0.00313	-1.07E-01	8.99E-01	-4.40E+48	2	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	2.25E-02
6	15	0.00313	-1.28E-01	8.80E-01	-4.40E+48	2	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	2.20E-02
7	17.5	0.00313	-1.49E-01	8.61E-01	-4.40E+48	2	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	2.15E-02
8	20	0.00313	-1.71E-01	8.43E-01	-4.40E+48	2	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	2.11E-02
9	22.5	0.00313	-1.92E-01	8.25E-01	-4.40E+48	2	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-1	2.06E-02
10	25	0.00313	-2.13E-01	8.08E-01	-4.40E+48	2	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-1	2.02E-02
11	27.5	0.00313	-2.34E-01	7.91E-01	-4.40E+48	2	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-1	1.98E-02
12	30	0.00313	-2.56E-01	7.74E-01	-4.40E+48	2	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	1.93E-02
13	32.5	0.00313	-2.77E-01	7.58E-01	-4.40E+48	2	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.999	1.89E-02
14	35	0.00313	-2.98E-01	7.42E-01	-4.40E+48	2	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.998	1.85E-02
15	37.5	0.00313	-3.20E-01	7.26E-01	-4.40E+48	2	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.998	1.81E-02
16	40	0.00313	-3.41E-01	7.11E-01	-4.40E+48	2	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	1.77E-02
17	42.5	0.00313	-3.62E-01	6.96E-01	-4.40E+48	2	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.996	1.73E-02
18	45	0.00313	-3.84E-01	6.81E-01	-4.40E+48	2	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.995	1.69E-02
19	47.5	0.00313	-4.05E-01	6.67E-01	-4.40E+48	2	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.993	1.66E-02
20	50	0.00313	-4.26E-01	6.53E-01	-4.40E+48	2	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	1.62E-02



Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.00313	-2.13E-02	9.79E-01	-4.40E+48	2	1.68E+01	1	-1.68E+01	-1	1.67E+01	1	-1.67E+01	-1	2.45E-02
2	5	0.00313	-4.26E-02	9.58E-01	-4.40E+48	2	1.19E+01	1	-1.19E+01	-1	1.18E+01	1	-1.18E+01	-1	2.40E-02
3	7.5	0.00313	-6.40E-02	9.38E-01	-4.40E+48	2	9.68E+00	1	-9.68E+00	-1	9.63E+00	1	-9.63E+00	-1	2.35E-02
4	10	0.00313	-8.53E-02	9.18E-01	-4.40E+48	2	8.39E+00	1	-8.39E+00	-1	8.34E+00	1	-8.34E+00	-1	2.30E-02
5	12.5	0.00313	-1.07E-01	8.99E-01	-4.40E+48	2	7.50E+00	1	-7.50E+00	-1	7.46E+00	1	-7.46E+00	-1	2.25E-02
6	15	0.00313	-1.28E-01	8.80E-01	-4.40E+48	2	6.85E+00	1	-6.85E+00	-1	6.81E+00	1	-6.81E+00	-1	2.20E-02
7	17.5	0.00313	-1.49E-01	8.61E-01	-4.40E+48	2	6.34E+00	1	-6.34E+00	-1	6.31E+00	1	-6.31E+00	-1	2.15E-02
8	20	0.00313	-1.71E-01	8.43E-01	-4.40E+48	2	5.93E+00	1	-5.93E+00	-1	5.90E+00	1	-5.90E+00	-1	2.11E-02
9	22.5	0.00313	-1.92E-01	8.25E-01	-4.40E+48	2	5.59E+00	1	-5.59E+00	-1	5.56E+00	1	-5.56E+00	-1	2.06E-02
10	25	0.00313	-2.13E-01	8.08E-01	-4.40E+48	2	5.30E+00	1	-5.30E+00	-1	5.28E+00	1	-5.28E+00	-1	2.02E-02
11	27.5	0.00313	-2.34E-01	7.91E-01	-4.40E+48	2	5.06E+00	1	-5.06E+00	-1	5.03E+00	1	-5.03E+00	-1	1.98E-02
12	30	0.00313	-2.56E-01	7.74E-01	-4.40E+48	2	4.84E+00	1	-4.84E+00	-1	4.82E+00	1	-4.82E+00	-1	1.94E-02
13	32.5	0.00313	-2.77E-01	7.58E-01	-4.40E+48	2	4.65E+00	1	-4.65E+00	-1	4.63E+00	1	-4.63E+00	-1	1.89E-02
14	35	0.00313	-2.98E-01	7.42E-01	-4.40E+48	2	4.48E+00	1	-4.48E+00	-1	4.46E+00	1	-4.46E+00	-1	1.85E-02
15	37.5	0.00313	-3.20E-01	7.26E-01	-4.40E+48	2	4.33E+00	1	-4.33E+00	-1	4.31E+00	1	-4.31E+00	-1	1.82E-02
16	40	0.00313	-3.41E-01	7.11E-01	-4.40E+48	2	4.19E+00	1	-4.19E+00	-1	4.17E+00	1	-4.17E+00	-1	1.78E-02
17	42.5	0.00313	-3.62E-01	6.96E-01	-4.40E+48	2	4.07E+00	1	-4.07E+00	-1	4.05E+00	1	-4.05E+00	-1	1.74E-02
18	45	0.00313	-3.84E-01	6.81E-01	-4.40E+48	2	3.95E+00	1	-3.95E+00	-1	3.93E+00	1	-3.93E+00	-1	1.70E-02
19	47.5	0.00313	-4.05E-01	6.67E-01	-4.40E+48	2	3.85E+00	1	-3.85E+00	-1	3.83E+00	1	-3.83E+00	-1	1.67E-02
20	50	0.00313	-4.26E-01	6.53E-01	-4.40E+48	2	3.75E+00	1	-3.75E+00	-1	3.73E+00	1	-3.73E+00	-1	1.63E-02



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	2.45E-02
5.0	2.40E-02
7.5	2.35E-02
10.0	2.30E-02
12.5	2.25E-02
15.0	2.20E-02
17.5	2.15E-02
20.0	2.11E-02
22.5	2.06E-02
25.0	2.02E-02
27.5	1.98E-02
30.0	1.94E-02
32.5	1.89E-02
35.0	1.85E-02
37.5	1.82E-02
40.0	1.78E-02
42.5	1.74E-02
45.0	1.70E-02
47.5	1.67E-02
50.0	1.63E-02

Hydrogeological risk assessment for land contamination

Remedial Targets Worksheet , Release 3.2

First released: 2006. Version 3.2: January 2013

This worksheet has been produced in combination with the document 'Remedial Targets Methodology: Hydrogeological risk assessment for land contamination (Environment Agency 2006).

Users of this worksheet should always refer to the User Manual to the Remedial Targets Methodology and to relevant guidance on UK legislation and policy, in order to understand how this procedure should be applied in an appropriate context.

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The calculation of equations in this worksheet has been independently checked by Entec (UK) Ltd on behalf of the Environment Agency.

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IMPORTANT: To enable MS Excel worksheet, click Tools, Add -Ins, Analysis Tool Pak and Analysis Tool Pak-VBA (to calculate error functions).

Details to be completed for each assessment				
Site Name:	Kelvedon Street			
Site Address:	Newport			
Completed by:	Michael Watkins			
Date:	11-Dec-25		Version:	1
Contaminant	Trichloroethene			
Target Concentration (C_T)	0.01	mg/l	Origin of C_T:	WFD for inland surface waters (annual average)

This worksheet can be used to determine remedial targets for soils (Worksheets Level 1 Soil, Level 2 and Level 3 Soil) or to determine remedial targets for groundwater (Level 3 Groundwater). For Level 3, parameter values must be entered separately dependent on whether the assessment is for soil or groundwater. For soil, remedial targets are calculated as either mg/kg (for comparision with soil measurements) or mg/l (for comparison with leaching tests or pore water concentrations).
Site details entered on this page are automatically copied to Level 1, 2 and 3 Worksheets.
Worksheet options are identified by brown background and employ a pull-down menus. Data entry are identified as blue background.
Data origin / justification should be noted in cells coloured yellow and fully documented in subsequent reports.
Data carried forward from an earlier worksheet are identified by a light green background
It is recommended that a copy of the original worksheet is saved (all data fields in the original copy are blank).

The spreadsheet also includes a porosity calculation worksheet, a soil impact calculation worksheet and a worksheet that performs some simple hydrogeological calculations.

Remedial Targets Worksheet , Release 3.2

Level 1 - Soil

Select the method of calculating the soil water Partition Co-efficient by using the pull down menu below

User specified value for partition coefficient

Contaminant		**Trichloroethene**	
Target concentration	C_T	**0.01**	**mg/l**

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**
Standard entry				
Water filled soil porosity	θ_w	0.00E+00	fraction	
Air filled soil porosity	θa	0.00E+00	fraction	
Bulk density of soil zone material	ρ	0.00E+00	g/cm^3	
Henry's Law constant	H	0.00E+00	dimensionless	
Entry if specify partition coefficient (option)				
Soil water partition coefficient	Kd	0.00E+00	l/kg	
Entry for non-polar organic chemicals (option)				
Fraction of organic carbon (in soil)	foc		fraction	
Organic carbon partition coefficient	Koc		l/kg	
Entry for ionic organic chemicals (option)				
Sorption coefficient for neutral species	$K_{oc,n}$		l/kg	
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg	
pH value	pH		pH units	
Acid dissociation constant	pKa			
Fraction of organic carbon (in soil)	foc		fraction	

This sheet calculates the Level 1 remedial target for soils(mg/kg) based on a selected target concentration and theoretical calculation of soil water partitioning. Three options are included for determining the partition coefficient.

The measured soil concentration as mg/kg should be compared with the Level 1 remedial target to determine the need for further action.

Soil water partition coefficient used in Level Assessment	**Kd**	**0.00E+00**	**l/kg**	*Specified value*

Level 1 Remedial Target

Level 1 Remedial Target	**#DIV/0!**	**mg/kg**	**(for comparison with soil analyses)**
	or		
	0.01	**mg/l**	**(for comparison with leachate test results)**

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 2 - Soil

Contaminant		**Trichloroethene**		from Level 1
Target concentration	C_T	**0.01**	**mg/l**	from Level 1

This sheet calculates the Level 2 remedial target for soils (mg/kg) or for pore water (mg/l).

The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 2 remedial target to determine the need for further action. Equations presented in 'Hydrogeological risk assessment for land contamiantion' (Environment Agency 2006)

Input Parameters	Variable	Value	Unit	Source of parameter value	
Standard entry					
Infiltration	Inf	0.00E+00	m/d		
Area of contaminant source	A	0.00E+00	m^2		Not used in calculation
Entry for groundwater flow below site					
Length of contaminant source in direction of groundwater flow	L	0.00E+00	m		
Saturated aquifer thickness	da	0.00E+00	m		
Hydraulic Conductivity of aquifer in which dilution occurs	K	0.00E+00	m/d		
Hydraulic gradient of water table	i	0.00E+00	fraction		
Width of contaminant source perpendicular to groundwater flow	w	0.00E+00	m		Not used in calculation
Background concentration of contaminant in groundwater beneath site	Cu	0.00E+00	mg/l		
Define mixing zone depth by specifying or calculating depth (using pull down list)		**Specify**			
Enter mixing zone thickness	Mz	0.00E+00	m		
Calculated mixing zone thickness	Mz		m		

Calculated Parameters

Dilution Factor	**DF**	**#DIV/0!**		
Level 2 Remedial Target		**#DIV/0!**	**mg/l**	**For comparison with measured pore water concentration. This assumes Level 1 Remedial Target is based on Target Concentration.**
		or		
		#DIV/0!	**mg/kg**	**For comparison with measured soil concentration. This assumes Level 1 Remedial Target calculated from soil-water**

Additional option

Calculation of impact on receptor

Concentration of contaminant in contaminated discharge (entering receptor)	Cc	0.00E+00	mg/l	
Calculated concentration within receptor (dilution only)		#DIV/0!	mg/l	0

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 3 - Soil

See Note

Input Parameters	Variable	Value	Unit	Source
Contaminant		Trichloroethene		from Level 1
Target Concentration	C_T	0.01	mg/l	from Level 1
Dilution Factor	DF	#DIV/0!		from Level 2

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value)

	Variable	Value	Unit	Source of parameter value
Enter source concentration		Soil concentration as mg/kg		
Enter soil concentration		0	mg/kg	
Half life for degradation of contaminant in water	$t_{1/2}$	1.00E+100	days	
Calculated decay rate	λ	6.93E-101	$days^{-1}$	calculated
Width of plume in aquifer at source	Sz	0.00E+00	m	from Level 2
Plume thickness in aquifer at source	Sy	0.00E+00	m	from Level 2
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Effective porosity of aquifer	n	0.00E+00	fraction	
Hydraulic gradient	i	#DIV/0!	fraction	from Level 2 (adjusted)
Hydraulic conductivity of saturated aquifer	K	0.00E+00	m/d	from Level 2
Distance to compliance point	x	0.00E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	1.00E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	0.00E+00	l/kg	*see options*
Longitudinal dispersivity	ax	0.000	m	*see options*
Transverse dispersivity	az	0.000	m	*see options*
Vertical dispersivity	ay	0.000	m	*see options*

Parameter values should be checked against Level 1 and 2

Calculated Parameters	Variable		
Groundwater flow velocity	v	#DIV/0!	m/d
Retardation factor	Rf	#DIV/0!	fraction
Decay rate used	λ	6.93E-101	d^{-1}
Hydraulic gradient used in aquifer flow down-gradient	i	#DIV/0!	fraction
Rate of contaminant flow due to retardation	u	#DIV/0!	m/d
Ratio of Compliance Point to Source Concentration	C_{cp}/C_0	#DIV/0!	fraction
Attenuation factor (C_o/C_{cp})	**AF**	**#DIV/0!**	**fraction**
Calculated soil leachate concentration	Co	#DIV/0!	mg/l

Remedial Targets

Level 3 Remedial Target	**#DIV/0!**	**mg/l**	For comparison with measured pore water concentration.
Ogata Banks	**or**		This assumes Level 1 Remedial Target is based on Target Concentration.
	#DIV/0!	**mg/kg**	For comparison with measured soil concentration. This
Distance to compliance point	**0**	**m**	assumes Level 1 Remedial Target calculated from soil-water partitioning equation.
Ratio of Compliance Point to Source Concentration	**#DIV/0!**	**fraction**	Ogata Banks

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99

Enter method of defining partition co-efficient (using pull down list)

Calculate for ionic organic chemicals (acids)

Entry if specify partition coefficient (option)

Soil water partition coefficient — Kd — [redacted] l/kg

Entry for non-polar organic chemicals (option)

Fraction of organic carbon in aquifer — foc — [redacted] fraction

Organic carbon partition coefficient — Koc — [redacted] l/kg

Entry for ionic organic chemicals (option)

Sorption coefficient for related species	$K_{oc,n}$	0.00E+00	l/kg
Sorption coefficient for ionised species	$K_{oc,i}$	0.00E+00	l/kg
pH value	pH	0.00E+00	
Acid dissociation constant	pKa	0.00E+00	
Fraction of organic carbon in aquifer	foc	0.00E+00	fraction
Soil water partition coefficient	Kd	0.00E+00	l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

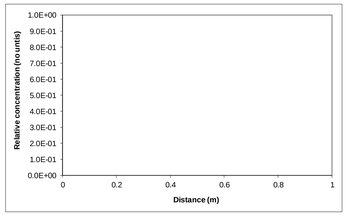
		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	0.00E+00	#NUM!	m
Transverse dispersivity	**az**	0.00E+00	0.00E+00	#NUM!	m
Vertical dispersivity	**ay**	0.00E+00	0.00E+00	#NUM!	m

Note values of dispersivity must be > 0

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed

Note
This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O_2, NO_3, SO_4 etc than an alternative solution should be used

Environment Agency



Note: 'Relative concentration' is the ratio of calculated concentation at a given position compared to the source concentration. The calculations assume plume disperses from the top of the aquifer. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

This sheet calculates the Level 3 remedial target for soils(mg/kg) or for pore water (mg/l), based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.By setting a long travel time (e.g. 9E99) it will give the steady state solution, which should always be used when calculating remedial targets.

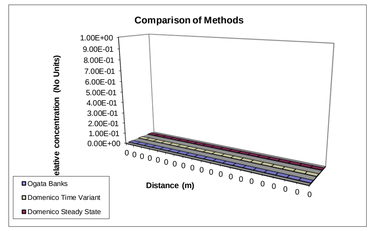
The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.9E+99.

Calculated (relative) concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Relative concentration (No units)	Concentration mg/l
0	1.0E+00	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!



Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Remedial Targets Worksheet , Release 3.2

Calculation of contaminant concentration in groundwater from a soil source

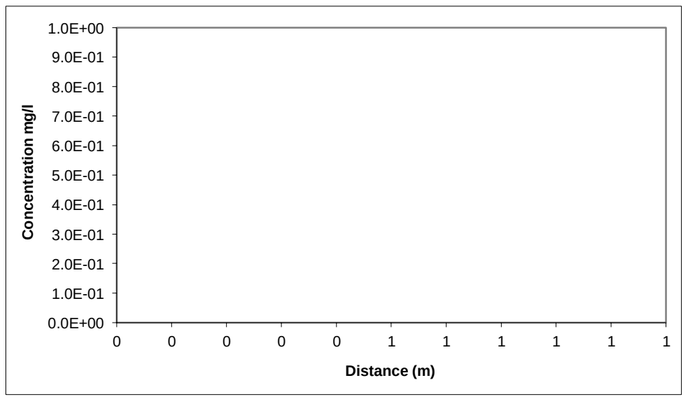
Only input required is Soil Contaminant Concentration

Input Parameters			
Soil contaminant concentration	C_0	0.00E+00	mg/kg
Level 1 Parameters			
Water filled soil porosity	θ_W	0.00E+00	fraction
Air filled soil porosity	θa	0.00E+00	fraction
Bulk density	ρ	0.00E+00	g/cm^3
Henry's Law constant	H	0.00E+00	dimensionless
Soil water partition coefficient used in Level Assessment	Kd	0.00E+00	l/kg
Factor (partitioning between soil and water)		#DIV/0!	dimensionless
Level 2 Parameters **Dilution Factor**	DF	#DIV/0!	
Level 3 Parameters **Attenuation factor (C_O/C_{ED})**	AF	#DIV/0!	

Predicted concentrations at compliance point

Level 1	C	#DIV/0!	mg/l	No dilution or attenuation
Level 2	C	#DIV/0!	mg/l	Dilution taken into account
Level 3	C	#DIV/0!	mg/l	Dilution and attenuation taken into account

Predicted concentrations between source and compliance point - Level 3



Distance m	Concentration mg/l
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu) | **Variable** | **Value** | **Unit** | **Source**

Contaminant		Trichloroethene		from Level 1
Target Concentration	C_T	1.00E-02	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Domenico - Steady state — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived va

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	2.50E-02	mg/l	*Site investigation data*
Half life for degradation of contaminant in water	$t_{1/2}$	2.35E+03	days	*Howard et al (1991) Low anaerobic biodeg*
Calculated decay rate	λ	2.95E-04	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	7.50E+01	m	*Length of site perpendicular to groundwater flow*
Plume thickness at source	Sy	5.90E+00	m	*Same as Mixing Zone Thickness. "For a thin aquifer (typically <10m), the mixing zone thickness can be taken as the actu*
Saturated aquifer thickness	da	6.00E+00	m	*Maximum thickness recorded in vicinity of*
Bulk density of aquifer materials	ρ	1.60E+00	g/cm^3	*Typical bulk density for river terrace deposits*
Effective porosity of aquifer	n	2.50E-01	fraction	*Maximum porosity for coarse Gravel (Lovanh et al 2000) - conservative estimate*
Hydraulic gradient	i	4.40E-02	fraction	*Borehole level data*
Hydraulic conductivity of aquifer	K	4.32E-01	m/d	*Maximum typical value for clayey sandy G*
Distance to compliance point	x	5.00E+01	m	*Default compliance distance*
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	9.90E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	2.15E+02	l/kg	*see options*
Longitudinal dispersivity	ax	5.00E+00	m	*see options*
Transverse dispersivity	az	5.00E-01	m	*see options*
Vertical dispersivity	ay	5.00E-02	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd	2.15E+02	l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc		fraction
Organic carbon partition coefficient	Koc		l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{oc,n}$		l/kg
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	2.15E+02	l/kg

Define dispersivity (click brown cell and use pull down list)

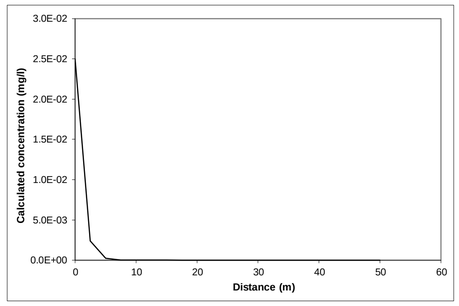
Dispersivities 10%, 1%, 0.1% of pathway length

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	5.00E+00	2.98E+00	m
Transverse dispersivity	**az**	0.00E+00	5.00E-01	2.98E-01	m
Vertical dispersivity	**ay**	0.00E+00	5.00E-02	2.98E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Calculated concentrations for distance-concentration graph

Domenico - Steady state
From calculation sheet

Distance	Concentration
	mg/l
0	2.5E-02
2.5	2.40E-03
5.0	2.30E-04
7.5	2.20E-05
10.0	2.11E-06
12.5	2.02E-07
15.0	1.94E-08
17.5	1.86E-09
20.0	1.78E-10
22.5	1.71E-11
25.0	1.63E-12
27.5	1.57E-13
30.0	1.50E-14
32.5	1.44E-15
35.0	1.38E-16
37.5	1.32E-17
40.0	1.26E-18
42.5	1.21E-19
45.0	1.16E-20
47.5	1.11E-21
50.0	1.06E-22

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Calculated Parameters | **Variable**

Groundwater flow velocity	v	7.60E-02	m/d
Retardation factor	Rf	1.38E+03	fraction
Decay rate used	λ	2.95E-04	d^{-1}
Rate of contaminant flow due to retardation	u	5.52E-05	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	1.06E-22	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**2.36E+20**	

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Remedial Targets

Remedial Target		**2.36E+18**	**mg/l**	For comparison with measured groundwater concentration.
Domenico - Steady state				
Distance to compliance point		**50**	**m**	
Concentration of contaminant at compliance point	C_{ED}/C_0	**1.06E-22**	**mg/l**	Domenico - Steady state

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.

Porosity Calculator

These results are not carried through to any of the other worksheets

DRY BULK DENSITY DATA

Variable	Value	Unit	justification
Natural Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Dry Bulk Density	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
Initial Saturation	#DIV/0!	%	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	
Water Filled Porosity	**#DIV/0!**	**fraction**	

WET BULK DENSITY DATA

Variable	Value	Unit	
Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Actual (wet) Bulk Density (i.e. at natural MC)	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
dry bulk density	0.00	tonnes/m^3	
Initial Saturation	#DIV/0!	%	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	**#DIV/0!**
Water Filled Porosity	**#DIV/0!**	**fraction**	

Analytical solutions provided by David Hall, Golder Associates (UK) Ltd

Simple hydrogeological calculations

(These are not specific to, or required in, the Remedial Targets Methodology)

Parameter	symbol		unit	justification
Hydraulic conductivity	K	0.00E+00	m/d	
Hydraulic gradient	i	0.00E+00	unitless	
Effective porosity of aquifer	n	0.00E+00	fraction	
Thickness of saturated aquifer	b	0.00E+00	m	
Width of aquifer perpendicular to flow	w	0.00E+00	m	
Distance to receptor	x	0.00E+00	m	
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Soil-water partition co-efficient	Kd	0.00E+00	l/kg	
Retardation factor of pollutant	R	#DIV/0!		

Groundwater flow velocity	v(GW)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for groundwater to reach receptor	t(GW)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years
Rate of groundwater flow through aquifer	Q	0.00E+00	m^3/s	0.00E+00	m^3/day	0.00E+00	m^3/year

Contaminant flow velocity	v(contam)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for contaminant to reach receptor	t(contam)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years

Level 1 Calculation Sheet

Contaminant **Trichloroethene**

Parameter	Value	Units
(carried over from input sheet)		
C_T	1.00E-02	mg/l
Kd	0.00E+00	l/kg
foc		fraction
koc		l/kg
θ_W	0.00E+00	fraction
θa	0.00E+00	fraction
ρ	0.00E+00	g/cm3
H	0.00E+00	dimensionless
Koc,n		l/kg
Koc,i		l/kg
pH		pH units
pKa		
foc (ionic)		fraction

Calculations (Refer toTable 4.3, R&D Publication 20)

Selected option User specified value for partition coefficient

calc calc Calc Kd l/kg

Calculation of partition coefficient for ionic organic chemical

Partition coefficient used in Level 1 Assessment 0.00E+00 l/kg

Calculated Remedial Target #DIV/0! mg/kg for Trichloroethene

Factor (partitioning between soil and water) #DIV/0!

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11/12/2025
Version:	1

Level 2 Calculation Sheet

Contaminant **Trichloroethene**

Site assessed:	Kelvedon Stre
Date:	11/12/2025
Version:	1

Parameter	Value	Units		
(carried over from input sheet)				
Mz	0.00E+00	m		
L	0.00E+00	m		
da	0.00E+00	m		Calculated
Inf	0.00E+00	m/d		Dilution Factor
K	0.00E+00	m/d		
i	0.00E+00		Calculation based on target concentration	#DIV/0!
A	0.00E+00	m3/d m2 m3/d	Calculation based on observed contaminant concentration	#DIV/0!
Cc	0.00E+00	mg/l		
C_T	1.00E-02	mg/l		
Cu	0.00E+00	mg/l		
w	0.00E+00	m		



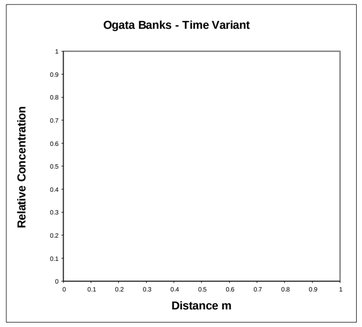
Contaminant **Trichloroethene**

OGATA BANKS SOLUTION

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-02	mg/l
DF	#DIV/0!	
λ	6.931E-101	days^{-1}
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Calc	Value	
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) -USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

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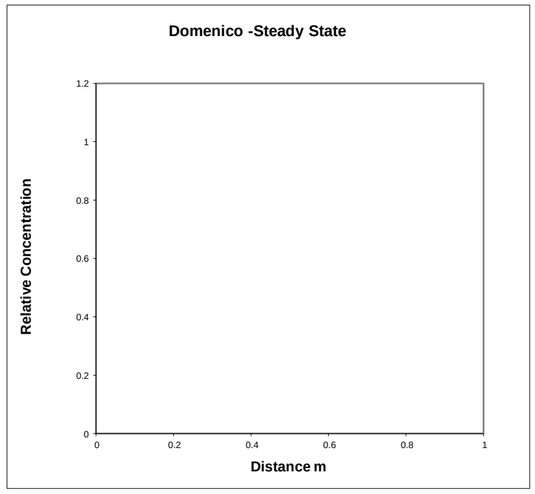
Contaminant **richloroethene**

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-02	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

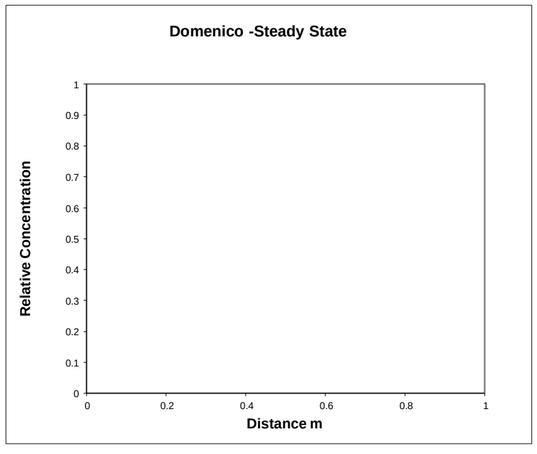


Calc	Value	
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



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Version:	1

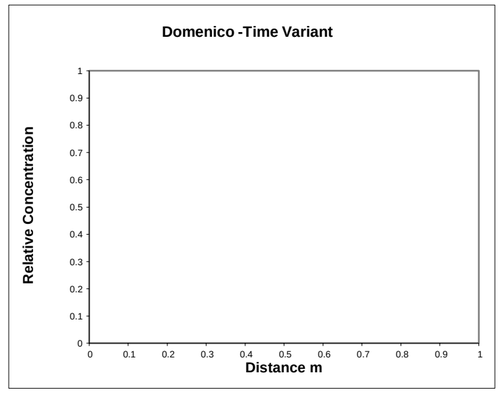
DOMENICO (TIME VARIANT)

Contaminant trichloroethene

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.01	mg/l
DF	#DIV/0!	
λ	6.931E-101	days^{-1}
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

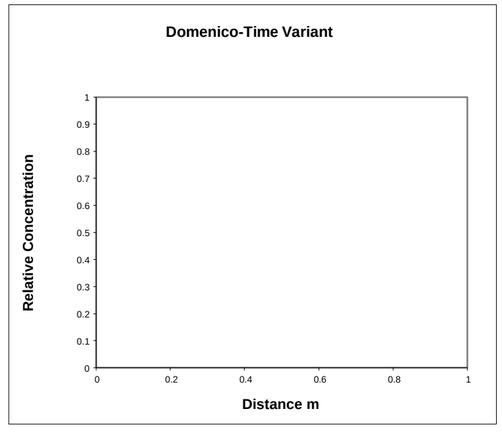


Calc **Value**

Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Date:	11/12/2025
Version:	1

OGATA BANKS SOLUTION

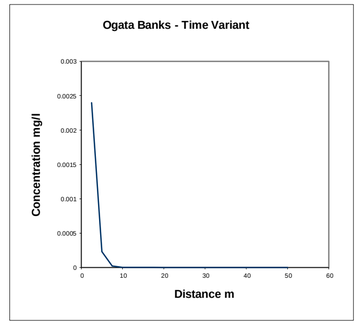
Contaminant **Trichloroethene**

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.01	mg/l
Co	2.50E-02	mg/l
λ	2.95E-04	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	2.15E+02	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.00313	-2.3E+00	9.6E-02	-1.7E+48	2.000	2.8E+00	1.7E+01	1.7E+48	0.000	1.7E+01	1	-1.7E+01	-1	4.2E+00	1	-4.2E+00	-1	2.40E-03
2	5	0.00313	-4.7E+00	9.2E-03	-1.7E+48	2.000	5.7E+00	3.0E+02	1.7E+48	0.000	1.2E+01	1	-1.2E+01	-1	3.0E+00	1	-3.0E+00	-0.99997	2.30E-04
3	7.5	0.00313	-7.0E+00	8.8E-04	-1.7E+48	2.000	8.5E+00	5.1E+03	1.7E+48	0.000	9.7E+00	1	-9.7E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	2.20E-05
4	10	0.00313	-9.4E+00	8.4E-05	-1.7E+48	2.000	1.1E+01	8.8E+04	1.7E+48	0.000	8.4E+00	1	-8.4E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	2.10E-06
5	12.5	0.00313	-1.2E+01	8.1E-06	-1.7E+48	2.000	1.4E+01	1.5E+06	1.7E+48	0.000	7.5E+00	1	-7.5E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	2.00E-07
6	15	0.00313	-1.4E+01	7.7E-07	-1.7E+48	2.000	1.7E+01	2.6E+07	1.7E+48	0.000	6.8E+00	1	-6.8E+00	-1	1.7E+00	0.984	-1.7E+00	-0.98399	1.91E-08
7	17.5	0.00313	-1.6E+01	7.4E-08	-1.7E+48	2.000	2.0E+01	4.5E+08	1.7E+48	0.000	6.3E+00	1	-6.3E+00	-1	1.6E+00	0.9743	-1.6E+00	-0.97425	1.81E-09
8	20	0.00313	-1.9E+01	7.1E-09	-1.7E+48	2.000	2.3E+01	7.7E+09	1.7E+48	0.000	5.9E+00	1	-5.9E+00	-1	1.5E+00	0.963	-1.5E+00	-0.96302	1.71E-10
9	22.5	0.00313	-2.1E+01	6.8E-10	-1.7E+48	2.000	2.6E+01	1.3E+11	1.7E+48	0.000	5.6E+00	1	-5.6E+00	-1	1.4E+00	0.9508	-1.4E+00	-0.95078	1.62E-11
10	25	0.00313	-2.3E+01	6.5E-11	-1.7E+48	2.000	2.8E+01	2.3E+12	1.7E+48	0.000	5.3E+00	1	-5.3E+00	-1	1.3E+00	0.9379	-1.3E+00	-0.93792	1.53E-12
11	27.5	0.00313	-2.6E+01	6.3E-12	-1.7E+48	2.000	3.1E+01	3.9E+13	1.7E+48	0.000	5.1E+00	1	-5.1E+00	-1	1.3E+00	0.9247	-1.3E+00	-0.92475	1.45E-13
12	30	0.00313	-2.8E+01	6.0E-13	-1.7E+48	2.000	3.4E+01	6.7E+14	1.7E+48	0.000	4.8E+00	1	-4.8E+00	-1	1.2E+00	0.9115	-1.2E+00	-0.91147	1.37E-14
13	32.5	0.00313	-3.0E+01	5.8E-14	-1.7E+48	2.000	3.7E+01	1.2E+16	1.7E+48	0.000	4.7E+00	1	-4.7E+00	-1	1.2E+00	0.8982	-1.2E+00	-0.89824	1.29E-15
14	35	0.00313	-3.3E+01	5.5E-15	-1.7E+48	2.000	4.0E+01	2.0E+17	1.7E+48	0.000	4.5E+00	1	-4.5E+00	-1	1.1E+00	0.8852	-1.1E+00	-0.88517	1.22E-16
15	37.5	0.00313	-3.5E+01	5.3E-16	-1.7E+48	2.000	4.3E+01	3.4E+18	1.7E+48	0.000	4.3E+00	1	-4.3E+00	-1	1.1E+00	0.8723	-1.1E+00	-0.87233	1.15E-17
16	40	0.00313	-3.8E+01	5.1E-17	-1.7E+48	2.000	4.6E+01	5.9E+19	1.7E+48	0.000	4.2E+00	1	-4.2E+00	-1	1.0E+00	0.8598	-1.0E+00	-0.85979	1.09E-18
17	42.5	0.00313	-4.0E+01	4.9E-18	-1.7E+48	2.000	4.8E+01	1.0E+21	1.7E+48	0.000	4.1E+00	1	-4.1E+00	-1	9.8E-01	0.8357	-9.8E-01	-0.83567	9.72E-21
18	45	0.00313	-4.2E+01	4.7E-19	-1.7E+48	2.000	5.1E+01	1.7E+22	1.7E+48	0.000	4.0E+00	1	-4.0E+00	-1	9.6E-01	0.8241	-9.6E-01	-0.82412	9.19E-22
19	47.5	0.00313	-4.5E+01	4.5E-20	-1.7E+48	2.000	5.4E+01	3.0E+23	1.7E+48	0.000	3.8E+00	1	-3.8E+00	-1	9.3E-01	0.8129	-9.3E-01	-0.81292	8.69E-23
20	50	0.00313	-4.7E+01	4.3E-21	-1.7E+48	2.000	5.7E+01	5.2E+24	1.7E+48	0.000	3.8E+00	1	-3.8E+00	-1	9.3E-01	0.8129	-9.3E-01	-0.81292	8.69E-23

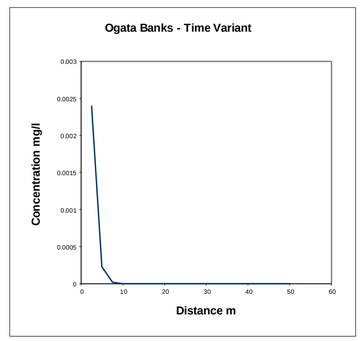


Calc **Value**

v	7.60E-02	m/d
Rc	1.38E+03	
u	5.52E-05	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.00313	-2.3E+00	9.6E-02	-1.7E+48	2.000	2.8E+00	1.7E+01	1.7E+48	0.000	1.7E+01	1	-1.7E+01	-1	8.3E+00	1	-8.3E+00	-1	2.40E-03
2	5	0.00313	-4.7E+00	9.2E-03	-1.7E+48	2.000	5.7E+00	3.0E+02	1.7E+48	0.000	1.2E+01	1	-1.2E+01	-1	5.9E+00	1	-5.9E+00	-1	2.30E-04
3	7.5	0.00313	-7.0E+00	8.8E-04	-1.7E+48	2.000	8.5E+00	5.1E+03	1.7E+48	0.000	9.7E+00	1	-9.7E+00	-1	4.8E+00	1	-4.8E+00	-1	2.20E-05
4	10	0.00313	-9.4E+00	8.4E-05	-1.7E+48	2.000	1.1E+01	8.8E+04	1.7E+48	0.000	8.4E+00	1	-8.4E+00	-1	4.2E+00	1	-4.2E+00	-1	2.11E-06
5	12.5	0.00313	-1.2E+01	8.1E-06	-1.7E+48	2.000	1.4E+01	1.5E+06	1.7E+48	0.000	7.5E+00	1	-7.5E+00	-1	3.7E+00	1	-3.7E+00	-1	2.02E-07
6	15	0.00313	-1.4E+01	7.7E-07	-1.7E+48	2.000	1.7E+01	2.6E+07	1.7E+48	0.000	6.8E+00	1	-6.8E+00	-1	3.4E+00	1	-3.4E+00	-1	1.94E-08
7	17.5	0.00313	-1.6E+01	7.4E-08	-1.7E+48	2.000	2.0E+01	4.5E+08	1.7E+48	0.000	6.3E+00	1	-6.3E+00	-1	3.2E+00	1	-3.2E+00	-0.99999	1.86E-09
8	20	0.00313	-1.9E+01	7.1E-09	-1.7E+48	2.000	2.3E+01	7.7E+09	1.7E+48	0.000	5.9E+00	1	-5.9E+00	-1	3.0E+00	1	-3.0E+00	-0.99997	1.78E-10
9	22.5	0.00313	-2.1E+01	6.8E-10	-1.7E+48	2.000	2.6E+01	1.3E+11	1.7E+48	0.000	5.6E+00	1	-5.6E+00	-1	2.8E+00	0.9999	-2.8E+00	-0.99992	1.71E-11
10	25	0.00313	-2.3E+01	6.5E-11	-1.7E+48	2.000	2.8E+01	2.3E+12	1.7E+48	0.000	5.3E+00	1	-5.3E+00	-1	2.6E+00	0.9998	-2.6E+00	-0.99981	1.63E-12
11	27.5	0.00313	-2.6E+01	6.3E-12	-1.7E+48	2.000	3.1E+01	3.9E+13	1.7E+48	0.000	5.1E+00	1	-5.1E+00	-1	2.5E+00	0.9996	-2.5E+00	-0.99963	1.57E-13
12	30	0.00313	-2.8E+01	6.0E-13	-1.7E+48	2.000	3.4E+01	6.7E+14	1.7E+48	0.000	4.8E+00	1	-4.8E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	1.50E-14
13	32.5	0.00313	-3.0E+01	5.8E-14	-1.7E+48	2.000	3.7E+01	1.2E+16	1.7E+48	0.000	4.7E+00	1	-4.7E+00	-1	2.3E+00	0.9989	-2.3E+00	-0.99893	1.44E-15
14	35	0.00313	-3.3E+01	5.5E-15	-1.7E+48	2.000	4.0E+01	2.0E+17	1.7E+48	0.000	4.5E+00	1	-4.5E+00	-1	2.2E+00	0.9984	-2.2E+00	-0.99839	1.38E-16
15	37.5	0.00313	-3.5E+01	5.3E-16	-1.7E+48	2.000	4.3E+01	3.4E+18	1.7E+48	0.000	4.3E+00	1	-4.3E+00	-1	2.2E+00	0.9977	-2.2E+00	-0.99769	1.32E-17
16	40	0.00313	-3.8E+01	5.1E-17	-1.7E+48	2.000	4.6E+01	5.9E+19	1.7E+48	0.000	4.2E+00	1	-4.2E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	1.26E-18
17	42.5	0.00313	-4.0E+01	4.9E-18	-1.7E+48	2.000	4.8E+01	1.0E+21	1.7E+48	0.000	4.1E+00	1	-4.1E+00	-1	2.0E+00	0.9958	-2.0E+00	-0.99579	1.21E-19
18	45	0.00313	-4.2E+01	4.7E-19	-1.7E+48	2.000	5.1E+01	1.7E+22	1.7E+48	0.000	4.0E+00	1	-4.0E+00	-1	2.0E+00	0.9946	-2.0E+00	-0.99459	1.16E-20
19	47.5	0.00313	-4.5E+01	4.5E-20	-1.7E+48	2.000	5.4E+01	3.0E+23	1.7E+48	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9932	-1.9E+00	-0.99321	1.11E-21
20	50	0.00313	-4.7E+01	4.3E-21	-1.7E+48	2.000	5.7E+01	5.2E+24	1.7E+48	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	1.06E-22



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	2.40E-03
5.0	2.30E-04
7.5	2.20E-05
10.0	2.11E-06
12.5	2.02E-07
15.0	1.94E-08
17.5	1.86E-09
20.0	1.78E-10
22.5	1.71E-11
25.0	1.63E-12
27.5	1.57E-13
30.0	1.50E-14
32.5	1.44E-15
35.0	1.38E-16
37.5	1.32E-17
40.0	1.26E-18
42.5	1.21E-19
45.0	1.16E-20
47.5	1.11E-21
50.0	1.06E-22

Contaminant **richloroethene**

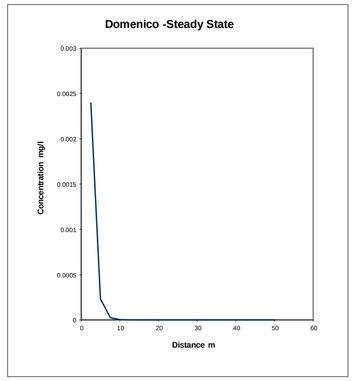
DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.01	mg/l
Co	2.50E-02	mg/l
λ	2.95E-04	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	2.15E+02	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion optio Simulate vertical dispersion in 1 direction

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.00625	-2.35E+00	9.58E-02	1.68E+01	1	-1.68E+01	-1	4.17E+00	1	-4.17E+00	-1	2.40E-03
2	5	0.00625	-4.69E+00	9.19E-03	1.19E+01	1	-1.19E+01	-1	2.95E+00	1	-2.95E+00	-1	2.30E-04
3	7.5	0.00625	-7.04E+00	8.80E-04	9.68E+00	1	-9.68E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	2.20E-05
4	10	0.00625	-9.38E+00	8.44E-05	8.39E+00	1	-8.39E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	2.10E-06
5	12.5	0.00625	-1.17E+01	8.09E-06	7.50E+00	1	-7.50E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	2.00E-07
6	15	0.00625	-1.41E+01	7.75E-07	6.85E+00	1	-6.85E+00	-1	1.70E+00	0.984	-1.70E+00	-0.984	1.91E-08
7	17.5	0.00625	-1.64E+01	7.43E-08	6.34E+00	1	-6.34E+00	-1	1.58E+00	0.9743	-1.58E+00	-0.9743	1.81E-09
8	20	0.00625	-1.88E+01	7.12E-09	5.93E+00	1	-5.93E+00	-1	1.48E+00	0.963	-1.48E+00	-0.963	1.71E-10
9	22.5	0.00625	-2.11E+01	6.82E-10	5.59E+00	1	-5.59E+00	-1	1.39E+00	0.9508	-1.39E+00	-0.9508	1.62E-11
10	25	0.00625	-2.35E+01	6.54E-11	5.30E+00	1	-5.30E+00	-1	1.32E+00	0.9379	-1.32E+00	-0.9379	1.53E-12
11	27.5	0.00625	-2.58E+01	6.27E-12	5.06E+00	1	-5.06E+00	-1	1.26E+00	0.9247	-1.26E+00	-0.9247	1.45E-13
12	30	0.00625	-2.81E+01	6.01E-13	4.84E+00	1	-4.84E+00	-1	1.20E+00	0.9115	-1.20E+00	-0.9115	1.37E-14
13	32.5	0.00625	-3.05E+01	5.76E-14	4.65E+00	1	-4.65E+00	-1	1.16E+00	0.8982	-1.16E+00	-0.8982	1.29E-15
14	35	0.00625	-3.28E+01	5.52E-15	4.48E+00	1	-4.48E+00	-1	1.11E+00	0.8852	-1.11E+00	-0.8852	1.22E-16
15	37.5	0.00625	-3.52E+01	5.29E-16	4.33E+00	1	-4.33E+00	-1	1.08E+00	0.8723	-1.08E+00	-0.8723	1.15E-17
16	40	0.00625	-3.75E+01	5.07E-17	4.19E+00	1	-4.19E+00	-1	1.04E+00	0.8598	-1.04E+00	-0.8598	1.09E-18
17	42.5	0.00625	-3.99E+01	4.86E-18	4.07E+00	1	-4.07E+00	-1	1.01E+00	0.8476	-1.01E+00	-0.8476	1.03E-19
18	45	0.00625	-4.22E+01	4.65E-19	3.95E+00	1	-3.95E+00	-1	9.83E-01	0.8357	-9.83E-01	-0.8357	9.72E-21
19	47.5	0.00625	-4.46E+01	4.46E-20	3.85E+00	1	-3.85E+00	-1	9.57E-01	0.8241	-9.57E-01	-0.8241	9.19E-22
20	50	0.00625	-4.69E+01	4.27E-21	3.75E+00	1	-3.75E+00	-1	9.33E-01	0.8129	-9.33E-01	-0.8129	8.69E-23



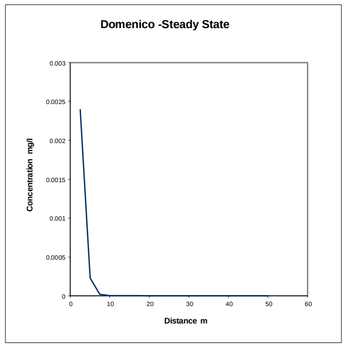
Calc **Value**

v	7.60E-02	m/d
Rc	1.38E+03	
u	5.52E-05	m/d

DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.00625	-2.35E+00	9.58E-02	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	2.40E-03
2	5	0.00625	-4.69E+00	9.19E-03	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	2.30E-04
3	7.5	0.00625	-7.04E+00	8.80E-04	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	2.20E-05
4	10	0.00625	-9.38E+00	8.44E-05	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	2.11E-06
5	12.5	0.00625	-1.17E+01	8.09E-06	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	2.02E-07
6	15	0.00625	-1.41E+01	7.75E-07	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	1.94E-08
7	17.5	0.00625	-1.64E+01	7.43E-08	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	1.86E-09
8	20	0.00625	-1.88E+01	7.12E-09	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	1.78E-10
9	22.5	0.00625	-2.11E+01	6.82E-10	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-0.9999	1.71E-11
10	25	0.00625	-2.35E+01	6.54E-11	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-0.9998	1.63E-12
11	27.5	0.00625	-2.58E+01	6.27E-12	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-0.9996	1.57E-13
12	30	0.00625	-2.81E+01	6.01E-13	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	1.50E-14
13	32.5	0.00625	-3.05E+01	5.76E-14	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.9989	1.44E-15
14	35	0.00625	-3.28E+01	5.52E-15	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.9984	1.38E-16
15	37.5	0.00625	-3.52E+01	5.29E-16	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.9977	1.32E-17
16	40	0.00625	-3.75E+01	5.07E-17	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	1.26E-18
17	42.5	0.00625	-3.99E+01	4.86E-18	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.9958	1.21E-19
18	45	0.00625	-4.22E+01	4.65E-19	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.9946	1.16E-20
19	47.5	0.00625	-4.46E+01	4.46E-20	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.9932	1.11E-21
20	50	0.00625	-4.69E+01	4.27E-21	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	1.06E-22



Date:	11/12/2025
Version:	1

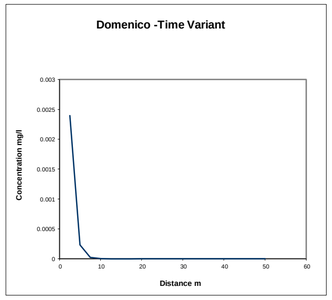
Values carried through to Level 3 Groundwater

x	Concentration
2.5	2.40E-03
5.0	2.30E-04
7.5	2.20E-05
10.0	2.11E-06
12.5	2.02E-07
15.0	1.94E-08
17.5	1.86E-09
20.0	1.78E-10
22.5	1.71E-11
25.0	1.63E-12
27.5	1.57E-13
30.0	1.50E-14
32.5	1.44E-15
35.0	1.38E-16
37.5	1.32E-17
40.0	1.26E-18
42.5	1.21E-19
45.0	1.16E-20
47.5	1.11E-21
50.0	1.06E-22

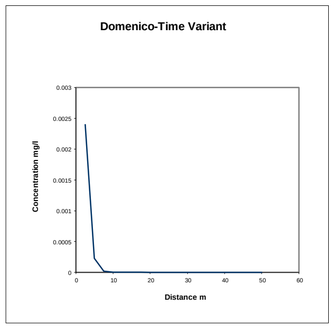
DOMENICO (TIME VARIANT)

Contaminant	'richloroethene																
					Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)												
				X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
Input	**Value**	**Units**		m														
C_T	0.01	mg/l	1	2.5	0.00313	-2.35E+00	9.58E-02	-1.72E+48	2	1.68E+01	1	-1.68E+01	-1	4.17E+00	1	-4.17E+00	-1	2.40E-03
			2	5	0.00313	-4.69E+00	9.19E-03	-1.72E+48	2	1.19E+01	1	-1.19E+01	-1	2.95E+00	1	-2.95E+00	-1	2.30E-04
			3	7.5	0.00313	-7.04E+00	8.80E-04	-1.72E+48	2	9.68E+00	1	-9.68E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	2.20E-05
Co	2.50E-02	mg/l	4	10	0.00313	-9.38E+00	8.44E-05	-1.72E+48	2	8.39E+00	1	-8.39E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	2.10E-06
λ	2.95E-04	$days^{-1}$	5	12.5	0.00313	-1.17E+01	8.09E-06	-1.72E+48	2	7.50E+00	1	-7.50E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	2.00E-07
Sz	7.50E+01	m	6	15	0.00313	-1.41E+01	7.75E-07	-1.72E+48	2	6.85E+00	1	-6.85E+00	-1	1.70E+00	0.984	-1.70E+00	-0.984	1.91E-08
Sy	5.90E+00	m	7	17.5	0.00313	-1.64E+01	7.43E-08	-1.72E+48	2	6.34E+00	1	-6.34E+00	-1	1.58E+00	0.9743	-1.58E+00	-0.974	1.81E-09
Kd	2.15E+02	l/kg	8	20	0.00313	-1.88E+01	7.12E-09	-1.72E+48	2	5.93E+00	1	-5.93E+00	-1	1.48E+00	0.963	-1.48E+00	-0.963	1.71E-10
ρ	1.60E+00	g/cm3	9	22.5	0.00313	-2.11E+01	6.82E-10	-1.72E+48	2	5.59E+00	1	-5.59E+00	-1	1.39E+00	0.9508	-1.39E+00	-0.951	1.62E-11
n	2.50E-01		10	25	0.00313	-2.35E+01	6.54E-11	-1.72E+48	2	5.30E+00	1	-5.30E+00	-1	1.32E+00	0.9379	-1.32E+00	-0.938	1.53E-12
i	4.40E-02		11	27.5	0.00313	-2.58E+01	6.27E-12	-1.72E+48	2	5.06E+00	1	-5.06E+00	-1	1.26E+00	0.9247	-1.26E+00	-0.925	1.45E-13
K	4.32E-01	m/d	12	30	0.00313	-2.81E+01	6.01E-13	-1.72E+48	2	4.84E+00	1	-4.84E+00	-1	1.20E+00	0.9115	-1.20E+00	-0.911	1.37E-14
x	5.00E+01	m	13	32.5	0.00313	-3.05E+01	5.76E-14	-1.72E+48	2	4.65E+00	1	-4.65E+00	-1	1.16E+00	0.8982	-1.16E+00	-0.898	1.29E-15
z	0.00E+00	m	14	35	0.00313	-3.28E+01	5.52E-15	-1.72E+48	2	4.48E+00	1	-4.48E+00	-1	1.11E+00	0.8852	-1.11E+00	-0.885	1.22E-16
y	0.00E+00	m	15	37.5	0.00313	-3.52E+01	5.29E-16	-1.72E+48	2	4.33E+00	1	-4.33E+00	-1	1.08E+00	0.8723	-1.08E+00	-0.872	1.15E-17
t	9.90E+99	days	16	40	0.00313	-3.75E+01	5.07E-17	-1.72E+48	2	4.19E+00	1	-4.19E+00	-1	1.04E+00	0.8598	-1.04E+00	-0.86	1.09E-18
ax	5.00E+00	m	17	42.5	0.00313	-3.99E+01	4.86E-18	-1.72E+48	2	4.07E+00	1	-4.07E+00	-1	1.01E+00	0.8476	-1.01E+00	-0.848	1.03E-19
az	5.00E-01	m	18	45	0.00313	-4.22E+01	4.65E-19	-1.72E+48	2	3.95E+00	1	-3.95E+00	-1	9.83E-01	0.8357	-9.83E-01	-0.836	9.72E-21
ay	5.00E-02	m	19	47.5	0.00313	-4.46E+01	4.46E-20	-1.72E+48	2	3.85E+00	1	-3.85E+00	-1	9.57E-01	0.8241	-9.57E-01	-0.824	9.19E-22
			20	50	0.00313	-4.69E+01	4.27E-21	-1.72E+48	2	3.75E+00	1	-3.75E+00	-1	9.33E-01	0.8129	-9.33E-01	-0.813	8.69E-23

Vertical dispersion option Simulate vertical dispersion in 1 direction



Calc	**Value**				Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT													
				X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
v	7.60E-02	m/d		m														
Rc	1.38E+03		1	2.5	0.00313	-2.35E+00	9.58E-02	-1.72E+48	2	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	2.40E-03
u	5.52E-05	m/d	2	5	0.00313	-4.69E+00	9.19E-03	-1.72E+48	2	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	2.30E-04
			3	7.5	0.00313	-7.04E+00	8.80E-04	-1.72E+48	2	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	2.20E-05
			4	10	0.00313	-9.38E+00	8.44E-05	-1.72E+48	2	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	2.11E-06
			5	12.5	0.00313	-1.17E+01	8.09E-06	-1.72E+48	2	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	2.02E-07
			6	15	0.00313	-1.41E+01	7.75E-07	-1.72E+48	2	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	1.94E-08
			7	17.5	0.00313	-1.64E+01	7.43E-08	-1.72E+48	2	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	1.86E-09
			8	20	0.00313	-1.88E+01	7.12E-09	-1.72E+48	2	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	1.78E-10
			9	22.5	0.00313	-2.11E+01	6.82E-10	-1.72E+48	2	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-1	1.71E-11
			10	25	0.00313	-2.35E+01	6.54E-11	-1.72E+48	2	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-1	1.63E-12
			11	27.5	0.00313	-2.58E+01	6.27E-12	-1.72E+48	2	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-1	1.57E-13
			12	30	0.00313	-2.81E+01	6.01E-13	-1.72E+48	2	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	1.50E-14
			13	32.5	0.00313	-3.05E+01	5.76E-14	-1.72E+48	2	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.999	1.44E-15
			14	35	0.00313	-3.28E+01	5.52E-15	-1.72E+48	2	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.998	1.38E-16
			15	37.5	0.00313	-3.52E+01	5.29E-16	-1.72E+48	2	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.998	1.32E-17
			16	40	0.00313	-3.75E+01	5.07E-17	-1.72E+48	2	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	1.26E-18
			17	42.5	0.00313	-3.99E+01	4.86E-18	-1.72E+48	2	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.996	1.21E-19
			18	45	0.00313	-4.22E+01	4.65E-19	-1.72E+48	2	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.995	1.16E-20
			19	47.5	0.00313	-4.46E+01	4.46E-20	-1.72E+48	2	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.993	1.11E-21
			20	50	0.00313	-4.69E+01	4.27E-21	-1.72E+48	2	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	1.06E-22



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	2.40E-03
5.0	2.30E-04
7.5	2.20E-05
10.0	2.11E-06
12.5	2.02E-07
15.0	1.94E-08
17.5	1.86E-09
20.0	1.78E-10
22.5	1.71E-11
25.0	1.63E-12
27.5	1.57E-13
30.0	1.50E-14
32.5	1.44E-15
35.0	1.38E-16
37.5	1.32E-17
40.0	1.26E-18
42.5	1.21E-19
45.0	1.16E-20
47.5	1.11E-21
50.0	1.06E-22

Hydrogeological risk assessment for land contamination

Remedial Targets Worksheet , Release 3.2

First released: 2006. Version 3.2: January 2013

This worksheet has been produced in combination with the document 'Remedial Targets Methodology: Hydrogeological risk assessment for land contamination (Environment Agency 2006).

