

4. EXPOSURE ASSESSMENT AND RISK EVALUATION CALCULATIONS



Non-Carcinogenic Worksheet: Arsenic

Receptors
 Contaminant of Concern
 Soil Concentration (5cm depth) (mg/kg)
 Pellet Concentration (mg/kg)
 Landfill Application soil Concentration (mg/kg)

Resident, Park User, City Worker
 Arsenic
 4.1E+00
 8.1E+00
 3.2E-01

AF.s Dermal Soil absorption factor (unitless)
 Bioavailability In Soil (unitless)
 Bioavailability In Food (unitless)
 Bioavailability In Water (unitless)
 Oral T.R.V (mg/kg-d)

0.03
 0.24
 0.7
 1
 3.00E-04

Soil Concentration (15 cm depth) (mg/kg)
 Plant Bioconcentration Factor (fruit)
 Plant Bioconcentration Factor (rootveg)
 Plant Bioconcentration Factor (veg)

3.0E+00
 0.006
 0.006
 0.059

Fruit Concentration (mg/kg)
 Root Vegetable Concentration (mg/kg)
 Other Vegetable Concentration (mg/kg)

3.4E-03
 3.4E-03
 3.3E-02

Inhalation Contaminated Soil Particles (y=1/n=0)
 Inhalation of Contaminated Vapours (y=1/n=0)
 Concentration in Vapours (mg/m3)

0
 0
 0

NOTE 1 Inhalation pathways to be used in this spreadsheet only if no inhalation TRV exists, if inhalation TRV exists use Inhalation Spreadsheet
NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles
NOTE 3 Oral TRV only to be used

Residential										
Non Carcinogenic Dose (mg/kg-d)										
Inadvertant Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark		
Toddler	4.0E-06	4.6E-08	NA	4.3E-06	1.1E-06	9.5E-06	3E-02	No		
Adult	1.4E-07	4.7E-08	NA	2.0E-06	2.5E-07	2.5E-06	8E-03	No		
Recreational										
Non Carcinogenic Dose (mg/kg-d)										
Inadvertant Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark		
Toddler	8.3E-06	4.5E-08	NA	NA	NA	8.4E-06	3E-02	No		
Adult Golfer	1.6E-07	8.2E-08	NA	NA	NA	2.4E-07	8E-04	No		
City Worker										
Non Carcinogenic Dose (mg/kg-d)										
Inadvertant Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark		
Worker	1.4E-06	6.1E-08	NA	NA	NA	1.4E-06	5E-03	No		
Landfill Worker										
Non Carcinogenic Dose (mg/kg-d)										
Inadvertant Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark		
Worker	5.3E-08	4.8E-09	NA	NA	NA	5.8E-08	2E-04	No		

Cancer Worksheet Target Risk 10⁻⁵: Arsenic

Receptors Resident, Park User, City Worker

Contaminant of Concern Arsenic
 Soil Concentration (5cm depth) (mg/kg) 4.1E+00
 Pellet Concentration (mg/kg) 8.1E+00
 Landfill Application soil Concentration (mg/kg) 3.2E-01
 AF-s Dermal Soil absorption factor (unitless) 0.03
 Oral Slope Factor (mg/kg-d)-1 1.50E+00
 Bioavailability In Soil (unitless) 0.24
 Bioavailability In Food (unitless) 0.7
 Bioavailability In Water (unitless) 1

Soil Concentration (15 cm depth) (mg/kg) 3.0E+00
 Plant Bioconcentration Factor (fruit) 0.006
 Plant Bioconcentration Factor (rootveg) 0.006
 Plant Bioconcentration Factor (veg) 0.059
 Fruit Concentration (mg/kg) 3.4E-03
 Root Vegetable Concentration (mg/kg) 3.4E-03
 Other Vegetable Concentration (mg/kg) 3.3E-02

Inhalation Contaminated Soil Particles (y=1/n=0) 0
 Inhalation of Contaminated Vapours (y=1/n=0) 0
 Concentration in Vapours (mg/m3)

Exposure Limit (mg/kg-day) 6.67E-06

NOTE 1 Inhalation pathways to be used in this spreadsheet only if no inhalation Slope Factor exists, if inhalation Slope Factor exists use Inhalation Spreadsheet
 NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles
 NOTE 3 Oral Slope Factor only to be used

	Residential						Exposure Ratio	Exceeds Tolerable Benchmark	
	Inadvertant Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit			Total Dose (mg/kg-d)
Composite Adult	4.1E-07	4.4E-08	NA	NA	2.4E-06	3.4E-07	3.1E-06	5E-01	No
Parkland									
	Carcinogenic Dose (mg/kg-d)						Exposure Ratio	Exceeds Tolerable Benchmark	
Inadvertant Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)			
Composite Adult	4.2E-07	3.3E-08	NA	NA	NA	NA	4.5E-07	7E-02	No
Adult Golfer	1.1E-07	6.0E-08	NA	NA	NA	NA	1.8E-07	3E-02	No
City Worker									
	Carcinogenic Dose (mg/kg-d)						Exposure Ratio	Exceeds Tolerable Benchmark	
Inadvertant Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)			
Worker	5.5E-07	2.5E-08	NA	NA	NA	NA	5.7E-07	9E-02	No
Landfill worker									
	Carcinogenic Dose (mg/kg-d)						Exposure Ratio	Exceeds Tolerable Benchmark	
Inadvertant Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)			
Worker	2.1E-08	1.9E-09	NA	NA	NA	NA	2.3E-08	3E-03	No

Cancer Worksheet Target Risk 10⁻⁶: Arsenic

Receptors Resident, Park User, City Worker

NOTE 1 Inhalation pathways to be used in this spreadsheet only if no inhalation Slope Factor exists, if Inhalation Slope Factor exists use Inhalation Spreadsheet

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

NOTE 3 Oral Slope Factor only to be used

Contaminant of Concern	Resident, Park User, City Worker
Arsenic	
Soil Concentration (5cm depth) (mg/kg)	4.1E+00
Pellet Concentration (mg/kg)	8.1E+00
Landfill Application soil Concentration (mg/kg)	3.2E-01
AF.s Dermal Soil absorption factor (unitless)	0.03
Oral Slope Factor (mg/kg-d)-1	1.50E+00
Bioavailability In Soil (unitless)	0.24
Bioavailability In Food (unitless)	0.7
Bioavailability In Water (unitless)	1
Soil Concentration (15 cm depth) (mg/kg)	3.0E+00
Plant Bioconcentration Factor (fruit)	0.006
Plant Bioconcentration Factor (rootveg)	0.006
Plant Bioconcentration Factor (veg)	0.059
Fruit Concentration (mg/kg)	3.4E-03
Root Vegetable Concentration (mg/kg)	3.4E-03
Other Vegetable Concentration (mg/kg)	3.3E-02
Inhalation of Contaminated Soil Particles (y=1/n=0)	0
Inhalation of Contaminated Vapours (y=1/n=0)	0
Concentration In Vapours (mg/m3)	
Exposure Limit (mg/kg-day)	6.67E-07

	Residential						Exposure Ratio	Exceeds Tolerable Benchmark	
	Inadvertant Ingestion	Dermal Contact	Inhalation contaminated particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit			Total Dose (mg/kg-d)
Composite Adult	4.1E-07	4.4E-08	NA	NA	2.4E-06	3.4E-07	3.1E-06	5E+00	Yes

	Parkland						Exposure Ratio	Exceeds Tolerable Benchmark	
	Inadvertant Ingestion	Dermal Contact	Inhalation contaminated particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit			Total Dose (mg/kg-d)
Composite Adult	4.2E-07	3.3E-08	NA	NA	NA	NA	4.5E-07	7E-01	No
Adult Golfer	1.1E-07	6.0E-08	NA	NA	NA	NA	1.8E-07	3E-01	No

	City Worker						Exposure Ratio	Exceeds Tolerable Benchmark	
	Inadvertant Ingestion	Dermal Contact	Inhalation contaminated particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit			Total Dose (mg/kg-d)
Worker	5.5E-07	2.5E-08	NA	NA	NA	NA	5.7E-07	9E-01	No

