

Soil Criteria

Section XXXX. Soil cleanup criteria for the combined exposure pathways of ingestion of and dermal contact with contaminated soil, and the inhalation of hazardous substances from soil emitted into ambient air.

(1) The department shall develop residential and non-residential soil cleanup criteria that are based on the combined ingestion, dermal contact, and inhalation exposure pathways. Ingestion of and dermal contact with contaminated soil along with the inhalation of hazardous substance emissions in ambient air from soil shall be considered reasonable and relevant pathways for all facilities. The criteria shall be calculated for the residential and non-residential land use categories in accordance with the algorithms in this section.

(2) The residential and non-residential soil cleanup criteria shall be calculated by combining an ingestion and dermal component with an inhalation component. The algorithm for both carcinogenic and noncarcinogenic hazardous substances is shown below:

$$SCC = \frac{1}{\left[\left(\frac{1}{IngDer} \right) + \left(\frac{1}{Inh} \right) \right]} \quad \text{(Equation 1)}$$

where,

Parameter	Definition	Units	Default
SCC	Soil clean-up criterion	µg/kg	Chemical-specific
IngDer	Ingestion and dermal component	µg/kg	Chemical-specific
Inh	Inhalation component	µg/kg	Chemical-specific

(3) The residential soil cleanup criteria for both carcinogenic and noncarcinogenic hazardous substances shall be calculated using the following algorithms.

(a) The ingestion and dermal component shall be calculated as shown below. The lowest of the IngDer component produced from the equations in (i) or (ii) shall be the final IngDer component used for derivation of the soil cleanup criterion.

(i) for carcinogens

(Equation 2)

$$IngDer_{ca} = \frac{TR \times AT_{ca} \times CF}{\left[(SF_{oral} \times EF_{ing} \times IF \times AE_{ing}) + (SF_{der} \times EF_{der} \times DF \times AE_{der}) \right]}$$

(ii) for noncarcinogens

(Equation 3)

$$IngDer_{nc} = \frac{THQ \times AT_{nc} \times CF \times RSC}{\left[\left(\frac{1}{RfD_{oral}} \times EF_{ing} \times IF \times AE_{ing} \right) + \left(\frac{1}{RfD_{der}} \times EF_{der} \times DF \times AE_{der} \right) \right]}$$

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where,

Parameter	Definition	Units	Default
IngDer _{ca}	Ingestion and dermal component, carcinogen	µg/kg	Chemical-specific
TR	Target risk level	unitless	10 ⁻⁵
AT _{ca}	Averaging time, carcinogen	days	25,550 (70 years x 365 days/year)
CF	Conversion factor	µg/kg	10 ⁹
SF _{oral}	Oral cancer slope factor	(mg/kg-day) ⁻¹	Chemical-specific
EF _{ing}	Ingestion exposure frequency	days/year	350
IF	Age-adjusted soil ingestion factor	mg-year/kg-day	97
AE _{ing}	Ingestion absorption efficiency	unitless	chemical-specific or default
SF _{der}	Dermal cancer slope factor or default SF _{oral}	(mg/kg-day) ⁻¹	Chemical-specific
EF _{der}	Dermal exposure frequency	days/year	250
DF	Age-adjusted soil dermal factor	mg-year/kg-day	361
AE _{der}	Dermal absorption efficiency	unitless	Chemical-specific or default
IngDer _{nc}	Ingestion and dermal component, noncarcinogen	µg/kg	Chemical-specific
THQ	Target hazard quotient	unitless	1
AT _{nc}	Averaging time, noncarcinogen	days	10,950 (30 years x 365 days/year)
RSC	Relative source contribution	unitless	1
RfD _{oral}	Oral reference dose	mg/kg-day	Chemical-specific
RfD _{der}	Dermal reference dose or default RfD _{oral}	mg/kg-day	Chemical-specific

(b) The age-adjusted soil ingestion factor (IF) shall be calculated using the following equation:

(Equation 4)

$$IF = \left(\frac{SIR_{age1-6} \times ED_{age1-6}}{BW_{age1-6}} \right) + \left(\frac{SIR_{adult} \times ED_{adult}}{BW_{adult}} \right)$$

(c) The age-adjusted dermal factor (DF) shall be calculated using the following equation:

(Equation 5)

$$DF = \left(\frac{SA_{age1-6} \times EV \times AF_{age-6} \times ED_{age1-6}}{BW_{age1-6}} \right) + \left(\frac{SA_{adult} \times EV \times AF_{adult} \times ED_{adult}}{BW_{adult}} \right)$$

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where,

Parameter	Definition	Units	Default
SIR _{age 1-6}	Soil ingestion rate, child	mg/day	200
SIR _{adult}	Soil ingestion rate, adult	mg/day	50
ED _{age 1-6}	Exposure duration, child	years	6
ED _{adult}	Exposure duration, adult	years	24
BW _{age 1-6}	Body weight, child	Kg	15
BW _{adult}	Body weight, adult	Kg	70
SA _{age 1-6}	Skin surface area, child	cm ² /event	2,800
SA _{adult}	Skin surface area, adult	cm ² /event	5,700
EV	Event frequency	event/day	1
AF _{age 1-6}	Soil adherence factor, child	mg/cm ²	0.2
AF _{adult}	Soil adherence factor, adult	mg/cm ²	0.07

(d) Absorption efficiencies used to calculate the default soil cleanup criteria are as follows:

- (i) Chemical-specific data may be submitted to the department to support development of updated default absorption efficiency and shall be used in this subsection to develop the soil cleanup criteria if determined by the department to be the best available information.
- (ii) If chemical-specific data are not available, then the following default absorption efficiencies shall be used:
 - a. AE_{ing} shall be 50% for organic hazardous substances which exhibit a log octanol-water partitioning coefficient greater than 5 and a molecular weight greater than 200 grams per mole or which are not ionizing organic compounds, and 100% for all other organic hazardous substances.
 - b. AE_{ing} shall be 50% for inorganic hazardous substances
 - c. AE_{der} shall be 10% for organic hazardous substances.
 - d. AE_{der} shall be 1% for inorganic hazardous substances.

(e) The Inhalation component shall be calculated as shown below:

(i) for carcinogens:

$$\text{Inh}_{ca} = \frac{\text{TR} \times \text{AT}_{ca}}{\text{EF} \times \text{ED} \times \text{AIF}_r \times \text{SF}_{inh} \times \left(\frac{1}{\text{VF}} + \frac{1}{\text{PEF}} \right)} \quad (\text{Equation 6})$$

(ii) for noncarcinogens:

a. ITSLs with annual averaging times

$$\text{Inh}_{nc} = \frac{\text{THQ} \times \text{AT}_{nc}}{\text{EF} \times \text{ED} \times \text{AIF}_r \times \frac{1}{\text{RfD}_{inh}} \times \left(\frac{1}{\text{VF}} + \frac{1}{\text{PEF}} \right)} \quad (\text{Equation 7})$$

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b. ITSLs with non-annual averaging times

$$\text{Inh}_{nc} = \frac{\text{THQ} \times \text{AT}_{nc}}{\text{EF} \times \text{AIF}_r \times \frac{1}{\text{RfD}_{inh}} \times \left(\frac{1}{\text{VF}} + \frac{1}{\text{PEF}/2} \right)} \quad \text{(Equation 8)}$$

where,

Parameter	Definition	Units	Default
Inh_{ca}	Inhalation component, carcinogen	$\mu\text{g}/\text{kg}$	Chemical-specific
TR	Target risk level	unitless	10^{-5}
AT_{ca}	Averaging time, carcinogen	days	25,550 (70 years x 365 days/year)
EF	Exposure frequency	days/year	350
ED	Exposure duration	years	30
AIF_r	Air inhalation rate adjustment factor, residential	$\text{m}^3\text{-yr}/\text{kg}\text{-day}$	10
SF_{inh}	Inhalation slope factor	$(\mu\text{g}/\text{kg}\text{-day})^{-1}$	Chemical-specific
VF	Volatilization factor	m^3/kg	Chemical-specific
PEF	Particulate emission factor	m^3/kg	Chemical-specific
Inh_{nc}	Inhalation component, noncarcinogen	$\mu\text{g}/\text{kg}$	Chemical-specific
THQ	Target hazard quotient	unitless	1
AT_{nc}	Averaging time, noncarcinogen	days	10,950 (30 years x 365 days/year)
RfD_{inh}	Inhalation reference dose	$\mu\text{g}/\text{kg}\text{-day}$	Chemical-specific