Users of this worksheet should always refer to the User Manual to the Remedial Targets Methodology and to relevant guidance on UK legislation and policy, in order to understand how this procedure should be applied in an appropriate context.

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The calculation of equations in this worksheet has been independently checked by Entec (UK) Ltd on behalf of the Environment Agency.

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IMPORTANT: To enable MS Excel worksheet, click Tools, Add -Ins, Analysis Tool Pak and Analysis Tool Pak-VBA (to calculate error functions).

Details to be completed for each assessment				
Site Name:	Kelvedon Street			
Site Address:	Newport			
Completed by:	Michael Watkins			
Date:	11-Dec-25		Version:	1
Contaminant	Tetrachloroethene			
Target Concentration (C_T)	0.01	mg/l	Origin of C_T:	WFD for inland surface waters (annual average)

This worksheet can be used to determine remedial targets for soils (Worksheets Level 1 Soil, Level 2 and Level 3 Soil) or to determine remedial targets for groundwater (Level 3 Groundwater). For Level 3, parameter values must be entered separately dependent on whether the assessment is for soil or groundwater. For soil, remedial targets are calculated as either mg/kg (for comparision with soil measurements) or mg/l (for comparison with leaching tests or pore water concentrations).
Site details entered on this page are automatically copied to Level 1, 2 and 3 Worksheets.
Worksheet options are identified by brown background and employ a pull-down menus. Data entry are identified as blue background.
Data origin / justification should be noted in cells coloured yellow and fully documented in subsequent reports.
Data carried forward from an earlier worksheet are identified by a light green background
It is recommended that a copy of the original worksheet is saved (all data fields in the original copy are blank).

The spreadsheet also includes a porosity calculation worksheet, a soil impact calculation worksheet and a worksheet that performs some simple hydrogeological calculations.

Remedial Targets Worksheet , Release 3.2

Level 1 - Soil

Select the method of calculating the soil water Partition Co-efficient by using the pull down menu below

User specified value for partition coefficient

Contaminant		**Tetrachloroethene**	
Target concentration	C_T	**0.01**	**mg/l**

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**
Standard entry				
Water filled soil porosity	θ_w	0.00E+00	fraction	
Air filled soil porosity	θa	0.00E+00	fraction	
Bulk density of soil zone material	ρ	0.00E+00	g/cm^3	
Henry's Law constant	H	0.00E+00	dimensionless	
Entry if specify partition coefficient (option)				
Soil water partition coefficient	Kd	0.00E+00	l/kg	
Entry for non-polar organic chemicals (option)				
Fraction of organic carbon (in soil)	foc		fraction	
Organic carbon partition coefficient	Koc		l/kg	
Entry for ionic organic chemicals (option)				
Sorption coefficient for neutral species	$K_{oc,n}$		l/kg	
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg	
pH value	pH		pH units	
Acid dissociation constant	pKa			
Fraction of organic carbon (in soil)	foc		fraction	
Soil water partition coefficient used in Level Assessment	**Kd**	**0.00E+00**	**l/kg**	*Specified value*

This sheet calculates the Level 1 remedial target for soils(mg/kg) based on a selected target concentration and theoretical calculation of soil water partitioning. Three options are included for determining the partition coefficient.

The measured soil concentration as mg/kg should be compared with the Level 1 remedial target to determine the need for further action.

Level 1 Remedial Target

Level 1 Remedial Target	**#DIV/0!**	**mg/kg**	**(for comparison with soil analyses)**
	or		
	0.01	**mg/l**	**(for comparison with leachate test results)**

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 2 - Soil

Contaminant		**Tetrachloroethene**		from Level 1
Target concentration	C_T	**0.01**	**mg/l**	from Level 1

This sheet calculates the Level 2 remedial target for soils (mg/kg) or for pore water (mg/l).

The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 2 remedial target to determine the need for further action. Equations presented in 'Hydrogeological risk assessment for land contamiantion' (Environment Agency 2006)

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**	
Standard entry					
Infiltration	Inf	0.00E+00	m/d		
Area of contaminant source	A	0.00E+00	m^2		Not used in calculation
Entry for groundwater flow below site					
Length of contaminant source in direction of groundwater flow	L	0.00E+00	m		
Saturated aquifer thickness	da	0.00E+00	m		
Hydraulic Conductivity of aquifer in which dilution occurs	K	0.00E+00	m/d		
Hydraulic gradient of water table	i	0.00E+00	fraction		
Width of contaminant source perpendicular to groundwater flow	w	0.00E+00	m		Not used in calculation
Background concentration of contaminant in groundwater beneath site	Cu	0.00E+00	mg/l		
Define mixing zone depth by specifying or calculating depth (using pull down list)		**Specify**			
Enter mixing zone thickness	Mz	0.00E+00	m		
Calculated mixing zone thickness	Mz		m		

Calculated Parameters

Dilution Factor	**DF**	**#DIV/0!**		
Level 2 Remedial Target		**#DIV/0!**	**mg/l**	**For comparison with measured pore water concentration. This assumes Level 1 Remedial Target is based on Target Concentration.**
		or		
		#DIV/0!	**mg/kg**	**For comparison with measured soil concentration. This assumes Level 1 Remedial Target calculated from soil-water**

Additional option

Calculation of impact on receptor

Concentration of contaminant in contaminated discharge (entering receptor)	Cc	0.00E+00	mg/l	
Calculated concentration within receptor (dilution only)		#DIV/0!	mg/l	0

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 3 - Soil

See Note

Input Parameters	Variable	Value	Unit	Source
Contaminant		Tetrachloroethene		from Level 1
Target Concentration	C_T	0.01	mg/l	from Level 1
Dilution Factor	DF	#DIV/0!		from Level 2

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value)

	Variable	Value	Unit	Source of parameter value
Enter source concentration		Soil concentration as mg/kg		
Enter soil concentration		0	mg/kg	
Half life for degradation of contaminant in water	$t_{1/2}$	1.00E+100	days	
Calculated decay rate	λ	6.93E-101	$days^{-1}$	calculated
Width of plume in aquifer at source	Sz	0.00E+00	m	from Level 2
Plume thickness in aquifer at source	Sy	0.00E+00	m	from Level 2
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Effective porosity of aquifer	n	0.00E+00	fraction	
Hydraulic gradient	i	#DIV/0!	fraction	from Level 2 (adjusted)
Hydraulic conductivity of saturated aquifer	K	0.00E+00	m/d	from Level 2
Distance to compliance point	x	0.00E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	1.00E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	0.00E+00	l/kg	*see options*
Longitudinal dispersivity	ax	0.000	m	*see options*
Transverse dispersivity	az	0.000	m	*see options*
Vertical dispersivity	ay	0.000	m	*see options*

Parameter values should be checked against Level 1 and 2

Calculated Parameters	Variable		
Groundwater flow velocity	v	#DIV/0!	m/d
Retardation factor	Rf	#DIV/0!	fraction
Decay rate used	λ	6.93E-101	d^{-1}
Hydraulic gradient used in aquifer flow down-gradient	i	#DIV/0!	fraction
Rate of contaminant flow due to retardation	u	#DIV/0!	m/d
Ratio of Compliance Point to Source Concentration	C_{cp}/C_0	#DIV/0!	fraction
Attenuation factor (C_o/C_{cp})	**AF**	**#DIV/0!**	**fraction**
Calculated soil leachate concentration	Co	#DIV/0!	mg/l

Remedial Targets

Level 3 Remedial Target	**#DIV/0!**	**mg/l**	For comparison with measured pore water concentration.
Ogata Banks	**or**		This assumes Level 1 Remedial Target is based on Target Concentration.
	#DIV/0!	**mg/kg**	For comparison with measured soil concentration. This
Distance to compliance point	**0**	**m**	assumes Level 1 Remedial Target calculated from soil-water partitioning equation.
Ratio of Compliance Point to Source Concentration	**#DIV/0!**	**fraction**	Ogata Banks

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99

Enter method of defining partition co-efficient (using pull down list)

Calculate for ionic organic chemicals (acids)

Entry if specify partition coefficient (option)

Soil water partition coefficient	Kd	l/kg

Entry for non-polar organic chemicals (option)

Fraction of organic carbon in aquifer	foc	fraction
Organic carbon partition coefficient	Koc	l/kg

Entry for ionic organic chemicals (option)

Sorption coefficient for related species	$K_{oc,n}$	0.00E+00	l/kg
Sorption coefficient for ionised species	$K_{oc,i}$	0.00E+00	l/kg
pH value	pH	0.00E+00	
Acid dissociation constant	pKa	0.00E+00	
Fraction of organic carbon in aquifer	foc	0.00E+00	fraction
Soil water partition coefficient	Kd	0.00E+00	l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

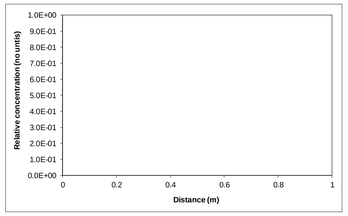
		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	0.00E+00	#NUM!	m
Transverse dispersivity	**az**	0.00E+00	0.00E+00	#NUM!	m
Vertical dispersivity	**ay**	0.00E+00	0.00E+00	#NUM!	m

Note values of dispersivity must be > 0

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed

Note
This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O_2, NO_3, SO_4 etc than an alternative solution should be used

Environment Agency



Note: 'Relative concentration' is the ratio of calculated concentation at a given position compared to the source concentration. The calculations assume plume disperses from the top of the aquifer. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

This sheet calculates the Level 3 remedial target for soils(mg/kg) or for pore water (mg/l), based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.By setting a long travel time (e.g. 9E99) it will give the steady state solution, which should always be used when calculating remedial targets.

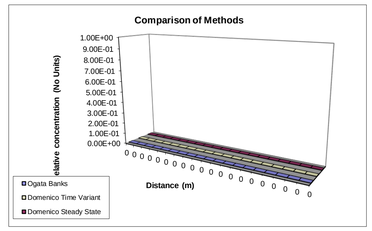
The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.9E+99.

Calculated (relative) concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Relative concentration (No units)	Concentration mg/l
0	1.0E+00	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!



Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Remedial Targets Worksheet , Release 3.2

Calculation of contaminant concentration in groundwater from a soil source

Only input required is Soil Contaminant Concentration

Input Parameters			
Soil contaminant concentration	C_0	0.00E+00	mg/kg

Level 1 Parameters

Water filled soil porosity	θ_W	0.00E+00	fraction
Air filled soil porosity	θa	0.00E+00	fraction
Bulk density	ρ	0.00E+00	g/cm^3
Henry's Law constant	H	0.00E+00	dimensionless
Soil water partition coefficient used in Level Assessment	Kd	0.00E+00	l/kg
Factor (partitioning between soil and water)		#DIV/0!	dimensionless

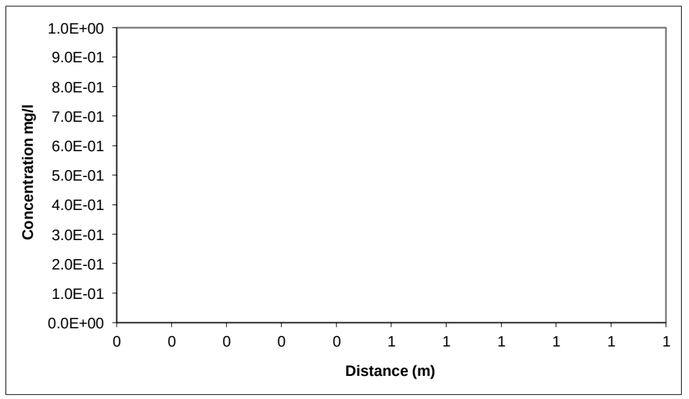
Level 2 Parameters **Dilution Factor** DF #DIV/0!

Level 3 Parameters **Attenuation factor (C_O/C_{ED})** AF #DIV/0!

Predicted concentrations at compliance point

Level 1	C	#DIV/0!	mg/l	No dilution or attenuation
Level 2	C	#DIV/0!	mg/l	Dilution taken into account
Level 3	C	#DIV/0!	mg/l	Dilution and attenuation taken into account

Predicted concentrations between source and compliance point - Level 3



Distance m	Concentration mg/l
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)	Variable	Value	Unit	Source
Contaminant		Tetrachloroethene		from Level 1
Target Concentration	C_T	1.00E-02	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Domenico - Steady state — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived va

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	9.80E-02	mg/l	*Site investigation data*
Half life for degradation of contaminant in water	$t_{1/2}$	2.35E+03	days	*Howard et al (1991) Low anaerobic biodeg*
Calculated decay rate	λ	2.95E-04	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	7.50E+01	m	*Length of site perpendicular to groundwater flow*
Plume thickness at source	Sy	1.18E+01	m	*Same as Mixing Zone Thickness. "For a thin aquifer (typically <10m), the mixing zone thickness can be taken as the acte*
Saturated aquifer thickness	da	1.20E+01	m	*Maximum thickness recorded in vicinity of*
Bulk density of aquifer materials	ρ	1.60E+00	g/cm^3	*Typical bulk density for river terrace deposits*
Effective porosity of aquifer	n	2.50E-01	fraction	*Maximum porosity for coarse Gravel (Lovanh et al 2000) - conservative estimate*
Hydraulic gradient	i	4.40E-02	fraction	*Borehole level data*
Hydraulic conductivity of aquifer	K	4.32E-01	m/d	*Maximum typical value for clayey sandy G*
Distance to compliance point	x	5.00E+01	m	*Default compliance distance*
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	9.90E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	2.43E+03	l/kg	*see options*
Longitudinal dispersivity	ax	5.00E+00	m	*see options*
Transverse dispersivity	az	5.00E-01	m	*see options*
Vertical dispersivity	ay	5.00E-02	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd	2.43E+03	l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc		fraction
Organic carbon partition coefficient	Koc		l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{oc,n}$		l/kg
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	2.43E+03	l/kg

Define dispersivity (click brown cell and use pull down list)

Dispersivities 10%, 1%, 0.1% of pathway length

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	5.00E+00	2.98E+00	m
Transverse dispersivity	**az**	0.00E+00	5.00E-01	2.98E-01	m
Vertical dispersivity	**ay**	0.00E+00	5.00E-02	2.98E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

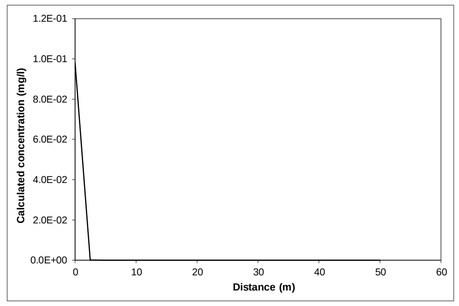
Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed

Calculated Parameters	Variable		
Groundwater flow velocity	v	7.60E-02	m/d
Retardation factor	Rf	1.56E+04	fraction
Decay rate used	λ	2.95E-04	d^{-1}
Rate of contaminant flow due to retardation	u	4.89E-06	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	5.37E-75	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**1.83E+73**	

Remedial Targets

Remedial Target		**1.83E+71**	**mg/l**	For comparison with measured groundwater concentration.
Domenico - Steady state				
Distance to compliance point		**50**	**m**	
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**5.37E-75**	**mg/l**	Domenico - Steady state

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Calculated concentrations for distance-concentration graph

Domenico - Steady state
From calculation sheet

Distance	Concentration
	mg/l
0	9.8E-02
2.5	2.13E-05
5.0	4.62E-09
7.5	1.00E-12
10.0	2.18E-16
12.5	4.74E-20
15.0	1.03E-23
17.5	2.24E-27
20.0	4.86E-31
22.5	1.06E-34
25.0	2.29E-38
27.5	4.98E-42
30.0	1.08E-45
32.5	2.35E-49
35.0	5.11E-53
37.5	1.11E-56
40.0	2.41E-60
42.5	5.24E-64
45.0	1.14E-67
47.5	2.47E-71
50.0	5.37E-75

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared
with the Level 3 remedial target to determine the need for further action.
Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Porosity Calculator

These results are not carried through to any of the other worksheets

DRY BULK DENSITY DATA

Variable	Value	Unit	justification
Natural Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Dry Bulk Density	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
Initial Saturation	#DIV/0!	%	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	
Water Filled Porosity	**#DIV/0!**	**fraction**	

WET BULK DENSITY DATA

Variable	Value	Unit	
Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Actual (wet) Bulk Density (i.e. at natural MC)	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
dry bulk density	0.00	tonnes/m^3	
Initial Saturation	#DIV/0!	%	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	**#DIV/0!**
Water Filled Porosity	**#DIV/0!**	**fraction**	

Analytical solutions provided by David Hall, Golder Associates (UK) Ltd

Simple hydrogeological calculations

(These are not specific to, or required in, the Remedial Targets Methodology)

Parameter	symbol		unit	justification
Hydraulic conductivity	K	0.00E+00	m/d	
Hydraulic gradient	i	0.00E+00	unitless	
Effective porosity of aquifer	n	0.00E+00	fraction	
Thickness of saturated aquifer	b	0.00E+00	m	
Width of aquifer perpendicular to flow	w	0.00E+00	m	
Distance to receptor	x	0.00E+00	m	
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Soil-water partition co-efficient	Kd	0.00E+00	l/kg	
Retardation factor of pollutant	R	#DIV/0!		

Groundwater flow velocity	v(GW)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for groundwater to reach receptor	t(GW)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years
Rate of groundwater flow through aquifer	Q	0.00E+00	m^3/s	0.00E+00	m^3/day	0.00E+00	m^3/year

Contaminant flow velocity	v(contam)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for contaminant to reach receptor	t(contam)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years

Level 1 Calculation Sheet

Contaminant Tetrachloroethene

Parameter	Value	Units
(carried over from input sheet)		
C_T	1.00E-02	mg/l
Kd	0.00E+00	l/kg
foc		fraction
koc		l/kg
θ_w	0.00E+00	fraction
θa	0.00E+00	fraction
ρ	0.00E+00	g/cm3
H	0.00E+00	dimensionless
Koc,n		l/kg
Koc,i		l/kg
pH		pH units
pKa		
foc (ionic)		fraction

Calculations (Refer toTable 4.3, R&D Publication 20)

Selected option User specified value for partition coefficient

calc calc Calc Kd l/kg

Calculation of partition coefficient for ionic organic chemical

Partition coefficient used in Level 1 Assessment 0.00E+00 l/kg

Calculated Remedial Target #DIV/0! mg/kg for Tetrachloroethene

Factor (partitioning between soil and water) #DIV/0!

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11/12/2025
Version:	1

Level 2 Calculation Sheet

Contaminant Tetrachloroethene

Site assessed:	Kelvedon Stre
Date:	11/12/2025
Version:	1

Parameter	Value	Units		
(carried over from input sheet)				
Mz	0.00E+00	m		
L	0.00E+00	m		
da	0.00E+00	m		Calculated Dilution Factor
Inf	0.00E+00	m/d		
K	0.00E+00	m/d		
i	0.00E+00		Calculation based on target concentration	#DIV/0!
A	0.00E+00	m3/d m2 m3/d	Calculation based on observed contaminant concentration	#DIV/0!
Cc	0.00E+00	mg/l		
C_T	1.00E-02	mg/l		
Cu	0.00E+00	mg/l		
w	0.00E+00	m		



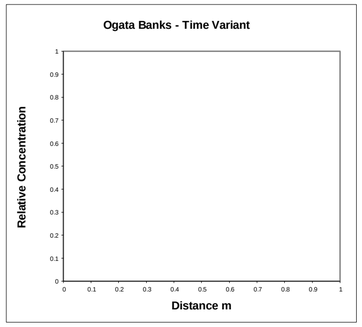
Contaminant etrachloroethene

OGATA BANKS SOLUTION

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-02	mg/l
DF	#DIV/0!	
λ	6.931E-101	days^{-1}
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Calc	Value	
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) -USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Date:	11/12/2025
Version:	1

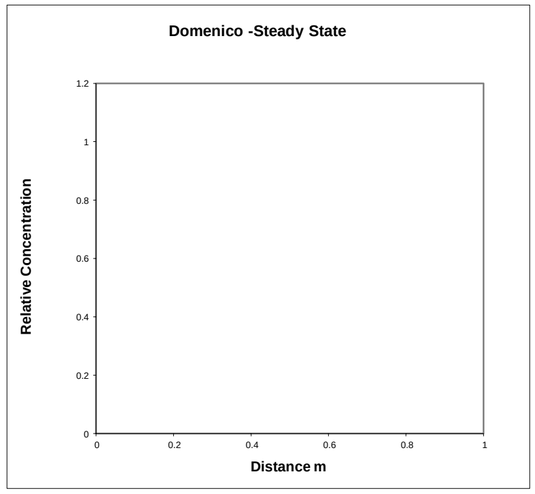
Contaminant trachloroethene

Input	Value	Units
C_T	1.000E-02	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

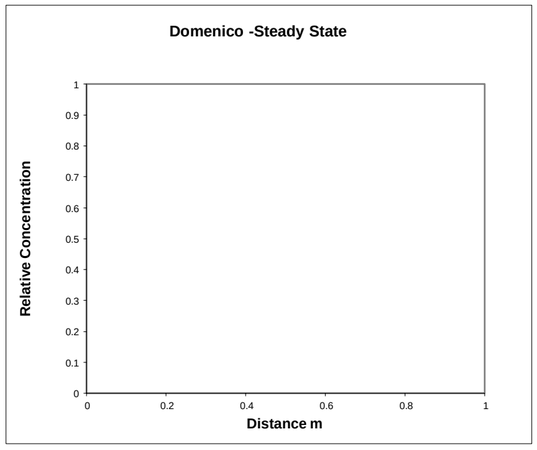


Calc	Value	Units
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Date:	11/12/2025
Version:	1

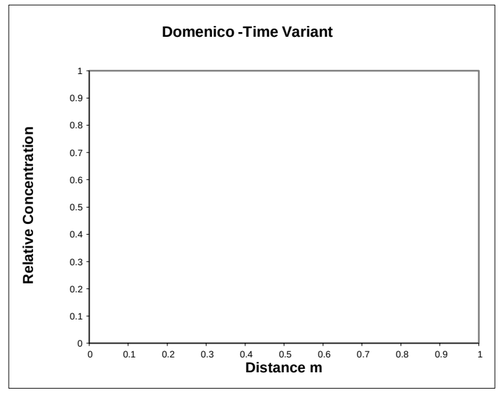
DOMENICO (TIME VARIANT)

Contaminant **trachloroethene**

Input	Value	Units
C_T	0.01	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

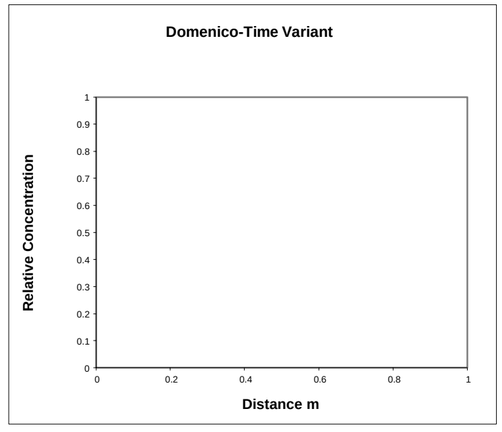
	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Calc	Value	
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Date:	11/12/2025
Version:	1

Contaminant **etrachloroethene**

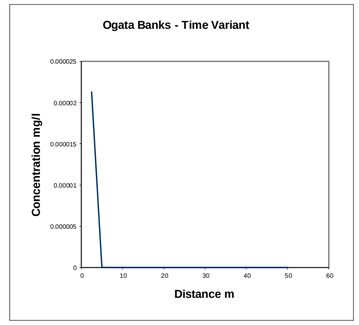
OGATA BANKS SOLUTION

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.01	mg/l
Co	9.80E-02	mg/l
λ	2.95E-04	days^{-1}
Sz	7.50E+01	m
Sy	1.18E+01	m
Kd	2.43E+03	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.01225	-8.4E+00	2.2E-04	-1.7E+48	2.000	8.9E+00	7.6E+03	1.7E+48	0.000	1.7E+01	1	-1.7E+01	-1	8.3E+00	1	-8.3E+00	-1	2.13E-05
2	5	0.01225	-1.7E+01	4.7E-08	-1.7E+48	2.000	1.8E+01	5.8E+07	1.7E+48	0.000	1.2E+01	1	-1.2E+01	-1	5.9E+00	1	-5.9E+00	-1	4.62E-09
3	7.5	0.01225	-2.5E+01	1.0E-11	-1.7E+48	2.000	2.7E+01	4.4E+11	1.7E+48	0.000	9.7E+00	1	-9.7E+00	-1	4.8E+00	1	-4.8E+00	-1	1.00E-12
4	10	0.01225	-3.4E+01	2.2E-15	-1.7E+48	2.000	3.6E+01	3.3E+15	1.7E+48	0.000	8.4E+00	1	-8.4E+00	-1	4.2E+00	1	-4.2E+00	-1	2.18E-16
5	12.5	0.01225	-4.2E+01	4.8E-19	-1.7E+48	2.000	4.5E+01	2.5E+19	1.7E+48	0.000	7.5E+00	1	-7.5E+00	-1	3.7E+00	1	-3.7E+00	-1	4.74E-20
6	15	0.01225	-5.1E+01	1.1E-22	-1.7E+48	2.000	5.4E+01	1.9E+23	1.7E+48	0.000	6.8E+00	1	-6.8E+00	-1	3.4E+00	1	-3.4E+00	-1	1.03E-23
7	17.5	0.01225	-5.9E+01	2.3E-26	-1.7E+48	2.000	6.3E+01	1.5E+27	1.7E+48	0.000	6.3E+00	1	-6.3E+00	-1	3.2E+00	1	-3.2E+00	-0.99999	2.24E-27
8	20	0.01225	-6.7E+01	5.0E-30	-1.7E+48	2.000	7.1E+01	1.1E+31	1.7E+48	0.000	5.9E+00	1	-5.9E+00	-1	3.0E+00	1	-3.0E+00	-0.99997	4.86E-31
9	22.5	0.01225	-7.6E+01	1.1E-33	-1.7E+48	2.000	8.0E+01	8.4E+34	1.7E+48	0.000	5.6E+00	1	-5.6E+00	-1	2.8E+00	0.9999	-2.8E+00	-0.99992	1.06E-34
10	25	0.01225	-8.4E+01	2.3E-37	-1.7E+48	2.000	8.9E+01	6.3E+38	1.7E+48	0.000	5.3E+00	1	-5.3E+00	-1	2.6E+00	0.9998	-2.6E+00	-0.99981	2.29E-38
11	27.5	0.01225	-9.3E+01	5.1E-41	-1.7E+48	2.000	9.8E+01	4.8E+42	1.7E+48	0.000	5.1E+00	1	-5.1E+00	-1	2.5E+00	0.9996	-2.5E+00	-0.99963	4.98E-42
12	30	0.01225	-1.0E+02	1.1E-44	-1.7E+48	2.000	1.1E+02	3.7E+46	1.7E+48	0.000	4.8E+00	1	-4.8E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	1.08E-45
13	32.5	0.01225	-1.1E+02	2.4E-48	-1.7E+48	2.000	1.2E+02	2.8E+50	1.7E+48	0.000	4.7E+00	1	-4.7E+00	-1	2.3E+00	0.9989	-2.3E+00	-0.99893	2.35E-49
14	35	0.01225	-1.2E+02	5.2E-52	-1.7E+48	2.000	1.3E+02	2.1E+54	1.7E+48	0.000	4.5E+00	1	-4.5E+00	-1	2.2E+00	0.9984	-2.2E+00	-0.99839	5.10E-53
15	37.5	0.01225	-1.3E+02	1.1E-55	-1.7E+48	2.000	1.3E+02	1.6E+58	1.7E+48	0.000	4.3E+00	1	-4.3E+00	-1	2.2E+00	0.9977	-2.2E+00	-0.99769	1.11E-56
16	40	0.01225	-1.3E+02	2.5E-59	-1.7E+48	2.000	1.4E+02	1.2E+62	1.7E+48	0.000	4.2E+00	1	-4.2E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	2.40E-60
17	42.5	0.01225	-1.4E+02	5.3E-63	-1.7E+48	2.000	1.5E+02	9.2E+65	1.7E+48	0.000	4.1E+00	1	-4.1E+00	-1	2.0E+00	0.9958	-2.0E+00	-0.99579	5.21E-64
18	45	0.01225	-1.5E+02	1.2E-66	-1.7E+48	2.000	1.6E+02	7.0E+69	1.7E+48	0.000	4.0E+00	1	-4.0E+00	-1	2.0E+00	0.9946	-2.0E+00	-0.99459	1.13E-67
19	47.5	0.01225	-1.6E+02	2.5E-70	-1.7E+48	2.000	1.7E+02	5.3E+73	1.7E+48	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9932	-1.9E+00	-0.99321	2.45E-71
20	50	0.01225	-1.7E+02	5.5E-74	-1.7E+48	2.000	1.8E+02	4.0E+77	1.7E+48	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	5.32E-75

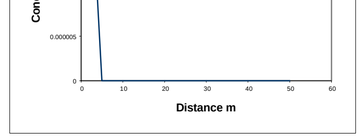


Calc **Value**

v	7.60E-02	m/d
Rc	1.56E+04	
u	4.89E-06	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.01225	-8.4E+00	2.2E-04	-1.7E+48	2.000	8.9E+00	7.6E+03	1.7E+48	0.000	1.7E+01	1	-1.7E+01	-1	1.7E+01	1	-1.7E+01	-1	2.13E-05
2	5	0.01225	-1.7E+01	4.7E-08	-1.7E+48	2.000	1.8E+01	5.8E+07	1.7E+48	0.000	1.2E+01	1	-1.2E+01	-1	1.2E+01	1	-1.2E+01	-1	4.62E-09
3	7.5	0.01225	-2.5E+01	1.0E-11	-1.7E+48	2.000	2.7E+01	4.4E+11	1.7E+48	0.000	9.7E+00	1	-9.7E+00	-1	9.6E+00	1	-9.6E+00	-1	1.00E-12
4	10	0.01225	-3.4E+01	2.2E-15	-1.7E+48	2.000	3.6E+01	3.3E+15	1.7E+48	0.000	8.4E+00	1	-8.4E+00	-1	8.3E+00	1	-8.3E+00	-1	2.18E-16
5	12.5	0.01225	-4.2E+01	4.8E-19	-1.7E+48	2.000	4.5E+01	2.5E+19	1.7E+48	0.000	7.5E+00	1	-7.5E+00	-1	7.5E+00	1	-7.5E+00	-1	4.74E-20
6	15	0.01225	-5.1E+01	1.1E-22	-1.7E+48	2.000	5.4E+01	1.9E+23	1.7E+48	0.000	6.8E+00	1	-6.8E+00	-1	6.8E+00	1	-6.8E+00	-1	1.03E-23
7	17.5	0.01225	-5.9E+01	2.3E-26	-1.7E+48	2.000	6.3E+01	1.5E+27	1.7E+48	0.000	6.3E+00	1	-6.3E+00	-1	6.3E+00	1	-6.3E+00	-1	2.24E-27
8	20	0.01225	-6.7E+01	5.0E-30	-1.7E+48	2.000	7.1E+01	1.1E+31	1.7E+48	0.000	5.9E+00	1	-5.9E+00	-1	5.9E+00	1	-5.9E+00	-1	4.86E-31
9	22.5	0.01225	-7.6E+01	1.1E-33	-1.7E+48	2.000	8.0E+01	8.4E+34	1.7E+48	0.000	5.6E+00	1	-5.6E+00	-1	5.6E+00	1	-5.6E+00	-1	1.06E-34
10	25	0.01225	-8.4E+01	2.3E-37	-1.7E+48	2.000	8.9E+01	6.3E+38	1.7E+48	0.000	5.3E+00	1	-5.3E+00	-1	5.3E+00	1	-5.3E+00	-1	2.29E-38
11	27.5	0.01225	-9.3E+01	5.1E-41	-1.7E+48	2.000	9.8E+01	4.8E+42	1.7E+48	0.000	5.1E+00	1	-5.1E+00	-1	5.0E+00	1	-5.0E+00	-1	4.98E-42
12	30	0.01225	-1.0E+02	1.1E-44	-1.7E+48	2.000	1.1E+02	3.7E+46	1.7E+48	0.000	4.8E+00	1	-4.8E+00	-1	4.8E+00	1	-4.8E+00	-1	1.08E-45
13	32.5	0.01225	-1.1E+02	2.4E-48	-1.7E+48	2.000	1.2E+02	2.8E+50	1.7E+48	0.000	4.7E+00	1	-4.7E+00	-1	4.6E+00	1	-4.6E+00	-1	2.35E-49
14	35	0.01225	-1.2E+02	5.2E-52	-1.7E+48	2.000	1.3E+02	2.1E+54	1.7E+48	0.000	4.5E+00	1	-4.5E+00	-1	4.5E+00	1	-4.5E+00	-1	5.11E-53
15	37.5	0.01225	-1.3E+02	1.1E-55	-1.7E+48	2.000	1.3E+02	1.6E+58	1.7E+48	0.000	4.3E+00	1	-4.3E+00	-1	4.3E+00	1	-4.3E+00	-1	1.11E-56
16	40	0.01225	-1.3E+02	2.5E-59	-1.7E+48	2.000	1.4E+02	1.2E+62	1.7E+48	0.000	4.2E+00	1	-4.2E+00	-1	4.2E+00	1	-4.2E+00	-1	2.41E-60
17	42.5	0.01225	-1.4E+02	5.3E-63	-1.7E+48	2.000	1.5E+02	9.2E+65	1.7E+48	0.000	4.1E+00	1	-4.1E+00	-1	4.0E+00	1	-4.0E+00	-1	5.24E-64
18	45	0.01225	-1.5E+02	1.2E-66	-1.7E+48	2.000	1.6E+02	7.0E+69	1.7E+48	0.000	4.0E+00	1	-4.0E+00	-1	3.9E+00	1	-3.9E+00	-1	1.14E-67
19	47.5	0.01225	-1.6E+02	2.5E-70	-1.7E+48	2.000	1.7E+02	5.3E+73	1.7E+48	0.000	3.8E+00	1	-3.8E+00	-1	3.8E+00	1	-3.8E+00	-1	2.47E-71
20	50	0.01225	-1.7E+02	5.5E-74	-1.7E+48	2.000	1.8E+02	4.0E+77	1.7E+48	0.000	3.8E+00	1	-3.8E+00	-1	3.7E+00	1	-3.7E+00	-1	5.37E-75



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	2.13E-05
5.0	4.62E-09
7.5	1.00E-12
10.0	2.18E-16
12.5	4.74E-20
15.0	1.03E-23
17.5	2.24E-27
20.0	4.86E-31
22.5	1.06E-34
25.0	2.29E-38
27.5	4.98E-42
30.0	1.08E-45
32.5	2.35E-49
35.0	5.11E-53
37.5	1.11E-56
40.0	2.41E-60
42.5	5.24E-64
45.0	1.14E-67
47.5	2.47E-71
50.0	5.37E-75

Contaminant **trachloroethene**

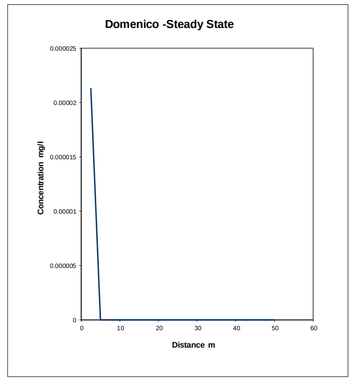
Input	Value	Units
C_T	0.01	mg/l
Co	9.80E-02	mg/l
λ	2.95E-04	days^{-1}
Sz	7.50E+01	m
Sy	1.18E+01	m
Kd	2.43E+03	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion optio Simulate vertical dispersion in 1 direction

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.0245	-8.43E+00	2.17E-04	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	2.13E-05
2	5	0.0245	-1.69E+01	4.72E-08	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	4.62E-09
3	7.5	0.0245	-2.53E+01	1.03E-11	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	1.00E-12
4	10	0.0245	-3.37E+01	2.23E-15	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	2.18E-16
5	12.5	0.0245	-4.22E+01	4.84E-19	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	4.74E-20
6	15	0.0245	-5.06E+01	1.05E-22	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	1.03E-23
7	17.5	0.0245	-5.90E+01	2.28E-26	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	2.24E-27
8	20	0.0245	-6.75E+01	4.96E-30	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	4.86E-31
9	22.5	0.0245	-7.59E+01	1.08E-33	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-0.9999	1.06E-34
10	25	0.0245	-8.43E+01	2.34E-37	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-0.9998	2.29E-38
11	27.5	0.0245	-9.28E+01	5.08E-41	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-0.9996	4.98E-42
12	30	0.0245	-1.01E+02	1.10E-44	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	1.08E-45
13	32.5	0.0245	-1.10E+02	2.40E-48	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.9989	2.35E-49
14	35	0.0245	-1.18E+02	5.21E-52	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.9984	5.10E-53
15	37.5	0.0245	-1.27E+02	1.13E-55	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.9977	1.11E-56
16	40	0.0245	-1.35E+02	2.46E-59	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	2.40E-60
17	42.5	0.0245	-1.43E+02	5.34E-63	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.9958	5.21E-64
18	45	0.0245	-1.52E+02	1.16E-66	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.9946	1.13E-67
19	47.5	0.0245	-1.60E+02	2.52E-70	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.9932	2.45E-71
20	50	0.0245	-1.69E+02	5.48E-74	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	5.32E-75



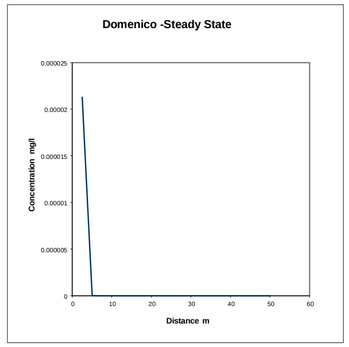
Calc **Value**

v	7.60E-02	m/d
Rc	1.56E+04	
u	4.89E-06	m/d

DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.0245	-8.43E+00	2.17E-04	1.68E+01	1	-1.68E+01	-1	1.67E+01	1	-1.67E+01	-1	2.13E-05
2	5	0.0245	-1.69E+01	4.72E-08	1.19E+01	1	-1.19E+01	-1	1.18E+01	1	-1.18E+01	-1	4.62E-09
3	7.5	0.0245	-2.53E+01	1.03E-11	9.68E+00	1	-9.68E+00	-1	9.63E+00	1	-9.63E+00	-1	1.00E-12
4	10	0.0245	-3.37E+01	2.23E-15	8.39E+00	1	-8.39E+00	-1	8.34E+00	1	-8.34E+00	-1	2.18E-16
5	12.5	0.0245	-4.22E+01	4.84E-19	7.50E+00	1	-7.50E+00	-1	7.46E+00	1	-7.46E+00	-1	4.74E-20
6	15	0.0245	-5.06E+01	1.05E-22	6.85E+00	1	-6.85E+00	-1	6.81E+00	1	-6.81E+00	-1	1.03E-23
7	17.5	0.0245	-5.90E+01	2.28E-26	6.34E+00	1	-6.34E+00	-1	6.31E+00	1	-6.31E+00	-1	2.24E-27
8	20	0.0245	-6.75E+01	4.96E-30	5.93E+00	1	-5.93E+00	-1	5.90E+00	1	-5.90E+00	-1	4.86E-31
9	22.5	0.0245	-7.59E+01	1.08E-33	5.59E+00	1	-5.59E+00	-1	5.56E+00	1	-5.56E+00	-1	1.06E-34
10	25	0.0245	-8.43E+01	2.34E-37	5.30E+00	1	-5.30E+00	-1	5.28E+00	1	-5.28E+00	-1	2.29E-38
11	27.5	0.0245	-9.28E+01	5.08E-41	5.06E+00	1	-5.06E+00	-1	5.03E+00	1	-5.03E+00	-1	4.98E-42
12	30	0.0245	-1.01E+02	1.10E-44	4.84E+00	1	-4.84E+00	-1	4.82E+00	1	-4.82E+00	-1	1.08E-45
13	32.5	0.0245	-1.10E+02	2.40E-48	4.65E+00	1	-4.65E+00	-1	4.63E+00	1	-4.63E+00	-1	2.35E-49
14	35	0.0245	-1.18E+02	5.21E-52	4.48E+00	1	-4.48E+00	-1	4.46E+00	1	-4.46E+00	-1	5.11E-53
15	37.5	0.0245	-1.27E+02	1.13E-55	4.33E+00	1	-4.33E+00	-1	4.31E+00	1	-4.31E+00	-1	1.11E-56
16	40	0.0245	-1.35E+02	2.46E-59	4.19E+00	1	-4.19E+00	-1	4.17E+00	1	-4.17E+00	-1	2.41E-60
17	42.5	0.0245	-1.43E+02	5.34E-63	4.07E+00	1	-4.07E+00	-1	4.05E+00	1	-4.05E+00	-1	5.24E-64
18	45	0.0245	-1.52E+02	1.16E-66	3.95E+00	1	-3.95E+00	-1	3.93E+00	1	-3.93E+00	-1	1.14E-67
19	47.5	0.0245	-1.60E+02	2.52E-70	3.85E+00	1	-3.85E+00	-1	3.83E+00	1	-3.83E+00	-1	2.47E-71
20	50	0.0245	-1.69E+02	5.48E-74	3.75E+00	1	-3.75E+00	-1	3.73E+00	1	-3.73E+00	-1	5.37E-75



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	2.13E-05
5.0	4.62E-09
7.5	1.00E-12
10.0	2.18E-16
12.5	4.74E-20
15.0	1.03E-23
17.5	2.24E-27
20.0	4.86E-31
22.5	1.06E-34
25.0	2.29E-38
27.5	4.98E-42
30.0	1.08E-45
32.5	2.35E-49
35.0	5.11E-53
37.5	1.11E-56
40.0	2.41E-60
42.5	5.24E-64
45.0	1.14E-67
47.5	2.47E-71
50.0	5.37E-75

DOMENICO (TIME VARIANT)

Contaminant trachloroethene

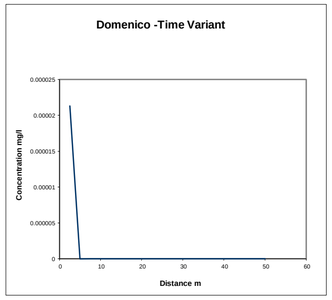
Input	Value	Units
C_T	0.01	mg/l
Co	9.80E-02	mg/l
λ	2.95E-04	days^{-1}
Sz	7.50E+01	m
Sy	1.18E+01	m
Kd	2.43E+03	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

Calc	Value	Units
v	7.60E-02	m/d
Rc	1.56E+04	
u	4.89E-06	m/d

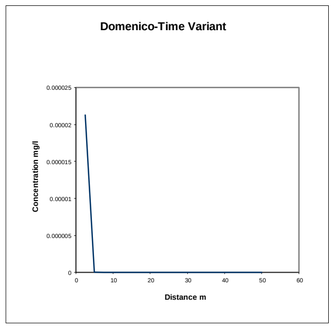
Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.01225	-8.43E+00	2.17E-04	-1.71E+48	2	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	2.13E-05
2	5	0.01225	-1.69E+01	4.72E-08	-1.71E+48	2	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	4.62E-09
3	7.5	0.01225	-2.53E+01	1.03E-11	-1.71E+48	2	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	1.00E-12
4	10	0.01225	-3.37E+01	2.23E-15	-1.71E+48	2	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	2.18E-16
5	12.5	0.01225	-4.22E+01	4.84E-19	-1.71E+48	2	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	4.74E-20
6	15	0.01225	-5.06E+01	1.05E-22	-1.71E+48	2	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	1.03E-23
7	17.5	0.01225	-5.90E+01	2.28E-26	-1.71E+48	2	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	2.24E-27
8	20	0.01225	-6.75E+01	4.96E-30	-1.71E+48	2	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	4.86E-31
9	22.5	0.01225	-7.59E+01	1.08E-33	-1.71E+48	2	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-1	1.06E-34
10	25	0.01225	-8.43E+01	2.34E-37	-1.71E+48	2	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-1	2.29E-38
11	27.5	0.01225	-9.28E+01	5.08E-41	-1.71E+48	2	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-1	4.98E-42
12	30	0.01225	-1.01E+02	1.10E-44	-1.71E+48	2	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	1.08E-45
13	32.5	0.01225	-1.10E+02	2.40E-48	-1.71E+48	2	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.999	2.35E-49
14	35	0.01225	-1.18E+02	5.21E-52	-1.71E+48	2	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.998	5.10E-53
15	37.5	0.01225	-1.27E+02	1.13E-55	-1.71E+48	2	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.998	1.11E-56
16	40	0.01225	-1.35E+02	2.46E-59	-1.71E+48	2	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	2.40E-60
17	42.5	0.01225	-1.43E+02	5.34E-63	-1.71E+48	2	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.996	5.21E-64
18	45	0.01225	-1.52E+02	1.16E-66	-1.71E+48	2	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.995	1.13E-67
19	47.5	0.01225	-1.60E+02	2.52E-70	-1.71E+48	2	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.993	2.45E-71
20	50	0.01225	-1.69E+02	5.48E-74	-1.71E+48	2	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	5.32E-75



Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.01225	-8.43E+00	2.17E-04	-1.71E+48	2	1.68E+01	1	-1.68E+01	-1	1.67E+01	1	-1.67E+01	-1	2.13E-05
2	5	0.01225	-1.69E+01	4.72E-08	-1.71E+48	2	1.19E+01	1	-1.19E+01	-1	1.18E+01	1	-1.18E+01	-1	4.62E-09
3	7.5	0.01225	-2.53E+01	1.03E-11	-1.71E+48	2	9.68E+00	1	-9.68E+00	-1	9.63E+00	1	-9.63E+00	-1	1.00E-12
4	10	0.01225	-3.37E+01	2.23E-15	-1.71E+48	2	8.39E+00	1	-8.39E+00	-1	8.34E+00	1	-8.34E+00	-1	2.18E-16
5	12.5	0.01225	-4.22E+01	4.84E-19	-1.71E+48	2	7.50E+00	1	-7.50E+00	-1	7.46E+00	1	-7.46E+00	-1	4.74E-20
6	15	0.01225	-5.06E+01	1.05E-22	-1.71E+48	2	6.85E+00	1	-6.85E+00	-1	6.81E+00	1	-6.81E+00	-1	1.03E-23
7	17.5	0.01225	-5.90E+01	2.28E-26	-1.71E+48	2	6.34E+00	1	-6.34E+00	-1	6.31E+00	1	-6.31E+00	-1	2.24E-27
8	20	0.01225	-6.75E+01	4.96E-30	-1.71E+48	2	5.93E+00	1	-5.93E+00	-1	5.90E+00	1	-5.90E+00	-1	4.86E-31
9	22.5	0.01225	-7.59E+01	1.08E-33	-1.71E+48	2	5.59E+00	1	-5.59E+00	-1	5.56E+00	1	-5.56E+00	-1	1.06E-34
10	25	0.01225	-8.43E+01	2.34E-37	-1.71E+48	2	5.30E+00	1	-5.30E+00	-1	5.28E+00	1	-5.28E+00	-1	2.29E-38
11	27.5	0.01225	-9.28E+01	5.08E-41	-1.71E+48	2	5.06E+00	1	-5.06E+00	-1	5.03E+00	1	-5.03E+00	-1	4.98E-42
12	30	0.01225	-1.01E+02	1.10E-44	-1.71E+48	2	4.84E+00	1	-4.84E+00	-1	4.82E+00	1	-4.82E+00	-1	1.08E-45
13	32.5	0.01225	-1.10E+02	2.40E-48	-1.71E+48	2	4.65E+00	1	-4.65E+00	-1	4.63E+00	1	-4.63E+00	-1	2.35E-49
14	35	0.01225	-1.18E+02	5.21E-52	-1.71E+48	2	4.48E+00	1	-4.48E+00	-1	4.46E+00	1	-4.46E+00	-1	5.11E-53
15	37.5	0.01225	-1.27E+02	1.13E-55	-1.71E+48	2	4.33E+00	1	-4.33E+00	-1	4.31E+00	1	-4.31E+00	-1	1.11E-56
16	40	0.01225	-1.35E+02	2.46E-59	-1.71E+48	2	4.19E+00	1	-4.19E+00	-1	4.17E+00	1	-4.17E+00	-1	2.41E-60
17	42.5	0.01225	-1.43E+02	5.34E-63	-1.71E+48	2	4.07E+00	1	-4.07E+00	-1	4.05E+00	1	-4.05E+00	-1	5.24E-64
18	45	0.01225	-1.52E+02	1.16E-66	-1.71E+48	2	3.95E+00	1	-3.95E+00	-1	3.93E+00	1	-3.93E+00	-1	1.14E-67
19	47.5	0.01225	-1.60E+02	2.52E-70	-1.71E+48	2	3.85E+00	1	-3.85E+00	-1	3.83E+00	1	-3.83E+00	-1	2.47E-71
20	50	0.01225	-1.69E+02	5.48E-74	-1.71E+48	2	3.75E+00	1	-3.75E+00	-1	3.73E+00	1	-3.73E+00	-1	5.37E-75



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	2.13E-05
5.0	4.62E-09
7.5	1.00E-12
10.0	2.18E-16
12.5	4.74E-20
15.0	1.03E-23
17.5	2.24E-27
20.0	4.86E-31
22.5	1.06E-34
25.0	2.29E-38
27.5	4.98E-42
30.0	1.08E-45
32.5	2.35E-49
35.0	5.11E-53
37.5	1.11E-56
40.0	2.41E-60
42.5	5.24E-64
45.0	1.14E-67
47.5	2.47E-71
50.0	5.37E-75

Hydrogeological risk assessment for land contamination

Remedial Targets Worksheet , Release 3.2

First released: 2006. Version 3.2: January 2013

This worksheet has been produced in combination with the document 'Remedial Targets Methodology: Hydrogeological risk assessment for land contamination (Environment Agency 2006).