	Landfill worker						Exposure Ratio	Exceeds Tolerable Benchmark	
	Inadvertant Ingestion	Dermal Contact	Inhalation contaminated particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit			Total Dose (mg/kg-d)
Worker	2.1E-08	1.9E-09	NA	NA	NA	NA	2.3E-08	3E-02	No

Inhalation Cancer Worksheet Target Risk 10⁻⁶: Arsenic

Receptors
 Contaminant of Concern
 Resident, Park User, City Worker
 Arsenic

Soil Concentration (5cm depth) (mg/kg) 4.1E+00
 Soil Concentration (15cm depth) (mg/kg) 3.0E+00
 Pellet concentration (mg/kg) 8.1E+00
 Landfill soil concentration (mg/kg) 3.2E-01

Estimated Vapour Concentration (mg/m³)

Inhalation Unit Risk (mg/m³-1) 4.30E+00
 Inhalation Exposure Limit (mg/m³) 2.33E-06

Inhalation Contaminated Soil Particles (y=1/m=0) 1
 Inhalation of Contaminated Vapours (y=1/m=0) 0

NOTE 1 Inhalation pathways to be used in this spreadsheet only if inhalation TRV exists, if no inhalation TRV exists use Total Dose Spreadsheet
NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

Residential				Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
Concentration of particulates (mg/m ³)	Exposure Ratio	Concentration of Vapours (mg/m ³)	Exposure Ratio		
Composite	2.7E-08	1E-02	NA	1E-02	No

Parkland				Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
Concentration of particulates (mg/m ³)	Exposure Ratio	Concentration of Vapours (mg/m ³)	Exposure Ratio		
Composite Adult Golfer	1.9E-08	8E-03	NA	8E-03	No
	5.1E-08	2E-02	NA	2E-02	No

City Worker				Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
Concentration of particulates (mg/m ³)	Exposure Ratio	Concentration of Vapours (mg/m ³)	Exposure Ratio		
Worker	1.0E-07	4E-02	NA	4E-02	No

Landfill Worker				Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
Concentration of particulates (mg/m ³)	Exposure Ratio	Concentration of Vapours (mg/m ³)	Exposure Ratio		
Worker	8.1E-09	3E-03	NA	3E-03	No

Inhalation Cancer Worksheet Target Risk 10^{-4} : Arsenic

Receptors
Contaminant of Concern
Resident, Park User, City Worker
Arsenic

Soil Concentration (5cm depth) (mg/kg) 4.1E+00
Soil Concentration (15cm depth) (mg/kg) 3.0E+00
Pellet concentration (mg/kg) 8.1E+00
Landfill soil concentration (mg/kg) 3.2E-01

Estimated Vapour Concentration (mg/m³)

Inhalation Unit Risk (mg/m³)⁻¹ 4.30E+00
Inhalation Exposure Limit (mg/m³) 2.33E-07

Inhalation Contaminated Soil Particles (y=1/n=0) 1
Inhalation of Contaminated Vapours (y=1/n=0) 0

NOTE 1 Inhalation pathways to be used in this spreadsheet only if inhalation TRV exists, if no inhalation TRV exists use Total Dose Spreadsheet
NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

Composite	Residential Carcinogenic			Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
	Concentration of particulates (mg/m ³)	Exposure Ratio	Concentration of Vapours (mg/m ³)		
	2.7E-08	1E-01	NA	1E-01	No

Composite Adult Golfer	Parkland Non Carcinogenic			Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
	Concentration of particulates (mg/m ³)	Exposure Ratio	Concentration of Vapours (mg/m ³)		
	1.9E-08	8E-02	NA	8E-02	No
	5.1E-08	2E-01	NA	2E-01	No

Worker	City Worker Non Carcinogenic Dose (mg/kg-d)			Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
	Concentration of particulates (mg/m ³)	Exposure Ratio	Concentration of Vapours (mg/m ³)		
	1.0E-07	4E-01	NA	4E-01	No

Worker	Landfill Worker Non Carcinogenic Dose (mg/kg-d)			Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
	Concentration of particulates (mg/m ³)	Exposure Ratio	Concentration of Vapours (mg/m ³)		
	8.1E-09	3E-02	NA	3E-02	No

Non-Carcinogenic Worksheet: Cadmium

Receptors
Resident, Park User, City Worker

Contaminant of Concern
Cadmium

Soil Concentration (5cm depth) (mg/kg) 1.3E+00
Pellet Concentration (mg/kg) 5.1E+00
Landfill Application soil Concentration (mg/kg) 2.0E-01

AF.s Dermal Soil absorption factor (unitless) 0.14
Oral T.R.V (mg/kg-d) 5.00E-04

Soil Concentration (15 cm depth) (mg/kg) 6.5E-01
Plant Bioconcentration Factor (fruit) 0.15
Plant Bioconcentration Factor (rootveg) 0.15
Plant Bioconcentration Factor (veg) 0.75

Fruit Concentration (mg/kg) 1.8E-02
Root Vegetable Concentration (mg/kg) 1.8E-02
Other Vegetable Concentration (mg/kg) 9.2E-02

Inhalation Contaminated Soil Particles (y=1/n=0) 0
Inhalation of Contaminated Vapours (y=1/n=0) 0
Concentration in Vapours (mg/m3) 0

NOTE 1 Inhalation pathways to be used in this spreadsheet only if no inhalation TRV exists, if inhalation TRV exists use Inhalation

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

NOTE 3 Oral TRV only to be used

	Residential							Hazard Quotient	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Toddler	7.2E-06	7.0E-08	NA	NA	2.0E-05	8.4E-06	3.5E-05	7E-02	No
Adult	1.7E-07	6.5E-08	NA	NA	9.1E-06	1.9E-06	1.1E-05	2E-02	No

	Recreational							Hazard Quotient	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Toddler	7.2E-06	7.0E-08	NA	NA	NA	NA	7.3E-06	1E-02	No
Adult Golfer	2.2E-07	1.3E-07	NA	NA	NA	NA	3.4E-07	7E-04	No

	City Worker							Hazard Quotient	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Worker	3.6E-06	1.8E-07	NA	NA	NA	NA	3.7E-06	7E-03	No

	Landfill Worker							Hazard Quotient	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Worker	1.4E-07	1.4E-08	NA	NA	NA	NA	1.5E-07	3E-04	No

Inhalation Cancer Target Risk 10⁻⁵: Cadmium

Receptors
Contaminant of Concern

Resident, Park User, City Worker
Cadmium

Soil Concentration (5cm depth) (mg/kg) 1.3E+00
 Soil Concentration (15cm depth) (mg/kg) 6.5E-01
 Pellet concentration (mg/kg) 5.1E+00
 Landfill soil concentration (mg/kg) 2.0E-01

Estimated Vapour Concentration (mg/m3)

9.80E+00
1.02E-06

Inhalation Unit Risk (mg/m3)-1
Inhalation Exposure Limit (mg/m3)

Inhalation Contaminated Soil Particles (y=1/n=0) 1
 Inhalation of Contaminated Vapours (y=1/n=0) 0

NOTE 1 Inhalation pathways to be used in this spreadsheet only if inhalation TRV exists, if no inhalation TRV exists use Total Dose Spreadsheet
NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

Residential Carcinogenic				Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
Composite	Concentration of particulates (mg/m ³)	Exposure Ratio	Concentration of Vapours (mg/m ³)		
	8.3E-09	8E-03	NA	8E-03	No

Parkland Non Carcinogenic				Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
Composite	Concentration of particulates (mg/m ³)	Exposure Ratio	Concentration of Vapours (mg/m ³)		
Adult Golfer	6.6E-09	6E-03	NA	6E-03	No
	1.7E-08	2E-02	NA	2E-02	No

City Worker Non Carcinogenic Dose (mg/kg-d)				Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
Worker	Concentration of particulates (mg/m ³)	Exposure Ratio	Concentration of Vapours (mg/m ³)		
	6.5E-08	6E-02	NA	6E-02	No

Landfill Worker Non Carcinogenic Dose (mg/kg-d)				Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
Worker	Concentration of particulates (mg/m ³)	Exposure Ratio	Concentration of Vapours (mg/m ³)		
	5.1E-09	5E-03	NA	5E-03	No

