Regional Screening Levels (RSLs) - Equations

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To download the most recent Regional Screening Level tables, please go to the Generic Tables <https://epa.gov/risk/regional-screening-levels-rsls-generic-tables> page. For assistance/questions please use the RSL C <https://epa.gov/risk/forms/contact-us-about-regional-screening-levels-rsls>ontact Us <https://epa.gov/risk/forms/contact-us-about-regional-screening-levels-rsls> page.

The Regional Screening Level (RSL) Equations Page provides quick access to the equations used in chemical risk assessments. The equations contain the defaults for the exposure parameters.

- **Resident**
- **Composite Worker**
- **Outdoor Worker**
- **Indoor Worker**
- **Construction Worker**
- **Recreator**
- **Fish Ingestion**
- **Soil to Groundwater**

Regional Screening Levels (RSLs)

- Home Page <https://epa.gov/risk/regional-screening-levels-rsls>
- User's Guide <https://epa.gov/risk/regional-screening-levels-rsls-users-guide>
- What's New <https://epa.gov/risk/regional-screening-levels-rsls-whats-new>

- **Supporting Equations**

Resident

Resident Soil

This land use is for developing residential default screening levels that are presented in the RSL Generic Tables.

- Frequent Questions <https://epa.gov/risk/regional-screening-levels-rsls-frequent-questions>
- Equations <https://epa.gov/risk/regional-screening-levels-rsls-equations>
- RSL Calculator <https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search>
- Generic Tables <https://epa.gov/risk/regional-screening-levels-rsls-generic-tables>
- Contact Us <https://epa.gov/risk/forms/contact-us-about-regional-screening-levels-rsls>

- **Noncarcinogenic-child**
  - Ingestion

$$SL_{res\text{-}sol\text{-}ingnc}\left(\frac{mg}{kg}\right) = \frac{THQ \times AT_{res\text{-}c}\left(\frac{365\ days}{yr} \times ED_{res\text{-}c}(6\ yr)\right) \times BW_{res\text{-}c}(15\ kg)}{\left(\frac{RBA}{RfD_o\left(\frac{mg}{kg-day}\right)}\right) \times \left(\frac{10^{-6}\ kg}{mg}\right) \times EF_{res\text{-}c}\left(\frac{350\ days}{yr}\right) \times ED_{res\text{-}c}(6\ yr) \times IRS_{res\text{-}c}\left(\frac{200\ mg}{day}\right)}$$

  - Dermal

$$SL_{res\text{-}sol\text{-}dernc}\left(\frac{mg}{kg}\right) = \frac{THQ \times AT_{res\text{-}c}\left(\frac{365\ days}{yr} \times ED_{res\text{-}c}(6\ yr)\right) \times BW_{res\text{-}c}(15\ kg)}{\left(\frac{1}{RfD_o\left(\frac{mg}{kg-day}\right) \times GIABS}\right) \times \left(\frac{10^{-6}\ kg}{mg}\right) \times EF_{res\text{-}c}\left(\frac{350\ days}{yr}\right) \times ED_{res\text{-}c}(6\ yr) \times SA_{res\text{-}c}\left(\frac{2{,}373\ cm^2}{day}\right) \times AF_{res\text{-}c}\left(\frac{0.2\ mg}{cm^2}\right) \times ABS_d}$$

  - Inhalation

$$SL_{res\text{-}sol\text{-}inhnc}\left(\frac{mg}{kg}\right) = \frac{THQ \times AT_{res\text{-}c}\left(\frac{365\ days}{yr} \times ED_{res\text{-}c}(6\ yr)\right)}{\left(\frac{1}{RfC\left(\frac{mg}{m^3}\right)}\right) \times EF_{res\text{-}c}\left(\frac{350\ days}{yr}\right) \times ED_{res\text{-}c}(6\ yr) \times ET_{res\text{-}c}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times \left(\frac{1}{VF_{ulim}\left(\frac{m^3}{kg}\right)} + \frac{1}{PEF\left(\frac{m^3}{kg}\right)}\right)}$$

  - Total

$$SL_{res\text{-}sol\text{-}totnc}\left(\frac{mg}{kg}\right) = \frac{1}{\frac{1}{SL_{res\text{-}sol\text{-}ingnc}} + \frac{1}{SL_{res\text{-}sol\text{-}inhnc}} + \frac{1}{SL_{res\text{-}sol\text{-}dernc}}}$$

- **Noncarcinogenic-adult**
  - Ingestion

$$SL_{res-sol-ingna}\left(\frac{mg}{kg}\right) = \frac{THQ \times AT_{res-a}\left(\frac{365\ days}{yr} \times ED_{res}(26\ yr)\right) \times BW_{res-a}(80\ kg)}{\left(\frac{RBA}{RfD_o\left(\frac{mg}{kg-day}\right)}\right) \times \left(\frac{10^{-6}\ kg}{mg}\right) \times EF_{res-a}\left(\frac{350\ days}{yr}\right) \times ED_{res}(26\ yr) \times IRS_{res-a}\left(\frac{100\ mg}{day}\right)}$$

  - Dermal

$$SL_{res-sol-derna}\left(\frac{mg}{kg}\right) = \frac{THQ \times AT_{res-a}\left(\frac{365\ days}{yr} \times ED_{res}(26\ yr)\right) \times BW_{res-a}(80\ kg)}{\left(\frac{1}{RfD_o\left(\frac{mg}{kg-day}\right) \times GIABS}\right) \times \left(\frac{10^{-6}\ kg}{mg}\right) \times EF_{res-a}\left(\frac{350\ days}{yr}\right) \times ED_{res}(26\ yr) \times SA_{res-a}\left(\frac{6{,}032\ cm^2}{day}\right) \times AF_{res-a}\left(\frac{0.07\ mg}{cm^2}\right) \times ABS_d}$$