Users of this worksheet should always refer to the User Manual to the Remedial Targets Methodology and to relevant guidance on UK legislation and policy, in order to understand how this procedure should be applied in an appropriate context.

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The calculation of equations in this worksheet has been independently checked by Entec (UK) Ltd on behalf of the Environment Agency.

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IMPORTANT: To enable MS Excel worksheet, click Tools, Add -Ins, Analysis Tool Pak and Analysis Tool Pak-VBA (to calculate error functions)

Details to be completed for each assessment				
Site Name:	Kelvedon Street			
Site Address:	Newport			
Completed by:	Michael Watkins			
Date:	11-Dec-25		Version:	1
Contaminant	Tetrachloroethene			
Target Concentration (C_T)	0.01	mg/l	Origin of C_T:	WFD for inland surface waters (annual average)

This worksheet can be used to determine remedial targets for soils (Worksheets Level 1 Soil, Level 2 and Level 3 Soil) or to determine remedial targets for groundwater (Level 3 Groundwater). For Level 3, parameter values must be entered separately dependent on whether the assessment is for soil or groundwater. For soil, remedial targets are calculated as either mg/kg (for comparision with soil measurements) or mg/l (for comparison with leaching tests or pore water concentrations).
Site details entered on this page are automatically copied to Level 1, 2 and 3 Worksheets.
Worksheet options are identified by brown background and employ a pull-down menus. Data entry are identified as blue background.
Data origin / justification should be noted in cells coloured yellow and fully documented in subsequent reports.
Data carried forward from an earlier worksheet are identified by a light green background
It is recommended that a copy of the original worksheet is saved (all data fields in the original copy are blank).

The spreadsheet also includes a porosity calculation worksheet, a soil impact calculation worksheet and a worksheet that performs some simple hydrogeological calculations.

Remedial Targets Worksheet , Release 3.2

Level 1 - Soil

Select the method of calculating the soil water Partition Co-efficient by using the pull down menu below

User specified value for partition coefficient

Contaminant		**Tetrachloroethene**		
Target concentration	**C_T**	**0.01**	**mg/l**	

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**
Standard entry				
Water filled soil porosity	θ_W	0.00E+00	fraction	
Air filled soil porosity	θa	0.00E+00	fraction	
Bulk density of soil zone material	ρ	0.00E+00	g/cm^3	
Henry's Law constant	H	0.00E+00	dimensionless	
Entry if specify partition coefficient (option)				
Soil water partition coefficient	Kd	0.00E+00	l/kg	
Entry for non-polar organic chemicals (option)				
Fraction of organic carbon (in soil)	foc		fraction	
Organic carbon partition coefficient	Koc		l/kg	
Entry for ionic organic chemicals (option)				
Sorption coefficient for neutral species	$K_{oc,n}$		l/kg	
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg	
pH value	pH		pH units	
Acid dissociation constant	pKa			
Fraction of organic carbon (in soil)	foc		fraction	

This sheet calculates the Level 1 remedial target for soils(mg/kg) based on a selected target concentration and theoretical calculation of soil water partitioning. Three options are included for determining the partition coefficient.

The measured soil concentration as mg/kg should be compared with the Level 1 remedial target to determine the need for further action.

Soil water partition coefficient used in Level Assessment	**Kd**	**0.00E+00**	**l/kg**	*Specified value*

Level 1 Remedial Target

Level 1 Remedial Target	**#DIV/0!**	**mg/kg**	**(for comparison with soil analyses)**
	or		
	0.01	**mg/l**	**(for comparison with leachate test results)**

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 2 - Soil

Contaminant		**Tetrachloroethene**		from Level 1
Target concentration	**C_T**	**0.01**	**mg/l**	from Level 1

This sheet calculates the Level 2 remedial target for soils (mg/kg) or for pore water (mg/l).

The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 2 remedial target to determine the need for further action. Equations presented in 'Hydrogeological risk assessment for land contamiantion' (Environment Agency 2006)

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**	
Standard entry					
Infiltration	Inf	0.00E+00	m/d		
Area of contaminant source	A	0.00E+00	m^2		Not used in calculation
Entry for groundwater flow below site					
Length of contaminant source in direction of groundwater flow	L	0.00E+00	m		
Saturated aquifer thickness	da	0.00E+00	m		
Hydraulic Conductivity of aquifer in which dilution occurs	K	0.00E+00	m/d		
Hydraulic gradient of water table	i	0.00E+00	fraction		
Width of contaminant source perpendicular to groundwater flow	w	0.00E+00	m		Not used in calculation
Background concentration of contaminant in groundwater beneath site	Cu	0.00E+00	mg/l		
Define mixing zone depth by specifying or calculating depth (using pull down list)		**Specify**			
Enter mixing zone thickness	Mz	0.00E+00	m		
Calculated mixing zone thickness	Mz		m		

Calculated Parameters

Dilution Factor	**DF**	**#DIV/0!**		
Level 2 Remedial Target		**#DIV/0!**	**mg/l**	**For comparison with measured pore water concentration. This assumes Level 1 Remedial Target is based on Target Concentrati**
		or		
		#DIV/0!	**mg/kg**	**For comparison with measured soil concentration. This assumes Level 1 Remedial Target calculated from soil-water**

Additional option

Calculation of impact on receptor

Concentration of contaminant in contaminated discharge (entering receptor)	Cc	0.00E+00	mg/l	
Calculated concentration within receptor (dilution only)		#DIV/0!	mg/l	0

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 3 - Soil

See Note

Input Parameters	Variable	Value	Unit	Source
Contaminant		Tetrachloroethene		from Level 1
Target Concentration	C_T	0.01	mg/l	from Level 1
Dilution Factor	DF	#DIV/0!		from Level 2

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value, l

	Variable	Value	Unit	Source of parameter value
Enter source concentration		Soil concentration as mg/kg		
Enter soil concentration		0	mg/kg	
Half life for degradation of contaminant in water	$t_{1/2}$	1.00E+100	days	
Calculated decay rate	λ	6.93E-101	$days^{-1}$	calculated
Width of plume in aquifer at source	Sz	0.00E+00	m	from Level 2
Plume thickness in aquifer at source	Sy	0.00E+00	m	from Level 2
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Effective porosity of aquifer	n	0.00E+00	fraction	
Hydraulic gradient	i	#DIV/0!	fraction	from Level 2 (adjusted)
Hydraulic conductivity of saturated aquifer	K	0.00E+00	m/d	from Level 2
Distance to compliance point	x	0.00E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	1.00E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	0.00E+00	l/kg	*see options*
Longitudinal dispersivity	ax	0.000	m	*see options*
Transverse dispersivity	az	0.000	m	*see options*
Vertical dispersivity	ay	0.000	m	*see options*

Parameter values should be checked against Level 1 and 2

Calculated Parameters	Variable		
Groundwater flow velocity	v	#DIV/0!	m/d
Retardation factor	Rf	#DIV/0!	fraction
Decay rate used	λ	6.93E-101	d^{-1}
Hydraulic gradient used in aquifer flow down-gradient	i	#DIV/0!	fraction
Rate of contaminant flow due to retardation	u	#DIV/0!	m/d
Ratio of Compliance Point to Source Concentration	C_{ED}/C_0	#DIV/0!	fraction
Attenuation factor (C_0/C_{ED})	**AF**	**#DIV/0!**	**fraction**
Calculated soil leachate concentration	Co	#DIV/0!	mg/l

Remedial Targets

Level 3 Remedial Target		**#DIV/0!**	**mg/l**	For comparison with measured pore water concentration.
Ogata Banks		**or**		This assumes Level 1 Remedial Target is based on Target Concentration.
		#DIV/0!	**mg/kg**	For comparison with measured soil concentration. This
Distance to compliance point		**0**	**m**	assumes Level 1 Remedial Target calculated from soil-water partitioning equation.
Ratio of Compliance Point to Source Concentration	**C_{ED}/C_0**	**#DIV/0!**	**fraction**	Ogata Banks

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99

Enter method of defining partition co-efficient (using pull down list)

Calculate for ionic organic chemicals (acids)

Entry if specify partition coefficient (option)

Soil water partition coefficient — Kd — l/kg

Entry for non-polar organic chemicals (option)

Fraction of organic carbon in aquifer — foc — fraction
Organic carbon partition coefficient — Koc — l/kg

Entry for ionic organic chemicals (option)

Sorption coefficient for related species	$K_{oc,n}$	0.00E+00	l/kg
Sorption coefficient for ionised species	$K_{oc,i}$	0.00E+00	l/kg
pH value	pH	0.00E+00	
Acid dissociation constant	pKa	0.00E+00	
Fraction of organic carbon in aquifer	foc	0.00E+00	fraction
Soil water partition coefficient	Kd	0.00E+00	l/kg

Define dispersivity (click brown cell and use pull down list)

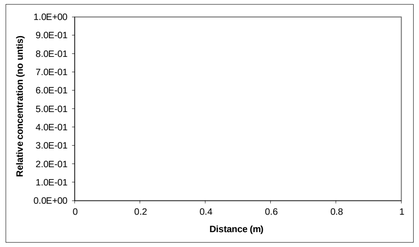
User defined values for dispersivity

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	0.00E+00	#NUM!	m
Transverse dispersivity	**az**	0.00E+00	0.00E+00	#NUM!	m
Vertical dispersivity	**ay**	0.00E+00	0.00E+00	#NUM!	m

Note values of dispersivity must be > 0

Xu & Eckstein (1995) report $ax = 0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed

Note
This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O_2, NO_3, SO_4 etc than an alternative solution should be used



Note: 'Relative concentration' is the ratio of calculated concentation at a given position compared to the source concentration. The calculations assume plume disperses from the top of the aquifer. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

This sheet calculates the Level 3 remedial target for soils(mg/kg) or for pore water (mg/l), based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.By setting a long travel time (e.g. 9E99) it will give the steady state solution, which should always be used when calculating remedial targets.

The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.9E+99.

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Calculated (relative) concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Relative concentration (No units)	Concentration mg/l
0	1.0E+00	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!

Remedial Targets Worksheet , Release 3.2

Calculation of contaminant concentration in groundwater from a soil source

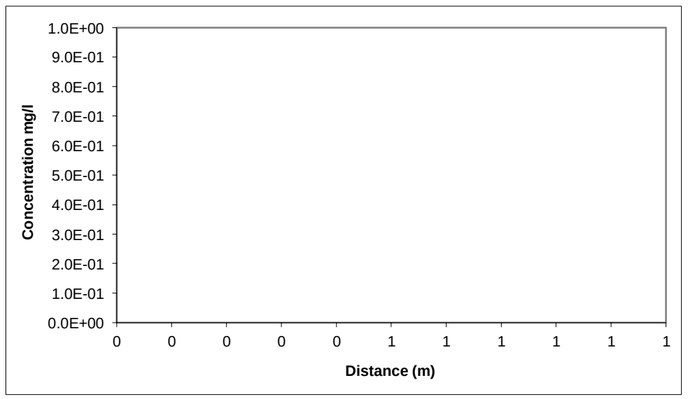
Only input required is Soil Contaminant Concentration

	Input Parameters			
	Soil contaminant concentration	C_0	0.00E+00	mg/kg
Level 1 Parameters				
	Water filled soil porosity	θ_W	0.00E+00	fraction
	Air filled soil porosity	θa	0.00E+00	fraction
	Bulk density	ρ	0.00E+00	g/cm^3
	Henry's Law constant	H	0.00E+00	dimensionless
	Soil water partition coefficient used in Level Assessment	Kd	0.00E+00	l/kg
	Factor (partitioning between soil and water)		#DIV/0!	dimensionless
Level 2 Parameters	**Dilution Factor**	DF	#DIV/0!	
Level 3 Parameters	**Attenuation factor (C_O/C_{ED})**	AF	#DIV/0!	

Predicted concentrations at compliance point

Level 1	C	#DIV/0!	mg/l	No dilution or attenuation
Level 2	C	#DIV/0!	mg/l	Dilution taken into account
Level 3	C	#DIV/0!	mg/l	Dilution and attenuation taken into account

Predicted concentrations between source and compliance point - Level 3



Distance m	Concentration mg/l
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)

	Variable	Value	Unit	Source
Contaminant		Tetrachloroethene		from Level 1
Target Concentration	C_T	1.00E-02	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Domenico - Steady state — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	9.80E+01	mg/l	*Site investigation data*
Half life for degradation of contaminant in water	$t_{1/2}$	2.35E+03	days	*Howard et al (1991) Low anaerobic biodeg*
Calculated decay rate	λ	2.95E-04	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	7.50E+01	m	*Length of site perpendicular to groundwater flow*
Plume thickness at source	Sy	5.90E+00	m	*Same as Mixing Zone Thickness. "For a thin aquifer (typically <10m), the mixing zone thickness can be taken as the ac*
Saturated aquifer thickness	da	6.00E+00	m	*Maximum thickness recorded in vicinity of*
Bulk density of aquifer materials	ρ	1.60E+00	g/cm^3	*Typical bulk density for river terrace deposits*
Effective porosity of aquifer	n	2.50E-01	fraction	*Maximum porosity for coarse Gravel (Lovanh et al 2000) - conservative estimate*
Hydraulic gradient	i	4.40E-02	fraction	*Borehole level data*
Hydraulic conductivity of aquifer	K	4.32E-01	m/d	*Maximum typical value for clayey sandy G*
Distance to compliance point	x	5.00E+01	m	*Default compliance distance*
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	9.90E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	2.43E+03	l/kg	*see options*
Longitudinal dispersivity	ax	5.00E+00	m	*see options*
Transverse dispersivity	az	5.00E-01	m	*see options*
Vertical dispersivity	ay	5.00E-02	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)

Soil water partition coefficient — Kd — 2.43E+03 — l/kg

Entry for non-polar organic chemicals (option)

Fraction of organic carbon in aquifer — foc — fraction

Organic carbon partition coefficient — Koc — l/kg

Entry for ionic organic chemicals (option)

Sorption coefficient for related species — $K_{OC,n}$ — l/kg

Sorption coefficient for ionised species — $K_{OC,I}$ — l/kg

pH value — pH

acid dissociation constant — pKa

Fraction of organic carbon in aquifer — foc — fraction

Soil water partition coefficient	Kd	2.43E+03	l/kg

Define dispersivity (click brown cell and use pull down list)

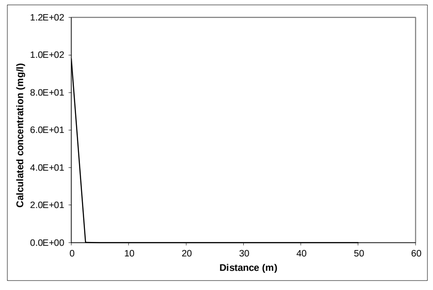
Dispersivities 10%, 1%, 0.1% of pathway length

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	5.00E+00	2.98E+00	m
Transverse dispersivity	**az**	0.00E+00	5.00E-01	2.98E-01	m
Vertical dispersivity	**ay**	0.00E+00	5.00E-02	2.98E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Calculated concentrations for distance-concentration graph

Domenico - Steady state
From calculation sheet

Distance	Concentration
	mg/l
0	9.8E+01
2.5	2.13E-02
5.0	4.62E-06
7.5	1.00E-09
10.0	2.18E-13
12.5	4.74E-17
15.0	1.03E-20
17.5	2.24E-24
20.0	4.86E-28
22.5	1.06E-31
25.0	2.29E-35
27.5	4.98E-39
30.0	1.08E-42
32.5	2.35E-46
35.0	5.10E-50
37.5	1.11E-53
40.0	2.40E-57
42.5	5.21E-61
45.0	1.13E-64
47.5	2.45E-68
50.0	5.32E-72

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared
with the Level 3 remedial target to determine the need for further action.
Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Calculated Parameters

	Variable		
Groundwater flow velocity	v	7.60E-02	m/d
Retardation factor	Rf	1.56E+04	fraction
Decay rate used	λ	2.95E-04	d^{-1}
Rate of contaminant flow due to retardation	u	4.89E-06	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	5.32E-72	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**1.84E+73**	

Remedial Targets

Remedial Target		**1.84E+71**	**mg/l**	For comparison with measured groundwater concentration.
Domenico - Steady state				
Distance to compliance point		**50**	**m**	
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**5.32E-72**	**mg/l**	Domenico - Steady state

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Porosity Calculator

These results are not carried through to any of the other worksheets

DRY BULK DENSITY DATA

Variable	Value	Unit	justification
Natural Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Dry Bulk Density	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
Initial Saturation	#DIV/0!	*%*	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	
Water Filled Porosity	**#DIV/0!**	**fraction**	

WET BULK DENSITY DATA

Variable	Value	Unit	
Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Actual (wet) Bulk Density (i.e. at natural MC)	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
dry bulk density	0.00	tonnes/m^3	
Initial Saturation	#DIV/0!	*%*	
Total porosity	**1.000**	**fraction**	**#DIV/0!**
Air Filled Porosity	**#DIV/0!**	**fraction**	
Water Filled Porosity	**#DIV/0!**	**fraction**	

Analytical solutions provided by David Hall, Golder Associates (UK) Ltd

Simple hydrogeological calculations

(These are not specific to, or required in, the Remedial Targets Methodology)

Parameter	symbol		unit	justification
Hydraulic conductivity	K	0.00E+00	m/d	
Hydraulic gradient	i	0.00E+00	unitless	
Effective porosity of aquifer	n	0.00E+00	fraction	
Thickness of saturated aquifer	b	0.00E+00	m	
Width of aquifer perpendicular to flow	w	0.00E+00	m	
Distance to receptor	x	0.00E+00	m	
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Soil-water partition co-efficient	Kd	0.00E+00	l/kg	
Retardation factor of pollutant	R	#DIV/0!		

Groundwater flow velocity	v(GW)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for groundwater to reach receptor	t(GW)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years
Rate of groundwater flow through aquifer	Q	0.00E+00	m^3/s	0.00E+00	m^3/day	0.00E+00	m^3/year

Contaminant flow velocity	v(contam)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for contaminant to reach receptor	t(contam)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years

Level 1 Calculation Sheet

Contaminant Tetrachloroethene

Parameter	Value	Units
(carried over from input sheet)		
C_T	1.00E-02	mg/l
Kd	0.00E+00	l/kg
foc		fraction
koc		l/kg
θ_W	0.00E+00	fraction
θa	0.00E+00	fraction
ρ	0.00E+00	g/cm3
H	0.00E+00	dimensionless
Koc,n		l/kg
Koc,i		l/kg
pH		pH units
pKa		
foc (ionic)		fraction

Calculations (Refer toTable 4.3, R&D Publication 20)

Selected option User specified value for partition coefficient

calc calc Calc Kd l/kg

Calculation of partition coefficient for ionic organic chemical

Partition coefficient used in Level 1 Assessment 0.00E+00 l/kg

Calculated Remedial Target #DIV/0! mg/kg for Tetrachloroethene

Factor (partitioning between soil and water) #DIV/0!

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11/12/2025
Version:	1

Level 2 Calculation Sheet

Contaminant Tetrachloroethene

Site assessed:	Kelvedon Stre
Date:	11/12/2025
Version:	1

Parameter	Value	Units		
(carried over from input sheet)				
Mz	0.00E+00	m		
L	0.00E+00	m		
da	0.00E+00	m		Calculated Dilution Factor
Inf	0.00E+00	m/d		
K	0.00E+00	m/d		
i	0.00E+00		Calculation based on target concentration	#DIV/0!
A	0.00E+00	m3/d m2 m3/d	Calculation based on observed contaminant concentration	#DIV/0!
Cc	0.00E+00	mg/l		
C_T	1.00E-02	mg/l		
Cu	0.00E+00	mg/l		
w	0.00E+00	m		



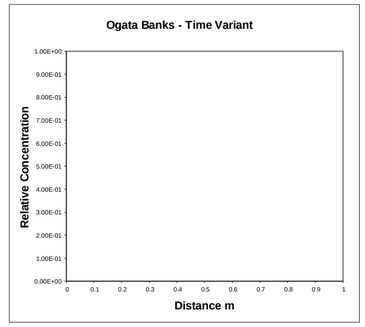
Contaminant Tetrachloroethene

OGATA BANKS SOLUTION

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-02	mg/l
DF	#DIV/0!	
λ	6.931E-101	days^{-1}
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Calc	Value	
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) -USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Date:	11/12/2025
Version:	1

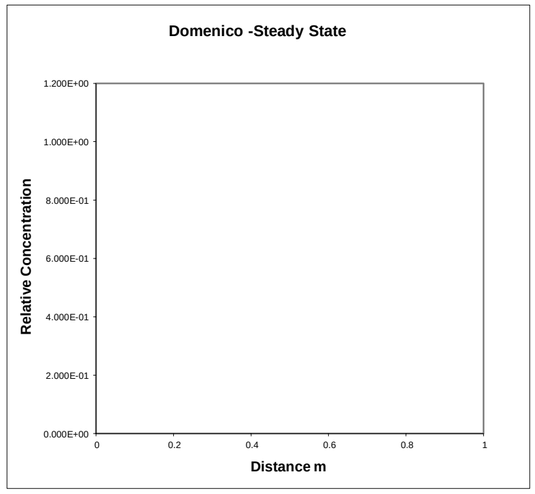
Contaminant trachloroethene

Input	Value	Units
C_T	1.000E-02	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

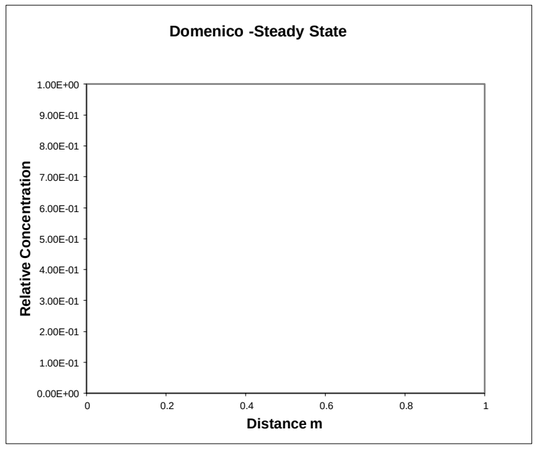


Calc	Value	Units
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



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Version:	1

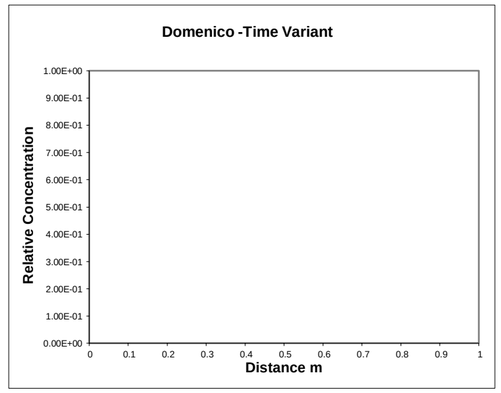
DOMENICO (TIME VARIANT)

Contaminant **trachloroethene**

Input	Value	Units
C_T	0.01	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

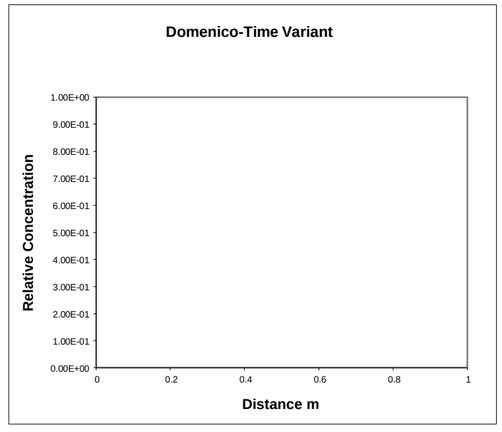
	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Calc	Value	
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



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OGATA BANKS SOLUTION

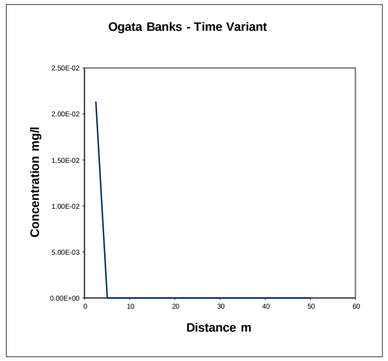
Contaminant etrachloroethene

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.01	mg/l
Co	9.80E+01	mg/l
λ	2.95E-04	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	2.43E+03	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	12.25	-8.4E+00	2.2E-04	-1.7E+48	2.000	8.9E+00	7.6E+03	1.7E+48	0.000	1.7E+01	1	-1.7E+01	-1	4.2E+00	1	-4.2E+00	-1	2.13E-02
2	5	12.25	-1.7E+01	4.7E-08	-1.7E+48	2.000	1.8E+01	5.8E+07	1.7E+48	0.000	1.2E+01	1	-1.2E+01	-1	3.0E+00	1	-3.0E+00	-0.99997	4.62E-06
3	7.5	12.25	-2.5E+01	1.0E-11	-1.7E+48	2.000	2.7E+01	4.4E+11	1.7E+48	0.000	9.7E+00	1	-9.7E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	1.00E-09
4	10	12.25	-3.4E+01	2.2E-15	-1.7E+48	2.000	3.6E+01	3.3E+15	1.7E+48	0.000	8.4E+00	1	-8.4E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	2.18E-13
5	12.5	12.25	-4.2E+01	4.8E-19	-1.7E+48	2.000	4.5E+01	2.5E+19	1.7E+48	0.000	7.5E+00	1	-7.5E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	4.70E-17
6	15	12.25	-5.1E+01	1.1E-22	-1.7E+48	2.000	5.4E+01	1.9E+23	1.7E+48	0.000	6.8E+00	1	-6.8E+00	-1	1.7E+00	0.984	-1.7E+00	-0.98399	1.01E-20
7	17.5	12.25	-5.9E+01	2.3E-26	-1.7E+48	2.000	6.3E+01	1.5E+27	1.7E+48	0.000	6.3E+00	1	-6.3E+00	-1	1.6E+00	0.9743	-1.6E+00	-0.97425	2.18E-24
8	20	12.25	-6.7E+01	5.0E-30	-1.7E+48	2.000	7.1E+01	1.1E+31	1.7E+48	0.000	5.9E+00	1	-5.9E+00	-1	1.5E+00	0.963	-1.5E+00	-0.96302	4.68E-28
9	22.5	12.25	-7.6E+01	1.1E-33	-1.7E+48	2.000	8.0E+01	8.4E+34	1.7E+48	0.000	5.6E+00	1	-5.6E+00	-1	1.4E+00	0.9508	-1.4E+00	-0.95078	1.00E-31
10	25	12.25	-8.4E+01	2.3E-37	-1.7E+48	2.000	8.9E+01	6.3E+38	1.7E+48	0.000	5.3E+00	1	-5.3E+00	-1	1.3E+00	0.9379	-1.3E+00	-0.93792	2.15E-35
11	27.5	12.25	-9.3E+01	5.1E-41	-1.7E+48	2.000	9.8E+01	4.8E+42	1.7E+48	0.000	5.1E+00	1	-5.1E+00	-1	1.3E+00	0.9247	-1.3E+00	-0.92475	4.61E-39
12	30	12.25	-1.0E+02	1.1E-44	-1.7E+48	2.000	1.1E+02	3.7E+46	1.7E+48	0.000	4.8E+00	1	-4.8E+00	-1	1.2E+00	0.9115	-1.2E+00	-0.91147	9.87E-43
13	32.5	12.25	-1.1E+02	2.4E-48	-1.7E+48	2.000	1.2E+02	2.8E+50	1.7E+48	0.000	4.7E+00	1	-4.7E+00	-1	1.2E+00	0.8982	-1.2E+00	-0.89824	2.11E-46
14	35	12.25	-1.2E+02	5.2E-52	-1.7E+48	2.000	1.3E+02	2.1E+54	1.7E+48	0.000	4.5E+00	1	-4.5E+00	-1	1.1E+00	0.8852	-1.1E+00	-0.88517	4.52E-50
15	37.5	12.25	-1.3E+02	1.1E-55	-1.7E+48	2.000	1.3E+02	1.6E+58	1.7E+48	0.000	4.3E+00	1	-4.3E+00	-1	1.1E+00	0.8723	-1.1E+00	-0.87233	9.68E-54
16	40	12.25	-1.3E+02	2.5E-59	-1.7E+48	2.000	1.4E+02	1.2E+62	1.7E+48	0.000	4.2E+00	1	-4.2E+00	-1	1.0E+00	0.8598	-1.0E+00	-0.85979	2.07E-57
17	42.5	12.25	-1.4E+02	5.3E-63	-1.7E+48	2.000	1.5E+02	9.2E+65	1.7E+48	0.000	4.1E+00	1	-4.1E+00	-1	1.0E+00	0.8476	-1.0E+00	-0.84756	4.44E-61
18	45	12.25	-1.5E+02	1.2E-66	-1.7E+48	2.000	1.6E+02	7.0E+69	1.7E+48	0.000	4.0E+00	1	-4.0E+00	-1	9.8E-01	0.8357	-9.8E-01	-0.83567	9.51E-65
19	47.5	12.25	-1.6E+02	2.5E-70	-1.7E+48	2.000	1.7E+02	5.3E+73	1.7E+48	0.000	3.8E+00	1	-3.8E+00	-1	9.6E-01	0.8241	-9.6E-01	-0.82412	2.04E-68
20	50	12.25	-1.7E+02	5.5E-74	-1.7E+48	2.000	1.8E+02	4.0E+77	1.7E+48	0.000	3.8E+00	1	-3.8E+00	-1	9.3E-01	0.8129	-9.3E-01	-0.81292	4.36E-72



Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

Calc	Value	
v	7.60E-02	m/d
Rc	1.56E+04	
u	4.89E-06	m/d

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	12.25	-8.4E+00	2.2E-04	-1.7E+48	2.000	8.9E+00	7.6E+03	1.7E+48	0.000	1.7E+01	1	-1.7E+01	-1	8.3E+00	1	-8.3E+00	-1	2.13E-02
2	5	12.25	-1.7E+01	4.7E-08	-1.7E+48	2.000	1.8E+01	5.8E+07	1.7E+48	0.000	1.2E+01	1	-1.2E+01	-1	5.9E+00	1	-5.9E+00	-1	4.62E-06
3	7.5	12.25	-2.5E+01	1.0E-11	-1.7E+48	2.000	2.7E+01	4.4E+11	1.7E+48	0.000	9.7E+00	1	-9.7E+00	-1	4.8E+00	1	-4.8E+00	-1	1.00E-09
4	10	12.25	-3.4E+01	2.2E-15	-1.7E+48	2.000	3.6E+01	3.3E+15	1.7E+48	0.000	8.4E+00	1	-8.4E+00	-1	4.2E+00	1	-4.2E+00	-1	2.18E-13
5	12.5	12.25	-4.2E+01	4.8E-19	-1.7E+48	2.000	4.5E+01	2.5E+19	1.7E+48	0.000	7.5E+00	1	-7.5E+00	-1	3.7E+00	1	-3.7E+00	-1	4.74E-17
6	15	12.25	-5.1E+01	1.1E-22	-1.7E+48	2.000	5.4E+01	1.9E+23	1.7E+48	0.000	6.8E+00	1	-6.8E+00	-1	3.4E+00	1	-3.4E+00	-1	1.03E-20
7	17.5	12.25	-5.9E+01	2.3E-26	-1.7E+48	2.000	6.3E+01	1.5E+27	1.7E+48	0.000	6.3E+00	1	-6.3E+00	-1	3.2E+00	1	-3.2E+00	-0.99999	2.24E-24
8	20	12.25	-6.7E+01	5.0E-30	-1.7E+48	2.000	7.1E+01	1.1E+31	1.7E+48	0.000	5.9E+00	1	-5.9E+00	-1	3.0E+00	1	-3.0E+00	-0.99997	4.86E-28
9	22.5	12.25	-7.6E+01	1.1E-33	-1.7E+48	2.000	8.0E+01	8.4E+34	1.7E+48	0.000	5.6E+00	1	-5.6E+00	-1	2.8E+00	0.9999	-2.8E+00	-0.99992	1.06E-31
10	25	12.25	-8.4E+01	2.3E-37	-1.7E+48	2.000	8.9E+01	6.3E+38	1.7E+48	0.000	5.3E+00	1	-5.3E+00	-1	2.6E+00	0.9998	-2.6E+00	-0.99981	2.29E-35
11	27.5	12.25	-9.3E+01	5.1E-41	-1.7E+48	2.000	9.8E+01	4.8E+42	1.7E+48	0.000	5.1E+00	1	-5.1E+00	-1	2.5E+00	0.9996	-2.5E+00	-0.99963	4.98E-39
12	30	12.25	-1.0E+02	1.1E-44	-1.7E+48	2.000	1.1E+02	3.7E+46	1.7E+48	0.000	4.8E+00	1	-4.8E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	1.08E-42
13	32.5	12.25	-1.1E+02	2.4E-48	-1.7E+48	2.000	1.2E+02	2.8E+50	1.7E+48	0.000	4.7E+00	1	-4.7E+00	-1	2.3E+00	0.9989	-2.3E+00	-0.99893	2.35E-46
14	35	12.25	-1.2E+02	5.2E-52	-1.7E+48	2.000	1.3E+02	2.1E+54	1.7E+48	0.000	4.5E+00	1	-4.5E+00	-1	2.2E+00	0.9984	-2.2E+00	-0.99839	5.10E-50
15	37.5	12.25	-1.3E+02	1.1E-55	-1.7E+48	2.000	1.3E+02	1.6E+58	1.7E+48	0.000	4.3E+00	1	-4.3E+00	-1	2.2E+00	0.9977	-2.2E+00	-0.99769	1.11E-53
16	40	12.25	-1.3E+02	2.5E-59	-1.7E+48	2.000	1.4E+02	1.2E+62	1.7E+48	0.000	4.2E+00	1	-4.2E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	2.40E-57
17	42.5	12.25	-1.4E+02	5.3E-63	-1.7E+48	2.000	1.5E+02	9.2E+65	1.7E+48	0.000	4.1E+00	1	-4.1E+00	-1	2.0E+00	0.9958	-2.0E+00	-0.99579	5.21E-61
18	45	12.25	-1.5E+02	1.2E-66	-1.7E+48	2.000	1.6E+02	7.0E+69	1.7E+48	0.000	4.0E+00	1	-4.0E+00	-1	2.0E+00	0.9946	-2.0E+00	-0.99459	1.13E-64
19	47.5	12.25	-1.6E+02	2.5E-70	-1.7E+48	2.000	1.7E+02	5.3E+73	1.7E+48	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9932	-1.9E+00	-0.99321	2.45E-68
20	50	12.25	-1.7E+02	5.5E-74	-1.7E+48	2.000	1.8E+02	4.0E+77	1.7E+48	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	5.32E-72

Date:	11/12/2025
Version:	1

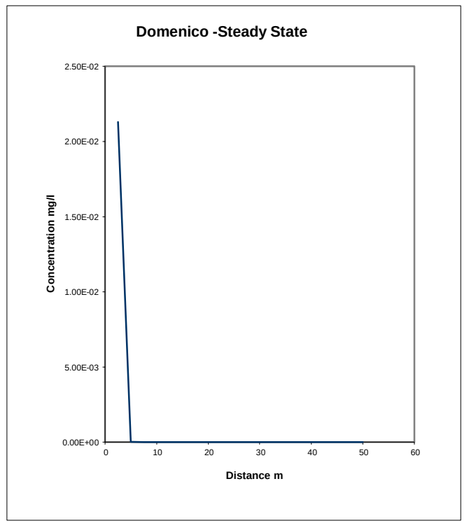
Contaminant **trachloroethene**

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.01	mg/l
Co	9.80E+01	mg/l
λ	2.95E-04	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	2.43E+03	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	24.5	-8.43E+00	2.17E-04	1.68E+01	1	-1.68E+01	-1	4.17E+00	1	-4.17E+00	-1	2.13E-02
2	5	24.5	-1.69E+01	4.72E-08	1.19E+01	1	-1.19E+01	-1	2.95E+00	1	-2.95E+00	-1	4.62E-06
3	7.5	24.5	-2.53E+01	1.03E-11	9.68E+00	1	-9.68E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	1.00E-09
4	10	24.5	-3.37E+01	2.23E-15	8.39E+00	1	-8.39E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	2.18E-13
5	12.5	24.5	-4.22E+01	4.84E-19	7.50E+00	1	-7.50E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	4.70E-17
6	15	24.5	-5.06E+01	1.05E-22	6.85E+00	1	-6.85E+00	-1	1.70E+00	0.984	-1.70E+00	-0.984	1.01E-20
7	17.5	24.5	-5.90E+01	2.28E-26	6.34E+00	1	-6.34E+00	-1	1.58E+00	0.9743	-1.58E+00	-0.9743	2.18E-24
8	20	24.5	-6.75E+01	4.96E-30	5.93E+00	1	-5.93E+00	-1	1.48E+00	0.963	-1.48E+00	-0.963	4.68E-28
9	22.5	24.5	-7.59E+01	1.08E-33	5.59E+00	1	-5.59E+00	-1	1.39E+00	0.9508	-1.39E+00	-0.9508	1.00E-31
10	25	24.5	-8.43E+01	2.34E-37	5.30E+00	1	-5.30E+00	-1	1.32E+00	0.9379	-1.32E+00	-0.9379	2.15E-35
11	27.5	24.5	-9.28E+01	5.08E-41	5.06E+00	1	-5.06E+00	-1	1.26E+00	0.9247	-1.26E+00	-0.9247	4.61E-39
12	30	24.5	-1.01E+02	1.10E-44	4.84E+00	1	-4.84E+00	-1	1.20E+00	0.9115	-1.20E+00	-0.9115	9.87E-43
13	32.5	24.5	-1.10E+02	2.40E-48	4.65E+00	1	-4.65E+00	-1	1.16E+00	0.8982	-1.16E+00	-0.8982	2.11E-46
14	35	24.5	-1.18E+02	5.21E-52	4.48E+00	1	-4.48E+00	-1	1.11E+00	0.8852	-1.11E+00	-0.8852	4.52E-50
15	37.5	24.5	-1.27E+02	1.13E-55	4.33E+00	1	-4.33E+00	-1	1.08E+00	0.8723	-1.08E+00	-0.8723	9.68E-54
16	40	24.5	-1.35E+02	2.46E-59	4.19E+00	1	-4.19E+00	-1	1.04E+00	0.8598	-1.04E+00	-0.8598	2.07E-57
17	42.5	24.5	-1.43E+02	5.34E-63	4.07E+00	1	-4.07E+00	-1	1.01E+00	0.8476	-1.01E+00	-0.8476	4.44E-61
18	45	24.5	-1.52E+02	1.16E-66	3.95E+00	1	-3.95E+00	-1	9.83E-01	0.8357	-9.83E-01	-0.8357	9.51E-65
19	47.5	24.5	-1.60E+02	2.52E-70	3.85E+00	1	-3.85E+00	-1	9.57E-01	0.8241	-9.57E-01	-0.8241	2.04E-68
20	50	24.5	-1.69E+02	5.48E-74	3.75E+00	1	-3.75E+00	-1	9.33E-01	0.8129	-9.33E-01	-0.8129	4.36E-72



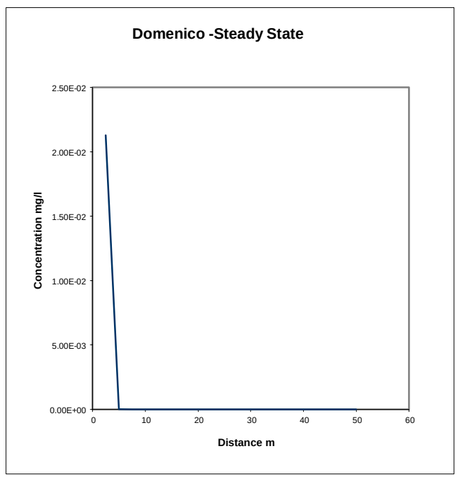
Vertical dispersion optio Simulate vertical dispersion in 1 direction

Calc	Value	
v	7.60E-02	m/d
Rc	1.56E+04	
u	4.89E-06	m/d

DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	24.5	-8.43E+00	2.17E-04	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	2.13E-02
2	5	24.5	-1.69E+01	4.72E-08	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	4.62E-06
3	7.5	24.5	-2.53E+01	1.03E-11	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	1.00E-09
4	10	24.5	-3.37E+01	2.23E-15	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	2.18E-13
5	12.5	24.5	-4.22E+01	4.84E-19	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	4.74E-17
6	15	24.5	-5.06E+01	1.05E-22	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	1.03E-20
7	17.5	24.5	-5.90E+01	2.28E-26	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	2.24E-24
8	20	24.5	-6.75E+01	4.96E-30	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	4.86E-28
9	22.5	24.5	-7.59E+01	1.08E-33	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-0.9999	1.06E-31
10	25	24.5	-8.43E+01	2.34E-37	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-0.9998	2.29E-35
11	27.5	24.5	-9.28E+01	5.08E-41	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-0.9996	4.98E-39
12	30	24.5	-1.01E+02	1.10E-44	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	1.08E-42
13	32.5	24.5	-1.10E+02	2.40E-48	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.9989	2.35E-46
14	35	24.5	-1.18E+02	5.21E-52	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.9984	5.10E-50
15	37.5	24.5	-1.27E+02	1.13E-55	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.9977	1.11E-53
16	40	24.5	-1.35E+02	2.46E-59	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	2.40E-57
17	42.5	24.5	-1.43E+02	5.34E-63	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.9958	5.21E-61
18	45	24.5	-1.52E+02	1.16E-66	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.9946	1.13E-64
19	47.5	24.5	-1.60E+02	2.52E-70	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.9932	2.45E-68
20	50	24.5	-1.69E+02	5.48E-74	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	5.32E-72



Date:	11/12/2025
Version:	1

DOMENICO (TIME VARIANT)

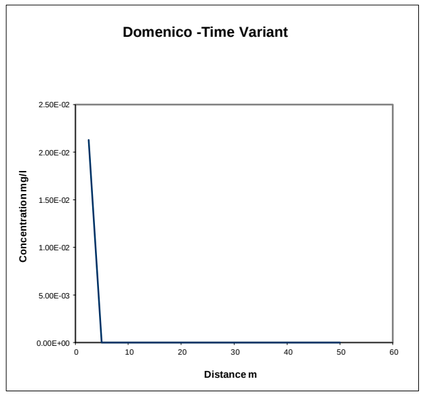
Contaminant **:trachloroethene**

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.01	mg/l
Co	9.80E+01	mg/l
λ	2.95E-04	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	2.43E+03	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

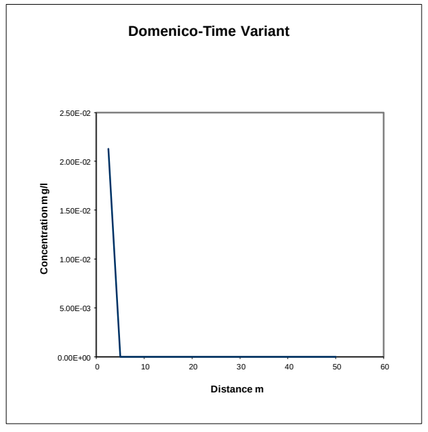
	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	12.25	-8.43E+00	2.17E-04	-1.71E+48	2	1.68E+01	1	-1.68E+01	-1	4.17E+00	1	-4.17E+00	-1	2.13E-02
2	5	12.25	-1.69E+01	4.72E-08	-1.71E+48	2	1.19E+01	1	-1.19E+01	-1	2.95E+00	1	-2.95E+00	-1	4.62E-06
3	7.5	12.25	-2.53E+01	1.03E-11	-1.71E+48	2	9.68E+00	1	-9.68E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	1.00E-09
4	10	12.25	-3.37E+01	2.23E-15	-1.71E+48	2	8.39E+00	1	-8.39E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	2.18E-13
5	12.5	12.25	-4.22E+01	4.84E-19	-1.71E+48	2	7.50E+00	1	-7.50E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	4.70E-17
6	15	12.25	-5.06E+01	1.05E-22	-1.71E+48	2	6.85E+00	1	-6.85E+00	-1	1.70E+00	0.984	-1.70E+00	-0.984	1.01E-20
7	17.5	12.25	-5.90E+01	2.28E-26	-1.71E+48	2	6.34E+00	1	-6.34E+00	-1	1.58E+00	0.9743	-1.58E+00	-0.974	2.18E-24
8	20	12.25	-6.75E+01	4.96E-30	-1.71E+48	2	5.93E+00	1	-5.93E+00	-1	1.48E+00	0.963	-1.48E+00	-0.963	4.68E-28
9	22.5	12.25	-7.59E+01	1.08E-33	-1.71E+48	2	5.59E+00	1	-5.59E+00	-1	1.39E+00	0.9508	-1.39E+00	-0.951	1.00E-31
10	25	12.25	-8.43E+01	2.34E-37	-1.71E+48	2	5.30E+00	1	-5.30E+00	-1	1.32E+00	0.9379	-1.32E+00	-0.938	2.15E-35
11	27.5	12.25	-9.28E+01	5.08E-41	-1.71E+48	2	5.06E+00	1	-5.06E+00	-1	1.26E+00	0.9247	-1.26E+00	-0.925	4.61E-39
12	30	12.25	-1.01E+02	1.10E-44	-1.71E+48	2	4.84E+00	1	-4.84E+00	-1	1.20E+00	0.9115	-1.20E+00	-0.911	9.87E-43
13	32.5	12.25	-1.10E+02	2.40E-48	-1.71E+48	2	4.65E+00	1	-4.65E+00	-1	1.16E+00	0.8982	-1.16E+00	-0.898	2.11E-46
14	35	12.25	-1.18E+02	5.21E-52	-1.71E+48	2	4.48E+00	1	-4.48E+00	-1	1.11E+00	0.8852	-1.11E+00	-0.885	4.52E-50
15	37.5	12.25	-1.27E+02	1.13E-55	-1.71E+48	2	4.33E+00	1	-4.33E+00	-1	1.08E+00	0.8723	-1.08E+00	-0.872	9.68E-54
16	40	12.25	-1.35E+02	2.46E-59	-1.71E+48	2	4.19E+00	1	-4.19E+00	-1	1.04E+00	0.8598	-1.04E+00	-0.86	2.07E-57
17	42.5	12.25	-1.43E+02	5.34E-63	-1.71E+48	2	4.07E+00	1	-4.07E+00	-1	1.01E+00	0.8476	-1.01E+00	-0.848	4.44E-61
18	45	12.25	-1.52E+02	1.16E-66	-1.71E+48	2	3.95E+00	1	-3.95E+00	-1	9.83E-01	0.8357	-9.83E-01	-0.836	9.51E-65
19	47.5	12.25	-1.60E+02	2.52E-70	-1.71E+48	2	3.85E+00	1	-3.85E+00	-1	9.57E-01	0.8241	-9.57E-01	-0.824	2.04E-68
20	50	12.25	-1.69E+02	5.48E-74	-1.71E+48	2	3.75E+00	1	-3.75E+00	-1	9.33E-01	0.8129	-9.33E-01	-0.813	4.36E-72



Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

Calc	Value	Units
v	7.60E-02	m/d
Rc	1.56E+04	
u	4.89E-06	m/d

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	12.25	-8.43E+00	2.17E-04	-1.71E+48	2	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	2.13E-02
2	5	12.25	-1.69E+01	4.72E-08	-1.71E+48	2	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	4.62E-06
3	7.5	12.25	-2.53E+01	1.03E-11	-1.71E+48	2	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	1.00E-09
4	10	12.25	-3.37E+01	2.23E-15	-1.71E+48	2	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	2.18E-13
5	12.5	12.25	-4.22E+01	4.84E-19	-1.71E+48	2	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	4.74E-17
6	15	12.25	-5.06E+01	1.05E-22	-1.71E+48	2	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	1.03E-20
7	17.5	12.25	-5.90E+01	2.28E-26	-1.71E+48	2	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	2.24E-24
8	20	12.25	-6.75E+01	4.96E-30	-1.71E+48	2	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	4.86E-28
9	22.5	12.25	-7.59E+01	1.08E-33	-1.71E+48	2	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-1	1.06E-31
10	25	12.25	-8.43E+01	2.34E-37	-1.71E+48	2	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-1	2.29E-35
11	27.5	12.25	-9.28E+01	5.08E-41	-1.71E+48	2	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-1	4.98E-39
12	30	12.25	-1.01E+02	1.10E-44	-1.71E+48	2	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	1.08E-42
13	32.5	12.25	-1.10E+02	2.40E-48	-1.71E+48	2	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.999	2.35E-46
14	35	12.25	-1.18E+02	5.21E-52	-1.71E+48	2	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.998	5.10E-50
15	37.5	12.25	-1.27E+02	1.13E-55	-1.71E+48	2	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.998	1.11E-53
16	40	12.25	-1.35E+02	2.46E-59	-1.71E+48	2	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	2.40E-57
17	42.5	12.25	-1.43E+02	5.34E-63	-1.71E+48	2	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.996	5.21E-61
18	45	12.25	-1.52E+02	1.16E-66	-1.71E+48	2	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.995	1.13E-64
19	47.5	12.25	-1.60E+02	2.52E-70	-1.71E+48	2	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.993	2.45E-68
20	50	12.25	-1.69E+02	5.48E-74	-1.71E+48	2	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	5.32E-72



Date:	11/12/2025
Version:	1

Hydrogeological risk assessment for land contamination

Remedial Targets Worksheet , Release 3.2

First released: 2006. Version 3.2: January 2013

This worksheet has been produced in combination with the document 'Remedial Targets Methodology: Hydrogeological risk assessment for land contamination (Environment Agency 2006).

Users of this worksheet should always refer to the User Manual to the Remedial Targets Methodology and to relevant guidance on UK legislation and policy, in order to understand how this procedure should be applied in an appropriate context.

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The calculation of equations in this worksheet has been independently checked by Entec (UK) Ltd on behalf of the Environment Agency.

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IMPORTANT: To enable MS Excel worksheet, click Tools, Add -Ins, Analysis Tool Pak and Analysis Tool Pak-VBA (to calculate error functions).

Details to be completed for each assessment				
Site Name:	Kelvedon Street			
Site Address:	Newport			
Completed by:	Michael Watkins			
Date:	11-Dec-25		Version:	1
Contaminant	Tetrachloroethene			
Target Concentration (C_T)	0.01	mg/l	Origin of C_T:	WFD for inland surface waters (annual average)

This worksheet can be used to determine remedial targets for soils (Worksheets Level 1 Soil, Level 2 and Level 3 Soil) or to determine remedial targets for groundwater (Level 3 Groundwater). For Level 3, parameter values must be entered separately dependent on whether the assessment is for soil or groundwater. For soil, remedial targets are calculated as either mg/kg (for comparision with soil measurements) or mg/l (for comparison with leaching tests or pore water concentrations).
Site details entered on this page are automatically copied to Level 1, 2 and 3 Worksheets.
Worksheet options are identified by brown background and employ a pull-down menus. Data entry are identified as blue background.
Data origin / justification should be noted in cells coloured yellow and fully documented in subsequent reports.
Data carried forward from an earlier worksheet are identified by a light green background
It is recommended that a copy of the original worksheet is saved (all data fields in the original copy are blank).

The spreadsheet also includes a porosity calculation worksheet, a soil impact calculation worksheet and a worksheet that performs some simple hydrogeological calculations.

Remedial Targets Worksheet , Release 3.2

Level 1 - Soil

Select the method of calculating the soil water Partition Co-efficient by using the pull down menu below

User specified value for partition coefficient

Contaminant		**Tetrachloroethene**		
Target concentration	C_T	**0.01**	**mg/l**	

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**
Standard entry				
Water filled soil porosity	θ_w	0.00E+00	fraction	
Air filled soil porosity	θa	0.00E+00	fraction	
Bulk density of soil zone material	ρ	0.00E+00	g/cm^3	
Henry's Law constant	H	0.00E+00	dimensionless	
Entry if specify partition coefficient (option)				
Soil water partition coefficient	Kd	0.00E+00	l/kg	
Entry for non-polar organic chemicals (option)				
Fraction of organic carbon (in soil)	foc		fraction	
Organic carbon partition coefficient	Koc		l/kg	
Entry for ionic organic chemicals (option)				
Sorption coefficient for neutral species	$K_{oc,n}$		l/kg	
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg	
pH value	pH		pH units	
Acid dissociation constant	pKa			
Fraction of organic carbon (in soil)	foc		fraction	

This sheet calculates the Level 1 remedial target for soils(mg/kg) based on a selected target concentration and theoretical calculation of soil water partitioning. Three options are included for determining the partition coefficient.

The measured soil concentration as mg/kg should be compared with the Level 1 remedial target to determine the need for further action.

Soil water partition coefficient used in Level Assessment	**Kd**	**0.00E+00**	**l/kg**	*Specified value*

Level 1 Remedial Target

Level 1 Remedial Target	**#DIV/0!**	**mg/kg**	**(for comparison with soil analyses)**
	or		
	0.01	**mg/l**	**(for comparison with leachate test results)**

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 2 - Soil

Contaminant		**Tetrachloroethene**		from Level 1
Target concentration	C_T	**0.01**	**mg/l**	from Level 1

This sheet calculates the Level 2 remedial target for soils (mg/kg) or for pore water (mg/l).