Inhalation Cancer Target Risk 10⁻⁶: Cadmium

Receptors
Contaminant of Concern

Resident, Park User, City Worker
Cadmium

Soil Concentration (5cm depth) (mg/kg)
Soil Concentration (15cm depth) (mg/kg)
Pellet concentration (mg/kg)
Landfill soil concentration (mg/kg)

1.3E+00
6.5E-01
5.1E+00
2.0E-01

Estimated Vapour Concentration (mg/m3)

9.80E+00
1.02E-07

Inhalation Unit Risk (mg/m3)-1
Inhalation Exposure Limit (mg/m3)

1
0

Inhalation Contaminated Soil Particles (y=1/n=0)
Inhalation of Contaminated Vapours (y=1/n=0)

NOTE 1 Inhalation pathways to be used in this spreadsheet only if inhalation TRV exists, if no inhalation TRV exists use Total Dose Spreadsheet

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

Residential Carcinogenic				Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
Concentration of particulates (mg/m ³)	Exposure Ratio	Concentration of Vapours (mg/m ³)	Exposure Ratio		
Composite 8.3E-09	8E-02	NA	NA	8E-02	No

Parkland Non Carcinogenic				Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
Concentration of particulates (mg/m ³)	Exposure Ratio	Concentration of Vapours (mg/m ³)	Exposure Ratio		
Composite 6.6E-09	6E-02	NA	NA	6E-02	No
Adult Golfer 1.7E-08	2E-01	NA	NA	2E-01	No

City Worker Non Carcinogenic Dose (mg/kg-d)				Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
Concentration of particulates (mg/m ³)	Exposure Ratio	Concentration of Vapours (mg/m ³)	Exposure Ratio		
Worker 6.5E-08	6E-01	NA	NA	6E-01	No

Landfill Worker Non Carcinogenic Dose (mg/kg-d)				Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
Concentration of particulates (mg/m ³)	Exposure Ratio	Concentration of Vapours (mg/m ³)	Exposure Ratio		
Worker 5.1E-09	5E-02	NA	NA	5E-02	No

Non-Carcinogenic Worksheet: Cobalt

Receptors Resident, Park User, City Worker

Contaminant of Concern Cobalt

Soil Concentration (5cm depth) (mg/kg) 8.4E+00
 Pellet Concentration (mg/kg) 3.3E+00
 Landfill Application soil Concentration (mg/kg) 1.3E-01

AF.s Dermal Soil absorption factor (unitless) 0.1
 Oral I.R.V (mg/kg-d) 2.00E-02
 Bioavailability in Soil (unitless) 3.00E-03

Soil Concentration (15 cm depth) (mg/kg) 7.9E+00
 Plant Bioconcentration Factor (fruit) 0.007
 Plant Bioconcentration Factor (rootveg) 0.007
 Plant Bioconcentration Factor (veg) 0.02

Fruit Concentration (mg/kg) 1.1E-02
 Root Vegetable Concentration (mg/kg) 1.1E-02
 Other Vegetable Concentration (mg/kg) 3.0E-02

Inhalation Contaminated Soil Particles (y=1/n=0) 0
 Inhalation of Contaminated Vapours (y=1/n=0) 0
 Concentration in Vapours (mg/m3) 0

NOTE 1 Inhalation pathways to be used in this spreadsheet only if no inhalation TRV exists, if inhalation TRV exists use Inhalation
 NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles
 NOTE 3 Oral TRV only to be used

Residential									
Non Carcinogenic Dose (mg/kg-d)									
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Toddler	7.6E-08	3.1E-07	NA	NA	7.6E-06	4.8E-06	1.3E-05	6E-04	No
Adult	3.9E-09	3.5E-07	NA	NA	3.4E-06	1.1E-06	4.9E-06	2E-04	No

Recreational									
Non Carcinogenic Dose (mg/kg-d)									
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Toddler	7.6E-08	3.1E-07	NA	NA	NA	NA	3.9E-07	2E-05	No
Adult Golfer	4.0E-09	5.7E-07	NA	NA	NA	NA	5.7E-07	3E-05	No

City Worker									
Non Carcinogenic Dose (mg/kg-d)									
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Worker	6.9E-09	8.3E-08	NA	NA	NA	NA	9.0E-08	4E-06	No

Landfill Worker									
Non Carcinogenic Dose (mg/kg-d)									
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Worker	2.7E-10	6.5E-09	NA	NA	NA	NA	6.7E-09	3E-07	No

Land Use
Receptors
Contaminant of Concern

Resident, Park User, City Worker
Cobalt

Soil Concentration (5cm depth) (mg/kg) 8.4E+00
Soil Concentration (15cm depth) (mg/kg) 7.9E+00
Pellet concentration (mg/kg) 3.3E+00
Landfill soil concentration (mg/kg) 1.3E-01

Estimated Vapour Concentration (mg/m³)

Inhalation T.R.V (mg/m³) 2.18E-05

Inhalation Contaminated Soil Particles (y=1/n=0) 1
Inhalation of Contaminated Vapours (y=1/n=0) 0

Residential						
Non Carcinogenic						
	Inhalation contaminated soil particles Dose (mg/m ³)	HQ Inhalation contaminated soil particles	Inhalation of contaminated vapours Dose (mg/m ³)	HQ Inhalation vapours	Total Inhalation HQ	Exceeds Tolerable Benchmark
Toddler	4.0E-08	2E-03	NA	NA	2E-03	No
Adult	6.5E-08	3E-03	NA	NA	3E-03	No

Parkland						
Non Carcinogenic						
	Inhalation contaminated soil particles Dose (mg/m ³)	HQ Inhalation contaminated soil particles	Inhalation of contaminated vapours Dose (mg/m ³)	HQ Inhalation vapours	Total Inhalation HQ	Exceeds Tolerable Benchmark
Toddler	4.0E-08	2E-03	NA	NA	2E-03	No
Adult Golfer	1.1E-07	5E-03	NA	NA	5E-03	No

City Worker						
Non Carcinogenic Dose (mg/kg-d)						
	Inhalation contaminated soil particles Dose (mg/m ³)	HQ Inhalation contaminated soil particles	Inhalation of contaminated vapours Dose (mg/m ³)	HQ Inhalation vapours	Total Inhalation HQ	Exceeds Tolerable Benchmark
Worker	4.2E-08	2E-03	NA	NA	2E-03	No

Landfill Worker						
Non Carcinogenic Dose (mg/kg-d)						
	Inhalation contaminated soil particles Dose (mg/m ³)	HQ Inhalation contaminated soil particles	Inhalation of contaminated vapours Dose (mg/m ³)	HQ Inhalation vapours	Total Inhalation HQ	Exceeds Tolerable Benchmark
Worker	3.3E-09	1E-04	NA	NA	1E-04	No

Non-Carcinogenic Worksheet: Chromium III

Receptors

Contaminant of Concern
 Soil Concentration (5cm depth) (mg/kg)
 Pellet Concentration (mg/kg)
 Landfill Application soil Concentration (mg/kg)

Resident, Park User, City Worker

Chromium
 5.8E+01
 1.6E+02
 6.2E+00

AF-s Dermal Soil absorption factor (unitless)
 Oral T.R.V (mg/kg-d)

0.04
 1.50E+00

Soil Concentration (15 cm depth) (mg/kg)
 Plant Bioconcentration Factor (fruit)
 Plant Bioconcentration Factor (rootveg)
 Plant Bioconcentration Factor (veg)

3.7E+01
 0.0045
 0.0045
 0.0075

Fruit Concentration (mg/kg)
 Root Vegetable Concentration (mg/kg)
 Other Vegetable Concentration (mg/kg)

3.1E-02
 3.1E-02
 5.2E-02

Inhalation Contaminated Soil Particles (y=1/n=0)
 Inhalation of Contaminated Vapours (y=1/n=0)
 Concentration in Vapours (mg/m3)

1
 0
 0

NOTE 1 Inhalation pathways to be used in this spreadsheet only if no inhalation TRV exists, if inhalation TRV exists use Inhalation Spreadsheet
NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles
NOTE 3 Oral TRV only to be used