  - Inhalation

$$SL_{res-sol-inhna}\left(\frac{mg}{kg}\right) = \frac{THQ \times AT_{res-a}\left(\frac{365\ days}{yr} \times ED_{res}(26\ yr)\right)}{\left(\frac{1}{RfC\left(\frac{mg}{m^3}\right)}\right) \times EF_{res-a}\left(\frac{350\ days}{yr}\right) \times ED_{res}(26\ yr) \times ET_{res-a}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times \left(\frac{1}{VF_{ulim}\left(\frac{m^3}{kg}\right)} + \frac{1}{PEF\left(\frac{m^3}{kg}\right)}\right)}$$

  - Total

$$SL_{res-sol-totna}\left(\frac{mg}{kg}\right) = \frac{1}{\frac{1}{SL_{res-sol-ingna}} + \frac{1}{SL_{res-sol-inhna}} + \frac{1}{SL_{res-sol-derna}}}$$

- **Carcinogenic**
  - Ingestion

$$SL_{res\text{-}sol\text{-}ingc}\left(\frac{mg}{kg}\right) = \frac{TR \times AT_{res}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{CSF_o\left(\frac{mg}{kg-day}\right)^{-1} \times \left(\frac{10^{-6}\ kg}{mg}\right) \times RBA \times IFS_{res\text{-}adj}\left(\frac{36,750\ mg}{kg}\right)}$$

where:

$$IFS_{res\text{-}adj}\left(\frac{36,750\ mg}{kg}\right) = \left[\frac{EF_{res\text{-}c}\left(\frac{350\ days}{yr}\right) \times ED_{res\text{-}c}(6\ yr) \times IRS_{res\text{-}c}\left(\frac{200\ mg}{day}\right)}{BW_{res\text{-}c}(15\ kg)} + \frac{EF_{res\text{-}a}\left(\frac{350\ days}{yr}\right) \times ED_{res\text{-}a}(20\ yr) \times IRS_{res\text{-}a}\left(\frac{100\ mg}{day}\right)}{BW_{res\text{-}a}(80\ kg)}\right]$$

  - Dermal

$$SL_{res\text{-}sol\text{-}derc}\left(\frac{mg}{kg}\right) = \frac{TR \times AT_{res}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{\left(\frac{CSF_o\left(\frac{mg}{kg-day}\right)^{-1}}{GIABS}\right) \times \left(\frac{10^{-6}\ kg}{mg}\right) \times DFS_{res\text{-}adj}\left(\frac{103,390\ mg}{kg}\right) \times ABS_d}$$

where:

$$DFS_{res\text{-}adj}\left(\frac{103,390\ mg}{kg}\right) = \left[\frac{EF_{res\text{-}c}\left(\frac{350\ days}{yr}\right) \times ED_{res\text{-}c}(6\ yr) \times SA_{res\text{-}c}\left(\frac{2,373\ cm^2}{day}\right) \times AF_{res\text{-}c}\left(\frac{0.2\ mg}{cm^2}\right)}{BW_{res\text{-}c}(15\ kg)} + \frac{EF_{res\text{-}a}\left(\frac{350\ days}{yr}\right) \times ED_{res\text{-}a}(20\ yr) \times SA_{res\text{-}a}\left(\frac{6,032\ cm^2}{day}\right) \times AF_{res\text{-}a}\left(\frac{0.07\ mg}{cm^2}\right)}{BW_{res\text{-}a}(80\ kg)}\right]$$

  - Inhalation

$$SL_{res\text{-}sol\text{-}inhc}\left(\frac{mg}{kg}\right) = \frac{TR \times AT_{res}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{IUR\left(\frac{\mu g}{m^3}\right)^{-1} \times \left(\frac{1000\ \mu g}{mg}\right) \times EF_{res}\left(\frac{350\ days}{yr}\right) \times ED_{res}(26\ yr) \times ET_{res}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times \left(\frac{1}{VF_{ulim}\left(\frac{m^3}{kg}\right)} + \frac{1}{PEF\left(\frac{m^3}{kg}\right)}\right)}$$

- Total

$$SL_{res\text{-}sol\text{-}totc}\left(\frac{mg}{kg}\right) = \frac{1}{\frac{1}{SL_{res\text{-}sol\text{-}ingc}} + \frac{1}{SL_{res\text{-}sol\text{-}inhc}} + \frac{1}{SL_{res\text{-}sol\text{-}derc}}}$$

- **Mutagenic**
  - Ingestion

$$SL_{res\text{-}sol\text{-}ingmu}\left(\frac{mg}{kg}\right) = \frac{TR \times AT_{res}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{CSF_o\left(\frac{mg}{kg-day}\right)^{-1} \times \left(\frac{10^{-6}\ kg}{mg}\right) \times RBA \times IFSM_{res\text{-}adj}\left(\frac{166,833.3\ mg}{kg}\right)}$$

where:

$$IFSM_{res\text{-}adj}\left(\frac{166,833.3\ mg}{kg}\right) = \left[\begin{array}{l} \frac{EF_{0-2}\left(\frac{350\ days}{yr}\right) \times ED_{0-2}(2\ yr) \times IRS_{0-2}\left(\frac{200\ mg}{day}\right) \times 10}{BW_{0-2}\,(15\ kg)} + \\ \frac{EF_{2-6}\left(\frac{350\ days}{yr}\right) \times ED_{2-6}(4\ yr) \times IRS_{2-6}\left(\frac{200\ mg}{day}\right) \times 3}{BW_{2-6}\,(15\ kg)} + \\ \frac{EF_{6-16}\left(\frac{350\ days}{yr}\right) \times ED_{6-16}(10\ yr) \times IRS_{6-16}\left(\frac{100\ mg}{day}\right) \times 3}{BW_{6-16}\,(80\ kg)} + \\ \frac{EF_{16-26}\left(\frac{350\ days}{yr}\right) \times ED_{16-26}(10\ yr) \times IRS_{16-26}\left(\frac{100\ mg}{day}\right) \times 1}{BW_{16-26}\,(80\ kg)} \end{array}\right]$$