The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 2 remedial target to determine the need for further action. Equations presented in 'Hydrogeological risk assessment for land contamiantion' (Environment Agency 2006)

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**	
Standard entry					
Infiltration	Inf	0.00E+00	m/d		
Area of contaminant source	A	0.00E+00	m^2		Not used in calculation
Entry for groundwater flow below site					
Length of contaminant source in direction of groundwater flow	L	0.00E+00	m		
Saturated aquifer thickness	da	0.00E+00	m		
Hydraulic Conductivity of aquifer in which dilution occurs	K	0.00E+00	m/d		
Hydraulic gradient of water table	i	0.00E+00	fraction		
Width of contaminant source perpendicular to groundwater flow	w	0.00E+00	m		Not used in calculation
Background concentration of contaminant in groundwater beneath site	Cu	0.00E+00	mg/l		
Define mixing zone depth by specifying or calculating depth (using pull down list)		**Specify**			
Enter mixing zone thickness	Mz	0.00E+00	m		
Calculated mixing zone thickness	Mz		m		

Calculated Parameters

Dilution Factor	**DF**	**#DIV/0!**		
Level 2 Remedial Target		**#DIV/0!**	**mg/l**	**For comparison with measured pore water concentration. This assumes Level 1 Remedial Target is based on Target Concentration.**
		or		
		#DIV/0!	**mg/kg**	**For comparison with measured soil concentration. This assumes Level 1 Remedial Target calculated from soil-water**

Additional option

Calculation of impact on receptor

Concentration of contaminant in contaminated discharge (entering receptor)	Cc	0.00E+00	mg/l	
Calculated concentration within receptor (dilution only)		#DIV/0!	mg/l	0

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 3 - Soil

See Note

Input Parameters	Variable	Value	Unit	Source
Contaminant		Tetrachloroethene		from Level 1
Target Concentration	C_T	0.01	mg/l	from Level 1
Dilution Factor	DF	#DIV/0!		from Level 2

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value)

	Variable	Value	Unit	Source of parameter value
Enter source concentration		Soil concentration as mg/kg		
Enter soil concentration		0	mg/kg	
Half life for degradation of contaminant in water	$t_{1/2}$	1.00E+100	days	
Calculated decay rate	λ	6.93E-101	$days^{-1}$	calculated
Width of plume in aquifer at source	Sz	0.00E+00	m	from Level 2
Plume thickness in aquifer at source	Sy	0.00E+00	m	from Level 2
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Effective porosity of aquifer	n	0.00E+00	fraction	
Hydraulic gradient	i	#DIV/0!	fraction	from Level 2 (adjusted)
Hydraulic conductivity of saturated aquifer	K	0.00E+00	m/d	from Level 2
Distance to compliance point	x	0.00E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	1.00E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	0.00E+00	l/kg	*see options*
Longitudinal dispersivity	ax	0.000	m	*see options*
Transverse dispersivity	az	0.000	m	*see options*
Vertical dispersivity	ay	0.000	m	*see options*

Parameter values should be checked against Level 1 and 2

Calculated Parameters	Variable		
Groundwater flow velocity	v	#DIV/0!	m/d
Retardation factor	Rf	#DIV/0!	fraction
Decay rate used	λ	6.93E-101	d^{-1}
Hydraulic gradient used in aquifer flow down-gradient	i	#DIV/0!	fraction
Rate of contaminant flow due to retardation	u	#DIV/0!	m/d
Ratio of Compliance Point to Source Concentration	C_{EG}/C_0	#DIV/0!	fraction
Attenuation factor (C_0/C_{EG})	**AF**	**#DIV/0!**	**fraction**
Calculated soil leachate concentration	Co	#DIV/0!	mg/l

Remedial Targets

Level 3 Remedial Target	**#DIV/0!**	**mg/l**	For comparison with measured pore water concentration.
Ogata Banks	**or**		This assumes Level 1 Remedial Target is based on Target Concentration.
	#DIV/0!	**mg/kg**	For comparison with measured soil concentration. This
Distance to compliance point	**0**	**m**	assumes Level 1 Remedial Target calculated from soil-water partitioning equation.
Ratio of Compliance Point to Source Concentration	**#DIV/0!**	**fraction**	Ogata Banks

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99

Enter method of defining partition co-efficient (using pull down list)

Calculate for ionic organic chemicals (acids)

Entry if specify partition coefficient (option)

Soil water partition coefficient	Kd	l/kg

Entry for non-polar organic chemicals (option)

Fraction of organic carbon in aquifer	foc	fraction
Organic carbon partition coefficient	Koc	l/kg

Entry for ionic organic chemicals (option)

Sorption coefficient for related species	$K_{oc,n}$	0.00E+00	l/kg
Sorption coefficient for ionised species	$K_{oc,i}$	0.00E+00	l/kg
pH value	pH	0.00E+00	
Acid dissociation constant	pKa	0.00E+00	
Fraction of organic carbon in aquifer	foc	0.00E+00	fraction
Soil water partition coefficient	Kd	0.00E+00	l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

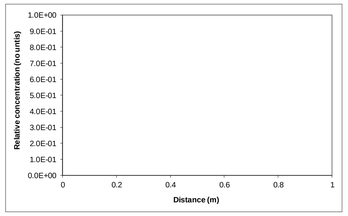
		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	0.00E+00	#NUM!	m
Transverse dispersivity	**az**	0.00E+00	0.00E+00	#NUM!	m
Vertical dispersivity	**ay**	0.00E+00	0.00E+00	#NUM!	m

Note values of dispersivity must be > 0

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed

Note
This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O_2, NO_3, SO_4 etc than an alternative solution should be used

Environment Agency



Note: 'Relative concentration' is the ratio of calculated concentation at a given position compared to the source concentration. The calculations assume plume disperses from the top of the aquifer. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

This sheet calculates the Level 3 remedial target for soils(mg/kg) or for pore water (mg/l), based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.By setting a long travel time (e.g. 9E99) it will give the steady state solution, which should always be used when calculating remedial targets.

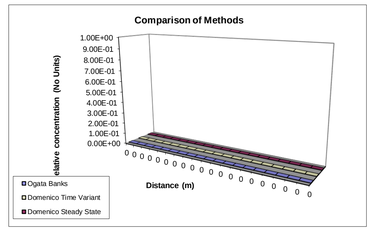
The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.9E+99.

Calculated (relative) concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Relative concentration (No units)	Concentration mg/l
0	1.0E+00	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!



Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Remedial Targets Worksheet , Release 3.2

Calculation of contaminant concentration in groundwater from a soil source

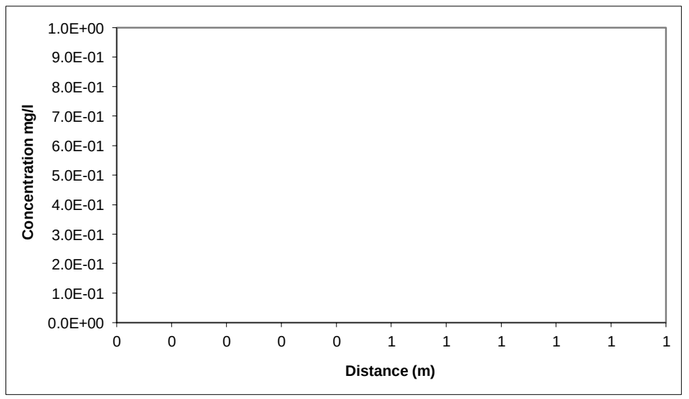
Only input required is Soil Contaminant Concentration

	Input Parameters			
	Soil contaminant concentration	C_0	0.00E+00	mg/kg
Level 1 Parameters				
	Water filled soil porosity	θ_W	0.00E+00	fraction
	Air filled soil porosity	θa	0.00E+00	fraction
	Bulk density	ρ	0.00E+00	g/cm^3
	Henry's Law constant	H	0.00E+00	dimensionless
	Soil water partition coefficient used in Level Assessment	Kd	0.00E+00	l/kg
	Factor (partitioning between soil and water)		#DIV/0!	dimensionless
Level 2 Parameters	**Dilution Factor**	DF	#DIV/0!	
Level 3 Parameters	**Attenuation factor (C_O/C_{ED})**	AF	#DIV/0!	

Predicted concentrations at compliance point

Level 1	C	#DIV/0!	mg/l	No dilution or attenuation
Level 2	C	#DIV/0!	mg/l	Dilution taken into account
Level 3	C	#DIV/0!	mg/l	Dilution and attenuation taken into account

Predicted concentrations between source and compliance point - Level 3



Distance m	Concentration mg/l
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)	Variable	Value	Unit	Source
Contaminant		Tetrachloroethene		from Level 1
Target Concentration	C_T	1.00E-02	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Domenico - Steady state — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived va

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	9.80E-02	mg/l	*Site investigation data*
Half life for degradation of contaminant in water	$t_{1/2}$	2.35E+03	days	*Howard et al (1991) Low anaerobic biodeg*
Calculated decay rate	λ	2.95E-04	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	1.50E+02	m	*Length of site perpendicular to groundwater flow*
Plume thickness at source	Sy	5.90E+00	m	*Same as Mixing Zone Thickness. "For a thin aquifer (typically <10m), the mixing zone thickness can be taken as the acte*
Saturated aquifer thickness	da	6.00E+00	m	*Maximum thickness recorded in vicinity of*
Bulk density of aquifer materials	ρ	1.60E+00	g/cm^3	*Typical bulk density for river terrace deposits*
Effective porosity of aquifer	n	2.50E-01	fraction	*Maximum porosity for coarse Gravel (Lovanh et al 2000) - conservative estimate*
Hydraulic gradient	i	4.40E-02	fraction	*Borehole level data*
Hydraulic conductivity of aquifer	K	4.32E-01	m/d	*Maximum typical value for clayey sandy G*
Distance to compliance point	x	5.00E+01	m	*Default compliance distance*
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	9.90E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	2.43E+03	l/kg	*see options*
Longitudinal dispersivity	ax	5.00E+00	m	*see options*
Transverse dispersivity	az	5.00E-01	m	*see options*
Vertical dispersivity	ay	5.00E-02	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd	2.43E+03	l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc		fraction
Organic carbon partition coefficient	Koc		l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{oc,n}$		l/kg
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	2.43E+03	l/kg

Define dispersivity (click brown cell and use pull down list)

Dispersivities 10%, 1%, 0.1% of pathway length

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	5.00E+00	2.98E+00	m
Transverse dispersivity	**az**	0.00E+00	5.00E-01	2.98E-01	m
Vertical dispersivity	**ay**	0.00E+00	5.00E-02	2.98E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

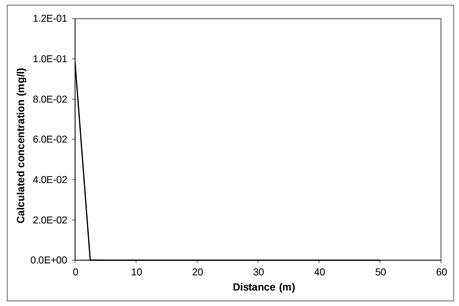
Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed

Calculated Parameters	Variable		
Groundwater flow velocity	v	7.60E-02	m/d
Retardation factor	Rf	1.56E+04	fraction
Decay rate used	λ	2.95E-04	d^{-1}
Rate of contaminant flow due to retardation	u	4.89E-06	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	5.32E-75	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**1.84E+73**	

Remedial Targets

Remedial Target		**1.84E+71**	**mg/l**	For comparison with measured groundwater concentration.
Domenico - Steady state				
Distance to compliance point		**50**	**m**	
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**5.32E-75**	**mg/l**	Domenico - Steady state

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Calculated concentrations for distance-concentration graph

Domenico - Steady state
From calculation sheet

Distance	Concentration
	mg/l
0	9.8E-02
2.5	2.13E-05
5.0	4.62E-09
7.5	1.00E-12
10.0	2.18E-16
12.5	4.74E-20
15.0	1.03E-23
17.5	2.24E-27
20.0	4.86E-31
22.5	1.06E-34
25.0	2.29E-38
27.5	4.98E-42
30.0	1.08E-45
32.5	2.35E-49
35.0	5.10E-53
37.5	1.11E-56
40.0	2.40E-60
42.5	5.21E-64
45.0	1.13E-67
47.5	2.45E-71
50.0	5.32E-75

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared
with the Level 3 remedial target to determine the need for further action.
Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Porosity Calculator

These results are not carried through to any of the other worksheets

DRY BULK DENSITY DATA

Variable	Value	Unit	justification
Natural Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Dry Bulk Density	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
Initial Saturation	#DIV/0!	%	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	
Water Filled Porosity	**#DIV/0!**	**fraction**	

WET BULK DENSITY DATA

Variable	Value	Unit	
Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Actual (wet) Bulk Density (i.e. at natural MC)	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
dry bulk density	0.00	tonnes/m^3	
Initial Saturation	#DIV/0!	%	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	**#DIV/0!**
Water Filled Porosity	**#DIV/0!**	**fraction**	

Analytical solutions provided by David Hall, Golder Associates (UK) Ltd

Simple hydrogeological calculations

(These are not specific to, or required in, the Remedial Targets Methodology)

Parameter	symbol		unit	justification
Hydraulic conductivity	K	0.00E+00	m/d	
Hydraulic gradient	i	0.00E+00	unitless	
Effective porosity of aquifer	n	0.00E+00	fraction	
Thickness of saturated aquifer	b	0.00E+00	m	
Width of aquifer perpendicular to flow	w	0.00E+00	m	
Distance to receptor	x	0.00E+00	m	
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Soil-water partition co-efficient	Kd	0.00E+00	l/kg	
Retardation factor of pollutant	R	#DIV/0!		

Groundwater flow velocity	v(GW)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for groundwater to reach receptor	t(GW)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years
Rate of groundwater flow through aquifer	Q	0.00E+00	m^3/s	0.00E+00	m^3/day	0.00E+00	m^3/year

Contaminant flow velocity	v(contam)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for contaminant to reach receptor	t(contam)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years

Level 1 Calculation Sheet

Contaminant Tetrachloroethene

Parameter	Value	Units
(carried over from input sheet)		
C_T	1.00E-02	mg/l
Kd	0.00E+00	l/kg
foc		fraction
koc		l/kg
θ_w	0.00E+00	fraction
θa	0.00E+00	fraction
ρ	0.00E+00	g/cm3
H	0.00E+00	dimensionless
Koc,n		l/kg
Koc,i		l/kg
pH		pH units
pKa		
foc (ionic)		fraction

Calculations (Refer toTable 4.3, R&D Publication 20)

Selected option User specified value for partition coefficient

calc calc Calc Kd l/kg

Calculation of partition coefficient for ionic organic chemical

Partition coefficient used in Level 1 Assessment 0.00E+00 l/kg

Calculated Remedial Target #DIV/0! mg/kg for Tetrachloroethene

Factor (partitioning between soil and water) #DIV/0!

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11/12/2025
Version:	1

Level 2 Calculation Sheet

Contaminant Tetrachloroethene

Site assessed:	Kelvedon Stre
Date:	11/12/2025
Version:	1

Parameter	Value	Units		
(carried over from input sheet)				
Mz	0.00E+00	m		
L	0.00E+00	m		
da	0.00E+00	m		Calculated
Inf	0.00E+00	m/d		Dilution Factor
K	0.00E+00	m/d		
i	0.00E+00		Calculation based on target concentration	#DIV/0!
A	0.00E+00	m3/d m2 m3/d	Calculation based on observed contaminant concentration	#DIV/0!
Cc	0.00E+00	mg/l		
C_T	1.00E-02	mg/l		
Cu	0.00E+00	mg/l		
w	0.00E+00	m		



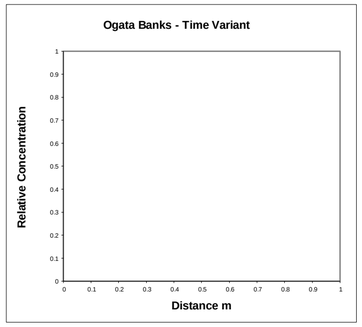
Contaminant etrachloroethene

OGATA BANKS SOLUTION

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-02	mg/l
DF	#DIV/0!	
λ	6.931E-101	days^{-1}
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Calc	Value	
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) -USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

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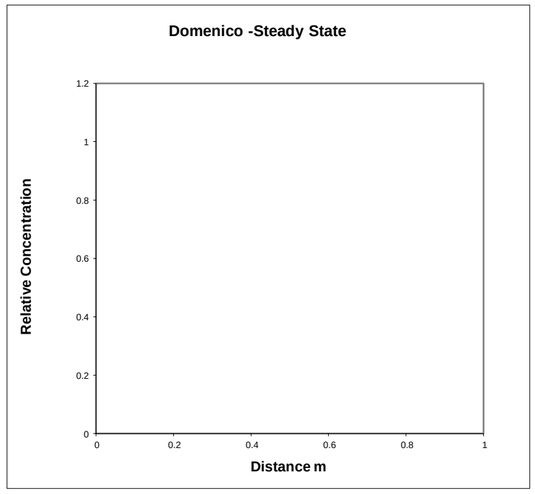
Contaminant trachloroethene

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-02	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

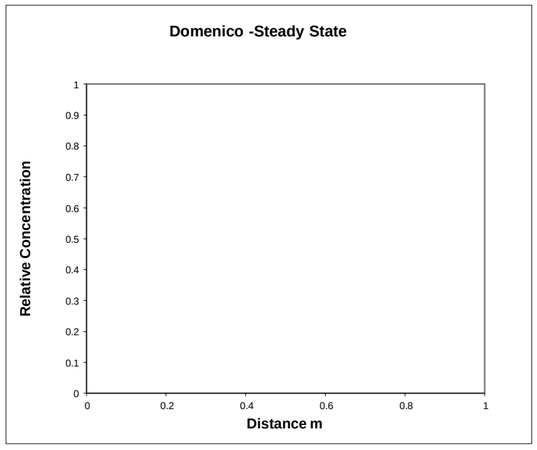


Calc	Value	Units
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



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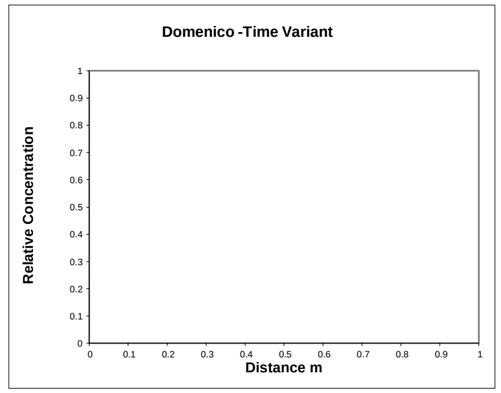
DOMENICO (TIME VARIANT)

Contaminant **trachloroethene**

Input	Value	Units
C_T	0.01	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

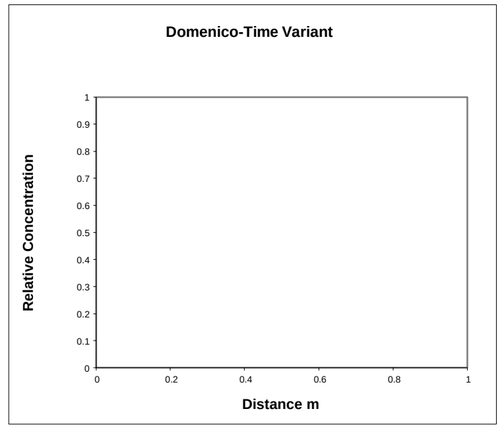
	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Calc	Value	
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Date:	11/12/2025
Version:	1

OGATA BANKS SOLUTION

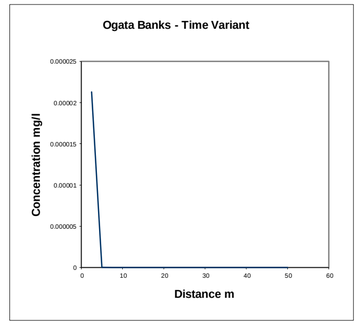
Contaminant Tetrachloroethene

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.01	mg/l
Co	9.80E-02	mg/l
λ	2.95E-04	days^{-1}
Sz	1.50E+02	m
Sy	5.90E+00	m
Kd	2.43E+03	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.01225	-8.4E+00	2.2E-04	-1.7E+48	2.000	8.9E+00	7.6E+03	1.7E+48	0.000	3.4E+01	1	-3.4E+01	-1	4.2E+00	1	-4.2E+00	-1	2.13E-05
2	5	0.01225	-1.7E+01	4.7E-08	-1.7E+48	2.000	1.8E+01	5.8E+07	1.7E+48	0.000	2.4E+01	1	-2.4E+01	-1	3.0E+00	1	-3.0E+00	-0.99997	4.62E-09
3	7.5	0.01225	-2.5E+01	1.0E-11	-1.7E+48	2.000	2.7E+01	4.4E+11	1.7E+48	0.000	1.9E+01	1	-1.9E+01	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	1.00E-12
4	10	0.01225	-3.4E+01	2.2E-15	-1.7E+48	2.000	3.6E+01	3.3E+15	1.7E+48	0.000	1.7E+01	1	-1.7E+01	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	2.18E-16
5	12.5	0.01225	-4.2E+01	4.8E-19	-1.7E+48	2.000	4.5E+01	2.5E+19	1.7E+48	0.000	1.5E+01	1	-1.5E+01	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	4.70E-20
6	15	0.01225	-5.1E+01	1.1E-22	-1.7E+48	2.000	5.4E+01	1.9E+23	1.7E+48	0.000	1.4E+01	1	-1.4E+01	-1	1.7E+00	0.984	-1.7E+00	-0.98399	1.01E-23
7	17.5	0.01225	-5.9E+01	2.3E-26	-1.7E+48	2.000	6.3E+01	1.5E+27	1.7E+48	0.000	1.3E+01	1	-1.3E+01	-1	1.6E+00	0.9743	-1.6E+00	-0.97425	2.18E-27
8	20	0.01225	-6.7E+01	5.0E-30	-1.7E+48	2.000	7.1E+01	1.1E+31	1.7E+48	0.000	1.2E+01	1	-1.2E+01	-1	1.5E+00	0.963	-1.5E+00	-0.96302	4.68E-31
9	22.5	0.01225	-7.6E+01	1.1E-33	-1.7E+48	2.000	8.0E+01	8.4E+34	1.7E+48	0.000	1.1E+01	1	-1.1E+01	-1	1.4E+00	0.9508	-1.4E+00	-0.95078	1.00E-34
10	25	0.01225	-8.4E+01	2.3E-37	-1.7E+48	2.000	8.9E+01	6.3E+38	1.7E+48	0.000	1.1E+01	1	-1.1E+01	-1	1.3E+00	0.9379	-1.3E+00	-0.93792	2.15E-38
11	27.5	0.01225	-9.3E+01	5.1E-41	-1.7E+48	2.000	9.8E+01	4.8E+42	1.7E+48	0.000	1.0E+01	1	-1.0E+01	-1	1.3E+00	0.9247	-1.3E+00	-0.92475	4.61E-42
12	30	0.01225	-1.0E+02	1.1E-44	-1.7E+48	2.000	1.1E+02	3.7E+46	1.7E+48	0.000	9.7E+00	1	-9.7E+00	-1	1.2E+00	0.9115	-1.2E+00	-0.91147	9.87E-46
13	32.5	0.01225	-1.1E+02	2.4E-48	-1.7E+48	2.000	1.2E+02	2.8E+50	1.7E+48	0.000	9.3E+00	1	-9.3E+00	-1	1.2E+00	0.8982	-1.2E+00	-0.89824	2.11E-49
14	35	0.01225	-1.2E+02	5.2E-52	-1.7E+48	2.000	1.3E+02	2.1E+54	1.7E+48	0.000	9.0E+00	1	-9.0E+00	-1	1.1E+00	0.8852	-1.1E+00	-0.88517	4.52E-53
15	37.5	0.01225	-1.3E+02	1.1E-55	-1.7E+48	2.000	1.3E+02	1.6E+58	1.7E+48	0.000	8.7E+00	1	-8.7E+00	-1	1.1E+00	0.8723	-1.1E+00	-0.87233	9.68E-57
16	40	0.01225	-1.3E+02	2.5E-59	-1.7E+48	2.000	1.4E+02	1.2E+62	1.7E+48	0.000	8.4E+00	1	-8.4E+00	-1	1.0E+00	0.8598	-1.0E+00	-0.85979	2.07E-60
17	42.5	0.01225	-1.4E+02	5.3E-63	-1.7E+48	2.000	1.5E+02	9.2E+65	1.7E+48	0.000	8.1E+00	1	-8.1E+00	-1	1.0E+00	0.8476	-1.0E+00	-0.84756	4.44E-64
18	45	0.01225	-1.5E+02	1.2E-66	-1.7E+48	2.000	1.6E+02	7.0E+69	1.7E+48	0.000	7.9E+00	1	-7.9E+00	-1	9.8E-01	0.8357	-9.8E-01	-0.83567	9.51E-68
19	47.5	0.01225	-1.6E+02	2.5E-70	-1.7E+48	2.000	1.7E+02	5.3E+73	1.7E+48	0.000	7.7E+00	1	-7.7E+00	-1	9.6E-01	0.8241	-9.6E-01	-0.82412	2.04E-71
20	50	0.01225	-1.7E+02	5.5E-74	-1.7E+48	2.000	1.8E+02	4.0E+77	1.7E+48	0.000	7.5E+00	1	-7.5E+00	-1	9.3E-01	0.8129	-9.3E-01	-0.81292	4.36E-75



Calc

Value	
7.60E-02	m/d
1.56E+04	
4.89E-06	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.01225	-8.4E+00	2.2E-04	-1.7E+48	2.000	8.9E+00	7.6E+03	1.7E+48	0.000	3.4E+01	1	-3.4E+01	-1	8.3E+00	1	-8.3E+00	-1	2.13E-05
2	5	0.01225	-1.7E+01	4.7E-08	-1.7E+48	2.000	1.8E+01	5.8E+07	1.7E+48	0.000	2.4E+01	1	-2.4E+01	-1	5.9E+00	1	-5.9E+00	-1	4.62E-09
3	7.5	0.01225	-2.5E+01	1.0E-11	-1.7E+48	2.000	2.7E+01	4.4E+11	1.7E+48	0.000	1.9E+01	1	-1.9E+01	-1	4.8E+00	1	-4.8E+00	-1	1.00E-12
4	10	0.01225	-3.4E+01	2.2E-15	-1.7E+48	2.000	3.6E+01	3.3E+15	1.7E+48	0.000	1.7E+01	1	-1.7E+01	-1	4.2E+00	1	-4.2E+00	-1	2.18E-16
5	12.5	0.01225	-4.2E+01	4.8E-19	-1.7E+48	2.000	4.5E+01	2.5E+19	1.7E+48	0.000	1.5E+01	1	-1.5E+01	-1	3.7E+00	1	-3.7E+00	-1	4.74E-20
6	15	0.01225	-5.1E+01	1.1E-22	-1.7E+48	2.000	5.4E+01	1.9E+23	1.7E+48	0.000	1.4E+01	1	-1.4E+01	-1	3.4E+00	1	-3.4E+00	-1	1.03E-23
7	17.5	0.01225	-5.9E+01	2.3E-26	-1.7E+48	2.000	6.3E+01	1.5E+27	1.7E+48	0.000	1.3E+01	1	-1.3E+01	-1	3.2E+00	1	-3.2E+00	-0.99999	2.24E-27
8	20	0.01225	-6.7E+01	5.0E-30	-1.7E+48	2.000	7.1E+01	1.1E+31	1.7E+48	0.000	1.2E+01	1	-1.2E+01	-1	3.0E+00	1	-3.0E+00	-0.99997	4.86E-31
9	22.5	0.01225	-7.6E+01	1.1E-33	-1.7E+48	2.000	8.0E+01	8.4E+34	1.7E+48	0.000	1.1E+01	1	-1.1E+01	-1	2.8E+00	0.9999	-2.8E+00	-0.99992	1.06E-34
10	25	0.01225	-8.4E+01	2.3E-37	-1.7E+48	2.000	8.9E+01	6.3E+38	1.7E+48	0.000	1.1E+01	1	-1.1E+01	-1	2.6E+00	0.9998	-2.6E+00	-0.99981	2.29E-38
11	27.5	0.01225	-9.3E+01	5.1E-41	-1.7E+48	2.000	9.8E+01	4.8E+42	1.7E+48	0.000	1.0E+01	1	-1.0E+01	-1	2.5E+00	0.9996	-2.5E+00	-0.99963	4.98E-42
12	30	0.01225	-1.0E+02	1.1E-44	-1.7E+48	2.000	1.1E+02	3.7E+46	1.7E+48	0.000	9.7E+00	1	-9.7E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	1.08E-45
13	32.5	0.01225	-1.1E+02	2.4E-48	-1.7E+48	2.000	1.2E+02	2.8E+50	1.7E+48	0.000	9.3E+00	1	-9.3E+00	-1	2.3E+00	0.9989	-2.3E+00	-0.99893	2.35E-49
14	35	0.01225	-1.2E+02	5.2E-52	-1.7E+48	2.000	1.3E+02	2.1E+54	1.7E+48	0.000	9.0E+00	1	-9.0E+00	-1	2.2E+00	0.9984	-2.2E+00	-0.99839	5.10E-53
15	37.5	0.01225	-1.3E+02	1.1E-55	-1.7E+48	2.000	1.3E+02	1.6E+58	1.7E+48	0.000	8.7E+00	1	-8.7E+00	-1	2.2E+00	0.9977	-2.2E+00	-0.99769	1.11E-56
16	40	0.01225	-1.3E+02	2.5E-59	-1.7E+48	2.000	1.4E+02	1.2E+62	1.7E+48	0.000	8.4E+00	1	-8.4E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	2.40E-60
17	42.5	0.01225	-1.4E+02	5.3E-63	-1.7E+48	2.000	1.5E+02	9.2E+65	1.7E+48	0.000	8.1E+00	1	-8.1E+00	-1	2.0E+00	0.9958	-2.0E+00	-0.99579	5.21E-64
18	45	0.01225	-1.5E+02	1.2E-66	-1.7E+48	2.000	1.6E+02	7.0E+69	1.7E+48	0.000	7.9E+00	1	-7.9E+00	-1	2.0E+00	0.9946	-2.0E+00	-0.99459	1.13E-67
19	47.5	0.01225	-1.6E+02	2.5E-70	-1.7E+48	2.000	1.7E+02	5.3E+73	1.7E+48	0.000	7.7E+00	1	-7.7E+00	-1	1.9E+00	0.9932	-1.9E+00	-0.99321	2.45E-71
20	50	0.01225	-1.7E+02	5.5E-74	-1.7E+48	2.000	1.8E+02	4.0E+77	1.7E+48	0.000	7.5E+00	1	-7.5E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	5.32E-75

Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	2.13E-05
5.0	4.62E-09
7.5	1.00E-12
10.0	2.18E-16
12.5	4.74E-20
15.0	1.03E-23
17.5	2.24E-27
20.0	4.86E-31
22.5	1.06E-34
25.0	2.29E-38
27.5	4.98E-42
30.0	1.08E-45
32.5	2.35E-49
35.0	5.10E-53
37.5	1.11E-56
40.0	2.40E-60
42.5	5.21E-64
45.0	1.13E-67
47.5	2.45E-71
50.0	5.32E-75

Contaminant **trachloroethene**

Input	Value	Units
C_T	0.01	mg/l
Co	9.80E-02	mg/l
λ	2.95E-04	days^{-1}
Sz	1.50E+02	m
Sy	5.90E+00	m
Kd	2.43E+03	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

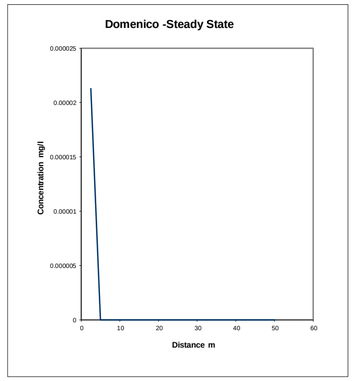
Vertical dispersion optio Simulate vertical dispersion in 1 direction

Calc	Value	
v	7.60E-02	m/d
Rc	1.56E+04	
u	4.89E-06	m/d

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

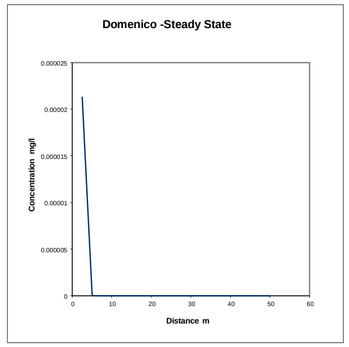
	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.0245	-8.43E+00	2.17E-04	3.35E+01	1	-3.35E+01	-1	4.17E+00	1	-4.17E+00	-1	2.13E-05
2	5	0.0245	-1.69E+01	4.72E-08	2.37E+01	1	-2.37E+01	-1	2.95E+00	1	-2.95E+00	-1	4.62E-09
3	7.5	0.0245	-2.53E+01	1.03E-11	1.94E+01	1	-1.94E+01	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	1.00E-12
4	10	0.0245	-3.37E+01	2.23E-15	1.68E+01	1	-1.68E+01	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	2.18E-16
5	12.5	0.0245	-4.22E+01	4.84E-19	1.50E+01	1	-1.50E+01	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	4.70E-20
6	15	0.0245	-5.06E+01	1.05E-22	1.37E+01	1	-1.37E+01	-1	1.70E+00	0.984	-1.70E+00	-0.984	1.01E-23
7	17.5	0.0245	-5.90E+01	2.28E-26	1.27E+01	1	-1.27E+01	-1	1.58E+00	0.9743	-1.58E+00	-0.9743	2.18E-27
8	20	0.0245	-6.75E+01	4.96E-30	1.19E+01	1	-1.19E+01	-1	1.48E+00	0.963	-1.48E+00	-0.963	4.68E-31
9	22.5	0.0245	-7.59E+01	1.08E-33	1.12E+01	1	-1.12E+01	-1	1.39E+00	0.9508	-1.39E+00	-0.9508	1.00E-34
10	25	0.0245	-8.43E+01	2.34E-37	1.06E+01	1	-1.06E+01	-1	1.32E+00	0.9379	-1.32E+00	-0.9379	2.15E-38
11	27.5	0.0245	-9.28E+01	5.08E-41	1.01E+01	1	-1.01E+01	-1	1.26E+00	0.9247	-1.26E+00	-0.9247	4.61E-42
12	30	0.0245	-1.01E+02	1.10E-44	9.68E+00	1	-9.68E+00	-1	1.20E+00	0.9115	-1.20E+00	-0.9115	9.87E-46
13	32.5	0.0245	-1.10E+02	2.40E-48	9.30E+00	1	-9.30E+00	-1	1.16E+00	0.8982	-1.16E+00	-0.8982	2.11E-49
14	35	0.0245	-1.18E+02	5.21E-52	8.96E+00	1	-8.96E+00	-1	1.11E+00	0.8852	-1.11E+00	-0.8852	4.52E-53
15	37.5	0.0245	-1.27E+02	1.13E-55	8.66E+00	1	-8.66E+00	-1	1.08E+00	0.8723	-1.08E+00	-0.8723	9.68E-57
16	40	0.0245	-1.35E+02	2.46E-59	8.39E+00	1	-8.39E+00	-1	1.04E+00	0.8598	-1.04E+00	-0.8598	2.07E-60
17	42.5	0.0245	-1.43E+02	5.34E-63	8.13E+00	1	-8.13E+00	-1	1.01E+00	0.8476	-1.01E+00	-0.8476	4.44E-64
18	45	0.0245	-1.52E+02	1.16E-66	7.91E+00	1	-7.91E+00	-1	9.83E-01	0.8357	-9.83E-01	-0.8357	9.51E-68
19	47.5	0.0245	-1.60E+02	2.52E-70	7.69E+00	1	-7.69E+00	-1	9.57E-01	0.8241	-9.57E-01	-0.8241	2.04E-71
20	50	0.0245	-1.69E+02	5.48E-74	7.50E+00	1	-7.50E+00	-1	9.33E-01	0.8129	-9.33E-01	-0.8129	4.36E-75



DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.0245	-8.43E+00	2.17E-04	3.35E+01	1	-3.35E+01	-1	8.34E+00	1	-8.34E+00	-1	2.13E-05
2	5	0.0245	-1.69E+01	4.72E-08	2.37E+01	1	-2.37E+01	-1	5.90E+00	1	-5.90E+00	-1	4.62E-09
3	7.5	0.0245	-2.53E+01	1.03E-11	1.94E+01	1	-1.94E+01	-1	4.82E+00	1	-4.82E+00	-1	1.00E-12
4	10	0.0245	-3.37E+01	2.23E-15	1.68E+01	1	-1.68E+01	-1	4.17E+00	1	-4.17E+00	-1	2.18E-16
5	12.5	0.0245	-4.22E+01	4.84E-19	1.50E+01	1	-1.50E+01	-1	3.73E+00	1	-3.73E+00	-1	4.74E-20
6	15	0.0245	-5.06E+01	1.05E-22	1.37E+01	1	-1.37E+01	-1	3.41E+00	1	-3.41E+00	-1	1.03E-23
7	17.5	0.0245	-5.90E+01	2.28E-26	1.27E+01	1	-1.27E+01	-1	3.15E+00	1	-3.15E+00	-1	2.24E-27
8	20	0.0245	-6.75E+01	4.96E-30	1.19E+01	1	-1.19E+01	-1	2.95E+00	1	-2.95E+00	-1	4.86E-31
9	22.5	0.0245	-7.59E+01	1.08E-33	1.12E+01	1	-1.12E+01	-1	2.78E+00	0.9999	-2.78E+00	-0.9999	1.06E-34
10	25	0.0245	-8.43E+01	2.34E-37	1.06E+01	1	-1.06E+01	-1	2.64E+00	0.9998	-2.64E+00	-0.9998	2.29E-38
11	27.5	0.0245	-9.28E+01	5.08E-41	1.01E+01	1	-1.01E+01	-1	2.52E+00	0.9996	-2.52E+00	-0.9996	4.98E-42
12	30	0.0245	-1.01E+02	1.10E-44	9.68E+00	1	-9.68E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	1.08E-45
13	32.5	0.0245	-1.10E+02	2.40E-48	9.30E+00	1	-9.30E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.9989	2.35E-49
14	35	0.0245	-1.18E+02	5.21E-52	8.96E+00	1	-8.96E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.9984	5.10E-53
15	37.5	0.0245	-1.27E+02	1.13E-55	8.66E+00	1	-8.66E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.9977	1.11E-56
16	40	0.0245	-1.35E+02	2.46E-59	8.39E+00	1	-8.39E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	2.40E-60
17	42.5	0.0245	-1.43E+02	5.34E-63	8.13E+00	1	-8.13E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.9958	5.21E-64
18	45	0.0245	-1.52E+02	1.16E-66	7.91E+00	1	-7.91E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.9946	1.13E-67
19	47.5	0.0245	-1.60E+02	2.52E-70	7.69E+00	1	-7.69E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.9932	2.45E-71
20	50	0.0245	-1.69E+02	5.48E-74	7.50E+00	1	-7.50E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	5.32E-75



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	2.13E-05
5.0	4.62E-09
7.5	1.00E-12
10.0	2.18E-16
12.5	4.74E-20
15.0	1.03E-23
17.5	2.24E-27
20.0	4.86E-31
22.5	1.06E-34
25.0	2.29E-38
27.5	4.98E-42
30.0	1.08E-45
32.5	2.35E-49
35.0	5.10E-53
37.5	1.11E-56
40.0	2.40E-60
42.5	5.21E-64
45.0	1.13E-67
47.5	2.45E-71
50.0	5.32E-75

DOMENICO (TIME VARIANT)

Contaminant trachloroethene

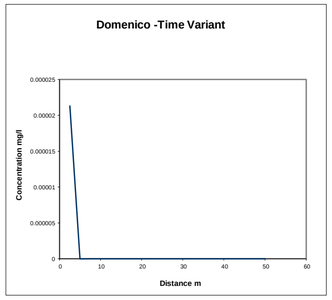
Input	Value	Units
C_T	0.01	mg/l
Co	9.80E-02	mg/l
λ	2.95E-04	days^{-1}
Sz	1.50E+02	m
Sy	5.90E+00	m
Kd	2.43E+03	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

Calc	Value	Units
v	7.60E-02	m/d
Rc	1.56E+04	
u	4.89E-06	m/d

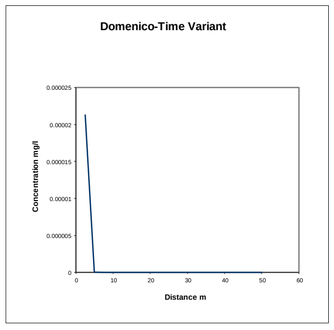
Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.01225	-8.43E+00	2.17E-04	-1.71E+48	2	3.35E+01	1	-3.35E+01	-1	4.17E+00	1	-4.17E+00	-1	2.13E-05
2	5	0.01225	-1.69E+01	4.72E-08	-1.71E+48	2	2.37E+01	1	-2.37E+01	-1	2.95E+00	1	-2.95E+00	-1	4.62E-09
3	7.5	0.01225	-2.53E+01	1.03E-11	-1.71E+48	2	1.94E+01	1	-1.94E+01	-1	2.41E+00	0.9993	-2.41E+00	-0.999	1.00E-12
4	10	0.01225	-3.37E+01	2.23E-15	-1.71E+48	2	1.68E+01	1	-1.68E+01	-1	2.09E+00	0.9968	-2.09E+00	-0.997	2.18E-16
5	12.5	0.01225	-4.22E+01	4.84E-19	-1.71E+48	2	1.50E+01	1	-1.50E+01	-1	1.87E+00	0.9917	-1.87E+00	-0.992	4.70E-20
6	15	0.01225	-5.06E+01	1.05E-22	-1.71E+48	2	1.37E+01	1	-1.37E+01	-1	1.70E+00	0.984	-1.70E+00	-0.984	1.01E-23
7	17.5	0.01225	-5.90E+01	2.28E-26	-1.71E+48	2	1.27E+01	1	-1.27E+01	-1	1.58E+00	0.9743	-1.58E+00	-0.974	2.18E-27
8	20	0.01225	-6.75E+01	4.96E-30	-1.71E+48	2	1.19E+01	1	-1.19E+01	-1	1.48E+00	0.963	-1.48E+00	-0.963	4.68E-31
9	22.5	0.01225	-7.59E+01	1.08E-33	-1.71E+48	2	1.12E+01	1	-1.12E+01	-1	1.39E+00	0.9508	-1.39E+00	-0.951	1.00E-34
10	25	0.01225	-8.43E+01	2.34E-37	-1.71E+48	2	1.06E+01	1	-1.06E+01	-1	1.32E+00	0.9379	-1.32E+00	-0.938	2.15E-38
11	27.5	0.01225	-9.28E+01	5.08E-41	-1.71E+48	2	1.01E+01	1	-1.01E+01	-1	1.26E+00	0.9247	-1.26E+00	-0.925	4.61E-42
12	30	0.01225	-1.01E+02	1.10E-44	-1.71E+48	2	9.68E+00	1	-9.68E+00	-1	1.20E+00	0.9115	-1.20E+00	-0.911	9.87E-46
13	32.5	0.01225	-1.10E+02	2.40E-48	-1.71E+48	2	9.30E+00	1	-9.30E+00	-1	1.16E+00	0.8982	-1.16E+00	-0.898	2.11E-49
14	35	0.01225	-1.18E+02	5.21E-52	-1.71E+48	2	8.96E+00	1	-8.96E+00	-1	1.11E+00	0.8852	-1.11E+00	-0.885	4.52E-53
15	37.5	0.01225	-1.27E+02	1.13E-55	-1.71E+48	2	8.66E+00	1	-8.66E+00	-1	1.08E+00	0.8723	-1.08E+00	-0.872	9.68E-57
16	40	0.01225	-1.35E+02	2.46E-59	-1.71E+48	2	8.39E+00	1	-8.39E+00	-1	1.04E+00	0.8598	-1.04E+00	-0.86	2.07E-60
17	42.5	0.01225	-1.43E+02	5.34E-63	-1.71E+48	2	8.13E+00	1	-8.13E+00	-1	1.01E+00	0.8476	-1.01E+00	-0.848	4.44E-64
18	45	0.01225	-1.52E+02	1.16E-66	-1.71E+48	2	7.91E+00	1	-7.91E+00	-1	9.83E-01	0.8357	-9.83E-01	-0.836	9.51E-68
19	47.5	0.01225	-1.60E+02	2.52E-70	-1.71E+48	2	7.69E+00	1	-7.69E+00	-1	9.57E-01	0.8241	-9.57E-01	-0.824	2.04E-71
20	50	0.01225	-1.69E+02	5.48E-74	-1.71E+48	2	7.50E+00	1	-7.50E+00	-1	9.33E-01	0.8129	-9.33E-01	-0.813	4.36E-75



Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.01225	-8.43E+00	2.17E-04	-1.71E+48	2	3.35E+01	1	-3.35E+01	-1	8.34E+00	1	-8.34E+00	-1	2.13E-05
2	5	0.01225	-1.69E+01	4.72E-08	-1.71E+48	2	2.37E+01	1	-2.37E+01	-1	5.90E+00	1	-5.90E+00	-1	4.62E-09
3	7.5	0.01225	-2.53E+01	1.03E-11	-1.71E+48	2	1.94E+01	1	-1.94E+01	-1	4.82E+00	1	-4.82E+00	-1	1.00E-12
4	10	0.01225	-3.37E+01	2.23E-15	-1.71E+48	2	1.68E+01	1	-1.68E+01	-1	4.17E+00	1	-4.17E+00	-1	2.18E-16
5	12.5	0.01225	-4.22E+01	4.84E-19	-1.71E+48	2	1.50E+01	1	-1.50E+01	-1	3.73E+00	1	-3.73E+00	-1	4.74E-20
6	15	0.01225	-5.06E+01	1.05E-22	-1.71E+48	2	1.37E+01	1	-1.37E+01	-1	3.41E+00	1	-3.41E+00	-1	1.03E-23
7	17.5	0.01225	-5.90E+01	2.28E-26	-1.71E+48	2	1.27E+01	1	-1.27E+01	-1	3.15E+00	1	-3.15E+00	-1	2.24E-27
8	20	0.01225	-6.75E+01	4.96E-30	-1.71E+48	2	1.19E+01	1	-1.19E+01	-1	2.95E+00	1	-2.95E+00	-1	4.86E-31
9	22.5	0.01225	-7.59E+01	1.08E-33	-1.71E+48	2	1.12E+01	1	-1.12E+01	-1	2.78E+00	0.9999	-2.78E+00	-1	1.06E-34
10	25	0.01225	-8.43E+01	2.34E-37	-1.71E+48	2	1.06E+01	1	-1.06E+01	-1	2.64E+00	0.9998	-2.64E+00	-1	2.29E-38
11	27.5	0.01225	-9.28E+01	5.08E-41	-1.71E+48	2	1.01E+01	1	-1.01E+01	-1	2.52E+00	0.9996	-2.52E+00	-1	4.98E-42
12	30	0.01225	-1.01E+02	1.10E-44	-1.71E+48	2	9.68E+00	1	-9.68E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	1.08E-45
13	32.5	0.01225	-1.10E+02	2.40E-48	-1.71E+48	2	9.30E+00	1	-9.30E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.999	2.35E-49
14	35	0.01225	-1.18E+02	5.21E-52	-1.71E+48	2	8.96E+00	1	-8.96E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.998	5.10E-53
15	37.5	0.01225	-1.27E+02	1.13E-55	-1.71E+48	2	8.66E+00	1	-8.66E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.998	1.11E-56
16	40	0.01225	-1.35E+02	2.46E-59	-1.71E+48	2	8.39E+00	1	-8.39E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	2.40E-60
17	42.5	0.01225	-1.43E+02	5.34E-63	-1.71E+48	2	8.13E+00	1	-8.13E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.996	5.21E-64
18	45	0.01225	-1.52E+02	1.16E-66	-1.71E+48	2	7.91E+00	1	-7.91E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.995	1.13E-67
19	47.5	0.01225	-1.60E+02	2.52E-70	-1.71E+48	2	7.69E+00	1	-7.69E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.993	2.45E-71
20	50	0.01225	-1.69E+02	5.48E-74	-1.71E+48	2	7.50E+00	1	-7.50E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	5.32E-75



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	2.13E-05
5.0	4.62E-09
7.5	1.00E-12
10.0	2.18E-16
12.5	4.74E-20
15.0	1.03E-23
17.5	2.24E-27
20.0	4.86E-31
22.5	1.06E-34
25.0	2.29E-38
27.5	4.98E-42
30.0	1.08E-45
32.5	2.35E-49
35.0	5.10E-53
37.5	1.11E-56
40.0	2.40E-60
42.5	5.21E-64
45.0	1.13E-67
47.5	2.45E-71
50.0	5.32E-75

Hydrogeological risk assessment for land contamination

Remedial Targets Worksheet , Release 3.2

First released: 2006. Version 3.2: January 2013

This worksheet has been produced in combination with the document 'Remedial Targets Methodology: Hydrogeological risk assessment for land contamination (Environment Agency 2006).

Users of this worksheet should always refer to the User Manual to the Remedial Targets Methodology and to relevant guidance on UK legislation and policy, in order to understand how this procedure should be applied in an appropriate context.

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The calculation of equations in this worksheet has been independently checked by Entec (UK) Ltd on behalf of the Environment Agency.

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IMPORTANT: To enable MS Excel worksheet, click Tools, Add -Ins, Analysis Tool Pak and Analysis Tool Pak-VBA (to calculate error functions).

Details to be completed for each assessment				
Site Name:	Kelvedon Street			
Site Address:	Newport			
Completed by:	Michael Watkins			
Date:	11-Dec-25		Version:	1
Contaminant	Tetrachloroethene			
Target Concentration (C_T)	0.01	mg/l	Origin of C_T:	WFD for inland surface waters (annual average)

This worksheet can be used to determine remedial targets for soils (Worksheets Level 1 Soil, Level 2 and Level 3 Soil) or to determine remedial targets for groundwater (Level 3 Groundwater). For Level 3, parameter values must be entered separately dependent on whether the assessment is for soil or groundwater. For soil, remedial targets are calculated as either mg/kg (for comparision with soil measurements) or mg/l (for comparison with leaching tests or pore water concentrations).
Site details entered on this page are automatically copied to Level 1, 2 and 3 Worksheets.
Worksheet options are identified by brown background and employ a pull-down menus. Data entry are identified as blue background.
Data origin / justification should be noted in cells coloured yellow and fully documented in subsequent reports.
Data carried forward from an earlier worksheet are identified by a light green background
It is recommended that a copy of the original worksheet is saved (all data fields in the original copy are blank).

The spreadsheet also includes a porosity calculation worksheet, a soil impact calculation worksheet and a worksheet that performs some simple hydrogeological calculations.

Remedial Targets Worksheet , Release 3.2

Level 1 - Soil

Select the method of calculating the soil water Partition Co-efficient by using the pull down menu below

User specified value for partition coefficient

Contaminant		**Tetrachloroethene**	
Target concentration	C_T	**0.01**	**mg/l**

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**
Standard entry				
Water filled soil porosity	θ_w	0.00E+00	fraction	
Air filled soil porosity	θa	0.00E+00	fraction	
Bulk density of soil zone material	ρ	0.00E+00	g/cm^3	
Henry's Law constant	H	0.00E+00	dimensionless	
Entry if specify partition coefficient (option)				
Soil water partition coefficient	Kd	0.00E+00	l/kg	
Entry for non-polar organic chemicals (option)				
Fraction of organic carbon (in soil)	foc		fraction	
Organic carbon partition coefficient	Koc		l/kg	
Entry for ionic organic chemicals (option)				
Sorption coefficient for neutral species	$K_{oc,n}$		l/kg	
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg	
pH value	pH		pH units	
Acid dissociation constant	pKa			
Fraction of organic carbon (in soil)	foc		fraction	

This sheet calculates the Level 1 remedial target for soils(mg/kg) based on a selected target concentration and theoretical calculation of soil water partitioning. Three options are included for determining the partition coefficient.

The measured soil concentration as mg/kg should be compared with the Level 1 remedial target to determine the need for further action.

Soil water partition coefficient used in Level Assessment	**Kd**	**0.00E+00**	**l/kg**	*Specified value*

Level 1 Remedial Target

Level 1 Remedial Target	**#DIV/0!**	**mg/kg**	**(for comparison with soil analyses)**
	or		
	0.01	**mg/l**	**(for comparison with leachate test results)**

Site being assessed:	Kelvedon Street
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Level 2 - Soil

Contaminant		**Tetrachloroethene**		from Level 1
Target concentration	C_T	**0.01**	**mg/l**	from Level 1

This sheet calculates the Level 2 remedial target for soils (mg/kg) or for pore water (mg/l).