Residential												
		Non Carcinogenic Dose (mg/kg-d)			Inhalation of contaminated vapours			Ingestion of contaminated		Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
		Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Ingestion of contaminated fruit	Ingestion of contaminated fruit	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Toddler		8.7E-07	2.3E-07	NA	1.6E-05	1.4E-05	3.0E-04	2E-04	2E-04	3.0E-04	2E-04	No
Adult		8.8E-07	7.8E-08	NA	7.4E-06	3.3E-06	2.0E-05	1E-05	1E-05	2.0E-05	1E-05	No
Recreational												
		Non Carcinogenic Dose (mg/kg-d)			Inhalation of contaminated vapours			Ingestion of contaminated		Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
		Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Ingestion of contaminated fruit	Ingestion of contaminated fruit	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Toddler		8.7E-07	2.3E-07	NA	NA	NA	2.7E-04	2E-04	2E-04	2.7E-04	2E-04	No
Adult Golfer		1.8E-06	1.4E-07	NA	NA	NA	1.1E-05	7E-06	7E-06	1.1E-05	7E-06	No
City Worker												
		Non Carcinogenic Dose (mg/kg-d)			Inhalation of contaminated vapours			Ingestion of contaminated		Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
		Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Ingestion of contaminated fruit	Ingestion of contaminated fruit	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Worker		1.8E-06	3.7E-07	NA	NA	NA	1.1E-04	8E-05	8E-05	1.1E-04	8E-05	No
Landfill Worker												
		Non Carcinogenic Dose (mg/kg-d)			Inhalation of contaminated vapours			Ingestion of contaminated		Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
		Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Ingestion of contaminated fruit	Ingestion of contaminated fruit	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Worker		1.3E-07	2.9E-08	NA	NA	NA	4.5E-06	3E-06	3E-06	4.5E-06	3E-06	No

Non-Carcinogenic Worksheet: Copper

Receptors

Resident, Park User, City Worker

Contaminant of Concern

Soil Concentration (5cm depth) (mg/kg)

Pellet Concentration (mg/kg)

Landfill Application soil Concentration (mg/kg)

Copper

2.6E+02

1.2E+03

4.5E+01

AF.s Dermal Soil absorption factor (unitless)

0.1

Adult Oral T.R.V (mg/kg-d)

3.00E-02

1.00E-01

Toddler Oral T.R.V (mg/kg-d)

1.1E+02

0.25

0.25

0.11

5.1

5.1

2.3

1

0

0

Soil Concentration (mg/kg)

Root Vegetable Concentration (mg/kg)

Other Vegetable Concentration (mg/kg)

Inhalation Contaminated Soil Particles (y=1/n=0)

Inhalation of Contaminated Vapours (y=1/n=0)

Concentration in Vapours (mg/m3)

NOTE 1 Inhalation pathways to be used in this spreadsheet only if no inhalation TRV exists, if inhalation TRV exists use Inhalation Spreadsheet

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

NOTE 3 Oral TRV only to be used

Residential							Hazard Quotient	Exceeds Tolerable Benchmark	
Non Carcinogenic Dose (mg/kg-d)									
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Toddler	1.5E-03	9.9E-06	1.0E-06	NA	1.7E-03	2.4E-03	5.6E-03	6E-02	No
Adult	3.3E-05	8.9E-06	3.2E-07	NA	7.2E-04	5.4E-04	1.3E-03	4E-02	No

Recreational							Hazard Quotient	Exceeds Tolerable Benchmark	
Non Carcinogenic Dose (mg/kg-d)									
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Toddler	1.5E-03	9.9E-06	1.0E-06	NA	NA	NA	1.5E-03	2E-02	No
Adult Golfer	4.3E-05	1.8E-05	6.5E-07	NA	NA	NA	6.1E-05	2E-03	No

City Worker							Hazard Quotient	Exceeds Tolerable Benchmark	
Non Carcinogenic Dose (mg/kg-d)									
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Worker	8.1E-04	2.9E-05	2.7E-06	NA	NA	NA	8.4E-04	3E-02	No

Landfill Worker							Hazard Quotient	Exceeds Tolerable Benchmark	
Non Carcinogenic Dose (mg/kg-d)									
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)		
Worker	3.2E-05	2.3E-06	2.1E-07	NA	NA	NA	3.4E-05	1E-03	No

Non-Carcinogen Worksheet: Mercury

Receptors
 Resident, Park User, City Worker

Contaminant of Concern
 Mercury

Soil Concentration (5cm depth) (mg/kg)
 1.15

Pellet Concentration (mg/kg)
 1.72

Landfill Application soil Concentration (mg/kg)
 6.7E-02

AF.s Dermal Soil absorption factor (unitless)
 0.05

Oral T.R.V (mg/kg-d)
 3.00E-04

Soil Concentration (15 cm depth) (mg/kg)
 0.92

Plant Bioconcentration Factor (fruit)
 0.2

Plant Bioconcentration Factor (rootveg)
 0.2

Plant Bioconcentration Factor (veg)
 0.38

Fruit Concentration (mg/kg)
 3.5E-02

Root Vegetable Concentration (mg/kg)
 3.5E-02

Other Vegetable Concentration (mg/kg)
 6.8E-02

Inhalation Contaminated Soil Particles (y=1/n=0)
 0

Inhalation of Contaminated Vapours (y=1/n=0)
 0

Concentration in Vapours (mg/m3)
 0

NOTE 1 Inhalation pathways to be used in this spreadsheet only if no inhalation TRV exists, if inhalation TRV exists use Inhalation

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

NOTE 3 Oral TRV only to be used

Residential									
Non Carcinogenic Dose (mg/kg-d)									
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Toddler	4.4E-06	2.1E-08	NA	NA	2.0E-05	1.6E-05	4.0E-05	1E-01	No
Adult	1.7E-07	2.3E-08	NA	NA	8.8E-06	3.7E-06	1.3E-05	4E-02	No

Recreational									
Non Carcinogenic Dose (mg/kg-d)									
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Toddler	4.4E-06	2.1E-08	NA	NA	NA	NA	4.4E-06	1E-02	No
Adult Golfer	1.9E-07	3.9E-08	NA	NA	NA	NA	2.2E-07	7E-04	No

City Worker									
Non Carcinogenic Dose (mg/kg-d)									
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Worker	1.2E-06	2.2E-08	NA	NA	NA	NA	1.2E-06	4E-03	No

Landfill Worker									
Non Carcinogenic Dose (mg/kg-d)									
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Worker	4.7E-08	1.7E-09	NA	NA	NA	NA	4.9E-08	2E-04	No

Non-Carcinogenic Inhalation Worksheet: Mercury

Receptors: Resident, Park User, City Worker
 Contaminant of Concern: Mercury

Soil Concentration (5cm depth) (mg/kg): 1.1E+00
 Soil Concentration (15cm depth) (mg/kg): 9.2E-01
 Pellet concentration (mg/kg): 1.7E+00
 Landfill soil concentration (mg/kg): 6.7E-02

Estimated Vapour Concentration (mg/m³): 3.00E-04

Inhalation T.R.V (mg/m³): 3.00E-04

Inhalation Contaminated Soil Particles (y=1/n=0): 1

Inhalation of Contaminated Vapours (y=1/n=0): 0

Residential						
Non Carcinogenic						
	Inhalation contaminated soil particles Dose (mg/m ³)	HQ Inhalation contaminated soil particles	Inhalation of contaminated vapours Dose (mg/m ³)	HQ Inhalation vapours	Total Inhalation HQ	Exceeds Tolerable Benchmark
Toddler	5.5E-09	2E-05	NA	NA	2E-05	No
Adult	8.5E-09	3E-05	NA	NA	3E-05	No

Parkland						
Non Carcinogenic						
	Inhalation contaminated soil particles Dose (mg/m ³)	HQ Inhalation contaminated soil particles	Inhalation of contaminated vapours Dose (mg/m ³)	HQ Inhalation vapours	Total Inhalation HQ	Exceeds Tolerable Benchmark
Toddler	5.5E-09	2E-05	NA	NA	2E-05	No
Adult Golfer	1.5E-08	5E-05	NA	NA	5E-05	No

