

APPENDIX G ADJUSTED HSLS



RISK / HEALTH-BASED CRITERIA MODEL
SOIL - DIRECT CONTACT

INPUTS

SIMULATION NO.

CALCULATION TYPE

0-Forward risk, 1-Health-based criteria
Select default scenario parameters
Select default chemical parameters
Comments
Soil source concentration (mg/kg)

CHEMICAL DATA

0-Cancer endpoint, 1-Non-cancer endpoint

Inhalation
0-Inhalation toxicity concentration, 1-Inhalation dose

Inhalation cancer unit risk (µg/m³)¹

Inhalation reference concentration (µg/m³)¹

Conversion factor from conc (µg/m³) to dose (mg/kg/d)

Calculated inhalation cancer slope factor (mg/kg/d)¹

Calculated inhalation RfD / ADI / TDI (mg/kg/d)¹

OR

Inhalation cancer slope factor (mg/kg/d)¹

Inhalation RfD / ADI / TDI (mg/kg/d)

Fraction of RfD/RfD to inhalation background exposure
(Inhalation RfD / ADI / TDI - BACKGROUND) (mg/kg/d)

OR

Oral

Oral cancer slope factor (mg/kg/d)¹

Oral RfD / ADI / TDI (mg/kg/d)

Fraction of RfD to oral background exposure
(Oral RfD / ADI / TDI - BACKGROUND) (mg/kg/d)

Oral RfD / ADI / TDI - (BACKGROUND) (mg/kg/d)

Gastro-intestinal absorption factor (GIAF)

OR

Dermal

0-Extrapolate oral toxicity values, 1-Enter dermal toxicity values

0-No toxicity adjustment, 1-Adjust based on GIAF

Calculated dermal cancer slope factor (mg/kg/d)¹

Calculated dermal RfD / ADI / TDI (mg/kg/d)¹

OR

Enter dermal cancer slope factor (mg/kg/d)¹

Enter dermal RfD / ADI / TDI (mg/kg/d)

Fraction of RfD to dermal background exposure
(Oral RfD / ADI / TDI - BACKGROUND) (mg/kg/d)

Oral RfD / ADI / TDI - BACKGROUND (mg/kg/d)

Skin relative absorption factor

EXPOSURE / RISK DATA

Exposure frequency (d/yr)

Average time (non-threshold) (yr)

Average time (threshold) (yr)

Exposure duration (yr)

Exposure time (hr/d)

Body weight (kg)

Inhalation rate (m³/h)

Soil ingestion rate (mg/d)

Skin area (cm²)

Soil adherence factor

Particle emission factor (PEF) (m³/kg)