  - Dermal

$$SL_{res\text{-}sol\text{-}dermu}\left(\frac{mg}{kg}\right) = \frac{TR \times AT_{res}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{\left(\frac{CSF_o\left(\frac{mg}{kg-day}\right)^{-1}}{GIABS}\right) \times \left(\frac{10^{-6}\ kg}{mg}\right) \times DFSM_{res\text{-}adj}\left(\frac{428,260\ mg}{kg}\right) \times ABS_d}$$

where:

$$DFSM_{res\text{-}adj}\left(\frac{428,260\ mg}{kg}\right) = \left[\begin{array}{l} \frac{EF_{0-2}\left(\frac{350\ days}{yr}\right) \times ED_{0-2}(2\ yr) \times SA_{0-2}\left(\frac{2,373\ cm^2}{day}\right) \times AF_{0-2}\left(\frac{0.2\ mg}{cm^2}\right) \times 10}{BW_{0-2}\,(15\ kg)} + \\ \frac{EF_{2-6}\left(\frac{350\ days}{yr}\right) \times ED_{2-6}(4\ yr) \times SA_{2-6}\left(\frac{2,373\ cm^2}{day}\right) \times AF_{2-6}\left(\frac{0.2\ mg}{cm^2}\right) \times 3}{BW_{2-6}\,(15\ kg)} + \\ \frac{EF_{6-16}\left(\frac{350\ days}{yr}\right) \times ED_{6-16}(10\ yr) \times SA_{6-16}\left(\frac{6,032\ cm^2}{day}\right) \times AF_{6-16}\left(\frac{0.07\ mg}{cm^2}\right) \times 3}{BW_{6-16}\,(80\ kg)} + \\ \frac{EF_{16-26}\left(\frac{350\ days}{yr}\right) \times ED_{16-26}(10\ yr) \times SA_{16-26}\left(\frac{6,032\ cm^2}{day}\right) \times AF_{16-26}\left(\frac{0.07\ mg}{cm^2}\right) \times 1}{BW_{16-26}\,(80\ kg)} \end{array}\right]$$

- Inhalation

$$SL_{res\text{-}sol\text{-}inhmu}\left(\frac{mg}{kg}\right) = \frac{TR \times AT_{res}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{IUR\left(\frac{\mu g}{m^3}\right)^{-1} \times \left(\frac{1000\ \mu g}{mg}\right) \times \left(\frac{1}{VF_{ulim}\left(\frac{m^3}{kg}\right)} + \frac{1}{PEF\left(\frac{m^3}{kg}\right)}\right) \times \left[\begin{array}{l} \left(EF_{0\text{-}2}\left(\frac{350\ days}{yr}\right) \times ED_{0\text{-}2}(2\ yr) \times ET_{0\text{-}2}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times 10\right) + \\ \left(EF_{2\text{-}6}\left(\frac{350\ days}{yr}\right) \times ED_{2\text{-}6}(4\ yr) \times ET_{2\text{-}6}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times 3\right) + \\ \left(EF_{6\text{-}16}\left(\frac{350\ days}{yr}\right) \times ED_{6\text{-}16}(10\ yr) \times ET_{6\text{-}16}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times 3\right) + \\ \left(EF_{16\text{-}26}\left(\frac{350\ days}{yr}\right) \times ED_{16\text{-}26}(10\ yr) \times ET_{16\text{-}26}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times 1\right) \end{array}\right]}$$

- Total

$$SL_{res\text{-}sol\text{-}totmu}\left(\frac{mg}{kg}\right) = \frac{1}{\frac{1}{SL_{res\text{-}sol\text{-}ingmu}} + \frac{1}{SL_{res\text{-}sol\text{-}inhmu}} + \frac{1}{SL_{res\text{-}sol\text{-}dermu}}}$$

- **Vinyl Chloride**
  - Ingestion

$$SL_{res\text{-}sol\text{-}ingvc}\left(\frac{mg}{kg}\right) = \frac{TR}{\left(\left(\frac{CSF_o\left(\frac{mg}{kg-day}\right)^{-1} \times \left(\frac{10^{-6}\ kg}{mg}\right) \times RBA \times IFS_{res\text{-}adj}\left(\frac{36,750\ mg}{kg}\right)}{AT_{res}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}\right) + \left(\frac{CSF_o\left(\frac{mg}{kg-day}\right)^{-1} \times \left(\frac{10^{-6}\ kg}{mg}\right) \times RBA \times IRS_{res\text{-}c}\left(\frac{200\ mg}{day}\right)}{BW_{res\text{-}c}\,(15\ kg)}\right)\right)}$$

where:

$$IFS_{res\text{-}adj}\left(\frac{36,750\ mg}{kg}\right) = \left[\frac{EF_{res\text{-}c}\left(\frac{350\ days}{yr}\right) \times ED_{res\text{-}c}\,(6\ yr) \times IRS_{res\text{-}c}\left(\frac{200\ mg}{day}\right)}{BW_{res\text{-}c}\,(15\ kg)} + \frac{EF_{res\text{-}a}\left(\frac{350\ days}{yr}\right) \times ED_{res\text{-}a}\,(20\ yr) \times IRS_{res\text{-}a}\left(\frac{100\ mg}{day}\right)}{BW_{res\text{-}a}\,(80\ kg)}\right]$$