City Worker						
Non Carcinogenic Dose (mg/kg-d)						
	Inhalation contaminated soil particles Dose (mg/m ³)	HQ Inhalation contaminated soil particles	Inhalation of contaminated vapours Dose (mg/m ³)	HQ Inhalation vapours	Total Inhalation HQ	Exceeds Tolerable Benchmark
Worker	2.2E-08	7E-05	NA	NA	7E-05	No

Landfill Worker						
Non Carcinogenic Dose (mg/kg-d)						
	Inhalation contaminated soil particles Dose (mg/m ³)	HQ Inhalation contaminated soil particles	Inhalation of contaminated vapours Dose (mg/m ³)	HQ Inhalation vapours	Total Inhalation HQ	Exceeds Tolerable Benchmark
Worker	1.7E-09	6E-06	NA	NA	6E-06	No

Non-Carcinogen Worksheet: Molybdenum

Receptors Resident, Park User, City Worker

Contaminant of Concern Molybdenum

Soil Concentration (5cm depth) (mg/kg) 2.8E+00

Pellet Concentration (mg/kg) 1.3E+01

Landfill Application soil Concentration (mg/kg) 5.0E-01

AF.s Dermal Soil absorption factor (unitless) 0.1

Oral T.R.V (mg/kg-d) 5.00E-03

Soil Concentration (15 cm depth) (mg/kg) 1.1E+00

Plant Bioconcentration Factor (fruit) 0.06

Plant Bioconcentration Factor (rootveg) 0.06

Plant Bioconcentration Factor (veg) 0.25

Fruit Concentration (mg/kg) 1.3E-02

Root Vegetable Concentration (mg/kg) 1.3E-02

Other Vegetable Concentration (mg/kg) 5.3E-02

Inhalation Contaminated Soil Particles (y=1/n=0) 1

Inhalation of Contaminated Vapours (y=1/n=0) 0

Concentration in Vapours (mg/m3) 0

NOTE 1 Inhalation pathways to be used in this spreadsheet only if no inhalation TRV exists, if inhalation TRV exists use Inhalation
NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles
NOTE 3 Oral TRV only to be used

Residential									
	Non Carcinogenic Dose (mg/kg-d)			Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles						
Toddler	1.7E-05	1.1E-07	1.1E-08	NA	1.2E-05	5.8E-06	3.4E-05	7E-03	No
Adult	3.5E-07	9.5E-08	3.4E-09	NA	5.4E-06	1.3E-06	7.2E-06	1E-03	No

Recreational									
	Non Carcinogenic Dose (mg/kg-d)			Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles						
Toddler	1.7E-05	1.1E-07	1.1E-08	NA	NA	NA	1.7E-05	3E-03	No
Adult Golfer	4.6E-07	1.9E-07	6.9E-09	NA	NA	NA	6.5E-07	1E-04	No

City Worker									
	Non Carcinogenic Dose (mg/kg-d)			Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles						
Worker	8.8E-06	3.2E-07	3.0E-08	NA	NA	NA	9.2E-06	2E-03	No

Landfill Worker									
	Non Carcinogenic Dose (mg/kg-d)			Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles						
Worker	3.5E-07	2.5E-08	2.3E-09	NA	NA	NA	3.7E-07	7E-05	No

Non-Carcinogen Worksheet: Nickel

Receptors Resident, Park User, City Worker

Nickel	2.3E+01
Soil Concentration (5cm depth) (mg/kg)	3.9E+01
Pellet Concentration (mg/kg)	1.5E+00
Landfill Application soil Concentration (mg/kg)	
AF.s Dermal Soil absorption factor (unitless)	0.35
Oral T.R.V (mg/kg-d)	2.00E-02

Soil Concentration (15 cm depth) (mg/kg)	17.61
Plant Bioconcentration Factor (fruit)	0.06
Plant Bioconcentration Factor (rootveg)	0.06
Plant Bioconcentration Factor (veg)	0.053

Fruit Concentration (mg/kg)	2.0E-01
Root Vegetable Concentration (mg/kg)	2.0E-01
Other Vegetable Concentration (mg/kg)	1.8E-01

Inhalation Contaminated Soil Particles (y=1/n=0)	0
Inhalation of Contaminated Vapours (y=1/n=0)	0
Concentration in Vapours (mg/m3)	0

NOTE 1 Inhalation pathways to be used in this spreadsheet only if no inhalation TRV exists, if inhalation TRV exists use Inhalation

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

NOTE 3 Oral TRV only to be used

Residential									
Non Carcinogenic Dose (mg/kg-d)									
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Toddler	9.0E-05	3.0E-06	NA	NA	8.0E-05	9.2E-05	2.6E-04	1E-02	No
Adult	3.4E-06	3.1E-06	NA	NA	3.5E-05	2.1E-05	6.3E-05	3E-03	No

Recreational									
Non Carcinogenic Dose (mg/kg-d)									
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Toddler	9.0E-05	3.0E-06	NA	NA	NA	NA	9.3E-05	5E-03	No
Adult Golfer	3.7E-06	5.4E-06	NA	NA	NA	NA	9.1E-06	5E-04	No

City Worker									
Non Carcinogenic Dose (mg/kg-d)									
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Worker	2.7E-05	3.4E-06	NA	NA	NA	NA	3.0E-05	2E-03	No

Landfill Worker									
Non Carcinogenic Dose (mg/kg-d)									
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Hazard Quotient	Exceeds Tolerable Benchmark
Worker	1.1E-06	2.6E-07	NA	NA	NA	NA	1.3E-06	7E-05	No

Inhalation Cancer Target Risk 10^{-5} Worksheet: Nickel

Receptors
 Contaminant of Concern
 Resident, Park User, City Worker
 Nickel

Soil Concentration (5cm depth) (mg/kg) 2.3E+01
 Soil Concentration (15cm depth) (mg/kg) 1.8E+01
 Pellet concentration (mg/kg) 3.9E+01
 Landfill soil concentration (mg/kg) 1.5E+00

Estimated Vapour Concentration (mg/m³)

Inhalation Unit Risk (mg/m³)-1 2.40E-01
 Inhalation Exposure Limit (mg/m³) 4.17E-05

Inhalation Contaminated Soil Particles (y=1/n=0) 1
 Inhalation of Contaminated Vapours (y=1/n=0) 0

NOTE 1 Inhalation pathways to be used in this spreadsheet only if inhalation TRV exists, if no inhalation TRV exists use Total Dose Spreadsheet

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

Residential Carcinogenic				Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
Concentration of particulates (mg/m ³)	Exposure Ratio	Concentration of Vapours (mg/m ³)	Exposure Ratio		
Composite 1.5E-07	4E-03	NA	NA	4E-03	No

Parkland Non Carcinogenic				Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
Concentration of particulates (mg/m ³)	Exposure Ratio	Concentration of Vapours (mg/m ³)	Exposure Ratio		
Composite 1.1E-07	3E-03	NA	NA	3E-03	No
Adult Golfer 2.9E-07	7E-03	NA	NA	7E-03	No

City Worker Non Carcinogenic Dose (mg/kg-d)				Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
Concentration of particulates (mg/m ³)	Exposure Ratio	Concentration of Vapours (mg/m ³)	Exposure Ratio		
Worker 4.9E-07	1E-02	NA	NA	1E-02	No

Landfill Worker Non Carcinogenic Dose (mg/kg-d)				Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
Concentration of particulates (mg/m ³)	Exposure Ratio	Concentration of Vapours (mg/m ³)	Exposure Ratio		
Worker 3.8E-08	9E-04	NA	NA	9E-04	No

Inhalation Cancer Target Risk 10⁻⁶ Worksheet: Nickel

Receptors: Resident, Park User, City Worker
 Contaminant of Concern: Nickel

Soil Concentration (5cm depth) (mg/kg) 2.3E+01
 Soil Concentration (15cm depth) (mg/kg) 1.8E+01
 Pellet concentration (mg/kg) 3.9E+01
 Landfill soil concentration (mg/kg) 1.5E+00

Estimated Vapour Concentration (mg/m3)

Inhalation Unit Risk (mg/m3)-1 2.40E-01
 Inhalation Exposure Limit (mg/m3) 4.17E-06