Lung retention factor

HEALTH-BASED CRITERIA RISK TARGETS

Target cancer risk

Target non-cancer HI

COMBINE RISK SCENARIOS

Combined risk of previous number of columns

	1	2	3	4	5	6	7	8	9	10
	1	1	1	1	1	1	1	1	1	1
	HSL-A (Young Child)	HSL-A (Older Child)	HSL-A (Adult)	COMBINE	HSL-A (Young Child)	HSL-A (Older Child)	HSL-A (Adult)	HSL-A (Young Child)	HSL-A (Older Child)	HSL-A (Adult)
	Benzene	Benzene	Benzene	Benzene	Naphthalene	Naphthalene	Naphthalene	TPH <C8-C10 aromatic	TPH <C8-C10 aromatic	TPH <C8-C10 aromatic
0-Cancer endpoint, 1-Non-cancer endpoint	0	0	0	0	1	1	1	1	1	1
Inhalation	0	0	0	0	0	0	0	0	0	0
Inhalation toxicity concentration, 1-Inhalation dose	0	0	0	0	0	0	0	0	0	0
Inhalation cancer unit risk (µg/m ³) ¹	6.00E-06	6.00E-06	6.00E-06	6.00E-06	3.00E+00	3.00E+00	3.00E+00	2.00E+02	2.00E+02	2.00E+02
Inhalation reference concentration (µg/m ³) ¹	3.00E+01	3.00E+01	3.00E+01	3.00E+01	2.86E-04	2.86E-04	2.86E-04	2.86E-04	2.86E-04	2.86E-04
Conversion factor from conc (µg/m ³) to dose (mg/kg/d)	2.86E-04	2.86E-04	2.86E-04	2.86E-04	2.86E-04	2.86E-04	2.86E-04	2.86E-04	2.86E-04	2.86E-04
Calculated inhalation cancer slope factor (mg/kg/d) ¹	2.10E-02	2.10E-02	2.10E-02	2.10E-02	8.57E-04	8.57E-04	8.57E-04	5.71E-02	5.71E-02	5.71E-02
Calculated inhalation RfD / ADI / TDI (mg/kg/d) ¹	8.57E-03	8.57E-03	8.57E-03	8.57E-03	8.57E-04	8.57E-04	8.57E-04	5.71E-02	5.71E-02	5.71E-02
OR										
Inhalation cancer slope factor (mg/kg/d) ¹										
Inhalation RfD / ADI / TDI (mg/kg/d)										
Fraction of RfD/RfD to inhalation background exposure (Inhalation RfD / ADI / TDI - BACKGROUND) (mg/kg/d)	6.86E-03	6.86E-03	6.86E-03	6.86E-03	8.57E-04	8.57E-04	8.57E-04	5.14E-02	5.14E-02	5.14E-02
OR										
Oral										
Oral cancer slope factor (mg/kg/d) ¹	3.50E-02	3.50E-02	3.50E-02	3.50E-02	2.00E-02	2.00E-02	2.00E-02	4.00E-02	4.00E-02	4.00E-02
Oral RfD / ADI / TDI (mg/kg/d)	4.00E-03	4.00E-03	4.00E-03	4.00E-03	2.00E-02	2.00E-02	2.00E-02	3.60E-02	3.60E-02	3.60E-02
Fraction of RfD to oral background exposure (Oral RfD / ADI / TDI - BACKGROUND) (mg/kg/d)	0.2	0.2	0.2	0.2	0	0	0	0.1	0.1	0.1
Oral RfD / ADI / TDI - (BACKGROUND) (mg/kg/d)	3.20E-03	3.20E-03	3.20E-03	3.20E-03	2.00E-02	2.00E-02	2.00E-02	3.60E-02	3.60E-02	3.60E-02
Gastro-intestinal absorption factor (GIAF)	1	1	1	1	1	1	1	1	1	1
OR										
Dermal										
0-Extrapolate oral toxicity values, 1-Enter dermal toxicity values	0	0	0	0	0	0	0	0	0	0
0-No toxicity adjustment, 1-Adjust based on GIAF	0	0	0	0	0	0	0	0	0	0
Calculated dermal cancer slope factor (mg/kg/d) ¹	3.50E-02	3.50E-02	3.50E-02	3.50E-02	2.00E-02	2.00E-02	2.00E-02	4.00E-02	4.00E-02	4.00E-02
Calculated dermal RfD / ADI / TDI (mg/kg/d) ¹	4.00E-03	4.00E-03	4.00E-03	4.00E-03	2.00E-02	2.00E-02	2.00E-02	4.00E-02	4.00E-02	4.00E-02
OR										
Enter dermal cancer slope factor (mg/kg/d) ¹										
Enter dermal RfD / ADI / TDI (mg/kg/d)										
Fraction of RfD to dermal background exposure (Oral RfD / ADI / TDI - BACKGROUND) (mg/kg/d)	0.2	0.2	0.2	0.2	0	0	0	0.1	0.1	0.1
Oral RfD / ADI / TDI - BACKGROUND (mg/kg/d)	3.20E-03	3.20E-03	3.20E-03	3.20E-03	2.00E-02	2.00E-02	2.00E-02	3.60E-02	3.60E-02	3.60E-02
Skin relative absorption factor	0.08	0.08	0.08	0.08	0.1	0.1	0.1	0.2	0.2	0.2

CALCULATION RESULTS

FORWARD RISK CALCULATION

DUST INHALATION CANCER RISK

ORAL CANCER RISK

DERMAL CANCER RISK

TOTAL CANCER RISK

DUST INHALATION HAZARD INDEX

ORAL HAZARD INDEX

DERMAL HAZARD INDEX

TOTAL HAZARD INDEX

SOIL HEALTH-BASED CRITERIA CALCULATION (mg/kg)

DUST INHALATION CANCER

ORAL CANCER

DERMAL CANCER

OVERALL CANCER HEALTH-BASED CRITERIA

DUST INHALATION NON-CANCER

ORAL NON-CANCER

DERMAL NON-CANCER

OVERALL NON-CANCER HEALTH-BASED CRITERIA

DUST INHALATION CANCER RISK	-	-	-	-	-	-	-	-	-	-
ORAL CANCER RISK	-	-	-	-	-	-	-	-	-	-
DERMAL CANCER RISK	-	-	-	-	-	-	-	-	-	-
TOTAL CANCER RISK	-	-	-	-	-	-	-	-	-	-
DUST INHALATION HAZARD INDEX	-	-	-	-	-	-	-	-	-	-
ORAL HAZARD INDEX	-	-	-	-	-	-	-	-	-	-
DERMAL HAZARD INDEX	-	-	-	-	-	-	-	-	-	-
TOTAL HAZARD INDEX	-	-	-	-	-	-	-	-	-	-
DUST INHALATION CANCER	3.86E+07	3.51E+07	4.99E+07	2.06E+07	-	-	-	-	-	-
ORAL CANCER	5.17E+02	7.12E+02	2.14E+03	5.34E+02	-	-	-	-	-	-
DERMAL CANCER	5.57E+02	5.11E+02	3.94E+02	2.23E+02	-	-	-	-	-	-
OVERALL CANCER HEALTH-BASED CRITERIA	2.68E+02	2.98E+02	3.33E+02	1.57E+02	-	-	-	-	-	-
DUST INHALATION NON-CANCER	-	-	-	-	5.95E+06	9.03E+06	1.80E+07	3.57E+08	5.42E+08	1.08E+09
ORAL NON-CANCER	-	-	-	-	3.10E+03	7.12E+03	3.00E+04	5.58E+03	1.28E+04	5.40E+04
DERMAL NON-CANCER	-	-	-	-	2.67E+03	4.09E+03	4.41E+03	2.41E+03	3.68E+03	3.97E+03
OVERALL NON-CANCER HEALTH-BASED CRITERIA	-	-	-	-	1.44E+03	2.60E+03	3.85E+03	1.68E+03	2.86E+03	3.70E+03



RISK / HEALTH-BASED CRITERIA MODEL
SOIL - DIRECT CONTACT

INPUTS

SIMULATION NO.