  - Dermal

$$SL_{res\text{-}sol\text{-}dervc}\left(\frac{mg}{kg}\right) = \frac{TR}{\left(\left(\frac{\frac{CSF_o\left(\frac{mg}{kg-day}\right)^{-1}}{GIABS} \times \left(\frac{10^{-6}\ kg}{mg}\right) \times DFS_{res\text{-}adj}\left(\frac{103,390\ mg}{kg}\right) \times ABS_d}{AT_{res}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}\right) + \left(\frac{\frac{CSF_o\left(\frac{mg}{kg-day}\right)^{-1}}{GIABS} \times \left(\frac{10^{-6}\ kg}{mg}\right) \times SA_{res\text{-}c}\left(\frac{2,373\ cm^2}{day}\right) \times AF_{res\text{-}c}\left(\frac{0.2\ mg}{cm^2}\right) \times ABS_d}{BW_{res\text{-}c}\,(15\ kg)}\right)\right)}$$

where:

$$DFS_{res\text{-}adj}\left(\frac{103,390\ mg}{kg}\right) = \left[\frac{EF_{res\text{-}c}\left(\frac{350\ days}{yr}\right) \times ED_{res\text{-}c}\,(6\ yr) \times SA_{res\text{-}c}\left(\frac{2,373\ cm^2}{day}\right) \times AF_{res\text{-}c}\left(\frac{0.2\ mg}{cm^2}\right)}{BW_{res\text{-}c}\,(15\ kg)} + \frac{EF_{res\text{-}a}\left(\frac{350\ days}{yr}\right) \times ED_{res\text{-}a}\,(20\ yr) \times SA_{res\text{-}a}\left(\frac{6,032\ cm^2}{day}\right) \times AF_{res\text{-}a}\left(\frac{0.07\ mg}{cm^2}\right)}{BW_{res\text{-}a}\,(80\ kg)}\right]$$

- Inhalation

$$SL_{res\text{-}sol\text{-}inhvc}\left(\frac{mg}{kg}\right) = \frac{TR}{\left(\frac{IUR\left(\frac{\mu g}{m^3}\right)^{-1} \times \left(\frac{1000\ \mu g}{mg}\right) \times EF_{res}\left(\frac{350\ days}{yr}\right) \times ED_{res}(26\ yr) \times ET_{res}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right)}{AT_{res}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right) \times VF_{ulim}\left(\frac{m^3}{kg}\right)}\right) + \left(\frac{IUR\left(\frac{\mu g}{m^3}\right)^{-1}}{VF_{ulim}\left(\frac{m^3}{kg}\right)} \times \left(\frac{1000\ \mu g}{mg}\right)\right)}$$

- Total

$$SL_{res\text{-}sol\text{-}totvc}\left(\frac{mg}{kg}\right) = \frac{1}{\frac{1}{SL_{res\text{-}sol\text{-}ingvc}} + \frac{1}{SL_{res\text{-}sol\text{-}inhvc}} + \frac{1}{SL_{res\text{-}sol\text{-}dervc}}}$$

- **Trichloroethylene**
  - Ingestion

$$SL_{res\text{-}sol\text{-}ingtce}\left(\frac{mg}{kg}\right) = \frac{TR \times AT_{res}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{CSF_o\left(\frac{mg}{kg-day}\right)^{-1} \times \left(\frac{10^{-6}\ kg}{mg}\right) \times RBA \times \left(\begin{array}{l}\left(CAF_o(0.804) \times IFS_{res\text{-}adj}\left(\frac{36{,}750\ mg}{kg}\right)\right) + \\ \left(MAF_o(0.202) \times IFSM_{res\text{-}adj}\left(\frac{166{,}833.3\ mg}{kg}\right)\right)\end{array}\right)}$$

where:

$$IFS_{res\text{-}adj}\left(\frac{36{,}750\ mg}{kg}\right) = \left[\begin{array}{l}\frac{EF_{res\text{-}c}\left(\frac{350\ days}{yr}\right) \times ED_{res\text{-}c}(6\ yr) \times IRS_{res\text{-}c}\left(\frac{200\ mg}{day}\right)}{BW_{res\text{-}c}(15\ kg)} + \\ \frac{EF_{res\text{-}a}\left(\frac{350\ days}{yr}\right) \times ED_{res\text{-}a}(20\ yr) \times IRS_{res\text{-}a}\left(\frac{100\ mg}{day}\right)}{BW_{res\text{-}a}(80\ kg)}\end{array}\right]$$

and:

$$IFSM_{res\text{-}adj}\left(\frac{166{,}833.3\ mg}{kg}\right) = \left[\begin{array}{l}\frac{EF_{0\text{-}2}\left(\frac{350\ days}{yr}\right) \times ED_{0\text{-}2}(2\ yr) \times IRS_{0\text{-}2}\left(\frac{200\ mg}{day}\right) \times 10}{BW_{0\text{-}2}(15\ kg)} + \\ \frac{EF_{2\text{-}6}\left(\frac{350\ days}{yr}\right) \times ED_{2\text{-}6}(4\ yr) \times IRS_{2\text{-}6}\left(\frac{200\ mg}{day}\right) \times 3}{BW_{2\text{-}6}(15\ kg)} + \\ \frac{EF_{6\text{-}16}\left(\frac{350\ days}{yr}\right) \times ED_{6\text{-}16}(10\ yr) \times IRS_{6\text{-}16}\left(\frac{100\ mg}{day}\right) \times 3}{BW_{6\text{-}16}(80\ kg)} + \\ \frac{EF_{16\text{-}26}\left(\frac{350\ days}{yr}\right) \times ED_{16\text{-}26}(10\ yr) \times IRS_{16\text{-}26}\left(\frac{100\ mg}{day}\right) \times 1}{BW_{16\text{-}26}(80\ kg)}\end{array}\right]$$

