Appendix 6.4

Modelling of PCDD/F Intake for Ringaskiddy Waste to Energy Facility 2015 by AWN (2015)

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MODELLING OF PCDD/F INTAKE FOR RINGASKIDDY RESOURCE RECOVERY CENTRE 2015

Technical Report Prepared For

Arup Consulting Engineers

Technical Report Prepared By

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Our Reference

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EXECUTIVE SUMMARY

Soil sampling and ambient air monitoring data, was used to establish a baseline for PCDD/F (hereafter referred to as 'dioxins and furans') intake for a theoretical Maximum At Risk Individual (MARI) in the vicinity of the proposed Ringaskiddy Waste to Energy plant.

The MARI was assumed to live at the point of maximum dioxin and furan deposition from the proposed development and to be a subsistence farmer, who obtained all their meat, milk and vegetables from a 100m diameter site, upon which the maximum deposition flux impacted.

The annual average dioxin and furan emissions under maximum operating conditions (worst case emissions) and assuming that both municipal solid waste and hazardous waste facilities were operating at maximum permitted dioxin concentration in the flue gas, maximum permitted flue gas exhaust flow rates and maximum throughput, were used to model soil PCDD/F concentrations over the operating life of the facility.

This was a very conservative assumption as it assumed the plant operated 24 hours per day, 365 days per year at the maximum emission concentration and flue gas flow rate.

The modelled soil and air values were then added to the baseline value for dioxin and furans and input to the RISC HUMAN Model.

The predicted increase in dioxin and furan intake for the MARI was determined to be only 2.2% of the EC TWI of 14 pg WHO-TEQ /kg body weight. The TWI was set by the EU in order to protect human health and was based on applying a safety factor to the LOAEL (Lowest Observed Abnormal Effect Levels) for dioxin and furans.

It was therefore concluded that the proposed municipal solid waste and hazardous waste-to-energy facilities will have no significant impact on dioxin and furan intake for even the theoretical MARI and that, with respect to dioxin and furan intake, the facility will have no impact on human health.

Report Prepared By: **Report Checked By:**

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CONTENTS

1.0 INTRODUCTION

AWN Consulting was instructed by Arup Consulting Engineers, on behalf of Indaver Ireland, to undertake a mathematical modelling study to assess the potential impact of dioxin and furan emissions from the proposed Ringaskiddy Waste to Energy facility on human dioxin and furan intake.

2.0 MODELLING PHILOSOPHY

It was proposed to model the impact of the emissions on human health and the environment following the methodology defined by the US EPA for hazardous waste facilities [1].

The modelling philosophy was as follows:

Develop a (Conceptual Site Model) CSM to assess the potential dietary intake of dioxin and furans for the theoretical Maximum at Risk Individual (MARI);

Select most appropriate background soil and ambient air dioxin and furan concentration;

Model dioxin and furan intake using background concentrations in soil and air;

Obtain data on deposition rates for dioxin and furans from proposed WTE facility (assuming municipal waste to energy and hazardous waste facilities operating simultaneously and at maximum licensed limits) ;

Model impact of deposition rates on soil concentrations of dioxin and furans over 30 year operating life of facility;

Model increase in ambient air concentrations;

Model impact of facility related dioxin and furan deposition rates and increased ambient air concentrations on dietary intake of dioxin and furans for the MARI.

3.0 CONCEPTUAL SITE MODEL AND MAXIMUM AT RISK INDIVIDUAL

3.1 Conceptual Site Model

The Conceptual Site Model (CSM) was developed, using the methodology presented in the relevant US EPA Modelling Guidance [1].

The methodology chosen also follows the UK recommended methodology "Risk Assessment of Dioxin Releases from Municipal Waste Incineration Processes, HMIP/CPR2/41/1/181, London 1996" in that it considers all likely pathways for dioxin and furan intake in a human and examines the impact of dioxin and furan deposition rate on soil dioxin and furan concentrations and subsequently food dioxin and furan concentrations.

The UK methodology uses the concept of the Hypothetically Maximum Exposed Individual (HMEI), in which the individual is assumed to live in the area of predicted maximum impact from the WTE facility and whose entire food intake is also assumed to be from this area (worst case scenario).

The US EPA Methodology uses the concept of the MARI (Maximum at Risk Individual), which is identical to the HMEI. The US EPA Methodology was chosen as it includes a mathematical model which allows calculation of average dioxin and furan concentrations over the lifetime of the facility, taking into account the natural processes which affect dioxin and furan concentrations in the soil over time, such as leaching, volatilisation and degradation.

Background concentrations of the 17 PCDD/F of interest are principally transferred to a human receptor by the following pathways (It should be noted that there are 75 polychlorinated dibenzo-p-dioxins and 135 polychlorinated dibenzo furans and only 17 of these have been shown to be toxic to laboratory animals, hence these 17 are considered appropriate for further assessment).

- Inhalation indoor air
- Inhalation outdoor air
- Ingestion of soil

- Dermal contact with soil
- Inhalation of soil dust
- Ingestion of drinking water
- Dermal contact with shower water
- Inhalation of water vapour in the shower
- Ingestion of meat
- Ingestion of milk
- Ingestion of vegetables
- Ingestion of surface water
- Ingestion of suspended matter in water
- Dermal contact with surface water

The CSM assumes all of the dioxin and furans emitted deposited on the ground and is available for uptake, apart from the fractions which are removed through volatilisation, surface water run off, erosion and degradation. These elements are calculated for each of the 17 dioxin and furan congeners.

The CSM then assumes the remainder of the dioxin and furans deposited is available for uptake through the pathways listed above.

The group of 17 dioxin and furan congeners vary widely in molecular weight and chemical characteristics and behave quite differently with respect to the fraction which absorbs to soil, is present in the vapour phase or accumulates in meat or milk. It is therefore not valid to model the dioxin and furan concentrations as I-TEQ values and each congener must be modelled separately.

3.2 Maximum At Risk Individual (MARI)

In order to conduct a conservative assessment of the potential impact of dioxin and furan emissions on a theoretical individual, the following assumptions were made for the MARI (these assumptions are based on the MARI as used by the US EPA for hazardous waste facility assessment) [1].

- The MARI lives at the point where the dioxin and furan deposition rate predicted to be generated by the facility when operating at maximum capacity impacts on the ground.

- The MARI is a subsistence farmer, who spends 16 hours per day, 7 days per week, 50 weeks per year outside in the field where the deposition occurs;

- The MARI spends 6 years as a child and 60 years as an adult living on the site;

- The MARI only eats vegetables grown on this soil, milk from a cow grazing on the site and meat from cattle raised on the site;

4.0 SOIL AND AMBIENT AIR BACKGROUND CONCENTRATIONS

Soil concentrations

A monitoring survey conducted by AWN found the background soil dioxin concentration in the immediate vicinity of the Ringaskiddy Waste to Energy site in the area likely to be the close to the location of maximum deposition was Sampling Site E, which is located on the high ground adjacent to the Ringaskiddy Waste to Energy Plant site The measured PCDD/F Concentration for this site was 0.3 ng/kg I-TEQ. It was proposed to use this concentration to define the baseline dioxin exposure for the MARI.

Ambient Air Concentrations

AWN also conducted an ambient air quality survey at the site, which is reported in the Air Chapter of the Ringaskiddy Waste to Energy EIS. The highest background air concentration measured was 0.0014 pg/m^3 TEQ. It was therefore decided that the ambient air dioxin concentration for the background on the site inhabited by the MARI would be 0.0014 pg/m^3 TEQ.

5.0 BASELINE PCDD/F INTAKE

5.1 Model Selection and Set up

The RISC Human Model Version 3.2 (May 2005) package was chosen to model intake of dioxin and furans. The model was developed by the Dutch National Institute of Public Health and Environmental Protection (RIVM), on behalf of the Dutch Ministry for Spatial Planning, Housing and the Environment and has been used to model the Dutch Soil standards for protection of human health [2].

The model consists of series of equations which allow each of the pathways listed in Section 3.1 to be modelled mathematically. The principal model variables used to calculate total exposure are presented as Attachment A.

The equations used to calculate each variable are presented in Attachment B.

The values selected for the model variables and the justification for selecting these values is presented as Attachment C.

The model data base contains many of the necessary chemical parameters such as the octanol-water coefficient, Henry's coefficient and the water solubility, which are necessary to model the behaviour of substances in soil and water environments. Where these parameters were not available from the model database, The Handbook of Physical Chemistry [3] and Appendices A – J of the US EPA Human Health and Ecological Risk Assessment Report [1] were used.

5.2 Model Results

The Model Output Report, for each of the 17 PCDD/F congeners for each intake pathway is presented as Attachment D. The modelled WHO TEF intake value for the MARI, in pg/kg body weight/day, is presented in Table 5.1.

	mg/kg/d	pg/kg/d	TEF	TEF	pg/kd/d	pg/kg/d
PCDD Congeners			NATO CCMS	WHO	NATO CCMS	WHO
2,3,7,8-TCDD	3.37E-11	3.37E-02	1	1	3.37E-02	3.37E-02
1,2,3,7,8-PeCDD	8.45E-11	8.45E-02	0.5	1	4.23E-02	8.45E-02
1,2,3,4,7,8-HxCDD	7.01E-11	7.01E-02	0.1	0.1	7.01E-03	7.01E-03
1,2,3,6,7,8-HxCDD	1.56E-10	1.56E-01	0.1	0.1	1.56E-02	1.56E-02
1,2,3,7,8,9-HxCDD	1.01E-10	1.01E-01	0.1	0.1	1.01E-02	1.01E-02
1,2,3,4,6,7,8-HpCDD	1.50E-09	1.50E+00	0.01	0.01	1.50E-02	1.50E-02
OCDD	1.18E-08	1.18E+01	0.001	0.0003	1.18E-02	3.54E-03
PCDF Congeners						
2,3,7,8-TCDF	3.04E-11	3.04E-02	0.1	0.1	3.04E-03	3.04E-03
1,2,3,7,8-PeCDF	6.90E-11	6.90E-02	0.05	0.03	3.45E-03	2.07E-03
2,3,4,7,8-PeCDF	6.09E-11	6.09E-02	0.5	0.3	3.05E-02	1.83E-02
1,2,3,4,7,8-HxCDF	2.50E-10	2.50E-01	0.1	0.1	2.50E-02	2.50E-02
1,2,3,6,7,8-HxCDF	1.99E-10	1.99E-01	0.1	0.1	1.99E-02	1.99E-02
1,2,3,7,8,9-HxCDF	6.61E-11	6.61E-02	0.1	0.1	6.61E-03	6.61E-03
2,3,4,6,7,8-HxCDF	2.74E-10	2.74E-01	0.1	0.1	2.74E-02	2.74E-02
1,2,3,4,6,7,8-HpCDF	1.44E-09	1.44E+00	0.01	0.01	1.44E-02	1.44E-02
1,2,3,4,7,8,9-HpCDF	1.95E-10	1.95E-01	0.01	0.01	1.95E-03	1.95E-03
OCDF	1.41E-09	1.41E+00	0.001	0.0003	1.41E-03	4.23E-04
pg/kg bw/day					0.269070	0.29
Base air						0.00035
Total						0.29
pg/kg bw/wk						2.02

Table 5.1 Modelled baseline PCDD/F intake for MARI– using WHO TEF

The total predicted background dose, combining both inhaled and ingested dioxin and furans is therefore 2.02 pg/kg body weight/week (WHO TEQ).

This is considerably less than the EU TWI value of 14 pg WHO-TEQ/kg body weight/wk (from Opinion of the Scientific Committee on the Risk Assessment of Dioxins and Dioxin-like PCBs in Food 22/11/2000 (SCF/CS/CNTMDIOXIN/ 8 Final)).

The TWI was set by the EU in order to protect human health and was based on applying a safety factor to the LOAEL (Lowest Observed Abnormal Effect Levels) for dioxin and furans.

6.0 DEPOSITION RATE OF PCDD/F FROM WTE EMISSIONS AND CALCULATION OF PREDICTED SOIL AND AIR CONCENTRATIONS

Air emissions from the proposed WTE facility were modelled by AWN Consulting, using the USEPA AERMOD Model, with the proposed municipal waste to energy and hazardous waste facilities operating at maximum capacity. Details of the modelling study are provided in the Air Quality Chapter of the EIS.

The annual predicted deposition rate under maximum operating conditions, assuming both municipal solid waste and hazardous waste facilities were operating simultaneously at maximum capacity (maximum exhaust gas flow rates and maximum permitted PCDD/F concentration of 0.1 ng/m^3 I-TEQ), for each of the 17 PCDD/F congeners was used to predict the soil concentration over the exposure duration period, by applying the model used by the US EPA for Assessment of Hazardous Waste Facilities [1].

The model enables increases in soil concentrations due to aerial deposition of dioxin and furans to be calculated, over a set time period and includes for natural processes such as volatilisation and sediment removal by surface water run-off, which reduce dioxin and furan concentrations in soil.

The model equation to predict the increase in soil concentration of dioxin and furans, resulting from aerial deposition is:

$$Sc_1 = \frac{Ds}{ks\ \ (Tc - T_1)} \left[\left(Tc + \frac{\exp(-ks\ \ Tc)}{ks} \right) - \left(T_1 + \frac{\exp(-ks\ \ T_1)}{ks} \right) \right] for\ 0 < T_1 < Tc$$

Equation terms are defined in Attachment E.

Ks, the soil loss constant due to all processes, is calculated using the following equation;

$$ks = ksl + kse + ksr + ksg + ksv$$

Equation terms and the equations used to calculate each of the “Ks” terms, are defined in Attachment F.

Ds, the dioxin and furan deposition term, expressed in terms of mg/kg/yr, is calculated as per Attachment G.

A radius of 50m was used to calculate the Ds values used in the modelling study. This assumes that the deposition occurs over a 100m diameter area, inside which the MARI spends all their time.

Tc, the time period over which the emissions occur, has been set at 30 years, as it has been assumed that the facility will have a 30 year operational lifetime
and T_1 = Tc – ED (where ED is the exposure duration).

The calculation of predicted soil concentration over the exposure period is presented as Attachment H.

Ambient air dioxin and furan concentrations were also modelled using the AERMOD model and were used to calculate the dioxin and furan intake from inhalation.

7.0 MODELLING OF IMPACT OF EMISSIONS ON PCDD/F INTAKE

The predicted ambient air concentrations and predicted soil concentrations were used to model the impact of WTE Emissions on dioxin and furan intake for the MARI, using the methodology and modelling tools outlined in Section 2.0 and Section 3.0 of this report.

The Model output, for each of the 17 PCDD/F congeners for each intake pathway is presented as Attachment J. The modelled dioxin and furan intake (for all ingestion sources) for the impact of emissions on dioxin and furan intake for the MARI, in pg/kg body weight/day, is presented in Table 7.1.

	mg/kg/d	pg/kg/d	TEF	TEF	pg/kd/d	pg/kg/d
PCDD Congeners			NATO CCMS	WHO	NATO CCMS	WHO
2,3,7,8-TCDD	5.20E-11	5.20E-02	1	1	5.20E-02	5.20E-02
1,2,3,7,8-PeCDD	8.41E-11	8.41E-02	0.5	1	4.21E-02	8.41E-02
1,2,3,4,7,8-HxCDD	7.44E-11	7.44E-02	0.1	0.1	7.44E-03	7.44E-03
1,2,3,6,7,8-HxCDD	1.58E-10	1.58E-01	0.1	0.1	1.58E-02	1.58E-02
1,2,3,7,8,9-HxCDD	1.13E-10	1.13E-01	0.1	0.1	1.13E-02	1.13E-02
1,2,3,4,6,7,8-HpCDD	1.50E-09	1.50E+00	0.01	0.01	1.50E-02	1.50E-02
OCDD	1.17E-08	1.17E+01	0.001	0.0003	1.17E-02	3.52E-03
PCDF Congeners						
2,3,7,8-TCDF	3.48E-11	3.48E-02	0.1	0.1	3.48E-03	3.48E-03
1,2,3,7,8-PeCDF	6.32E-11	6.32E-02	0.05	0.03	3.16E-03	1.90E-03
2,3,4,7,8-PeCDF	6.67E-11	6.67E-02	0.5	0.3	3.34E-02	2.00E-02
1,2,3,4,7,8-HxCDF	2.81E-10	2.81E-01	0.1	0.1	2.81E-02	2.81E-02
1,2,3,6,7,8-HxCDF	1.99E-10	1.99E-01	0.1	0.1	1.99E-02	1.99E-02
1,2,3,7,8,9-HxCDF	7.48E-11	7.48E-02	0.1	0.1	7.48E-03	7.48E-03
2,3,4,6,7,8-HxCDF	3.51E-10	3.51E-01	0.1	0.1	3.51E-02	3.51E-02
1,2,3,4,6,7,8-HpCDF	1.48E-09	1.48E+00	0.01	0.01	1.48E-02	1.48E-02
1,2,3,4,7,8,9-HpCDF	1.99E-10	1.99E-01	0.01	0.01	1.99E-03	1.99E-03
OCDF	1.60E-09	1.60E+00	0.001	0.0003	1.60E-03	4.81E-04
pg/kg bw/day					0.304314	0.32
Base air + Predicted						0.0003535
Total						0.32
pg/kg bw/wk						2.26

Table 7.1 Modelled WTE + baseline PCDD/F intake for MARI

The predicted dioxin and furan dose (for all exposure routes) was therefore estimated to increase by 0.24 pg WHO-TEQ/kg body weight/wk, to 2.26 WHO-TEQ/kg body weight/wk, an increase of 1.7% of the EC TWI limit value of 14 pg WHO-TEQ /kg body weight. The predicted dose is therefore well below applicable limit values for PCDD/F intake.

The TWI was set by the EU in order to protect human health and was based on applying a safety factor to the LOAEL (Lowest Observed Abnormal Effect Levels) for dioxin and furans.

8.0 CONCLUSIONS

It was concluded that the predicted impact of the emissions from the waste-to-energy facility, even assuming both municipal solid waste and hazardous waste facilities operating at maximum capacity, maximum permitted exhaust flow rates and maximum permitted dioxin and furan concentrations, in terms of dioxin and furan dose to a theoretical MARI, is not significant, with the dioxin and furan dose to the MARI predicted to increase by only 1.7 % of the limit value.

Based on a worst case scenario, the predicted dioxin and furan intake for the MARI was predicted to be well within the EU 14 pg WHO-TEQ /kg bw/wk value, a limit set for the protection of human health.

It can therefore be concluded that the proposed municipal solid waste and hazardous waste-to-energy facilities will have no significant impact on dioxin and furan intake for even the theoretical MARI and that, with respect to dioxin and furan intake, the facility will have no impact on human health.

9.0 REFERENCES

1. Human Health And Ecological Risk Assessment Support To The Development Of Technical Standards For Emissions From Combustion Units Burning Hazardous Waste, EPA Contract No. 68 - W6 – 0053, US EPA, Washington, July 1999.

2. Van Hall Institut, Leeuwarden/Groningen, for the Dutch National Institute of Public Health and Environmental Protection (RIVM), on behalf of the Dutch Ministry for Spatial Planning, Housing and the Environment, February 2000.

3. Illustrated Handbook of Physical-Chemical Properties and Environmental Fate for Organic Chemicals, Volume II, Polynuclear Aromatic Hydrocarbons, Polychlorinated Dioxins and Dibenzofurans, Mackay, D., Ying Shiu, W. and Chimg Ma, K., Lewis Publishers, Ann Arbor, Tokyo and London, 1995.

ATTACHMENTS A - J

ATTACHMENT A

Principal Model Variables

Total exposure:	Total exposure via relevant routes
Distribution over (soil) phases	Fugacity Mass fraction in soil phases Concentration in soil water Concentration in soil air Concentration in surface water Concentration in suspended matter
Evaporation from soil:	Diffusion coefficient Fluxes Dilution in outdoor air Concentration in outdoor air Concentration in indoor air
Drinking water:	Permeation through service pipes Concentration in drinking water Concentration in bathroom air
Plants:	Bioconcentration factors Concentration in plants through uptake Concentration in plants due to deposition Total concentration in plant
Meat and milk:	Time division cattle Uptake by cattle Concentration in meat and milk
Fish:	Bioconcentration factor fish Concentration in Fish
Time division	Time division Daily amount of soil ingested Daily amount of ingested surface water
Ingestion:	Ingestion of soil and dust Ingestion of vegetables Ingestion of meat Ingestion of milk Ingestion of drinking water Ingestion of surface water Ingestion of suspended matter Ingestion of fish
Dermal contact:	Dermal contact with soil and dust Dermal contact with surface water Dermal contact with shower water
Inhalation:	Inhalation of soil and dust Inhalation of indoor air Inhalation of outdoor air Inhalation of vapours shower water

ATTACHMENT B

MODEL EQUATIONS

$$Dose,a = \sum_{i=1}^{n} \text{exposure via selected routes. If all routes are selected:}$$
$$= IVo,a + IVi,a + IP,a + IVw,a + DA,a + DAw,a + DI,a + DIw,a + MIme,a + MImi,a + VI,a + DAsw,a + DIsw,a + DIsm,a + FI,a$$

$$Dose,c = \sum_{i=1}^{n} \text{exposure via selected routes. If all routes are selected:}$$
$$= IVo,c + IVi,c + IP,c + IVw,c + DA,c + DAw,c + DI,c + DIw,c + MIme,c + MImi,c + VI,c + DAsw,c + DIsw,c + DIsm,c + FI,c$$

$$Dose = (Dose,a * Ifta + Dose,c * Iftc)/ (Ifta + Iftc)$$

Element	Definition
Dose a	Dose adult
Dose c	Dose child
Dose	Intake mg/kg body weight/day
Ifta	Exposure period adult
Iftc	Exposure period child
IVi	Volume of air inhaled (indoor)
IVo	Volume of air inhaled (outdoor)
IP	Mass of inhaled particulates
IVw	Inhaled volume of water vapour shower
DAa	Dermal contact with soil and dust
DAw	Dermal contact shower water
Dlw	Ingestion of soil and dust
Mlme	Ingestion of meat
Mlmi	Ingestion of milk
Vl	Ingestion of leafy vegetables
DAsw	Dermal content surface water
Dlsw	Ingestion surface water
Dlsm	Ingestion suspended matter
Fl	Ingestion of fish

ATTACHMENT C

Justification for Selecting Model Variables

SOIL PARAMETERS

Soil temperature, soil water

Van den Berg, 1991

Berg, R. van den, 1991, *Blootstelling van de mens aan bodemverontreiniging. Een kwalitatieve en kwanitatieve analyse, leidend tot voorstellen voor humaan toxicologische C-toetsingswaarden*, RIVM reportnumber 725201006. In Dutch

Exposure of man to soil contamination. Proposals for human-toxicological soil standards as a result of an analysis on quantitative and qualitative aspects.

Capillary transition boundary

Explanation
The height of the capillary transition boundary above the groundwater table depends on soil properties. It can be calculated using the retention curve of the soil together with an average capillary rise of water, and the pressure head, corresponding to the air-entry value.

It can be calculated from pressure profiles, which are unique for each soil (De Laat, 1980). The pressure profiles give the relation between the height above the groundwater table (z) and the pressure-head (h) for different values of steady upward flow.
According to this method heights above the groundwater table of the capillary transition boundary can be assessed for different soil types:

Soil type	Arithmetic mean of: (see table above)	Clay (%)	Org. Matter (%)	z (cm)
Sand	B1, B2, B3, B4	< 8	0 - 15	50
Loam	B7, B8, B9	8 - 25	0 - 15	60
Clay	B10, B11, B12	25 - 100	0 - 15	20
Peat	B16, B17, B18	0 - 100	16 - 100	40

Explanation:
Proposed (rounded off downward) height (z) of the capillary transition boundary above the groundwater table for a steady upward water flow of 0.1 cm.d-1 for different soil classes.

De Laat, 1980

Laat PJM de (1980): Model for unsaturated flow above a shallow water-table; applied to a regional sub-surface flow problem. PhD Thesis, Wageningen Agricultural University, The Netherlands.

However, if more detailed soil research is available the first table can be applied.

The height of the capillary transition boundary, the depth of the groundwater table and the depth of crawl space beneath soil surface it determines the length of soil column.

Ls = (dg - z) - dc,volasoil

Ls length of soil column
dg depth of groundwater table
z height of the capillary transition boundary
dc,volasoil depth of crawl space beneath soil surface

Note: If the calculated length of the soil column is smaller than 0.01 m, the value 0.01 m is used. A negative value or a value of zero gives inaccurate results.