CALCULATION TYPE

0-Forward risk, 1-Health-based criteria
Select default scenario parameters
Select default chemical parameters
Comments
Soil source concentration (mg/kg)

CHEMICAL DATA

0-Cancer endpoint, 1-Non-cancer endpoint

Inhalation

0-Inhalation toxicity concentration, 1-Inhalation dose

Inhalation cancer unit risk ($\mu\text{g}/\text{m}^3$)¹

Inhalation reference concentration ($\mu\text{g}/\text{m}^3$)

Conversion factor from conc ($\mu\text{g}/\text{m}^3$) to dose (mg/kg/d)

Calculated inhalation cancer slope factor (mg/kg/d)¹

Calculated inhalation RID / ADI / TDI (mg/kg/d)

OR

Inhalation cancer slope factor (mg/kg/d)¹

Inhalation RID / ADI / TDI (mg/kg/d)

Fraction of RfC/RfD to inhalation background exposure

(Inhalation RID / ADI / TDI) - (BACKGROUND) (mg/kg/d)

Oral

Oral cancer slope factor (mg/kg/d)¹

Oral RID / ADI / TDI (mg/kg/d)

Fraction of RID to oral background exposure

(Oral RID / ADI / TDI) - (BACKGROUND) (mg/kg/d)

Gastro-intestinal absorption factor (GIAF)

Dermal

0-Extrapolate oral toxicity values, 1-Enter dermal toxicity values

0-No toxicity adjustment, 1-Adjust based on GIAF

Calculated dermal cancer slope factor (mg/kg/d)¹

Calculated dermal RID / ADI / TDI (mg/kg/d)

OR

Enter dermal cancer slope factor (mg/kg/d)¹

Enter dermal RID / ADI / TDI (mg/kg/d)

Fraction of RID to dermal background exposure

(Oral RID / ADI / TDI) - (BACKGROUND) (mg/kg/d)

Skin relative absorption factor

EXPOSURE / RISK DATA

Exposure frequency (d/yr)

Average time (non-threshold) (yr)

Average time (threshold) (yr)

Exposure duration (yr)

Exposure time (hr/d)

Body weight (kg)

Inhalation rate (m³/h)

Soil ingestion rate (mg/d)

Skin area (cm²)

Soil adherence factor

Particle emission factor (PEF) (m³/kg)

Lung retention factor

HEALTH-BASED CRITERIA RISK TARGETS

Target cancer risk

Target non-cancer HI

COMBINE RISK SCENARIOS

Combined risk of previous number of columns

CALCULATION RESULTS

FORWARD RISK CALCULATION

DUST INHALATION CANCER RISK

ORAL CANCER RISK

DERMAL CANCER RISK

TOTAL CANCER RISK

DUST INHALATION HAZARD INDEX

ORAL HAZARD INDEX

DERMAL HAZARD INDEX

TOTAL HAZARD INDEX

SOIL HEALTH-BASED CRITERIA CALCULATION (mg/kg)