- (f) The inhalation slope factor (SF_{inh}), inhalation reference dose (RfD_{inh}) and residential air inhalation rate adjustment factor shall be calculated using the following equations:

$$\text{SF}_{inh} = \text{IURF} \times \frac{\text{BW}_{adult}}{\text{AIR}_{adult}} \quad \text{(Equation 9)}$$

$$\text{RfD}_{inh} = \text{ITSL} \times \frac{\text{AIR}_{adult}}{\text{BW}_{adult}} \quad \text{(Equation 10)}$$

$$\text{AIF}_r = \left(\frac{\text{AIR}_{age1-6} \times \text{ED}_{age1-6}}{\text{BW}_{age1-6}} \right) + \left(\frac{\text{AIR}_{adult} \times \text{ED}_{adult}}{\text{BW}_{adult}} \right) \quad \text{(Equation 11)}$$

where,

Parameter	Definition	Units	Default
SF_{inh}	Inhalation slope factor	$(\mu\text{g}/\text{kg}\text{-day})^{-1}$	Chemical-specific
IURF	Inhalation unit risk factor	$(\mu\text{g}/\text{m}^3)^{-1}$	Chemical-specific

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BW _{adult}	Body weight, adult	kg	70
AIR _{adult}	Air inhalation rate, adult	m ³ /day	20
RfD _{inh}	Inhalation reference dose	µg/kg-day	Chemical-specific
ITSL	Initial threshold screening level	µg /m ³	Chemical-specific
AIF _r	Age-adjusted air inhalation rate factor	m ³ -yr/kg-day	10
AIR _{age 1-6}	Air inhalation rate, child	m ³ /day	8
ED _{age 1-6}	Exposure duration, child	years	6
ED _{adult}	Exposure duration, adult	years	24
BW _{age 1-6}	Body weight, child	kg	15

(4) The restricted non-residential soil cleanup criteria for both carcinogenic and noncarcinogenic hazardous substances shall be calculated using the following algorithms:

(a) The ingestion and dermal component shall be calculated as shown below. The lowest of the IngDer component produced from the equations in (i) or (ii) shall be the final IngDer component used for the derivation of the soil cleanup criterion.

(i) for carcinogens:

(Equation 12)

$$\text{IngDer}_{ca} = \frac{\text{TR} \times \text{AT}_{ca} \times \text{BW} \times \text{CF}}{\text{ED} \times \left[(\text{SF}_{oral} \times \text{EF}_{ing} \times \text{SIR} \times \text{AE}_{ing}) + (\text{SF}_{der} \times \text{EF}_{der} \times \text{SA} \times \text{EV} \times \text{AF} \times \text{AE}_{der}) \right]}$$

(ii) for noncarcinogens

(Equation 13)

$$\text{IngDer}_{nc} = \frac{\text{THQ} \times \text{AT}_{nc} \times \text{BW} \times \text{CF} \times \text{RSC}}{\text{ED} \times \left[\left(\frac{1}{\text{RfD}_{oral}} \times \text{EF}_{ing} \times \text{SIR} \times \text{AE}_{ing} \right) + \left(\frac{1}{\text{RfD}_{der}} \times \text{EF}_{der} \times \text{SA} \times \text{EV} \times \text{AF} \times \text{AE}_{der} \right) \right]}$$

where,

Parameter	Definition	Units	Default
IngDer _{ca}	Ingestion and dermal component, carcinogen	µg/kg	Chemical-specific
TR	Target risk level	unitless	10 ⁻⁵
AT _{ca}	Averaging time, carcinogen	days	25,550 (70 years x 365 days/year)
BW	Body weight	kg	70
CF	Conversion factor	µg/kg	10 ⁹
ED	Exposure duration	years	21
SF _{oral}	Oral cancer slope factor	(mg/kg-day) ⁻¹	Chemical-specific
EF _{ing}	Ingestion exposure frequency	days/year	250
SIR	Soil ingestion rate	mg/day	100
AE _{ing}	Ingestion absorption efficiency	unitless	Chemical-specific or default