The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 2 remedial target to determine the need for further action. Equations presented in 'Hydrogeological risk assessment for land contamiantion' (Environment Agency 2006)

Input Parameters	Variable	Value	Unit	Source of parameter value	
Standard entry					
Infiltration	Inf	0.00E+00	m/d		
Area of contaminant source	A	0.00E+00	m^2		Not used in calculation
Entry for groundwater flow below site					
Length of contaminant source in direction of groundwater flow	L	0.00E+00	m		
Saturated aquifer thickness	da	0.00E+00	m		
Hydraulic Conductivity of aquifer in which dilution occurs	K	0.00E+00	m/d		
Hydraulic gradient of water table	i	0.00E+00	fraction		
Width of contaminant source perpendicular to groundwater flow	w	0.00E+00	m		Not used in calculation
Background concentration of contaminant in groundwater beneath site	Cu	0.00E+00	mg/l		
Define mixing zone depth by specifying or calculating depth (using pull down list)		**Specify**			
Enter mixing zone thickness	Mz	0.00E+00	m		
Calculated mixing zone thickness	Mz		m		

Calculated Parameters

Dilution Factor	**DF**	**#DIV/0!**		
Level 2 Remedial Target		**#DIV/0!**	**mg/l**	**For comparison with measured pore water concentration. This assumes Level 1 Remedial Target is based on Target Concentration.**
		or		
		#DIV/0!	**mg/kg**	**For comparison with measured soil concentration. This assumes Level 1 Remedial Target calculated from soil-water**

Additional option

Calculation of impact on receptor

Concentration of contaminant in contaminated discharge (entering receptor)	Cc	0.00E+00	mg/l	
Calculated concentration within receptor (dilution only)		#DIV/0!	mg/l	0

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Level 3 - Soil

See Note

Input Parameters	Variable	Value	Unit	Source
Contaminant		Tetrachloroethene		from Level 1
Target Concentration	C_T	0.01	mg/l	from Level 1
Dilution Factor	DF	#DIV/0!		from Level 2

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value)

	Variable	Value	Unit	Source of parameter value
Enter source concentration		Soil concentration as mg/kg		
Enter soil concentration		0	mg/kg	
Half life for degradation of contaminant in water	$t_{1/2}$	1.00E+100	days	
Calculated decay rate	λ	6.93E-101	$days^{-1}$	calculated
Width of plume in aquifer at source	Sz	0.00E+00	m	from Level 2
Plume thickness in aquifer at source	Sy	0.00E+00	m	from Level 2
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Effective porosity of aquifer	n	0.00E+00	fraction	
Hydraulic gradient	i	#DIV/0!	fraction	from Level 2 (adjusted)
Hydraulic conductivity of saturated aquifer	K	0.00E+00	m/d	from Level 2
Distance to compliance point	x	0.00E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	1.00E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	0.00E+00	l/kg	*see options*
Longitudinal dispersivity	ax	0.000	m	*see options*
Transverse dispersivity	az	0.000	m	*see options*
Vertical dispersivity	ay	0.000	m	*see options*

Parameter values should be checked against Level 1 and 2

Calculated Parameters	Variable		
Groundwater flow velocity	v	#DIV/0!	m/d
Retardation factor	Rf	#DIV/0!	fraction
Decay rate used	λ	6.93E-101	d^{-1}
Hydraulic gradient used in aquifer flow down-gradient	i	#DIV/0!	fraction
Rate of contaminant flow due to retardation	u	#DIV/0!	m/d
Ratio of Compliance Point to Source Concentration	C_{cp}/C_0	#DIV/0!	fraction
Attenuation factor (C_o/C_{cp})	**AF**	**#DIV/0!**	**fraction**
Calculated soil leachate concentration	Co	#DIV/0!	mg/l

Remedial Targets

Level 3 Remedial Target		**#DIV/0!**	**mg/l**
Ogata Banks		**or**	
		#DIV/0!	**mg/kg**
Distance to compliance point		**0**	**m**
Ratio of Compliance Point to Source Concentration	**C_{cp}/C_0**	**#DIV/0!**	**fraction**

For comparison with measured pore water concentration.
This assumes Level 1 Remedial Target is based on Target Concentration.
For comparison with measured soil concentration. This assumes Level 1 Remedial Target calculated from soil-water partitioning equation.
Ogata Banks

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99

Enter method of defining partition co-efficient (using pull down list)

Calculate for ionic organic chemicals (acids)

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd		l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc		fraction
Organic carbon partition coefficient	Koc		l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{oc,n}$	0.00E+00	l/kg
Sorption coefficient for ionised species	$K_{oc,i}$	0.00E+00	l/kg
pH value	pH	0.00E+00	
Acid dissociation constant	pKa	0.00E+00	
Fraction of organic carbon in aquifer	foc	0.00E+00	fraction
Soil water partition coefficient	Kd	0.00E+00	l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

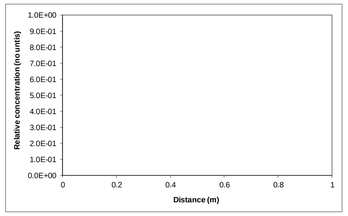
		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	0.00E+00	#NUM!	m
Transverse dispersivity	**az**	0.00E+00	0.00E+00	#NUM!	m
Vertical dispersivity	**ay**	0.00E+00	0.00E+00	#NUM!	m

Note values of dispersivity must be > 0

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed

Note
This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O_2, NO_3, SO_4 etc than an alternative solution should be used

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Note: 'Relative concentration' is the ratio of calculated concentation at a given position compared to the source concentration. The calculations assume plume disperses from the top of the aquifer. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

This sheet calculates the Level 3 remedial target for soils(mg/kg) or for pore water (mg/l), based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.By setting a long travel time (e.g. 9E99) it will give the steady state solution, which should always be used when calculating remedial targets.

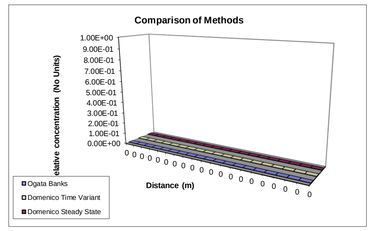
The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.9E+99.

Calculated (relative) concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Relative concentration (No units)	Concentration mg/l
0	1.0E+00	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!



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Calculation of contaminant concentration in groundwater from a soil source

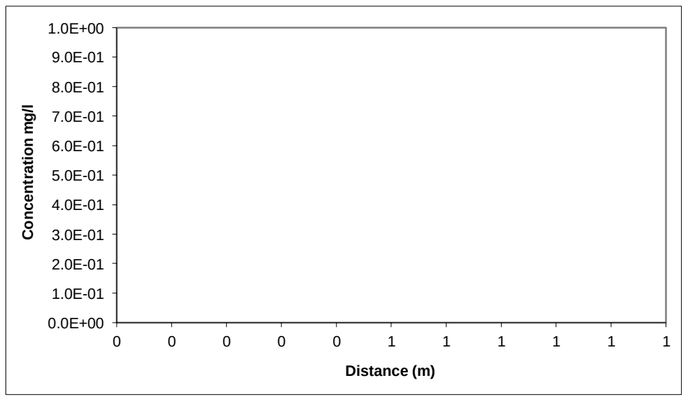
Only input required is Soil Contaminant Concentration

	Input Parameters			
	Soil contaminant concentration	C_0	0.00E+00	mg/kg
Level 1 Parameters				
	Water filled soil porosity	θ_W	0.00E+00	fraction
	Air filled soil porosity	θa	0.00E+00	fraction
	Bulk density	ρ	0.00E+00	g/cm^3
	Henry's Law constant	H	0.00E+00	dimensionless
	Soil water partition coefficient used in Level Assessment	Kd	0.00E+00	l/kg
	Factor (partitioning between soil and water)		#DIV/0!	dimensionless
Level 2 Parameters	**Dilution Factor**	DF	#DIV/0!	
Level 3 Parameters	**Attenuation factor (C_O/C_{ED})**	AF	#DIV/0!	

Predicted concentrations at compliance point

Level 1	C	#DIV/0!	mg/l	No dilution or attenuation
Level 2	C	#DIV/0!	mg/l	Dilution taken into account
Level 3	C	#DIV/0!	mg/l	Dilution and attenuation taken into account

Predicted concentrations between source and compliance point - Level 3



Distance m	Concentration mg/l
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!

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Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)	Variable	Value	Unit	Source
Contaminant		Tetrachloroethene		from Level 1
Target Concentration	C_T	1.00E-02	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Domenico - Steady state — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived va

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	9.80E-02	mg/l	*Site investigation data*
Half life for degradation of contaminant in water	$t_{1/2}$	2.35E+03	days	*Howard et al (1991) Low anaerobic biodeg*
Calculated decay rate	λ	2.95E-04	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	7.50E+01	m	*Length of site perpendicular to groundwater flow*
Plume thickness at source	Sy	5.90E+00	m	*Same as Mixing Zone Thickness. "For a thin aquifer (typically <10m), the mixing zone thickness can be taken as the acte*
Saturated aquifer thickness	da	6.00E+00	m	*Maximum thickness recorded in vicinity of*
Bulk density of aquifer materials	ρ	1.60E+00	g/cm^3	*Typical bulk density for river terrace deposits*
Effective porosity of aquifer	n	4.40E-01	fraction	*Maximum porosity for coarse Gravel (Lovanh et al 2000) - conservative estimate*
Hydraulic gradient	i	4.40E-02	fraction	*Borehole level data*
Hydraulic conductivity of aquifer	K	1.00E+02	m/d	*Maximum typical value for clayey sandy G*
Distance to compliance point	x	5.00E+01	m	*Default compliance distance*
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	9.90E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	2.43E+03	l/kg	*see options*
Longitudinal dispersivity	ax	5.00E+00	m	*see options*
Transverse dispersivity	az	5.00E-01	m	*see options*
Vertical dispersivity	ay	5.00E-02	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd	2.43E+03	l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc		fraction
Organic carbon partition coefficient	Koc		l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{oc,n}$		l/kg
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	2.43E+03	l/kg

Define dispersivity (click brown cell and use pull down list)

Dispersivities 10%, 1%, 0.1% of pathway length

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	5.00E+00	2.98E+00	m
Transverse dispersivity	**az**	0.00E+00	5.00E-01	2.98E-01	m
Vertical dispersivity	**ay**	0.00E+00	5.00E-02	2.98E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed

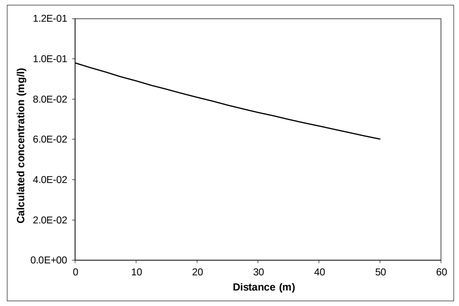
Calculated Parameters

	Variable		
Groundwater flow velocity	v	1.00E+01	m/d
Retardation factor	Rf	8.84E+03	fraction
Decay rate used	λ	2.95E-04	d^{-1}
Rate of contaminant flow due to retardation	u	1.13E-03	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	5.60E-05	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**1.75E+03**	

Remedial Targets

Remedial Target		**1.75E+01**	**mg/l**	For comparison with measured groundwater concentration.
Domenico - Steady state				
Distance to compliance point		**50**	**m**	
Concentration of contaminant at compliance point	C_{ED}/C_0	**5.60E-05**	**mg/l**	Domenico - Steady state

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Calculated concentrations for distance-concentration graph

Domenico - Steady state
From calculation sheet

Distance	Concentration
	mg/l
0	9.8E-02
2.5	6.75E-02
5.0	4.65E-02
7.5	3.20E-02
10.0	2.20E-02
12.5	1.52E-02
15.0	1.05E-02
17.5	7.20E-03
20.0	4.96E-03
22.5	3.42E-03
25.0	2.35E-03
27.5	1.62E-03
30.0	1.12E-03
32.5	7.68E-04
35.0	5.28E-04
37.5	3.64E-04
40.0	2.50E-04
42.5	1.72E-04
45.0	1.18E-04
47.5	8.14E-05
50.0	5.60E-05

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared
with the Level 3 remedial target to determine the need for further action.
Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

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Porosity Calculator

These results are not carried through to any of the other worksheets

DRY BULK DENSITY DATA

Variable	Value	Unit	justification
Natural Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Dry Bulk Density	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
Initial Saturation	#DIV/0!	%	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	
Water Filled Porosity	**#DIV/0!**	**fraction**	

WET BULK DENSITY DATA

Variable	Value	Unit	
Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Actual (wet) Bulk Density (i.e. at natural MC)	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
dry bulk density	0.00	tonnes/m^3	
Initial Saturation	#DIV/0!	%	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	**#DIV/0!**
Water Filled Porosity	**#DIV/0!**	**fraction**	

Analytical solutions provided by David Hall, Golder Associates (UK) Ltd

Simple hydrogeological calculations

(These are not specific to, or required in, the Remedial Targets Methodology)

Parameter	symbol		unit	justification
Hydraulic conductivity	K	0.00E+00	m/d	
Hydraulic gradient	i	0.00E+00	unitless	
Effective porosity of aquifer	n	0.00E+00	fraction	
Thickness of saturated aquifer	b	0.00E+00	m	
Width of aquifer perpendicular to flow	w	0.00E+00	m	
Distance to receptor	x	0.00E+00	m	
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Soil-water partition co-efficient	Kd	0.00E+00	l/kg	
Retardation factor of pollutant	R	#DIV/0!		

Groundwater flow velocity	v(GW)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for groundwater to reach receptor	t(GW)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years
Rate of groundwater flow through aquifer	Q	0.00E+00	m^3/s	0.00E+00	m^3/day	0.00E+00	m^3/year

Contaminant flow velocity	v(contam)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for contaminant to reach receptor	t(contam)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years

Level 1 Calculation Sheet

Contaminant Tetrachloroethene

Parameter	Value	Units
(carried over from input sheet)		
C_T	1.00E-02	mg/l
Kd	0.00E+00	l/kg
foc		fraction
koc		l/kg
θ_W	0.00E+00	fraction
θa	0.00E+00	fraction
ρ	0.00E+00	g/cm3
H	0.00E+00	dimensionless
Koc,n		l/kg
Koc,i		l/kg
pH		pH units
pKa		
foc (ionic)		fraction

Calculations (Refer toTable 4.3, R&D Publication 20)

Selected option User specified value for partition coefficient

calc calc Calc Kd l/kg

Calculation of partition coefficient for ionic organic chemical

Partition coefficient used in Level 1 Assessment 0.00E+00 l/kg

Calculated Remedial Target #DIV/0! mg/kg for Tetrachloroethene

Factor (partitioning between soil and water) #DIV/0!

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11/12/2025
Version:	1

Level 2 Calculation Sheet

Contaminant Tetrachloroethene

Site assessed:	Kelvedon Stre
Date:	11/12/2025
Version:	1

Parameter	Value	Units		
(carried over from input sheet)				
Mz	0.00E+00	m		
L	0.00E+00	m		
da	0.00E+00	m		Calculated Dilution Factor
Inf	0.00E+00	m/d		
K	0.00E+00	m/d		
i	0.00E+00		Calculation based on target concentration	#DIV/0!
A	0.00E+00	m3/d m2 m3/d	Calculation based on observed contaminant concentration	#DIV/0!
Cc	0.00E+00	mg/l		
C_T	1.00E-02	mg/l		
Cu	0.00E+00	mg/l		
w	0.00E+00	m		



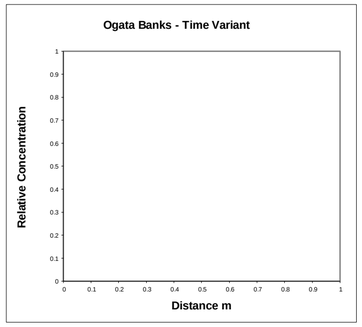
Contaminant Tetrachloroethene

OGATA BANKS SOLUTION

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-02	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Calc	Value	
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) -USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Date:	11/12/2025
Version:	1

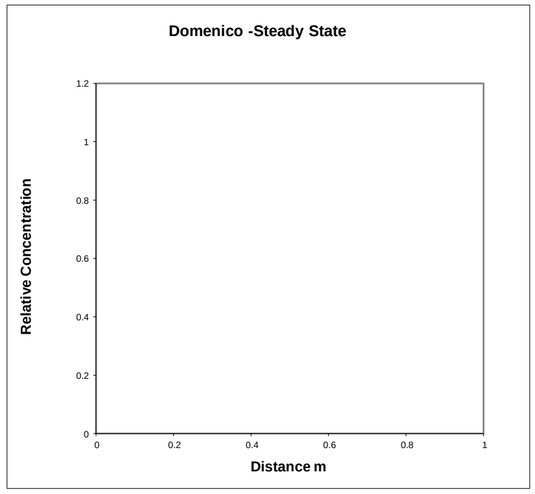
Contaminant trachloroethene

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-02	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

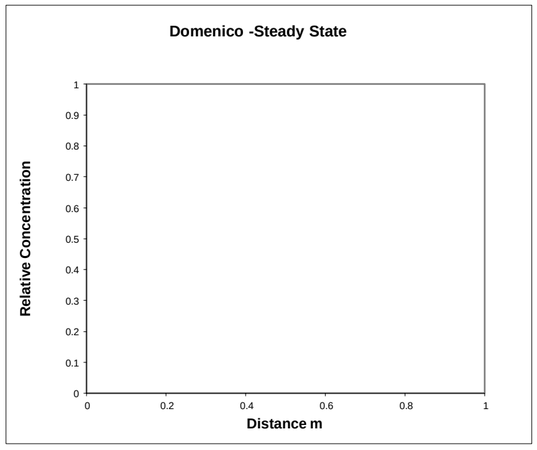


Calc	Value	Units
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Date:	11/12/2025
Version:	1

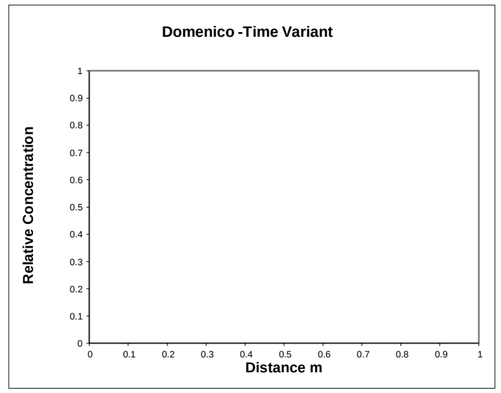
DOMENICO (TIME VARIANT)

Contaminant **trachloroethene**

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.01	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

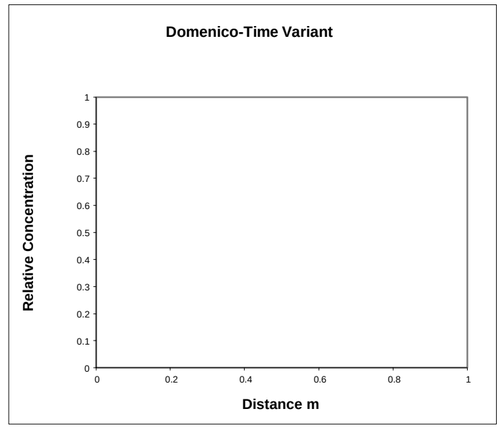


Calc **Value**

v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Date:	11/12/2025
Version:	1

OGATA BANKS SOLUTION

Contaminant Tetrachloroethene

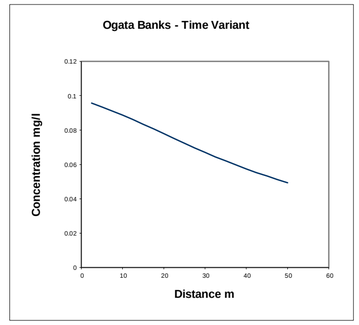
Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.01	mg/l
Co	9.80E-02	mg/l
λ	2.95E-04	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	2.43E+03	l/kg
ρ	1.60E+00	g/cm3
n	4.40E-01	
i	4.40E-02	
K	1.00E+02	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

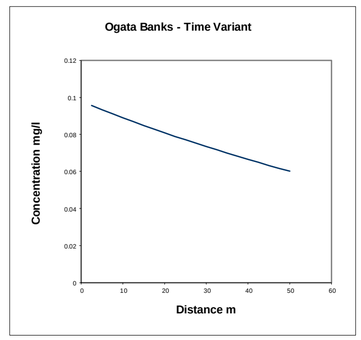
Calc	Value	
v	1.00E+01	m/d
Rc	8.84E+03	
u	1.13E-03	m/d

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.01225	-3.7E-01	6.9E-01	-1.9E+48	2.000	8.7E-01	2.4E+00	1.9E+48	0.000	1.7E+01	1	-1.7E+01	-1	4.2E+00	1	-4.2E+00	-1	6.75E-02
2	5	0.01225	-7.5E-01	4.7E-01	-1.9E+48	2.000	1.7E+00	5.7E+00	1.9E+48	0.000	1.2E+01	1	-1.2E+01	-1	3.0E+00	1	-3.0E+00	-0.99997	4.65E-02
3	7.5	0.01225	-1.1E+00	3.3E-01	-1.9E+48	2.000	2.6E+00	1.4E+01	1.9E+48	0.000	9.7E+00	1	-9.7E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	3.20E-02
4	10	0.01225	-1.5E+00	2.2E-01	-1.9E+48	2.000	3.5E+00	3.3E+01	1.9E+48	0.000	8.4E+00	1	-8.4E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	2.20E-02
5	12.5	0.01225	-1.9E+00	1.5E-01	-1.9E+48	2.000	4.4E+00	7.9E+01	1.9E+48	0.000	7.5E+00	1	-7.5E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	1.51E-02
6	15	0.01225	-2.2E+00	1.1E-01	-1.9E+48	2.000	5.2E+00	1.9E+02	1.9E+48	0.000	6.8E+00	1	-6.8E+00	-1	1.7E+00	0.984	-1.7E+00	-0.98399	1.03E-02
7	17.5	0.01225	-2.6E+00	7.3E-02	-1.9E+48	2.000	6.1E+00	4.5E+02	1.9E+48	0.000	6.3E+00	1	-6.3E+00	-1	1.6E+00	0.9743	-1.6E+00	-0.97425	7.02E-03
8	20	0.01225	-3.0E+00	5.1E-02	-1.9E+48	2.000	7.0E+00	1.1E+03	1.9E+48	0.000	5.9E+00	1	-5.9E+00	-1	1.5E+00	0.963	-1.5E+00	-0.96302	4.78E-03
9	22.5	0.01225	-3.4E+00	3.5E-02	-1.9E+48	2.000	7.9E+00	2.6E+03	1.9E+48	0.000	5.6E+00	1	-5.6E+00	-1	1.4E+00	0.9508	-1.4E+00	-0.95078	3.25E-03
10	25	0.01225	-3.7E+00	2.4E-02	-1.9E+48	2.000	8.7E+00	6.2E+03	1.9E+48	0.000	5.3E+00	1	-5.3E+00	-1	1.3E+00	0.9379	-1.3E+00	-0.93792	2.21E-03
11	27.5	0.01225	-4.1E+00	1.7E-02	-1.9E+48	2.000	9.6E+00	1.5E+04	1.9E+48	0.000	5.1E+00	1	-5.1E+00	-1	1.3E+00	0.9247	-1.3E+00	-0.92475	1.50E-03
12	30	0.01225	-4.5E+00	1.1E-02	-1.9E+48	2.000	1.0E+01	3.5E+04	1.9E+48	0.000	4.8E+00	1	-4.8E+00	-1	1.2E+00	0.9115	-1.2E+00	-0.91147	1.02E-03
13	32.5	0.01225	-4.8E+00	7.8E-03	-1.9E+48	2.000	1.1E+01	8.5E+04	1.9E+48	0.000	4.7E+00	1	-4.7E+00	-1	1.2E+00	0.8982	-1.2E+00	-0.89824	6.90E-04
14	35	0.01225	-5.2E+00	5.4E-03	-1.9E+48	2.000	1.2E+01	2.0E+05	1.9E+48	0.000	4.5E+00	1	-4.5E+00	-1	1.1E+00	0.8852	-1.1E+00	-0.88517	4.68E-04
15	37.5	0.01225	-5.6E+00	3.7E-03	-1.9E+48	2.000	1.3E+01	4.9E+05	1.9E+48	0.000	4.3E+00	1	-4.3E+00	-1	1.1E+00	0.8723	-1.1E+00	-0.87233	3.18E-04
16	40	0.01225	-6.0E+00	2.6E-03	-1.9E+48	2.000	1.4E+01	1.2E+06	1.9E+48	0.000	4.2E+00	1	-4.2E+00	-1	1.0E+00	0.8598	-1.0E+00	-0.85979	2.16E-04
17	42.5	0.01225	-6.3E+00	1.8E-03	-1.9E+48	2.000	1.5E+01	2.8E+06	1.9E+48	0.000	4.1E+00	1	-4.1E+00	-1	1.0E+00	0.8476	-1.0E+00	-0.84756	1.47E-04
18	45	0.01225	-6.7E+00	1.2E-03	-1.9E+48	2.000	1.6E+01	6.7E+06	1.9E+48	0.000	4.0E+00	1	-4.0E+00	-1	9.8E-01	0.8357	-9.8E-01	-0.83567	9.95E-05
19	47.5	0.01225	-7.1E+00	8.4E-04	-1.9E+48	2.000	1.7E+01	1.6E+07	1.9E+48	0.000	3.8E+00	1	-3.8E+00	-1	9.6E-01	0.8241	-9.6E-01	-0.82412	6.76E-05
20	50	0.01225	-7.5E+00	5.8E-04	-1.9E+48	2.000	1.7E+01	3.8E+07	1.9E+48	0.000	3.8E+00	1	-3.8E+00	-1	9.3E-01	0.8129	-9.3E-01	-0.81292	4.59E-05



Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.01225	-3.7E-01	6.9E-01	-1.9E+48	2.000	8.7E-01	2.4E+00	1.9E+48	0.000	1.7E+01	1	-1.7E+01	-1	8.3E+00	1	-8.3E+00	-1	6.75E-02
2	5	0.01225	-7.5E-01	4.7E-01	-1.9E+48	2.000	1.7E+00	5.7E+00	1.9E+48	0.000	1.2E+01	1	-1.2E+01	-1	5.9E+00	1	-5.9E+00	-1	4.65E-02
3	7.5	0.01225	-1.1E+00	3.3E-01	-1.9E+48	2.000	2.6E+00	1.4E+01	1.9E+48	0.000	9.7E+00	1	-9.7E+00	-1	4.8E+00	1	-4.8E+00	-1	3.20E-02
4	10	0.01225	-1.5E+00	2.2E-01	-1.9E+48	2.000	3.5E+00	3.3E+01	1.9E+48	0.000	8.4E+00	1	-8.4E+00	-1	4.2E+00	1	-4.2E+00	-1	2.20E-02
5	12.5	0.01225	-1.9E+00	1.5E-01	-1.9E+48	2.000	4.4E+00	7.9E+01	1.9E+48	0.000	7.5E+00	1	-7.5E+00	-1	3.7E+00	1	-3.7E+00	-1	1.52E-02
6	15	0.01225	-2.2E+00	1.1E-01	-1.9E+48	2.000	5.2E+00	1.9E+02	1.9E+48	0.000	6.8E+00	1	-6.8E+00	-1	3.4E+00	1	-3.4E+00	-1	1.05E-02
7	17.5	0.01225	-2.6E+00	7.3E-02	-1.9E+48	2.000	6.1E+00	4.5E+02	1.9E+48	0.000	6.3E+00	1	-6.3E+00	-1	3.2E+00	1	-3.2E+00	-0.99999	7.20E-03
8	20	0.01225	-3.0E+00	5.1E-02	-1.9E+48	2.000	7.0E+00	1.1E+03	1.9E+48	0.000	5.9E+00	1	-5.9E+00	-1	3.0E+00	1	-3.0E+00	-0.99997	4.96E-03
9	22.5	0.01225	-3.4E+00	3.5E-02	-1.9E+48	2.000	7.9E+00	2.6E+03	1.9E+48	0.000	5.6E+00	1	-5.6E+00	-1	2.8E+00	0.9999	-2.8E+00	-0.99992	3.42E-03
10	25	0.01225	-3.7E+00	2.4E-02	-1.9E+48	2.000	8.7E+00	6.2E+03	1.9E+48	0.000	5.3E+00	1	-5.3E+00	-1	2.6E+00	0.9998	-2.6E+00	-0.99981	2.35E-03
11	27.5	0.01225	-4.1E+00	1.7E-02	-1.9E+48	2.000	9.6E+00	1.5E+04	1.9E+48	0.000	5.1E+00	1	-5.1E+00	-1	2.5E+00	0.9996	-2.5E+00	-0.99963	1.62E-03
12	30	0.01225	-4.5E+00	1.1E-02	-1.9E+48	2.000	1.0E+01	3.5E+04	1.9E+48	0.000	4.8E+00	1	-4.8E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	1.12E-03
13	32.5	0.01225	-4.8E+00	7.8E-03	-1.9E+48	2.000	1.1E+01	8.5E+04	1.9E+48	0.000	4.7E+00	1	-4.7E+00	-1	2.3E+00	0.9989	-2.3E+00	-0.99893	7.68E-04
14	35	0.01225	-5.2E+00	5.4E-03	-1.9E+48	2.000	1.2E+01	2.0E+05	1.9E+48	0.000	4.5E+00	1	-4.5E+00	-1	2.2E+00	0.9984	-2.2E+00	-0.99839	5.28E-04
15	37.5	0.01225	-5.6E+00	3.7E-03	-1.9E+48	2.000	1.3E+01	4.9E+05	1.9E+48	0.000	4.3E+00	1	-4.3E+00	-1	2.2E+00	0.9977	-2.2E+00	-0.99769	3.64E-04
16	40	0.01225	-6.0E+00	2.6E-03	-1.9E+48	2.000	1.4E+01	1.2E+06	1.9E+48	0.000	4.2E+00	1	-4.2E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	2.50E-04
17	42.5	0.01225	-6.3E+00	1.8E-03	-1.9E+48	2.000	1.5E+01	2.8E+06	1.9E+48	0.000	4.1E+00	1	-4.1E+00	-1	2.0E+00	0.9958	-2.0E+00	-0.99579	1.72E-04
18	45	0.01225	-6.7E+00	1.2E-03	-1.9E+48	2.000	1.6E+01	6.7E+06	1.9E+48	0.000	4.0E+00	1	-4.0E+00	-1	2.0E+00	0.9946	-2.0E+00	-0.99459	1.18E-04
19	47.5	0.01225	-7.1E+00	8.4E-04	-1.9E+48	2.000	1.7E+01	1.6E+07	1.9E+48	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9932	-1.9E+00	-0.99321	8.14E-05
20	50	0.01225	-7.5E+00	5.8E-04	-1.9E+48	2.000	1.7E+01	3.8E+07	1.9E+48	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	5.60E-05



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	6.75E-02
5.0	4.65E-02
7.5	3.20E-02
10.0	2.20E-02
12.5	1.52E-02
15.0	1.05E-02
17.5	7.20E-03
20.0	4.96E-03
22.5	3.42E-03
25.0	2.35E-03
27.5	1.62E-03
30.0	1.12E-03
32.5	7.68E-04
35.0	5.28E-04
37.5	3.64E-04
40.0	2.50E-04
42.5	1.72E-04
45.0	1.18E-04
47.5	8.14E-05
50.0	5.60E-05

Contaminant **trachloroethene**

Input	Value	Units
C_T	0.01	mg/l
Co	9.80E-02	mg/l
λ	2.95E-04	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	2.43E+03	l/kg
ρ	1.60E+00	g/cm3
n	4.40E-01	
i	4.40E-02	
K	1.00E+02	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

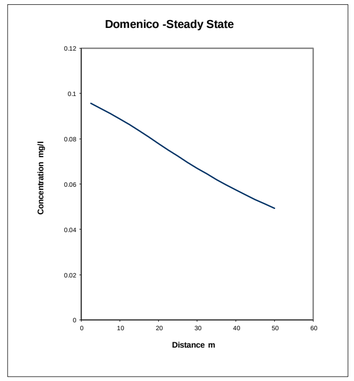
Vertical dispersion optio Simulate vertical dispersion in 1 direction

Calc	Value	
v	1.00E+01	m/d
Rc	8.84E+03	
u	1.13E-03	m/d

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

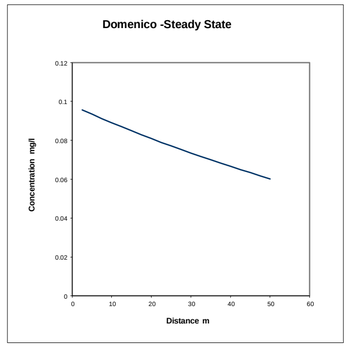
	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.0245	-3.73E-01	6.89E-01	1.68E+01	1	-1.68E+01	-1	4.17E+00	1	-4.17E+00	-1	6.75E-02
2	5	0.0245	-7.46E-01	4.74E-01	1.19E+01	1	-1.19E+01	-1	2.95E+00	1	-2.95E+00	-1	4.65E-02
3	7.5	0.0245	-1.12E+00	3.27E-01	9.68E+00	1	-9.68E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	3.20E-02
4	10	0.0245	-1.49E+00	2.25E-01	8.39E+00	1	-8.39E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	2.20E-02
5	12.5	0.0245	-1.86E+00	1.55E-01	7.50E+00	1	-7.50E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	1.51E-02
6	15	0.0245	-2.24E+00	1.07E-01	6.85E+00	1	-6.85E+00	-1	1.70E+00	0.984	-1.70E+00	-0.984	1.03E-02
7	17.5	0.0245	-2.61E+00	7.35E-02	6.34E+00	1	-6.34E+00	-1	1.58E+00	0.9743	-1.58E+00	-0.9743	7.02E-03
8	20	0.0245	-2.98E+00	5.06E-02	5.93E+00	1	-5.93E+00	-1	1.48E+00	0.963	-1.48E+00	-0.963	4.78E-03
9	22.5	0.0245	-3.36E+00	3.49E-02	5.59E+00	1	-5.59E+00	-1	1.39E+00	0.9508	-1.39E+00	-0.9508	3.25E-03
10	25	0.0245	-3.73E+00	2.40E-02	5.30E+00	1	-5.30E+00	-1	1.32E+00	0.9379	-1.32E+00	-0.9379	2.21E-03
11	27.5	0.0245	-4.10E+00	1.65E-02	5.06E+00	1	-5.06E+00	-1	1.26E+00	0.9247	-1.26E+00	-0.9247	1.50E-03
12	30	0.0245	-4.48E+00	1.14E-02	4.84E+00	1	-4.84E+00	-1	1.20E+00	0.9115	-1.20E+00	-0.9115	1.02E-03
13	32.5	0.0245	-4.85E+00	7.84E-03	4.65E+00	1	-4.65E+00	-1	1.16E+00	0.8982	-1.16E+00	-0.8982	6.90E-04
14	35	0.0245	-5.22E+00	5.40E-03	4.48E+00	1	-4.48E+00	-1	1.11E+00	0.8852	-1.11E+00	-0.8852	4.68E-04
15	37.5	0.0245	-5.59E+00	3.72E-03	4.33E+00	1	-4.33E+00	-1	1.08E+00	0.8723	-1.08E+00	-0.8723	3.18E-04
16	40	0.0245	-5.97E+00	2.56E-03	4.19E+00	1	-4.19E+00	-1	1.04E+00	0.8598	-1.04E+00	-0.8598	2.16E-04
17	42.5	0.0245	-6.34E+00	1.76E-03	4.07E+00	1	-4.07E+00	-1	1.01E+00	0.8476	-1.01E+00	-0.8476	1.47E-04
18	45	0.0245	-6.71E+00	1.21E-03	3.95E+00	1	-3.95E+00	-1	9.83E-01	0.8357	-9.83E-01	-0.8357	9.95E-05
19	47.5	0.0245	-7.09E+00	8.37E-04	3.85E+00	1	-3.85E+00	-1	9.57E-01	0.8241	-9.57E-01	-0.8241	6.76E-05
20	50	0.0245	-7.46E+00	5.76E-04	3.75E+00	1	-3.75E+00	-1	9.33E-01	0.8129	-9.33E-01	-0.8129	4.59E-05



DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.0245	-3.73E-01	6.89E-01	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	6.75E-02
2	5	0.0245	-7.46E-01	4.74E-01	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	4.65E-02
3	7.5	0.0245	-1.12E+00	3.27E-01	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	3.20E-02
4	10	0.0245	-1.49E+00	2.25E-01	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	2.20E-02
5	12.5	0.0245	-1.86E+00	1.55E-01	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	1.52E-02
6	15	0.0245	-2.24E+00	1.07E-01	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	1.05E-02
7	17.5	0.0245	-2.61E+00	7.35E-02	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	7.20E-03
8	20	0.0245	-2.98E+00	5.06E-02	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	4.96E-03
9	22.5	0.0245	-3.36E+00	3.49E-02	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-0.9999	3.42E-03
10	25	0.0245	-3.73E+00	2.40E-02	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-0.9998	2.35E-03
11	27.5	0.0245	-4.10E+00	1.65E-02	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-0.9996	1.62E-03
12	30	0.0245	-4.48E+00	1.14E-02	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	1.12E-03
13	32.5	0.0245	-4.85E+00	7.84E-03	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.9989	7.68E-04
14	35	0.0245	-5.22E+00	5.40E-03	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.9984	5.28E-04
15	37.5	0.0245	-5.59E+00	3.72E-03	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.9977	3.64E-04
16	40	0.0245	-5.97E+00	2.56E-03	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	2.50E-04
17	42.5	0.0245	-6.34E+00	1.76E-03	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.9958	1.72E-04
18	45	0.0245	-6.71E+00	1.21E-03	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.9946	1.18E-04
19	47.5	0.0245	-7.09E+00	8.37E-04	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.9932	8.14E-05
20	50	0.0245	-7.46E+00	5.76E-04	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	5.60E-05



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	6.75E-02
5.0	4.65E-02
7.5	3.20E-02
10.0	2.20E-02
12.5	1.52E-02
15.0	1.05E-02
17.5	7.20E-03
20.0	4.96E-03
22.5	3.42E-03
25.0	2.35E-03
27.5	1.62E-03
30.0	1.12E-03
32.5	7.68E-04
35.0	5.28E-04
37.5	3.64E-04
40.0	2.50E-04
42.5	1.72E-04
45.0	1.18E-04
47.5	8.14E-05
50.0	5.60E-05

DOMENICO (TIME VARIANT)

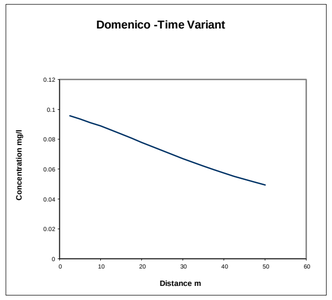
Contaminant	:trachloroethene	
Input	**Value**	**Units**
C_T	0.01	mg/l
Co	9.80E-02	mg/l
λ	2.95E-04	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	2.43E+03	l/kg
ρ	1.60E+00	g/cm3
n	4.40E-01	
i	4.40E-02	
K	1.00E+02	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

Calc	**Value**	
v	1.00E+01	m/d
Rc	8.84E+03	
u	1.13E-03	m/d

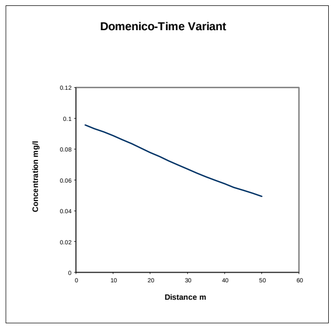
Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.01225	-3.73E-01	6.89E-01	-1.86E+48	2	1.68E+01	1	-1.68E+01	-1	4.17E+00	1	-4.17E+00	-1	6.75E-02
2	5	0.01225	-7.46E-01	4.74E-01	-1.86E+48	2	1.19E+01	1	-1.19E+01	-1	2.95E+00	1	-2.95E+00	-1	4.65E-02
3	7.5	0.01225	-1.12E+00	3.27E-01	-1.86E+48	2	9.68E+00	1	-9.68E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	3.20E-02
4	10	0.01225	-1.49E+00	2.25E-01	-1.86E+48	2	8.39E+00	1	-8.39E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	2.20E-02
5	12.5	0.01225	-1.86E+00	1.55E-01	-1.86E+48	2	7.50E+00	1	-7.50E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	1.51E-02
6	15	0.01225	-2.24E+00	1.07E-01	-1.86E+48	2	6.85E+00	1	-6.85E+00	-1	1.70E+00	0.984	-1.70E+00	-0.984	1.03E-02
7	17.5	0.01225	-2.61E+00	7.35E-02	-1.86E+48	2	6.34E+00	1	-6.34E+00	-1	1.58E+00	0.9743	-1.58E+00	-0.974	7.02E-03
8	20	0.01225	-2.98E+00	5.06E-02	-1.86E+48	2	5.93E+00	1	-5.93E+00	-1	1.48E+00	0.963	-1.48E+00	-0.963	4.78E-03
9	22.5	0.01225	-3.36E+00	3.49E-02	-1.86E+48	2	5.59E+00	1	-5.59E+00	-1	1.39E+00	0.9508	-1.39E+00	-0.951	3.25E-03
10	25	0.01225	-3.73E+00	2.40E-02	-1.86E+48	2	5.30E+00	1	-5.30E+00	-1	1.32E+00	0.9379	-1.32E+00	-0.938	2.21E-03
11	27.5	0.01225	-4.10E+00	1.65E-02	-1.86E+48	2	5.06E+00	1	-5.06E+00	-1	1.26E+00	0.9247	-1.26E+00	-0.925	1.50E-03
12	30	0.01225	-4.48E+00	1.14E-02	-1.86E+48	2	4.84E+00	1	-4.84E+00	-1	1.20E+00	0.9115	-1.20E+00	-0.911	1.02E-03
13	32.5	0.01225	-4.85E+00	7.84E-03	-1.86E+48	2	4.65E+00	1	-4.65E+00	-1	1.16E+00	0.8982	-1.16E+00	-0.898	6.90E-04
14	35	0.01225	-5.22E+00	5.40E-03	-1.86E+48	2	4.48E+00	1	-4.48E+00	-1	1.11E+00	0.8852	-1.11E+00	-0.885	4.68E-04
15	37.5	0.01225	-5.59E+00	3.72E-03	-1.86E+48	2	4.33E+00	1	-4.33E+00	-1	1.08E+00	0.8723	-1.08E+00	-0.872	3.18E-04
16	40	0.01225	-5.97E+00	2.56E-03	-1.86E+48	2	4.19E+00	1	-4.19E+00	-1	1.04E+00	0.8598	-1.04E+00	-0.86	2.16E-04
17	42.5	0.01225	-6.34E+00	1.76E-03	-1.86E+48	2	4.07E+00	1	-4.07E+00	-1	1.01E+00	0.8476	-1.01E+00	-0.848	1.47E-04
18	45	0.01225	-6.71E+00	1.21E-03	-1.86E+48	2	3.95E+00	1	-3.95E+00	-1	9.83E-01	0.8357	-9.83E-01	-0.836	9.95E-05
19	47.5	0.01225	-7.09E+00	8.37E-04	-1.86E+48	2	3.85E+00	1	-3.85E+00	-1	9.57E-01	0.8241	-9.57E-01	-0.824	6.76E-05
20	50	0.01225	-7.46E+00	5.76E-04	-1.86E+48	2	3.75E+00	1	-3.75E+00	-1	9.33E-01	0.8129	-9.33E-01	-0.813	4.59E-05



Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.01225	-3.73E-01	6.89E-01	-1.86E+48	2	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	6.75E-02
2	5	0.01225	-7.46E-01	4.74E-01	-1.86E+48	2	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	4.65E-02
3	7.5	0.01225	-1.12E+00	3.27E-01	-1.86E+48	2	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	3.20E-02
4	10	0.01225	-1.49E+00	2.25E-01	-1.86E+48	2	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	2.20E-02
5	12.5	0.01225	-1.86E+00	1.55E-01	-1.86E+48	2	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	1.52E-02
6	15	0.01225	-2.24E+00	1.07E-01	-1.86E+48	2	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	1.05E-02
7	17.5	0.01225	-2.61E+00	7.35E-02	-1.86E+48	2	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	7.20E-03
8	20	0.01225	-2.98E+00	5.06E-02	-1.86E+48	2	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	4.96E-03
9	22.5	0.01225	-3.36E+00	3.49E-02	-1.86E+48	2	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-1	3.42E-03
10	25	0.01225	-3.73E+00	2.40E-02	-1.86E+48	2	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-1	2.35E-03
11	27.5	0.01225	-4.10E+00	1.65E-02	-1.86E+48	2	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-1	1.62E-03
12	30	0.01225	-4.48E+00	1.14E-02	-1.86E+48	2	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	1.12E-03
13	32.5	0.01225	-4.85E+00	7.84E-03	-1.86E+48	2	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.999	7.68E-04
14	35	0.01225	-5.22E+00	5.40E-03	-1.86E+48	2	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.998	5.28E-04
15	37.5	0.01225	-5.59E+00	3.72E-03	-1.86E+48	2	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.998	3.64E-04
16	40	0.01225	-5.97E+00	2.56E-03	-1.86E+48	2	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	2.50E-04
17	42.5	0.01225	-6.34E+00	1.76E-03	-1.86E+48	2	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.996	1.72E-04
18	45	0.01225	-6.71E+00	1.21E-03	-1.86E+48	2	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.995	1.18E-04
19	47.5	0.01225	-7.09E+00	8.37E-04	-1.86E+48	2	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.993	8.14E-05
20	50	0.01225	-7.46E+00	5.76E-04	-1.86E+48	2	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	5.60E-05



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	6.75E-02
5.0	4.65E-02
7.5	3.20E-02
10.0	2.20E-02
12.5	1.52E-02
15.0	1.05E-02
17.5	7.20E-03
20.0	4.96E-03
22.5	3.42E-03
25.0	2.35E-03
27.5	1.62E-03
30.0	1.12E-03
32.5	7.68E-04
35.0	5.28E-04
37.5	3.64E-04
40.0	2.50E-04
42.5	1.72E-04
45.0	1.18E-04
47.5	8.14E-05
50.0	5.60E-05

Hydrogeological risk assessment for land contamination

Remedial Targets Worksheet , Release 3.2

First released: 2006. Version 3.2: January 2013

This worksheet has been produced in combination with the document 'Remedial Targets Methodology: Hydrogeological risk assessment for land contamination (Environment Agency 2006).

Users of this worksheet should always refer to the User Manual to the Remedial Targets Methodology and to relevant guidance on UK legislation and policy, in order to understand how this procedure should be applied in an appropriate context.

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The calculation of equations in this worksheet has been independently checked by Entec (UK) Ltd on behalf of the Environment Agency.

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IMPORTANT: To enable MS Excel worksheet, click Tools, Add -Ins, Analysis Tool Pak and Analysis Tool Pak-VBA (to calculate error functions).

Details to be completed for each assessment				
Site Name:	Kelvedon Street			
Site Address:	Newport			
Completed by:	Michael Watkins			
Date:	11-Dec-25		Version:	1
Contaminant	Tetrachloroethene			
Target Concentration (C_T)	0.01	mg/l	Origin of C_T:	WFD for inland surface waters (annual average)

This worksheet can be used to determine remedial targets for soils (Worksheets Level 1 Soil, Level 2 and Level 3 Soil) or to determine remedial targets for groundwater (Level 3 Groundwater). For Level 3, parameter values must be entered separately dependent on whether the assessment is for soil or groundwater. For soil, remedial targets are calculated as either mg/kg (for comparision with soil measurements) or mg/l (for comparison with leaching tests or pore water concentrations).
Site details entered on this page are automatically copied to Level 1, 2 and 3 Worksheets.
Worksheet options are identified by brown background and employ a pull-down menus. Data entry are identified as blue background.
Data origin / justification should be noted in cells coloured yellow and fully documented in subsequent reports.
Data carried forward from an earlier worksheet are identified by a light green background
It is recommended that a copy of the original worksheet is saved (all data fields in the original copy are blank).

The spreadsheet also includes a porosity calculation worksheet, a soil impact calculation worksheet and a worksheet that performs some simple hydrogeological calculations.

Remedial Targets Worksheet , Release 3.2

Level 1 - Soil

Select the method of calculating the soil water Partition Co-efficient by using the pull down menu below

User specified value for partition coefficient

Contaminant		**Tetrachloroethene**		
Target concentration	C_T	**0.01**	**mg/l**	

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**
Standard entry				
Water filled soil porosity	θ_w	0.00E+00	fraction	
Air filled soil porosity	θa	0.00E+00	fraction	
Bulk density of soil zone material	ρ	0.00E+00	g/cm^3	
Henry's Law constant	H	0.00E+00	dimensionless	
Entry if specify partition coefficient (option)				
Soil water partition coefficient	Kd	0.00E+00	l/kg	
Entry for non-polar organic chemicals (option)				
Fraction of organic carbon (in soil)	foc		fraction	
Organic carbon partition coefficient	Koc		l/kg	
Entry for ionic organic chemicals (option)				
Sorption coefficient for neutral species	$K_{oc,n}$		l/kg	
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg	
pH value	pH		pH units	
Acid dissociation constant	pKa			
Fraction of organic carbon (in soil)	foc		fraction	

This sheet calculates the Level 1 remedial target for soils(mg/kg) based on a selected target concentration and theoretical calculation of soil water partitioning. Three options are included for determining the partition coefficient.

The measured soil concentration as mg/kg should be compared with the Level 1 remedial target to determine the need for further action.

Soil water partition coefficient used in Level Assessment	**Kd**	**0.00E+00**	**l/kg**	*Specified value*

Level 1 Remedial Target

Level 1 Remedial Target	**#DIV/0!**	**mg/kg**	**(for comparison with soil analyses)**
	or		
	0.01	**mg/l**	**(for comparison with leachate test results)**

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 2 - Soil

Contaminant		**Tetrachloroethene**		from Level 1
Target concentration	C_T	**0.01**	**mg/l**	from Level 1

This sheet calculates the Level 2 remedial target for soils (mg/kg) or for pore water (mg/l).

The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 2 remedial target to determine the need for further action. Equations presented in 'Hydrogeological risk assessment for land contamiantion' (Environment Agency 2006)

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**	
Standard entry					
Infiltration	Inf	0.00E+00	m/d		
Area of contaminant source	A	0.00E+00	m^2		Not used in calculation
Entry for groundwater flow below site					
Length of contaminant source in direction of groundwater flow	L	0.00E+00	m		
Saturated aquifer thickness	da	0.00E+00	m		
Hydraulic Conductivity of aquifer in which dilution occurs	K	0.00E+00	m/d		
Hydraulic gradient of water table	i	0.00E+00	fraction		
Width of contaminant source perpendicular to groundwater flow	w	0.00E+00	m		Not used in calculation
Background concentration of contaminant in groundwater beneath site	Cu	0.00E+00	mg/l		
Define mixing zone depth by specifying or calculating depth (using pull down list)		**Specify**			
Enter mixing zone thickness	Mz	0.00E+00	m		
Calculated mixing zone thickness	Mz		m		

Calculated Parameters

Dilution Factor	**DF**	**#DIV/0!**		
Level 2 Remedial Target		**#DIV/0!**	**mg/l**	**For comparison with measured pore water concentration. This assumes Level 1 Remedial Target is based on Target Concentration.**
		or		
		#DIV/0!	**mg/kg**	**For comparison with measured soil concentration. This assumes Level 1 Remedial Target calculated from soil-water**

Additional option

Calculation of impact on receptor

Concentration of contaminant in contaminated discharge (entering receptor)	Cc	0.00E+00	mg/l	
Calculated concentration within receptor (dilution only)		#DIV/0!	mg/l	0

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 3 - Soil

See Note

Input Parameters	Variable	Value	Unit	Source
Contaminant		Tetrachloroethene		from Level 1
Target Concentration	C_T	0.01	mg/l	from Level 1
Dilution Factor	DF	#DIV/0!		from Level 2

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value)

	Variable	Value	Unit	Source of parameter value
Enter source concentration		Soil concentration as mg/kg		
Enter soil concentration		0	mg/kg	
Half life for degradation of contaminant in water	$t_{1/2}$	1.00E+100	days	
Calculated decay rate	λ	6.93E-101	$days^{-1}$	calculated
Width of plume in aquifer at source	Sz	0.00E+00	m	from Level 2
Plume thickness in aquifer at source	Sy	0.00E+00	m	from Level 2
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Effective porosity of aquifer	n	0.00E+00	fraction	
Hydraulic gradient	i	#DIV/0!	fraction	from Level 2 (adjusted)
Hydraulic conductivity of saturated aquifer	K	0.00E+00	m/d	from Level 2
Distance to compliance point	x	0.00E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	1.00E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	0.00E+00	l/kg	*see options*
Longitudinal dispersivity	ax	0.000	m	*see options*
Transverse dispersivity	az	0.000	m	*see options*
Vertical dispersivity	ay	0.000	m	*see options*

Parameter values should be checked against Level 1 and 2

Calculated Parameters	Variable		
Groundwater flow velocity	v	#DIV/0!	m/d
Retardation factor	Rf	#DIV/0!	fraction
Decay rate used	λ	6.93E-101	d^{-1}
Hydraulic gradient used in aquifer flow down-gradient	i	#DIV/0!	fraction
Rate of contaminant flow due to retardation	u	#DIV/0!	m/d
Ratio of Compliance Point to Source Concentration	C_{cp}/C_0	#DIV/0!	fraction
Attenuation factor (C_0/C_{cp})	**AF**	**#DIV/0!**	**fraction**
Calculated soil leachate concentration	Co	#DIV/0!	mg/l

Remedial Targets

Level 3 Remedial Target	**#DIV/0!**	**mg/l**	For comparison with measured pore water concentration.
Ogata Banks	**or**		This assumes Level 1 Remedial Target is based on Target Concentration.
	#DIV/0!	**mg/kg**	For comparison with measured soil concentration. This
Distance to compliance point	**0**	**m**	assumes Level 1 Remedial Target calculated from soil-water partitioning equation.
Ratio of Compliance Point to Source Concentration	**#DIV/0!**	**fraction**	Ogata Banks

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99

Enter method of defining partition co-efficient (using pull down list)

Calculate for ionic organic chemicals (acids)

Entry if specify partition coefficient (option)

Soil water partition coefficient	Kd		l/kg

Entry for non-polar organic chemicals (option)

Fraction of organic carbon in aquifer	foc		fraction
Organic carbon partition coefficient	Koc		l/kg

Entry for ionic organic chemicals (option)

Sorption coefficient for related species	$K_{oc,n}$	0.00E+00	l/kg
Sorption coefficient for ionised species	$K_{oc,i}$	0.00E+00	l/kg
pH value	pH	0.00E+00	
Acid dissociation constant	pKa	0.00E+00	
Fraction of organic carbon in aquifer	foc	0.00E+00	fraction
Soil water partition coefficient	Kd	0.00E+00	l/kg

Define dispersivity (click brown cell and use pull down list)

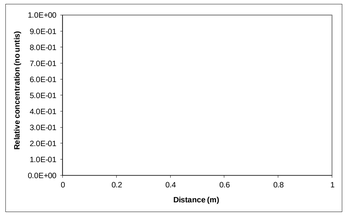
User defined values for dispersivity

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	0.00E+00	#NUM!	m
Transverse dispersivity	**az**	0.00E+00	0.00E+00	#NUM!	m
Vertical dispersivity	**ay**	0.00E+00	0.00E+00	#NUM!	m

Note values of dispersivity must be > 0

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed

Note
This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O_2, NO_3, SO_4 etc than an alternative solution should be used



Note: 'Relative concentration' is the ratio of calculated concentation at a given position compared to the source concentration. The calculations assume plume disperses from the top of the aquifer. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

This sheet calculates the Level 3 remedial target for soils(mg/kg) or for pore water (mg/l), based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.By setting a long travel time (e.g. 9E99) it will give the steady state solution, which should always be used when calculating remedial targets.