DUST INHALATION CANCER

ORAL CANCER

DERMAL CANCER

OVERALL CANCER HEALTH-BASED CRITERIA

DUST INHALATION NON-CANCER

ORAL NON-CANCER

DERMAL NON-CANCER

OVERALL NON-CANCER HEALTH-BASED CRITERIA

	1	2	3	4	5	6	7	8	9	10
HSL-C (Young Child) Benzene	1	1	1	1	1	1	1	1	1	1
HSL-C (Older Child) Benzene	1	1	1	1	1	1	1	1	1	1
HSL-C (Adult) Benzene	1	1	1	1	1	1	1	1	1	1
COMBINE Benzene	1	1	1	1	1	1	1	1	1	1
HSL-C (Young Child) Naphthalene	1	1	1	1	1	1	1	1	1	1
HSL-C (Older Child) Naphthalene	1	1	1	1	1	1	1	1	1	1
HSL-C (Adult) Naphthalene	1	1	1	1	1	1	1	1	1	1
HSL-C (Young Child) TPH >C8-C10 aromatic	1	1	1	1	1	1	1	1	1	1
HSL-C (Older Child) TPH >C8-C10 aromatic	1	1	1	1	1	1	1	1	1	1
HSL-C (Adult) TPH >C8-C10 aromatic	1	1	1	1	1	1	1	1	1	1
0-Cancer endpoint, 1-Non-cancer endpoint	0	0	0	0	1	1	1	1	1	1
0-Inhalation toxicity concentration, 1-Inhalation dose	0	0	0	0	0	0	0	0	0	0
Inhalation cancer unit risk ($\mu\text{g}/\text{m}^3$) ¹	6.00E-06	6.00E-06	6.00E-06	6.00E-06						
Inhalation reference concentration ($\mu\text{g}/\text{m}^3$)	3.00E+01	3.00E+01	3.00E+01	3.00E+01	3.00E+00	3.00E+00	3.00E+00	2.00E+02	2.00E+02	2.00E+02
Conversion factor from conc ($\mu\text{g}/\text{m}^3$) to dose (mg/kg/d)	2.86E-04	2.86E-04	2.86E-04	2.86E-04	2.86E-04	2.86E-04	2.86E-04	2.86E-04	2.86E-04	2.86E-04
Calculated inhalation cancer slope factor (mg/kg/d) ¹	2.10E-02	2.10E-02	2.10E-02	2.10E-02						
Calculated inhalation RID / ADI / TDI (mg/kg/d)	8.57E-03	8.57E-03	8.57E-03	8.57E-03	8.57E-04	8.57E-04	8.57E-04	5.71E-02	5.71E-02	5.71E-02
OR										
Inhalation cancer slope factor (mg/kg/d) ¹										
Inhalation RID / ADI / TDI (mg/kg/d)										
Fraction of RfC/RfD to inhalation background exposure (Inhalation RID / ADI / TDI) - (BACKGROUND) (mg/kg/d)	0.2	0.2	0.2	0.2	0	0	0	0.1	0.1	0.1
6.86E-03	6.86E-03	6.86E-03	6.86E-03	6.86E-03	8.57E-04	8.57E-04	8.57E-04	5.14E-02	5.14E-02	5.14E-02
Oral										
Oral cancer slope factor (mg/kg/d) ¹	3.50E-02	3.50E-02	3.50E-02	3.50E-02						
Oral RID / ADI / TDI (mg/kg/d)	4.00E-03	4.00E-03	4.00E-03	4.00E-03	2.00E-02	2.00E-02	2.00E-02	4.00E-02	4.00E-02	4.00E-02
Fraction of RID to oral background exposure (Oral RID / ADI / TDI) - (BACKGROUND) (mg/kg/d)	0.2	0.2	0.2	0.2	0	0	0	0.1	0.1	0.1
3.02E-03	3.02E-03	3.02E-03	3.02E-03	3.02E-03	2.00E-02	2.00E-02	2.00E-02	3.60E-02	3.60E-02	3.60E-02
Gastro-intestinal absorption factor (GIAF)	1	1	1	1	1	1	1	1	1	1
Dermal										
0-Extrapolate oral toxicity values, 1-Enter dermal toxicity values	0	0	0	0	0	0	0	0	0	0
0-No toxicity adjustment, 1-Adjust based on GIAF	0	0	0	0	0	0	0	0	0	0
Calculated dermal cancer slope factor (mg/kg/d) ¹	3.50E-02	3.50E-02	3.50E-02	3.50E-02						
Calculated dermal RID / ADI / TDI (mg/kg/d)	4.00E-03	4.00E-03	4.00E-03	4.00E-03	2.00E-02	2.00E-02	2.00E-02	4.00E-02	4.00E-02	4.00E-02
OR										
Enter dermal cancer slope factor (mg/kg/d) ¹										
Enter dermal RID / ADI / TDI (mg/kg/d)										
Fraction of RID to dermal background exposure (Oral RID / ADI / TDI) - (BACKGROUND) (mg/kg/d)	0.2	0.2	0.2	0.2	0	0	0	0.1	0.1	0.1
3.02E-03	3.02E-03	3.02E-03	3.02E-03	3.02E-03	2.00E-02	2.00E-02	2.00E-02	3.60E-02	3.60E-02	3.60E-02
Skin relative absorption factor	0.08	0.08	0.08	0.08	0.1	0.1	0.1	0.2	0.2	0.2
EXPOSURE / RISK DATA										
Exposure frequency (d/yr)	365	365	365	365	365	365	365	365	365	365
Average time (non-threshold) (yr)	70	70	70	70	70	70	70	70	70	70
Average time (threshold) (yr)	6	10	14	6	10	14	6	10	14	14
Exposure duration (yr)	6	10	14	6	10	14	6	10	14	14
Exposure time (hr/d)	2	2	2	2	2	2	2	2	2	2
Body weight (kg)	15.5	35.6	75	15.5	35.6	75	15.5	35.6	75	75
Inhalation rate (m ³ /h)	1.26	1.59	1.59	1.26	1.59	1.59	1.26	1.59	1.59	1.59
Soil ingestion rate (mg/d)	50	50	25	50	50	25	50	50	25	25
Skin area (cm ²)	2318	3480	6800	2318	3480	6800	2318	3480	6800	6800
Soil adherence factor	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Particle emission factor (PEF) (m ³ /kg)	1360000000	1360000000	1360000000	1360000000	1360000000	1360000000	1360000000	1360000000	1360000000	1360000000
Lung retention factor	0.378	0.378	0.378	0.378	0.378	0.378	0.378	0.378	0.378	0.378
HEALTH-BASED CRITERIA RISK TARGETS										
Target cancer risk	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06	1.00E-06
Target non-cancer HI	1	1	1	1	1	1	1	1	1	1
COMBINE RISK SCENARIOS										
Combined risk of previous number of columns				3.00E-06						
CALCULATION RESULTS										
FORWARD RISK CALCULATION										
DUST INHALATION CANCER RISK	-	-	-	-	-	-	-	-	-	-
ORAL CANCER RISK	-	-	-	-	-	-	-	-	-	-
DERMAL CANCER RISK	-	-	-	-	-	-	-	-	-	-
TOTAL CANCER RISK	-	-	-	-	-	-	-	-	-	-
DUST INHALATION HAZARD INDEX	-	-	-	-	-	-	-	-	-	-
ORAL HAZARD INDEX	-	-	-	-	-	-	-	-	-	-
DERMAL HAZARD INDEX	-	-	-	-	-	-	-	-	-	-
TOTAL HAZARD INDEX	-	-	-	-	-	-	-	-	-	-
SOIL HEALTH-BASED CRITERIA CALCULATION (mg/kg)										
DUST INHALATION CANCER	1.23E+07	1.34E+07	2.02E+07	8.07E+06	-	-	-	-	-	-
ORAL CANCER	1.03E+02	1.42E+02	4.29E+02	1.07E+02	-	-	-	-	-	-
DERMAL CANCER	5.57E+01	5.11E+01	3.94E+01	2.32E+01	-	-	-	-	-	-
OVERALL CANCER HEALTH-BASED CRITERIA	3.62E+01	3.76E+01	3.61E+01	1.84E+01	-	-	-	-	-	-
DUST INHALATION NON-CANCER	-	-	-	-	1.90E+07	3.45E+07	7.27E+07	1.14E+09	2.07E+09	4.36E+09
ORAL NON-CANCER	-	-	-	-	6.20E+03	1.42E+04	6.00E+04	1.12E+04	2.55E+04	1.08E+05
DERMAL NON-CANCER	-	-	-	-	2.67E+03	4.09E+03	4.41E+03	2.41E+03	3.68E+03	3.97E+03
OVERALL NON-CANCER HEALTH-BASED CRITERIA	-	-	-	-	1.87E+03	3.18E+03	4.11E+03	1.88E+03	3.22E+03	3.83E+03