- Dermal

$$SL_{res\text{-}sol\text{-}dertce}\left(\frac{mg}{kg}\right) = \frac{TR \times AT_{res}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{\left(\frac{CSF_o\left(\frac{mg}{kg-day}\right)^{-1}}{GIABS}\right) \times \left(\frac{10^{-6}\ kg}{mg}\right) \times \left(\begin{array}{l}\left(CAF_o(0.804) \times DFS_{res\text{-}adj}\left(\frac{103,390\ mg}{kg}\right) \times ABS_d\right) + \\ \left(MAF_o(0.202) \times DFSM_{res\text{-}adj}\left(\frac{428,260\ mg}{kg}\right) \times ABS_d\right)\end{array}\right)}$$

where:

$$DFS_{res\text{-}adj}\left(\frac{103,390\ mg}{kg}\right) = \left[\begin{array}{l}\frac{EF_{res\text{-}c}\left(\frac{350\ days}{yr}\right) \times ED_{res\text{-}c}(6\ yr) \times SA_{res\text{-}c}\left(\frac{2,373\ cm^2}{day}\right) \times AF_{res\text{-}c}\left(\frac{0.2\ mg}{cm^2}\right)}{BW_{res\text{-}c}(15\ kg)} + \\ \frac{EF_{res\text{-}a}\left(\frac{350\ days}{yr}\right) \times ED_{res\text{-}a}(20\ yr) \times SA_{res\text{-}a}\left(\frac{6,032\ cm^2}{day}\right) \times AF_{res\text{-}a}\left(\frac{0.07\ mg}{cm^2}\right)}{BW_{res\text{-}a}(80\ kg)}\end{array}\right]$$

and:

$$DFSM_{res\text{-}adj}\left(\frac{428,260\ mg}{kg}\right) = \left[\begin{array}{l}\frac{EF_{0\text{-}2}\left(\frac{350\ days}{yr}\right) \times ED_{0\text{-}2}(2\ yr) \times SA_{0\text{-}2}\left(\frac{2,373\ cm^2}{day}\right) \times AF_{0\text{-}2}\left(\frac{0.2\ mg}{cm^2}\right) \times 10}{BW_{0\text{-}2}(15\ kg)} + \\ \frac{EF_{2\text{-}6}\left(\frac{350\ days}{yr}\right) \times ED_{2\text{-}6}(4\ yr) \times SA_{2\text{-}6}\left(\frac{2,373\ cm^2}{day}\right) \times AF_{2\text{-}6}\left(\frac{0.2\ mg}{cm^2}\right) \times 3}{BW_{2\text{-}6}(15\ kg)} + \\ \frac{EF_{6\text{-}16}\left(\frac{350\ days}{yr}\right) \times ED_{6\text{-}16}(10\ yr) \times SA_{6\text{-}16}\left(\frac{6,032\ cm^2}{day}\right) \times AF_{6\text{-}16}\left(\frac{0.07\ mg}{cm^2}\right) \times 3}{BW_{6\text{-}16}(80\ kg)} + \\ \frac{EF_{16\text{-}26}\left(\frac{350\ days}{yr}\right) \times ED_{16\text{-}26}(10\ yr) \times SA_{16\text{-}26}\left(\frac{6,032\ cm^2}{day}\right) \times AF_{16\text{-}26}\left(\frac{0.07\ mg}{cm^2}\right) \times 1}{BW_{16\text{-}26}(80\ kg)}\end{array}\right]$$

- Inhalation

$$SL_{res\text{-}sol\text{-}inhtce}\left(\frac{mg}{kg}\right) = \frac{TR \times AT_{res}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{IUR\left(\frac{\mu g}{m^3}\right)^{-1} \times \left(\frac{1000\ \mu g}{mg}\right) \times \left(\frac{1}{VF_{ulim}\left(\frac{m^3}{kg}\right)} + \frac{1}{PEF\left(\frac{m^3}{kg}\right)}\right) \times \left[\begin{array}{l}\left(EF_{res}\left(\frac{350\ days}{yr}\right) \times ED_{res}(26\ yr) \times ET_{res}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times CAF_i(0.756)\right) + \\ \left(EF_{0\text{-}2}\left(\frac{350\ days}{yr}\right) \times ED_{0\text{-}2}(2\ yr) \times ET_{0\text{-}2}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times MAF_i(0.244) \times 10\right) + \\ \left(EF_{2\text{-}6}\left(\frac{350\ days}{yr}\right) \times ED_{2\text{-}6}(4\ yr) \times ET_{2\text{-}6}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times MAF_i(0.244) \times 3\right) + \\ \left(EF_{6\text{-}16}\left(\frac{350\ days}{yr}\right) \times ED_{6\text{-}16}(10\ yr) \times ET_{6\text{-}16}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times MAF_i(0.244) \times 3\right) + \\ \left(EF_{16\text{-}26}\left(\frac{350\ days}{yr}\right) \times ED_{16\text{-}26}(10\ yr) \times ET_{16\text{-}26}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times MAF_i(0.244) \times 1\right)\end{array}\right]}$$