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SF _{der}	Absorbed cancer slope factor or default SF _{oral}	(mg/kg-day) ⁻¹	Chemical-specific
EF _{der}	Dermal exposure frequency	days/year	250
SA	Skin surface area	cm ² /event	3,300
EV	Event frequency	event/day	1
AF	Soil adherence factor	mg/cm ²	0.2
AE _{der}	Dermal absorption efficiency)	unitless	Chemical-specific or default
IngDer _{nc}	Ingestion and dermal component, noncarcinogen	µg/kg	Chemical-specific
THQ	Target hazard quotient	unitless	1
AT _{nc}	Averaging time	days	7,665 (21 years x 365 days/year)
RSC	Relative source contribution	unitless	1
RfD _{oral}	Oral reference dose	mg/kg-day	Chemical-specific
RfD _{der}	Absorbed reference dose or default RfD _{oral}	mg/kg-day	Chemical-specific

(b) The inhalation component shall be calculated using the equations shown below:

(i) for carcinogens:

$$\text{Inh}_{ca} = \frac{\text{TR} \times \text{AT}_{ca}}{\text{IURF} \times \text{ED} \times \text{EF} \times \text{AIF}_{nr} \times \left(\frac{1}{\text{VF}} + \frac{1}{\text{PEF}} \right)} \quad \text{(Equation 14)}$$

(ii) for noncarcinogens:

a. ITSLs with annual averaging times:

$$\text{Inh}_{nc} = \frac{\text{THQ} \times \text{ITSL} \times \text{AT}_{nc}}{\text{ED} \times \text{EF} \times \text{AIF}_{nr} \times \left(\frac{1}{\text{VF}} + \frac{1}{\text{PEF}} \right)} \quad \text{(Equation 15)}$$

b. ITSLs with non-annual averaging times:

$$\text{Inh}_{nc} = \frac{\text{THQ} \times \text{ITSL} \times \text{AT}_{nc}}{\text{ED} \times \text{EF} \times \text{AIF}_{nr} \times \left(\frac{1}{\text{VF}} + \frac{1}{\text{PEF}/2} \right)} \quad \text{(Equation 16)}$$

where,

Parameter	Definition	Units	Default
Inh _{ca}	Inhalation component, carcinogen	µg/kg	Chemical-specific
TR	Target risk level	unitless	10 ⁻⁵
AT _{ca}	Averaging time, carcinogen	days	25,550 (70 years x 365 days/year)
IURF	Inhalation unit risk factor	(µg /m ³) ⁻¹	Chemical-specific
ED	Exposure duration	years	21
EF	Exposure frequency	days/year	250

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AIF _{nr}	Air inhalation rate adjustment factor, non-residential	unitless	0.5
VF	Volatilization factor	m ³ /kg	Chemical and source area size-specific
PEF	Particulate emission factor	m ³ /kg	Source area size-specific
Inh _{nc}	Inhalation component, noncarcinogen	µg/kg	Chemical-specific
THQ	Target hazard quotient	unitless	1
AT _{nc}	Averaging time, noncarcinogen	days	7,665 (21 years x 365 days/year)
ITSL	Initial threshold screening level	µg /m ³	Chemical-specific

(c) The non-residential air inhalation rate adjustment factor shall be calculated using the following equation:

$$AIF_{nr} = \frac{AIR_{worker}}{AIR_{adult}} \times ET \quad \text{(Equation 17)}$$

where,

Parameter	Definition	Units	Default
AIF	Air inhalation rate adjustment factor	unitless	0.5
AIR _{worker}	Air inhalation rate, adult worker	m ³ / 8 hr-day	10
ET	Exposure time at work	hr-day/24 hr-day	8
AIR _{adult}	Air inhalation rate, average adult	m ³ /24 hr-day	20

(5) The volatilization factor (VF) shall be calculated for hazardous substances with a Henry's Law constant of 1×10^{-5} atm-m³/mole or greater and with a molecular weight of less than 200 g/mole.

$$VF = (Q/C) \times (1/J_s^{ave}) \quad \text{(Equation 18)}$$

$$J_s^{ave} = \rho_b (4D_A/\pi t)^{1/2} \times 10^4 \text{ cm}^2/\text{m}^2 \quad \text{(Equation 19)}$$

$$D_A = \frac{[(\theta_a^{3.33} D_a (H' \times TAF) + \theta_w^{3.33} D_w)/n^2]}{\rho_b K_d + \theta_w + \theta_a (H' \times TAF)} \quad \text{(Equation 20)}$$

where,

Parameter	Definition	Units	Default
VF	Soil to air volatilization factor	m ³ /kg	Chemical and source area size-