RISK / HEALTH-BASED CRITERIA MODEL
SOIL - DIRECT CONTACT

INPUTS

SIMULATION NO.

CALCULATION TYPE

0-Forward risk, 1-Health-based criteria
Select default scenario parameters
Select default chemical parameters
Comments
Soil source concentration (mg/kg)

CHEMICAL DATA

0-Cancer endpoint, 1-Non-cancer endpoint

Inhalation
0-Inhalation toxicity concentration, 1-Inhalation dose

Inhalation cancer unit risk (µg/m³)¹

Inhalation reference concentration (µg/m³)¹

Conversion factor from conc (µg/m³) to dose (mg/kg/d)

Calculated inhalation cancer slope factor (mg/kg/d)¹

Calculated inhalation RfD / ADI / TDI (mg/kg/d)¹

OR

Inhalation cancer slope factor (mg/kg/d)¹

Inhalation RfD / ADI / TDI (mg/kg/d)

Fraction of RfD/RfD to inhalation background exposure
(Inhalation RfD / ADI / TDI - BACKGROUND) (mg/kg/d)

OR

Oral
Oral cancer slope factor (mg/kg/d)¹

Oral RfD / ADI / TDI (mg/kg/d)

Fraction of RfD to oral background exposure
(Oral RfD / ADI / TDI - BACKGROUND) (mg/kg/d)

OR

Gastro-intestinal absorption factor (GIAF)

OR

Enter dermal cancer slope factor (mg/kg/d)¹

Enter dermal RfD / ADI / TDI (mg/kg/d)

Fraction of RfD to dermal background exposure
(Oral RfD / ADI / TDI - BACKGROUND) (mg/kg/d)

OR

Skin relative absorption factor

EXPOSURE / RISK DATA

Exposure frequency (d/yr)

Average time (non-threshold) (yr)

Average time (threshold) (yr)

Exposure duration (yr)

Exposure time (hr/d)

Body weight (kg)

Inhalation rate (m³/h)

Soil ingestion rate (mg/d)

Skin area (cm²)

Soil adherence factor

Particle emission factor (PEF) (m³/kg)