Air permeability of soil

Definition: air permeability of soil
Symbol: kappa
Unit: m2
Default: 3.2E-11
Range: 1E-07 - 1E-30
Reference: Waitz et al., 1996for comparison purposesExposure route: Inhalation of indoor air

Used to calculate
Air conductivity of soil

Change at:
Edit Case: Site parameters; Soil parameters
Edit Case: Measurements; Soil parameters
Edit Landuse: Parameters; Soil parameters

Explanation
The air permeability and the dynamic viscosity of air [6.0 * E-9 Pa.h] are used to calculate the air conductivity of soil. Air permeabilties depend on the type of soil. Values for this parameter can be found in various references. The permeability in the table below are determined at field capacity moisture content

Soil type	Permeability kappa m2	Reference
Coarse sand	1 E-10	Nazaroff et al., 1988; Sextro et al., 1986; Put and Meijer, 1985
Medium sand	3.2 E -11	Johnson and Ettinger, 1991; Ferguson et al., 1995
Fine sand	3.2 E -12	Johnson and Ettinger, 1991; Ferguson et al., 1995
Silty sand	3.2 E -13	Johnson and Ettinger, 1991; Ferguson et al., 1995
Silt	3.2 E -14	Johnson and Ettinger, 1991; Ferguson et al., 1995
Clay	1 E-16	Nazaroff et al., 1988; Sextro et al., 1986; Put and Meijer, 1985

Nazaroff et al., 1988

Nazaroff WW, Moed BA, Sextro RG (1988): Soil as a source of indoor radon: generation, migration, and entry, Chapter 2. In: Radon and its decay products in indoor air. Wiley-Interscience, New York, NY.

PARTICLES IN AIR

suspended particles – indoors

Hawley, 1985

Hawley, 1985, *Assessment of Health Risk from Exposure to Contaminated Soil*, Risk Analysis, vol 5, No. 4, p. 289-302.

INHALATION INDOOR AIR

Thickness of concrete slab minimum default value,

Veerkamp and ten Berge, 1994

Veerkamp, W. and W. ten Berge, 1994, *The concepts of HESP. Reference manual. Human exposure to soil pollutants*, versie 2.10a, Shell internationale Petroleum Maatschappij, The Hague.

Boundary layer – thickness of stagnant air layer between soil and air

Jury et al., 1983

Jury, W. A., W. F. Spencer and W. J. Farmer, 1983, *Behavior Assessment Model for Trace organics in Soil: I. Model description*, Journal of Environmental Quality, vol. 12, no. 4, p. 558-564.

INHALATION OF OUTDOOR AIR

Diameter of contaminated area

Van den Berg, 1991

Berg, R. van den, 1991, *Blootstelling van de mens aan bodemverontreiniging. Een kwalitatieve en kwanitatieve analyse, leidend tot voorstellen voor humaan toxicologische C-toetsingswaarden*, RIVM reportnumber 725201006. In Dutch

Exposure of man to soil contamination. Proposals for human-toxicological soil standards as a result of an analysis on quantitative and qualitative aspects.

Surface roughness

Definition:	A measure of roughness for the terrain. A high surface roughness means a large number of obstacles (for wind)
Symbol:	Zo
Unit:	m
Default:	1
Range:	0.03 -3
Reference:	Default, Van den Berg, 1991, Range: Wieringa and Rijkoort, 1983
Exposure route:	Inhalation of outdoor air

Used to calculate
Friction velocity
Wind velocity at respiration height

Change at:
Edit Case: Site parameters
Edit Landuse: Parameters

Explanation
The surface roughness length is used to convert the wind velocity at a height of 10 m (default value) to the wind velocity at respiration height. The surface roughness length is used in both steps of the calculation (calculation friction velocity and wind velocity at respiration height). The wind velocity at respiration height is used to calculate the dilution velocity and therefore the concentration in outdoor air at respiration height.
Factors which effect the surface roughness length:
- the height of the obstacles on the site
- the distance between obstacles on the site
- the amount of obstacles

Standard values for the surface roughness length for certain types of areas are stated below. Surface roughness lengths can be determined with the help of this list.

surface roughness length	description site
0.03	flat land with little vegetation (grass) and small obstacles, e.g.: runway, grass-land without hedges, fallow farm-land
0.1	farm-land with regular low crops, grass-land with ditches, scattered obstacles
0.25	farm-land with varying high and low crops. Large obstacles with distances between them of ± 15 times the obstacle height
0.5	groups of obstacles separated by open spaces, ± 10 times the obstacle height. For example scattered bushes, young (crowded) forest, orchards
1.0	ground regularly and completely covered with reasonably large obstacles, spaces between obstacles not larger than a couple of obstacle heights, e.g. forest, low-rise buildings in villages and cities.
2.0	city centres with varying low- and high-rise buildings.

A large surface roughness length implies many obstacles, which are higher than the respiration height. These obstacles influence the wind patterns to an extent of 20 times the surface roughness length above obstacle height and all wind velocities at respiration heights vary heavily. Only an indication of the wind velocity and concentration at respiration height can be given as a result of this.

Van den Berg, 1991

Berg, R. van den, 1991, *Blootstelling van de mens aan bodemverontreiniging. Een kwalitatieve en kwanitatieve analyse, leidend tot voorstellen voor humaan toxicologische C-toetsingswaarden*, RIVM reportnumber 725201006. In Dutch

Exposure of man to soil contamination. Proposals for human-toxicological soil standards as a result of an analysis on quantitative and qualitative aspects.

Wind velocity

Assumed neutral as per Van Den Bergh 1991

Wind velocity measured at height of 10m as per

Wieringa and Rijkoort, 1983

Wieringa, J. and P.J. Rijkoort, 1983, *Windklimaat van Nederland*, Koninklijk Nederlands Meteorologisch Instituut Klimaat van Nederland 2, Staatsuitgeverij, The Hague. In Dutch.

Wind characteristics of the Netherlands.

INGESTION OF VEGETABLES

Ratio dry weight fresh weight, stem

Definition: Ratio between the dry weight of leafy vegetables and the fresh weight (after harvest)
Symbol: kg dw. kg^{-1} fw
Unit: -
Default: 0.117
Range: 0 - 1
Reference: Bockting and van den Berg, 1992, calculated from data by Ng et al., 1982
Exposure route: Ingestion of vegetables, ingestion meat, ingestion milk

Used to calculate
Bioconcentration factors
Concentration in plant through uptake

Change at:
Edit Case: Site parameters
Edit Landuse: Parameters

Explanation
The ratio dry weight-fresh weight for stem is used to calculate the concentration in leafy vegetables (based on fresh weight). The concentration in leafy vegetables is the sum of the concentration (via deposition) and the concentration via uptake from the soil or the soil water. These concentrations are based on dry weight. The ratio dry weight-fresh weight is used to convert to fresh weight. The concentration in leafy vegetables has to be converted to fresh weight, because consumption data are based on fresh weight. For inorganic substances it is assumed that the concentration of contamination in the water in leafy vegetables equals the concentration in the soil water. This means that the concentration in leafy vegetables (based on fresh weight) equals the water content of the leafy vegetables times the soil water concentration, so:

(1- ratio dry weight-fresh weight) * soil water concentration.

For metals and organic substances a bioconcentration factor is used. Factors effecting the ratio dry weight-fresh weight stem:
- type of leafy vegetable
- the time between harvest and consumption

Bockting and van den Berg, 1992

Bockting, G. and R. van den Berg, 1992, *De accumulatie van sporenmetalen in groenten geteeld op verontreinigde bodems. Een literatuurstudie*, RIVM Reportnumber 725201009. In Dutch.

Accumulation of metals in vegetables cultivated on contaminated soils.

Yield

Nijs and Vermeire, 1990

Nijs, A.C.M de, and T.G.Vermeire, 1990, *Soil plant and plant-mammal transfer factors*, RIVM-reportnumber 670203001.

Grass Growth Period

Veerkamp and ten Berge, 1994

Veerkamp, W. and W. ten Berge, 1994, *The concepts of HESP. Reference manual. Human exposure to soi. pollutants*, versie 2.10a, Shell internationale Petroleum Maatschappij, The Hague.

Weathering Constant

Nijs and Vermeire, 1990

Nijs, A.C.M de, and T.G.Vermeire, 1990, *Soil plant and plant-mammal transfer factors* RIVM-reportnumber 670203001.

Fraction Of Particles Absorbed By The Plant

Van Den Berg 1991

Deposition Velocity

Van Den Berg 1991

CATTLE

Milk production 30 litres/day:

Veerkamp and ten Berge, 1994

Veerkamp, W. and W. ten Berge, 1994, *The concepts of HESP. Reference manual. Human exposure to soil pollutants*, versie 2.10a, Shell internationale Petroleum Maatschappij, The Hague.

Milk fat average 4% as per Irish EPA 2000 milk report

Consumption Of Food

***From*: IUNA North/South Ireland Food Consumption Survey: Food and Nutrient Intakes, Anthropometry, Attidudinal Data and Physical Activity Patterns, published by the Irish Universities Nutrition Alliance and The Food Safety Promotion Board, Abbey Court, Lower Abbey St, Dublin, 2001**

All values are Mean Consumption Data from a sample group that the Research team which prepared the report deemed a representative grouping (n = 1379) of adults (18 – 64 year old category) from the Republic of Ireland and Northern Ireland, who were assessed over the period 1997 – 1999. The Survey was one of the most comprehensive of its kind ever undertaken in Europe. The survey was jointly funded by the Department of Agriculture and Food, the Food Safety Authority and the Northern Ireland Centre for Diet and Health.

Consumption Rates - Adult

Leafy Vegetables = 0.118 kg/day

Tuberous vegetables = 0.225 kg/day

Meat = 0.179 kg/day

Milk = 0.243 kg/day

Assume child is 50% consumption of adult

Consumption Rates - Child

Leafy Vegetables = 0.059 kg/day

Tuberous vegetables = 0.112 kg/day

Meat = 0.089kg/day

Milk = 0.122 kg/day

Exposure To Soil And Air

Assume MARI works 16 hours per day 7 days per week 50 weeks per year outside, as both a child and an adult

ATTACHMENT D

BASELINE INTAKE MODEL REPORT

```
= Site =

Data from file: RINBSL4.loc
Name:  Indaver Ringaskiddy Baseline15
Code:

Description:
Scenario                Scenario 0
Characteristic          Standard Scenario
CSoilModel / VolaSoil: CSoilModel
Landuse                 none

Selected exposure routes on site level:
  inhalation indoor air
  inhalation outdoor air
  ingestion soil
  dermal contact soil
  inhalation soil
  ingestion drinking water
  dermal contact shower
  inhalation vapour shower
  ingestion milk
  ingestion meat
  ingestion vegetables
  ingestion surface water
  ingestion suspended matter
  dermal contact surface water

Changed parameters on site level:
Organic matter content [OS]
 4.6E+0       %
Justification
  Measured value for site
Depth of ground water table [Dg]
 3.0E+0       m
Justification
  Assumed value for groundwater in Ireland
Depth of contaminant below surface level [Dp.o]
 1.0E-2       m
Justification
  Assume contaminant at surface
Acidity [pH]
 6.3E+0       -
Justification
  Measured value for site
Height of capillary transition boundary above ground water table [z]
 2.0E-1       m
Justification
  De Laat et al
Air permeability of soil [kappa]
 1.0E-16      m2
Justification
  Nazaroff et al
Depth of contaminant below crawl space [Dp.b]
```

```
 1.0E-2       m
Justification
  Changed without justification
Organic matter content sediment [OSse]
 6.0E+0       %
Justification
  Changed without justification
Organic matter content suspended matter [OSsm]
 6.0E+0       %
Justification
  Changed without justification
Surface roughness [Zo]
 2.5E-1       m
Justification
  Van Den Bergh 1991
Fraction fat in milk [ffmi]
 4.0E-2       -
Justification
  Average value from EPA 2000 Milk Dioxin Report
Fraction ground water in drinking water cattle [fgcat]
 1.0E-2       -
Justification
  Assume minimum
Fraction surface water in drinking water cattle [fscat]
 9.9E-1       -
Justification
  Assume maximum surface water consumption by cattle
Weeks summer [wscat]
 4.9E+1       w.y-1
Justification
  Cattle outside for maximum amount of time
Daily consumption of leafy vegetables (adult) [Qvla]
 1.18E-1      kg fw.d-1
Justification
  safefood.ie survey 2001
Daily consumption of tuberous vegetables (adult) [Qvra]
 2.25E-1      kg fw.d-1
Justification
  Safefood.ie survey 2001
Daily consumption of meat (adult) [Qmea]
 1.79E-1      kg.d-1
Justification
  North/South SafeFood.ie Survey 2001
Daily consumption of milk (adult) [Qmia]
 2.43E-1      l.d-1
Justification
  North/South Food Survey 2001 Safefood.ie
Body weight (adult) [Wa]
 6.0E+1       kg
Justification
  Body weight from US EPA
Daily consumption of leafy vegetables (child) [Qvlc]
 5.9E-2       kg fw.d-1
Justification
  assume 50% of adult
Daily consumption of tuberous vegetables (child) [Qvrc]
 1.13E-1      kg fw.d-1
Justification
  Assume 50% of adult
Daily consumption of meat (child) [Qmec]
 8.95E-2      kg.d-1
Justification
```

```
  assume 50% of adult
Daily consumption of milk (child) [Qmic]
 1.21E-1      l.d-1
Justification
  Safefood.ie survey 2001



Subsite: Subsite 0
Selected exposure routes on subsite level:
  inhalation indoor air
  inhalation outdoor air
  ingestion soil
  dermal contact soil
  inhalation soil
  ingestion drinking water
  dermal contact shower
  inhalation vapour shower
  ingestion milk
  ingestion meat
  ingestion vegetables
  ingestion surface water
  ingestion suspended matter
  dermal contact surface water

Changed parameters on subsite level:
Floor open or concrete [floor]
 concrete     -
Justification
  Changed without justification

Fraction of crawl space (indoor air) [fbi]
 0.0E+0       -
Justification
  Changed without justification

Height of crawl space/basement [He]
 0.0E+0       m
Justification
  Changed without justification

Length of crawl space/basement [Le]
 0.0E+0       m
Justification
  Changed without justification

Width of crawl space/basement [Wi]
 0.0E+0       m
Justification
  Changed without justification

Ground water used as drinking water [fg]
 yes          -
Justification
  Changed without justification

Lenght of water pipe [Ll]
 1.0E+1       m
Justification
  Changed without justification
```

```
Fraction contaminated leafy vegetables (adult) [fla]
 1.0E+0       -
Justification
  Changed without justification

Fraction contaminated leafy vegetables (child) [flc]
 1.0E+0       -
Justification
  Changed without justification

Fraction contaminated tuberous vegetables (adult) [fta]
 1.0E+0       -
Justification
  Changed without justification

Fraction contaminated tuberous vegetables (child) [ftc]
 1.0E+0       -
Justification
  Changed without justification

Fraction contaminated meat (adult) [fmea]
 1.0E+0       -
Justification
  Changed without justification

Fraction contaminated milk (adult) [fmia]
 1.0E+0       -
Justification
  Changed without justification

Fraction contaminated milk (child) [fmic]
 1.0E+0       -
Justification
  Changed without justification

Fraction contaminated meat (child) [fmec]
 1.0E+0       -
Justification
  Changed without justification

Swimming frequency adult [Tdsa]
 0.0E+0       d.y-1
Justification
  Changed without justification

Swimming frequency child [Tdsc]
 0.0E+0       d.y-1
Justification
  Changed without justification

Ingested amount of surface water adult [IDswa]
 0.0E+0       l.d-1
Justification
  Changed without justification

Ingested amount of surface water child [IDswc]
 0.0E+0       l.d-1
Justification
  Changed without justification

Time swimming adult [Tsa]
 0.0E+0       h.d-1
```

Justification
Changed without justification

Time swimming child [Tsc]
0.0E+0 h.d-1
Justification
Changed without justification

Time division adult:

days off	winter	h/d	d/w	w/y	summer	h/d	d/w	w/y
inside dermal		0.0	0.0	0.0		0.0	0.0	0.0
outside inhalant		0.0	0.0	0.0		0.0	0.0	0.0
outside dermal		0.0	0.0	0.0		0.0	0.0	0.0
working days	winter	h/d	d/w	w/y	summer	h/d	d/w	w/y
inside dermal		0.0	0.0	0.0		0.0	0.0	0.0
outside inhalant		16.0	7.0	25.0		16.0	7.0	25.0
outside dermal		16.0	7.0	25.0		16.0	7.0	25.0
time inside sleeping	winter+ summer	h/d	d/w	w/y				
		8.0	7.0	50.0				

Justification
Assume farmer works 16 hours per day 7 days per week

Time division child:

days off	winter	h/d	d/w	w/y	summer	h/d	d/w	w/y
inside dermal		12.0	2.0	25.0		12.0	2.0	25.0
outside inhalant		0.0	0.0	0.0		0.0	0.0	0.0

outside dermal		0.0	0.0	0.0		0.0	0.0	0.0
working days	winter	h/d	d/w	w/y	summer	h/d	d/w	w/y
inside dermal		12.0	5.0	25.0		4.0	5.0	25.0
outside inhalant		0.0	0.0	0.0		8.0	5.0	25.0
outside dermal		0.0	0.0	0.0		8.0	5.0	25.0

time inside sleeping	winter+ summer	h/d	d/w	w/y
		12.0	7.0	50.0

Measurements
Code of measurement: Measurement 6
Substance: dioxine 1,2,3,4,6,7,8

Site

Concentration in soil	1.6E-5	mg.kg-1

Built on area:

Concentration in soil	1.6E-5	mg.kg-1

Open surface:

Concentration in soil	1.6E-5	mg.kg-1

Garden or cultivated area:

Concentration in soil	1.6E-5	mg.kg-1

Sediment:

Contactmedia:

Soil parameters:	Current	Default
Depth of contaminant below surface level	1.0E-2	1.25

Organic matter content	3.0E+0
10	
Bulk density	1.5E+0
1.5	
Fraction water in soil	2.0E-1
0.2	
Fraction air in soil	2.0E-1
0.2	
Acidity	6.0E+0
6	
Temperature of soil	2.83E+2
283	
Bulk density sediment	1.3E+0
1.3	
Organic matter content sediment	1.0E+1
10	
Fraction water in sediment	4.0E-1
0.4	
Bulk density suspended matter	1.3E+0
1.3	
Organic matter content suspended matter	2.0E+1
20	
Fraction water in suspended matter	4.0E-1
0.4	

Measurements
Code of measurement: Measurement 7
Substance: dioxine OCDD

Site

Concentration in soil	1.0E-4	mg.kg-1

Built on area:

Concentration in soil	1.0E-4	mg.kg-1

Open surface:

Concentration in soil	1.0E-4	mg.kg-1

Garden or cultivated area:

Concentration in soil	1.0E-4	mg.kg-1

Sediment:

Contactmedia:

Soil parameters:	Current	Default
Depth of contaminant below surface level	1.0E-2	1.25
Organic matter content	3.0E+0	10
Bulk density	1.5E+0	1.5
Fraction water in soil	2.0E-1	0.2
Fraction air in soil	2.0E-1	0.2
Acidity	6.0E+0	6
Temperature of soil	2.83E+2	283
Bulk density sediment	1.3E+0	1.3
Organic matter content sediment	1.0E+1	10
Fraction water in sediment	4.0E-1	0.4
Bulk density suspended matter	1.3E+0	1.3
Organic matter content suspended matter	2.0E+1	20
Fraction water in suspended matter	4.0E-1	0.4

Measurements
Code of measurement: Measurement 15
Substance: 1,2,3,4,6,7,8 HpCDF

Site

Concentration in soil	2.2E-6	mg.kg-1

Built on area:

Concentration in soil	2.2E-6	mg.kg-1

Open surface:

Concentration in soil	2.2E-6	mg.kg-1

Garden or cultivated area:

Concentration in soil	2.2E-6	mg.kg-1

Sediment:

Contactmedia:

Soil parameters:	Current	Default
Depth of contaminant below surface level	1.0E-2	1.25
Organic matter content	3.0E+0	10
Bulk density	1.5E+0	1.5
Fraction water in soil	2.0E-1	0.2
Fraction air in soil	2.0E-1	0.2
Acidity	6.0E+0	6
Temperature of soil	2.83E+2	283
Bulk density sediment	1.3E+0	1.3
Organic matter content sediment	1.0E+1	10
Fraction water in sediment	4.0E-1	0.4
Bulk density suspended matter	1.3E+0	1.3
Organic matter content suspended matter	2.0E+1	20
Fraction water in suspended matter	4.0E-1	0.4

Measurements
Code of measurement: Measurement 17
Substance: OCDF

Site

Concentration in soil	9.5E-6	mg.kg-1

Built on area:

Concentration in soil	9.5E-6	mg.kg-1

Open surface:

Concentration in soil	9.5E-6	mg.kg-1

Garden or cultivated area:

```
  Concentration in soil                    9.5E-6      mg.kg-1

Sediment:
-------------------------------------------------------------------------------

Contactmedia:
-------------------------------------------------------------------------------

Soil parameters:                                                  Current
Default
-------------------------------------------------------------------------------
 Depth of contaminant below surface level                         1.0E-2
1.25
 Organic matter content                                           3.0E+0
10
 Bulk density                                                     1.5E+0
1.5
 Fraction water in soil                                           2.0E-1
0.2
 Fraction air in soil                                             2.0E-1
0.2
 Acidity                                                          6.0E+0
6
 Temperature of soil                                              2.83E+2
283
 Bulk density sediment                                            1.3E+0
1.3
 Organic matter content sediment                                  1.0E+1
10
 Fraction water in sediment                                       4.0E-1
0.4
 Bulk density suspended matter                                    1.3E+0
1.3
 Organic matter content suspended matter                          2.0E+1
20
 Fraction water in suspended matter                               4.0E-1
0.4



Measurements
Code of measurement:     Measurement 1
Substance:               dioxine 1,2,3,6,7,8


Site
-------------------------------------------------------------------------------
  Concentration in soil                    6.1E-7      mg.kg-1

Built on area:
-------------------------------------------------------------------------------
  Concentration in soil                    6.1E-7      mg.kg-1

Open surface:
-------------------------------------------------------------------------------
```

Concentration in soil	6.1E-7	mg.kg-1

Garden or cultivated area:

Concentration in soil	6.1E-7	mg.kg-1

Sediment:

Contactmedia:

Soil parameters:	Current	Default
Depth of contaminant below surface level	1.0E-2	1.25
Organic matter content	4.6E+0	10
Bulk density	1.5E+0	1.5
Fraction water in soil	2.0E-1	0.2
Fraction air in soil	2.0E-1	0.2
Acidity	6.3E+0	6
Temperature of soil	2.83E+2	283
Bulk density sediment	1.3E+0	1.3
Organic matter content sediment	6.0E+0	10
Fraction water in sediment	4.0E-1	0.4
Bulk density suspended matter	1.3E+0	1.3
Organic matter content suspended matter	6.0E+0	20
Fraction water in suspended matter	4.0E-1	0.4

Measurements
Code of measurement: Measurement 2
Substance: dioxine 1,2,3,4,7,8

Site

Concentration in soil	7.8E-7	mg.kg-1

Built on area:

```
  Concentration in soil                    7.8E-7      mg.kg-1

Open surface:
--------------------------------------------------------------------------------
  Concentration in soil                    7.8E-7      mg.kg-1

Garden or cultivated area:
--------------------------------------------------------------------------------
  Concentration in soil                    7.8E-7      mg.kg-1

Sediment:
--------------------------------------------------------------------------------

Contactmedia:
--------------------------------------------------------------------------------

Soil parameters:                                                  Current
Default
--------------------------------------------------------------------------------
 Depth of contaminant below surface level                         1.0E-2
1.25
 Organic matter content                                           4.6E+0
10
 Bulk density                                                     1.5E+0
1.5
 Fraction water in soil                                           2.0E-1
0.2
 Fraction air in soil                                             2.0E-1
0.2
 Acidity                                                          6.3E+0
6
 Temperature of soil                                              2.83E+2
283
 Bulk density sediment                                            1.3E+0
1.3
 Organic matter content sediment                                  6.0E+0
10
 Fraction water in sediment                                       4.0E-1
0.4
 Bulk density suspended matter                                    1.3E+0
1.3
 Organic matter content suspended matter                          6.0E+0
20
 Fraction water in suspended matter                               4.0E-1
0.4



Measurements
Code of measurement:     Measurement 3
Substance:               2,3,7,8 TCDF


Site
--------------------------------------------------------------------------------
```