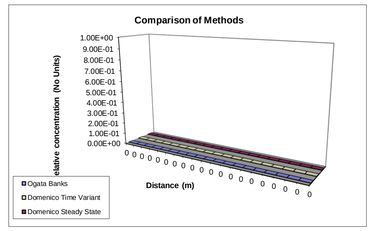
The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.9E+99.

Calculated (relative) concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Relative concentration (No units)	Concentration mg/l
0	1.0E+00	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!



Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Remedial Targets Worksheet , Release 3.2

Calculation of contaminant concentration in groundwater from a soil source

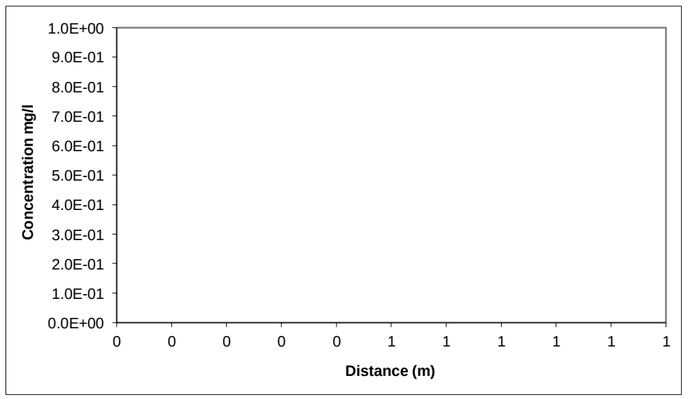
Only input required is Soil Contaminant Concentration

	Input Parameters			
	Soil contaminant concentration	C_0	0.00E+00	mg/kg
Level 1 Parameters				
	Water filled soil porosity	θ_W	0.00E+00	fraction
	Air filled soil porosity	θa	0.00E+00	fraction
	Bulk density	ρ	0.00E+00	g/cm^3
	Henry's Law constant	H	0.00E+00	dimensionless
	Soil water partition coefficient used in Level Assessment	Kd	0.00E+00	l/kg
	Factor (partitioning between soil and water)		#DIV/0!	dimensionless
Level 2 Parameters	**Dilution Factor**	DF	#DIV/0!	
Level 3 Parameters	**Attenuation factor (C_O/C_{ED})**	AF	#DIV/0!	

Predicted concentrations at compliance point

Level 1	C	#DIV/0!	mg/l	No dilution or attenuation
Level 2	C	#DIV/0!	mg/l	Dilution taken into account
Level 3	C	#DIV/0!	mg/l	Dilution and attenuation taken into account

Predicted concentrations between source and compliance point - Level 3



Distance m	Concentration mg/l
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)	Variable	Value	Unit	Source
Contaminant		Tetrachloroethene		from Level 1
Target Concentration	C_T	1.00E-02	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Domenico - Steady state — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived va

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	9.80E-02	mg/l	*Site investigation data*
Half life for degradation of contaminant in water	$t_{1/2}$	2.35E+03	days	*Howard et al (1991) Low anaerobic biodeg*
Calculated decay rate	λ	2.95E-04	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	7.50E+01	m	*Length of site perpendicular to groundwater flow*
Plume thickness at source	Sy	5.90E+00	m	*Same as Mixing Zone Thickness. "For a thin aquifer (typically <10m), the mixing zone thickness can be taken as the acte*
Saturated aquifer thickness	da	6.00E+00	m	*Maximum thickness recorded in vicinity of*
Bulk density of aquifer materials	ρ	1.60E+00	g/cm^3	*Typical bulk density for river terrace deposits*
Effective porosity of aquifer	n	4.40E-01	fraction	*Maximum porosity for coarse Gravel (Lovanh et al 2000) - conservative estimate*
Hydraulic gradient	i	4.40E-02	fraction	*Borehole level data*
Hydraulic conductivity of aquifer	K	2.59E+03	m/d	*Maximum typical value for clayey sandy G*
Distance to compliance point	x	5.00E+01	m	*Default compliance distance*
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	9.90E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	2.43E+03	l/kg	*see options*
Longitudinal dispersivity	ax	5.00E+00	m	*see options*
Transverse dispersivity	az	5.00E-01	m	*see options*
Vertical dispersivity	ay	5.00E-02	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd	2.43E+03	l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc		fraction
Organic carbon partition coefficient	Koc		l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{oc,n}$		l/kg
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	2.43E+03	l/kg

Define dispersivity (click brown cell and use pull down list)

Dispersivities 10%, 1%, 0.1% of pathway length

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	5.00E+00	2.98E+00	m
Transverse dispersivity	**az**	0.00E+00	5.00E-01	2.98E-01	m
Vertical dispersivity	**ay**	0.00E+00	5.00E-02	2.98E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

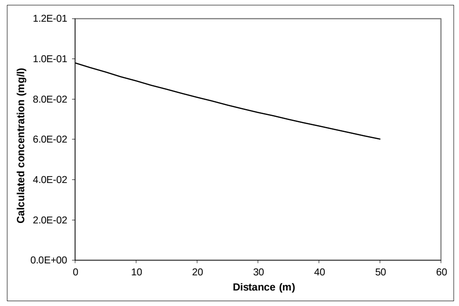
Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed

Calculated Parameters	Variable		
Groundwater flow velocity	v	2.59E+02	m/d
Retardation factor	Rf	8.84E+03	fraction
Decay rate used	λ	2.95E-04	d^{-1}
Rate of contaminant flow due to retardation	u	2.93E-02	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	6.02E-02	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**1.63E+00**	

Remedial Targets

Remedial Target		**1.63E-02**	**mg/l**	For comparison with measured groundwater concentration.
Domenico - Steady state				
Distance to compliance point		**50**	**m**	
Concentration of contaminant at compliance point	C_{ED}/C_0	**6.02E-02**	**mg/l**	Domenico - Steady state

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Calculated concentrations for distance-concentration graph

Domenico - Steady state
From calculation sheet

Distance	Concentration
	mg/l
0	9.8E-02
2.5	9.57E-02
5.0	9.34E-02
7.5	9.12E-02
10.0	8.90E-02
12.5	8.69E-02
15.0	8.49E-02
17.5	8.29E-02
20.0	8.09E-02
22.5	7.90E-02
25.0	7.71E-02
27.5	7.53E-02
30.0	7.35E-02
32.5	7.17E-02
35.0	6.99E-02
37.5	6.82E-02
40.0	6.66E-02
42.5	6.49E-02
45.0	6.33E-02
47.5	6.17E-02
50.0	6.02E-02

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared
with the Level 3 remedial target to determine the need for further action.
Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Porosity Calculator

These results are not carried through to any of the other worksheets

DRY BULK DENSITY DATA

Variable	Value	Unit	justification
Natural Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Dry Bulk Density	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
Initial Saturation	#DIV/0!	%	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	
Water Filled Porosity	**#DIV/0!**	**fraction**	

WET BULK DENSITY DATA

Variable	Value	Unit	
Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Actual (wet) Bulk Density (i.e. at natural MC)	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
dry bulk density	0.00	tonnes/m^3	
Initial Saturation	#DIV/0!	%	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	**#DIV/0!**
Water Filled Porosity	**#DIV/0!**	**fraction**	

Analytical solutions provided by David Hall, Golder Associates (UK) Ltd

Simple hydrogeological calculations

(These are not specific to, or required in, the Remedial Targets Methodology)

Parameter	symbol		unit	justification
Hydraulic conductivity	K	0.00E+00	m/d	
Hydraulic gradient	i	0.00E+00	unitless	
Effective porosity of aquifer	n	0.00E+00	fraction	
Thickness of saturated aquifer	b	0.00E+00	m	
Width of aquifer perpendicular to flow	w	0.00E+00	m	
Distance to receptor	x	0.00E+00	m	
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Soil-water partition co-efficient	Kd	0.00E+00	l/kg	
Retardation factor of pollutant	R	#DIV/0!		

Groundwater flow velocity	v(GW)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for groundwater to reach receptor	t(GW)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years
Rate of groundwater flow through aquifer	Q	0.00E+00	m^3/s	0.00E+00	m^3/day	0.00E+00	m^3/year

Contaminant flow velocity	v(contam)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for contaminant to reach receptor	t(contam)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years

Level 1 Calculation Sheet

Contaminant Tetrachloroethene

Parameter	Value	Units
(carried over from input sheet)		
C_T	1.00E-02	mg/l
Kd	0.00E+00	l/kg
foc		fraction
koc		l/kg
θ_W	0.00E+00	fraction
θa	0.00E+00	fraction
ρ	0.00E+00	g/cm3
H	0.00E+00	dimensionless
Koc,n		l/kg
Koc,i		l/kg
pH		pH units
pKa		
foc (ionic)		fraction

Calculations (Refer toTable 4.3, R&D Publication 20)

Selected option User specified value for partition coefficient

calc calc Calc Kd l/kg

Calculation of partition coefficient for ionic organic chemical

Partition coefficient used in Level 1 Assessment 0.00E+00 l/kg

Calculated Remedial Target #DIV/0! mg/kg for Tetrachloroethene

Factor (partitioning between soil and water) #DIV/0!

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11/12/2025
Version:	1

Level 2 Calculation Sheet

Contaminant Tetrachloroethene

Site assessed:	Kelvedon Stre
Date:	11/12/2025
Version:	1

Parameter	Value	Units		
(carried over from input sheet)				
Mz	0.00E+00	m		
L	0.00E+00	m		
da	0.00E+00	m		Calculated Dilution Factor
Inf	0.00E+00	m/d		
K	0.00E+00	m/d		
i	0.00E+00		Calculation based on target concentration	#DIV/0!
A	0.00E+00	m3/d m2 m3/d	Calculation based on observed contaminant concentration	#DIV/0!
Cc	0.00E+00	mg/l		
C_T	1.00E-02	mg/l		
Cu	0.00E+00	mg/l		
w	0.00E+00	m		



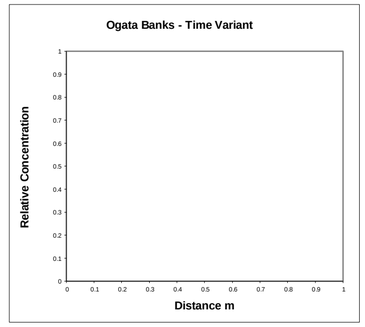
Contaminant Tetrachloroethene

OGATA BANKS SOLUTION

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-02	mg/l
DF	#DIV/0!	
λ	6.931E-101	days^{-1}
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Calc	Value	
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) -USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

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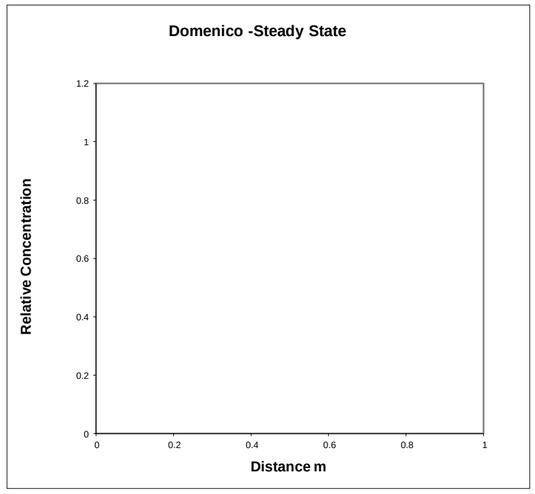
Contaminant trachloroethene

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-02	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

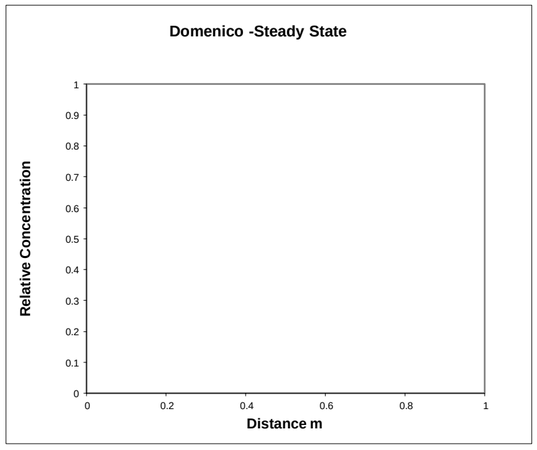


Calc	Value	Units
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



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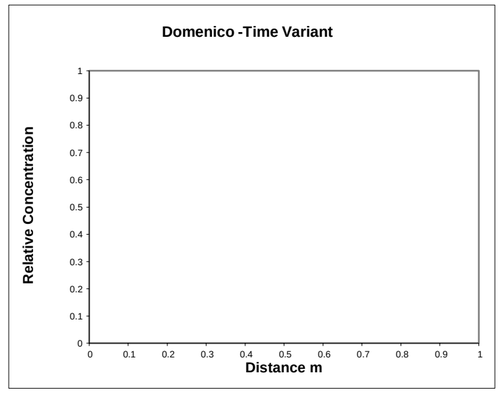
DOMENICO (TIME VARIANT)

Contaminant **trachloroethene**

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	**Value**	**Units**
C_T	0.01	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

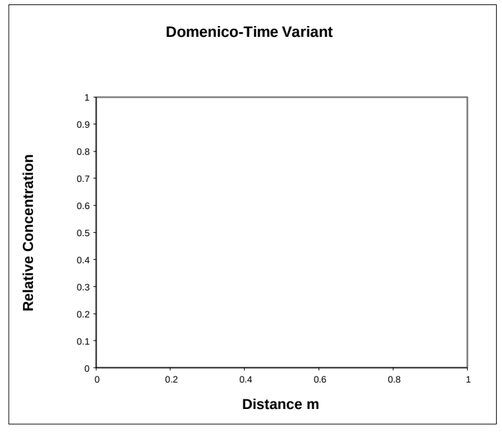


Calc **Value**

v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Date:	11/12/2025
Version:	1

OGATA BANKS SOLUTION

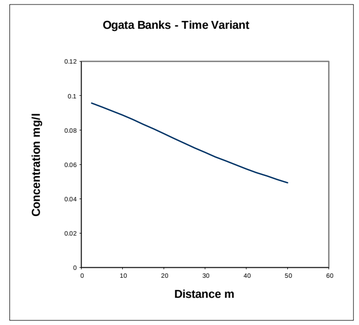
Contaminant Tetrachloroethene

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.01	mg/l
Co	9.80E-02	mg/l
λ	2.95E-04	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	2.43E+03	l/kg
ρ	1.60E+00	g/cm3
n	4.40E-01	
i	4.40E-02	
K	2.59E+03	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

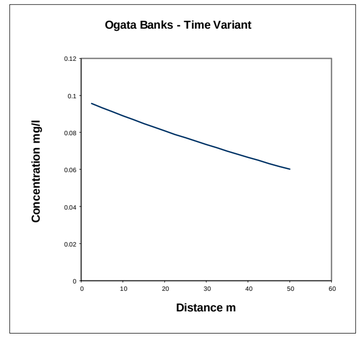
	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.01225	-2.4E-02	9.8E-01	-4.2E+48	2.000	5.2E-01	1.7E+00	4.2E+48	0.000	1.7E+01	1	-1.7E+01	-1	4.2E+00	1	-4.2E+00	-1	9.57E-02
2	5	0.01225	-4.8E-02	9.5E-01	-4.2E+48	2.000	1.0E+00	2.9E+00	4.2E+48	0.000	1.2E+01	1	-1.2E+01	-1	3.0E+00	1	-3.0E+00	-0.99997	9.34E-02
3	7.5	0.01225	-7.2E-02	9.3E-01	-4.2E+48	2.000	1.6E+00	4.8E+00	4.2E+48	0.000	9.7E+00	1	-9.7E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	9.11E-02
4	10	0.01225	-9.6E-02	9.1E-01	-4.2E+48	2.000	2.1E+00	8.1E+00	4.2E+48	0.000	8.4E+00	1	-8.4E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	8.88E-02
5	12.5	0.01225	-1.2E-01	8.9E-01	-4.2E+48	2.000	2.6E+00	1.4E+01	4.2E+48	0.000	7.5E+00	1	-7.5E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	8.62E-02
6	15	0.01225	-1.4E-01	8.7E-01	-4.2E+48	2.000	3.1E+00	2.3E+01	4.2E+48	0.000	6.8E+00	1	-6.8E+00	-1	1.7E+00	0.984	-1.7E+00	-0.98399	8.35E-02
7	17.5	0.01225	-1.7E-01	8.5E-01	-4.2E+48	2.000	3.7E+00	3.9E+01	4.2E+48	0.000	6.3E+00	1	-6.3E+00	-1	1.6E+00	0.9743	-1.6E+00	-0.97425	8.07E-02
8	20	0.01225	-1.9E-01	8.3E-01	-4.2E+48	2.000	4.2E+00	6.6E+01	4.2E+48	0.000	5.9E+00	1	-5.9E+00	-1	1.5E+00	0.963	-1.5E+00	-0.96302	7.79E-02
9	22.5	0.01225	-2.2E-01	8.1E-01	-4.2E+48	2.000	4.7E+00	1.1E+02	4.2E+48	0.000	5.6E+00	1	-5.6E+00	-1	1.4E+00	0.9508	-1.4E+00	-0.95078	7.51E-02
10	25	0.01225	-2.4E-01	7.9E-01	-4.2E+48	2.000	5.2E+00	1.9E+02	4.2E+48	0.000	5.3E+00	1	-5.3E+00	-1	1.3E+00	0.9379	-1.3E+00	-0.93792	7.23E-02
11	27.5	0.01225	-2.6E-01	7.7E-01	-4.2E+48	2.000	5.8E+00	3.2E+02	4.2E+48	0.000	5.1E+00	1	-5.1E+00	-1	1.3E+00	0.9247	-1.3E+00	-0.92475	6.96E-02
12	30	0.01225	-2.9E-01	7.5E-01	-4.2E+48	2.000	6.3E+00	5.4E+02	4.2E+48	0.000	4.8E+00	1	-4.8E+00	-1	1.2E+00	0.9115	-1.2E+00	-0.91147	6.70E-02
13	32.5	0.01225	-3.1E-01	7.3E-01	-4.2E+48	2.000	6.8E+00	9.1E+02	4.2E+48	0.000	4.7E+00	1	-4.7E+00	-1	1.2E+00	0.8982	-1.2E+00	-0.89824	6.45E-02
14	35	0.01225	-3.4E-01	7.1E-01	-4.2E+48	2.000	7.3E+00	1.5E+03	4.2E+48	0.000	4.5E+00	1	-4.5E+00	-1	1.1E+00	0.8852	-1.1E+00	-0.88517	6.20E-02
15	37.5	0.01225	-3.6E-01	7.0E-01	-4.2E+48	2.000	7.9E+00	2.6E+03	4.2E+48	0.000	4.3E+00	1	-4.3E+00	-1	1.1E+00	0.8723	-1.1E+00	-0.87233	5.97E-02
16	40	0.01225	-3.8E-01	6.8E-01	-4.2E+48	2.000	8.4E+00	4.4E+03	4.2E+48	0.000	4.2E+00	1	-4.2E+00	-1	1.0E+00	0.8598	-1.0E+00	-0.85979	5.74E-02
17	42.5	0.01225	-4.1E-01	6.7E-01	-4.2E+48	2.000	8.9E+00	7.4E+03	4.2E+48	0.000	4.1E+00	1	-4.1E+00	-1	1.0E+00	0.8476	-1.0E+00	-0.84756	5.53E-02
18	45	0.01225	-4.3E-01	6.5E-01	-4.2E+48	2.000	9.4E+00	1.2E+04	4.2E+48	0.000	4.0E+00	1	-4.0E+00	-1	9.8E-01	0.8357	-9.8E-01	-0.83567	5.32E-02
19	47.5	0.01225	-4.6E-01	6.3E-01	-4.2E+48	2.000	1.0E+01	2.1E+04	4.2E+48	0.000	3.8E+00	1	-3.8E+00	-1	9.6E-01	0.8241	-9.6E-01	-0.82412	5.12E-02
20	50	0.01225	-4.8E-01	6.2E-01	-4.2E+48	2.000	1.0E+01	3.6E+04	4.2E+48	0.000	3.8E+00	1	-3.8E+00	-1	9.3E-01	0.8129	-9.3E-01	-0.81292	4.93E-02



Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

Calc	Value	
v	2.59E+02	m/d
Rc	8.84E+03	
u	2.93E-02	m/d

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.01225	-2.4E-02	9.8E-01	-4.2E+48	2.000	5.2E-01	1.7E+00	4.2E+48	0.000	1.7E+01	1	-1.7E+01	-1	8.3E+00	1	-8.3E+00	-1	9.57E-02
2	5	0.01225	-4.8E-02	9.5E-01	-4.2E+48	2.000	1.0E+00	2.9E+00	4.2E+48	0.000	1.2E+01	1	-1.2E+01	-1	5.9E+00	1	-5.9E+00	-1	9.34E-02
3	7.5	0.01225	-7.2E-02	9.3E-01	-4.2E+48	2.000	1.6E+00	4.8E+00	4.2E+48	0.000	9.7E+00	1	-9.7E+00	-1	4.8E+00	1	-4.8E+00	-1	9.12E-02
4	10	0.01225	-9.6E-02	9.1E-01	-4.2E+48	2.000	2.1E+00	8.1E+00	4.2E+48	0.000	8.4E+00	1	-8.4E+00	-1	4.2E+00	1	-4.2E+00	-1	8.90E-02
5	12.5	0.01225	-1.2E-01	8.9E-01	-4.2E+48	2.000	2.6E+00	1.4E+01	4.2E+48	0.000	7.5E+00	1	-7.5E+00	-1	3.7E+00	1	-3.7E+00	-1	8.69E-02
6	15	0.01225	-1.4E-01	8.7E-01	-4.2E+48	2.000	3.1E+00	2.3E+01	4.2E+48	0.000	6.8E+00	1	-6.8E+00	-1	3.4E+00	1	-3.4E+00	-1	8.49E-02
7	17.5	0.01225	-1.7E-01	8.5E-01	-4.2E+48	2.000	3.7E+00	3.9E+01	4.2E+48	0.000	6.3E+00	1	-6.3E+00	-1	3.2E+00	1	-3.2E+00	-0.99999	8.29E-02
8	20	0.01225	-1.9E-01	8.3E-01	-4.2E+48	2.000	4.2E+00	6.6E+01	4.2E+48	0.000	5.9E+00	1	-5.9E+00	-1	3.0E+00	1	-3.0E+00	-0.99997	8.09E-02
9	22.5	0.01225	-2.2E-01	8.1E-01	-4.2E+48	2.000	4.7E+00	1.1E+02	4.2E+48	0.000	5.6E+00	1	-5.6E+00	-1	2.8E+00	0.9999	-2.8E+00	-0.99992	7.90E-02
10	25	0.01225	-2.4E-01	7.9E-01	-4.2E+48	2.000	5.2E+00	1.9E+02	4.2E+48	0.000	5.3E+00	1	-5.3E+00	-1	2.6E+00	0.9998	-2.6E+00	-0.99981	7.71E-02
11	27.5	0.01225	-2.6E-01	7.7E-01	-4.2E+48	2.000	5.8E+00	3.2E+02	4.2E+48	0.000	5.1E+00	1	-5.1E+00	-1	2.5E+00	0.9996	-2.5E+00	-0.99963	7.53E-02
12	30	0.01225	-2.9E-01	7.5E-01	-4.2E+48	2.000	6.3E+00	5.4E+02	4.2E+48	0.000	4.8E+00	1	-4.8E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	7.35E-02
13	32.5	0.01225	-3.1E-01	7.3E-01	-4.2E+48	2.000	6.8E+00	9.1E+02	4.2E+48	0.000	4.7E+00	1	-4.7E+00	-1	2.3E+00	0.9989	-2.3E+00	-0.99893	7.17E-02
14	35	0.01225	-3.4E-01	7.1E-01	-4.2E+48	2.000	7.3E+00	1.5E+03	4.2E+48	0.000	4.5E+00	1	-4.5E+00	-1	2.2E+00	0.9984	-2.2E+00	-0.99839	6.99E-02
15	37.5	0.01225	-3.6E-01	7.0E-01	-4.2E+48	2.000	7.9E+00	2.6E+03	4.2E+48	0.000	4.3E+00	1	-4.3E+00	-1	2.2E+00	0.9977	-2.2E+00	-0.99769	6.82E-02
16	40	0.01225	-3.8E-01	6.8E-01	-4.2E+48	2.000	8.4E+00	4.4E+03	4.2E+48	0.000	4.2E+00	1	-4.2E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	6.66E-02
17	42.5	0.01225	-4.1E-01	6.7E-01	-4.2E+48	2.000	8.9E+00	7.4E+03	4.2E+48	0.000	4.1E+00	1	-4.1E+00	-1	2.0E+00	0.9958	-2.0E+00	-0.99579	6.49E-02
18	45	0.01225	-4.3E-01	6.5E-01	-4.2E+48	2.000	9.4E+00	1.2E+04	4.2E+48	0.000	4.0E+00	1	-4.0E+00	-1	2.0E+00	0.9946	-2.0E+00	-0.99459	6.33E-02
19	47.5	0.01225	-4.6E-01	6.3E-01	-4.2E+48	2.000	1.0E+01	2.1E+04	4.2E+48	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9932	-1.9E+00	-0.99321	6.17E-02
20	50	0.01225	-4.8E-01	6.2E-01	-4.2E+48	2.000	1.0E+01	3.6E+04	4.2E+48	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	6.02E-02



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	9.57E-02
5.0	9.34E-02
7.5	9.12E-02
10.0	8.90E-02
12.5	8.69E-02
15.0	8.49E-02
17.5	8.29E-02
20.0	8.09E-02
22.5	7.90E-02
25.0	7.71E-02
27.5	7.53E-02
30.0	7.35E-02
32.5	7.17E-02
35.0	6.99E-02
37.5	6.82E-02
40.0	6.66E-02
42.5	6.49E-02
45.0	6.33E-02
47.5	6.17E-02
50.0	6.02E-02

Contaminant **trachloroethene**

Input	Value	Units
C_T	0.01	mg/l
Co	9.80E-02	mg/l
λ	2.95E-04	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	2.43E+03	l/kg
ρ	1.60E+00	g/cm3
n	4.40E-01	
i	4.40E-02	
K	2.59E+03	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

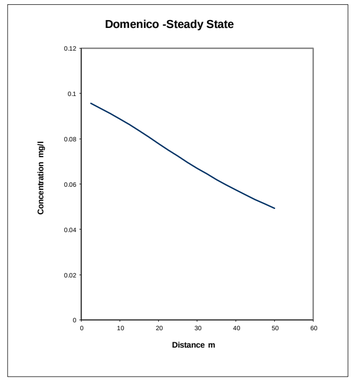
Vertical dispersion optio Simulate vertical dispersion in 1 direction

Calc	Value	
v	2.59E+02	m/d
Rc	8.84E+03	
u	2.93E-02	m/d

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

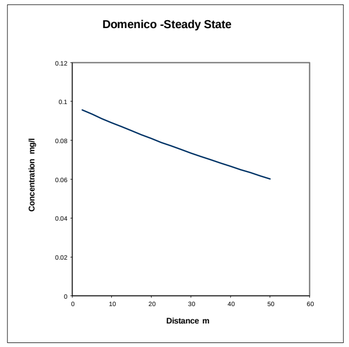
	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.0245	-2.40E-02	9.76E-01	1.68E+01	1	-1.68E+01	-1	4.17E+00	1	-4.17E+00	-1	9.57E-02
2	5	0.0245	-4.79E-02	9.53E-01	1.19E+01	1	-1.19E+01	-1	2.95E+00	1	-2.95E+00	-1	9.34E-02
3	7.5	0.0245	-7.19E-02	9.31E-01	9.68E+00	1	-9.68E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	9.11E-02
4	10	0.0245	-9.59E-02	9.09E-01	8.39E+00	1	-8.39E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	8.88E-02
5	12.5	0.0245	-1.20E-01	8.87E-01	7.50E+00	1	-7.50E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	8.62E-02
6	15	0.0245	-1.44E-01	8.66E-01	6.85E+00	1	-6.85E+00	-1	1.70E+00	0.984	-1.70E+00	-0.984	8.35E-02
7	17.5	0.0245	-1.68E-01	8.46E-01	6.34E+00	1	-6.34E+00	-1	1.58E+00	0.9743	-1.58E+00	-0.9743	8.07E-02
8	20	0.0245	-1.92E-01	8.25E-01	5.93E+00	1	-5.93E+00	-1	1.48E+00	0.963	-1.48E+00	-0.963	7.79E-02
9	22.5	0.0245	-2.16E-01	8.06E-01	5.59E+00	1	-5.59E+00	-1	1.39E+00	0.9508	-1.39E+00	-0.9508	7.51E-02
10	25	0.0245	-2.40E-01	7.87E-01	5.30E+00	1	-5.30E+00	-1	1.32E+00	0.9379	-1.32E+00	-0.9379	7.23E-02
11	27.5	0.0245	-2.64E-01	7.68E-01	5.06E+00	1	-5.06E+00	-1	1.26E+00	0.9247	-1.26E+00	-0.9247	6.96E-02
12	30	0.0245	-2.88E-01	7.50E-01	4.84E+00	1	-4.84E+00	-1	1.20E+00	0.9115	-1.20E+00	-0.9115	6.70E-02
13	32.5	0.0245	-3.12E-01	7.32E-01	4.65E+00	1	-4.65E+00	-1	1.16E+00	0.8982	-1.16E+00	-0.8982	6.45E-02
14	35	0.0245	-3.36E-01	7.15E-01	4.48E+00	1	-4.48E+00	-1	1.11E+00	0.8852	-1.11E+00	-0.8852	6.20E-02
15	37.5	0.0245	-3.60E-01	6.98E-01	4.33E+00	1	-4.33E+00	-1	1.08E+00	0.8723	-1.08E+00	-0.8723	5.97E-02
16	40	0.0245	-3.84E-01	6.81E-01	4.19E+00	1	-4.19E+00	-1	1.04E+00	0.8598	-1.04E+00	-0.8598	5.74E-02
17	42.5	0.0245	-4.08E-01	6.65E-01	4.07E+00	1	-4.07E+00	-1	1.01E+00	0.8476	-1.01E+00	-0.8476	5.53E-02
18	45	0.0245	-4.31E-01	6.50E-01	3.95E+00	1	-3.95E+00	-1	9.83E-01	0.8357	-9.83E-01	-0.8357	5.32E-02
19	47.5	0.0245	-4.55E-01	6.34E-01	3.85E+00	1	-3.85E+00	-1	9.57E-01	0.8241	-9.57E-01	-0.8241	5.12E-02
20	50	0.0245	-4.79E-01	6.19E-01	3.75E+00	1	-3.75E+00	-1	9.33E-01	0.8129	-9.33E-01	-0.8129	4.93E-02



DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.0245	-2.40E-02	9.76E-01	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	9.57E-02
2	5	0.0245	-4.79E-02	9.53E-01	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	9.34E-02
3	7.5	0.0245	-7.19E-02	9.31E-01	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	9.12E-02
4	10	0.0245	-9.59E-02	9.09E-01	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	8.90E-02
5	12.5	0.0245	-1.20E-01	8.87E-01	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	8.69E-02
6	15	0.0245	-1.44E-01	8.66E-01	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	8.49E-02
7	17.5	0.0245	-1.68E-01	8.46E-01	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	8.29E-02
8	20	0.0245	-1.92E-01	8.25E-01	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	8.09E-02
9	22.5	0.0245	-2.16E-01	8.06E-01	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-0.9999	7.90E-02
10	25	0.0245	-2.40E-01	7.87E-01	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-0.9998	7.71E-02
11	27.5	0.0245	-2.64E-01	7.68E-01	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-0.9996	7.53E-02
12	30	0.0245	-2.88E-01	7.50E-01	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	7.35E-02
13	32.5	0.0245	-3.12E-01	7.32E-01	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.9989	7.17E-02
14	35	0.0245	-3.36E-01	7.15E-01	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.9984	6.99E-02
15	37.5	0.0245	-3.60E-01	6.98E-01	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.9977	6.82E-02
16	40	0.0245	-3.84E-01	6.81E-01	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	6.66E-02
17	42.5	0.0245	-4.08E-01	6.65E-01	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.9958	6.49E-02
18	45	0.0245	-4.31E-01	6.50E-01	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.9946	6.33E-02
19	47.5	0.0245	-4.55E-01	6.34E-01	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.9932	6.17E-02
20	50	0.0245	-4.79E-01	6.19E-01	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	6.02E-02



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	9.57E-02
5.0	9.34E-02
7.5	9.12E-02
10.0	8.90E-02
12.5	8.69E-02
15.0	8.49E-02
17.5	8.29E-02
20.0	8.09E-02
22.5	7.90E-02
25.0	7.71E-02
27.5	7.53E-02
30.0	7.35E-02
32.5	7.17E-02
35.0	6.99E-02
37.5	6.82E-02
40.0	6.66E-02
42.5	6.49E-02
45.0	6.33E-02
47.5	6.17E-02
50.0	6.02E-02

DOMENICO (TIME VARIANT)

Contaminant trachloroethene

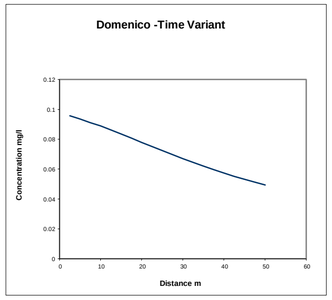
Input	Value	Units
C_T	0.01	mg/l
Co	9.80E-02	mg/l
λ	2.95E-04	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	2.43E+03	l/kg
ρ	1.60E+00	g/cm3
n	4.40E-01	
i	4.40E-02	
K	2.59E+03	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

Calc	Value	
v	2.59E+02	m/d
Rc	8.84E+03	
u	2.93E-02	m/d

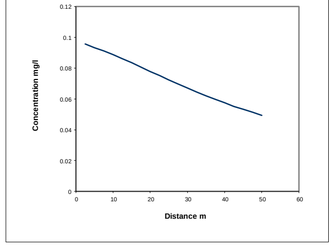
Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.01225	-2.40E-02	9.76E-01	-4.18E+48	2	1.68E+01	1	-1.68E+01	-1	4.17E+00	1	-4.17E+00	-1	9.57E-02
2	5	0.01225	-4.79E-02	9.53E-01	-4.18E+48	2	1.19E+01	1	-1.19E+01	-1	2.95E+00	1	-2.95E+00	-1	9.34E-02
3	7.5	0.01225	-7.19E-02	9.31E-01	-4.18E+48	2	9.68E+00	1	-9.68E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	9.11E-02
4	10	0.01225	-9.59E-02	9.09E-01	-4.18E+48	2	8.39E+00	1	-8.39E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	8.88E-02
5	12.5	0.01225	-1.20E-01	8.87E-01	-4.18E+48	2	7.50E+00	1	-7.50E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	8.62E-02
6	15	0.01225	-1.44E-01	8.66E-01	-4.18E+48	2	6.85E+00	1	-6.85E+00	-1	1.70E+00	0.984	-1.70E+00	-0.984	8.35E-02
7	17.5	0.01225	-1.68E-01	8.46E-01	-4.18E+48	2	6.34E+00	1	-6.34E+00	-1	1.58E+00	0.9743	-1.58E+00	-0.974	8.07E-02
8	20	0.01225	-1.92E-01	8.25E-01	-4.18E+48	2	5.93E+00	1	-5.93E+00	-1	1.48E+00	0.963	-1.48E+00	-0.963	7.79E-02
9	22.5	0.01225	-2.16E-01	8.06E-01	-4.18E+48	2	5.59E+00	1	-5.59E+00	-1	1.39E+00	0.9508	-1.39E+00	-0.951	7.51E-02
10	25	0.01225	-2.40E-01	7.87E-01	-4.18E+48	2	5.30E+00	1	-5.30E+00	-1	1.32E+00	0.9379	-1.32E+00	-0.938	7.23E-02
11	27.5	0.01225	-2.64E-01	7.68E-01	-4.18E+48	2	5.06E+00	1	-5.06E+00	-1	1.26E+00	0.9247	-1.26E+00	-0.925	6.96E-02
12	30	0.01225	-2.88E-01	7.50E-01	-4.18E+48	2	4.84E+00	1	-4.84E+00	-1	1.20E+00	0.9115	-1.20E+00	-0.911	6.70E-02
13	32.5	0.01225	-3.12E-01	7.32E-01	-4.18E+48	2	4.65E+00	1	-4.65E+00	-1	1.16E+00	0.8982	-1.16E+00	-0.898	6.45E-02
14	35	0.01225	-3.36E-01	7.15E-01	-4.18E+48	2	4.48E+00	1	-4.48E+00	-1	1.11E+00	0.8852	-1.11E+00	-0.885	6.20E-02
15	37.5	0.01225	-3.60E-01	6.98E-01	-4.18E+48	2	4.33E+00	1	-4.33E+00	-1	1.08E+00	0.8723	-1.08E+00	-0.872	5.97E-02
16	40	0.01225	-3.84E-01	6.81E-01	-4.18E+48	2	4.19E+00	1	-4.19E+00	-1	1.04E+00	0.8598	-1.04E+00	-0.86	5.74E-02
17	42.5	0.01225	-4.08E-01	6.65E-01	-4.18E+48	2	4.07E+00	1	-4.07E+00	-1	1.01E+00	0.8476	-1.01E+00	-0.848	5.53E-02
18	45	0.01225	-4.31E-01	6.50E-01	-4.18E+48	2	3.95E+00	1	-3.95E+00	-1	9.83E-01	0.8357	-9.83E-01	-0.836	5.32E-02
19	47.5	0.01225	-4.55E-01	6.34E-01	-4.18E+48	2	3.85E+00	1	-3.85E+00	-1	9.57E-01	0.8241	-9.57E-01	-0.824	5.12E-02
20	50	0.01225	-4.79E-01	6.19E-01	-4.18E+48	2	3.75E+00	1	-3.75E+00	-1	9.33E-01	0.8129	-9.33E-01	-0.813	4.93E-02



Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.01225	-2.40E-02	9.76E-01	-4.18E+48	2	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	9.57E-02
2	5	0.01225	-4.79E-02	9.53E-01	-4.18E+48	2	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	9.34E-02
3	7.5	0.01225	-7.19E-02	9.31E-01	-4.18E+48	2	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	9.12E-02
4	10	0.01225	-9.59E-02	9.09E-01	-4.18E+48	2	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	8.90E-02
5	12.5	0.01225	-1.20E-01	8.87E-01	-4.18E+48	2	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	8.69E-02
6	15	0.01225	-1.44E-01	8.66E-01	-4.18E+48	2	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	8.49E-02
7	17.5	0.01225	-1.68E-01	8.46E-01	-4.18E+48	2	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	8.29E-02
8	20	0.01225	-1.92E-01	8.25E-01	-4.18E+48	2	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	8.09E-02
9	22.5	0.01225	-2.16E-01	8.06E-01	-4.18E+48	2	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-1	7.90E-02
10	25	0.01225	-2.40E-01	7.87E-01	-4.18E+48	2	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-1	7.71E-02
11	27.5	0.01225	-2.64E-01	7.68E-01	-4.18E+48	2	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-1	7.53E-02
12	30	0.01225	-2.88E-01	7.50E-01	-4.18E+48	2	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	7.35E-02
13	32.5	0.01225	-3.12E-01	7.32E-01	-4.18E+48	2	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.999	7.17E-02
14	35	0.01225	-3.36E-01	7.15E-01	-4.18E+48	2	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.998	6.99E-02
15	37.5	0.01225	-3.60E-01	6.98E-01	-4.18E+48	2	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.998	6.82E-02
16	40	0.01225	-3.84E-01	6.81E-01	-4.18E+48	2	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	6.66E-02
17	42.5	0.01225	-4.08E-01	6.65E-01	-4.18E+48	2	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.996	6.49E-02
18	45	0.01225	-4.31E-01	6.50E-01	-4.18E+48	2	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.995	6.33E-02
19	47.5	0.01225	-4.55E-01	6.34E-01	-4.18E+48	2	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.993	6.17E-02
20	50	0.01225	-4.79E-01	6.19E-01	-4.18E+48	2	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	6.02E-02



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	9.57E-02
5.0	9.34E-02
7.5	9.12E-02
10.0	8.90E-02
12.5	8.69E-02
15.0	8.49E-02
17.5	8.29E-02
20.0	8.09E-02
22.5	7.90E-02
25.0	7.71E-02
27.5	7.53E-02
30.0	7.35E-02
32.5	7.17E-02
35.0	6.99E-02
37.5	6.82E-02
40.0	6.66E-02
42.5	6.49E-02
45.0	6.33E-02
47.5	6.17E-02
50.0	6.02E-02

Hydrogeological risk assessment for land contamination

Remedial Targets Worksheet , Release 3.2

First released: 2006. Version 3.2: January 2013

This worksheet has been produced in combination with the document 'Remedial Targets Methodology: Hydrogeological risk assessment for land contamination (Environment Agency 2006).

Users of this worksheet should always refer to the User Manual to the Remedial Targets Methodology and to relevant guidance on UK legislation and policy, in order to understand how this procedure should be applied in an appropriate context.

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The calculation of equations in this worksheet has been independently checked by Entec (UK) Ltd on behalf of the Environment Agency.

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IMPORTANT: To enable MS Excel worksheet, click Tools, Add -Ins, Analysis Tool Pak and Analysis Tool Pak-VBA (to calculate error functions).

Details to be completed for each assessment				
Site Name:	Kelvedon Street			
Site Address:	Newport			
Completed by:	Michael Watkins			
Date:	11-Dec-25		Version:	1
Contaminant	Tetrachloroethene			
Target Concentration (C_T)	0.01	mg/l	Origin of C_T:	WFD for inland surface waters (annual average)

This worksheet can be used to determine remedial targets for soils (Worksheets Level 1 Soil, Level 2 and Level 3 Soil) or to determine remedial targets for groundwater (Level 3 Groundwater). For Level 3, parameter values must be entered separately dependent on whether the assessment is for soil or groundwater. For soil, remedial targets are calculated as either mg/kg (for comparision with soil measurements) or mg/l (for comparison with leaching tests or pore water concentrations).
Site details entered on this page are automatically copied to Level 1, 2 and 3 Worksheets.
Worksheet options are identified by brown background and employ a pull-down menus. Data entry are identified as blue background.
Data origin / justification should be noted in cells coloured yellow and fully documented in subsequent reports.
Data carried forward from an earlier worksheet are identified by a light green background
It is recommended that a copy of the original worksheet is saved (all data fields in the original copy are blank).

The spreadsheet also includes a porosity calculation worksheet, a soil impact calculation worksheet and a worksheet that performs some simple hydrogeological calculations.

Remedial Targets Worksheet , Release 3.2

Level 1 - Soil

Select the method of calculating the soil water Partition Co-efficient by using the pull down menu below

User specified value for partition coefficient

Contaminant		**Tetrachloroethene**	
Target concentration	C_T	**0.01**	**mg/l**

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**
Standard entry				
Water filled soil porosity	θ_w	0.00E+00	fraction	
Air filled soil porosity	θa	0.00E+00	fraction	
Bulk density of soil zone material	ρ	0.00E+00	g/cm^3	
Henry's Law constant	H	0.00E+00	dimensionless	
Entry if specify partition coefficient (option)				
Soil water partition coefficient	Kd	0.00E+00	l/kg	
Entry for non-polar organic chemicals (option)				
Fraction of organic carbon (in soil)	foc		fraction	
Organic carbon partition coefficient	Koc		l/kg	
Entry for ionic organic chemicals (option)				
Sorption coefficient for neutral species	$K_{oc,n}$		l/kg	
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg	
pH value	pH		pH units	
Acid dissociation constant	pKa			
Fraction of organic carbon (in soil)	foc		fraction	

This sheet calculates the Level 1 remedial target for soils(mg/kg) based on a selected target concentration and theoretical calculation of soil water partitioning. Three options are included for determining the partition coefficient.

The measured soil concentration as mg/kg should be compared with the Level 1 remedial target to determine the need for further action.

Soil water partition coefficient used in Level Assessment	**Kd**	**0.00E+00**	**l/kg**	*Specified value*

Level 1 Remedial Target

Level 1 Remedial Target	**#DIV/0!**	**mg/kg**	**(for comparison with soil analyses)**
	or		
	0.01	**mg/l**	**(for comparison with leachate test results)**

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 2 - Soil

Contaminant		**Tetrachloroethene**		from Level 1
Target concentration	C_T	**0.01**	**mg/l**	from Level 1

This sheet calculates the Level 2 remedial target for soils (mg/kg) or for pore water (mg/l).

The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 2 remedial target to determine the need for further action. Equations presented in 'Hydrogeological risk assessment for land contamiantion' (Environment Agency 2006)

Input Parameters	Variable	Value	Unit	Source of parameter value	
Standard entry					
Infiltration	Inf	0.00E+00	m/d		
Area of contaminant source	A	0.00E+00	m^2		Not used in calculation
Entry for groundwater flow below site					
Length of contaminant source in direction of groundwater flow	L	0.00E+00	m		
Saturated aquifer thickness	da	0.00E+00	m		
Hydraulic Conductivity of aquifer in which dilution occurs	K	0.00E+00	m/d		
Hydraulic gradient of water table	i	0.00E+00	fraction		
Width of contaminant source perpendicular to groundwater flow	w	0.00E+00	m		Not used in calculation
Background concentration of contaminant in groundwater beneath site	Cu	0.00E+00	mg/l		
Define mixing zone depth by specifying or calculating depth (using pull down list)		**Specify**			
Enter mixing zone thickness	Mz	0.00E+00	m		
Calculated mixing zone thickness	Mz		m		

Calculated Parameters

Dilution Factor	**DF**	**#DIV/0!**		
Level 2 Remedial Target		**#DIV/0!**	**mg/l**	**For comparison with measured pore water concentration. This assumes Level 1 Remedial Target is based on Target Concentration.**
		or		
		#DIV/0!	**mg/kg**	**For comparison with measured soil concentration. This assumes Level 1 Remedial Target calculated from soil-water**

Additional option

Calculation of impact on receptor

Concentration of contaminant in contaminated discharge (entering receptor)	Cc	0.00E+00	mg/l	
Calculated concentration within receptor (dilution only)		#DIV/0!	mg/l	0

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 3 - Soil

See Note

Input Parameters	Variable	Value	Unit	Source
Contaminant		Tetrachloroethene		from Level 1
Target Concentration	C_T	0.01	mg/l	from Level 1
Dilution Factor	DF	#DIV/0!		from Level 2

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value)

	Variable	Value	Unit	Source of parameter value
Enter source concentration		Soil concentration as mg/kg		
Enter soil concentration		0	mg/kg	
Half life for degradation of contaminant in water	$t_{1/2}$	1.00E+100	days	
Calculated decay rate	λ	6.93E-101	$days^{-1}$	calculated
Width of plume in aquifer at source	Sz	0.00E+00	m	from Level 2
Plume thickness in aquifer at source	Sy	0.00E+00	m	from Level 2
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Effective porosity of aquifer	n	0.00E+00	fraction	
Hydraulic gradient	i	#DIV/0!	fraction	from Level 2 (adjusted)
Hydraulic conductivity of saturated aquifer	K	0.00E+00	m/d	from Level 2
Distance to compliance point	x	0.00E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	1.00E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	0.00E+00	l/kg	*see options*
Longitudinal dispersivity	ax	0.000	m	*see options*
Transverse dispersivity	az	0.000	m	*see options*
Vertical dispersivity	ay	0.000	m	*see options*

Parameter values should be checked against Level 1 and 2

Calculated Parameters	Variable		
Groundwater flow velocity	v	#DIV/0!	m/d
Retardation factor	Rf	#DIV/0!	fraction
Decay rate used	λ	6.93E-101	d^{-1}
Hydraulic gradient used in aquifer flow down-gradient	i	#DIV/0!	fraction
Rate of contaminant flow due to retardation	u	#DIV/0!	m/d
Ratio of Compliance Point to Source Concentration	C_{cp}/C_0	#DIV/0!	fraction
Attenuation factor (C_0/C_{cp})	**AF**	**#DIV/0!**	**fraction**
Calculated soil leachate concentration	Co	#DIV/0!	mg/l

Remedial Targets

Level 3 Remedial Target	**#DIV/0!**	**mg/l**	For comparison with measured pore water concentration.
Ogata Banks	**or**		This assumes Level 1 Remedial Target is based on Target Concentration.
	#DIV/0!	**mg/kg**	For comparison with measured soil concentration. This
Distance to compliance point	**0**	**m**	assumes Level 1 Remedial Target calculated from soil-water partitioning equation.
Ratio of Compliance Point to Source Concentration	**#DIV/0!**	**fraction**	Ogata Banks

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99

Enter method of defining partition co-efficient (using pull down list)

Calculate for ionic organic chemicals (acids)

Entry if specify partition coefficient (option)

Soil water partition coefficient	Kd	l/kg

Entry for non-polar organic chemicals (option)

Fraction of organic carbon in aquifer	foc	fraction
Organic carbon partition coefficient	Koc	l/kg

Entry for ionic organic chemicals (option)

Sorption coefficient for related species	$K_{oc,n}$	0.00E+00	l/kg
Sorption coefficient for ionised species	$K_{oc,i}$	0.00E+00	l/kg
pH value	pH	0.00E+00	
Acid dissociation constant	pKa	0.00E+00	
Fraction of organic carbon in aquifer	foc	0.00E+00	fraction
Soil water partition coefficient	Kd	0.00E+00	l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

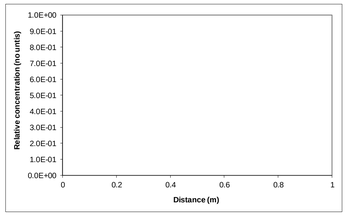
		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	0.00E+00	#NUM!	m
Transverse dispersivity	**az**	0.00E+00	0.00E+00	#NUM!	m
Vertical dispersivity	**ay**	0.00E+00	0.00E+00	#NUM!	m

Note values of dispersivity must be > 0

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed

Note
This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O_2, NO_3, SO_4 etc than an alternative solution should be used

Environment Agency



Note: 'Relative concentration' is the ratio of calculated concentation at a given position compared to the source concentration. The calculations assume plume disperses from the top of the aquifer. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

This sheet calculates the Level 3 remedial target for soils(mg/kg) or for pore water (mg/l), based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.By setting a long travel time (e.g. 9E99) it will give the steady state solution, which should always be used when calculating remedial targets.

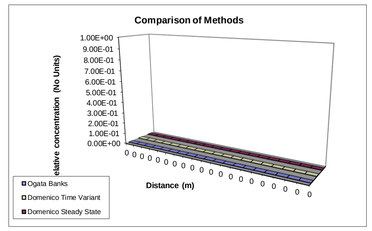
The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.9E+99.

Calculated (relative) concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Relative concentration (No units)	Concentration mg/l
0	1.0E+00	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!



Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Remedial Targets Worksheet , Release 3.2

Calculation of contaminant concentration in groundwater from a soil source

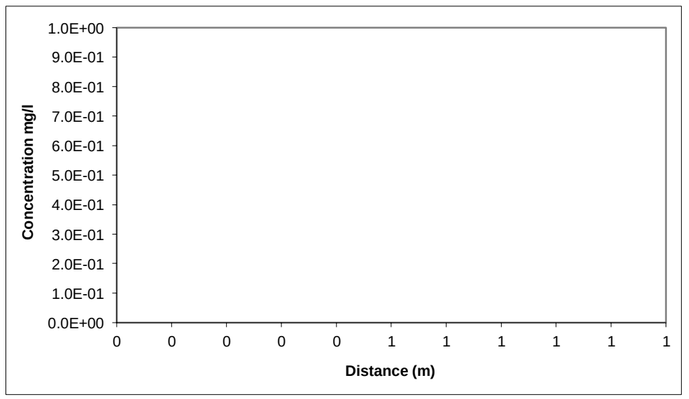
Only input required is Soil Contaminant Concentration

	Input Parameters			
	Soil contaminant concentration	C_0	0.00E+00	mg/kg
Level 1 Parameters				
	Water filled soil porosity	θ_W	0.00E+00	fraction
	Air filled soil porosity	θa	0.00E+00	fraction
	Bulk density	ρ	0.00E+00	g/cm^3
	Henry's Law constant	H	0.00E+00	dimensionless
	Soil water partition coefficient used in Level Assessment	Kd	0.00E+00	l/kg
	Factor (partitioning between soil and water)		#DIV/0!	dimensionless
Level 2 Parameters	**Dilution Factor**	DF	#DIV/0!	
Level 3 Parameters	**Attenuation factor (C_O/C_{ED})**	AF	#DIV/0!	

Predicted concentrations at compliance point

Level 1	C	#DIV/0!	mg/l	No dilution or attenuation
Level 2	C	#DIV/0!	mg/l	Dilution taken into account
Level 3	C	#DIV/0!	mg/l	Dilution and attenuation taken into account

Predicted concentrations between source and compliance point - Level 3



Distance m	Concentration mg/l
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)	Variable	Value	Unit	Source
Contaminant		Tetrachloroethene		from Level 1
Target Concentration	C_T	1.00E-02	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Domenico - Steady state — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived va

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	9.80E-02	mg/l	*Site investigation data*
Half life for degradation of contaminant in water	$t_{1/2}$	2.35E+04	days	*Howard et al (1991) Low anaerobic biodeg*
Calculated decay rate	λ	2.95E-05	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	7.50E+01	m	*Length of site perpendicular to groundwater flow*
Plume thickness at source	Sy	5.90E+00	m	*Same as Mixing Zone Thickness. "For a thin aquifer (typically <10m), the mixing zone thickness can be taken as the acte*
Saturated aquifer thickness	da	6.00E+00	m	*Maximum thickness recorded in vicinity of*
Bulk density of aquifer materials	ρ	1.60E+00	g/cm^3	*Typical bulk density for river terrace deposits*
Effective porosity of aquifer	n	2.50E-01	fraction	*Maximum porosity for coarse Gravel (Lovanh et al 2000) - conservative estimate*
Hydraulic gradient	i	4.40E-02	fraction	*Borehole level data*
Hydraulic conductivity of aquifer	K	4.32E-01	m/d	*Maximum typical value for clayey sandy G*
Distance to compliance point	x	5.00E+01	m	*Default compliance distance*
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	9.90E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	2.43E+03	l/kg	*see options*
Longitudinal dispersivity	ax	5.00E+00	m	*see options*
Transverse dispersivity	az	5.00E-01	m	*see options*
Vertical dispersivity	ay	5.00E-02	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd	2.43E+03	l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc		fraction
Organic carbon partition coefficient	Koc		l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{oc,n}$		l/kg
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	2.43E+03	l/kg

Define dispersivity (click brown cell and use pull down list)

Dispersivities 10%, 1%, 0.1% of pathway length

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	5.00E+00	2.98E+00	m
Transverse dispersivity	**az**	0.00E+00	5.00E-01	2.98E-01	m
Vertical dispersivity	**ay**	0.00E+00	5.00E-02	2.98E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

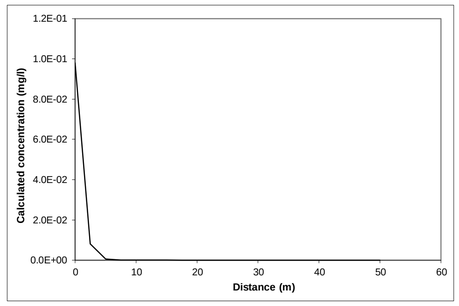
Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed

Calculated Parameters	Variable		
Groundwater flow velocity	v	7.60E-02	m/d
Retardation factor	Rf	1.56E+04	fraction
Decay rate used	λ	2.95E-05	d^{-1}
Rate of contaminant flow due to retardation	u	4.89E-06	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	1.65E-23	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**5.96E+21**	

Remedial Targets

Remedial Target		**5.96E+19**	**mg/l**	For comparison with measured groundwater concentration.
Domenico - Steady state				
Distance to compliance point		**50**	**m**	
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**1.65E-23**	**mg/l**	Domenico - Steady state

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Calculated concentrations for distance-concentration graph

Domenico - Steady state
From calculation sheet

Distance	Concentration
	mg/l
0	9.8E-02
2.5	7.99E-03
5.0	6.52E-04
7.5	5.32E-05
10.0	4.33E-06
12.5	3.54E-07
15.0	2.88E-08
17.5	2.35E-09
20.0	1.92E-10
22.5	1.56E-11
25.0	1.27E-12
27.5	1.04E-13
30.0	8.48E-15
32.5	6.91E-16
35.0	5.63E-17
37.5	4.59E-18
40.0	3.74E-19
42.5	3.05E-20
45.0	2.48E-21
47.5	2.02E-22
50.0	1.65E-23

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared
with the Level 3 remedial target to determine the need for further action.
Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Porosity Calculator

These results are not carried through to any of the other worksheets

DRY BULK DENSITY DATA

Variable	Value	Unit	justification
Natural Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Dry Bulk Density	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
Initial Saturation	#DIV/0!	%	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	
Water Filled Porosity	**#DIV/0!**	**fraction**	

WET BULK DENSITY DATA

Variable	Value	Unit	
Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Actual (wet) Bulk Density (i.e. at natural MC)	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
dry bulk density	0.00	tonnes/m^3	
Initial Saturation	#DIV/0!	%	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	**#DIV/0!**
Water Filled Porosity	**#DIV/0!**	**fraction**	

Analytical solutions provided by David Hall, Golder Associates (UK) Ltd

Simple hydrogeological calculations

(These are not specific to, or required in, the Remedial Targets Methodology)

Parameter	symbol		unit	justification
Hydraulic conductivity	K	0.00E+00	m/d	
Hydraulic gradient	i	0.00E+00	unitless	
Effective porosity of aquifer	n	0.00E+00	fraction	
Thickness of saturated aquifer	b	0.00E+00	m	
Width of aquifer perpendicular to flow	w	0.00E+00	m	
Distance to receptor	x	0.00E+00	m	
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Soil-water partition co-efficient	Kd	0.00E+00	l/kg	
Retardation factor of pollutant	R	#DIV/0!		

Groundwater flow velocity	v(GW)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for groundwater to reach receptor	t(GW)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years
Rate of groundwater flow through aquifer	Q	0.00E+00	m^3/s	0.00E+00	m^3/day	0.00E+00	m^3/year

Contaminant flow velocity	v(contam)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for contaminant to reach receptor	t(contam)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years

Level 1 Calculation Sheet

Contaminant Tetrachloroethene

Parameter	Value	Units
(carried over from input sheet)		
C_T	1.00E-02	mg/l
Kd	0.00E+00	l/kg
foc		fraction
koc		l/kg
θ_W	0.00E+00	fraction
θa	0.00E+00	fraction
ρ	0.00E+00	g/cm3
H	0.00E+00	dimensionless
Koc,n		l/kg
Koc,i		l/kg
pH		pH units
pKa		
foc (ionic)		fraction

Calculations (Refer toTable 4.3, R&D Publication 20)

Selected option User specified value for partition coefficient

calc calc Calc Kd l/kg

Calculation of partition coefficient for ionic organic chemical

Partition coefficient used in Level 1 Assessment 0.00E+00 l/kg

Calculated Remedial Target #DIV/0! mg/kg for Tetrachloroethene

Factor (partitioning between soil and water) #DIV/0!

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11/12/2025
Version:	1

Level 2 Calculation Sheet

Contaminant Γetrachloroethene

Site assessed:	Kelvedon Stre
Date:	11/12/2025
Version:	1

Parameter	Value	Units		
(carried over from input sheet)				
Mz	0.00E+00	m		
L	0.00E+00	m		
da	0.00E+00	m		Calculated Dilution Factor
Inf	0.00E+00	m/d		
K	0.00E+00	m/d		
i	0.00E+00		Calculation based on target concentration	#DIV/0!
A	0.00E+00	m3/d m2 m3/d	Calculation based on observed contaminant concentration	#DIV/0!
Cc	0.00E+00	mg/l		
C_T	1.00E-02	mg/l		
Cu	0.00E+00	mg/l		
w	0.00E+00	m		



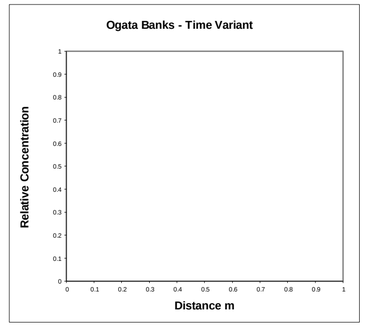
Contaminant Tetrachloroethene

OGATA BANKS SOLUTION

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-02	mg/l
DF	#DIV/0!	
λ	6.931E-101	days^{-1}
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Calc	Value	
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) -USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Date:	11/12/2025
Version:	1

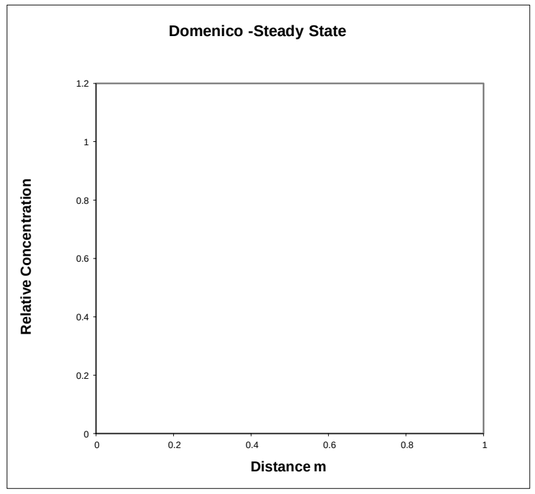
Contaminant trachloroethene

Input	Value	Units
C_T	1.000E-02	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

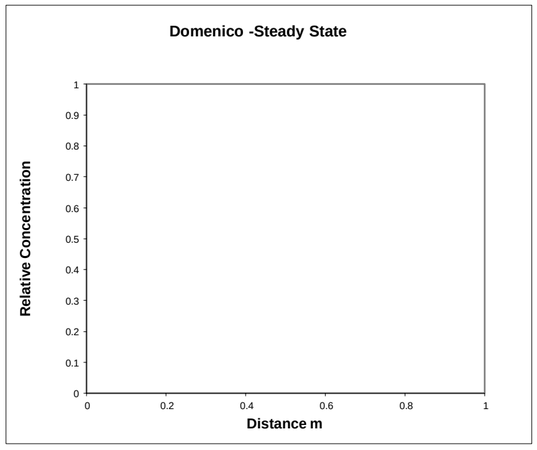


Calc	Value	Units
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Date:	11/12/2025
Version:	1

DOMENICO (TIME VARIANT)

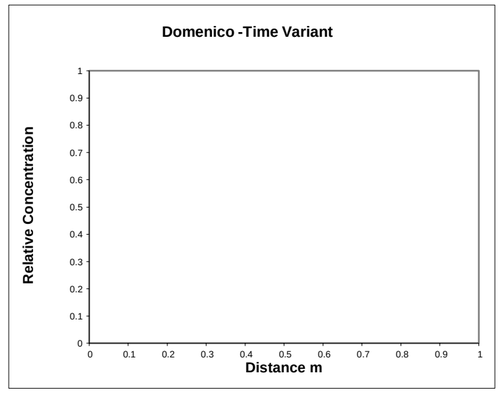
Contaminant **trachloroethene**

Input	Value	Units
C_T	0.01	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

Calc	Value	Units
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

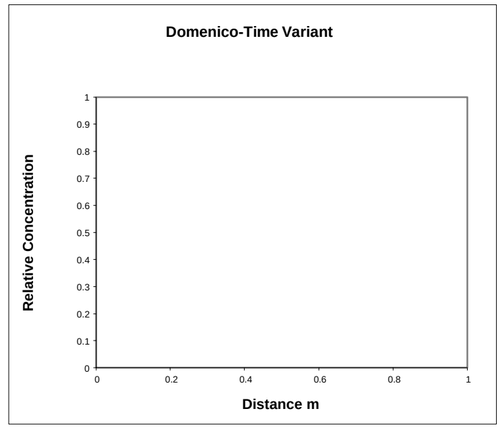
Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Date:	11/12/2025
Version:	1

OGATA BANKS SOLUTION

Contaminant Tetrachloroethene

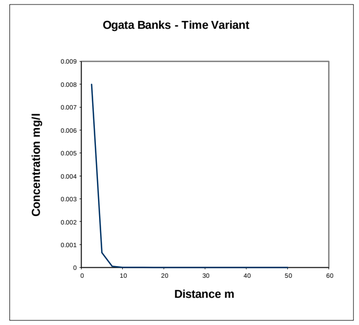
Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.01	mg/l
Co	9.80E-02	mg/l
λ	2.95E-05	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	2.43E+03	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

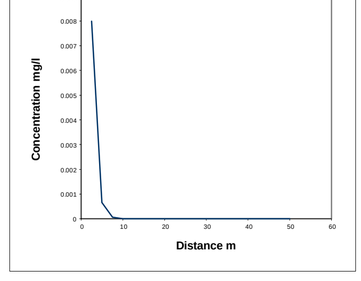
Calc	Value
v	7.60E-02 m/d
Rc	1.56E+04
u	4.89E-06 m/d

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.01225	-2.5E+00	8.2E-02	-5.4E+47	2.000	3.0E+00	2.0E+01	5.4E+47	0.000	1.7E+01	1	-1.7E+01	-1	4.2E+00	1	-4.2E+00	-1	7.99E-03
2	5	0.01225	-5.0E+00	6.7E-03	-5.4E+47	2.000	6.0E+00	4.1E+02	5.4E+47	0.000	1.2E+01	1	-1.2E+01	-1	3.0E+00	1	-3.0E+00	-0.99997	6.52E-04
3	7.5	0.01225	-7.5E+00	5.4E-04	-5.4E+47	2.000	9.0E+00	8.3E+03	5.4E+47	0.000	9.7E+00	1	-9.7E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	5.31E-05
4	10	0.01225	-1.0E+01	4.4E-05	-5.4E+47	2.000	1.2E+01	1.7E+05	5.4E+47	0.000	8.4E+00	1	-8.4E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	4.32E-06
5	12.5	0.01225	-1.3E+01	3.6E-06	-5.4E+47	2.000	1.5E+01	3.4E+06	5.4E+47	0.000	7.5E+00	1	-7.5E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	3.51E-07
6	15	0.01225	-1.5E+01	2.9E-07	-5.4E+47	2.000	1.8E+01	6.8E+07	5.4E+47	0.000	6.8E+00	1	-6.8E+00	-1	1.7E+00	0.984	-1.7E+00	-0.98399	2.84E-08
7	17.5	0.01225	-1.8E+01	2.4E-08	-5.4E+47	2.000	2.1E+01	1.4E+09	5.4E+47	0.000	6.3E+00	1	-6.3E+00	-1	1.6E+00	0.9743	-1.6E+00	-0.97425	2.29E-09
8	20	0.01225	-2.0E+01	2.0E-09	-5.4E+47	2.000	2.4E+01	2.8E+10	5.4E+47	0.000	5.9E+00	1	-5.9E+00	-1	1.5E+00	0.963	-1.5E+00	-0.96302	1.85E-10
9	22.5	0.01225	-2.3E+01	1.6E-10	-5.4E+47	2.000	2.7E+01	5.6E+11	5.4E+47	0.000	5.6E+00	1	-5.6E+00	-1	1.4E+00	0.9508	-1.4E+00	-0.95078	1.49E-11
10	25	0.01225	-2.5E+01	1.3E-11	-5.4E+47	2.000	3.0E+01	1.1E+13	5.4E+47	0.000	5.3E+00	1	-5.3E+00	-1	1.3E+00	0.9379	-1.3E+00	-0.93792	1.20E-12
11	27.5	0.01225	-2.8E+01	1.1E-12	-5.4E+47	2.000	3.3E+01	2.3E+14	5.4E+47	0.000	5.1E+00	1	-5.1E+00	-1	1.3E+00	0.9247	-1.3E+00	-0.92475	9.62E-14
12	30	0.01225	-3.0E+01	8.7E-14	-5.4E+47	2.000	3.6E+01	4.7E+15	5.4E+47	0.000	4.8E+00	1	-4.8E+00	-1	1.2E+00	0.9115	-1.2E+00	-0.91147	7.73E-15
13	32.5	0.01225	-3.3E+01	7.1E-15	-5.4E+47	2.000	3.9E+01	9.4E+16	5.4E+47	0.000	4.7E+00	1	-4.7E+00	-1	1.2E+00	0.8982	-1.2E+00	-0.89824	6.21E-16
14	35	0.01225	-3.5E+01	5.8E-16	-5.4E+47	2.000	4.2E+01	1.9E+18	5.4E+47	0.000	4.5E+00	1	-4.5E+00	-1	1.1E+00	0.8852	-1.1E+00	-0.88517	4.99E-17
15	37.5	0.01225	-3.8E+01	4.7E-17	-5.4E+47	2.000	4.5E+01	3.9E+19	5.4E+47	0.000	4.3E+00	1	-4.3E+00	-1	1.1E+00	0.8723	-1.1E+00	-0.87233	4.01E-18
16	40	0.01225	-4.0E+01	3.8E-18	-5.4E+47	2.000	4.8E+01	7.8E+20	5.4E+47	0.000	4.2E+00	1	-4.2E+00	-1	1.0E+00	0.8598	-1.0E+00	-0.85979	3.23E-19
17	42.5	0.01225	-4.3E+01	3.1E-19	-5.4E+47	2.000	5.1E+01	1.6E+22	5.4E+47	0.000	4.1E+00	1	-4.1E+00	-1	1.0E+00	0.8476	-1.0E+00	-0.84756	2.59E-20
18	45	0.01225	-4.5E+01	2.5E-20	-5.4E+47	2.000	5.4E+01	3.2E+23	5.4E+47	0.000	4.0E+00	1	-4.0E+00	-1	9.8E-01	0.8357	-9.8E-01	-0.83567	2.08E-21
19	47.5	0.01225	-4.8E+01	2.1E-21	-5.4E+47	2.000	5.7E+01	6.4E+24	5.4E+47	0.000	3.8E+00	1	-3.8E+00	-1	9.6E-01	0.8241	-9.6E-01	-0.82412	1.68E-22
20	50	0.01225	-5.0E+01	1.7E-22	-5.4E+47	2.000	6.0E+01	1.3E+26	5.4E+47	0.000	3.8E+00	1	-3.8E+00	-1	9.3E-01	0.8129	-9.3E-01	-0.81292	1.35E-23



Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.01225	-2.5E+00	8.2E-02	-5.4E+47	2.000	3.0E+00	2.0E+01	5.4E+47	0.000	1.7E+01	1	-1.7E+01	-1	8.3E+00	1	-8.3E+00	-1	7.99E-03
2	5	0.01225	-5.0E+00	6.7E-03	-5.4E+47	2.000	6.0E+00	4.1E+02	5.4E+47	0.000	1.2E+01	1	-1.2E+01	-1	5.9E+00	1	-5.9E+00	-1	6.52E-04
3	7.5	0.01225	-7.5E+00	5.4E-04	-5.4E+47	2.000	9.0E+00	8.3E+03	5.4E+47	0.000	9.7E+00	1	-9.7E+00	-1	4.8E+00	1	-4.8E+00	-1	5.32E-05
4	10	0.01225	-1.0E+01	4.4E-05	-5.4E+47	2.000	1.2E+01	1.7E+05	5.4E+47	0.000	8.4E+00	1	-8.4E+00	-1	4.2E+00	1	-4.2E+00	-1	4.33E-06
5	12.5	0.01225	-1.3E+01	3.6E-06	-5.4E+47	2.000	1.5E+01	3.4E+06	5.4E+47	0.000	7.5E+00	1	-7.5E+00	-1	3.7E+00	1	-3.7E+00	-1	3.54E-07
6	15	0.01225	-1.5E+01	2.9E-07	-5.4E+47	2.000	1.8E+01	6.8E+07	5.4E+47	0.000	6.8E+00	1	-6.8E+00	-1	3.4E+00	1	-3.4E+00	-1	2.88E-08
7	17.5	0.01225	-1.8E+01	2.4E-08	-5.4E+47	2.000	2.1E+01	1.4E+09	5.4E+47	0.000	6.3E+00	1	-6.3E+00	-1	3.2E+00	1	-3.2E+00	-0.99999	2.35E-09
8	20	0.01225	-2.0E+01	2.0E-09	-5.4E+47	2.000	2.4E+01	2.8E+10	5.4E+47	0.000	5.9E+00	1	-5.9E+00	-1	3.0E+00	1	-3.0E+00	-0.99997	1.92E-10
9	22.5	0.01225	-2.3E+01	1.6E-10	-5.4E+47	2.000	2.7E+01	5.6E+11	5.4E+47	0.000	5.6E+00	1	-5.6E+00	-1	2.8E+00	0.9999	-2.8E+00	-0.99992	1.56E-11
10	25	0.01225	-2.5E+01	1.3E-11	-5.4E+47	2.000	3.0E+01	1.1E+13	5.4E+47	0.000	5.3E+00	1	-5.3E+00	-1	2.6E+00	0.9998	-2.6E+00	-0.99981	1.27E-12
11	27.5	0.01225	-2.8E+01	1.1E-12	-5.4E+47	2.000	3.3E+01	2.3E+14	5.4E+47	0.000	5.1E+00	1	-5.1E+00	-1	2.5E+00	0.9996	-2.5E+00	-0.99963	1.04E-13
12	30	0.01225	-3.0E+01	8.7E-14	-5.4E+47	2.000	3.6E+01	4.7E+15	5.4E+47	0.000	4.8E+00	1	-4.8E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	8.48E-15
13	32.5	0.01225	-3.3E+01	7.1E-15	-5.4E+47	2.000	3.9E+01	9.4E+16	5.4E+47	0.000	4.7E+00	1	-4.7E+00	-1	2.3E+00	0.9989	-2.3E+00	-0.99893	6.91E-16
14	35	0.01225	-3.5E+01	5.8E-16	-5.4E+47	2.000	4.2E+01	1.9E+18	5.4E+47	0.000	4.5E+00	1	-4.5E+00	-1	2.2E+00	0.9984	-2.2E+00	-0.99839	5.63E-17
15	37.5	0.01225	-3.8E+01	4.7E-17	-5.4E+47	2.000	4.5E+01	3.9E+19	5.4E+47	0.000	4.3E+00	1	-4.3E+00	-1	2.2E+00	0.9977	-2.2E+00	-0.99769	4.59E-18
16	40	0.01225	-4.0E+01	3.8E-18	-5.4E+47	2.000	4.8E+01	7.8E+20	5.4E+47	0.000	4.2E+00	1	-4.2E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	3.74E-19
17	42.5	0.01225	-4.3E+01	3.1E-19	-5.4E+47	2.000	5.1E+01	1.6E+22	5.4E+47	0.000	4.1E+00	1	-4.1E+00	-1	2.0E+00	0.9958	-2.0E+00	-0.99579	3.05E-20
18	45	0.01225	-4.5E+01	2.5E-20	-5.4E+47	2.000	5.4E+01	3.2E+23	5.4E+47	0.000	4.0E+00	1	-4.0E+00	-1	2.0E+00	0.9946	-2.0E+00	-0.99459	2.48E-21
19	47.5	0.01225	-4.8E+01	2.1E-21	-5.4E+47	2.000	5.7E+01	6.4E+24	5.4E+47	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9932	-1.9E+00	-0.99321	2.02E-22
20	50	0.01225	-5.0E+01	1.7E-22	-5.4E+47	2.000	6.0E+01	1.3E+26	5.4E+47	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	1.65E-23



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	7.99E-03
5.0	6.52E-04
7.5	5.32E-05
10.0	4.33E-06
12.5	3.54E-07
15.0	2.88E-08
17.5	2.35E-09
20.0	1.92E-10
22.5	1.56E-11
25.0	1.27E-12
27.5	1.04E-13
30.0	8.48E-15
32.5	6.91E-16
35.0	5.63E-17
37.5	4.59E-18
40.0	3.74E-19
42.5	3.05E-20
45.0	2.48E-21
47.5	2.02E-22
50.0	1.65E-23

Contaminant **trachloroethene**

Input	Value	Units
C_T	0.01	mg/l
Co	9.80E-02	mg/l
λ	2.95E-05	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	2.43E+03	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

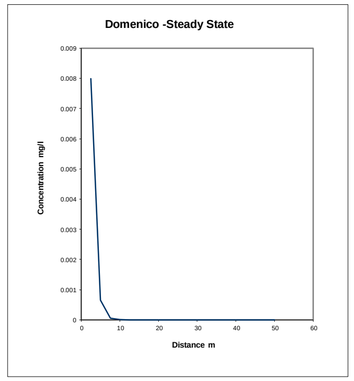
Vertical dispersion optio Simulate vertical dispersion in 1 direction

Calc	Value	
v	7.60E-02	m/d
Rc	1.56E+04	
u	4.89E-06	m/d

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

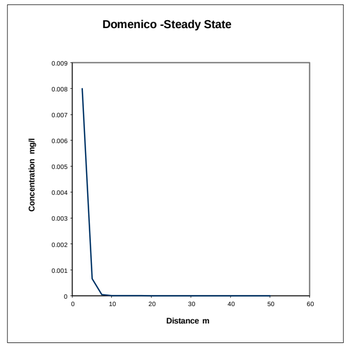
	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.0245	-2.51E+00	8.16E-02	1.68E+01	1	-1.68E+01	-1	4.17E+00	1	-4.17E+00	-1	7.99E-03
2	5	0.0245	-5.01E+00	6.65E-03	1.19E+01	1	-1.19E+01	-1	2.95E+00	1	-2.95E+00	-1	6.52E-04
3	7.5	0.0245	-7.52E+00	5.42E-04	9.68E+00	1	-9.68E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	5.31E-05
4	10	0.0245	-1.00E+01	4.42E-05	8.39E+00	1	-8.39E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	4.32E-06
5	12.5	0.0245	-1.25E+01	3.61E-06	7.50E+00	1	-7.50E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	3.51E-07
6	15	0.0245	-1.50E+01	2.94E-07	6.85E+00	1	-6.85E+00	-1	1.70E+00	0.984	-1.70E+00	-0.984	2.84E-08
7	17.5	0.0245	-1.75E+01	2.40E-08	6.34E+00	1	-6.34E+00	-1	1.58E+00	0.9743	-1.58E+00	-0.9743	2.29E-09
8	20	0.0245	-2.01E+01	1.96E-09	5.93E+00	1	-5.93E+00	-1	1.48E+00	0.963	-1.48E+00	-0.963	1.85E-10
9	22.5	0.0245	-2.26E+01	1.60E-10	5.59E+00	1	-5.59E+00	-1	1.39E+00	0.9508	-1.39E+00	-0.9508	1.49E-11
10	25	0.0245	-2.51E+01	1.30E-11	5.30E+00	1	-5.30E+00	-1	1.32E+00	0.9379	-1.32E+00	-0.9379	1.20E-12
11	27.5	0.0245	-2.76E+01	1.06E-12	5.06E+00	1	-5.06E+00	-1	1.26E+00	0.9247	-1.26E+00	-0.9247	9.62E-14
12	30	0.0245	-3.01E+01	8.65E-14	4.84E+00	1	-4.84E+00	-1	1.20E+00	0.9115	-1.20E+00	-0.9115	7.73E-15
13	32.5	0.0245	-3.26E+01	7.06E-15	4.65E+00	1	-4.65E+00	-1	1.16E+00	0.8982	-1.16E+00	-0.8982	6.21E-16
14	35	0.0245	-3.51E+01	5.76E-16	4.48E+00	1	-4.48E+00	-1	1.11E+00	0.8852	-1.11E+00	-0.8852	4.99E-17
15	37.5	0.0245	-3.76E+01	4.69E-17	4.33E+00	1	-4.33E+00	-1	1.08E+00	0.8723	-1.08E+00	-0.8723	4.01E-18
16	40	0.0245	-4.01E+01	3.83E-18	4.19E+00	1	-4.19E+00	-1	1.04E+00	0.8598	-1.04E+00	-0.8598	3.23E-19
17	42.5	0.0245	-4.26E+01	3.12E-19	4.07E+00	1	-4.07E+00	-1	1.01E+00	0.8476	-1.01E+00	-0.8476	2.59E-20
18	45	0.0245	-4.51E+01	2.55E-20	3.95E+00	1	-3.95E+00	-1	9.83E-01	0.8357	-9.83E-01	-0.8357	2.08E-21
19	47.5	0.0245	-4.76E+01	2.08E-21	3.85E+00	1	-3.85E+00	-1	9.57E-01	0.8241	-9.57E-01	-0.8241	1.68E-22
20	50	0.0245	-5.01E+01	1.69E-22	3.75E+00	1	-3.75E+00	-1	9.33E-01	0.8129	-9.33E-01	-0.8129	1.35E-23



DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.0245	-2.51E+00	8.16E-02	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	7.99E-03
2	5	0.0245	-5.01E+00	6.65E-03	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	6.52E-04
3	7.5	0.0245	-7.52E+00	5.42E-04	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	5.32E-05
4	10	0.0245	-1.00E+01	4.42E-05	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	4.33E-06
5	12.5	0.0245	-1.25E+01	3.61E-06	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	3.54E-07
6	15	0.0245	-1.50E+01	2.94E-07	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	2.88E-08
7	17.5	0.0245	-1.75E+01	2.40E-08	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	2.35E-09
8	20	0.0245	-2.01E+01	1.96E-09	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	1.92E-10
9	22.5	0.0245	-2.26E+01	1.60E-10	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-0.9999	1.56E-11
10	25	0.0245	-2.51E+01	1.30E-11	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-0.9998	1.27E-12
11	27.5	0.0245	-2.76E+01	1.06E-12	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-0.9996	1.04E-13
12	30	0.0245	-3.01E+01	8.65E-14	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	8.48E-15
13	32.5	0.0245	-3.26E+01	7.06E-15	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.9989	6.91E-16
14	35	0.0245	-3.51E+01	5.76E-16	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.9984	5.63E-17
15	37.5	0.0245	-3.76E+01	4.69E-17	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.9977	4.59E-18
16	40	0.0245	-4.01E+01	3.83E-18	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	3.74E-19
17	42.5	0.0245	-4.26E+01	3.12E-19	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.9958	3.05E-20
18	45	0.0245	-4.51E+01	2.55E-20	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.9946	2.48E-21
19	47.5	0.0245	-4.76E+01	2.08E-21	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.9932	2.02E-22
20	50	0.0245	-5.01E+01	1.69E-22	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	1.65E-23



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	7.99E-03
5.0	6.52E-04
7.5	5.32E-05
10.0	4.33E-06
12.5	3.54E-07
15.0	2.88E-08
17.5	2.35E-09
20.0	1.92E-10
22.5	1.56E-11
25.0	1.27E-12
27.5	1.04E-13
30.0	8.48E-15
32.5	6.91E-16
35.0	5.63E-17
37.5	4.59E-18
40.0	3.74E-19
42.5	3.05E-20
45.0	2.48E-21
47.5	2.02E-22
50.0	1.65E-23

DOMENICO (TIME VARIANT)

Contaminant trachloroethene

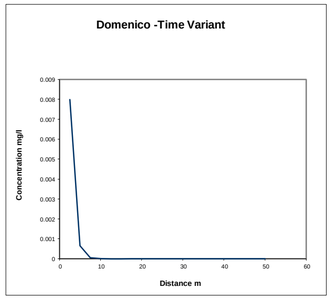
Input	Value	Units
C_T	0.01	mg/l
Co	9.80E-02	mg/l
λ	2.95E-05	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	2.43E+03	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

Calc	Value	
v	7.60E-02	m/d
Rc	1.56E+04	
u	4.89E-06	m/d

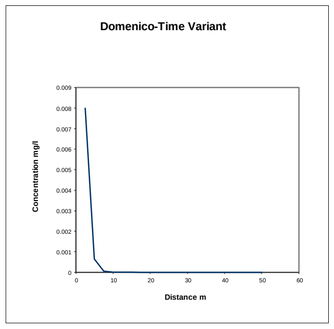
Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.01225	-2.51E+00	8.16E-02	-5.42E+47	2	1.68E+01	1	-1.68E+01	-1	4.17E+00	1	-4.17E+00	-1	7.99E-03
2	5	0.01225	-5.01E+00	6.65E-03	-5.42E+47	2	1.19E+01	1	-1.19E+01	-1	2.95E+00	1	-2.95E+00	-1	6.52E-04
3	7.5	0.01225	-7.52E+00	5.42E-04	-5.42E+47	2	9.68E+00	1	-9.68E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	5.31E-05
4	10	0.01225	-1.00E+01	4.42E-05	-5.42E+47	2	8.39E+00	1	-8.39E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	4.32E-06
5	12.5	0.01225	-1.25E+01	3.61E-06	-5.42E+47	2	7.50E+00	1	-7.50E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	3.51E-07
6	15	0.01225	-1.50E+01	2.94E-07	-5.42E+47	2	6.85E+00	1	-6.85E+00	-1	1.70E+00	0.984	-1.70E+00	-0.984	2.84E-08
7	17.5	0.01225	-1.75E+01	2.40E-08	-5.42E+47	2	6.34E+00	1	-6.34E+00	-1	1.58E+00	0.9743	-1.58E+00	-0.974	2.29E-09
8	20	0.01225	-2.01E+01	1.96E-09	-5.42E+47	2	5.93E+00	1	-5.93E+00	-1	1.48E+00	0.963	-1.48E+00	-0.963	1.85E-10
9	22.5	0.01225	-2.26E+01	1.60E-10	-5.42E+47	2	5.59E+00	1	-5.59E+00	-1	1.39E+00	0.9508	-1.39E+00	-0.951	1.49E-11
10	25	0.01225	-2.51E+01	1.30E-11	-5.42E+47	2	5.30E+00	1	-5.30E+00	-1	1.32E+00	0.9379	-1.32E+00	-0.938	1.20E-12
11	27.5	0.01225	-2.76E+01	1.06E-12	-5.42E+47	2	5.06E+00	1	-5.06E+00	-1	1.26E+00	0.9247	-1.26E+00	-0.925	9.62E-14
12	30	0.01225	-3.01E+01	8.65E-14	-5.42E+47	2	4.84E+00	1	-4.84E+00	-1	1.20E+00	0.9115	-1.20E+00	-0.911	7.73E-15
13	32.5	0.01225	-3.26E+01	7.06E-15	-5.42E+47	2	4.65E+00	1	-4.65E+00	-1	1.16E+00	0.8982	-1.16E+00	-0.898	6.21E-16
14	35	0.01225	-3.51E+01	5.76E-16	-5.42E+47	2	4.48E+00	1	-4.48E+00	-1	1.11E+00	0.8852	-1.11E+00	-0.885	4.99E-17
15	37.5	0.01225	-3.76E+01	4.69E-17	-5.42E+47	2	4.33E+00	1	-4.33E+00	-1	1.08E+00	0.8723	-1.08E+00	-0.872	4.01E-18
16	40	0.01225	-4.01E+01	3.83E-18	-5.42E+47	2	4.19E+00	1	-4.19E+00	-1	1.04E+00	0.8598	-1.04E+00	-0.86	3.23E-19
17	42.5	0.01225	-4.26E+01	3.12E-19	-5.42E+47	2	4.07E+00	1	-4.07E+00	-1	1.01E+00	0.8476	-1.01E+00	-0.848	2.59E-20
18	45	0.01225	-4.51E+01	2.55E-20	-5.42E+47	2	3.95E+00	1	-3.95E+00	-1	9.83E-01	0.8357	-9.83E-01	-0.836	2.08E-21
19	47.5	0.01225	-4.76E+01	2.08E-21	-5.42E+47	2	3.85E+00	1	-3.85E+00	-1	9.57E-01	0.8241	-9.57E-01	-0.824	1.68E-22
20	50	0.01225	-5.01E+01	1.69E-22	-5.42E+47	2	3.75E+00	1	-3.75E+00	-1	9.33E-01	0.8129	-9.33E-01	-0.813	1.35E-23



Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.01225	-2.51E+00	8.16E-02	-5.42E+47	2	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	7.99E-03
2	5	0.01225	-5.01E+00	6.65E-03	-5.42E+47	2	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	6.52E-04
3	7.5	0.01225	-7.52E+00	5.42E-04	-5.42E+47	2	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	5.32E-05
4	10	0.01225	-1.00E+01	4.42E-05	-5.42E+47	2	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	4.33E-06
5	12.5	0.01225	-1.25E+01	3.61E-06	-5.42E+47	2	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	3.54E-07
6	15	0.01225	-1.50E+01	2.94E-07	-5.42E+47	2	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	2.88E-08
7	17.5	0.01225	-1.75E+01	2.40E-08	-5.42E+47	2	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	2.35E-09
8	20	0.01225	-2.01E+01	1.96E-09	-5.42E+47	2	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	1.92E-10
9	22.5	0.01225	-2.26E+01	1.60E-10	-5.42E+47	2	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-1	1.56E-11
10	25	0.01225	-2.51E+01	1.30E-11	-5.42E+47	2	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-1	1.27E-12
11	27.5	0.01225	-2.76E+01	1.06E-12	-5.42E+47	2	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-1	1.04E-13
12	30	0.01225	-3.01E+01	8.65E-14	-5.42E+47	2	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	8.48E-15
13	32.5	0.01225	-3.26E+01	7.06E-15	-5.42E+47	2	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.999	6.91E-16
14	35	0.01225	-3.51E+01	5.76E-16	-5.42E+47	2	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.998	5.63E-17
15	37.5	0.01225	-3.76E+01	4.69E-17	-5.42E+47	2	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.998	4.59E-18
16	40	0.01225	-4.01E+01	3.83E-18	-5.42E+47	2	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	3.74E-19
17	42.5	0.01225	-4.26E+01	3.12E-19	-5.42E+47	2	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.996	3.05E-20
18	45	0.01225	-4.51E+01	2.55E-20	-5.42E+47	2	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.995	2.48E-21
19	47.5	0.01225	-4.76E+01	2.08E-21	-5.42E+47	2	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.993	2.02E-22
20	50	0.01225	-5.01E+01	1.69E-22	-5.42E+47	2	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	1.65E-23



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	7.99E-03
5.0	6.52E-04
7.5	5.32E-05
10.0	4.33E-06
12.5	3.54E-07
15.0	2.88E-08
17.5	2.35E-09
20.0	1.92E-10
22.5	1.56E-11
25.0	1.27E-12
27.5	1.04E-13
30.0	8.48E-15
32.5	6.91E-16
35.0	5.63E-17
37.5	4.59E-18
40.0	3.74E-19
42.5	3.05E-20
45.0	2.48E-21
47.5	2.02E-22
50.0	1.65E-23

Hydrogeological risk assessment for land contamination

Remedial Targets Worksheet , Release 3.2

First released: 2006. Version 3.2: January 2013

This worksheet has been produced in combination with the document 'Remedial Targets Methodology: Hydrogeological risk assessment for land contamination (Environment Agency 2006).

Users of this worksheet should always refer to the User Manual to the Remedial Targets Methodology and to relevant guidance on UK legislation and policy, in order to understand how this procedure should be applied in an appropriate context.

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The calculation of equations in this worksheet has been independently checked by Entec (UK) Ltd on behalf of the Environment Agency.

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IMPORTANT: To enable MS Excel worksheet, click Tools, Add -Ins, Analysis Tool Pak and Analysis Tool Pak-VBA (to calculate error functions).

Details to be completed for each assessment				
Site Name:	Kelvedon Street			
Site Address:	Newport			
Completed by:	Michael Watkins			
Date:	11-Dec-25		Version:	1
Contaminant	Tetrachloroethene			
Target Concentration (C_T)	0.01	mg/l	Origin of C_T:	WFD for inland surface waters (annual average)

This worksheet can be used to determine remedial targets for soils (Worksheets Level 1 Soil, Level 2 and Level 3 Soil) or to determine remedial targets for groundwater (Level 3 Groundwater). For Level 3, parameter values must be entered separately dependent on whether the assessment is for soil or groundwater. For soil, remedial targets are calculated as either mg/kg (for comparision with soil measurements) or mg/l (for comparison with leaching tests or pore water concentrations).
Site details entered on this page are automatically copied to Level 1, 2 and 3 Worksheets.
Worksheet options are identified by brown background and employ a pull-down menus. Data entry are identified as blue background.
Data origin / justification should be noted in cells coloured yellow and fully documented in subsequent reports.
Data carried forward from an earlier worksheet are identified by a light green background
It is recommended that a copy of the original worksheet is saved (all data fields in the original copy are blank).

The spreadsheet also includes a porosity calculation worksheet, a soil impact calculation worksheet and a worksheet that performs some simple hydrogeological calculations.

Remedial Targets Worksheet , Release 3.2

Level 1 - Soil

Select the method of calculating the soil water Partition Co-efficient by using the pull down menu below

User specified value for partition coefficient

Contaminant		**Tetrachloroethene**	
Target concentration	C_T	**0.01**	**mg/l**

Input Parameters	**Variable**	**Value**	**Unit**	**Source of parameter value**
Standard entry				
Water filled soil porosity	θ_w	0.00E+00	fraction	
Air filled soil porosity	θa	0.00E+00	fraction	
Bulk density of soil zone material	ρ	0.00E+00	g/cm^3	
Henry's Law constant	H	0.00E+00	dimensionless	
Entry if specify partition coefficient (option)				
Soil water partition coefficient	Kd	0.00E+00	l/kg	
Entry for non-polar organic chemicals (option)				
Fraction of organic carbon (in soil)	foc		fraction	
Organic carbon partition coefficient	Koc		l/kg	
Entry for ionic organic chemicals (option)				
Sorption coefficient for neutral species	$K_{oc,n}$		l/kg	
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg	
pH value	pH		pH units	
Acid dissociation constant	pKa			
Fraction of organic carbon (in soil)	foc		fraction	

This sheet calculates the Level 1 remedial target for soils(mg/kg) based on a selected target concentration and theoretical calculation of soil water partitioning. Three options are included for determining the partition coefficient.

The measured soil concentration as mg/kg should be compared with the Level 1 remedial target to determine the need for further action.

Soil water partition coefficient used in Level Assessment	**Kd**	**0.00E+00**	**l/kg**	*Specified value*

Level 1 Remedial Target

Level 1 Remedial Target	**#DIV/0!**	**mg/kg**	**(for comparison with soil analyses)**
	or		
	0.01	**mg/l**	**(for comparison with leachate test results)**

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 2 - Soil

Contaminant		**Tetrachloroethene**		from Level 1
Target concentration	C_T	**0.01**	**mg/l**	from Level 1

This sheet calculates the Level 2 remedial target for soils (mg/kg) or for pore water (mg/l).

The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 2 remedial target to determine the need for further action. Equations presented in 'Hydrogeological risk assessment for land contamiantion' (Environment Agency 2006)

Input Parameters	Variable	Value	Unit	Source of parameter value	
Standard entry					
Infiltration	Inf	0.00E+00	m/d		
Area of contaminant source	A	0.00E+00	m^2		Not used in calculation
Entry for groundwater flow below site					
Length of contaminant source in direction of groundwater flow	L	0.00E+00	m		
Saturated aquifer thickness	da	0.00E+00	m		
Hydraulic Conductivity of aquifer in which dilution occurs	K	0.00E+00	m/d		
Hydraulic gradient of water table	i	0.00E+00	fraction		
Width of contaminant source perpendicular to groundwater flow	w	0.00E+00	m		Not used in calculation
Background concentration of contaminant in groundwater beneath site	Cu	0.00E+00	mg/l		
Define mixing zone depth by specifying or calculating depth (using pull down list)		**Specify**			
Enter mixing zone thickness	Mz	0.00E+00	m		
Calculated mixing zone thickness	Mz		m		

Calculated Parameters

Dilution Factor	**DF**	**#DIV/0!**		
Level 2 Remedial Target		**#DIV/0!**	**mg/l**	**For comparison with measured pore water concentration. This assumes Level 1 Remedial Target is based on Target Concentration.**
		or		
		#DIV/0!	**mg/kg**	**For comparison with measured soil concentration. This assumes Level 1 Remedial Target calculated from soil-water**

Additional option

Calculation of impact on receptor

Concentration of contaminant in contaminated discharge (entering receptor)	Cc	0.00E+00	mg/l	
Calculated concentration within receptor (dilution only)		#DIV/0!	mg/l	0

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11-Dec-25
Version:	1

Remedial Targets Worksheet , Release 3.2

Level 3 - Soil

See Note

Input Parameters	Variable	Value	Unit	Source
Contaminant		Tetrachloroethene		from Level 1
Target Concentration	C_T	0.01	mg/l	from Level 1
Dilution Factor	DF	#DIV/0!		from Level 2

Select analytical solution (click on brown cell below, then on pull-down menu)

Ogata Banks — Equations in HRA publication

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived value)

	Variable	Value	Unit	Source of parameter value
Enter source concentration		Soil concentration as mg/kg		
Enter soil concentration		0	mg/kg	
Half life for degradation of contaminant in water	$t_{1/2}$	1.00E+100	days	
Calculated decay rate	λ	6.93E-101	$days^{-1}$	calculated
Width of plume in aquifer at source	Sz	0.00E+00	m	from Level 2
Plume thickness in aquifer at source	Sy	0.00E+00	m	from Level 2
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Effective porosity of aquifer	n	0.00E+00	fraction	
Hydraulic gradient	i	#DIV/0!	fraction	from Level 2 (adjusted)
Hydraulic conductivity of saturated aquifer	K	0.00E+00	m/d	from Level 2
Distance to compliance point	x	0.00E+00	m	
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	1.00E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	0.00E+00	l/kg	*see options*
Longitudinal dispersivity	ax	0.000	m	*see options*
Transverse dispersivity	az	0.000	m	*see options*
Vertical dispersivity	ay	0.000	m	*see options*

Parameter values should be checked against Level 1 and 2

Calculated Parameters	Variable		
Groundwater flow velocity	v	#DIV/0!	m/d
Retardation factor	Rf	#DIV/0!	fraction
Decay rate used	λ	6.93E-101	d^{-1}
Hydraulic gradient used in aquifer flow down-gradient	i	#DIV/0!	fraction
Rate of contaminant flow due to retardation	u	#DIV/0!	m/d
Ratio of Compliance Point to Source Concentration	C_{cp}/C_0	#DIV/0!	fraction
Attenuation factor (C_o/C_{cp})	**AF**	**#DIV/0!**	**fraction**
Calculated soil leachate concentration	Co	#DIV/0!	mg/l

Remedial Targets

Level 3 Remedial Target	**#DIV/0!**	**mg/l**	For comparison with measured pore water concentration.
Ogata Banks	**or**		This assumes Level 1 Remedial Target is based on Target Concentration.
	#DIV/0!	**mg/kg**	For comparison with measured soil concentration. This
Distance to compliance point	**0**	**m**	assumes Level 1 Remedial Target calculated from soil-water partitioning equation.
Ratio of Compliance Point to Source Concentration	**#DIV/0!**	**fraction**	Ogata Banks

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99

Enter method of defining partition co-efficient (using pull down list)

Calculate for ionic organic chemicals (acids)

Entry if specify partition coefficient (option)

Soil water partition coefficient	Kd		l/kg

Entry for non-polar organic chemicals (option)

Fraction of organic carbon in aquifer	foc		fraction
Organic carbon partition coefficient	Koc		l/kg

Entry for ionic organic chemicals (option)

Sorption coefficient for related species	$K_{oc,n}$	0.00E+00	l/kg
Sorption coefficient for ionised species	$K_{oc,i}$	0.00E+00	l/kg
pH value	pH	0.00E+00	
Acid dissociation constant	pKa	0.00E+00	
Fraction of organic carbon in aquifer	foc	0.00E+00	fraction
Soil water partition coefficient	Kd	0.00E+00	l/kg

Define dispersivity (click brown cell and use pull down list)

User defined values for dispersivity

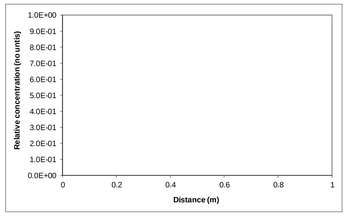
		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	0.00E+00	#NUM!	m
Transverse dispersivity	**az**	0.00E+00	0.00E+00	#NUM!	m
Vertical dispersivity	**ay**	0.00E+00	0.00E+00	#NUM!	m

Note values of dispersivity must be > 0

Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed

Note
This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O_2, NO_3, SO_4 etc than an alternative solution should be used

Environment Agency



Note: 'Relative concentration' is the ratio of calculated concentation at a given position compared to the source concentration. The calculations assume plume disperses from the top of the aquifer. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

This sheet calculates the Level 3 remedial target for soils(mg/kg) or for pore water (mg/l), based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.By setting a long travel time (e.g. 9E99) it will give the steady state solution, which should always be used when calculating remedial targets.

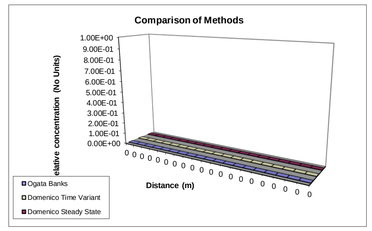
The measured soil concentration as mg/kg or pore water concentration should be compared with the Level 3 remedial target to determine the need for further action.

Note if contaminant is not subject to first order degradation, then set half life as 9.9E+99.

Calculated (relative) concentrations for distance-concentration graph

Ogata Banks
From calculation sheet

Distance	Relative concentration (No units)	Concentration mg/l
0	1.0E+00	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!
0.0	#DIV/0!	#DIV/0!



Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Remedial Targets Worksheet , Release 3.2

Calculation of contaminant concentration in groundwater from a soil source

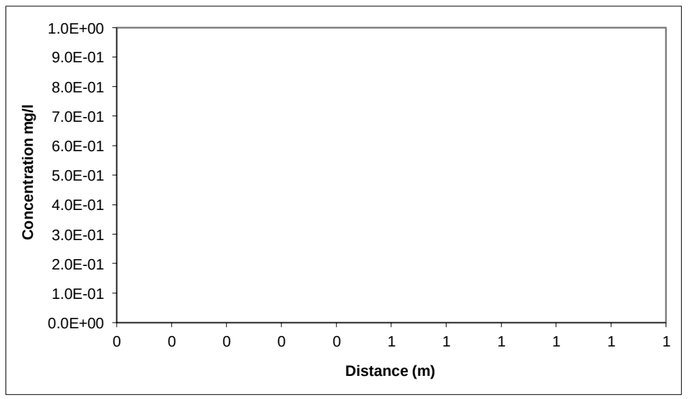
Only input required is Soil Contaminant Concentration

	Input Parameters			
	Soil contaminant concentration	C_0	0.00E+00	mg/kg
Level 1 Parameters				
	Water filled soil porosity	θ_W	0.00E+00	fraction
	Air filled soil porosity	θa	0.00E+00	fraction
	Bulk density	ρ	0.00E+00	g/cm^3
	Henry's Law constant	H	0.00E+00	dimensionless
	Soil water partition coefficient used in Level Assessment	Kd	0.00E+00	l/kg
	Factor (partitioning between soil and water)		#DIV/0!	dimensionless
Level 2 Parameters	**Dilution Factor**	DF	#DIV/0!	
Level 3 Parameters	**Attenuation factor (C_O/C_{ED})**	AF	#DIV/0!	

Predicted concentrations at compliance point

Level 1	C	#DIV/0!	mg/l	No dilution or attenuation
Level 2	C	#DIV/0!	mg/l	Dilution taken into account
Level 3	C	#DIV/0!	mg/l	Dilution and attenuation taken into account

Predicted concentrations between source and compliance point - Level 3



Distance m	Concentration mg/l
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!
0.00	#DIV/0!