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J_s^{ave}	Normalized average flux from soil	g/m ² -second	specific Chemical-specific
D_A	Apparent diffusivity	cm ² /second	Chemical-specific
Q/C	Dispersion factor	g/m ² -second per kg/m ³	Source area size-specific
T	Exposure time	seconds	ED x 3.1536E+07 seconds/year
θ_a	Soil air-filled porosity	(L_{air}/L_{soil})	0.28
N	Total soil porosity	(L_{pore}/L_{soil})	0.43
θ_w	Soil water-filled porosity	(L_{water}/L_{soil})	0.15
ρ_b	Dry soil bulk density	g/cm ³	1.5
D_a	Diffusivity in air	cm ² /second	Chemical-specific
D_w	Diffusivity in water	cm ² /second	Chemical-specific
H'	Dimensionless Henry's law constant	unitless	Chemical-specific
TAF	Temperature adjustment factor (account for Michigan annual average soil temperature of 10°C)	0.5	0.5
K_d	Soil-water partition coefficient For organic compounds ($K_d = K_{oc} \times f_{oc}$)	cm ³ /g	Chemical-specific
K_{oc}	Soil organic carbon partition coefficient	cm ³ /g	Chemical-specific
f_{oc}	Organic carbon content of soil	g/g (%)	0.006 (0.6%)

The H' is calculated as:

$$H' = \frac{HLC \times CF}{(R \times T)} \quad \text{(Equation 21)}$$

where,

Parameter	Definition	Units	Default
H'	Dimensionless Henry's Law Constant	unitless	Chemical-specific
HLC	Henry's Law Constant at 25°C	atm-m ³ /mol	Chemical-specific
CF	Conversion Factor	L/m ³	1.0E+03
R	Ideal Gas Constant	atm-L/mol-K	8.206E-02
T	Temperature	K	298.15

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(6) The particulate emission factor (PEF) shall be calculated as follows:

$$PEF = Q/C \times \frac{1}{(E_w + E_v)} \quad \text{(Equation 22)}$$

where,

Parameter	Definition	Units	Default
PEF	Particulate emission factor	m ³ /kg	Source area size-specific
Q/C	Dispersion factor	g/m ² -sec per kg/m ³	Source area size-specific
E _w	Particulate emission due to wind erosion	g/m ² -sec	6.9E-08 (residential) 1.2E-07 (non-residential)
E _v	Particulate emission due to vehicle traffic	g/m ² -sec	7.4E-07 (residential) 5.2E-06 (non-residential)

a. The particulate emissions due to wind erosion (E_w) shall be calculated using the following calculations:

$$E_w = 0.036 \times (1 - V) \times \left(\frac{U_m}{U_{t_{adj}}} \right)^3 \times \frac{F(x)}{3600 \text{ sec/hr}} \quad \text{(Equation 23)}$$

$$U_m = U_{mz} \times \left(\frac{H}{Z} \right)^{0.15} \quad \text{(Equation 24)}$$

$$U_{t_{adj}} = \left(\frac{U_t \times CF}{0.4} \right) \times \ln \left(\frac{H}{z_0} \right) \quad \text{(Equation 25)}$$

$$x = 0.886 \times \left(\frac{U_{t_{adj}}}{U_m} \right) \quad \text{(Equation 26)}$$

where,

Parameter	Definition	Units	Default
E _w	Particulate emissions due to wind erosion	g/m ² -s	
	– Residential		6.9E-08
	– Non-residential		1.2E-07
0.036	Respirable fraction emission rate	g/m ² -s	
V	Fraction of vegetative cover:	%	
	– Residential		50% (0.5)
	– Non-residential		10% (0.1)
U _m	Michigan mean annual wind speed adjusted to H	m/s	4.16
H	Default height	m	7
U _{mz}	Michigan measured annual average	m/s	3.94