Concentration in soil	2.4E-7	mg.kg-1

Built on area:

Concentration in soil	2.4E-7	mg.kg-1

Open surface:

Concentration in soil	2.4E-7	mg.kg-1

Garden or cultivated area:

Concentration in soil	2.4E-7	mg.kg-1

Sediment:

Contactmedia:

Soil parameters:	Current	Default
Depth of contaminant below surface level	1.0E-2	1.25
Organic matter content	4.6E+0	10
Bulk density	1.5E+0	1.5
Fraction water in soil	2.0E-1	0.2
Fraction air in soil	2.0E-1	0.2
Acidity	6.3E+0	6
Temperature of soil	2.83E+2	283
Bulk density sediment	1.3E+0	1.3
Organic matter content sediment	6.0E+0	10
Fraction water in sediment	4.0E-1	0.4
Bulk density suspended matter	1.3E+0	1.3
Organic matter content suspended matter	6.0E+0	20
Fraction water in suspended matter	4.0E-1	0.4

Measurements
Code of measurement: Measurement 4
Substance: dioxine 2378 TeCDD

Site

Concentration in soil	3.0E-7	mg.kg-1

Built on area:

Concentration in soil	3.0E-7	mg.kg-1

Open surface:

Concentration in soil	3.0E-7	mg.kg-1

Garden or cultivated area:

Concentration in soil	3.0E-7	mg.kg-1

Sediment:

Contactmedia:

Soil parameters:	Current	Default
Depth of contaminant below surface level	1.0E-2	1.25
Organic matter content	4.6E+0	10
Bulk density	1.5E+0	1.5
Fraction water in soil	2.0E-1	0.2
Fraction air in soil	2.0E-1	0.2
Acidity	6.3E+0	6
Temperature of soil	2.83E+2	283
Bulk density sediment	1.3E+0	1.3
Organic matter content sediment	6.0E+0	10
Fraction water in sediment	4.0E-1	0.4
Bulk density suspended matter	1.3E+0	1.3
Organic matter content suspended matter	6.0E+0	20
Fraction water in suspended matter	4.0E-1	0.4

Measurements
Code of measurement: Measurement 5
Substance: dioxine 1,2,3,7,8-PeCDD

Site

Concentration in soil	3.0E-7	mg.kg-1

Built on area:

Concentration in soil	3.0E-7	mg.kg-1

Open surface:

Concentration in soil	3.0E-7	mg.kg-1

Garden or cultivated area:

Concentration in soil	3.0E-7	mg.kg-1

Sediment:

Contactmedia:

Soil parameters:	Current	Default
Depth of contaminant below surface level	1.0E-2	1.25
Organic matter content	4.6E+0	10
Bulk density	1.5E+0	1.5
Fraction water in soil	2.0E-1	0.2
Fraction air in soil	2.0E-1	0.2
Acidity	6.3E+0	6
Temperature of soil	2.83E+2	283
Bulk density sediment	1.3E+0	1.3
Organic matter content sediment	6.0E+0	10
Fraction water in sediment	4.0E-1	0.4
Bulk density suspended matter	1.3E+0	1.3

Organic matter content suspended matter	6.0E+0
20	
Fraction water in suspended matter	4.0E-1
0.4	

Measurements
Code of measurement: Measurement 8
Substance: dioxine 1,2,3,7,8,9

Site

Concentration in soil	3.0E-7	mg.kg-1

Built on area:

Concentration in soil	3.0E-7	mg.kg-1

Open surface:

Concentration in soil	3.0E-7	mg.kg-1

Garden or cultivated area:

Concentration in soil	3.0E-7	mg.kg-1

Sediment:

Contactmedia:

Soil parameters:	Current
Default	
Depth of contaminant below surface level	1.0E-2
1.25	
Organic matter content	4.6E+0
10	
Bulk density	1.5E+0
1.5	
Fraction water in soil	2.0E-1
0.2	
Fraction air in soil	2.0E-1
0.2	
Acidity	6.3E+0
6	
Temperature of soil	2.83E+2
283	
Bulk density sediment	1.3E+0
1.3	

Organic matter content sediment		6.0E+0
10		
Fraction water in sediment		4.0E-1
0.4		
Bulk density suspended matter		1.3E+0
1.3		
Organic matter content suspended matter		6.0E+0
20		
Fraction water in suspended matter		4.0E-1
0.4		

Measurements
Code of measurement: Measurement 9
Substance: 1,2,3,7,8 PeCDF

Site

Concentration in soil	3.0E-7	mg.kg-1

Built on area:

Concentration in soil	3.0E-7	mg.kg-1

Open surface:

Concentration in soil	3.0E-7	mg.kg-1

Garden or cultivated area:

Concentration in soil	3.0E-7	mg.kg-1

Sediment:

Contactmedia:

Soil parameters:	Current	Default
Depth of contaminant below surface level	1.0E-2	1.25
Organic matter content	4.6E+0	10
Bulk density	1.5E+0	1.5
Fraction water in soil	2.0E-1	0.2
Fraction air in soil	2.0E-1	0.2

Acidity	6.3E+0
6	
Temperature of soil	2.83E+2
283	
Bulk density sediment	1.3E+0
1.3	
Organic matter content sediment	6.0E+0
10	
Fraction water in sediment	4.0E-1
0.4	
Bulk density suspended matter	1.3E+0
1.3	
Organic matter content suspended matter	6.0E+0
20	
Fraction water in suspended matter	4.0E-1
0.4	

Measurements
Code of measurement: Measurement 10
Substance: 2,3,4,7,8 PeCDF

Site

Concentration in soil	3.0E-7	mg.kg-1

Built on area:

Concentration in soil	3.0E-7	mg.kg-1

Open surface:

Concentration in soil	3.0E-7	mg.kg-1

Garden or cultivated area:

Concentration in soil	3.0E-7	mg.kg-1

Sediment:

Contactmedia:

Soil parameters:	Current
Default	
Depth of contaminant below surface level	1.0E-2
1.25	
Organic matter content	4.6E+0
10	

Bulk density	1.5E+0
	1.5
Fraction water in soil	2.0E-1
	0.2
Fraction air in soil	2.0E-1
	0.2
Acidity	6.3E+0
	6
Temperature of soil	2.83E+2
	283
Bulk density sediment	1.3E+0
	1.3
Organic matter content sediment	6.0E+0
	10
Fraction water in sediment	4.0E-1
	0.4
Bulk density suspended matter	1.3E+0
	1.3
Organic matter content suspended matter	6.0E+0
	20
Fraction water in suspended matter	4.0E-1
	0.4

Measurements
Code of measurement: Measurement 11
Substance: 1,2,3,4,7,8 HxCDF

Site

Concentration in soil	3.0E-7	mg.kg-1

Built on area:

Concentration in soil	3.0E-7	mg.kg-1

Open surface:

Concentration in soil	3.0E-7	mg.kg-1

Garden or cultivated area:

Concentration in soil	3.0E-7	mg.kg-1

Sediment:

Contactmedia:

Soil parameters:	Current	Default

Depth of contaminant below surface level	1.0E-2
	1.25
Organic matter content	4.6E+0
	10
Bulk density	1.5E+0
	1.5
Fraction water in soil	2.0E-1
	0.2
Fraction air in soil	2.0E-1
	0.2
Acidity	6.3E+0
	6
Temperature of soil	2.83E+2
	283
Bulk density sediment	1.3E+0
	1.3
Organic matter content sediment	6.0E+0
	10
Fraction water in sediment	4.0E-1
	0.4
Bulk density suspended matter	1.3E+0
	1.3
Organic matter content suspended matter	6.0E+0
	20
Fraction water in suspended matter	4.0E-1
	0.4

Measurements
Code of measurement: Measurement 12
Substance: 1,2,3,6,7,8 HxCDF

Site

Concentration in soil	3.0E-7	mg.kg-1

Built on area:

Concentration in soil	3.0E-7	mg.kg-1

Open surface:

Concentration in soil	3.0E-7	mg.kg-1

Garden or cultivated area:

Concentration in soil	3.0E-7	mg.kg-1

Sediment:

Contactmedia:

Soil parameters:	Current	Default
Depth of contaminant below surface level	1.0E-2	1.25
Organic matter content	4.6E+0	10
Bulk density	1.5E+0	1.5
Fraction water in soil	2.0E-1	0.2
Fraction air in soil	2.0E-1	0.2
Acidity	6.3E+0	6
Temperature of soil	2.83E+2	283
Bulk density sediment	1.3E+0	1.3
Organic matter content sediment	6.0E+0	10
Fraction water in sediment	4.0E-1	0.4
Bulk density suspended matter	1.3E+0	1.3
Organic matter content suspended matter	6.0E+0	20
Fraction water in suspended matter	4.0E-1	0.4

Measurements
Code of measurement: Measurement 13
Substance: 2,3,4,6,7,8 Hp CDF

Site

Concentration in soil	3.0E-7	mg.kg-1

Built on area:

Concentration in soil	3.0E-7	mg.kg-1

Open surface:

Concentration in soil	3.0E-7	mg.kg-1

Garden or cultivated area:

Concentration in soil	3.0E-7	mg.kg-1

Sediment:

Contactmedia:

Soil parameters:	Current	Default
Depth of contaminant below surface level	1.0E-2	1.25
Organic matter content	4.6E+0	10
Bulk density	1.5E+0	1.5
Fraction water in soil	2.0E-1	0.2
Fraction air in soil	2.0E-1	0.2
Acidity	6.3E+0	6
Temperature of soil	2.83E+2	283
Bulk density sediment	1.3E+0	1.3
Organic matter content sediment	6.0E+0	10
Fraction water in sediment	4.0E-1	0.4
Bulk density suspended matter	1.3E+0	1.3
Organic matter content suspended matter	6.0E+0	20
Fraction water in suspended matter	4.0E-1	0.4

Measurements
Code of measurement: Measurement 14
Substance: 1,2,3,7,8,9 HxCDF

Site

Concentration in soil	3.0E-7	mg.kg-1

Built on area:

Concentration in soil	3.0E-7	mg.kg-1

Open surface:

Concentration in soil	3.0E-7	mg.kg-1

Garden or cultivated area:

Concentration in soil	3.0E-7	mg.kg-1

Sediment:

Contactmedia:

Soil parameters:	Current	Default
Depth of contaminant below surface level	1.0E-2	1.25
Organic matter content	4.6E+0	10
Bulk density	1.5E+0	1.5
Fraction water in soil	2.0E-1	0.2
Fraction air in soil	2.0E-1	0.2
Acidity	6.3E+0	6
Temperature of soil	2.83E+2	283
Bulk density sediment	1.3E+0	1.3
Organic matter content sediment	6.0E+0	10
Fraction water in sediment	4.0E-1	0.4
Bulk density suspended matter	1.3E+0	1.3
Organic matter content suspended matter	6.0E+0	20
Fraction water in suspended matter	4.0E-1	0.4

Measurements
Code of measurement: Measurement 16
Substance: 1,2,3,4,7,8,9 HpCDF

Site

Concentration in soil	3.0E-7	mg.kg-1

Built on area:

Concentration in soil	3.0E-7	mg.kg-1

Open surface:

Concentration in soil 3.0E-7 mg.kg-1

Garden or cultivated area:

Concentration in soil 3.0E-7 mg.kg-1

Sediment:

Contactmedia:

Soil parameters:	Current	Default
Depth of contaminant below surface level	1.0E-2	1.25
Organic matter content	4.6E+0	10
Bulk density	1.5E+0	1.5
Fraction water in soil	2.0E-1	0.2
Fraction air in soil	2.0E-1	0.2
Acidity	6.3E+0	6
Temperature of soil	2.83E+2	283
Bulk density sediment	1.3E+0	1.3
Organic matter content sediment	6.0E+0	10
Fraction water in sediment	4.0E-1	0.4
Bulk density suspended matter	1.3E+0	1.3
Organic matter content suspended matter	6.0E+0	20
Fraction water in suspended matter	4.0E-1	0.4

==== Result ====

Scenario: Scenario 0
Subsite: Subsite 0

= Uptake Table =

Measurement : Measurement 6
Substance : dioxine 1,2,3,4,6,7,8

Exposure per route (mg/(kg.d))

Exposure route	Child	Adult	Lifelong
inhalation indoor air	2.43E-16	5.96E-17	7.53E-17
inhalation outdoor air	2.87E-17	8.5E-17	8.02E-17
ingestion soil	1.6E-10	1.33E-11	2.59E-11
dermal contact soil	6.86E-12	2.04E-11	1.92E-11
inhalation soil	2.53E-13	1.49E-13	1.58E-13
ingestion drinking water	0.0E+0	0.0E+0	0.0E+0
dermal contact shower	0.0E+0	0.0E+0	0.0E+0
inhalation vapour shower	0.0E+0	0.0E+0	0.0E+0
ingestion milk	2.83E-9	1.42E-9	1.54E-9
ingestion meat	1.36E-8	6.81E-9	7.4E-9
ingestion vegetables	4.78E-9	2.39E-9	2.59E-9
ingestion surface water	0.0E+0	0.0E+0	0.0E+0
ingestion suspended matter	0.0E+0	0.0E+0	0.0E+0
dermal contact surface water	0.0E+0	0.0E+0	0.0E+0
Total exposure	2.14E-8	1.07E-8	1.16E-8

= Uptake Table =

Measurement : Measurement 7
Substance : dioxine OCDD

Exposure per route (mg/(kg.d))

Exposure route	Child	Adult	Lifelong
inhalation indoor air	2.78E-15	6.82E-16	8.61E-16
inhalation outdoor air	3.29E-16	9.72E-16	9.17E-16
ingestion soil	1.0E-9	8.33E-11	1.62E-10
dermal contact soil	4.28E-11	1.28E-10	1.2E-10
inhalation soil	1.58E-12	9.3E-13	9.85E-13
ingestion drinking water	0.0E+0	0.0E+0	0.0E+0
dermal contact shower	0.0E+0	0.0E+0	0.0E+0
inhalation vapour shower	0.0E+0	0.0E+0	0.0E+0
ingestion milk	1.77E-8	8.89E-9	9.65E-9
ingestion meat	8.52E-8	4.26E-8	4.62E-8
ingestion vegetables	4.16E-8	2.08E-8	2.26E-8
ingestion surface water	0.0E+0	0.0E+0	0.0E+0
ingestion suspended matter	0.0E+0	0.0E+0	0.0E+0

dermal contact surface water	0.0E+0	0.0E+0	0.0E+0
Total exposure	1.46E-7	7.25E-8	7.87E-8

= Uptake Table =

Measurement : Measurement 15
Substance : 1,2,3,4,6,7,8 HpCDF

Exposure per route (mg/(kg.d))

Exposure route	Child	Adult	Lifelong
inhalation indoor air	8.87E-17	2.18E-17	2.75E-17
inhalation outdoor air	1.05E-17	3.1E-17	2.93E-17
ingestion soil	2.2E-11	1.83E-12	3.56E-12
dermal contact soil	9.43E-13	2.81E-12	2.65E-12
inhalation soil	3.48E-14	2.05E-14	2.17E-14
ingestion drinking water	0.0E+0	0.0E+0	0.0E+0
dermal contact shower	0.0E+0	0.0E+0	0.0E+0
inhalation vapour shower	0.0E+0	0.0E+0	0.0E+0
ingestion milk	3.9E-10	1.96E-10	2.12E-10
ingestion meat	1.87E-9	9.37E-10	1.02E-9
ingestion vegetables	1.81E-10	9.05E-11	9.82E-11
ingestion surface water	0.0E+0	0.0E+0	0.0E+0
ingestion suspended matter	0.0E+0	0.0E+0	0.0E+0
dermal contact surface water	0.0E+0	0.0E+0	0.0E+0
Total exposure	2.47E-9	1.23E-9	1.33E-9

= Uptake Table =

Measurement : Measurement 17
Substance : OCDF

Exposure per route (mg/(kg.d))

Exposure route	Child	Adult	Lifelong
inhalation indoor air	2.53E-16	6.21E-17	7.85E-17

inhalation outdoor air	2.99E-17	8.86E-17	8.36E-17
ingestion soil	9.5E-11	7.92E-12	1.54E-11
dermal contact soil	4.07E-12	1.21E-11	1.14E-11
inhalation soil	1.5E-13	8.83E-14	9.36E-14
ingestion drinking water	0.0E+0	0.0E+0	0.0E+0
dermal contact shower	0.0E+0	0.0E+0	0.0E+0
inhalation vapour shower	0.0E+0	0.0E+0	0.0E+0
ingestion milk	1.68E-9	8.45E-10	9.17E-10
ingestion meat	8.09E-9	4.05E-9	4.39E-9
ingestion vegetables	7.12E-9	3.56E-9	3.87E-9
ingestion surface water	0.0E+0	0.0E+0	0.0E+0
ingestion suspended matter	0.0E+0	0.0E+0	0.0E+0
dermal contact surface water	0.0E+0	0.0E+0	0.0E+0
Total exposure	1.7E-8	8.47E-9	9.2E-9

= Uptake Table =

Measurement : Measurement 1
Substance : dioxine 1,2,3,6,7,8

Exposure per route (mg/(kg.d))

Exposure route	Child	Adult	Lifelong
inhalation indoor air	4.83E-17	1.18E-17	1.5E-17
inhalation outdoor air	5.71E-18	1.69E-17	1.59E-17
ingestion soil	6.1E-12	5.08E-13	9.88E-13
dermal contact soil	2.61E-13	7.78E-13	7.33E-13
inhalation soil	9.64E-15	5.67E-15	6.01E-15
ingestion drinking water	0.0E+0	0.0E+0	0.0E+0
dermal contact shower	0.0E+0	0.0E+0	0.0E+0
inhalation vapour shower	0.0E+0	0.0E+0	0.0E+0
ingestion milk	1.08E-10	5.42E-11	5.89E-11
ingestion meat	5.19E-10	2.6E-10	2.82E-10
ingestion vegetables	4.17E-10	2.09E-10	2.27E-10
ingestion surface water	0.0E+0	0.0E+0	0.0E+0
ingestion suspended matter	0.0E+0	0.0E+0	0.0E+0
dermal contact surface water	0.0E+0	0.0E+0	0.0E+0
Total exposure	1.05E-9	5.24E-10	5.69E-10

= Uptake Table =

Measurement : Measurement 2
Substance : dioxine 1,2,3,4,7,8

Exposure per route (mg/(kg.d))

Exposure route	Child	Adult	Lifelong
inhalation indoor air	6.17E-17	1.51E-17	1.91E-17
inhalation outdoor air	7.3E-18	2.16E-17	2.04E-17
ingestion soil	7.8E-12	6.5E-13	1.26E-12
dermal contact soil	3.34E-13	9.95E-13	9.38E-13
inhalation soil	1.23E-14	7.25E-15	7.69E-15
ingestion drinking water	0.0E+0	0.0E+0	0.0E+0
dermal contact shower	0.0E+0	0.0E+0	0.0E+0
inhalation vapour shower	0.0E+0	0.0E+0	0.0E+0
ingestion milk	1.38E-10	6.94E-11	7.53E-11
ingestion meat	6.64E-10	3.32E-10	3.61E-10
ingestion vegetables	5.34E-10	2.67E-10	2.9E-10
ingestion surface water	0.0E+0	0.0E+0	0.0E+0
ingestion suspended matter	0.0E+0	0.0E+0	0.0E+0
dermal contact surface water	0.0E+0	0.0E+0	0.0E+0
Total exposure	1.34E-9	6.7E-10	7.28E-10

= Uptake Table =

Measurement : Measurement 3
Substance : 2,3,7,8 TCDF

Exposure per route (mg/(kg.d))

Exposure route	Child	Adult	Lifelong
inhalation indoor air	5.82E-18	1.43E-18	1.8E-18
inhalation outdoor air	6.88E-19	2.04E-18	1.92E-18
ingestion soil	2.4E-12	2.0E-13	3.89E-13

dermal contact soil	1.03E-13	3.06E-13	2.89E-13
inhalation soil	3.79E-15	2.23E-15	2.37E-15
ingestion drinking water	0.0E+0	0.0E+0	0.0E+0
dermal contact shower	0.0E+0	0.0E+0	0.0E+0
inhalation vapour shower	0.0E+0	0.0E+0	0.0E+0
ingestion milk	1.36E-11	6.83E-12	7.41E-12
ingestion meat	3.75E-11	1.87E-11	2.03E-11
ingestion vegetables	3.33E-12	1.67E-12	1.81E-12
ingestion surface water	0.0E+0	0.0E+0	0.0E+0
ingestion suspended matter	0.0E+0	0.0E+0	0.0E+0
dermal contact surface water	0.0E+0	0.0E+0	0.0E+0
Total exposure	5.69E-11	2.77E-11	3.02E-11

= Uptake Table =

Measurement : Measurement 4
Substance : dioxine 2378 TeCDD

Exposure per route (mg/(kg.d))

Exposure route	Child	Adult	Lifelong
inhalation indoor air	2.75E-16	6.74E-17	8.52E-17
inhalation outdoor air	3.25E-17	9.61E-17	9.07E-17
ingestion soil	3.0E-12	2.5E-13	4.86E-13
dermal contact soil	1.29E-13	3.83E-13	3.61E-13
inhalation soil	4.74E-15	2.79E-15	2.96E-15
ingestion drinking water	0.0E+0	0.0E+0	0.0E+0
dermal contact shower	0.0E+0	0.0E+0	0.0E+0
inhalation vapour shower	0.0E+0	0.0E+0	0.0E+0
ingestion milk	5.32E-11	2.67E-11	2.9E-11
ingestion meat	2.48E-10	1.24E-10	1.35E-10
ingestion vegetables	1.71E-10	8.54E-11	9.27E-11
ingestion surface water	0.0E+0	0.0E+0	0.0E+0
ingestion suspended matter	0.0E+0	0.0E+0	0.0E+0
dermal contact surface water	0.0E+0	0.0E+0	0.0E+0
Total exposure	4.75E-10	2.37E-10	2.57E-10

= Uptake Table =

Measurement : Measurement 5
Substance : dioxine 1,2,3,7,8-PeCDD

Exposure per route (mg/(kg.d))

Exposure route	Child	Adult	Lifelong
inhalation indoor air	6.78E-17	1.66E-17	2.1E-17
inhalation outdoor air	8.01E-18	2.37E-17	2.24E-17
ingestion soil	3.0E-12	2.5E-13	4.86E-13
dermal contact soil	1.29E-13	3.83E-13	3.61E-13
inhalation soil	4.74E-15	2.79E-15	2.96E-15
ingestion drinking water	0.0E+0	0.0E+0	0.0E+0
dermal contact shower	0.0E+0	0.0E+0	0.0E+0
inhalation vapour shower	0.0E+0	0.0E+0	0.0E+0
ingestion milk	5.31E-11	2.67E-11	2.89E-11
ingestion meat	2.55E-10	1.28E-10	1.39E-10
ingestion vegetables	5.3E-10	2.65E-10	2.88E-10
ingestion surface water	0.0E+0	0.0E+0	0.0E+0
ingestion suspended matter	0.0E+0	0.0E+0	0.0E+0
dermal contact surface water	0.0E+0	0.0E+0	0.0E+0
Total exposure	8.42E-10	4.2E-10	4.56E-10

= Uptake Table =

Measurement : Measurement 8
Substance : dioxine 1,2,3,7,8,9

Exposure per route (mg/(kg.d))

Exposure route	Child	Adult	Lifelong
inhalation indoor air	2.32E-17	5.69E-18	7.2E-18
inhalation outdoor air	2.74E-18	8.12E-18	7.66E-18
ingestion soil	3.0E-12	2.5E-13	4.86E-13

dermal contact soil	1.29E-13	3.83E-13	3.61E-13
inhalation soil	4.74E-15	2.79E-15	2.96E-15
ingestion drinking water	0.0E+0	0.0E+0	0.0E+0
dermal contact shower	0.0E+0	0.0E+0	0.0E+0
inhalation vapour shower	0.0E+0	0.0E+0	0.0E+0
ingestion milk	5.31E-11	2.67E-11	2.89E-11
ingestion meat	2.55E-10	1.28E-10	1.39E-10
ingestion vegetables	2.05E-10	1.03E-10	1.11E-10
ingestion surface water	0.0E+0	0.0E+0	0.0E+0
ingestion suspended matter	0.0E+0	0.0E+0	0.0E+0
dermal contact surface water	0.0E+0	0.0E+0	0.0E+0
Total exposure	5.17E-10	2.58E-10	2.8E-10