Lung retention factor

HEALTH-BASED CRITERIA RISK TARGETS

Target cancer risk

Target non-cancer HI

COMBINE RISK SCENARIOS

Combined risk of previous number of columns

	1	2	3	4	5	6	7	8	9	10
SIMULATION NO.	1	2	3	4	5	6	7	8	9	10
CALCULATION TYPE	1	1	1	1	1	1	1	1	1	1
0-Forward risk, 1-Health-based criteria	1	1	1	1	1	1	1	1	1	1
Select default scenario parameters	1	1	1	1	1	1	1	1	1	1
Select default chemical parameters	1	1	1	1	1	1	1	1	1	1
Comments										
Soil source concentration (mg/kg)										
CHEMICAL DATA										
0-Cancer endpoint, 1-Non-cancer endpoint	0	0	0	0	1	1	1	1	1	1
Inhalation										
0-Inhalation toxicity concentration, 1-Inhalation dose	0	0	0	0	0	0	0	0	0	0
Inhalation cancer unit risk (µg/m³)¹	6.00E-06	6.00E-06	6.00E-06	6.00E-06	3.00E+00	3.00E+00	3.00E+00	2.00E+02	2.00E+02	2.00E+02
Inhalation reference concentration (µg/m³)¹	3.00E+01	3.00E+01	3.00E+01	3.00E+01	3.00E+00	3.00E+00	3.00E+00	2.00E+02	2.00E+02	2.00E+02
Conversion factor from conc (µg/m³) to dose (mg/kg/d)	2.86E-04	2.86E-04	2.86E-04	2.86E-04	2.86E-04	2.86E-04	2.86E-04	2.86E-04	2.86E-04	2.86E-04
Calculated inhalation cancer slope factor (mg/kg/d)¹	2.10E-02	2.10E-02	2.10E-02	2.10E-02	8.57E-04	8.57E-04	8.57E-04	5.71E-02	5.71E-02	5.71E-02
Calculated inhalation RfD / ADI / TDI (mg/kg/d)¹	8.57E-03	8.57E-03	8.57E-03	8.57E-03	8.57E-04	8.57E-04	8.57E-04	5.71E-02	5.71E-02	5.71E-02
OR										
Inhalation cancer slope factor (mg/kg/d)¹										
Inhalation RfD / ADI / TDI (mg/kg/d)										
Fraction of RfD/RfD to inhalation background exposure (Inhalation RfD / ADI / TDI - BACKGROUND) (mg/kg/d)	0.2	0.2	0.2	0.2	0	0	0	0.1	0.1	0.1
OR										
Oral										
Oral cancer slope factor (mg/kg/d)¹	3.50E-02	3.50E-02	3.50E-02	3.50E-02	2.00E-02	2.00E-02	2.00E-02	4.00E-02	4.00E-02	4.00E-02
Oral RfD / ADI / TDI (mg/kg/d)	4.00E-03	4.00E-03	4.00E-03	4.00E-03	2.00E-02	2.00E-02	2.00E-02	4.00E-02	4.00E-02	4.00E-02
Fraction of RfD to oral background exposure (Oral RfD / ADI / TDI - BACKGROUND) (mg/kg/d)	0.2	0.2	0.2	0.2	0	0	0	0.1	0.1	0.1
OR										
Gastro-intestinal absorption factor (GIAF)	1	1	1	1	1	1	1	1	1	1
OR										
Enter dermal cancer slope factor (mg/kg/d)¹										
Enter dermal RfD / ADI / TDI (mg/kg/d)										
Fraction of RfD to dermal background exposure (Oral RfD / ADI / TDI - BACKGROUND) (mg/kg/d)	0.2	0.2	0.2	0.2	0	0	0	0.1	0.1	0.1
OR										
Skin relative absorption factor	0.08	0.08	0.08	0.08	0.1	0.1	0.1	0.2	0.2	0.2
EXPOSURE / RISK DATA										
Exposure frequency (d/yr)	365	365	365	365	365	365	365	365	365	365
Average time (non-threshold) (yr)	70	70	70	70	70	70	70	70	70	70
Average time (threshold) (yr)	6	10	14	6	6	10	14	6	10	14
Exposure duration (yr)	6	10	14	6	6	10	14	6	10	14
Exposure time (hr/d)	2	2	2	2	2	2	2	2	2	2
Body weight (kg)	15.5	35.6	75	15.5	15.5	35.6	75	15.5	35.6	75
Inhalation rate (m³/h)	1.26	1.59	1.59	1.26	1.26	1.59	1.59	1.26	1.59	1.59
Soil ingestion rate (mg/d)	50	50	25	50	50	50	25	50	50	25
Skin area (cm²)	2318	3480	6800	2318	2318	3480	6800	2318	3480	6800
Soil adherence factor	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Particle emission factor (PEF) (m³/kg)	1360000000	1360000000	1360000000	1360000000	1360000000	1360000000	1360000000	1360000000	1360000000	1360000000
Lung retention factor	0.378	0.378	0.378	0.378	0.378	0.378	0.378	0.378	0.378	0.378
HEALTH-BASED CRITERIA RISK TARGETS										
Target cancer risk	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05
Target non-cancer HI	1	1	1	1	1	1	1	1	1	1
COMBINE RISK SCENARIOS										
Combined risk of previous number of columns				3						

CALCULATION RESULTS

FORWARD RISK CALCULATION

DUST INHALATION CANCER RISK

ORAL CANCER RISK

DERMAL CANCER RISK

TOTAL CANCER RISK

DUST INHALATION HAZARD INDEX

ORAL HAZARD INDEX

DERMAL HAZARD INDEX

TOTAL HAZARD INDEX

SOIL HEALTH-BASED CRITERIA CALCULATION (mg/kg)

DUST INHALATION CANCER

ORAL CANCER

DERMAL CANCER

OVERALL CANCER HEALTH-BASED CRITERIA

DUST INHALATION NON-CANCER

ORAL NON-CANCER

DERMAL NON-CANCER

OVERALL NON-CANCER HEALTH-BASED CRITERIA

DUST INHALATION CANCER RISK	-	-	-	-	-	-	-	-	-	-
ORAL CANCER RISK	-	-	-	-	-	-	-	-	-	-
DERMAL CANCER RISK	-	-	-	-	-	-	-	-	-	-
TOTAL CANCER RISK	-	-	-	-	-	-	-	-	-	-
DUST INHALATION HAZARD INDEX	-	-	-	-	-	-	-	-	-	-
ORAL HAZARD INDEX	-	-	-	-	-	-	-	-	-	-
DERMAL HAZARD INDEX	-	-	-	-	-	-	-	-	-	-
TOTAL HAZARD INDEX	-	-	-	-	-	-	-	-	-	-
SOIL HEALTH-BASED CRITERIA CALCULATION (mg/kg)										
DUST INHALATION CANCER	1.23E+08	1.34E+08	2.02E+08	4.87E+07	-	-	-	-	-	-
ORAL CANCER	1.03E+03	1.42E+03	4.29E+03	5.25E+02	-	-	-	-	-	-
DERMAL CANCER	5.57E+02	5.11E+02	3.94E+02	1.99E+02	-	-	-	-	-	-
OVERALL CANCER HEALTH-BASED CRITERIA	3.62E+02	3.78E+02	3.61E+02	1.22E+02	-	-	-	-	-	-
DUST INHALATION NON-CANCER	-	-	-	-	1.90E+07	3.45E+07	7.27E+07	1.14E+09	2.07E+09	4.38E+09
ORAL NON-CANCER	-	-	-	-	6.20E+03	1.42E+04	6.00E+04	1.12E+04	2.56E+04	1.09E+05
DERMAL NON-CANCER	-	-	-	-	2.67E+03	4.09E+03	4.41E+03	2.41E+03	3.68E+03	3.97E+03
OVERALL NON-CANCER HEALTH-BASED CRITERIA	-	-	-	-	1.87E+03	3.18E+03	4.11E+03	1.98E+03	3.22E+03	3.83E+03