- Total

$$SL_{res\text{-}sol\text{-}tottce}\left(\frac{mg}{kg}\right) = \frac{1}{\frac{1}{SL_{res\text{-}sol\text{-}ingtce}} + \frac{1}{SL_{res\text{-}sol\text{-}inhtce}} + \frac{1}{SL_{res\text{-}sol\text{-}dertce}}}$$

- **Supporting Equations**
  - Child

$$ED_{res\text{-}c}(6\ yr) = ED_{0\text{-}2}(2\ yr) + ED_{2\text{-}6}(4\ yr)$$

$$BW_{res\text{-}c}(15\ kg) = \frac{ED_{0\text{-}2}(2\ yr) \times BW_{0\text{-}2}(15\ kg) + ED_{2\text{-}6}(4\ yr) \times BW_{2\text{-}6}(15\ kg)}{ED_{0\text{-}2}(2\ yr) + ED_{2\text{-}6}(4\ yr)}$$

$$EF_{res\text{-}c}\left(\frac{350\ days}{yr}\right) = \frac{ED_{0\text{-}2}(2\ yr) \times EF_{0\text{-}2}\left(\frac{350\ days}{yr}\right) + ED_{2\text{-}6}(4\ yr) \times EF_{2\text{-}6}\left(\frac{350\ days}{yr}\right)}{ED_{0\text{-}2}(2\ yr) + ED_{2\text{-}6}(4\ yr)}$$

$$ET_{res\text{-}c}\left(\frac{24\ hrs}{day}\right) = \frac{ED_{0\text{-}2}(2\ yr) \times ET_{0\text{-}2}\left(\frac{24\ hrs}{day}\right) + ED_{2\text{-}6}(4\ yr) \times ET_{2\text{-}6}\left(\frac{24\ hrs}{day}\right)}{ED_{0\text{-}2}(2\ yr) + ED_{2\text{-}6}(4\ yr)}$$

$$AF_{res\text{-}c}\left(\frac{0.2\ mg}{cm^2}\right) = \frac{ED_{0\text{-}2}(2\ yr) \times AF_{0\text{-}2}\left(\frac{0.2\ mg}{cm^2}\right) + ED_{2\text{-}6}(4\ yr) \times AF_{2\text{-}6}\left(\frac{0.2\ mg}{cm^2}\right)}{ED_{0\text{-}2}(2\ yr) + ED_{2\text{-}6}(4\ yr)}$$

$$SA_{res\text{-}c}\left(\frac{2{,}373\ cm^2}{day}\right) = \frac{ED_{0\text{-}2}(2\ yr) \times SA_{0\text{-}2}\left(\frac{2{,}373\ cm^2}{day}\right) + ED_{2\text{-}6}(4\ yr) \times SA_{2\text{-}6}\left(\frac{2{,}373\ cm^2}{day}\right)}{ED_{0\text{-}2}(2\ yr) + ED_{2\text{-}6}(4\ yr)}$$

$$IRS_{res\text{-}c}\left(\frac{200\ mg}{day}\right) = \frac{ED_{0\text{-}2}(2\ yr) \times IRS_{0\text{-}2}\left(\frac{200\ mg}{day}\right) + ED_{2\text{-}6}(4\ yr) \times IRS_{2\text{-}6}\left(\frac{200\ mg}{day}\right)}{ED_{0\text{-}2}(2\ yr) + ED_{2\text{-}6}(4\ yr)}$$

- Adult

$$ED_{res\text{-}a}\,(20\ \text{yr}) = ED_{6\text{-}16}\,(10\ \text{yr}) + ED_{16\text{-}26}\,(10\ \text{yr})$$

$$BW_{res\text{-}a}\,(80\ \text{kg}) = \frac{ED_{6\text{-}16}\,(10\ \text{yr}) \times BW_{6\text{-}16}\,(80\ \text{kg}) + ED_{16\text{-}26}\,(10\ \text{yr}) \times BW_{16\text{-}26}\,(80\ \text{kg})}{ED_{6\text{-}16}\,(10\ \text{yr}) + ED_{16\text{-}26}\,(10\ \text{yr})}$$

$$EF_{res\text{-}a}\left(\frac{350\ \text{days}}{\text{yr}}\right) = \frac{ED_{6\text{-}16}\,(10\ \text{yr}) \times EF_{6\text{-}16}\left(\frac{350\ \text{days}}{\text{yr}}\right) + ED_{16\text{-}26}\,(10\ \text{yr}) \times EF_{16\text{-}26}\left(\frac{350\ \text{days}}{\text{yr}}\right)}{ED_{6\text{-}16}\,(10\ \text{yr}) + ED_{16\text{-}26}\,(10\ \text{yr})}$$

$$ET_{res\text{-}a}\left(\frac{24\ \text{hrs}}{\text{day}}\right) = \frac{ED_{6\text{-}16}\,(10\ \text{yr}) \times ET_{6\text{-}16}\left(\frac{24\ \text{hrs}}{\text{day}}\right) + ED_{16\text{-}26}\,(10\ \text{yr}) \times ET_{16\text{-}26}\left(\frac{24\ \text{hrs}}{\text{day}}\right)}{ED_{6\text{-}16}\,(10\ \text{yr}) + ED_{16\text{-}26}\,(10\ \text{yr})}$$