= Uptake Table =

Measurement : Measurement 9
Substance : 1,2,3,7,8 PeCDF

Exposure per route (mg/(kg.d))

Exposure route	Child	Adult	Lifelong
inhalation indoor air	1.33E-17	3.26E-18	4.12E-18
inhalation outdoor air	1.57E-18	4.65E-18	4.38E-18
ingestion soil	3.0E-12	2.5E-13	4.86E-13
dermal contact soil	1.29E-13	3.83E-13	3.61E-13
inhalation soil	4.74E-15	2.79E-15	2.96E-15
ingestion drinking water	0.0E+0	0.0E+0	0.0E+0
dermal contact shower	0.0E+0	0.0E+0	0.0E+0
inhalation vapour shower	0.0E+0	0.0E+0	0.0E+0
ingestion milk	4.24E-11	2.13E-11	2.31E-11
ingestion meat	1.21E-10	6.06E-11	6.58E-11
ingestion vegetables	1.04E-11	5.21E-12	5.65E-12
ingestion surface water	0.0E+0	0.0E+0	0.0E+0
ingestion suspended matter	0.0E+0	0.0E+0	0.0E+0
dermal contact surface water	0.0E+0	0.0E+0	0.0E+0
Total exposure	1.77E-10	8.78E-11	9.54E-11

= Uptake Table =

Measurement : Measurement 10
Substance : 2,3,4,7,8 PeCDF

Exposure per route (mg/(kg.d))

Exposure route	Child	Adult	Lifelong
inhalation indoor air	4.89E-19	1.2E-19	1.52E-19
inhalation outdoor air	5.78E-20	1.71E-19	1.61E-19
ingestion soil	3.0E-12	2.5E-13	4.86E-13
dermal contact soil	1.29E-13	3.83E-13	3.61E-13
inhalation soil	4.74E-15	2.79E-15	2.96E-15
ingestion drinking water	0.0E+0	0.0E+0	0.0E+0
dermal contact shower	0.0E+0	0.0E+0	0.0E+0
inhalation vapour shower	0.0E+0	0.0E+0	0.0E+0
ingestion milk	4.24E-11	2.13E-11	2.31E-11
ingestion meat	1.21E-10	6.06E-11	6.58E-11
ingestion vegetables	1.04E-11	5.21E-12	5.65E-12
ingestion surface water	0.0E+0	0.0E+0	0.0E+0
ingestion suspended matter	0.0E+0	0.0E+0	0.0E+0
dermal contact surface water	0.0E+0	0.0E+0	0.0E+0
Total exposure	1.77E-10	8.78E-11	9.54E-11

= Uptake Table =

Measurement : Measurement 11
Substance : 1,2,3,4,7,8 HxCDF

Exposure per route (mg/(kg.d))

Exposure route	Child	Adult	Lifelong
inhalation indoor air	6.97E-18	1.71E-18	2.16E-18
inhalation outdoor air	8.24E-19	2.44E-18	2.3E-18

ingestion soil	3.0E-12	2.5E-13	4.86E-13
dermal contact soil	1.29E-13	3.83E-13	3.61E-13
inhalation soil	4.74E-15	2.79E-15	2.96E-15
ingestion drinking water	0.0E+0	0.0E+0	0.0E+0
dermal contact shower	0.0E+0	0.0E+0	0.0E+0
inhalation vapour shower	0.0E+0	0.0E+0	0.0E+0
ingestion milk	5.31E-11	2.67E-11	2.89E-11
ingestion meat	2.56E-10	1.28E-10	1.39E-10
ingestion vegetables	2.5E-11	1.25E-11	1.36E-11
ingestion surface water	0.0E+0	0.0E+0	0.0E+0
ingestion suspended matter	0.0E+0	0.0E+0	0.0E+0
dermal contact surface water	0.0E+0	0.0E+0	0.0E+0
Total exposure	3.37E-10	1.68E-10	1.82E-10

= Uptake Table =

Measurement : Measurement 12
Substance : 1,2,3,6,7,8 HxCDF

Exposure per route (mg/(kg.d))

Exposure route	Child	Adult	Lifelong
inhalation indoor air	6.97E-18	1.71E-18	2.16E-18
inhalation outdoor air	8.24E-19	2.44E-18	2.3E-18
ingestion soil	3.0E-12	2.5E-13	4.86E-13
dermal contact soil	1.29E-13	3.83E-13	3.61E-13
inhalation soil	4.74E-15	2.79E-15	2.96E-15
ingestion drinking water	0.0E+0	0.0E+0	0.0E+0
dermal contact shower	0.0E+0	0.0E+0	0.0E+0
inhalation vapour shower	0.0E+0	0.0E+0	0.0E+0
ingestion milk	5.31E-11	2.67E-11	2.89E-11
ingestion meat	2.56E-10	1.28E-10	1.39E-10
ingestion vegetables	2.5E-11	1.25E-11	1.36E-11
ingestion surface water	0.0E+0	0.0E+0	0.0E+0
ingestion suspended matter	0.0E+0	0.0E+0	0.0E+0
dermal contact surface water	0.0E+0	0.0E+0	0.0E+0

Total exposure	3.37E-10	1.68E-10	1.82E-10

= Uptake Table =

Measurement : Measurement 13
Substance : 2,3,4,6,7,8 Hp CDF

Exposure per route (mg/(kg.d))

Exposure route	Child	Adult	Lifelong
inhalation indoor air	7.89E-18	1.94E-18	2.45E-18
inhalation outdoor air	9.33E-19	2.76E-18	2.6E-18
ingestion soil	3.0E-12	2.5E-13	4.86E-13
dermal contact soil	1.29E-13	3.83E-13	3.61E-13
inhalation soil	4.74E-15	2.79E-15	2.96E-15
ingestion drinking water	0.0E+0	0.0E+0	0.0E+0
dermal contact shower	0.0E+0	0.0E+0	0.0E+0
inhalation vapour shower	0.0E+0	0.0E+0	0.0E+0
ingestion milk	5.31E-11	2.67E-11	2.89E-11
ingestion meat	2.55E-10	1.28E-10	1.39E-10
ingestion vegetables	1.61E-11	8.07E-12	8.77E-12
ingestion surface water	0.0E+0	0.0E+0	0.0E+0
ingestion suspended matter	0.0E+0	0.0E+0	0.0E+0
dermal contact surface water	0.0E+0	0.0E+0	0.0E+0
Total exposure	3.28E-10	1.63E-10	1.77E-10

= Uptake Table =

Measurement : Measurement 14
Substance : 1,2,3,7,8,9 HxCDF

Exposure per route (mg/(kg.d))

Exposure route	Child	Adult	Lifelong
inhalation indoor air	6.97E-18	1.71E-18	2.16E-18
inhalation outdoor air	8.24E-19	2.44E-18	2.3E-18

ingestion soil	3.0E-12	2.5E-13	4.86E-13
dermal contact soil	1.29E-13	3.83E-13	3.61E-13
inhalation soil	4.74E-15	2.79E-15	2.96E-15
ingestion drinking water	0.0E+0	0.0E+0	0.0E+0
dermal contact shower	0.0E+0	0.0E+0	0.0E+0
inhalation vapour shower	0.0E+0	0.0E+0	0.0E+0
ingestion milk	5.31E-11	2.67E-11	2.89E-11
ingestion meat	2.56E-10	1.28E-10	1.39E-10
ingestion vegetables	2.5E-11	1.25E-11	1.36E-11
ingestion surface water	0.0E+0	0.0E+0	0.0E+0
ingestion suspended matter	0.0E+0	0.0E+0	0.0E+0
dermal contact surface water	0.0E+0	0.0E+0	0.0E+0
Total exposure	3.37E-10	1.68E-10	1.82E-10

= Uptake Table =

Measurement : Measurement 16
Substance : 1,2,3,4,7,8,9 HpCDF

Exposure per route (mg/(kg.d))

Exposure route	Child	Adult	Lifelong
inhalation indoor air	9.71E-16	2.38E-16	3.01E-16
inhalation outdoor air	1.15E-16	3.4E-16	3.21E-16
ingestion soil	3.0E-12	2.5E-13	4.86E-13
dermal contact soil	1.29E-13	3.83E-13	3.61E-13
inhalation soil	4.74E-15	2.79E-15	2.96E-15
ingestion drinking water	0.0E+0	0.0E+0	0.0E+0
dermal contact shower	0.0E+0	0.0E+0	0.0E+0
inhalation vapour shower	0.0E+0	0.0E+0	0.0E+0
ingestion milk	5.31E-11	2.67E-11	2.9E-11
ingestion meat	2.56E-10	1.28E-10	1.39E-10
ingestion vegetables	2.54E-10	1.27E-10	1.38E-10
ingestion surface water	0.0E+0	0.0E+0	0.0E+0
ingestion suspended matter	0.0E+0	0.0E+0	0.0E+0
dermal contact surface water	0.0E+0	0.0E+0	0.0E+0

Total exposure 5.65E-10 2.82E-10 3.06E-10

= Risk Table =

Maximum Permissable Risk level

Measurement	Substance	Dose(mg/(kg.d))	RfD(mg/(kg.d))	Dose/RfD
Measurement 6	dioxine 1,2,3,4,6,7,8	1.16E-8	0.0E+0	-
Measurement 7	dioxine OCDD	7.87E-8	1.0E-8	7.87E+0
Measurement 15	1,2,3,4,6,7,8 HpCDF	1.33E-9	0.0E+0	-
Measurement 17	OCDF	9.2E-9	0.0E+0	-
Measurement 1	dioxine 1,2,3,6,7,8	5.69E-10	0.0E+0	-
Measurement 2	dioxine 1,2,3,4,7,8	7.28E-10	0.0E+0	-
Measurement 3	2,3,7,8 TCDF	3.02E-11	0.0E+0	-
Measurement 4	dioxine 2378 TeCDD	2.57E-10	1.0E-8	2.57E-2
Measurement 5	dioxine 1,2,3,7,8-PeCDD	4.56E-10	0.0E+0	-
Measurement 8	dioxine 1,2,3,7,8,9	2.8E-10	0.0E+0	-
Measurement 9	1,2,3,7,8 PeCDF	9.54E-11	0.0E+0	-
Measurement 10	2,3,4,7,8 PeCDF	9.54E-11	0.0E+0	-
Measurement 11	1,2,3,4,7,8 HxCDF	1.82E-10	0.0E+0	-
Measurement 12	1,2,3,6,7,8 HxCDF	1.82E-10	0.0E+0	-
Measurement 13	2,3,4,6,7,8 Hp CDF	1.77E-10	0.0E+0	-
Measurement 14	1,2,3,7,8,9 HxCDF	1.82E-10	0.0E+0	-
Measurement 16	1,2,3,4,7,8,9 HpCDF	3.06E-10	0.0E+0	-

RfD = Reference Dose

Indoor concentration in air

Measurement	Substance	Cia(µg/m3)	TCA(µg/m3)	Cia/TCA
Measurement 6	dioxine 1,2,3,4,6,7,8	5.38E-13	0.0E+0	-
Measurement 7	dioxine OCDD	6.16E-12	0.0E+0	-
Measurement 15	1,2,3,4,6,7,8 HpCDF	1.97E-13	0.0E+0	-
Measurement 17	OCDF	5.61E-13	0.0E+0	-
Measurement 1	dioxine 1,2,3,6,7,8	1.07E-13	0.0E+0	-
Measurement 2	dioxine 1,2,3,4,7,8	1.37E-13	0.0E+0	-
Measurement 3	2,3,7,8 TCDF	1.29E-14	0.0E+0	-
Measurement 4	dioxine 2378 TeCDD	6.09E-13	0.0E+0	-
Measurement 5	dioxine 1,2,3,7,8-PeCDD	1.5E-13	0.0E+0	-
Measurement 8	dioxine 1,2,3,7,8,9	5.15E-14	0.0E+0	-
Measurement 9	1,2,3,7,8 PeCDF	2.94E-14	0.0E+0	-
Measurement 10	2,3,4,7,8 PeCDF	1.08E-15	0.0E+0	-
Measurement 11	1,2,3,4,7,8 HxCDF	1.55E-14	0.0E+0	-

Measurement 12	1,2,3,6,7,8 HxCDF	1.55E-14	0.0E+0	-
Measurement 13	2,3,4,6,7,8 Hp CDF	1.75E-14	0.0E+0	-
Measurement 14	1,2,3,7,8,9 HxCDF	1.55E-14	0.0E+0	-
Measurement 16	1,2,3,4,7,8,9 HpCDF	2.15E-12	0.0E+0	-

TCA = Tolerable Concentration in Air Cia = Concentration in indoor air

Outdoor concentration in air

Measurement	Substance	Coa(µg/m3)	TCA(µg/m3)	Coa/TCA
Measurement 6	dioxine 1,2,3,4,6,7,8	4.71E-13	0.0E+0	-
Measurement 7	dioxine OCDD	5.39E-12	0.0E+0	-
Measurement 15	1,2,3,4,6,7,8 HpCDF	1.72E-13	0.0E+0	-
Measurement 17	OCDF	4.91E-13	0.0E+0	-
Measurement 1	dioxine 1,2,3,6,7,8	9.36E-14	0.0E+0	-
Measurement 2	dioxine 1,2,3,4,7,8	1.2E-13	0.0E+0	-
Measurement 3	2,3,7,8 TCDF	1.13E-14	0.0E+0	-
Measurement 4	dioxine 2378 TeCDD	5.33E-13	0.0E+0	-
Measurement 5	dioxine 1,2,3,7,8-PeCDD	1.31E-13	0.0E+0	-
Measurement 8	dioxine 1,2,3,7,8,9	4.5E-14	0.0E+0	-
Measurement 9	1,2,3,7,8 PeCDF	2.58E-14	0.0E+0	-
Measurement 10	2,3,4,7,8 PeCDF	9.49E-16	0.0E+0	-
Measurement 11	1,2,3,4,7,8 HxCDF	1.35E-14	0.0E+0	-
Measurement 12	1,2,3,6,7,8 HxCDF	1.35E-14	0.0E+0	-
Measurement 13	2,3,4,6,7,8 Hp CDF	1.53E-14	0.0E+0	-
Measurement 14	1,2,3,7,8,9 HxCDF	1.35E-14	0.0E+0	-
Measurement 16	1,2,3,4,7,8,9 HpCDF	1.88E-12	0.0E+0	-

TCA = Tolerable Concentration in Air Coa = Concentration in outdoor air

Concentration in drinking water

Measurement	Substance	Cdw(µg/l)	standard(µg/l)	Cdw/standard
Measurement 6	dioxine 1,2,3,4,6,7,8	0.0E+0	0.0E+0	-
Measurement 7	dioxine OCDD	0.0E+0	0.0E+0	-
Measurement 15	1,2,3,4,6,7,8 HpCDF	0.0E+0	0.0E+0	-
Measurement 17	OCDF	0.0E+0	0.0E+0	-
Measurement 1	dioxine 1,2,3,6,7,8	0.0E+0	0.0E+0	-
Measurement 2	dioxine 1,2,3,4,7,8	0.0E+0	0.0E+0	-
Measurement 3	2,3,7,8 TCDF	0.0E+0	0.0E+0	-
Measurement 4	dioxine 2378 TeCDD	0.0E+0	0.0E+0	-
Measurement 5	dioxine 1,2,3,7,8-PeCDD	0.0E+0	0.0E+0	-
Measurement 8	dioxine 1,2,3,7,8,9	0.0E+0	0.0E+0	-
Measurement 9	1,2,3,7,8 PeCDF	0.0E+0	0.0E+0	-
Measurement 10	2,3,4,7,8 PeCDF	0.0E+0	0.0E+0	-
Measurement 11	1,2,3,4,7,8 HxCDF	0.0E+0	0.0E+0	-
Measurement 12	1,2,3,6,7,8 HxCDF	0.0E+0	0.0E+0	-
Measurement 13	2,3,4,6,7,8 Hp CDF	0.0E+0	0.0E+0	-
Measurement 14	1,2,3,7,8,9 HxCDF	0.0E+0	0.0E+0	-

Measurement 16	1,2,3,4,7,8,9 HpCDF	0.0E+0	0.0E+0 -

Cdw = Concentration in drinking water

Background

Measurement	Substance	Dose(mg/(kg.d))	Background(mg/(kg.d))
Measurement 6	dioxine 1,2,3,4,6,7,8	1.16E-8	0.0E+0
Measurement 7	dioxine OCDD	7.87E-8	0.0E+0
Measurement 15	1,2,3,4,6,7,8 HpCDF	1.33E-9	0.0E+0
Measurement 17	OCDF	9.2E-9	0.0E+0
Measurement 1	dioxine 1,2,3,6,7,8	5.69E-10	0.0E+0
Measurement 2	dioxine 1,2,3,4,7,8	7.28E-10	0.0E+0
Measurement 3	2,3,7,8 TCDF	3.02E-11	0.0E+0
Measurement 4	dioxine 2378 TeCDD	2.57E-10	0.0E+0
Measurement 5	dioxine 1,2,3,7,8-PeCDD	4.56E-10	0.0E+0
Measurement 8	dioxine 1,2,3,7,8,9	2.8E-10	0.0E+0
Measurement 9	1,2,3,7,8 PeCDF	9.54E-11	0.0E+0
Measurement 10	2,3,4,7,8 PeCDF	9.54E-11	0.0E+0
Measurement 11	1,2,3,4,7,8 HxCDF	1.82E-10	0.0E+0
Measurement 12	1,2,3,6,7,8 HxCDF	1.82E-10	0.0E+0
Measurement 13	2,3,4,6,7,8 Hp CDF	1.77E-10	0.0E+0
Measurement 14	1,2,3,7,8,9 HxCDF	1.82E-10	0.0E+0
Measurement 16	1,2,3,4,7,8,9 HpCDF	3.06E-10	0.0E+0

Substance: dioxine 2378 TeCDD

Physical-chemical parameters

Moleculair weight	3.22E+2	g.mol-1
Water solubility	3.0E-4	mg.l-1
Vapour pressure	1.4E-6	Pa
Klw	6.39E-4	-
Log Kow	6.8E+0	-
Log Koc	6.41E+0	dm3.kg-1
Kd	-	dm3.kg-1
BCF(root)	-	-
BCF(stem)	-	-
D(pe)	1.0E-7	m2.d-1
Diffusion coefficient (air)	-	m2.h-1
Diffusion coefficient(water)	-	m2.h-1
DAR(adult)	5.0E-3	h-1
DAR(child)	1.0E-2	h-1
fexcr	-	-
pKa	-	-

Standards

RfD	1.0E-8	mg.kg-1.d-1
TCA	-	µg.m-3

Drinking water standard	-	µg.l-1	
Background dose			
Background concentration	0.0E+0	µg.m-3	

Substance: dioxine OCDD

Physical-chemical parameters			
Moleculair weight	4.6E+2	g.mol-1	
Water solubility	4.0E-7	mg.l-1	
Vapour pressure	5.93E-10	Pa	
Klw	2.9E-4	-	
Log Kow	8.2E+0	-	
Log Koc	7.81E+0	dm3.kg-1	
Kd	-	dm3.kg-1	
BCF(root)	-	-	
BCF(stem)	-	-	
D(pe)	1.0E-7	m2.d-1	
Diffusion coefficient (air)	-	m2.h-1	
Diffusion coefficient(water)	-	m2.h-1	
DAR(adult)	5.0E-3	h-1	
DAR(child)	1.0E-2	h-1	
fexcr	-	-	
pKa	-	-	
Standards			
RfD	1.0E-8	mg.kg-1.d-1	
TCA	-	µg.m-3	
Drinking water standard	-	µg.l-1	
Background dose			
Background concentration	0.0E+0	µg.m-3	

Substance: dioxine 1,2,3,7,8-PeCDD
Based on: none [organic - user defined]
Description
1,2,3,7,8-PeCDD

Physical-chemical parameters			
Moleculair weight	3.56E+2	g.mol-1	
Water solubility	1.18E-4	mg.l-1	
Vapour pressure	8.8E-8	Pa	
Klw	1.13E-4	-	
Log Kow	7.4E+0	-	
Log Koc	6.38E+0	dm3.kg-1	
Kd	0.0E+0	dm3.kg-1	
BCF(root)	-	-	calculated
BCF(stem)	0.0E+0	-	
D(pe)	0.0E+0	m2.d-1	
Diffusion coefficient (air)	-	m2.h-1	calculated
Diffusion coefficient(water)	0.0E+0	m2.h-1	

DAR(adult)	5.0E-3	h-1	
DAR(child)	1.0E-2	h-1	
fexcr	0.0E+0	-	
pKa	-	-	calculated

Justification
Parameters from Phys Chem Props of organic chemicals Vol 3 and US EPA vol 3

Standards		
RfD	0.0E+0	mg.kg-1.d-1
TCA	0.0E+0	µg.m-3
Drinking water standard	0.0E+0	µg.l-1

Justification

Background dose		
Background concentration	0.0E+0	µg.m-3

Justification

Substance: dioxine 1,2,3,6,7,8
Based on: none [organic - user defined]
Description
dioxin 1,2,3,6,7,8 HxCDD
Physical-chemical parameters

Moleculair weight	3.91E+2	g.mol-1	
Water solubility	4.4E-6	mg.l-1	
Vapour pressure	5.1E-9	Pa	
Klw	4.61E-4	-	
Log Kow	7.8E+0	-	
Log Koc	7.1E+0	dm3.kg-1	
Kd	0.0E+0	dm3.kg-1	
BCF(root)	-	-	calculated
BCF(stem)	-	-	calculated
D(pe)	0.0E+0	m2.d-1	
Diffusion coefficient (air)	-	m2.h-1	calculated
Diffusion coefficient(water)	-	m2.h-1	calculated
DAR(adult)	5.0E-3	h-1	
DAR(child)	1.0E-2	h-1	
fexcr	0.0E+0	-	
pKa	-	-	calculated

Justification
As above

Standards		
RfD	0.0E+0	mg.kg-1.d-1
TCA	0.0E+0	µg.m-3
Drinking water standard	0.0E+0	µg.l-1

Justification

Background dose		
Background concentration	0.0E+0	µg.m-3

Justification

Substance: dioxine 1,2,3,4,7,8
Based on: none [organic - user defined]
Description
dioxin 1,2,3,4,7,8 HcDD
Physical-chemical parameters

Moleculair weight	3.91E+2	g.mol-1	
Water solubility	4.4E-6	mg.l-1	
Vapour pressure	5.1E-9	Pa	
Klw	4.61E-4	-	
Log Kow	7.8E+0	-	
Log Koc	7.1E+0	dm3.kg-1	
Kd	0.0E+0	dm3.kg-1	
BCF(root)	-	-	calculated
BCF(stem)	-	-	calculated
D(pe)	0.0E+0	m2.d-1	
Diffusion coefficient (air)	-	m2.h-1	calculated
Diffusion coefficient(water)	-	m2.h-1	calculated
DAR(adult)	5.0E-3	h-1	
DAR(child)	1.0E-2	h-1	
fexcr	0.0E+0	-	
pKa	-	-	calculated

Justification
as above

Standards

RfD	0.0E+0	mg.kg-1.d-1
TCA	0.0E+0	µg.m-3
Drinking water standard	0.0E+0	µg.l-1

Justification

Background dose
Background concentration 0.0E+0 µg.m-3

Justification

Substance: dioxine 1,2,3,7,8,9
Based on: none [organic - user defined]
Description
dioxin 1,2,3,7,8,9 HxCDD
Physical-chemical parameters

Moleculair weight	3.91E+2	g.mol-1
Water solubility	4.6E-6	mg.l-1
Vapour pressure	5.1E-9	Pa
Klw	4.61E-4	-
Log Kow	7.8E+0	-
Log Koc	7.1E+0	dm3.kg-1
Kd	0.0E+0	dm3.kg-1

BCF(root)	-	-	calculated
BCF(stem)	-	-	calculated
D(pe)	0.0E+0	m2.d-1	
Diffusion coefficient (air)	-	m2.h-1	calculated
Diffusion coefficient(water)	-	m2.h-1	calculated
DAR(adult)	5.0E-3	h-1	
DAR(child)	1.0E-2	h-1	
fexcr	0.0E+0	-	
pKa	-	-	calculated