RISK / HEALTH-BASED CRITERIA MODEL
SOIL - DIRECT CONTACT

INPUTS

SIMULATION NO.

CALCULATION TYPE

0-Forward risk, 1-Health-based criteria
Select default scenario parameters
Select default chemical parameters
Comments
Soil source concentration (mg/kg)

CHEMICAL DATA

0-Cancer endpoint, 1-Non-cancer endpoint

Inhalation
0-Inhalation toxicity concentration, 1-Inhalation dose

Inhalation cancer unit risk (µg/m³)⁻¹
Inhalation reference concentration (µg/m³)
Conversion factor from conc (µg/m³) to dose (mg/kg/d)
Calculated inhalation cancer slope factor (mg/kg/d)⁻¹
Calculated inhalation RfD / ADI / TDI (mg/kg/d)
OR
Inhalation cancer slope factor (mg/kg/d)⁻¹
Inhalation RfD / ADI / TDI (mg/kg/d)

Fraction of RfD/RfC to inhalation background exposure
(Inhalation RfD / ADI / TDI) - (BACKGROUND) (mg/kg/d)

Oral
Oral cancer slope factor (mg/kg/d)⁻¹
Oral RfD / ADI / TDI (mg/kg/d)

Fraction of RfD to oral background exposure
(Oral RfD / ADI / TDI) - (BACKGROUND) (mg/kg/d)
Gastro-intestinal absorption factor (GIAF)

Dermal
0-Extrapolate oral toxicity values, 1-Enter dermal toxicity values
0-No toxicity adjustment, 1-Adjust based on GIAF
Calculated dermal cancer slope factor (mg/kg/d)⁻¹
Calculated dermal RfD / ADI / TDI (mg/kg/d)
OR
Enter dermal cancer slope factor (mg/kg/d)⁻¹
Enter dermal RfD / ADI / TDI (mg/kg/d)

Fraction of RfD to dermal background exposure
(Oral RfD / ADI / TDI) - (BACKGROUND) (mg/kg/d)

Skin relative absorption factor

EXPOSURE / RISK DATA

Exposure frequency (d/yr)
Average time (non-threshold) (yr)
Average time (threshold) (yr)
Exposure duration (yr)
Exposure time (hr/d)
Body weight (kg)
Inhalation rate (m³/h)
Soil ingestion rate (mg/d)
Skin area (cm²)
Soil adherence factor
Particle emission factor (PEF) (m³/kg)
Lung retention factor