Inhalation Contaminated Soil Particles (y=1/n=0) 1
 Inhalation of Contaminated Vapours (y=1/n=0) 0

		Residential		Total Inhalation		Exceeds Tolerable Benchmark	
		Carcinogenic		Exposure Ratio		Exceeds Tolerable Benchmark	
	Concentration of particulates (mg/m ³)	Exposure Ratio	Concentration of Vapours (mg/m ³)	Exposure Ratio	Total Inhalation Exposure Ratio		
Composite	1.5E-07	4E-02	NA	NA	4E-02	No	

		Parkland		Total Inhalation		Exceeds Tolerable Benchmark	
		Non Carcinogenic		Exposure Ratio		Exceeds Tolerable Benchmark	
	Concentration of particulates (mg/m ³)	Exposure Ratio	Concentration of Vapours (mg/m ³)	Exposure Ratio	Total Inhalation Exposure Ratio		
Composite	1.1E-07	3E-02	NA	NA	3E-02	No	
Adult Golfer	2.9E-07	7E-02	NA	NA	7E-02	No	

		City Worker		Total Inhalation		Exceeds Tolerable Benchmark	
		Non Carcinogenic Dose (mg/kg-d)		Exposure Ratio		Exceeds Tolerable Benchmark	
	Concentration of particulates (mg/m ³)	Exposure Ratio	Concentration of Vapours (mg/m ³)	Exposure Ratio	Total Inhalation Exposure Ratio		
Worker	4.9E-07	1E-01	NA	NA	1E-01	No	

		Landfill Worker		Total Inhalation		Exceeds Tolerable Benchmark	
		Non Carcinogenic Dose (mg/kg-d)		Exposure Ratio		Exceeds Tolerable Benchmark	
	Concentration of particulates (mg/m ³)	Exposure Ratio	Concentration of Vapours (mg/m ³)	Exposure Ratio	Total Inhalation Exposure Ratio		
Worker	3.8E-08	9E-03	NA	NA	9E-03	No	

Non-Carcinogen Worksheet : Zinc

Receptors Resident, Park User, City Worker

Contaminant of Concern

Zinc

Soil Concentration (5cm depth) (mg/kg)
 Pellet Concentration (mg/kg)
 Landfill Application soil Concentration (mg/kg)

2.6E+02
 9.0E+02
 3.5E+01

AF.s Dermal Soil absorption factor (unitless)
 Oral T.R.V (mg/kg-d)

0.02
 3.00E-01

Soil Concentration (15 cm depth) (mg/kg)
 Plant Bioconcentration Factor (fruit)
 Plant Bioconcentration Factor (root/veg)
 Plant Bioconcentration Factor (veg)

1.4E+02
 0.9
 0.9
 0.56

Fruit Concentration (mg/kg)
 Root Vegetable Concentration (mg/kg)
 ||Other Vegetable Concentration (mg/kg)

2.3E+01
 2.3E+01
 1.4E+01

Inhalation Contaminated Soil Particles (y=1/n=0)
 Inhalation of Contaminated Vapours (y=1/n=0)
 Concentration in Vapours (mg/m3)

1
 0
 0

NOTE 1 Inhalation pathways to be used in this spreadsheet only if no inhalation TRV exists, if inhalation TRV exists use Inhalation Spreadsheet

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

NOTE 3 Oral TRV only to be used

Residential									
	Non Carcinogenic Dose (mg/kg-d)					Hazard Quotient	Exceeds Tolerable Benchmark		
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables			Ingestion of contaminated fruit	Total Dose (mg/kg-d)
Toddler	1.3E-03	1.9E-06	1.0E-06	NA	8.2E-03	1.1E-02	2.0E-02	7E-02	No
Adult	3.4E-05	1.8E-06	3.3E-07	NA	3.6E-03	2.4E-03	6.0E-03	2E-02	No

Recreational									
	Non Carcinogenic Dose (mg/kg-d)					Hazard Quotient	Exceeds Tolerable Benchmark		
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables			Ingestion of contaminated fruit	Total Dose (mg/kg-d)
Toddler	1.3E-03	1.9E-06	1.0E-06	NA	NA	NA	1.3E-03	4E-03	No
Adult Golfer	4.1E-05	3.5E-06	6.3E-07	NA	NA	NA	4.5E-05	2E-04	No

City Worker									
	Non Carcinogenic Dose (mg/kg-d)					Hazard Quotient	Exceeds Tolerable Benchmark		
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables			Ingestion of contaminated fruit	Total Dose (mg/kg-d)
Worker	6.2E-04	4.5E-06	2.1E-06	NA	NA	NA	6.3E-04	2E-03	No

Landfill Worker									
	Non Carcinogenic Dose (mg/kg-d)					Hazard Quotient	Exceeds Tolerable Benchmark		
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables			Ingestion of contaminated fruit	Total Dose (mg/kg-d)
Worker	2.4E-05	3.5E-07	1.6E-07	NA	NA	NA	2.5E-05	8E-05	No

Non-Carcinogen Worksheet: PCB

Receptors

Resident, Park User, City Worker

PCBs

Contaminant of Concern 1.1E-02
 Soil Concentration (5cm depth) (mg/kg) 1.7E-04
 Pellet Concentration (mg/kg) 6.5E-06
 Landfill Application soil Concentration (mg/kg)

AF.s Dermal Soil absorption factor (unitless) 0.067
 Oral T.R.V (mg/kg-d) 2.00E-05

Soil Concentration (15 cm depth) (mg/kg) 1.1E-02
 Plant Bioconcentration Factor (fruit) 0.01
 Plant Bioconcentration Factor (rootveg) 0.01
 Plant Bioconcentration Factor (veg) 0.01

Fruit Concentration (mg/kg) 2.0E-05
 Root Vegetable Concentration (mg/kg) 2.0E-05
 Other Vegetable Concentration (mg/kg) 2.0E-05

Inhalation Contaminated Soil Particles (y=1/n=0) 0
 Inhalation of Contaminated Vapours (y=1/n=0) 0

NOTE 1 Inhalation pathways to be used in this spreadsheet only if no inhalation TRV exists, if inhalation TRV exists use Inhalation Spreadsheet
 NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles
 NOTE 3 Oral TRV only to be used

Residential									
	Non Carcinogenic Dose (mg/kg-d)					Hazard Quotient	Exceeds Tolerable Benchmark		
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables			Ingestion of contaminated fruit	Total Dose (mg/kg-d)
Toddler	2.9E-08	2.8E-10	NA	NA	8.3E-09	9.1E-09	4.7E-08	2E-03	No
Adult	1.7E-09	3.0E-10	NA	NA	3.7E-09	2.1E-09	7.7E-09	4E-04	No

Recreational									
	Non Carcinogenic Dose (mg/kg-d)					Hazard Quotient	Exceeds Tolerable Benchmark		
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables			Ingestion of contaminated fruit	Total Dose (mg/kg-d)
Toddler	2.9E-08	2.8E-10	NA	NA	NA	NA	2.9E-08	1E-03	No
Adult Golfer	1.7E-09	4.8E-10	NA	NA	NA	NA	2.2E-09	1E-04	No

City Worker									
	Non Carcinogenic Dose (mg/kg-d)					Hazard Quotient	Exceeds Tolerable Benchmark		
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables			Ingestion of contaminated fruit	Total Dose (mg/kg-d)
Worker	1.2E-10	2.8E-12	NA	NA	NA	NA	1.2E-10	6E-06	No

Landfill Worker									
	Non Carcinogenic Dose (mg/kg-d)					Hazard Quotient	Exceeds Tolerable Benchmark		
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables			Ingestion of contaminated fruit	Total Dose (mg/kg-d)
Worker	4.5E-12	2.2E-13	NA	NA	NA	NA	4.7E-12	2E-07	No

Carcinogen Worksheet Target Risk 10^{-5} : PCB

Receptors Resident, Park User, City Worker

Contaminant of Concern

PCBs

Soil Concentration (5cm depth) (mg/kg) 1.1E-02
 Pellet Concentration (mg/kg) 1.7E-04
 Landfill Application soil Concentration (mg/kg) 6.5E-06
 AF-s Dermal Soil absorption factor (unitless) 0.067
 Oral Slope Factor (mg/kg-d)-1 2.00E+00