Justification
as above

Standards

RfD	0.0E+0	mg.kg-1.d-1
TCA	0.0E+0	µg.m-3
Drinking water standard	0.0E+0	µg.l-1

Justification

Background dose

Background concentration	0.0E+0	µg.m-3

Justification

Substance: dioxine 1,2,3,4,6,7,8
Based on: none [organic - user defined]
Description
dioxin 1,2,3,4,6,7,8, HpCdd
Physical-chemical parameters

Moleculair weight	4.25E+2	g.mol-1	
Water solubility	2.4E-6	mg.l-1	
Vapour pressure	7.5E-10	Pa	
Klw	5.41E-4	-	
Log Kow	8.0E+0	-	
Log Koc	7.8E+0	dm3.kg-1	
Kd	0.0E+0	dm3.kg-1	
BCF(root)	-	-	calculated
BCF(stem)	-	-	calculated
D(pe)	0.0E+0	m2.d-1	
Diffusion coefficient (air)	-	m2.h-1	calculated
Diffusion coefficient(water)	-	m2.h-1	calculated
DAR(adult)	5.0E-3	h-1	
DAR(child)	1.0E-2	h-1	
fexcr	0.0E+0	-	
pKa	-	-	calculated

Justification
as above

Standards

RfD	0.0E+0	mg.kg-1.d-1
TCA	0.0E+0	µg.m-3
Drinking water standard	0.0E+0	µg.l-1

Justification

Background dose
Background concentration 0.0E+0 µg.m-3

Justification

Substance: 2,3,7,8 TCDF
Based on: none [organic - user defined]
Description
2,3,7,8 TCDF
Physical-chemical parameters

Moleculair weight	1.68E+2	g.mol-1	
Water solubility	4.19E-3	mg.l-1	
Vapour pressure	2.0E-6	Pa	
Klw	6.21E-4	-	
Log Kow	6.1E+0	-	
Log Koc	7.5E+0	dm3.kg-1	
Kd	0.0E+0	dm3.kg-1	
BCF(root)	-	-	calculated
BCF(stem)	-	-	calculated
D(pe)	0.0E+0	m2.d-1	
Diffusion coefficient (air)	-	m2.h-1	calculated
Diffusion coefficient(water)	-	m2.h-1	calculated
DAR(adult)	5.0E-3	h-1	
DAR(child)	1.0E-2	h-1	
fexcr	0.0E+0	-	
pKa	-	-	calculated

Justification
As above

Standards

RfD	0.0E+0	mg.kg-1.d-1
TCA	0.0E+0	µg.m-3
Drinking water standard	0.0E+0	µg.l-1

Justification

Background dose
Background concentration 0.0E+0 µg.m-3

Justification

Substance: 1,2,3,7,8 PeCDF
Based on: none [organic - user defined]
Description
1,2,3,7,8 PeCDF
Physical-chemical parameters

Moleculair weight	3.4E+2	g.mol-1
Water solubility	2.36E-4	mg.l-1

Vapour pressure	3.5E-7	Pa	
Klw	2.15E-4	-	
Log Kow	6.5E+0	-	
Log Koc	7.4E+0	dm3.kg-1	
Kd	0.0E+0	dm3.kg-1	
BCF(root)	-	-	calculated
BCF(stem)	-	-	calculated
D(pe)	0.0E+0	m2.d-1	
Diffusion coefficient (air)	-	m2.h-1	calculated
Diffusion coefficient(water)	-	m2.h-1	calculated
DAR(adult)	5.0E-3	h-1	
DAR(child)	1.0E-2	h-1	
fexcr	0.0E+0	-	
pKa	-	-	calculated

Justification
As above

Standards

RfD	0.0E+0	mg.kg-1.d-1
TCA	0.0E+0	µg.m-3
Drinking water standard	0.0E+0	µg.l-1

Justification

Background dose

Background concentration	0.0E+0	µg.m-3

Justification

Substance: 2,3,4,7,8 PeCDF
Based on: 1,2,3,7,8 PeCDF [organic - user defined]
Description
2,3,4,7,8 Pe CDF
Physical-chemical parameters

Moleculair weight	3.4E+2	g.mol-1	
Water solubility	2.36E-1	mg.l-1	
Vapour pressure	3.5E-7	Pa	
Klw	2.15E-4	-	
Log Kow	6.5E+0	-	
Log Koc	7.4E+0	dm3.kg-1	
Kd	0.0E+0	dm3.kg-1	
BCF(root)	-	-	calculated
BCF(stem)	-	-	calculated
D(pe)	0.0E+0	m2.d-1	
Diffusion coefficient (air)	-	m2.h-1	calculated
Diffusion coefficient(water)	-	m2.h-1	calculated
DAR(adult)	5.0E-3	h-1	
DAR(child)	1.0E-2	h-1	
fexcr	0.0E+0	-	
pKa	-	-	calculated

Justification
As above

Standards

RfD	0.0E+0	mg.kg-1.d-1	
TCA	0.0E+0	µg.m-3	
Drinking water standard	0.0E+0	µg.l-1	

Justification

Background dose
Background concentration 0.0E+0 µg.m-3

Justification

Substance: 1,2,3,4,7,8 HxCDF
Based on: none [organic - user defined]
Description
1,2,3,4,7,8 HxCDF
Physical-chemical parameters

Moleculair weight	3.75E+2	g.mol-1	
Water solubility	1.77E-4	mg.l-1	
Vapour pressure	3.5E-8	Pa	
Klw	3.15E-4	-	
Log Kow	7.0E+0	-	
Log Koc	7.4E+0	dm3.kg-1	
Kd	0.0E+0	dm3.kg-1	
BCF(root)	-	-	calculated
BCF(stem)	-	-	calculated
D(pe)	0.0E+0	m2.d-1	
Diffusion coefficient (air)	-	m2.h-1	calculated
Diffusion coefficient(water)	-	m2.h-1	calculated
DAR(adult)	5.0E-3	h-1	
DAR(child)	1.0E-2	h-1	
fexcr	0.0E+0	-	
pKa	-	-	calculated

Justification
as above

Standards

RfD	0.0E+0	mg.kg-1.d-1	
TCA	0.0E+0	µg.m-3	
Drinking water standard	0.0E+0	µg.l-1	

Justification

Background dose
Background concentration 0.0E+0 µg.m-3

Justification

Substance: 1,2,3,6,7,8 HxCDF
Based on: 1,2,3,4,7,8 HxCDF [organic - user defined]

Description
1,2,3,6,7,8 Hx CDF
Physical-chemical parameters

Moleculair weight	3.75E+2	g.mol-1	
Water solubility	1.77E-4	mg.l-1	
Vapour pressure	3.5E-8	Pa	
Klw	3.15E-4	-	
Log Kow	7.0E+0	-	
Log Koc	7.4E+0	dm3.kg-1	
Kd	0.0E+0	dm3.kg-1	
BCF(root)	-	-	calculated
BCF(stem)	-	-	calculated
D(pe)	0.0E+0	m2.d-1	
Diffusion coefficient (air)	-	m2.h-1	calculated
Diffusion coefficient(water)	-	m2.h-1	calculated
DAR(adult)	5.0E-3	h-1	
DAR(child)	1.0E-2	h-1	
fexcr	0.0E+0	-	
pKa	-	-	calculated

Justification
as above

Standards

RfD	0.0E+0	mg.kg-1.d-1
TCA	0.0E+0	µg.m-3
Drinking water standard	0.0E+0	µg.l-1

Justification

Background dose

Background concentration	0.0E+0	µg.m-3

Justification

Substance: 1,2,3,7,8,9 HxCDF
Based on: 1,2,3,6,7,8 HxCDF [organic - user defined]
Description
1,2,3,7,8,9 HxCDF
Physical-chemical parameters

Moleculair weight	3.75E+2	g.mol-1	
Water solubility	1.77E-4	mg.l-1	
Vapour pressure	3.5E-8	Pa	
Klw	3.15E-4	-	
Log Kow	7.0E+0	-	
Log Koc	7.4E+0	dm3.kg-1	
Kd	0.0E+0	dm3.kg-1	
BCF(root)	-	-	calculated
BCF(stem)	-	-	calculated
D(pe)	0.0E+0	m2.d-1	
Diffusion coefficient (air)	-	m2.h-1	calculated
Diffusion coefficient(water)	-	m2.h-1	calculated
DAR(adult)	5.0E-3	h-1	
DAR(child)	1.0E-2	h-1	
fexcr	0.0E+0	-	
pKa	-	-	calculated

Justification
as above

Standards		
RfD	0.0E+0	mg.kg-1.d-1
TCA	0.0E+0	µg.m-3
Drinking water standard	0.0E+0	µg.l-1

Justification

Background dose
Background concentration 0.0E+0 µg.m-3

Justification

Substance: 2,3,4,6,7,8 Hp CDF
Based on: none [organic - user defined]
Description
2,3,4,6,7,8 Hp CDF

Physical-chemical parameters			
Moleculair weight	4.09E+2	g.mol-1	
Water solubility	1.3E-6	mg.l-1	
Vapour pressure	4.7E-9	Pa	
Klw	6.06E-4	-	
Log Kow	7.4E+0	-	
Log Koc	7.9E+0	dm3.kg-1	
Kd	0.0E+0	dm3.kg-1	
BCF(root)	-	-	calculated
BCF(stem)	-	-	calculated
D(pe)	0.0E+0	m2.d-1	
Diffusion coefficient (air)	-	m2.h-1	calculated
Diffusion coefficient(water)	-	m2.h-1	calculated
DAR(adult)	5.0E-3	h-1	
DAR(child)	1.0E-2	h-1	
fexcr	0.0E+0	-	
pKa	-	-	calculated

Justification
as above

Standards		
RfD	0.0E+0	mg.kg-1.d-1
TCA	0.0E+0	µg.m-3
Drinking water standard	0.0E+0	µg.l-1

Justification

Background dose
Background concentration 0.0E+0 µg.m-3

Justification

Substance: 1,2,3,4,6,7,8 HpCDF
Based on: 2,3,4,6,7,8 Hp CDF [organic - user defined]
Description
1,2,3,4,6,7,8 HpCDF
Physical-chemical parameters

Moleculair weight	4.09E+2	g.mol-1	
Water solubility	1.3E-6	mg.l-1	
Vapour pressure	4.7E-9	Pa	
Klw	6.06E-4	-	
Log Kow	7.4E+0	-	
Log Koc	7.9E+0	dm3.kg-1	
Kd	0.0E+0	dm3.kg-1	
BCF(root)	-	-	calculated
BCF(stem)	-	-	calculated
D(pe)	0.0E+0	m2.d-1	
Diffusion coefficient (air)	-	m2.h-1	calculated
Diffusion coefficient(water)	-	m2.h-1	calculated
DAR(adult)	5.0E-3	h-1	
DAR(child)	1.0E-2	h-1	
fexcr	0.0E+0	-	
pKa	-	-	calculated

Justification
as above

Standards

RfD	0.0E+0	mg.kg-1.d-1
TCA	0.0E+0	µg.m-3
Drinking water standard	0.0E+0	µg.l-1

Justification

Background dose

Background concentration	0.0E+0	µg.m-3

Justification

Substance: 1,2,3,4,7,8,9 HpCDF
Based on: 1,2,3,4,6,7,8 HpCDF [organic - user defined]
Description
1,2,3,4,7,8,9 HpCDF
Physical-chemical parameters

Moleculair weight	4.09E+2	g.mol-1	
Water solubility	1.3E-6	mg.l-1	
Vapour pressure	4.62E-8	Pa	
Klw	6.06E-4	-	
Log Kow	7.4E+0	-	
Log Koc	6.7E+0	dm3.kg-1	
Kd	0.0E+0	dm3.kg-1	
BCF(root)	-	-	calculated
BCF(stem)	-	-	calculated
D(pe)	0.0E+0	m2.d-1	
Diffusion coefficient (air)	-	m2.h-1	calculated
Diffusion coefficient(water)	-	m2.h-1	calculated
DAR(adult)	5.0E-3	h-1	

DAR(child)	1.0E-2	h-1	
fexcr	0.0E+0	-	
pKa	-	-	calculated

Justification
as above

Standards

RfD	0.0E+0	mg.kg-1.d-1	
TCA	0.0E+0	µg.m-3	
Drinking water standard	0.0E+0	µg.l-1	

Justification

Background dose

Background concentration	0.0E+0	µg.m-3	

Justification

Substance: OCDF
Based on: none [organic - user defined]
Description
OCDF
Physical-chemical parameters

Moleculair weight	4.44E+2	g.mol-1	
Water solubility	1.16E-6	mg.l-1	
Vapour pressure	5.1E-10	Pa	
Klw	8.12E-5	-	
Log Kow	8.0E+0	-	
Log Koc	7.4E+0	dm3.kg-1	
Kd	0.0E+0	dm3.kg-1	
BCF(root)	-	-	calculated
BCF(stem)	-	-	calculated
D(pe)	0.0E+0	m2.d-1	
Diffusion coefficient (air)	-	m2.h-1	calculated
Diffusion coefficient(water)	0.0E+0	m2.h-1	
DAR(adult)	5.0E-3	h-1	
DAR(child)	1.0E-2	h-1	
fexcr	0.0E+0	-	
pKa	-	-	calculated

Justification
as above

Standards

RfD	0.0E+0	mg.kg-1.d-1	
TCA	0.0E+0	µg.m-3	
Drinking water standard	0.0E+0	µg.l-1	

Justification

Background dose

Background concentration	0.0E+0	µg.m-3	

Justification

ATTACHMENT E

TERMS FOR SOIL EQUATION (PREDICTION OF AVERAGE SOIL CONCENTRATION OVER EXPOSURE PERIOD)

Parameter	Definition
Sc	Average soil concentration over exposure duration (mg/kg)
Ds	Deposition term (mg/kg-yr)
ks	Soil loss constant (yr^{-1})
Tc	Time period over which deposition occurs (yr)
T_i	Time at beginning of exposure period (yr)

ATTACHMENT F

DEFINITION OF KS

Parameter	Definition
ks	Soil loss constant due to all processes (yr^{-1})
ksl	Loss constant due to leaching (yr^{-1})
kse	Loss constant due to soil erosion (yr^{-1})
ksr	Loss constant due to surface runoff (yr^{-1})
ksg	Loss constant due to degradation (yr^{-1})
ksv	Loss constant due to volatilization (yr^{-1})

$$ksl = \frac{P + I - R - E_v}{\theta_s \bullet Z \bullet [1.0 + (BD \bullet Kd_s/\theta_s)]}$$

$$Kd_s = f_{oc} \bullet K_{oc}$$

Parameter	Definition
ksl	Loss constant due to leaching (yr^{-1})
P	Average annual precipitation (cm/yr)
I	Average annual irrigation (cm/yr)
R	Average annual runoff (cm/yr)
E_v	Average annual evapotranspiration (cm/yr)
θ_s	Soil volumetric water content (mL/cm^3)
Z	Soil depth from which leaching removal occurs (cm) (= soil mixing depth)
BD	Soil bulk density (g/cm^3)
Kd_s	Soil-water partition coefficient (cm^3/g)
f_{oc}	Fraction organic carbon in soil (unitless)
K_{oc}	Organic carbon partition coefficient (mL/g)

$$ksr = \frac{R}{\theta_s \bullet Z} \bullet \left(\frac{1}{1 + (Kd_s \bullet BD / \theta_s)} \right)$$

Parameter	Definition
ksr	Loss constant due to runoff (yr^{-1})
R	Average annual runoff (cm/yr)
θ_s	Soil volumetric water content (ml/cm^3)
Z	Soil mixing depth (cm)
Kd_s	Soil-water partition coefficient (cm^3/g)
BD	Soil bulk density (g/cm^3)

$$ksv = \left[\frac{3.1536x10^{7} \bullet H}{Z \bullet Kd_{s} \bullet R \bullet T \bullet BD}\right] \bullet \left[0.482 \bullet u^{0.78} \bullet \left(\frac{\mu_{a}}{\rho_{a} \bullet Da}\right)^{-0.67} \bullet \left(\sqrt{\frac{4 \bullet A}{\pi}}\right)^{-0.11}\right]$$

Parameter	Definition
ksv	Loss constant due to volatilization (yr^{-1})
$3.1536x10^{7}$	Conversion constant (s/yr)
H	Henry's law constant (atm-m^3/mol)
Z	Soil mixing depth (cm)
Kd_s	Soil-water partition coefficient (cm^3/g)
R	Universal gas constant (atm-m^3/mol-K)
T	Ambient air temperature (K)
BD	Soil bulk density (g/cm^3)
u	Average annual wind speed (m/s)
μ_a	Viscosity of air (g/cm-s)
ρa	Density of air (g/cm^3)
Da	Diffusivity of contaminant in air (cm^2/s)
A	Surface area of contaminated area (m^2)

APPENDIX G
CALCULATION OF DS FOR SOIL CONCENTRATION EQUATION

	Area of deposition	Total flux	mass PCDD/F	Mass of	Ds	Ds
	m2	g/m2/yr	over area g/yr	soil kg	g/kg/yr	mg/kg/yr
2,3,7,8-TCDD	7854	2.58198E-12	2.02789E-08	824670	2.45903E-14	2.45903E-11
1,2,3,7,8-PeCDD	7854	1.47704E-11	1.16007E-07	824670	1.40671E-13	1.40671E-10
1,2,3,6,7,8-HxCDD	7854	6.28024E-11	4.9325E-07	824670	5.98118E-13	5.98118E-10
1,2,3,4,7,8-HcCDD	7854	5.13837E-11	4.03567E-07	824670	4.89368E-13	4.89368E-10
1,2,3,7,8,9-HxCDD	7854	1.17382E-10	9.21921E-07	824670	1.11793E-12	1.11793E-09
1,2,3,4,6,7,8-HpCDD	7854	5.4278E-10	4.26299E-06	824670	5.16933E-12	5.16933E-09
OCDD	7854	3.06022E-09	2.4035E-05	824670	2.9145E-11	2.9145E-08
2,3,7,8-TCDF	7854	1.80129E-11	1.41474E-07	824670	1.71552E-13	1.71552E-10
1,2,3,7,8-PeCDF	7854	7.95938E-11	6.2513E-07	824670	7.58036E-13	7.58036E-10
2,3,4,7,8-PeCDF	7854	1.72942E-10	1.35829E-06	824670	1.64707E-12	1.64707E-09
1,2,3,4,7,8-HxCDF	7854	3.6932E-10	2.90064E-06	824670	3.51733E-12	3.51733E-09
1,2,3,6,7,8 HxCDF	7854	1.57189E-10	1.23456E-06	824670	1.49704E-12	1.49704E-09
2,3,4,6,7,8-HpCDF	7854	2.63452E-10	2.06916E-06	824670	2.50907E-12	2.50907E-09
1,2,3,7,8,9-HxCDF	7854	3.4452E-10	2.8336E-06	824670	3.78997E-12	3.7899E-09
1,2,3,4,6,7,8-HpCDF	7854	9.05389E-10	7.11093E-06	824670	8.62276E-12	8.62276E-09
1,2,3,4,7,8,9-HpCDF	7854	1.04511E-10	8.20826E-07	824670	9.95339E-13	9.95339E-10
OCDF	7854	1.84819E-09	1.45157E-05	824670	1.76019E-11	1.76019E-08

ATTACHMENT H

CALCULATION OF MODEL PARAMETER FOR PREDICTION OF SOIL CONCENTRATION

	Background	Sc	Sc	Background + Sc	Background + Sc
	ng/kg	Sc mg/kg	ng/kg as TEQ	ng/kg	mg/kg
2,3,7,8-TCDD	0.061	2.89149E-10	0.000289149	0.061289149	6.13E-08
1,2,3,7,8-PeCDD	0.085	2.69562E-09	0.002695619	0.087695619	8.77E-08
1,2,3,6,7,8-HxCDD	0.2	1.2755E-08	0.012755037	0.212755037	2.13E-07
1,2,3,4,7,8-HcCDD	0.09	1.02311E-08	0.010231146	0.100231146	1.00E-07
1,2,3,7,8,9-HxCDD	0.13	2.14565E-08	0.021456461	0.151456461	1.51E-07
1,2,3,4,6,7,8-HpCDD	2.2	1.10353E-07	0.110352908	2.310352908	2.31E-06
OCDD	17	6.22006E-07	0.622006096	17.6220061	1.76E-05
2,3,7,8-TCDF	0.33	2.3663E-09	0.002366299	0.332366299	3.32E-07
1,2,3,7,8-PeCDF	0.24	1.35003E-08	0.013500251	0.253500251	2.54E-07
2,3,4,7,8-PeCDF	0.24	3.06991E-08	0.030699052	0.270699052	2.71E-07
1,2,3,4,7,8-HxCDF	0.39	6.61869E-08	0.066186868	0.456186868	4.56E-07
1,2,3,6,7,8 HxCDF	0.31	3.02244E-08	0.0302244	0.3402244	3.40E-07
2,3,4,6,7,8-HpCDF	0.42	4.89319E-08	0.048931908	0.468931908	4.69E-07
1,2,3,7,8,9-HxCDF	0.3	3.4E-08	0.03444	0.3402244	3.40E-07
1,2,3,4,6,7,8-HpCDF	2.2	1.64412E-07	0.164411543	2.364411543	2.36E-06
1,2,3,4,7,8,9-HpCDF	0.24	1.89859E-08	0.018985946	0.258985946	2.59E-07
OCDF	1.9	3.75552E-07	0.375551626	2.275551626	2.28E-06

ATTACHMENT J
MODEL OUTPUT FILE FOR CHANGE IN PCDD/F DOSE

```
= Site =

Data from file: RINBSL5.loc
Name:  Indaver Ringaskiddy Intake15
Code:

Description:
Scenario                Scenario 0
Characteristic          Standard Scenario
CSoilModel / VolaSoil: CSoilModel
Landuse                 none

Selected exposure routes on site level:
  inhalation indoor air
  inhalation outdoor air
  ingestion soil
  dermal contact soil
  inhalation soil
  ingestion drinking water
  dermal contact shower
  inhalation vapour shower
  ingestion milk
  ingestion meat
  ingestion vegetables
  ingestion surface water
  ingestion suspended matter
  dermal contact surface water

Changed parameters on site level:
Organic matter content [OS]
 4.6E+0       %
Justification
  Measured value for site
Depth of ground water table [Dg]
 3.0E+0       m
Justification
  Assumed value for groundwater in Ireland
Depth of contaminant below surface level [Dp.o]
 1.0E-2       m
Justification
  Assume contaminant at surface
Acidity [pH]
 6.3E+0       -
Justification
  Measured value for site
Height of capillary transition boundary above ground water table [z]
 2.0E-1       m
Justification
  De Laat et al
Air permeability of soil [kappa]
 1.0E-16      m2
Justification
  Nazaroff et al
Depth of contaminant below crawl space [Dp.b]
 1.0E-2       m
```

```
Justification
  Changed without justification
Organic matter content sediment [OSse]
 6.0E+0       %
Justification
  Changed without justification
Organic matter content suspended matter [OSsm]
 6.0E+0       %
Justification
  Changed without justification
Surface roughness [Zo]
 2.5E-1       m
Justification
  Van Den Bergh 1991
Fraction fat in milk [ffmi]
 4.0E-2       -
Justification
  Average value from EPA 2000 Milk Dioxin Report
Fraction ground water in drinking water cattle [fgcat]
 1.0E-2       -
Justification
  Assume minimum
Fraction surface water in drinking water cattle [fscat]
 9.9E-1       -
Justification
  Assume maximum surface water consumption by cattle
Weeks summer [wscat]
 4.9E+1       w.y-1
Justification
  Cattle outside for maximum amount of time
Daily consumption of leafy vegetables (adult) [Qvla]
 1.18E-1      kg fw.d-1
Justification
  safefood.ie survey 2001
Daily consumption of tuberous vegetables (adult) [Qvra]
 2.25E-1      kg fw.d-1
Justification
  Safefood.ie survey 2001
Daily consumption of meat (adult) [Qmea]
 1.79E-1      kg.d-1
Justification
  North/South SafeFood.ie Survey 2001
Daily consumption of milk (adult) [Qmia]
 2.43E-1      l.d-1
Justification
  North/South Food Survey 2001 Safefood.ie
Body weight (adult) [Wa]
 6.0E+1       kg
Justification
  Body weight from US EPA
Daily consumption of leafy vegetables (child) [Qvlc]
 5.9E-2       kg fw.d-1
Justification
  assume 50% of adult
Daily consumption of tuberous vegetables (child) [Qvrc]
 1.13E-1      kg fw.d-1
Justification
  Assume 50% of adult
Daily consumption of meat (child) [Qmec]
 8.95E-2      kg.d-1
Justification
  assume 50% of adult
```