HEALTH-BASED CRITERIA RISK TARGETS

Target cancer risk
Target non-cancer HI

COMBINE RISK SCENARIOS

Combined risk of previous number of columns

	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
HSL-C (Young Child)	HSL-C (Elder Child)	HSL-C (Adult)	HSL-C (Young Child)	HSL-C (Elder Child)	HSL-C (Adult)	HSL-C (Young Child)	HSL-C (Elder Child)	HSL-C (Adult)	HSL-C (Young Child)	HSL-C (Elder Child)	HSL-C (Adult)	HSL-C (Young Child)	HSL-C (Elder Child)	HSL-C (Adult)	HSL-C (Adult)
TPH <C10-C12 aromatic>	TPH <C10-C12 aromatic>	TPH <C10-C12 aromatic>	TPH <C10-C12 aromatic>	TPH <C10-C12 aromatic>	TPH <C10-C12 aromatic>	TPH <C10-C12 aromatic>	TPH <C10-C12 aromatic>	TPH <C10-C12 aromatic>	TPH <C10-C12 aromatic>	TPH <C10-C12 aromatic>	TPH <C10-C12 aromatic>	TPH <C10-C12 aromatic>	TPH <C10-C12 aromatic>	TPH <C10-C12 aromatic>	TPH <C10-C12 aromatic>
0-Cancer endpoint	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Inhalation toxicity concentration	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Inhalation cancer unit risk	2.00E+02	2.00E+02	2.00E+02	2.00E+02	2.00E+02	2.00E+02	2.00E+02	2.00E+02	2.00E+02	2.00E+02	2.00E+02	2.00E+02	2.00E+02	2.00E+02	2.00E+02
Conversion factor	2.86E-04	2.86E-04	2.86E-04	2.86E-04	2.86E-04	2.86E-04	2.86E-04	2.86E-04	2.86E-04	2.86E-04	2.86E-04	2.86E-04	2.86E-04	2.86E-04	2.86E-04
Calculated inhalation cancer slope factor	5.71E-02	5.71E-02	5.71E-02	5.71E-02	5.71E-02	5.71E-02	5.71E-02	5.71E-02	5.71E-02	5.71E-02	5.71E-02	5.71E-02	5.71E-02	5.71E-02	5.71E-02
Calculated inhalation RfD / ADI / TDI	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Fraction of RfD/RfC to inhalation background exposure	5.14E-02	5.14E-02	5.14E-02	5.14E-02	5.14E-02	5.14E-02	5.14E-02	5.14E-02	5.14E-02	5.14E-02	5.14E-02	5.14E-02	5.14E-02	5.14E-02	5.14E-02
Oral cancer slope factor	4.00E-02	4.00E-02	4.00E-02	4.00E-02	4.00E-02	4.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02
Oral RfD / ADI / TDI	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Fraction of RfD to oral background exposure	3.60E-02	3.60E-02	3.60E-02	3.60E-02	3.60E-02	3.60E-02	2.70E-02	2.70E-02	2.70E-02	2.70E-02	2.70E-02	2.70E-02	2.70E-02	2.70E-02	2.70E-02
Gastro-intestinal absorption factor	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
0-Extrapolate oral toxicity values	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Calculated dermal cancer slope factor	4.00E-02	4.00E-02	4.00E-02	4.00E-02	4.00E-02	4.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02	3.00E-02
Calculated dermal RfD / ADI / TDI	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Fraction of RfD to dermal background exposure	3.60E-02	3.60E-02	3.60E-02	3.60E-02	3.60E-02	3.60E-02	2.70E-02	2.70E-02	2.70E-02	2.70E-02	2.70E-02	2.70E-02	2.70E-02	2.70E-02	2.70E-02
Skin relative absorption factor	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Exposure frequency	365	365	365	365	365	365	365	365	365	365	365	365	365	365	365
Average time (non-threshold)	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70
Average time (threshold)	6	10	14	6	10	14	6	10	14	6	10	14	6	10	14
Exposure duration	6	10	14	6	10	14	6	10	14	6	10	14	6	10	14
Exposure time	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Body weight	15.5	35.6	75	15.5	35.6	75	15.5	35.6	75	15.5	35.6	75	15.5	35.6	75
Inhalation rate	1.26	1.59	1.59	1.26	1.59	1.59	1.26	1.59	1.59	1.26	1.59	1.59	1.26	1.59	1.59
Soil ingestion rate	50	50	25	50	50	25	50	50	25	50	50	25	50	50	25
Skin area	2318	3480	6800	2318	3480	6800	2318	3480	6800	2318	3480	6800	2318	3480	6800
Soil adherence factor	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Particle emission factor	1360000000	1360000000	1360000000	1360000000	1360000000	1360000000	1360000000	1360000000	1360000000	1360000000	1360000000	1360000000	1360000000	1360000000	1360000000
Lung retention factor	0.378	0.378	0.378	0.378	0.378	0.378	0.378	0.378	0.378	0.378	0.378	0.378	0.378	0.378	0.378
Target cancer risk	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05	1.00E-05
Target non-cancer HI	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

CALCULATION RESULTS

FORWARD RISK CALCULATION

DUST INHALATION CANCER RISK
ORAL CANCER RISK
DERMAL CANCER RISK
TOTAL CANCER RISK
DUST INHALATION HAZARD INDEX
ORAL HAZARD INDEX
DERMAL HAZARD INDEX
TOTAL HAZARD INDEX

SOIL HEALTH-BASED CRITERIA CALCULATION (mg/kg)

DUST INHALATION CANCER
ORAL CANCER
DERMAL CANCER
OVERALL CANCER HEALTH-BASED CRITERIA
DUST INHALATION NON-CANCER
ORAL NON-CANCER
DERMAL NON-CANCER
OVERALL NON-CANCER HEALTH-BASED CRITERIA

DUST INHALATION CANCER RISK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ORAL CANCER RISK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DERMAL CANCER RISK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL CANCER RISK	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DUST INHALATION HAZARD INDEX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ORAL HAZARD INDEX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DERMAL HAZARD INDEX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TOTAL HAZARD INDEX	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DUST INHALATION CANCER	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ORAL CANCER	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DERMAL CANCER	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
OVERALL CANCER HEALTH-BASED CRITERIA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DUST INHALATION NON-CANCER	1.14E+09	2.07E+09	4.36E+09	1.14E+09	2.07E+09	4.36E+09	1.14E+09	2.07E+09	4.36E+09	1.14E+09	2.07E+09	4.36E+09	1.14E+09	2.07E+09	4.36E+09
ORAL NON-CANCER	1.12E+04	2.56E+04	1.08E+05	1.12E+04	2.56E+04	1.08E+05	8.37E+03	1.92E+04	8.10E+04	8.37E+03	1.92E+04	8.10E+04	8.37E+03	1.92E+04	8.10E+04
DERMAL NON-CANCER	2.41E+03	3.66E+03	3.97E+03	2.41E+03	3.66E+03	3.97E+03	1.81E+03	2.76E+03	2.98E+03	1.81E+03	2.76E+03	2.98E+03	1.81E+03	2.76E+03	2.98E+03
OVERALL NON-CANCER HEALTH-BASED CRITERIA	1.98E+03	3.22E+03	3.83E+03	1.98E+03	3.22E+03	3.83E+03	1.49E+03	2.42E+03	2.87E+03	1.49E+03	2.42E+03	2.87E+03	1.49E+03	2.42E+03	2.87E+03