Soil Concentration (15 cm depth) (mg/kg) 1.1E-02
 Plant Bioconcentration Factor (fruit) 0.01
 Plant Bioconcentration Factor (rootveg) 0.01
 Plant Bioconcentration Factor (veg) 0.01

Fruit Concentration (mg/kg) 2.0E-05
 Root Vegetable Concentration (mg/kg) 2.0E-05
 ||Other Vegetable Concentration (mg/kg) 2.0E-05

Inhalation Contaminated Soil Particles (y=1/n=0) 0
 Inhalation of Contaminated Vapours (y=1/n=0) 0
 Concentration in Vapours (mg/m³) 0

Exposure Limit (mg/kg-day) 5.00E-06

Residential									
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Cancer Dose (mg/kg-d)	Exposure Ratio	Exceeds Tolerable Benchmark
Composite Adult	3.6E-09	2.8E-10	NA	NA	4.4E-09	2.8E-09	1.1E-08	2E-03	No

Parkland									
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Exposure Ratio	Exceeds Tolerable Benchmark
Composite Adult	3.6E-09	1.9E-10	NA	NA	NA	NA	3.8E-09	8E-04	No
Adult Golfer	1.2E-09	3.5E-10	NA	NA	NA	NA	1.6E-09	3E-04	No

City Worker									
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Exposure Ratio	Exceeds Tolerable Benchmark
Worker	4.6E-11	1.1E-12	NA	NA	NA	NA	4.7E-11	9E-06	No

Landfill worker									
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Exposure Ratio	Exceeds Tolerable Benchmark
Worker	1.8E-12	8.7E-14	NA	NA	NA	NA	1.9E-12	4E-07	No

NOTE 1 Inhalation pathways to be used in this spreadsheet only if no inhalation Slope Factor exists, if inhalation Slope Factor exists use Inhalation Spreadsheet

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no

an Inhalation of Contaminated Soil Particles

NOTE 3 Oral Slope Factor only to be used

Carcinogen Worksheet Target Risk 10⁻⁶: PCB

Receptors

Resident, Park User, City Worker

Contaminant of Concern
 Soil Concentration (5cm depth) (mg/kg) 1.1E-02
 Pellet Concentration (mg/kg) 1.7E-04
 Landfill Application soil Concentration (mg/kg) 6.5E-06
 AF.s Dermal Soil absorption factor (unitless) 0.067
 Oral Slope Factor (mg/kg-d)-1 2.00E+00

Soil Concentration (15 cm depth) (mg/kg) 1.1E-02
 Plant Bioconcentration Factor (fruit) 0.01
 Plant Bioconcentration Factor (rootveg) 0.01
 Plant Bioconcentration Factor (veg) 0.01

Fruit Concentration (mg/kg) 2.0E-05
 Root Vegetable Concentration (mg/kg) 2.0E-05
 ||Other Vegetable Concentration (mg/kg) 2.0E-05

Inhalation Contaminated Soil Particles (y=1/n=0) 0
 Inhalation of Contaminated Vapours (y=1/n=0) 0
 Concentration in Vapours (mg/m3)

Exposure Limit (mg/kg-day) 5.00E-07

Residential									
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Cancer Dose (mg/kg-d)	Exposure Ratio	Exceeds Tolerable Benchmark
Composite Adult	3.9E-09	2.8E-10	NA	NA	4.4E-09	2.8E-09	1.1E-08	2E-02	No

Parkland									
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Exposure Ratio	Exceeds Tolerable Benchmark
Composite Adult	3.6E-09	1.9E-10	NA	NA	NA	NA	3.8E-09	8E-03	No
Adult Golfer	1.2E-09	3.5E-10	NA	NA	NA	NA	1.6E-09	3E-03	No

City Worker									
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Exposure Ratio	Exceeds Tolerable Benchmark
Worker	4.6E-11	1.1E-12	NA	NA	NA	NA	4.7E-11	9E-05	No

Landfill worker									
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Dose (mg/kg-d)	Exposure Ratio	Exceeds Tolerable Benchmark
Worker	1.8E-12	8.7E-14	NA	NA	NA	NA	1.9E-12	4E-06	No

NOTE 1 Inhalation pathways to be used in this spreadsheet only if no Inhalation Slope Factor exists, if Inhalation Slope Factor exists use Inhalation Spreadsheet

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no

an Inhalation of Contaminated Soil Particles

NOTE 3 Oral Slope Factor only to be used

Inhalation Cancer Target Risk 10⁻⁵: PCB

Receptors Resident, Park User, City Worker
Contaminant of Concern PCBs

Soil Concentration (5cm depth) (mg/kg) 1.1E-02
 Soil Concentration (15cm depth) (mg/kg) 1.1E-02
 Pellet concentration (mg/kg) 1.7E-04
 Landfill soil concentration (mg/kg) 6.5E-06
 Estimated Vapour Concentration (mg/m3) 1.3E-09
 Inhalation Unit Risk (mg/m3)-1 1.00E-01
 Inhalation Exposure Limit (mg/m3) 1.00E-04

Inhalation Contaminated Soil Particles (y=1/n=0) 1
 Inhalation of Contaminated Vapours (y=1/n=0) 1

Residential				
Carcinogenic				
Concentration of particulates (mg/m ³)	Exposure Ratio	Concentration of Vapours (mg/m ³)	Exposure Ratio	Total Inhalation Exposure Ratio
7.4E-11	7E-07	1.3E-09	1E-05	1E-05
Composite				No

Parkland				
Non Carcinogenic				
Concentration of particulates (mg/m ³)	Exposure Ratio	Concentration of Vapours (mg/m ³)	Exposure Ratio	Total Inhalation Exposure Ratio
4.9E-11	5E-07	1.3E-09	1E-05	1E-05
1.3E-10	1E-06	1.3E-09	1E-05	1E-05
Adult Golfer				No

City Worker				
Non Carcinogenic Dose (mg/kg-d)				
Concentration of particulates (mg/m ³)	Exposure Ratio	Concentration of Vapours (mg/m ³)	Exposure Ratio	Total Inhalation Exposure Ratio
2.1E-12	2E-08	1.3E-09	1E-05	1E-05
Worker				No

Landfill Worker				
Non Carcinogenic Dose (mg/kg-d)				
Concentration of particulates (mg/m ³)	Exposure Ratio	Concentration of Vapours (mg/m ³)	Exposure Ratio	Total Inhalation Exposure Ratio
1.6E-13	2E-09	1.3E-09	1E-05	1E-05
Worker				No

NOTE 1 Inhalation pathways to be used in this spreadsheet only if inhalation TRV exists, if no inhalation TRV exists use Total Dose Spreadsheet

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

Inhalation Cancer Target Risk 10⁻⁶: PCB

Receptors Resident, Park User, City Worker
Contaminant of Concern PCBs

Soil Concentration (5cm depth) (mg/kg) 1.1E-02
Soil Concentration (15cm depth) (mg/kg) 1.1E-02
Pellet concentration (mg/kg) 1.7E-04
Landfill soil concentration (mg/kg) 6.5E-06
Estimated Vapour Concentration (mg/m³) 1.3E-09
Inhalation Unit Risk (mg/m³)⁻¹ 1.00E-01
Inhalation Exposure Limit (mg/m³) 1.00E-05

Inhalation Contaminated Soil Particles (y=1/n=0) 1
Inhalation of Contaminated Vapours (y=1/n=0) 1

Residential						
Carcinogenic						
	Concentration of particulates (mg/m ³)	Exposure Ratio	Concentration of Vapours (mg/m ³)	Exposure Ratio	Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
Composite	7.4E-11	7E-06	1.3E-09	1E-04	1E-04	No

Parkland						
Non Carcinogenic						
	Concentration of particulates (mg/m ³)	Exposure Ratio	Concentration of Vapours (mg/m ³)	Exposure Ratio	Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
Composite	4.9E-11	5E-06	1.3E-09	1E-04	1E-04	No
Adult Golfer	1.3E-10	1E-05	1.3E-09	1E-04	1E-04	No