Daily consumption of milk (child) [Qmic]
1.21E-1 l.d-1
Justification
Safefood.ie survey 2001

Subsite: Subsite 0
Selected exposure routes on subsite level:
inhalation indoor air
inhalation outdoor air
ingestion soil
dermal contact soil
inhalation soil
ingestion drinking water
dermal contact shower
inhalation vapour shower
ingestion milk
ingestion meat
ingestion vegetables
ingestion surface water
ingestion suspended matter
dermal contact surface water

Changed parameters on subsite level:
Floor open or concrete [floor]
concrete -
Justification
Changed without justification

Fraction of crawl space (indoor air) [fbi]
0.0E+0 -
Justification
Changed without justification

Height of crawl space/basement [He]
0.0E+0 m
Justification
Changed without justification

Length of crawl space/basement [Le]
0.0E+0 m
Justification
Changed without justification

Width of crawl space/basement [Wi]
0.0E+0 m
Justification
Changed without justification

Ground water used as drinking water [fg]
yes -
Justification
Changed without justification

Lenght of water pipe [Ll]
1.0E+1 m
Justification
Changed without justification

Fraction contaminated leafy vegetables (adult) [fla]

```
 1.0E+0       -
Justification
  Changed without justification

Fraction contaminated leafy vegetables (child) [flc]
 1.0E+0       -
Justification
  Changed without justification

Fraction contaminated tuberous vegetables (adult) [fta]
 1.0E+0       -
Justification
  Changed without justification

Fraction contaminated tuberous vegetables (child) [ftc]
 1.0E+0       -
Justification
  Changed without justification

Fraction contaminated meat (adult) [fmea]
 1.0E+0       -
Justification
  Changed without justification

Fraction contaminated milk (adult) [fmia]
 1.0E+0       -
Justification
  Changed without justification

Fraction contaminated milk (child) [fmic]
 1.0E+0       -
Justification
  Changed without justification

Fraction contaminated meat (child) [fmec]
 1.0E+0       -
Justification
  Changed without justification

Swimming frequency adult [Tdsa]
 0.0E+0       d.y-1
Justification
  Changed without justification

Swimming frequency child [Tdsc]
 0.0E+0       d.y-1
Justification
  Changed without justification

Ingested amount of surface water adult [IDswa]
 0.0E+0       l.d-1
Justification
  Changed without justification

Ingested amount of surface water child [IDswc]
 0.0E+0       l.d-1
Justification
  Changed without justification

Time swimming adult [Tsa]
 0.0E+0       h.d-1
Justification
```

Changed without justification

Time swimming child [Tsc]
0.0E+0 h.d-1
Justification
Changed without justification

Time division adult:

days off	winter	h/d	d/w	w/y	summer	h/d	d/w	w/y
inside dermal		0.0	0.0	0.0		0.0	0.0	0.0
outside inhalant		0.0	0.0	0.0		0.0	0.0	0.0
outside dermal		0.0	0.0	0.0		0.0	0.0	0.0
working days	winter	h/d	d/w	w/y	summer	h/d	d/w	w/y
inside dermal		0.0	0.0	0.0		0.0	0.0	0.0
outside inhalant		16.0	7.0	25.0		16.0	7.0	25.0
outside dermal		16.0	7.0	25.0		16.0	7.0	25.0
time inside sleeping	winter+ summer	h/d	d/w	w/y				
		8.0	7.0	50.0				

Justification
Assume farmer works 16 hours per day 7 days per week

Time division child:

days off	winter	h/d	d/w	w/y	summer	h/d	d/w	w/y
inside dermal		12.0	2.0	25.0		12.0	2.0	25.0
outside inhalant		0.0	0.0	0.0		0.0	0.0	0.0

outside dermal		0.0	0.0	0.0		0.0	0.0	0.0
working days	winter	h/d	d/w	w/y	summer	h/d	d/w	w/y
inside dermal		12.0	5.0	25.0		4.0	5.0	25.0
outside inhalant		0.0	0.0	0.0		8.0	5.0	25.0
outside dermal		0.0	0.0	0.0		8.0	5.0	25.0

time inside sleeping	winter+ summer	h/d	d/w	w/y
		12.0	7.0	50.0

Measurements
Code of measurement: Measurement 6
Substance: dioxine 1,2,3,4,6,7,8

Site

Concentration in soil	5.2E-6	mg.kg-1

Built on area:

Concentration in soil	5.2E-6	mg.kg-1

Open surface:

Concentration in soil	5.2E-6	mg.kg-1

Garden or cultivated area:

Concentration in soil	5.2E-6	mg.kg-1

Sediment:

Contactmedia:

Soil parameters:	Current	Default
Depth of contaminant below surface level	1.0E-2	1.25

Organic matter content	3.0E+0
10	
Bulk density	1.5E+0
1.5	
Fraction water in soil	2.0E-1
0.2	
Fraction air in soil	2.0E-1
0.2	
Acidity	6.0E+0
6	
Temperature of soil	2.83E+2
283	
Bulk density sediment	1.3E+0
1.3	
Organic matter content sediment	1.0E+1
10	
Fraction water in sediment	4.0E-1
0.4	
Bulk density suspended matter	1.3E+0
1.3	
Organic matter content suspended matter	2.0E+1
20	
Fraction water in suspended matter	4.0E-1
0.4	

Measurements
Code of measurement: Measurement 7
Substance: dioxine OCDD

Site

Concentration in soil	1.5E-5	mg.kg-1

Built on area:

Concentration in soil	1.5E-5	mg.kg-1

Open surface:

Concentration in soil	1.5E-5	mg.kg-1

Garden or cultivated area:

Concentration in soil	1.5E-5	mg.kg-1

Sediment:

Contactmedia:

Soil parameters:	Current	Default
Depth of contaminant below surface level	1.0E-2	1.25
Organic matter content	3.0E+0	10
Bulk density	1.5E+0	1.5
Fraction water in soil	2.0E-1	0.2
Fraction air in soil	2.0E-1	0.2
Acidity	6.0E+0	6
Temperature of soil	2.83E+2	283
Bulk density sediment	1.3E+0	1.3
Organic matter content sediment	1.0E+1	10
Fraction water in sediment	4.0E-1	0.4
Bulk density suspended matter	1.3E+0	1.3
Organic matter content suspended matter	2.0E+1	20
Fraction water in suspended matter	4.0E-1	0.4

Measurements
Code of measurement: Measurement 10
Substance: 1,2,3,4,7,8 HxCDF

Site

Concentration in soil	6.3E-7	mg.kg-1

Built on area:

Concentration in soil	6.3E-7	mg.kg-1

Open surface:

Concentration in soil	6.3E-7	mg.kg-1

Garden or cultivated area:

Concentration in soil	6.3E-7	mg.kg-1

Sediment:

Contactmedia:

Soil parameters:	Current	Default
Depth of contaminant below surface level	1.0E-2	1.25
Organic matter content	3.0E+0	10
Bulk density	1.5E+0	1.5
Fraction water in soil	2.0E-1	0.2
Fraction air in soil	2.0E-1	0.2
Acidity	6.0E+0	6
Temperature of soil	2.83E+2	283
Bulk density sediment	1.3E+0	1.3
Organic matter content sediment	1.0E+1	10
Fraction water in sediment	4.0E-1	0.4
Bulk density suspended matter	1.3E+0	1.3
Organic matter content suspended matter	2.0E+1	20
Fraction water in suspended matter	4.0E-1	0.4

Measurements
Code of measurement: Measurement 12
Substance: 1,2,3,6,7,8 HxCDF

Site

Concentration in soil	5.74E-7	mg.kg-1

Built on area:

Concentration in soil	5.74E-7	mg.kg-1

Open surface:

Concentration in soil	5.74E-7	mg.kg-1

Garden or cultivated area:

```
  Concentration in soil                    5.74E-7     mg.kg-1

Sediment:
-------------------------------------------------------------------------------

Contactmedia:
-------------------------------------------------------------------------------

Soil parameters:                                                  Current
Default
-------------------------------------------------------------------------------
 Depth of contaminant below surface level                         1.0E-2
1.25
 Organic matter content                                           3.0E+0
10
 Bulk density                                                     1.5E+0
1.5
 Fraction water in soil                                           2.0E-1
0.2
 Fraction air in soil                                             2.0E-1
0.2
 Acidity                                                          6.0E+0
6
 Temperature of soil                                              2.83E+2
283
 Bulk density sediment                                            1.3E+0
1.3
 Organic matter content sediment                                  1.0E+1
10
 Fraction water in sediment                                       4.0E-1
0.4
 Bulk density suspended matter                                    1.3E+0
1.3
 Organic matter content suspended matter                          2.0E+1
20
 Fraction water in suspended matter                               4.0E-1
0.4




Measurements
Code of measurement:     Measurement 14
Substance:               2,3,4,6,7,8 Hp CDF


Site
-------------------------------------------------------------------------------
  Concentration in soil                    4.92E-7     mg.kg-1

Built on area:
-------------------------------------------------------------------------------
  Concentration in soil                    4.92E-7     mg.kg-1

Open surface:
-------------------------------------------------------------------------------
```

Concentration in soil	4.92E-7	mg.kg-1

Garden or cultivated area:

Concentration in soil	4.92E-7	mg.kg-1

Sediment:

Contactmedia:

Soil parameters:	Current	Default
Depth of contaminant below surface level	1.0E-2	1.25
Organic matter content	3.0E+0	10
Bulk density	1.5E+0	1.5
Fraction water in soil	2.0E-1	0.2
Fraction air in soil	2.0E-1	0.2
Acidity	6.0E+0	6
Temperature of soil	2.83E+2	283
Bulk density sediment	1.3E+0	1.3
Organic matter content sediment	1.0E+1	10
Fraction water in sediment	4.0E-1	0.4
Bulk density suspended matter	1.3E+0	1.3
Organic matter content suspended matter	2.0E+1	20
Fraction water in suspended matter	4.0E-1	0.4

Measurements
Code of measurement: Measurement 15
Substance: 1,2,3,4,6,7,8 HpCDF

Site

Concentration in soil	3.0E-6	mg.kg-1

Built on area:

Concentration in soil	3.0E-6	mg.kg-1

Open surface:

Concentration in soil	3.0E-6	mg.kg-1

Garden or cultivated area:

Concentration in soil	3.0E-6	mg.kg-1

Sediment:

Contactmedia:

Soil parameters:	Current	Default
Depth of contaminant below surface level	1.0E-2	1.25
Organic matter content	3.0E+0	10
Bulk density	1.5E+0	1.5
Fraction water in soil	2.0E-1	0.2
Fraction air in soil	2.0E-1	0.2
Acidity	6.0E+0	6
Temperature of soil	2.83E+2	283
Bulk density sediment	1.3E+0	1.3
Organic matter content sediment	1.0E+1	10
Fraction water in sediment	4.0E-1	0.4
Bulk density suspended matter	1.3E+0	1.3
Organic matter content suspended matter	2.0E+1	20
Fraction water in suspended matter	4.0E-1	0.4

Measurements
Code of measurement: Measurement 17
Substance: OCDF

Site

Concentration in soil	9.3E-6	mg.kg-1

Built on area:

Concentration in soil	9.3E-6	mg.kg-1

Open surface:

Concentration in soil	9.3E-6	mg.kg-1

Garden or cultivated area:

Concentration in soil	9.3E-6	mg.kg-1

Sediment:

Contactmedia:

Soil parameters:	Current	Default
Depth of contaminant below surface level	1.0E-2	1.25
Organic matter content	3.0E+0	10
Bulk density	1.5E+0	1.5
Fraction water in soil	2.0E-1	0.2
Fraction air in soil	2.0E-1	0.2
Acidity	6.0E+0	6
Temperature of soil	2.83E+2	283
Bulk density sediment	1.3E+0	1.3
Organic matter content sediment	1.0E+1	10
Fraction water in sediment	4.0E-1	0.4
Bulk density suspended matter	1.3E+0	1.3
Organic matter content suspended matter	2.0E+1	20
Fraction water in suspended matter	4.0E-1	0.4

Measurements
Code of measurement: Measurement 1
Substance: dioxine 2378 TeCDD

Site

Concentration in soil	2.86E-9	mg.kg-1

Built on area:

Concentration in soil	2.86E-9	mg.kg-1

Open surface:

Concentration in soil	2.86E-9	mg.kg-1

Garden or cultivated area:

Concentration in soil	2.86E-9	mg.kg-1

Sediment:

Contactmedia:

Soil parameters:	Current	Default
Depth of contaminant below surface level	1.0E-2	1.25
Organic matter content	3.0E+0	10
Bulk density	1.5E+0	1.5
Fraction water in soil	2.0E-1	0.2
Fraction air in soil	2.0E-1	0.2
Acidity	6.0E+0	6
Temperature of soil	2.83E+2	283
Bulk density sediment	1.3E+0	1.3
Organic matter content sediment	6.0E+0	10
Fraction water in sediment	4.0E-1	0.4
Bulk density suspended matter	1.3E+0	1.3
Organic matter content suspended matter	6.0E+0	20
Fraction water in suspended matter	4.0E-1	0.4

Measurements
Code of measurement: Measurement 2
Substance: dioxine 1,2,3,7,8-PeCDD

Site

Concentration in soil	5.52E-9	mg.kg-1

Built on area:

Concentration in soil	5.52E-9	mg.kg-1

Open surface:

Concentration in soil	5.52E-9	mg.kg-1

Garden or cultivated area:

Concentration in soil	5.52E-9	mg.kg-1

Sediment:

Contactmedia:

Soil parameters:	Current	Default
Depth of contaminant below surface level	1.0E-2	1.25
Organic matter content	3.0E+0	10
Bulk density	1.5E+0	1.5
Fraction water in soil	2.0E-1	0.2
Fraction air in soil	2.0E-1	0.2
Acidity	6.0E+0	6
Temperature of soil	2.83E+2	283
Bulk density sediment	1.3E+0	1.3
Organic matter content sediment	6.0E+0	10
Fraction water in sediment	4.0E-1	0.4
Bulk density suspended matter	1.3E+0	1.3

Organic matter content suspended matter	6.0E+0
20	
Fraction water in suspended matter	4.0E-1
0.4	

Measurements
Code of measurement: Measurement 3
Substance: dioxine 1,2,3,6,7,8

Site

Concentration in soil	8.12E-10	mg.kg-1

Built on area:

Concentration in soil	8.12E-10	mg.kg-1

Open surface:

Concentration in soil	8.12E-10	mg.kg-1

Garden or cultivated area:

Concentration in soil	8.12E-10	mg.kg-1

Sediment:

Contactmedia:

Soil parameters:	Current
Default	
Depth of contaminant below surface level	1.0E-2
1.25	
Organic matter content	3.0E+0
10	
Bulk density	1.5E+0
1.5	
Fraction water in soil	2.0E-1
0.2	
Fraction air in soil	2.0E-1
0.2	
Acidity	6.0E+0
6	
Temperature of soil	2.83E+2
283	
Bulk density sediment	1.3E+0
1.3	

Organic matter content sediment	6.0E+0
	10
Fraction water in sediment	4.0E-1
	0.4
Bulk density suspended matter	1.3E+0
	1.3
Organic matter content suspended matter	6.0E+0
	20
Fraction water in suspended matter	4.0E-1
	0.4

Measurements
Code of measurement: Measurement 4
Substance: dioxine 1,2,3,4,7,8

Site

Concentration in soil	3.94E-10	mg.kg-1

Built on area:

Concentration in soil	3.94E-10	mg.kg-1

Open surface:

Concentration in soil	3.94E-10	mg.kg-1

Garden or cultivated area:

Concentration in soil	3.94E-10	mg.kg-1

Sediment:

Contactmedia:

Soil parameters:	Current Default
Depth of contaminant below surface level	1.0E-2
	1.25
Organic matter content	3.0E+0
	10
Bulk density	1.5E+0
	1.5
Fraction water in soil	2.0E-1
	0.2
Fraction air in soil	2.0E-1
	0.2

Acidity	6.0E+0
6	
Temperature of soil	2.83E+2
283	
Bulk density sediment	1.3E+0
1.3	
Organic matter content sediment	6.0E+0
10	
Fraction water in sediment	4.0E-1
0.4	
Bulk density suspended matter	1.3E+0
1.3	
Organic matter content suspended matter	6.0E+0
20	
Fraction water in suspended matter	4.0E-1
0.4	

Measurements
Code of measurement: Measurement 5
Substance: dioxine 1,2,3,7,8,9

Site

Concentration in soil	3.46E-10	mg.kg-1

Built on area:

Concentration in soil	3.46E-10	mg.kg-1

Open surface:

Concentration in soil	3.46E-10	mg.kg-1

Garden or cultivated area:

Concentration in soil	3.46E-10	mg.kg-1

Sediment:

Contactmedia:

Soil parameters:	Current
Default	
Depth of contaminant below surface level	1.0E-2
1.25	
Organic matter content	3.0E+0
10	

Bulk density	1.5E+0
	1.5
Fraction water in soil	2.0E-1
	0.2
Fraction air in soil	2.0E-1
	0.2
Acidity	6.0E+0
	6
Temperature of soil	2.83E+2
	283
Bulk density sediment	1.3E+0
	1.3
Organic matter content sediment	6.0E+0
	10
Fraction water in sediment	4.0E-1
	0.4
Bulk density suspended matter	1.3E+0
	1.3
Organic matter content suspended matter	6.0E+0
	20
Fraction water in suspended matter	4.0E-1
	0.4

Measurements
Code of measurement: Measurement 8
Substance: 2,3,7,8 TCDF

Site

Concentration in soil	3.23E-9	mg.kg-1

Built on area:

Concentration in soil	3.23E-9	mg.kg-1

Open surface:

Concentration in soil	3.23E-9	mg.kg-1

Garden or cultivated area:

Concentration in soil	3.23E-9	mg.kg-1

Sediment:

Contactmedia:

Soil parameters:	Current	Default

Depth of contaminant below surface level	1.0E-2
	1.25
Organic matter content	3.0E+0
	10
Bulk density	1.5E+0
	1.5
Fraction water in soil	2.0E-1
	0.2
Fraction air in soil	2.0E-1
	0.2
Acidity	6.0E+0
	6
Temperature of soil	2.83E+2
	283
Bulk density sediment	1.3E+0
	1.3
Organic matter content sediment	6.0E+0
	10
Fraction water in sediment	4.0E-1
	0.4
Bulk density suspended matter	1.3E+0
	1.3
Organic matter content suspended matter	6.0E+0
	20
Fraction water in suspended matter	4.0E-1
	0.4

Measurements
Code of measurement: Measurement 9
Substance: 1,2,3,7,8 PeCDF

Site

Concentration in soil	3.56E-9	mg.kg-1

Built on area:

Concentration in soil	3.56E-9	mg.kg-1

Open surface:

Concentration in soil	3.56E-9	mg.kg-1

Garden or cultivated area:

Concentration in soil	3.56E-9	mg.kg-1

Sediment:

Contactmedia:

Soil parameters:	Current	Default
Depth of contaminant below surface level	1.0E-2	1.25
Organic matter content	3.0E+0	10
Bulk density	1.5E+0	1.5
Fraction water in soil	2.0E-1	0.2
Fraction air in soil	2.0E-1	0.2
Acidity	6.0E+0	6
Temperature of soil	2.83E+2	283
Bulk density sediment	1.3E+0	1.3
Organic matter content sediment	6.0E+0	10
Fraction water in sediment	4.0E-1	0.4
Bulk density suspended matter	1.3E+0	1.3
Organic matter content suspended matter	6.0E+0	20
Fraction water in suspended matter	4.0E-1	0.4

Measurements
Code of measurement: Measurement 11
Substance: 2,3,4,7,8 PeCDF

Site

Concentration in soil	2.43E-8	mg.kg-1

Built on area:

Concentration in soil	2.43E-8	mg.kg-1

Open surface:

Concentration in soil	2.43E-8	mg.kg-1

Garden or cultivated area:

Concentration in soil	2.43E-8	mg.kg-1

Sediment:

Contactmedia:

Soil parameters:	Current	Default
Depth of contaminant below surface level	1.0E-2	1.25
Organic matter content	3.0E+0	10
Bulk density	1.5E+0	1.5
Fraction water in soil	2.0E-1	0.2
Fraction air in soil	2.0E-1	0.2
Acidity	6.0E+0	6
Temperature of soil	2.83E+2	283
Bulk density sediment	1.3E+0	1.3
Organic matter content sediment	6.0E+0	10
Fraction water in sediment	4.0E-1	0.4
Bulk density suspended matter	1.3E+0	1.3
Organic matter content suspended matter	6.0E+0	20
Fraction water in suspended matter	4.0E-1	0.4

Measurements
Code of measurement: Measurement 13
Substance: 1,2,3,7,8,9 HxCDF

Site

Concentration in soil	3.54E-10	mg.kg-1

Built on area:

Concentration in soil	3.54E-10	mg.kg-1

Open surface:

Concentration in soil	3.54E-10	mg.kg-1

Garden or cultivated area:

Concentration in soil	3.54E-10	mg.kg-1

Sediment:

Contactmedia:

Soil parameters:	Current	Default
Depth of contaminant below surface level	1.0E-2	1.25
Organic matter content	3.0E+0	10
Bulk density	1.5E+0	1.5
Fraction water in soil	2.0E-1	0.2
Fraction air in soil	2.0E-1	0.2
Acidity	6.0E+0	6
Temperature of soil	2.83E+2	283
Bulk density sediment	1.3E+0	1.3
Organic matter content sediment	6.0E+0	10
Fraction water in sediment	4.0E-1	0.4
Bulk density suspended matter	1.3E+0	1.3
Organic matter content suspended matter	6.0E+0	20
Fraction water in suspended matter	4.0E-1	0.4

Measurements
Code of measurement: Measurement 16
Substance: 1,2,3,4,7,8,9 HpCDF

Site

Concentration in soil	1.7E-10	mg.kg-1

Built on area:

Concentration in soil	1.7E-10	mg.kg-1

Open surface:

Concentration in soil 1.7E-10 mg.kg-1

Garden or cultivated area:

Concentration in soil 1.7E-10 mg.kg-1

Sediment:

Contactmedia:

Soil parameters:	Current	Default
Depth of contaminant below surface level	1.0E-2	1.25
Organic matter content	3.0E+0	10
Bulk density	1.5E+0	1.5
Fraction water in soil	2.0E-1	0.2
Fraction air in soil	2.0E-1	0.2
Acidity	6.0E+0	6
Temperature of soil	2.83E+2	283
Bulk density sediment	1.3E+0	1.3
Organic matter content sediment	6.0E+0	10
Fraction water in sediment	4.0E-1	0.4
Bulk density suspended matter	1.3E+0	1.3
Organic matter content suspended matter	6.0E+0	20
Fraction water in suspended matter	4.0E-1	0.4

==== Result ====

Scenario: Scenario 0
Subsite: Subsite 0

= Uptake Table =

Measurement : Measurement 6
Substance : dioxine 1,2,3,4,6,7,8

Exposure per route (mg/(kg.d))

Exposure route	Child	Adult	Lifelong
inhalation indoor air	7.89E-17	1.94E-17	2.45E-17
inhalation outdoor air	9.33E-18	2.76E-17	2.61E-17
ingestion soil	5.2E-11	4.33E-12	8.42E-12
dermal contact soil	2.23E-12	6.63E-12	6.25E-12
inhalation soil	8.22E-14	4.83E-14	5.12E-14
ingestion drinking water	0.0E+0	0.0E+0	0.0E+0
dermal contact shower	0.0E+0	0.0E+0	0.0E+0
inhalation vapour shower	0.0E+0	0.0E+0	0.0E+0
ingestion milk	9.21E-10	4.62E-10	5.02E-10
ingestion meat	4.43E-9	2.21E-9	2.4E-9
ingestion vegetables	1.55E-9	7.77E-10	8.43E-10
ingestion surface water	0.0E+0	0.0E+0	0.0E+0
ingestion suspended matter	0.0E+0	0.0E+0	0.0E+0
dermal contact surface water	0.0E+0	0.0E+0	0.0E+0
Total exposure	6.96E-9	3.46E-9	3.76E-9