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	windspeed		
Z	Wind speed measurement height	m	10.0
U _{tadj}	Adjusted threshold friction velocity at 7 m height	m/s	9.51
U _t	Equivalent threshold friction velocity for a 0.35 mm mode soil aggregate size	m/s	0.42
z ₀	Roughness height	m	0.005
CF	Correction factor to account for non-erodible elements	unitless	1.25
X	U _{tadj} /U _m derived using Cowherd et al. (1985)		2.136
F(x)	Function dependent on U _m /U _t derived using Cowherd et al. (1985)	unitless	0.194

b. The particulate emissions due to vehicle traffic (E_v) shall be calculated using the following equations:

$$E_v = \frac{E_{10} \times VT \times DL \times T \times CF_1}{A \times CF_2 \times CF_3} \quad \text{(Equation 27)}$$

where,

Parameter	Definition	Units	Residential	Non-residential
E _v	Emissions due to vehicle	g/m ² -s	7.4E-07	5.2E-06
A	Area of site excluding house or building	m ²	1,965	3930
CF ₁	Conversion factor	g/kg	1,000	1,000
E ₁₀	PM ₁₀ emissions in kg/vehicle-km travel	kg/V-km	0.326	1.155
VT	Number of vehicle trips (one way) /day	unitless	20	50
DL	Length of unpaved driveway	m	20	45
T	Time duration	days/year	350	250
CF ₂	Conversion factor	m/Km	1,000	1,000
CF ₃	Conversion factor	sec/year	3.2E+07	3.2E+07

c. The PM₁₀ emission factors (E₁₀) shall be calculated using the following equations:

(i) for residential land use

$$E_{10} = \frac{\left[k \times \left(\frac{s}{12} \right)^a \times \left(\frac{S}{30} \right)^d \times \left(\frac{365-p}{365} \right) \times CF \right]}{\left(\frac{M}{0.5} \right)^c} - C \quad \text{(Equation 28)}$$

where,

Parameter	Definition	Units	Default
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E ₁₀	PM ₁₀ emissions in kg/vehicle-km travel	kg/V-km	0.326
CF	Conversion factor	kg/V-km per lb/VMT	0.2819
k	Particle size multiplier for PM ₁₀	lb/VMT	1.8
s	Surface material silt content	%	15
S	Mean vehicle speed	miles/hr	20
a	Constant for PM ₁₀	unitless	1
c	Constant for PM ₁₀	unitless	0.2
d	Constant for PM ₁₀	unitless	0.5
M	Surface material moisture content	%	5
p	Mean number of days with 0.01 in precipitation	days	135
C	PM ₁₀ emission factor for vehicle exhaust and brake and tire wear	lb/VMT	0.00047

(ii) for non-residential land use

$$E_{10} = k \times \left(\frac{s}{12}\right)^a \times \left(\frac{W}{3}\right)^b \times \left(\frac{365-p}{365}\right) \times CF \quad \text{(Equation 29)}$$

where,

Parameter	Definition	Units	Default
E ₁₀	PM ₁₀ emissions in kg/vehicle-km travel	kg/V-km	1.15
CF	Conversion factor	kg/V-km per lb/VMT	0.2819
K	Particle size multiplier for PM ₁₀	lb/VMT	1.8
S	Surface material silt content	%	15
W	Mean vehicle weight	tons	50
A	Constant for PM ₁₀	unit less	0.9
B	Constant for PM ₁₀	unit less	0.45
P	Mean number of days with 0.01 inch precipitation	days	135

d. The inhalation components of the residential and non-residential soil criteria presented in the criteria table have been calculated using dispersion factors (Q/C) for a 32 and 100 acre-source area size, respectively. For other source area sizes, the applicable soil criterion shall be established or modified using the Q/C or Modifier given in the following table:

Source Area Size, Q/C, and Modifier Table

Source Area Size (sq. ft. or acres)	Q/C (g/m ² -s kg/m ³)	Residential Soil Criterion Modifier	Non-residential Soil Criterion Modifier
100 sq ft	439.22	13.78	16.27
400 sq ft	185.8	5.83	6.88

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1000 sq ft	126.57	3.97	4.69
2000 sq ft	103.79	3.26	3.84
1/2 acre	62.27	1.95	2.31
1 acre	55.03	1.73	2.04
5 acres	41.91	1.31	1.55
10 acres	38.04	1.19	1.41
32 acres	31.88	1	1.18
100 acres	27	0.85	1
200 acres	24.48	0.77	0.91
300 acres	23.16	0.73	0.86
500 acres	21.6	0.68	0.80
1000 acres	19.49	0.61	0.72
1500 acres	18.34	0.58	0.68

(7) To demonstrate compliance with the residential and nonresidential soil cleanup criteria, the criteria shall be applied without regard to the depth of the contaminated soil.