R&D Publication 20 Remedial Targets Worksheet, Release 3.2

Level 3 - Groundwater

See Note

Input Parameters (using pull down menu)	Variable	Value	Unit	Source
Contaminant		Tetrachloroethene		from Level 1
Target Concentration	C_T	1.00E-02	mg/l	from Level 1

Select analytical solution (click on brown cell below, then on pull-down menu)

Domenico - Steady state — Equations in HRA publication

Approach for simulating vertical dispersion: Simulate vertical dispersion in 1 direction

Select nature of decay rate (click on brown cell below, then on pull-down menu)

Approach for simulating degradation of pollutants: Apply degradation rate to pollutants in all phases (e.g. field derived va

				Source of parameter value
Initial contaminant concentration in groundwater at plume core	C_0	9.80E-02	mg/l	*Site investigation data*
Half life for degradation of contaminant in water	$t_{1/2}$	2.35E+03	days	*Howard et al (1991) Low anaerobic biodeg*
Calculated decay rate	λ	2.95E-04	$days^{-1}$	
Width of plume in aquifer at source (perpendicular to flow)	Sz	7.50E+01	m	*Length of site perpendicular to groundwater flow*
Plume thickness at source	Sy	5.90E+00	m	*Same as Mixing Zone Thickness. "For a thin aquifer (typically <10m), the mixing zone thickness can be taken as the acte*
Saturated aquifer thickness	da	6.00E+00	m	*Maximum thickness recorded in vicinity of*
Bulk density of aquifer materials	ρ	1.60E+00	g/cm^3	*Typical bulk density for river terrace deposits*
Effective porosity of aquifer	n	2.50E-01	fraction	*Maximum porosity for coarse Gravel (Lovanh et al 2000) - conservative estimate*
Hydraulic gradient	i	4.40E-02	fraction	*Borehole level data*
Hydraulic conductivity of aquifer	K	4.32E-01	m/d	*Maximum typical value for clayey sandy G*
Distance to compliance point	x	5.00E+01	m	*Default compliance distance*
Distance (lateral) to compliance point perpendicular to flow direction	z		m	
Distance (depth) to compliance point perpendicular to flow direction	y		m	
Time since pollutant entered groundwater	t	9.90E+99	days	*time variant options only*
Parameters values determined from options				
Partition coefficient	Kd	2.43E+02	l/kg	*see options*
Longitudinal dispersivity	ax	5.00E+00	m	*see options*
Transverse dispersivity	az	5.00E-01	m	*see options*
Vertical dispersivity	ay	5.00E-02	m	*see options*

Select Method for deriving Partition Co-efficient (using pull down menu)

User specified value for partition coefficient

Entry if specify partition coefficient (option)			
Soil water partition coefficient	Kd	2.43E+02	l/kg
Entry for non-polar organic chemicals (option)			
Fraction of organic carbon in aquifer	foc		fraction
Organic carbon partition coefficient	Koc		l/kg
Entry for ionic organic chemicals (option)			
Sorption coefficient for related species	$K_{oc,n}$		l/kg
Sorption coefficient for ionised species	$K_{oc,i}$		l/kg
pH value	pH		
acid dissociation constant	pKa		
Fraction of organic carbon in aquifer	foc		fraction
Soil water partition coefficient	Kd	2.43E+02	l/kg

Define dispersivity (click brown cell and use pull down list)

Dispersivities 10%, 1%, 0.1% of pathway length

		Enter value	Calc value	Xu & Eckstein	
Longitudinal dispersivity	**ax**	0.00E+00	5.00E+00	2.98E+00	m
Transverse dispersivity	**az**	0.00E+00	5.00E-01	2.98E-01	m
Vertical dispersivity	**ay**	0.00E+00	5.00E-02	2.98E-02	

Note values of dispersivity must be > 0

For calculated value, assumes ax = 0.1 *x, az = 0.01 * x, ay = 0.001 * x

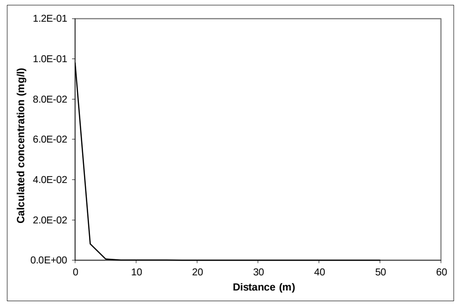
Xu & Eckstein (1995) report ax = $0.83(\log_{10}x)^{2.414}$; az = ax/10, ay = ax/100 are assumed

Calculated Parameters	Variable		
Groundwater flow velocity	v	7.60E-02	m/d
Retardation factor	Rf	1.56E+03	fraction
Decay rate used	λ	2.95E-04	d^{-1}
Rate of contaminant flow due to retardation	u	4.89E-05	m/d
Contaminant concentration at distance x, assuming one-way vertical dispersion	C_{ED}	1.62E-23	mg/l
Attenuation factor (one way vertical dispersion, CO/CED)	**AF**	**6.05E+21**	

Remedial Targets

Remedial Target		**6.05E+19**	**mg/l**	For comparison with measured groundwater concentration.
Domenico - Steady state				
Distance to compliance point		**50**	**m**	
Concentration of contaminant at compliance point	**C_{ED}/C_0**	**1.62E-23**	**mg/l**	Domenico - Steady state

Care should be used when calculating remedial targets using the time variant options as this may result in an overestimate of the remedial target.
The recommended value for time when calculating the remedial target is 9.9E+99.



Note graph assumes plume disperses vertically in one direction only. An alternative solution assuming the centre of the plume is located at the mid-depth of the aquifer is presented in the calculation sheets.

Calculated concentrations for distance-concentration graph

Domenico - Steady state
From calculation sheet

Distance	Concentration
	mg/l
0	9.8E-02
2.5	7.99E-03
5.0	6.51E-04
7.5	5.30E-05
10.0	4.32E-06
12.5	3.52E-07
15.0	2.87E-08
17.5	2.34E-09
20.0	1.91E-10
22.5	1.55E-11
25.0	1.26E-12
27.5	1.03E-13
30.0	8.40E-15
32.5	6.84E-16
35.0	5.57E-17
37.5	4.54E-18
40.0	3.69E-19
42.5	3.01E-20
45.0	2.45E-21
47.5	1.99E-22
50.0	1.62E-23

Note

This sheet calculates the Level 3 remedial target for groundwater, based on the distance to the receptor or compliance located down hydraulic gradient of the source Three solution methods are included, the preferred option is Ogata Banks.

By setting a long travel time it will give the steady state solution, which should be used to calculate remedial targets.

The measured groundwater concentration should be compared
with the Level 3 remedial target to determine the need for further action.
Note if contaminant is not subject to first order degradation, then set half life as 9.0E+99.

This worksheet should be used if pollutant transport and degradation is best described by a first order reaction. If degradation is best desribed by an electron limited degradation such as oxidation by O2, NO3, SO4 etc than an alternative solution should be used

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	########
Version:	1

Porosity Calculator

These results are not carried through to any of the other worksheets

DRY BULK DENSITY DATA

Variable	Value	Unit	justification
Natural Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Dry Bulk Density	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
Initial Saturation	#DIV/0!	%	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	
Water Filled Porosity	**#DIV/0!**	**fraction**	

WET BULK DENSITY DATA

Variable	Value	Unit	
Moisture Content	0.00	% wt	
Particle Density	2.78	tonnes/m^3	(Change this number only if you have specific information)
Actual (wet) Bulk Density (i.e. at natural MC)	0.00	tonnes/m^3	
Calculated Parameters			
Voids Ratio	#DIV/0!	fraction	
dry bulk density	0.00	tonnes/m^3	
Initial Saturation	#DIV/0!	%	
Total porosity	**1.000**	**fraction**	
Air Filled Porosity	**#DIV/0!**	**fraction**	**#DIV/0!**
Water Filled Porosity	**#DIV/0!**	**fraction**	

Analytical solutions provided by David Hall, Golder Associates (UK) Ltd

Simple hydrogeological calculations

(These are not specific to, or required in, the Remedial Targets Methodology)

Parameter	symbol		unit	justification
Hydraulic conductivity	K	0.00E+00	m/d	
Hydraulic gradient	i	0.00E+00	unitless	
Effective porosity of aquifer	n	0.00E+00	fraction	
Thickness of saturated aquifer	b	0.00E+00	m	
Width of aquifer perpendicular to flow	w	0.00E+00	m	
Distance to receptor	x	0.00E+00	m	
Bulk density of aquifer materials	ρ	0.00E+00	g/cm^3	
Soil-water partition co-efficient	Kd	0.00E+00	l/kg	
Retardation factor of pollutant	R	#DIV/0!		

Groundwater flow velocity	v(GW)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for groundwater to reach receptor	t(GW)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years
Rate of groundwater flow through aquifer	Q	0.00E+00	m^3/s	0.00E+00	m^3/day	0.00E+00	m^3/year

Contaminant flow velocity	v(contam)	#DIV/0!	m/s	#DIV/0!	m/day	#DIV/0!	m/year
Time for contaminant to reach receptor	t(contam)	#DIV/0!	seconds	#DIV/0!	days	#DIV/0!	years

Level 1 Calculation Sheet

Contaminant Tetrachloroethene

Parameter	Value	Units
(carried over from input sheet)		
C_T	1.00E-02	mg/l
Kd	0.00E+00	l/kg
foc		fraction
koc		l/kg
θ_w	0.00E+00	fraction
θa	0.00E+00	fraction
ρ	0.00E+00	g/cm3
H	0.00E+00	dimensionless
Koc,n		l/kg
Koc,i		l/kg
pH		pH units
pKa		
foc (ionic)		fraction

Calculations (Refer toTable 4.3, R&D Publication 20)

Selected option User specified value for partition coefficient

calc calc Calc Kd l/kg

Calculation of partition coefficient for ionic organic chemical

Partition coefficient used in Level 1 Assessment 0.00E+00 l/kg

Calculated Remedial Target #DIV/0! mg/kg for Tetrachloroethene

Factor (partitioning between soil and water) #DIV/0!

Site being assessed:	Kelvedon Street
Completed by:	Michael Watkins
Date:	11/12/2025
Version:	1

Level 2 Calculation Sheet

Contaminant Tetrachloroethene

Site assessed:	Kelvedon Stre
Date:	11/12/2025
Version:	1

Parameter	Value	Units		
(carried over from input sheet)				
Mz	0.00E+00	m		
L	0.00E+00	m		
da	0.00E+00	m		Calculated
Inf	0.00E+00	m/d		Dilution Factor
K	0.00E+00	m/d		
i	0.00E+00		Calculation based on target concentration	#DIV/0!
A	0.00E+00	m3/d m2 m3/d	Calculation based on observed contaminant concentration	#DIV/0!
Cc	0.00E+00	mg/l		
C_T	1.00E-02	mg/l		
Cu	0.00E+00	mg/l		
w	0.00E+00	m		



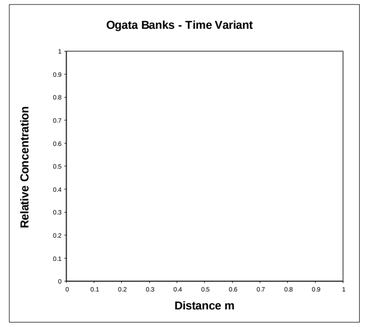
Contaminant Tetrachloroethene

OGATA BANKS SOLUTION

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-02	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Calc	Value	
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) -USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Relative Concentration
1	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.13	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

Date:	11/12/2025
Version:	1

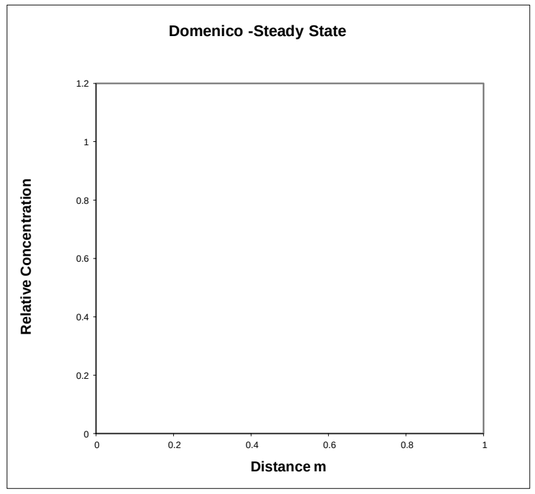
Contaminant trachloroethene

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	1.000E-02	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

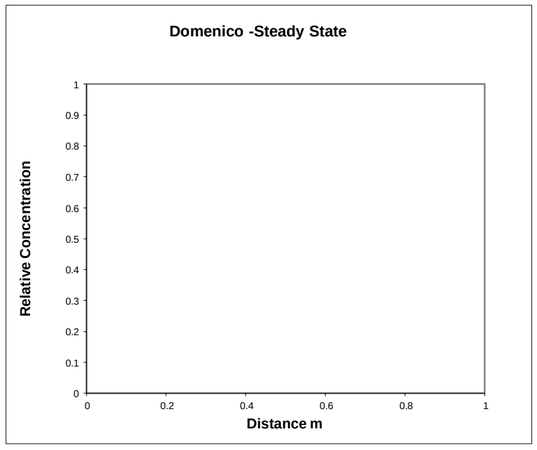


Calc	Value	Units
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Relative Concentration
1	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.25	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



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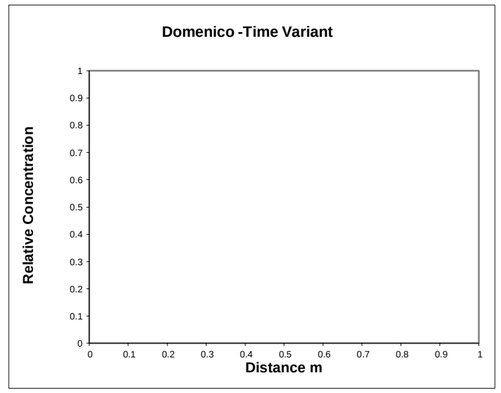
DOMENICO (TIME VARIANT)

Contaminant **trachloroethene**

Input	Value	Units
C_T	0.01	mg/l
DF	#DIV/0!	
λ	6.931E-101	$days^{-1}$
Sz	0.000E+00	m
Sy	0.000E+00	m
Kd	0.000E+00	l/kg
ρ	0.000E+00	g/cm3
n	0.000E+00	
i	#DIV/0!	
K	0.000E+00	m/d
x	0.000E+00	m
z	0.000E+00	m
y	0.000E+00	m
t	1.000E+99	days
ax	0.000E+00	m
az	0.000E+00	m
ay	0.000E+00	m

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

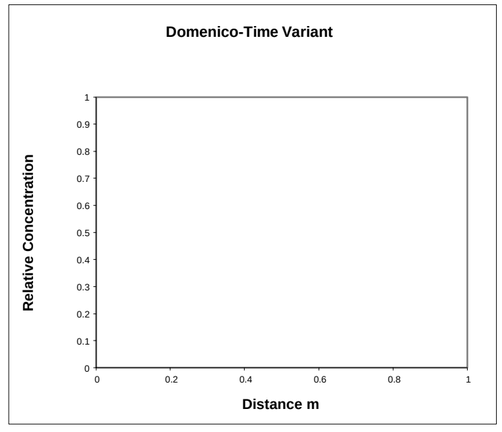
	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Calc	Value	
v	#DIV/0!	m/d
Rc	#DIV/0!	
u	#DIV/0!	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Relative Concentration
	m														
1	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
2	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
3	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
4	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
5	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
6	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
7	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
8	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
9	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
11	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
12	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
13	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
14	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
15	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
16	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
17	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
18	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
19	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
20	0	0.125	#DIV/0!	#DIV/0!	#DIV/0!	#####	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



Date:	11/12/2025
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OGATA BANKS SOLUTION

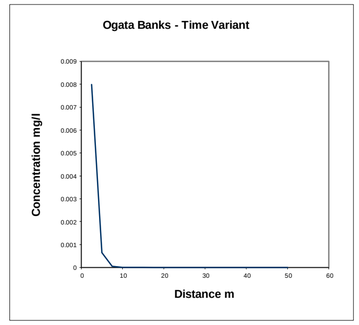
Contaminant Tetrachloroethene

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

Input	Value	Units
C_T	0.01	mg/l
Co	9.80E-02	mg/l
λ	2.95E-04	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	2.43E+02	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.01225	-2.5E+00	8.1E-02	-1.7E+48	2.000	3.0E+00	2.0E+01	1.7E+48	0.000	1.7E+01	1	-1.7E+01	-1	4.2E+00	1	-4.2E+00	-1	7.99E-03
2	5	0.01225	-5.0E+00	6.6E-03	-1.7E+48	2.000	6.0E+00	4.1E+02	1.7E+48	0.000	1.2E+01	1	-1.2E+01	-1	3.0E+00	1	-3.0E+00	-0.99997	6.51E-04
3	7.5	0.01225	-7.5E+00	5.4E-04	-1.7E+48	2.000	9.0E+00	8.3E+03	1.7E+48	0.000	9.7E+00	1	-9.7E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	5.30E-05
4	10	0.01225	-1.0E+01	4.4E-05	-1.7E+48	2.000	1.2E+01	1.7E+05	1.7E+48	0.000	8.4E+00	1	-8.4E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	4.31E-06
5	12.5	0.01225	-1.3E+01	3.6E-06	-1.7E+48	2.000	1.5E+01	3.4E+06	1.7E+48	0.000	7.5E+00	1	-7.5E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	3.49E-07
6	15	0.01225	-1.5E+01	2.9E-07	-1.7E+48	2.000	1.8E+01	6.9E+07	1.7E+48	0.000	6.8E+00	1	-6.8E+00	-1	1.7E+00	0.984	-1.7E+00	-0.98399	2.82E-08
7	17.5	0.01225	-1.8E+01	2.4E-08	-1.7E+48	2.000	2.1E+01	1.4E+09	1.7E+48	0.000	6.3E+00	1	-6.3E+00	-1	1.6E+00	0.9743	-1.6E+00	-0.97425	2.28E-09
8	20	0.01225	-2.0E+01	1.9E-09	-1.7E+48	2.000	2.4E+01	2.8E+10	1.7E+48	0.000	5.9E+00	1	-5.9E+00	-1	1.5E+00	0.963	-1.5E+00	-0.96302	1.83E-10
9	22.5	0.01225	-2.3E+01	1.6E-10	-1.7E+48	2.000	2.7E+01	5.7E+11	1.7E+48	0.000	5.6E+00	1	-5.6E+00	-1	1.4E+00	0.9508	-1.4E+00	-0.95078	1.48E-11
10	25	0.01225	-2.5E+01	1.3E-11	-1.7E+48	2.000	3.0E+01	1.1E+13	1.7E+48	0.000	5.3E+00	1	-5.3E+00	-1	1.3E+00	0.9379	-1.3E+00	-0.93792	1.19E-12
11	27.5	0.01225	-2.8E+01	1.1E-12	-1.7E+48	2.000	3.3E+01	2.3E+14	1.7E+48	0.000	5.1E+00	1	-5.1E+00	-1	1.3E+00	0.9247	-1.3E+00	-0.92475	9.53E-14
12	30	0.01225	-3.0E+01	8.6E-14	-1.7E+48	2.000	3.6E+01	4.7E+15	1.7E+48	0.000	4.8E+00	1	-4.8E+00	-1	1.2E+00	0.9115	-1.2E+00	-0.91147	7.66E-15
13	32.5	0.01225	-3.3E+01	7.0E-15	-1.7E+48	2.000	3.9E+01	9.5E+16	1.7E+48	0.000	4.7E+00	1	-4.7E+00	-1	1.2E+00	0.8982	-1.2E+00	-0.89824	6.15E-16
14	35	0.01225	-3.5E+01	5.7E-16	-1.7E+48	2.000	4.2E+01	1.9E+18	1.7E+48	0.000	4.5E+00	1	-4.5E+00	-1	1.1E+00	0.8852	-1.1E+00	-0.88517	4.94E-17
15	37.5	0.01225	-3.8E+01	4.6E-17	-1.7E+48	2.000	4.5E+01	3.9E+19	1.7E+48	0.000	4.3E+00	1	-4.3E+00	-1	1.1E+00	0.8723	-1.1E+00	-0.87233	3.97E-18
16	40	0.01225	-4.0E+01	3.8E-18	-1.7E+48	2.000	4.8E+01	7.9E+20	1.7E+48	0.000	4.2E+00	1	-4.2E+00	-1	1.0E+00	0.8598	-1.0E+00	-0.85979	3.18E-19
17	42.5	0.01225	-4.3E+01	3.1E-19	-1.7E+48	2.000	5.1E+01	1.6E+22	1.7E+48	0.000	4.1E+00	1	-4.1E+00	-1	1.0E+00	0.8476	-1.0E+00	-0.84756	2.56E-20
18	45	0.01225	-4.5E+01	2.5E-20	-1.7E+48	2.000	5.4E+01	3.2E+23	1.7E+48	0.000	4.0E+00	1	-4.0E+00	-1	9.8E-01	0.8357	-9.8E-01	-0.83567	2.06E-21
19	47.5	0.01225	-4.8E+01	2.0E-21	-1.7E+48	2.000	5.7E+01	6.5E+24	1.7E+48	0.000	3.8E+00	1	-3.8E+00	-1	9.6E-01	0.8241	-9.6E-01	-0.82412	1.65E-22
20	50	0.01225	-5.0E+01	1.7E-22	-1.7E+48	2.000	6.0E+01	1.3E+26	1.7E+48	0.000	3.8E+00	1	-3.8E+00	-1	9.3E-01	0.8129	-9.3E-01	-0.81292	1.33E-23

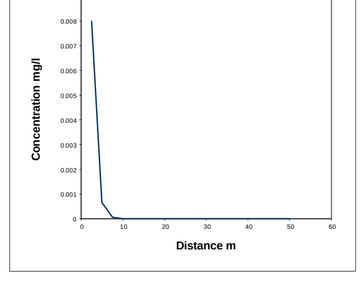


Calc **Value**

v	7.60E-02	m/d
Rc	1.56E+03	
u	4.89E-05	m/d

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4	EXP	Term 5	ERFC	Term 6a	ERF	Term 6b	ERF	Term 7a	ERF	Term 7b	ERF	Concentration
1	2.5	0.01225	-2.5E+00	8.1E-02	-1.7E+48	2.000	3.0E+00	2.0E+01	1.7E+48	0.000	1.7E+01	1	-1.7E+01	-1	8.3E+00	1	-8.3E+00	-1	7.99E-03
2	5	0.01225	-5.0E+00	6.6E-03	-1.7E+48	2.000	6.0E+00	4.1E+02	1.7E+48	0.000	1.2E+01	1	-1.2E+01	-1	5.9E+00	1	-5.9E+00	-1	6.51E-04
3	7.5	0.01225	-7.5E+00	5.4E-04	-1.7E+48	2.000	9.0E+00	8.3E+03	1.7E+48	0.000	9.7E+00	1	-9.7E+00	-1	4.8E+00	1	-4.8E+00	-1	5.30E-05
4	10	0.01225	-1.0E+01	4.4E-05	-1.7E+48	2.000	1.2E+01	1.7E+05	1.7E+48	0.000	8.4E+00	1	-8.4E+00	-1	4.2E+00	1	-4.2E+00	-1	4.32E-06
5	12.5	0.01225	-1.3E+01	3.6E-06	-1.7E+48	2.000	1.5E+01	3.4E+06	1.7E+48	0.000	7.5E+00	1	-7.5E+00	-1	3.7E+00	1	-3.7E+00	-1	3.52E-07
6	15	0.01225	-1.5E+01	2.9E-07	-1.7E+48	2.000	1.8E+01	6.9E+07	1.7E+48	0.000	6.8E+00	1	-6.8E+00	-1	3.4E+00	1	-3.4E+00	-1	2.87E-08
7	17.5	0.01225	-1.8E+01	2.4E-08	-1.7E+48	2.000	2.1E+01	1.4E+09	1.7E+48	0.000	6.3E+00	1	-6.3E+00	-1	3.2E+00	1	-3.2E+00	-0.99999	2.34E-09
8	20	0.01225	-2.0E+01	1.9E-09	-1.7E+48	2.000	2.4E+01	2.8E+10	1.7E+48	0.000	5.9E+00	1	-5.9E+00	-1	3.0E+00	1	-3.0E+00	-0.99997	1.91E-10
9	22.5	0.01225	-2.3E+01	1.6E-10	-1.7E+48	2.000	2.7E+01	5.7E+11	1.7E+48	0.000	5.6E+00	1	-5.6E+00	-1	2.8E+00	0.9999	-2.8E+00	-0.99992	1.55E-11
10	25	0.01225	-2.5E+01	1.3E-11	-1.7E+48	2.000	3.0E+01	1.1E+13	1.7E+48	0.000	5.3E+00	1	-5.3E+00	-1	2.6E+00	0.9998	-2.6E+00	-0.99981	1.26E-12
11	27.5	0.01225	-2.8E+01	1.1E-12	-1.7E+48	2.000	3.3E+01	2.3E+14	1.7E+48	0.000	5.1E+00	1	-5.1E+00	-1	2.5E+00	0.9996	-2.5E+00	-0.99963	1.03E-13
12	30	0.01225	-3.0E+01	8.6E-14	-1.7E+48	2.000	3.6E+01	4.7E+15	1.7E+48	0.000	4.8E+00	1	-4.8E+00	-1	2.4E+00	0.9993	-2.4E+00	-0.99934	8.40E-15
13	32.5	0.01225	-3.3E+01	7.0E-15	-1.7E+48	2.000	3.9E+01	9.5E+16	1.7E+48	0.000	4.7E+00	1	-4.7E+00	-1	2.3E+00	0.9989	-2.3E+00	-0.99893	6.84E-16
14	35	0.01225	-3.5E+01	5.7E-16	-1.7E+48	2.000	4.2E+01	1.9E+18	1.7E+48	0.000	4.5E+00	1	-4.5E+00	-1	2.2E+00	0.9984	-2.2E+00	-0.99839	5.57E-17
15	37.5	0.01225	-3.8E+01	4.6E-17	-1.7E+48	2.000	4.5E+01	3.9E+19	1.7E+48	0.000	4.3E+00	1	-4.3E+00	-1	2.2E+00	0.9977	-2.2E+00	-0.99769	4.54E-18
16	40	0.01225	-4.0E+01	3.8E-18	-1.7E+48	2.000	4.8E+01	7.9E+20	1.7E+48	0.000	4.2E+00	1	-4.2E+00	-1	2.1E+00	0.9968	-2.1E+00	-0.99682	3.69E-19
17	42.5	0.01225	-4.3E+01	3.1E-19	-1.7E+48	2.000	5.1E+01	1.6E+22	1.7E+48	0.000	4.1E+00	1	-4.1E+00	-1	2.0E+00	0.9958	-2.0E+00	-0.99579	3.01E-20
18	45	0.01225	-4.5E+01	2.5E-20	-1.7E+48	2.000	5.4E+01	3.2E+23	1.7E+48	0.000	4.0E+00	1	-4.0E+00	-1	2.0E+00	0.9946	-2.0E+00	-0.99459	2.45E-21
19	47.5	0.01225	-4.8E+01	2.0E-21	-1.7E+48	2.000	5.7E+01	6.5E+24	1.7E+48	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9932	-1.9E+00	-0.99321	1.99E-22
20	50	0.01225	-5.0E+01	1.7E-22	-1.7E+48	2.000	6.0E+01	1.3E+26	1.7E+48	0.000	3.8E+00	1	-3.8E+00	-1	1.9E+00	0.9917	-1.9E+00	-0.99167	1.62E-23



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	7.99E-03
5.0	6.51E-04
7.5	5.30E-05
10.0	4.32E-06
12.5	3.52E-07
15.0	2.87E-08
17.5	2.34E-09
20.0	1.91E-10
22.5	1.55E-11
25.0	1.26E-12
27.5	1.03E-13
30.0	8.40E-15
32.5	6.84E-16
35.0	5.57E-17
37.5	4.54E-18
40.0	3.69E-19
42.5	3.01E-20
45.0	2.45E-21
47.5	1.99E-22
50.0	1.62E-23

Contaminant **trachloroethene**

Input	Value	Units
C_T	0.01	mg/l
Co	9.80E-02	mg/l
λ	2.95E-04	$days^{-1}$
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	2.43E+02	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

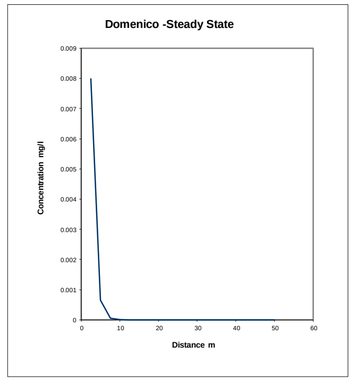
Vertical dispersion optio Simulate vertical dispersion in 1 direction

Calc	Value	
v	7.60E-02	m/d
Rc	1.56E+03	
u	4.89E-05	m/d

DOMENICO (STEADY STATE)

Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

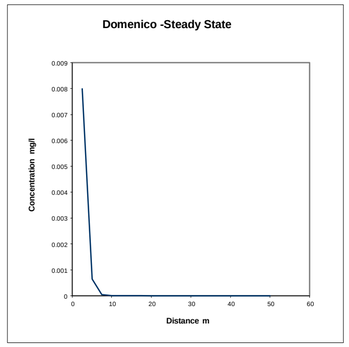
	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.0245	-2.51E+00	8.15E-02	1.68E+01	1	-1.68E+01	-1	4.17E+00	1	-4.17E+00	-1	7.99E-03
2	5	0.0245	-5.01E+00	6.64E-03	1.19E+01	1	-1.19E+01	-1	2.95E+00	1	-2.95E+00	-1	6.51E-04
3	7.5	0.0245	-7.52E+00	5.41E-04	9.68E+00	1	-9.68E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	5.30E-05
4	10	0.0245	-1.00E+01	4.41E-05	8.39E+00	1	-8.39E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	4.31E-06
5	12.5	0.0245	-1.25E+01	3.59E-06	7.50E+00	1	-7.50E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	3.49E-07
6	15	0.0245	-1.50E+01	2.93E-07	6.85E+00	1	-6.85E+00	-1	1.70E+00	0.984	-1.70E+00	-0.984	2.82E-08
7	17.5	0.0245	-1.76E+01	2.39E-08	6.34E+00	1	-6.34E+00	-1	1.58E+00	0.9743	-1.58E+00	-0.9743	2.28E-09
8	20	0.0245	-2.01E+01	1.94E-09	5.93E+00	1	-5.93E+00	-1	1.48E+00	0.963	-1.48E+00	-0.963	1.83E-10
9	22.5	0.0245	-2.26E+01	1.58E-10	5.59E+00	1	-5.59E+00	-1	1.39E+00	0.9508	-1.39E+00	-0.9508	1.48E-11
10	25	0.0245	-2.51E+01	1.29E-11	5.30E+00	1	-5.30E+00	-1	1.32E+00	0.9379	-1.32E+00	-0.9379	1.19E-12
11	27.5	0.0245	-2.76E+01	1.05E-12	5.06E+00	1	-5.06E+00	-1	1.26E+00	0.9247	-1.26E+00	-0.9247	9.53E-14
12	30	0.0245	-3.01E+01	8.57E-14	4.84E+00	1	-4.84E+00	-1	1.20E+00	0.9115	-1.20E+00	-0.9115	7.66E-15
13	32.5	0.0245	-3.26E+01	6.99E-15	4.65E+00	1	-4.65E+00	-1	1.16E+00	0.8982	-1.16E+00	-0.8982	6.15E-16
14	35	0.0245	-3.51E+01	5.69E-16	4.48E+00	1	-4.48E+00	-1	1.11E+00	0.8852	-1.11E+00	-0.8852	4.94E-17
15	37.5	0.0245	-3.76E+01	4.64E-17	4.33E+00	1	-4.33E+00	-1	1.08E+00	0.8723	-1.08E+00	-0.8723	3.97E-18
16	40	0.0245	-4.01E+01	3.78E-18	4.19E+00	1	-4.19E+00	-1	1.04E+00	0.8598	-1.04E+00	-0.8598	3.18E-19
17	42.5	0.0245	-4.26E+01	3.08E-19	4.07E+00	1	-4.07E+00	-1	1.01E+00	0.8476	-1.01E+00	-0.8476	2.56E-20
18	45	0.0245	-4.51E+01	2.51E-20	3.95E+00	1	-3.95E+00	-1	9.83E-01	0.8357	-9.83E-01	-0.8357	2.06E-21
19	47.5	0.0245	-4.76E+01	2.05E-21	3.85E+00	1	-3.85E+00	-1	9.57E-01	0.8241	-9.57E-01	-0.8241	1.65E-22
20	50	0.0245	-5.01E+01	1.67E-22	3.75E+00	1	-3.75E+00	-1	9.33E-01	0.8129	-9.33E-01	-0.8129	1.33E-23



DOMENICO (STEADY STATE)

Calculations for source located at top of aquifer (ie vertical dispersion in one direction) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3A	ERF	Term 3B	ERF	Term 4A	ERF	Term 4B	ERF	Concentration
1	2.5	0.0245	-2.51E+00	8.15E-02	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	7.99E-03
2	5	0.0245	-5.01E+00	6.64E-03	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	6.51E-04
3	7.5	0.0245	-7.52E+00	5.41E-04	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	5.30E-05
4	10	0.0245	-1.00E+01	4.41E-05	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	4.32E-06
5	12.5	0.0245	-1.25E+01	3.59E-06	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	3.52E-07
6	15	0.0245	-1.50E+01	2.93E-07	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	2.87E-08
7	17.5	0.0245	-1.76E+01	2.39E-08	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	2.34E-09
8	20	0.0245	-2.01E+01	1.94E-09	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	1.91E-10
9	22.5	0.0245	-2.26E+01	1.58E-10	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-0.9999	1.55E-11
10	25	0.0245	-2.51E+01	1.29E-11	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-0.9998	1.26E-12
11	27.5	0.0245	-2.76E+01	1.05E-12	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-0.9996	1.03E-13
12	30	0.0245	-3.01E+01	8.57E-14	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.9993	8.40E-15
13	32.5	0.0245	-3.26E+01	6.99E-15	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.9989	6.84E-16
14	35	0.0245	-3.51E+01	5.69E-16	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.9984	5.57E-17
15	37.5	0.0245	-3.76E+01	4.64E-17	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.9977	4.54E-18
16	40	0.0245	-4.01E+01	3.78E-18	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.9968	3.69E-19
17	42.5	0.0245	-4.26E+01	3.08E-19	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.9958	3.01E-20
18	45	0.0245	-4.51E+01	2.51E-20	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.9946	2.45E-21
19	47.5	0.0245	-4.76E+01	2.05E-21	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.9932	1.99E-22
20	50	0.0245	-5.01E+01	1.67E-22	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.9917	1.62E-23



Date:	11/12/2025
Version:	1

Values carried through to Level 3 Groundwater

x	Concentration
2.5	7.99E-03
5.0	6.51E-04
7.5	5.30E-05
10.0	4.32E-06
12.5	3.52E-07
15.0	2.87E-08
17.5	2.34E-09
20.0	1.91E-10
22.5	1.55E-11
25.0	1.26E-12
27.5	1.03E-13
30.0	8.40E-15
32.5	6.84E-16
35.0	5.57E-17
37.5	4.54E-18
40.0	3.69E-19
42.5	3.01E-20
45.0	2.45E-21
47.5	1.99E-22
50.0	1.62E-23

DOMENICO (TIME VARIANT)

Contaminant :trachloroethene

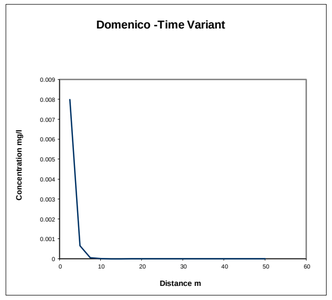
Input	Value	Units
C_T	0.01	mg/l
Co	9.80E-02	mg/l
λ	2.95E-04	days^{-1}
Sz	7.50E+01	m
Sy	5.90E+00	m
Kd	2.43E+02	l/kg
ρ	1.60E+00	g/cm3
n	2.50E-01	
i	4.40E-02	
K	4.32E-01	m/d
x	5.00E+01	m
z	0.00E+00	m
y	0.00E+00	m
t	9.90E+99	days
ax	5.00E+00	m
az	5.00E-01	m
ay	5.00E-02	m

Vertical dispersion option Simulate vertical dispersion in 1 direction

Calc	Value	
v	7.60E-02	m/d
Rc	1.56E+03	
u	4.89E-05	m/d

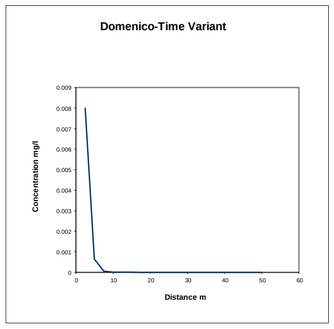
Calculations for source located in centre of aquifer (ie vertical dispersion in two directions)

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.01225	-2.51E+00	8.15E-02	-1.72E+48	2	1.68E+01	1	-1.68E+01	-1	4.17E+00	1	-4.17E+00	-1	7.99E-03
2	5	0.01225	-5.01E+00	6.64E-03	-1.72E+48	2	1.19E+01	1	-1.19E+01	-1	2.95E+00	1	-2.95E+00	-1	6.51E-04
3	7.5	0.01225	-7.52E+00	5.41E-04	-1.72E+48	2	9.68E+00	1	-9.68E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	5.30E-05
4	10	0.01225	-1.00E+01	4.41E-05	-1.72E+48	2	8.39E+00	1	-8.39E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	4.31E-06
5	12.5	0.01225	-1.25E+01	3.59E-06	-1.72E+48	2	7.50E+00	1	-7.50E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	3.49E-07
6	15	0.01225	-1.50E+01	2.93E-07	-1.72E+48	2	6.85E+00	1	-6.85E+00	-1	1.70E+00	0.984	-1.70E+00	-0.984	2.82E-08
7	17.5	0.01225	-1.76E+01	2.39E-08	-1.72E+48	2	6.34E+00	1	-6.34E+00	-1	1.58E+00	0.9743	-1.58E+00	-0.974	2.28E-09
8	20	0.01225	-2.01E+01	1.94E-09	-1.72E+48	2	5.93E+00	1	-5.93E+00	-1	1.48E+00	0.963	-1.48E+00	-0.963	1.83E-10
9	22.5	0.01225	-2.26E+01	1.58E-10	-1.72E+48	2	5.59E+00	1	-5.59E+00	-1	1.39E+00	0.9508	-1.39E+00	-0.951	1.48E-11
10	25	0.01225	-2.51E+01	1.29E-11	-1.72E+48	2	5.30E+00	1	-5.30E+00	-1	1.32E+00	0.9379	-1.32E+00	-0.938	1.19E-12
11	27.5	0.01225	-2.76E+01	1.05E-12	-1.72E+48	2	5.06E+00	1	-5.06E+00	-1	1.26E+00	0.9247	-1.26E+00	-0.925	9.53E-14
12	30	0.01225	-3.01E+01	8.57E-14	-1.72E+48	2	4.84E+00	1	-4.84E+00	-1	1.20E+00	0.9115	-1.20E+00	-0.911	7.66E-15
13	32.5	0.01225	-3.26E+01	6.99E-15	-1.72E+48	2	4.65E+00	1	-4.65E+00	-1	1.16E+00	0.8982	-1.16E+00	-0.898	6.15E-16
14	35	0.01225	-3.51E+01	5.69E-16	-1.72E+48	2	4.48E+00	1	-4.48E+00	-1	1.11E+00	0.8852	-1.11E+00	-0.885	4.94E-17
15	37.5	0.01225	-3.76E+01	4.64E-17	-1.72E+48	2	4.33E+00	1	-4.33E+00	-1	1.08E+00	0.8723	-1.08E+00	-0.872	3.97E-18
16	40	0.01225	-4.01E+01	3.78E-18	-1.72E+48	2	4.19E+00	1	-4.19E+00	-1	1.04E+00	0.8598	-1.04E+00	-0.86	3.18E-19
17	42.5	0.01225	-4.26E+01	3.08E-19	-1.72E+48	2	4.07E+00	1	-4.07E+00	-1	1.01E+00	0.8476	-1.01E+00	-0.848	2.56E-20
18	45	0.01225	-4.51E+01	2.51E-20	-1.72E+48	2	3.95E+00	1	-3.95E+00	-1	9.83E-01	0.8357	-9.83E-01	-0.836	2.06E-21
19	47.5	0.01225	-4.76E+01	2.05E-21	-1.72E+48	2	3.85E+00	1	-3.85E+00	-1	9.57E-01	0.8241	-9.57E-01	-0.824	1.65E-22
20	50	0.01225	-5.01E+01	1.67E-22	-1.72E+48	2	3.75E+00	1	-3.75E+00	-1	9.33E-01	0.8129	-9.33E-01	-0.813	1.33E-23



Calculations for source located at top of aquifer (ie vertical dispersion in one direction only) - USED FOR LEVEL ASSESSMENT

	X	Term 1	Term 2	EXP	Term 3	ERFC	Term 4A	ERF	Term 4B	ERF	Term 5A	ERF	Term 5B	ERF	Concentration
	m														
1	2.5	0.01225	-2.51E+00	8.15E-02	-1.72E+48	2	1.68E+01	1	-1.68E+01	-1	8.34E+00	1	-8.34E+00	-1	7.99E-03
2	5	0.01225	-5.01E+00	6.64E-03	-1.72E+48	2	1.19E+01	1	-1.19E+01	-1	5.90E+00	1	-5.90E+00	-1	6.51E-04
3	7.5	0.01225	-7.52E+00	5.41E-04	-1.72E+48	2	9.68E+00	1	-9.68E+00	-1	4.82E+00	1	-4.82E+00	-1	5.30E-05
4	10	0.01225	-1.00E+01	4.41E-05	-1.72E+48	2	8.39E+00	1	-8.39E+00	-1	4.17E+00	1	-4.17E+00	-1	4.32E-06
5	12.5	0.01225	-1.25E+01	3.59E-06	-1.72E+48	2	7.50E+00	1	-7.50E+00	-1	3.73E+00	1	-3.73E+00	-1	3.52E-07
6	15	0.01225	-1.50E+01	2.93E-07	-1.72E+48	2	6.85E+00	1	-6.85E+00	-1	3.41E+00	1	-3.41E+00	-1	2.87E-08
7	17.5	0.01225	-1.76E+01	2.39E-08	-1.72E+48	2	6.34E+00	1	-6.34E+00	-1	3.15E+00	1	-3.15E+00	-1	2.34E-09
8	20	0.01225	-2.01E+01	1.94E-09	-1.72E+48	2	5.93E+00	1	-5.93E+00	-1	2.95E+00	1	-2.95E+00	-1	1.91E-10
9	22.5	0.01225	-2.26E+01	1.58E-10	-1.72E+48	2	5.59E+00	1	-5.59E+00	-1	2.78E+00	0.9999	-2.78E+00	-1	1.55E-11
10	25	0.01225	-2.51E+01	1.29E-11	-1.72E+48	2	5.30E+00	1	-5.30E+00	-1	2.64E+00	0.9998	-2.64E+00	-1	1.26E-12
11	27.5	0.01225	-2.76E+01	1.05E-12	-1.72E+48	2	5.06E+00	1	-5.06E+00	-1	2.52E+00	0.9996	-2.52E+00	-1	1.03E-13
12	30	0.01225	-3.01E+01	8.57E-14	-1.72E+48	2	4.84E+00	1	-4.84E+00	-1	2.41E+00	0.9993	-2.41E+00	-0.999	8.40E-15
13	32.5	0.01225	-3.26E+01	6.99E-15	-1.72E+48	2	4.65E+00	1	-4.65E+00	-1	2.31E+00	0.9989	-2.31E+00	-0.999	6.84E-16
14	35	0.01225	-3.51E+01	5.69E-16	-1.72E+48	2	4.48E+00	1	-4.48E+00	-1	2.23E+00	0.9984	-2.23E+00	-0.998	5.57E-17
15	37.5	0.01225	-3.76E+01	4.64E-17	-1.72E+48	2	4.33E+00	1	-4.33E+00	-1	2.15E+00	0.9977	-2.15E+00	-0.998	4.54E-18
16	40	0.01225	-4.01E+01	3.78E-18	-1.72E+48	2	4.19E+00	1	-4.19E+00	-1	2.09E+00	0.9968	-2.09E+00	-0.997	3.69E-19
17	42.5	0.01225	-4.26E+01	3.08E-19	-1.72E+48	2	4.07E+00	1	-4.07E+00	-1	2.02E+00	0.9958	-2.02E+00	-0.996	3.01E-20
18	45	0.01225	-4.51E+01	2.51E-20	-1.72E+48	2	3.95E+00	1	-3.95E+00	-1	1.97E+00	0.9946	-1.97E+00	-0.995	2.45E-21
19	47.5	0.01225	-4.76E+01	2.05E-21	-1.72E+48	2	3.85E+00	1	-3.85E+00	-1	1.91E+00	0.9932	-1.91E+00	-0.993	1.99E-22
20	50	0.01225	-5.01E+01	1.67E-22	-1.72E+48	2	3.75E+00	1	-3.75E+00	-1	1.87E+00	0.9917	-1.87E+00	-0.992	1.62E-23



Date:	11/12/2025
Version:	1

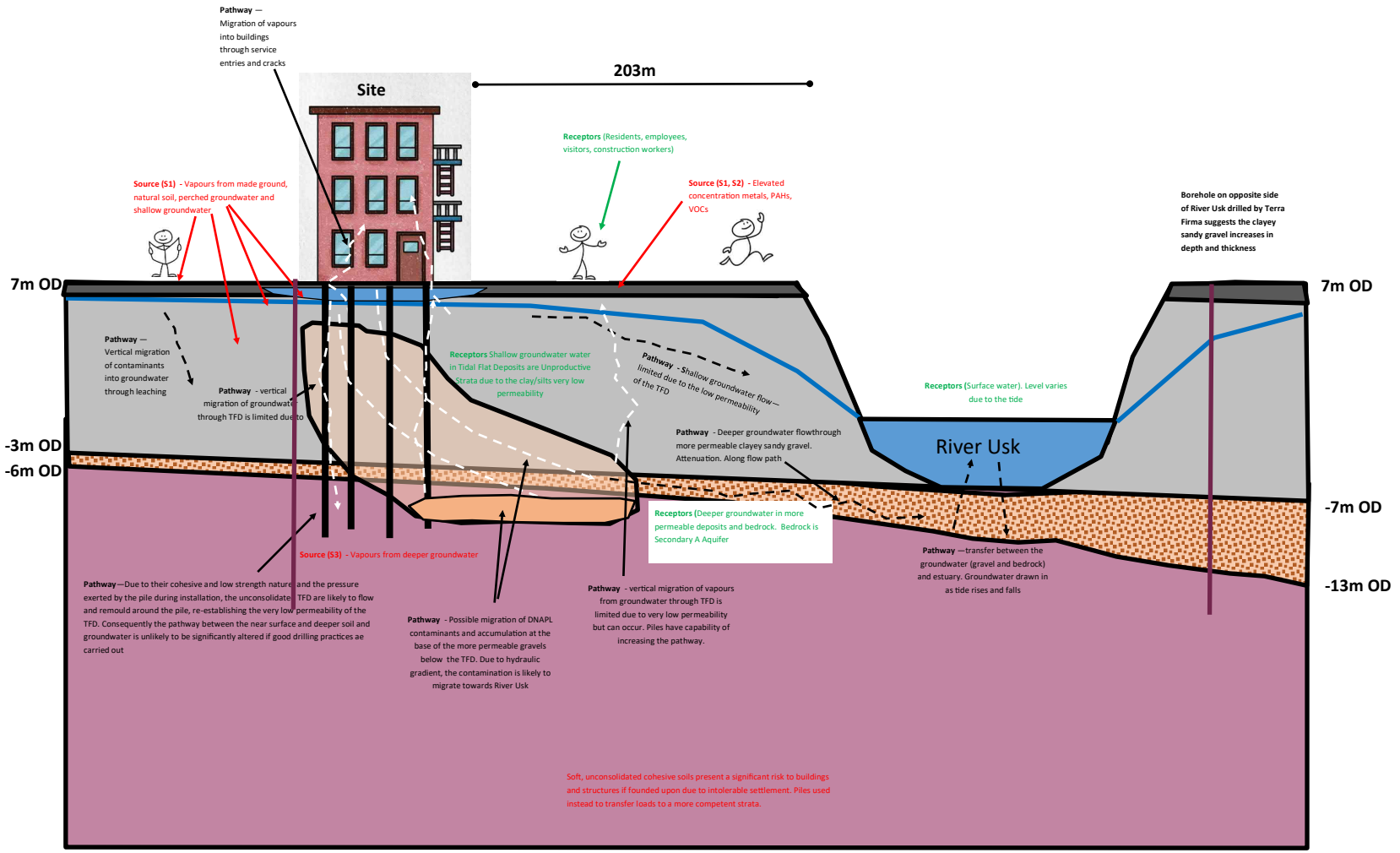
Values carried through to Level 3 Groundwater

x	Concentration
2.5	7.99E-03
5.0	6.51E-04
7.5	5.30E-05
10.0	4.32E-06
12.5	3.52E-07
15.0	2.87E-08
17.5	2.34E-09
20.0	1.91E-10
22.5	1.55E-11
25.0	1.26E-12
27.5	1.03E-13
30.0	8.40E-15
32.5	6.84E-16
35.0	5.57E-17
37.5	4.54E-18
40.0	3.69E-19
42.5	3.01E-20
45.0	2.45E-21
47.5	1.99E-22
50.0	1.62E-23

DRAWINGS



Site Name: Land off Kelvedon street, Newport
Project Number: 13203
Drawing Title: Exploratory Hole Layout
Drawing Number: 01
Scale: Not to scale



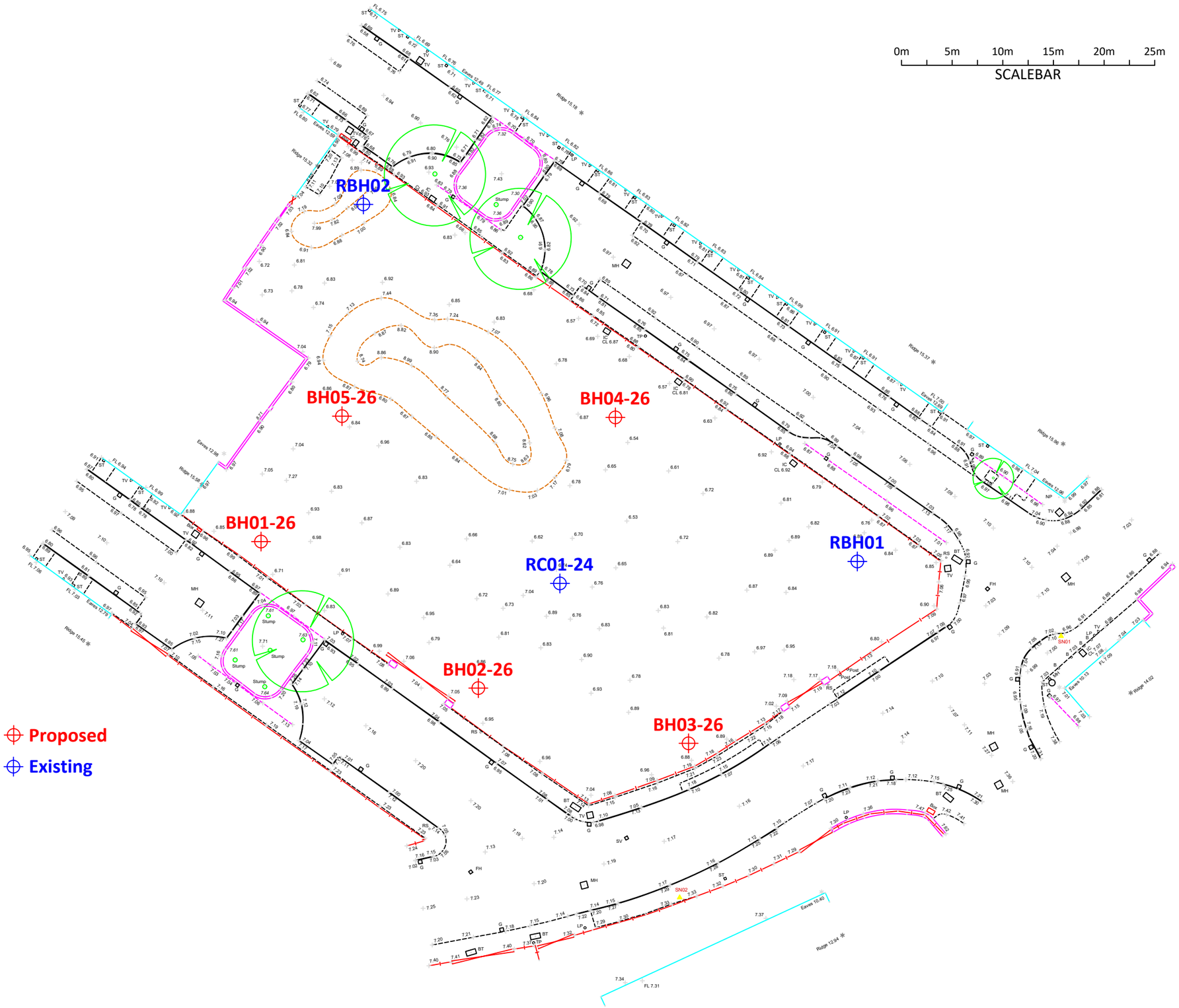
Site Name: Land off Kelvedon street, Newport

Project Number: 13203

Drawing Title: Conceptual site Model

Drawing Number: 02

Scale: Not to scale



terra firma earth matters
5 Deryn Court, Wharfedale Road, Pentwyn, Cardiff
TEL: 02920 735354

Site:
Land off Kelvedon Street, Newport

Project No:
13203

Scale:
1:250 (at A3 size)

Drawing 03

Proposed and Existing Groundwater Monitoring Locations



TFW Group Ltd, 5 Deryn Court, Wharfedale Road, Pentwyn, Cardiff. CF23 7HA
Tel: 033 022 36380 **Email**: hello@tfwgroup.co.uk **www.tfwgroup.co.uk**