= Uptake Table =

Measurement : Measurement 7
Substance : dioxine OCDD

Exposure per route (mg/(kg.d))

Exposure route	Child	Adult	Lifelong
inhalation indoor air	4.17E-16	1.02E-16	1.29E-16
inhalation outdoor air	4.93E-17	1.46E-16	1.38E-16
ingestion soil	1.5E-10	1.25E-11	2.43E-11
dermal contact soil	6.43E-12	1.91E-11	1.8E-11
inhalation soil	2.37E-13	1.39E-13	1.48E-13
ingestion drinking water	0.0E+0	0.0E+0	0.0E+0
dermal contact shower	0.0E+0	0.0E+0	0.0E+0
inhalation vapour shower	0.0E+0	0.0E+0	0.0E+0
ingestion milk	2.66E-9	1.33E-9	1.45E-9
ingestion meat	1.28E-8	6.39E-9	6.93E-9
ingestion vegetables	6.24E-9	3.12E-9	3.39E-9

ingestion surface water	0.0E+0	0.0E+0	0.0E+0
ingestion suspended matter	0.0E+0	0.0E+0	0.0E+0
dermal contact surface water	0.0E+0	0.0E+0	0.0E+0
Total exposure	2.18E-8	1.09E-8	1.18E-8

= Uptake Table =

Measurement : Measurement 10
Substance : 1,2,3,4,7,8 HxCDF

Exposure per route (mg/(kg.d))

Exposure route	Child	Adult	Lifelong
inhalation indoor air	2.24E-17	5.51E-18	6.96E-18
inhalation outdoor air	2.65E-18	7.85E-18	7.41E-18
ingestion soil	6.3E-12	5.25E-13	1.02E-12
dermal contact soil	2.7E-13	8.03E-13	7.58E-13
inhalation soil	9.96E-15	5.86E-15	6.21E-15
ingestion drinking water	0.0E+0	0.0E+0	0.0E+0
dermal contact shower	0.0E+0	0.0E+0	0.0E+0
inhalation vapour shower	0.0E+0	0.0E+0	0.0E+0
ingestion milk	1.12E-10	5.6E-11	6.08E-11
ingestion meat	5.37E-10	2.68E-10	2.91E-10
ingestion vegetables	8.05E-11	4.02E-11	4.37E-11
ingestion surface water	0.0E+0	0.0E+0	0.0E+0
ingestion suspended matter	0.0E+0	0.0E+0	0.0E+0
dermal contact surface water	0.0E+0	0.0E+0	0.0E+0
Total exposure	7.35E-10	3.66E-10	3.98E-10

= Uptake Table =

Measurement : Measurement 12
Substance : 1,2,3,6,7,8 HxCDF

Exposure per route (mg/(kg.d))

Exposure route	Child	Adult	Lifelong

inhalation indoor air	2.04E-17	5.02E-18	6.34E-18
inhalation outdoor air	2.42E-18	7.16E-18	6.75E-18
ingestion soil	5.74E-12	4.78E-13	9.29E-13
dermal contact soil	2.46E-13	7.32E-13	6.9E-13
inhalation soil	9.07E-15	5.34E-15	5.66E-15
ingestion drinking water	0.0E+0	0.0E+0	0.0E+0
dermal contact shower	0.0E+0	0.0E+0	0.0E+0
inhalation vapour shower	0.0E+0	0.0E+0	0.0E+0
ingestion milk	1.02E-10	5.11E-11	5.54E-11
ingestion meat	4.89E-10	2.44E-10	2.65E-10
ingestion vegetables	7.33E-11	3.67E-11	3.98E-11
ingestion surface water	0.0E+0	0.0E+0	0.0E+0
ingestion suspended matter	0.0E+0	0.0E+0	0.0E+0
dermal contact surface water	0.0E+0	0.0E+0	0.0E+0
Total exposure	6.7E-10	3.33E-10	3.62E-10

= Uptake Table =

Measurement : Measurement 14
Substance : 2,3,4,6,7,8 Hp CDF

Exposure per route (mg/(kg.d))

Exposure route	Child	Adult	Lifelong
inhalation indoor air	1.98E-17	4.87E-18	6.15E-18
inhalation outdoor air	2.35E-18	6.94E-18	6.55E-18
ingestion soil	4.92E-12	4.1E-13	7.97E-13
dermal contact soil	2.11E-13	6.27E-13	5.92E-13
inhalation soil	7.78E-15	4.57E-15	4.85E-15
ingestion drinking water	0.0E+0	0.0E+0	0.0E+0
dermal contact shower	0.0E+0	0.0E+0	0.0E+0
inhalation vapour shower	0.0E+0	0.0E+0	0.0E+0
ingestion milk	8.71E-11	4.38E-11	4.75E-11
ingestion meat	4.19E-10	2.09E-10	2.27E-10
ingestion vegetables	4.05E-11	2.02E-11	2.2E-11
ingestion surface water	0.0E+0	0.0E+0	0.0E+0

ingestion suspended matter	0.0E+0	0.0E+0	0.0E+0
dermal contact surface water	0.0E+0	0.0E+0	0.0E+0
Total exposure	5.52E-10	2.75E-10	2.98E-10

= Uptake Table =

Measurement : Measurement 15
Substance : 1,2,3,4,6,7,8 HpCDF

Exposure per route (mg/(kg.d))

Exposure route	Child	Adult	Lifelong
inhalation indoor air	1.21E-16	2.97E-17	3.75E-17
inhalation outdoor air	1.43E-17	4.23E-17	3.99E-17
ingestion soil	3.0E-11	2.5E-12	4.86E-12
dermal contact soil	1.29E-12	3.83E-12	3.61E-12
inhalation soil	4.74E-14	2.79E-14	2.96E-14
ingestion drinking water	0.0E+0	0.0E+0	0.0E+0
dermal contact shower	0.0E+0	0.0E+0	0.0E+0
inhalation vapour shower	0.0E+0	0.0E+0	0.0E+0
ingestion milk	5.31E-10	2.67E-10	2.89E-10
ingestion meat	2.55E-9	1.28E-9	1.39E-9
ingestion vegetables	2.47E-10	1.23E-10	1.34E-10
ingestion surface water	0.0E+0	0.0E+0	0.0E+0
ingestion suspended matter	0.0E+0	0.0E+0	0.0E+0
dermal contact surface water	0.0E+0	0.0E+0	0.0E+0
Total exposure	3.36E-9	1.67E-9	1.82E-9

= Uptake Table =

Measurement : Measurement 17
Substance : OCDF

Exposure per route (mg/(kg.d))

Exposure route	Child	Adult	Lifelong

inhalation indoor air	2.48E-16	6.08E-17	7.68E-17
inhalation outdoor air	2.93E-17	8.67E-17	8.18E-17
ingestion soil	9.3E-11	7.75E-12	1.51E-11
dermal contact soil	3.98E-12	1.19E-11	1.12E-11
inhalation soil	1.47E-13	8.65E-14	9.16E-14
ingestion drinking water	0.0E+0	0.0E+0	0.0E+0
dermal contact shower	0.0E+0	0.0E+0	0.0E+0
inhalation vapour shower	0.0E+0	0.0E+0	0.0E+0
ingestion milk	1.65E-9	8.27E-10	8.97E-10
ingestion meat	7.92E-9	3.96E-9	4.3E-9
ingestion vegetables	6.97E-9	3.49E-9	3.78E-9
ingestion surface water	0.0E+0	0.0E+0	0.0E+0
ingestion suspended matter	0.0E+0	0.0E+0	0.0E+0
dermal contact surface water	0.0E+0	0.0E+0	0.0E+0
Total exposure	1.66E-8	8.29E-9	9.01E-9

= Uptake Table =

Measurement : Measurement 1
Substance : dioxine 2378 TeCDD

Exposure per route (mg/(kg.d))

Exposure route	Child	Adult	Lifelong
inhalation indoor air	4.02E-18	9.85E-19	1.24E-18
inhalation outdoor air	4.75E-19	1.41E-18	1.33E-18
ingestion soil	2.86E-14	2.38E-15	4.63E-15
dermal contact soil	1.23E-15	3.65E-15	3.44E-15
inhalation soil	4.52E-17	2.66E-17	2.82E-17
ingestion drinking water	0.0E+0	0.0E+0	0.0E+0
dermal contact shower	0.0E+0	0.0E+0	0.0E+0
inhalation vapour shower	0.0E+0	0.0E+0	0.0E+0
ingestion milk	5.07E-13	2.55E-13	2.76E-13
ingestion meat	2.36E-12	1.18E-12	1.28E-12
ingestion vegetables	2.5E-12	1.25E-12	1.35E-12
ingestion surface water	0.0E+0	0.0E+0	0.0E+0
ingestion suspended matter	0.0E+0	0.0E+0	0.0E+0
dermal contact surface water	0.0E+0	0.0E+0	0.0E+0

Total exposure	5.4E-12	2.69E-12	2.92E-12

= Uptake Table =

Measurement : Measurement 2
Substance : dioxine 1,2,3,7,8-PeCDD

Exposure per route (mg/(kg.d))

Exposure route	Child	Adult	Lifelong
inhalation indoor air	1.91E-18	4.69E-19	5.93E-19
inhalation outdoor air	2.26E-19	6.69E-19	6.31E-19
ingestion soil	5.52E-14	4.6E-15	8.94E-15
dermal contact soil	2.37E-15	7.04E-15	6.64E-15
inhalation soil	8.73E-17	5.13E-17	5.44E-17
ingestion drinking water	0.0E+0	0.0E+0	0.0E+0
dermal contact shower	0.0E+0	0.0E+0	0.0E+0
inhalation vapour shower	0.0E+0	0.0E+0	0.0E+0
ingestion milk	9.78E-13	4.91E-13	5.33E-13
ingestion meat	4.7E-12	2.35E-12	2.55E-12
ingestion vegetables	1.49E-11	7.47E-12	8.11E-12
ingestion surface water	0.0E+0	0.0E+0	0.0E+0
ingestion suspended matter	0.0E+0	0.0E+0	0.0E+0
dermal contact surface water	0.0E+0	0.0E+0	0.0E+0
Total exposure	2.07E-11	1.03E-11	1.12E-11

= Uptake Table =

Measurement : Measurement 3
Substance : dioxine 1,2,3,6,7,8

Exposure per route (mg/(kg.d))

Exposure route	Child	Adult	Lifelong

inhalation indoor air	9.85E-20	2.42E-20	3.05E-20
inhalation outdoor air	1.16E-20	3.45E-20	3.25E-20
ingestion soil	8.12E-15	6.77E-16	1.31E-15
dermal contact soil	3.48E-16	1.04E-15	9.76E-16
inhalation soil	1.28E-17	7.55E-18	8.0E-18
ingestion drinking water	0.0E+0	0.0E+0	0.0E+0
dermal contact shower	0.0E+0	0.0E+0	0.0E+0
inhalation vapour shower	0.0E+0	0.0E+0	0.0E+0
ingestion milk	1.44E-13	7.22E-14	7.84E-14
ingestion meat	6.92E-13	3.46E-13	3.75E-13
ingestion vegetables	8.52E-13	4.26E-13	4.62E-13
ingestion surface water	0.0E+0	0.0E+0	0.0E+0
ingestion suspended matter	0.0E+0	0.0E+0	0.0E+0
dermal contact surface water	0.0E+0	0.0E+0	0.0E+0
Total exposure	1.7E-12	8.46E-13	9.18E-13

= Uptake Table =

Measurement : Measurement 4
Substance : dioxine 1,2,3,4,7,8

Exposure per route (mg/(kg.d))

Exposure route	Child	Adult	Lifelong
inhalation indoor air	4.78E-20	1.17E-20	1.48E-20
inhalation outdoor air	5.65E-21	1.67E-20	1.58E-20
ingestion soil	3.94E-15	3.28E-16	6.38E-16
dermal contact soil	1.69E-16	5.02E-16	4.74E-16
inhalation soil	6.23E-18	3.66E-18	3.88E-18
ingestion drinking water	0.0E+0	0.0E+0	0.0E+0
dermal contact shower	0.0E+0	0.0E+0	0.0E+0
inhalation vapour shower	0.0E+0	0.0E+0	0.0E+0
ingestion milk	6.98E-14	3.5E-14	3.8E-14
ingestion meat	3.36E-13	1.68E-13	1.82E-13
ingestion vegetables	4.13E-13	2.07E-13	2.24E-13
ingestion surface water	0.0E+0	0.0E+0	0.0E+0
ingestion suspended matter	0.0E+0	0.0E+0	0.0E+0
dermal contact surface water	0.0E+0	0.0E+0	0.0E+0

Total exposure	8.23E-13	4.1E-13	4.46E-13

= Uptake Table =

Measurement : Measurement 5
Substance : dioxine 1,2,3,7,8,9

Exposure per route (mg/(kg.d))

Exposure route	Child	Adult	Lifelong
inhalation indoor air	4.1E-20	1.01E-20	1.27E-20
inhalation outdoor air	4.85E-21	1.44E-20	1.36E-20
ingestion soil	3.46E-15	2.88E-16	5.6E-16
dermal contact soil	1.48E-16	4.41E-16	4.16E-16
inhalation soil	5.47E-18	3.22E-18	3.41E-18
ingestion drinking water	0.0E+0	0.0E+0	0.0E+0
dermal contact shower	0.0E+0	0.0E+0	0.0E+0
inhalation vapour shower	0.0E+0	0.0E+0	0.0E+0
ingestion milk	6.13E-14	3.08E-14	3.34E-14
ingestion meat	2.95E-13	1.47E-13	1.6E-13
ingestion vegetables	3.63E-13	1.81E-13	1.97E-13
ingestion surface water	0.0E+0	0.0E+0	0.0E+0
ingestion suspended matter	0.0E+0	0.0E+0	0.0E+0
dermal contact surface water	0.0E+0	0.0E+0	0.0E+0
Total exposure	7.22E-13	3.6E-13	3.91E-13

= Uptake Table =

Measurement : Measurement 8
Substance : 2,3,7,8 TCDF

Exposure per route (mg/(kg.d))

Exposure route	Child	Adult	Lifelong
inhalation indoor air	1.2E-19	2.94E-20	3.72E-20

inhalation outdoor air	1.42E-20	4.2E-20	3.96E-20
ingestion soil	3.23E-14	2.69E-15	5.23E-15
dermal contact soil	1.38E-15	4.12E-15	3.88E-15
inhalation soil	5.11E-17	3.0E-17	3.18E-17
ingestion drinking water	0.0E+0	0.0E+0	0.0E+0
dermal contact shower	0.0E+0	0.0E+0	0.0E+0
inhalation vapour shower	0.0E+0	0.0E+0	0.0E+0
ingestion milk	1.83E-13	9.19E-14	9.97E-14
ingestion meat	5.04E-13	2.52E-13	2.74E-13
ingestion vegetables	6.79E-14	3.39E-14	3.69E-14
ingestion surface water	0.0E+0	0.0E+0	0.0E+0
ingestion suspended matter	0.0E+0	0.0E+0	0.0E+0
dermal contact surface water	0.0E+0	0.0E+0	0.0E+0
Total exposure	7.89E-13	3.85E-13	4.2E-13

= Uptake Table =

Measurement : Measurement 9
Substance : 1,2,3,7,8 PeCDF

Exposure per route (mg/(kg.d))

Exposure route	Child	Adult	Lifelong
inhalation indoor air	2.42E-19	5.93E-20	7.49E-20
inhalation outdoor air	2.86E-20	8.46E-20	7.98E-20
ingestion soil	3.56E-14	2.97E-15	5.76E-15
dermal contact soil	1.53E-15	4.54E-15	4.28E-15
inhalation soil	5.63E-17	3.31E-17	3.51E-17
ingestion drinking water	0.0E+0	0.0E+0	0.0E+0
dermal contact shower	0.0E+0	0.0E+0	0.0E+0
inhalation vapour shower	0.0E+0	0.0E+0	0.0E+0
ingestion milk	5.03E-13	2.53E-13	2.74E-13
ingestion meat	1.44E-12	7.2E-13	7.81E-13
ingestion vegetables	1.88E-13	9.42E-14	1.02E-13
ingestion surface water	0.0E+0	0.0E+0	0.0E+0
ingestion suspended matter	0.0E+0	0.0E+0	0.0E+0
dermal contact surface water	0.0E+0	0.0E+0	0.0E+0

Total exposure	2.17E-12	1.07E-12	1.17E-12

= Uptake Table =

Measurement : Measurement 11
Substance : 2,3,4,7,8 PeCDF

Exposure per route (mg/(kg.d))

Exposure route	Child	Adult	Lifelong
inhalation indoor air	6.08E-20	1.49E-20	1.88E-20
inhalation outdoor air	7.18E-21	2.13E-20	2.01E-20
ingestion soil	2.43E-13	2.03E-14	3.93E-14
dermal contact soil	1.04E-14	3.1E-14	2.92E-14
inhalation soil	3.84E-16	2.26E-16	2.39E-16
ingestion drinking water	0.0E+0	0.0E+0	0.0E+0
dermal contact shower	0.0E+0	0.0E+0	0.0E+0
inhalation vapour shower	0.0E+0	0.0E+0	0.0E+0
ingestion milk	3.43E-12	1.72E-12	1.87E-12
ingestion meat	9.83E-12	4.91E-12	5.33E-12
ingestion vegetables	1.29E-12	6.43E-13	6.98E-13
ingestion surface water	0.0E+0	0.0E+0	0.0E+0
ingestion suspended matter	0.0E+0	0.0E+0	0.0E+0
dermal contact surface water	0.0E+0	0.0E+0	0.0E+0
Total exposure	1.48E-11	7.33E-12	7.97E-12

= Uptake Table =

Measurement : Measurement 13
Substance : 1,2,3,7,8,9 HxCDF

Exposure per route (mg/(kg.d))

Exposure route	Child	Adult	Lifelong

inhalation indoor air	1.26E-20	3.09E-21	3.91E-21
inhalation outdoor air	1.49E-21	4.41E-21	4.16E-21
ingestion soil	3.54E-15	2.95E-16	5.73E-16
dermal contact soil	1.52E-16	4.51E-16	4.26E-16
inhalation soil	5.6E-18	3.29E-18	3.49E-18
ingestion drinking water	0.0E+0	0.0E+0	0.0E+0
dermal contact shower	0.0E+0	0.0E+0	0.0E+0
inhalation vapour shower	0.0E+0	0.0E+0	0.0E+0
ingestion milk	6.27E-14	3.15E-14	3.42E-14
ingestion meat	3.02E-13	1.51E-13	1.64E-13
ingestion vegetables	4.52E-14	2.26E-14	2.45E-14
ingestion surface water	0.0E+0	0.0E+0	0.0E+0
ingestion suspended matter	0.0E+0	0.0E+0	0.0E+0
dermal contact surface water	0.0E+0	0.0E+0	0.0E+0
Total exposure	4.13E-13	2.06E-13	2.23E-13

= Uptake Table =

Measurement : Measurement 16
Substance : 1,2,3,4,7,8,9 HpCDF

Exposure per route (mg/(kg.d))

Exposure route	Child	Adult	Lifelong
inhalation indoor air	8.44E-19	2.07E-19	2.62E-19
inhalation outdoor air	9.98E-20	2.95E-19	2.79E-19
ingestion soil	1.7E-15	1.42E-16	2.75E-16
dermal contact soil	7.28E-17	2.17E-16	2.04E-16
inhalation soil	2.69E-18	1.58E-18	1.68E-18
ingestion drinking water	0.0E+0	0.0E+0	0.0E+0
dermal contact shower	0.0E+0	0.0E+0	0.0E+0
inhalation vapour shower	0.0E+0	0.0E+0	0.0E+0
ingestion milk	3.01E-14	1.51E-14	1.64E-14
ingestion meat	1.45E-13	7.24E-14	7.86E-14
ingestion vegetables	2.2E-13	1.1E-13	1.2E-13
ingestion surface water	0.0E+0	0.0E+0	0.0E+0
ingestion suspended matter	0.0E+0	0.0E+0	0.0E+0

dermal contact surface water	0.0E+0	0.0E+0	0.0E+0
Total exposure	3.97E-13	1.98E-13	2.15E-13

= Risk Table =

Maximum Permissable Risk level

Measurement	Substance	Dose(mg/(kg.d))	RfD(mg/(kg.d))	Dose/RfD
Measurement 6	dioxine 1,2,3,4,6,7,8	3.76E-9	0.0E+0	-
Measurement 7	dioxine OCDD	1.18E-8	1.0E-8	1.18E+0
Measurement 10	1,2,3,4,7,8 HxCDF	3.98E-10	0.0E+0	-
Measurement 12	1,2,3,6,7,8 HxCDF	3.62E-10	0.0E+0	-
Measurement 14	2,3,4,6,7,8 Hp CDF	2.98E-10	0.0E+0	-
Measurement 15	1,2,3,4,6,7,8 HpCDF	1.82E-9	0.0E+0	-
Measurement 17	OCDF	9.01E-9	0.0E+0	-
Measurement 1	dioxine 2378 TeCDD	2.92E-12	1.0E-8	2.92E-4
Measurement 2	dioxine 1,2,3,7,8-PeCDD	1.12E-11	0.0E+0	-
Measurement 3	dioxine 1,2,3,6,7,8	9.18E-13	0.0E+0	-
Measurement 4	dioxine 1,2,3,4,7,8	4.46E-13	0.0E+0	-
Measurement 5	dioxine 1,2,3,7,8,9	3.91E-13	0.0E+0	-
Measurement 8	2,3,7,8 TCDF	4.2E-13	0.0E+0	-
Measurement 9	1,2,3,7,8 PeCDF	1.17E-12	0.0E+0	-
Measurement 11	2,3,4,7,8 PeCDF	7.97E-12	0.0E+0	-
Measurement 13	1,2,3,7,8,9 HxCDF	2.23E-13	0.0E+0	-
Measurement 16	1,2,3,4,7,8,9 HpCDF	2.15E-13	0.0E+0	-

RfD = Reference Dose

Indoor concentration in air

Measurement	Substance	Cia(µg/m3)	TCA(µg/m3)	Cia/TCA
Measurement 6	dioxine 1,2,3,4,6,7,8	1.75E-13	0.0E+0	-
Measurement 7	dioxine OCDD	9.24E-13	0.0E+0	-
Measurement 10	1,2,3,4,7,8 HxCDF	4.98E-14	0.0E+0	-
Measurement 12	1,2,3,6,7,8 HxCDF	4.53E-14	0.0E+0	-
Measurement 14	2,3,4,6,7,8 Hp CDF	4.4E-14	0.0E+0	-
Measurement 15	1,2,3,4,6,7,8 HpCDF	2.68E-13	0.0E+0	-
Measurement 17	OCDF	5.49E-13	0.0E+0	-
Measurement 1	dioxine 2378 TeCDD	8.9E-15	0.0E+0	-
Measurement 2	dioxine 1,2,3,7,8-PeCDD	4.24E-15	0.0E+0	-
Measurement 3	dioxine 1,2,3,6,7,8	2.18E-16	0.0E+0	-

Measurement 4	dioxine 1,2,3,4,7,8	1.06E-16	0.0E+0	-
Measurement 5	dioxine 1,2,3,7,8,9	9.1E-17	0.0E+0	-
Measurement 8	2,3,7,8 TCDF	2.66E-16	0.0E+0	-
Measurement 9	1,2,3,7,8 PeCDF	5.36E-16	0.0E+0	-
Measurement 11	2,3,4,7,8 PeCDF	1.35E-16	0.0E+0	-
Measurement 13	1,2,3,7,8,9 HxCDF	2.8E-17	0.0E+0	-
Measurement 16	1,2,3,4,7,8,9 HpCDF	1.87E-15	0.0E+0	-