City Worker						
Non Carcinogenic Dose (mg/kg-d)						
	Concentration of particulates (mg/m ³)	Exposure Ratio	Concentration of Vapours (mg/m ³)	Exposure Ratio	Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
Worker	2.1E-12	2E-07	1.3E-09	1E-04	1E-04	No

Landfill Worker						
Non Carcinogenic Dose (mg/kg-d)						
	Concentration of particulates (mg/m ³)	Exposure Ratio	Concentration of Vapours (mg/m ³)	Exposure Ratio	Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
Worker	1.6E-13	2E-08	1.3E-09	1E-04	1E-04	No

NOTE 1 Inhalation pathways to be used in this spreadsheet only if inhalation TRV exists, if no inhalation TRV exists use Total Dose Spreadsheet

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

Non-Carcinogen Worksheet: Dioxins/Furans

Receptors Resident, Park User, City Worker

Contaminant of Concern Dioxins/Furans

Soil Concentration (5cm depth) (mg/kg) 4.7E-06

Pellet Concentration (mg/kg) 1.5E-05

Landfill Application soil Concentration (mg/kg) 5.8E-07

AF's Dermal Soil absorption factor (unitless) 0.06

Oral T.R.V (mg/kg-d) 2.00E-09

Soil Concentration (15 cm depth) (mg/kg) 2.7E-06

Plant Bioconcentration Factor (fruit) 0.0056

Plant Bioconcentration Factor (rootveg) 0.0056

Plant Bioconcentration Factor (veg) 0.0056

Fruit Concentration (mg/kg) 2.9E-09

Root Vegetable Concentration (mg/kg) 2.9E-09

Other Vegetable Concentration (mg/kg) 2.9E-09

Inhalation Contaminated Soil Particles (y=1/n=0) 0

Inhalation of Contaminated Vapours (y=1/n=0) 0

Concentration in Vapours (mg/m3)

NOTE 1 Inhalation pathways to be used in this spreadsheet only if no inhalation TRV exists, if inhalation TRV exists use Inhalation Spreadsheet

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

NOTE 3 Oral TRV only to be used

	Residential						Hazard Quotient	Exceeds Tolerable Benchmark	
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit			Total Dose (mg/kg-d)
Toddler Adult	2.3E-11 6.4E-13	1.1E-13 1.0E-13	NA NA	NA NA	1.2E-12 5.3E-13	1.3E-12 3.0E-13	2.6E-11 1.6E-12	1E-02 8E-04	No No

	Recreational						Hazard Quotient	Exceeds Tolerable Benchmark	
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit			Total Dose (mg/kg-d)
Toddler Adult Golfer	2.3E-11 7.6E-13	1.1E-13 1.9E-13	NA NA	NA NA	NA NA	NA NA	2.3E-11 9.5E-13	1E-02 5E-04	No No

	City Worker						Hazard Quotient	Exceeds Tolerable Benchmark	
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit			Total Dose (mg/kg-d)
Worker	1.0E-11	2.2E-13	NA	NA	NA	NA	1.1E-11	5E-03	No

	Landfill Worker						Hazard Quotient	Exceeds Tolerable Benchmark	
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit			Total Dose (mg/kg-d)
Worker	4.0E-13	1.7E-14	NA	NA	NA	NA	4.2E-13	2E-04	No

Carcinogen Worksheet Target Risk 10⁻⁵: Dioxins/Furans

Receptors
Resident, Park User, City Worker

Dioxins/Furans

Contaminant of Concern

Soil Concentration (5cm depth) (mg/kg)

Pellet Concentration (mg/kg)

Landfill Application soil Concentration (mg/kg)

AF.s Dermal Soil absorption factor (unitless)

Oral Slope Factor (mg/kg-d)⁻¹

Soil Concentration (15 cm depth) (mg/kg)

Plant Bioconcentration Factor (fruit)

Plant Bioconcentration Factor (root/veg)

Plant Bioconcentration Factor (veg)

Fruit Concentration (mg/kg)

Root Vegetable Concentration (mg/kg)

Other Vegetable Concentration (mg/kg)

Inhalation Contaminated Soil Particles (y=1/n=0)

Inhalation of Contaminated Vapours (y=1/n=0)

Exposure Limit (mg/kg-day)

NOTE 1 Inhalation pathways to be used in this spreadsheet only if no Inhalation Slope Factor exists, if Inhalation Slope Factor exists use Inhalation Spreadsheet

NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

NOTE 3 Oral Slope Factor only to be used

	Residential							Exposure Ratio	Exceeds Tolerable Benchmark
	Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Cancer Dose (mg/kg-d)		
Composite	2.2E-12	9.9E-14	NA	NA	6.3E-13	4.1E-13	3.3E-12	5E-02	No
Parkland									
	Carcinogenic Dose (mg/kg-d)							Exposure Ratio	Exceeds Tolerable Benchmark
Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Cancer Dose (mg/kg-d)			
Composite Adult	2.2E-12	7.6E-14	NA	NA	NA	NA	2.3E-12	3E-02	No
Adult Golfer	5.6E-13	1.4E-13	NA	NA	NA	NA	7.0E-13	1E-02	No
City Worker									
	Carcinogenic Dose (mg/kg-d)							Exposure Ratio	Exceeds Tolerable Benchmark
Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Cancer Dose (mg/kg-d)			
Worker	4.1E-12	8.9E-14	NA	NA	NA	NA	4.2E-12	6E-02	No
Landfill worker									
	Carcinogenic Dose (mg/kg-d)							Exposure Ratio	Exceeds Tolerable Benchmark
Inadvertent Ingestion	Dermal Contact	Inhalation contaminated soil particles	Inhalation of contaminated vapours	Ingestion of contaminated vegetables	Ingestion of contaminated fruit	Total Cancer Dose (mg/kg-d)			
Worker	1.6E-13	7.0E-15	NA	NA	NA	NA	1.7E-13	3E-03	No

Inhalation Cancer Target Risk 10^{-6} : Dioxin/Furans

Receptors
Contaminant of Concern Resident, Park User, City Worker
Dioxins/Furans

Soil Concentration (5cm depth) (mg/kg) 4.7E-06
Soil Concentration (15cm depth) (mg/kg) 2.7E-06
Pellet concentration (mg/kg) 1.5E-05
Landfill soil concentration (mg/kg) 5.8E-07

Estimated Vapour Concentration (mg/m³) 8.5E-14

Inhalation Unit Risk (mg/m³-1) 3.44E+04
Inhalation Exposure Limit (mg/m³) 2.91E-10

Inhalation Contaminated Soil Particles (y=1/n=0) 1
Inhalation of Contaminated Vapours (y=1/n=0) 1

NOTE 1 Inhalation pathways to be used in this spreadsheet only if inhalation TRV exists, if no inhalation TRV exists use Total Dose Spreadsheet
NOTE 2 Choose only 1 Inhalation Pathway, if measured concentrations then use Inhalation of Contaminated Vapours, if no analytical data then Inhalation of Contaminated Soil Particles

Residential				Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
Concentration of particulates (mg/m ³)	Exposure Ratio	Concentration of Vapours (mg/m ³)	Exposure Ratio		
Composite	3.0E-14	1E-04	8.5E-14	4E-04	No

Total Concentration
1.2E-13

Parkland				Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
Concentration of particulates (mg/m ³)	Exposure Ratio	Concentration of Vapours (mg/m ³)	Exposure Ratio		
Composite	2.3E-14	8E-05	8.5E-14	4E-04	No
Adult Golfer	6.0E-14	2E-04	8.5E-14	5E-04	No

1.1E-13
1.4E-13

City Worker				Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
Concentration of particulates (mg/m ³)	Exposure Ratio	Concentration of Vapours (mg/m ³)	Exposure Ratio		
Worker	1.9E-13	6E-04	8.5E-14	9E-04	No

2.7E-13

Landfill Worker				Total Inhalation Exposure Ratio	Exceeds Tolerable Benchmark
Concentration of particulates (mg/m ³)	Exposure Ratio	Concentration of Vapours (mg/m ³)	Exposure Ratio		
Worker	1.5E-14	5E-05	8.5E-14	3E-04	No

1.0E-13