TCA = Tolerable Concentration in Air Cia = Concentration in indoor air

Outdoor concentration in air

Measurement	Substance	Coa(µg/m3)	TCA(µg/m3)	Coa/TCA
Measurement 6	dioxine 1,2,3,4,6,7,8	1.53E-13	0.0E+0	-
Measurement 7	dioxine OCDD	8.08E-13	0.0E+0	-
Measurement 10	1,2,3,4,7,8 HxCDF	4.35E-14	0.0E+0	-
Measurement 12	1,2,3,6,7,8 HxCDF	3.97E-14	0.0E+0	-
Measurement 14	2,3,4,6,7,8 Hp CDF	3.85E-14	0.0E+0	-
Measurement 15	1,2,3,4,6,7,8 HpCDF	2.35E-13	0.0E+0	-
Measurement 17	OCDF	4.81E-13	0.0E+0	-
Measurement 1	dioxine 2378 TeCDD	7.79E-15	0.0E+0	-
Measurement 2	dioxine 1,2,3,7,8-PeCDD	3.71E-15	0.0E+0	-
Measurement 3	dioxine 1,2,3,6,7,8	1.91E-16	0.0E+0	-
Measurement 4	dioxine 1,2,3,4,7,8	9.27E-17	0.0E+0	-
Measurement 5	dioxine 1,2,3,7,8,9	7.96E-17	0.0E+0	-
Measurement 8	2,3,7,8 TCDF	2.33E-16	0.0E+0	-
Measurement 9	1,2,3,7,8 PeCDF	4.69E-16	0.0E+0	-
Measurement 11	2,3,4,7,8 PeCDF	1.18E-16	0.0E+0	-
Measurement 13	1,2,3,7,8,9 HxCDF	2.45E-17	0.0E+0	-
Measurement 16	1,2,3,4,7,8,9 HpCDF	1.64E-15	0.0E+0	-

TCA = Tolerable Concentration in Air Coa = Concentration in outdoor air

Concentration in drinking water

Measurement	Substance	Cdw(µg/l)	standard(µg/l)	Cdw/standard
Measurement 6	dioxine 1,2,3,4,6,7,8	0.0E+0	0.0E+0	-
Measurement 7	dioxine OCDD	0.0E+0	0.0E+0	-
Measurement 10	1,2,3,4,7,8 HxCDF	0.0E+0	0.0E+0	-
Measurement 12	1,2,3,6,7,8 HxCDF	0.0E+0	0.0E+0	-
Measurement 14	2,3,4,6,7,8 Hp CDF	0.0E+0	0.0E+0	-
Measurement 15	1,2,3,4,6,7,8 HpCDF	0.0E+0	0.0E+0	-
Measurement 17	OCDF	0.0E+0	0.0E+0	-
Measurement 1	dioxine 2378 TeCDD	0.0E+0	0.0E+0	-
Measurement 2	dioxine 1,2,3,7,8-PeCDD	0.0E+0	0.0E+0	-
Measurement 3	dioxine 1,2,3,6,7,8	0.0E+0	0.0E+0	-
Measurement 4	dioxine 1,2,3,4,7,8	0.0E+0	0.0E+0	-
Measurement 5	dioxine 1,2,3,7,8,9	0.0E+0	0.0E+0	-
Measurement 8	2,3,7,8 TCDF	0.0E+0	0.0E+0	-

Measurement 9	1,2,3,7,8 PeCDF	0.0E+0	0.0E+0	-
Measurement 11	2,3,4,7,8 PeCDF	0.0E+0	0.0E+0	-
Measurement 13	1,2,3,7,8,9 HxCDF	0.0E+0	0.0E+0	-
Measurement 16	1,2,3,4,7,8,9 HpCDF	0.0E+0	0.0E+0	-

Cdw = Concentration in drinking water

Background

Measurement	Substance	Dose(mg/(kg.d))	Background(mg/(kg.d))
Measurement 6	dioxine 1,2,3,4,6,7,8	3.76E-9	0.0E+0
Measurement 7	dioxine OCDD	1.18E-8	0.0E+0
Measurement 10	1,2,3,4,7,8 HxCDF	3.98E-10	0.0E+0
Measurement 12	1,2,3,6,7,8 HxCDF	3.62E-10	0.0E+0
Measurement 14	2,3,4,6,7,8 Hp CDF	2.98E-10	0.0E+0
Measurement 15	1,2,3,4,6,7,8 HpCDF	1.82E-9	0.0E+0
Measurement 17	OCDF	9.01E-9	0.0E+0
Measurement 1	dioxine 2378 TeCDD	2.92E-12	0.0E+0
Measurement 2	dioxine 1,2,3,7,8-PeCDD	1.12E-11	0.0E+0
Measurement 3	dioxine 1,2,3,6,7,8	9.18E-13	0.0E+0
Measurement 4	dioxine 1,2,3,4,7,8	4.46E-13	0.0E+0
Measurement 5	dioxine 1,2,3,7,8,9	3.91E-13	0.0E+0
Measurement 8	2,3,7,8 TCDF	4.2E-13	0.0E+0
Measurement 9	1,2,3,7,8 PeCDF	1.17E-12	0.0E+0
Measurement 11	2,3,4,7,8 PeCDF	7.97E-12	0.0E+0
Measurement 13	1,2,3,7,8,9 HxCDF	2.23E-13	0.0E+0
Measurement 16	1,2,3,4,7,8,9 HpCDF	2.15E-13	0.0E+0

Substance: dioxine 2378 TeCDD
Physical-chemical parameters

Moleculair weight	3.22E+2	g.mol-1
Water solubility	3.0E-4	mg.l-1
Vapour pressure	1.4E-6	Pa
Klw	6.39E-4	-
Log Kow	6.8E+0	-
Log Koc	6.41E+0	dm3.kg-1
Kd	-	dm3.kg-1
BCF(root)	-	-
BCF(stem)	-	-
D(pe)	1.0E-7	m2.d-1
Diffusion coefficient (air)	-	m2.h-1
Diffusion coefficient(water)	-	m2.h-1
DAR(adult)	5.0E-3	h-1
DAR(child)	1.0E-2	h-1
fexcr	-	-
pKa	-	-

Standards		
RfD	1.0E-8	mg.kg-1.d-1
TCA	-	µg.m-3
Drinking water standard	-	µg.l-1
Background dose		
Background concentration	0.0E+0	µg.m-3

Substance: dioxine OCDD		
Physical-chemical parameters		
Moleculair weight	4.6E+2	g.mol-1
Water solubility	4.0E-7	mg.l-1
Vapour pressure	5.93E-10	Pa
Klw	2.9E-4	-
Log Kow	8.2E+0	-
Log Koc	7.81E+0	dm3.kg-1
Kd	-	dm3.kg-1
BCF(root)	-	-
BCF(stem)	-	-
D(pe)	1.0E-7	m2.d-1
Diffusion coefficient (air)	-	m2.h-1
Diffusion coefficient(water)	-	m2.h-1
DAR(adult)	5.0E-3	h-1
DAR(child)	1.0E-2	h-1
fexcr	-	-
pKa	-	-
Standards		
RfD	1.0E-8	mg.kg-1.d-1
TCA	-	µg.m-3
Drinking water standard	-	µg.l-1
Background dose		
Background concentration	0.0E+0	µg.m-3

Substance: dioxine 1,2,3,7,8-PeCDD			
Based on: none [organic - user defined]			
Description			
1,2,3,7,8-PeCDD			
Physical-chemical parameters			
Moleculair weight	3.56E+2	g.mol-1	
Water solubility	1.18E-4	mg.l-1	
Vapour pressure	8.8E-8	Pa	
Klw	1.13E-4	-	
Log Kow	7.4E+0	-	
Log Koc	6.38E+0	dm3.kg-1	
Kd	0.0E+0	dm3.kg-1	
BCF(root)	-	-	calculated
BCF(stem)	0.0E+0	-	

D(pe)	0.0E+0	m2.d-1	
Diffusion coefficient (air)	-	m2.h-1	calculated
Diffusion coefficient(water)	0.0E+0	m2.h-1	
DAR(adult)	5.0E-3	h-1	
DAR(child)	1.0E-2	h-1	
fexcr	0.0E+0	-	
pKa	-	-	calculated

Justification
Parameters from Phys Chem Props of organic chemicals Vol 3 and US EPA vol 3

Standards			
RfD	0.0E+0	mg.kg-1.d-1	
TCA	0.0E+0	µg.m-3	
Drinking water standard	0.0E+0	µg.l-1	

Justification

Background dose

Background concentration	0.0E+0	µg.m-3	

Justification

Substance: dioxine 1,2,3,6,7,8
Based on: none [organic - user defined]
Description
dioxin 1,2,3,6,7,8 HxCDD
Physical-chemical parameters

Moleculair weight	3.91E+2	g.mol-1	
Water solubility	4.4E-6	mg.l-1	
Vapour pressure	5.1E-9	Pa	
Klw	4.61E-4	-	
Log Kow	7.8E+0	-	
Log Koc	7.1E+0	dm3.kg-1	
Kd	0.0E+0	dm3.kg-1	
BCF(root)	-	-	calculated
BCF(stem)	-	-	calculated
D(pe)	0.0E+0	m2.d-1	
Diffusion coefficient (air)	-	m2.h-1	calculated
Diffusion coefficient(water)	-	m2.h-1	calculated
DAR(adult)	5.0E-3	h-1	
DAR(child)	1.0E-2	h-1	
fexcr	0.0E+0	-	
pKa	-	-	calculated

Justification
As above

Standards			
RfD	0.0E+0	mg.kg-1.d-1	
TCA	0.0E+0	µg.m-3	
Drinking water standard	0.0E+0	µg.l-1	

Justification

Background dose
Background concentration 0.0E+0 µg.m-3

Justification

Substance: dioxine 1,2,3,4,7,8
Based on: none [organic - user defined]
Description
dioxin 1,2,3,4,7,8 HcDD
Physical-chemical parameters

Moleculair weight	3.91E+2	g.mol-1	
Water solubility	4.4E-6	mg.l-1	
Vapour pressure	5.1E-9	Pa	
Klw	4.61E-4	-	
Log Kow	7.8E+0	-	
Log Koc	7.1E+0	dm3.kg-1	
Kd	0.0E+0	dm3.kg-1	
BCF(root)	-	-	calculated
BCF(stem)	-	-	calculated
D(pe)	0.0E+0	m2.d-1	
Diffusion coefficient (air)	-	m2.h-1	calculated
Diffusion coefficient(water)	-	m2.h-1	calculated
DAR(adult)	5.0E-3	h-1	
DAR(child)	1.0E-2	h-1	
fexcr	0.0E+0	-	
pKa	-	-	calculated

Justification
as above

Standards

RfD	0.0E+0	mg.kg-1.d-1
TCA	0.0E+0	µg.m-3
Drinking water standard	0.0E+0	µg.l-1

Justification

Background dose
Background concentration 0.0E+0 µg.m-3

Justification

Substance: dioxine 1,2,3,7,8,9
Based on: none [organic - user defined]
Description
dioxin 1,2,3,7,8,9 HxCDD
Physical-chemical parameters

Moleculair weight	3.91E+2	g.mol-1
Water solubility	4.6E-6	mg.l-1
Vapour pressure	5.1E-9	Pa
Klw	4.61E-4	-

Log Kow	7.8E+0	-	
Log Koc	7.1E+0	dm3.kg-1	
Kd	0.0E+0	dm3.kg-1	
BCF(root)	-	-	calculated
BCF(stem)	-	-	calculated
D(pe)	0.0E+0	m2.d-1	
Diffusion coefficient (air)	-	m2.h-1	calculated
Diffusion coefficient(water)	-	m2.h-1	calculated
DAR(adult)	5.0E-3	h-1	
DAR(child)	1.0E-2	h-1	
fexcr	0.0E+0	-	
pKa	-	-	calculated

Justification
as above

Standards

RfD	0.0E+0	mg.kg-1.d-1
TCA	0.0E+0	µg.m-3
Drinking water standard	0.0E+0	µg.l-1

Justification

Background dose

Background concentration	0.0E+0	µg.m-3

Justification

Substance: dioxine 1,2,3,4,6,7,8
Based on: none [organic - user defined]
Description
dioxin 1,2,3,4,6,7,8, HpCdd
Physical-chemical parameters

Moleculair weight	4.25E+2	g.mol-1	
Water solubility	2.4E-6	mg.l-1	
Vapour pressure	7.5E-10	Pa	
Klw	5.41E-4	-	
Log Kow	8.0E+0	-	
Log Koc	7.8E+0	dm3.kg-1	
Kd	0.0E+0	dm3.kg-1	
BCF(root)	-	-	calculated
BCF(stem)	-	-	calculated
D(pe)	0.0E+0	m2.d-1	
Diffusion coefficient (air)	-	m2.h-1	calculated
Diffusion coefficient(water)	-	m2.h-1	calculated
DAR(adult)	5.0E-3	h-1	
DAR(child)	1.0E-2	h-1	
fexcr	0.0E+0	-	
pKa	-	-	calculated

Justification
as above

Standards

RfD	0.0E+0	mg.kg-1.d-1
TCA	0.0E+0	µg.m-3

Drinking water standard	0.0E+0	µg.l-1	

Justification

Background dose
Background concentration 0.0E+0 µg.m-3

Justification

Substance: 2,3,7,8 TCDF
Based on: none [organic - user defined]
Description
2,3,7,8 TCDF
Physical-chemical parameters

Moleculair weight	1.68E+2	g.mol-1	
Water solubility	4.19E-3	mg.l-1	
Vapour pressure	2.0E-6	Pa	
Klw	6.21E-4	-	
Log Kow	6.1E+0	-	
Log Koc	7.5E+0	dm3.kg-1	
Kd	0.0E+0	dm3.kg-1	
BCF(root)	-	-	calculated
BCF(stem)	-	-	calculated
D(pe)	0.0E+0	m2.d-1	
Diffusion coefficient (air)	-	m2.h-1	calculated
Diffusion coefficient(water)	-	m2.h-1	calculated
DAR(adult)	5.0E-3	h-1	
DAR(child)	1.0E-2	h-1	
fexcr	0.0E+0	-	
pKa	-	-	calculated

Justification
As above

Standards

RfD	0.0E+0	mg.kg-1.d-1
TCA	0.0E+0	µg.m-3
Drinking water standard	0.0E+0	µg.l-1

Justification

Background dose
Background concentration 0.0E+0 µg.m-3

Justification

Substance: 1,2,3,7,8 PeCDF
Based on: none [organic - user defined]
Description
1,2,3,7,8 PeCDF

Physical-chemical parameters

Moleculair weight	3.4E+2	g.mol-1	
Water solubility	2.36E-4	mg.l-1	
Vapour pressure	3.5E-7	Pa	
Klw	2.15E-4	-	
Log Kow	6.5E+0	-	
Log Koc	7.4E+0	dm3.kg-1	
Kd	0.0E+0	dm3.kg-1	
BCF(root)	-	-	calculated
BCF(stem)	-	-	calculated
D(pe)	0.0E+0	m2.d-1	
Diffusion coefficient (air)	-	m2.h-1	calculated
Diffusion coefficient(water)	-	m2.h-1	calculated
DAR(adult)	5.0E-3	h-1	
DAR(child)	1.0E-2	h-1	
fexcr	0.0E+0	-	
pKa	-	-	calculated

Justification
As above

Standards

RfD	0.0E+0	mg.kg-1.d-1
TCA	0.0E+0	µg.m-3
Drinking water standard	0.0E+0	µg.l-1

Justification

Background dose

Background concentration	0.0E+0	µg.m-3

Justification

Substance: 2,3,4,7,8 PeCDF
Based on: 1,2,3,7,8 PeCDF [organic - user defined]
Description
2,3,4,7,8 Pe CDF
Physical-chemical parameters

Moleculair weight	3.4E+2	g.mol-1	
Water solubility	2.36E-1	mg.l-1	
Vapour pressure	3.5E-7	Pa	
Klw	2.15E-4	-	
Log Kow	6.5E+0	-	
Log Koc	7.4E+0	dm3.kg-1	
Kd	0.0E+0	dm3.kg-1	
BCF(root)	-	-	calculated
BCF(stem)	-	-	calculated
D(pe)	0.0E+0	m2.d-1	
Diffusion coefficient (air)	-	m2.h-1	calculated
Diffusion coefficient(water)	-	m2.h-1	calculated
DAR(adult)	5.0E-3	h-1	
DAR(child)	1.0E-2	h-1	
fexcr	0.0E+0	-	
pKa	-	-	calculated

Justification

As above

Standards

RfD	0.0E+0	mg.kg-1.d-1
TCA	0.0E+0	µg.m-3
Drinking water standard	0.0E+0	µg.l-1

Justification

Background dose

Background concentration	0.0E+0	µg.m-3

Justification

Substance: 1,2,3,4,7,8 HxCDF
Based on: none [organic - user defined]
Description
1,2,3,4,7,8 HxCDF
Physical-chemical parameters

Moleculair weight	3.75E+2	g.mol-1	
Water solubility	1.77E-4	mg.l-1	
Vapour pressure	3.5E-8	Pa	
Klw	3.15E-4	-	
Log Kow	7.0E+0	-	
Log Koc	7.4E+0	dm3.kg-1	
Kd	0.0E+0	dm3.kg-1	
BCF(root)	-	-	calculated
BCF(stem)	-	-	calculated
D(pe)	0.0E+0	m2.d-1	
Diffusion coefficient (air)	-	m2.h-1	calculated
Diffusion coefficient(water)	-	m2.h-1	calculated
DAR(adult)	5.0E-3	h-1	
DAR(child)	1.0E-2	h-1	
fexcr	0.0E+0	-	
pKa	-	-	calculated

Justification
as above

Standards

RfD	0.0E+0	mg.kg-1.d-1
TCA	0.0E+0	µg.m-3
Drinking water standard	0.0E+0	µg.l-1

Justification

Background dose

Background concentration	0.0E+0	µg.m-3

Justification

Substance: 1,2,3,6,7,8 HxCDF
Based on: 1,2,3,4,7,8 HxCDF [organic - user defined]
Description
1,2,3,6,7,8 Hx CDF
Physical-chemical parameters

Moleculair weight	3.75E+2	g.mol-1	
Water solubility	1.77E-4	mg.l-1	
Vapour pressure	3.5E-8	Pa	
Klw	3.15E-4	-	
Log Kow	7.0E+0	-	
Log Koc	7.4E+0	dm3.kg-1	
Kd	0.0E+0	dm3.kg-1	
BCF(root)	-	-	calculated
BCF(stem)	-	-	calculated
D(pe)	0.0E+0	m2.d-1	
Diffusion coefficient (air)	-	m2.h-1	calculated
Diffusion coefficient(water)	-	m2.h-1	calculated
DAR(adult)	5.0E-3	h-1	
DAR(child)	1.0E-2	h-1	
fexcr	0.0E+0	-	
pKa	-	-	calculated

Justification
as above

Standards

RfD	0.0E+0	mg.kg-1.d-1
TCA	0.0E+0	µg.m-3
Drinking water standard	0.0E+0	µg.l-1

Justification

Background dose

Background concentration	0.0E+0	µg.m-3

Justification

Substance: 1,2,3,7,8,9 HxCDF
Based on: 1,2,3,6,7,8 HxCDF [organic - user defined]
Description
1,2,3,7,8,9 HxCDF
Physical-chemical parameters

Moleculair weight	3.75E+2	g.mol-1	
Water solubility	1.77E-4	mg.l-1	
Vapour pressure	3.5E-8	Pa	
Klw	3.15E-4	-	
Log Kow	7.0E+0	-	
Log Koc	7.4E+0	dm3.kg-1	
Kd	0.0E+0	dm3.kg-1	
BCF(root)	-	-	calculated
BCF(stem)	-	-	calculated
D(pe)	0.0E+0	m2.d-1	
Diffusion coefficient (air)	-	m2.h-1	calculated
Diffusion coefficient(water)	-	m2.h-1	calculated
DAR(adult)	5.0E-3	h-1	

DAR(child)	1.0E-2	h-1	
fexcr	0.0E+0	-	
pKa	-	-	calculated

Justification
as above

Standards

RfD	0.0E+0	mg.kg-1.d-1
TCA	0.0E+0	µg.m-3
Drinking water standard	0.0E+0	µg.l-1

Justification

Background dose

Background concentration	0.0E+0	µg.m-3

Justification

Substance: 2,3,4,6,7,8 Hp CDF
Based on: none [organic - user defined]
Description
2,3,4,6,7,8 Hp CDF
Physical-chemical parameters

Moleculair weight	4.09E+2	g.mol-1	
Water solubility	1.3E-6	mg.l-1	
Vapour pressure	4.7E-9	Pa	
Klw	6.06E-4	-	
Log Kow	7.4E+0	-	
Log Koc	7.9E+0	dm3.kg-1	
Kd	0.0E+0	dm3.kg-1	
BCF(root)	-	-	calculated
BCF(stem)	-	-	calculated
D(pe)	0.0E+0	m2.d-1	
Diffusion coefficient (air)	-	m2.h-1	calculated
Diffusion coefficient(water)	-	m2.h-1	calculated
DAR(adult)	5.0E-3	h-1	
DAR(child)	1.0E-2	h-1	
fexcr	0.0E+0	-	
pKa	-	-	calculated

Justification
as above

Standards

RfD	0.0E+0	mg.kg-1.d-1
TCA	0.0E+0	µg.m-3
Drinking water standard	0.0E+0	µg.l-1

Justification

Background dose

Background concentration	0.0E+0	µg.m-3

Justification

Substance: 1,2,3,4,6,7,8 HpCDF
Based on: 2,3,4,6,7,8 Hp CDF [organic - user defined]
Description
1,2,3,4,6,7,8 HpCDF
Physical-chemical parameters

Moleculair weight	4.09E+2	g.mol-1	
Water solubility	1.3E-6	mg.l-1	
Vapour pressure	4.7E-9	Pa	
Klw	6.06E-4	-	
Log Kow	7.4E+0	-	
Log Koc	7.9E+0	dm3.kg-1	
Kd	0.0E+0	dm3.kg-1	
BCF(root)	-	-	calculated
BCF(stem)	-	-	calculated
D(pe)	0.0E+0	m2.d-1	
Diffusion coefficient (air)	-	m2.h-1	calculated
Diffusion coefficient(water)	-	m2.h-1	calculated
DAR(adult)	5.0E-3	h-1	
DAR(child)	1.0E-2	h-1	
fexcr	0.0E+0	-	
pKa	-	-	calculated

Justification
as above

Standards

RfD	0.0E+0	mg.kg-1.d-1
TCA	0.0E+0	µg.m-3
Drinking water standard	0.0E+0	µg.l-1

Justification

Background dose

Background concentration	0.0E+0	µg.m-3

Justification

Substance: 1,2,3,4,7,8,9 HpCDF
Based on: 1,2,3,4,6,7,8 HpCDF [organic - user defined]
Description
1,2,3,4,7,8,9 HpCDF
Physical-chemical parameters

Moleculair weight	4.09E+2	g.mol-1	
Water solubility	1.3E-6	mg.l-1	
Vapour pressure	4.62E-8	Pa	
Klw	6.06E-4	-	
Log Kow	7.4E+0	-	
Log Koc	6.7E+0	dm3.kg-1	
Kd	0.0E+0	dm3.kg-1	
BCF(root)	-	-	calculated

BCF(stem)	-	-	calculated
D(pe)	0.0E+0	m2.d-1	
Diffusion coefficient (air)	-	m2.h-1	calculated
Diffusion coefficient(water)	-	m2.h-1	calculated
DAR(adult)	5.0E-3	h-1	
DAR(child)	1.0E-2	h-1	
fexcr	0.0E+0	-	
pKa	-	-	calculated

Justification
as above

Standards

RfD	0.0E+0	mg.kg-1.d-1
TCA	0.0E+0	µg.m-3
Drinking water standard	0.0E+0	µg.l-1

Justification

Background dose

Background concentration	0.0E+0	µg.m-3

Justification

Substance: OCDF
Based on: none [organic - user defined]
Description
OCDF
Physical-chemical parameters

Moleculair weight	4.44E+2	g.mol-1	
Water solubility	1.16E-6	mg.l-1	
Vapour pressure	5.1E-10	Pa	
Klw	8.12E-5	-	
Log Kow	8.0E+0	-	
Log Koc	7.4E+0	dm3.kg-1	
Kd	0.0E+0	dm3.kg-1	
BCF(root)	-	-	calculated
BCF(stem)	-	-	calculated
D(pe)	0.0E+0	m2.d-1	
Diffusion coefficient (air)	-	m2.h-1	calculated
Diffusion coefficient(water)	0.0E+0	m2.h-1	
DAR(adult)	5.0E-3	h-1	
DAR(child)	1.0E-2	h-1	
fexcr	0.0E+0	-	
pKa	-	-	calculated

Justification
as above

Standards

RfD	0.0E+0	mg.kg-1.d-1
TCA	0.0E+0	µg.m-3
Drinking water standard	0.0E+0	µg.l-1

Justification

Background dose
Background concentration 0.0E+0 µg.m-3

Justification

END OF REPORT