$$AF_{res\text{-}a}\left(\frac{0.07\ \text{mg}}{\text{cm}^2}\right) = \frac{ED_{6\text{-}16}\,(10\ \text{yr}) \times AF_{6\text{-}16}\left(\frac{0.07\ \text{mg}}{\text{cm}^2}\right) + ED_{16\text{-}26}\,(10\ \text{yr}) \times AF_{16\text{-}26}\left(\frac{0.07\ \text{mg}}{\text{cm}^2}\right)}{ED_{6\text{-}16}\,(10\ \text{yr}) + ED_{16\text{-}26}\,(10\ \text{yr})}$$

$$SA_{res\text{-}a}\left(\frac{6{,}032\ \text{cm}^2}{\text{day}}\right) = \frac{ED_{6\text{-}16}\,(10\ \text{yr}) \times SA_{6\text{-}16}\left(\frac{6{,}032\ \text{cm}^2}{\text{day}}\right) + ED_{16\text{-}26}\,(10\ \text{yr}) \times SA_{16\text{-}26}\left(\frac{6{,}032\ \text{cm}^2}{\text{day}}\right)}{ED_{6\text{-}16}\,(10\ \text{yr}) + ED_{16\text{-}26}\,(10\ \text{yr})}$$

$$IRS_{res\text{-}a}\left(\frac{100\ \text{mg}}{\text{day}}\right) = \frac{ED_{6\text{-}16}\,(10\ \text{yr}) \times IRS_{6\text{-}16}\left(\frac{100\ \text{mg}}{\text{day}}\right) + ED_{16\text{-}26}\,(10\ \text{yr}) \times IRS_{16\text{-}26}\left(\frac{100\ \text{mg}}{\text{day}}\right)}{ED_{6\text{-}16}\,(10\ \text{yr}) + ED_{16\text{-}26}\,(10\ \text{yr})}$$

- Age-adjusted

$$ED_{res}(26\ yr) = ED_{0-2}(2\ yr) + ED_{2-6}(4\ yr) + ED_{6-16}(10\ yr) + ED_{16-26}(10\ yr)$$

$$EF_{res}\left(\frac{350\ days}{yr}\right) = \frac{\left(\begin{array}{c} ED_{0-2}(2\ yr) \times EF_{0-2}\left(\frac{350\ days}{yr}\right) + ED_{2-6}(4\ yr) \times EF_{2-6}\left(\frac{350\ days}{yr}\right) + \\ ED_{6-16}(10\ yr) \times EF_{6-16}\left(\frac{350\ days}{yr}\right) + ED_{16-26}(10\ yr) \times EF_{16-26}\left(\frac{350\ days}{yr}\right) \end{array}\right)}{ED_{0-2}(2\ yr) + ED_{2-6}(4\ yr) + ED_{6-16}(10\ yr) + ED_{16-26}(10\ yr)}$$

$$ET_{res}\left(\frac{24\ hrs}{day}\right) = \frac{\left(\begin{array}{c} ED_{0-2}(2\ yr) \times ET_{0-2}\left(\frac{24\ hrs}{day}\right) + ED_{2-6}(4\ yr) \times ET_{2-6}\left(\frac{24\ hrs}{day}\right) + \\ ED_{6-16}(10\ yr) \times ET_{6-16}\left(\frac{24\ hrs}{day}\right) + ED_{16-26}(10\ yr) \times ET_{16-26}\left(\frac{24\ hrs}{day}\right) \end{array}\right)}{ED_{0-2}(2\ yr) + ED_{2-6}(4\ yr) + ED_{6-16}(10\ yr) + ED_{16-26}(10\ yr)}$$

Resident Tap Water

This land use is for developing residential default screening levels that are presented in the RSL Generic Tables.

- **Noncarcinogenic-child**
  - Ingestion

$$SL_{res\text{-}wat\text{-}ingnc}\left(\frac{\mu g}{L}\right) = \frac{THQ \times AT_{res\text{-}c}\left(\frac{365\ days}{yr} \times ED_{res\text{-}c}(6\ yr)\right) \times BW_{res\text{-}c}(15\ kg)}{\left(\frac{1}{RfD_o\left(\frac{mg}{kg-day}\right)}\right) \times \left(\frac{mg}{1000\ \mu g}\right) \times EF_{res\text{-}c}\left(\frac{350\ days}{yr}\right) \times ED_{res\text{-}c}(6\ yr) \times IRW_{res\text{-}c}\left(\frac{0.78\ L}{day}\right)}$$

  - Dermal

For Inorganics:

$$SL_{res\text{-}wat\text{-}dernc}\left(\frac{\mu g}{L}\right) = \frac{DA_{event}\left(\frac{\mu g}{cm^2-event}\right) \times \left(\frac{1000\ cm^3}{L}\right)}{K_p\left(\frac{cm}{hr}\right) \times ET_{event\text{-}res\text{-}c}\left(\frac{0.54\ hrs}{event}\right)}$$

For Organics:

IF $ET_{event\text{-}res\text{-}c}\left(\frac{0.54\ hrs}{event}\right) \leq t^*\ (hrs)$, then:

$$SL_{res\text{-}wat\text{-}dernc}\left(\frac{\mu g}{L}\right) = \frac{DA_{event}\left(\frac{\mu g}{cm^2-event}\right) \times \left(\frac{1000\ cm^3}{L}\right)}{2 \times FA \times K_p\left(\frac{cm}{hr}\right) \times \sqrt{\frac{6 \times \tau_{event}\left(\frac{hrs}{event}\right) \times ET_{event\text{-}res\text{-}c}\left(\frac{0.54\ hrs}{event}\right)}{\pi}}}$$

or:

IF $ET_{event\text{-}res\text{-}c}\left(\frac{0.54\ hrs}{event}\right) > t^*\ (hrs)$, then:

$$SL_{res\text{-}wat\text{-}dernc}\left(\frac{\mu g}{L}\right) = \frac{DA_{event}\left(\frac{\mu g}{cm^2-event}\right) \times \left(\frac{1000\ cm^3}{L}\right)}{FA \times K_p\left(\frac{cm}{hr}\right) \times \left[\frac{ET_{event\text{-}res\text{-}c}\left(\frac{0.54\ hrs}{event}\right)}{1+B} + 2 \times \tau_{event}\left(\frac{hrs}{event}\right) \times \left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right]}$$

where:

$$DA_{event}\left(\frac{\mu g}{cm^2-event}\right) = \frac{THQ \times AT_{res\text{-}c}\left(\frac{365\ days}{yr} \times ED_{res\text{-}c}(6\ yr)\right) \times BW_{res\text{-}c}(15\ kg)}{\left(\frac{1}{RfD_o\left(\frac{mg}{kg-day}\right) \times GIABS}\right) \times \left(\frac{mg}{1000\ \mu g}\right) \times EF_{res\text{-}c}\left(\frac{350\ days}{yr}\right) \times ED_{res\text{-}c}(6\ yr) \times EV_{res\text{-}c}\left(\frac{1\ event}{day}\right) \times SA_{res\text{-}c}(6,365\ cm^2)}$$

  - Inhalation

$$SL_{res\text{-}wat\text{-}inhnc}\left(\frac{\mu g}{L}\right) = \frac{THQ \times AT_{res\text{-}c}\left(\frac{365\ days}{yr} \times ED_{res\text{-}c}(6\ yr)\right)}{\left(\frac{1}{RfC\left(\frac{mg}{m^3}\right)}\right) \times \left(\frac{mg}{1000\ \mu g}\right) \times EF_{res\text{-}c}\left(\frac{350\ days}{yr}\right) \times ED_{res\text{-}c}(6\ yr) \times ET_{res\text{-}c}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times K\left(\frac{0.5\ L}{m^3}\right)}$$

- Total

$$SL_{res\text{-}wat\text{-}totnc}\left(\frac{\mu g}{L}\right) = \frac{1}{\frac{1}{SL_{res\text{-}wat\text{-}ingnc}} + \frac{1}{SL_{res\text{-}wat\text{-}inhnc}} + \frac{1}{SL_{res\text{-}wat\text{-}dernc}}}$$

- **Noncarcinogenic-adult**
  - Ingestion

$$SL_{res\text{-}wat\text{-}ingna}\left(\frac{\mu g}{L}\right) = \frac{THQ \times AT_{res\text{-}a}\left(\frac{365\ days}{yr} \times ED_{res}(26\ yr)\right) \times BW_{res\text{-}a}(80\ kg)}{\left(\frac{1}{RfD_o\left(\frac{mg}{kg\text{-}day}\right)}\right) \times \left(\frac{mg}{1000\ \mu g}\right) \times EF_{res\text{-}a}\left(\frac{350\ days}{yr}\right) \times ED_{res}(26\ yr) \times IRW_{res\text{-}a}\left(\frac{2.5\ L}{day}\right)}$$

  - Dermal

For Inorganics:

$$SL_{res\text{-}wat\text{-}derna}\left(\frac{\mu g}{L}\right) = \frac{DA_{event}\left(\frac{\mu g}{cm^2\text{-}event}\right) \times \left(\frac{1000\ cm^3}{L}\right)}{K_p\left(\frac{cm}{hr}\right) \times ET_{event\text{-}res\text{-}a}\left(\frac{0.71\ hrs}{event}\right)}$$

For Organics:

IF $ET_{event\text{-}res\text{-}a}\left(\frac{0.71\ hrs}{event}\right) \leq t^*\ (hrs)$, then:

$$SL_{res\text{-}wat\text{-}derna}\left(\frac{\mu g}{L}\right) = \frac{DA_{event}\left(\frac{\mu g}{cm^2\text{-}event}\right) \times \left(\frac{1000\ cm^3}{L}\right)}{2 \times FA \times K_p\left(\frac{cm}{hr}\right) \times \sqrt{\frac{6 \times \tau_{event}\left(\frac{hrs}{event}\right) \times ET_{event\text{-}res\text{-}a}\left(\frac{0.71\ hrs}{event}\right)}{\pi}}}$$

or:

IF $ET_{event\text{-}res\text{-}a}\left(\frac{0.71\ hrs}{event}\right) > t^*\ (hrs)$, then:

$$SL_{res\text{-}wat\text{-}derna}\left(\frac{\mu g}{L}\right) = \frac{DA_{event}\left(\frac{\mu g}{cm^2\text{-}event}\right) \times \left(\frac{1000\ cm^3}{L}\right)}{FA \times K_p\left(\frac{cm}{hr}\right) \times \left[\frac{ET_{event\text{-}res\text{-}a}\left(\frac{0.71\ hrs}{event}\right)}{1 + B} + 2 \times \tau_{event}\left(\frac{hrs}{event}\right) \times \left(\frac{1 + 3B + 3B^2}{(1 + B)^2}\right)\right]}$$

where:

$$DA_{event}\left(\frac{\mu g}{cm^2\text{-}event}\right) = \frac{THQ \times AT_{res\text{-}a}\left(\frac{365\ days}{yr} \times ED_{res}(26\ yr)\right) \times BW_{res\text{-}a}(80\ kg)}{\left(\frac{1}{RfD_o\left(\frac{mg}{kg\text{-}day}\right) \times GIABS}\right) \times \left(\frac{mg}{1000\ \mu g}\right) \times EF_{res\text{-}a}\left(\frac{350\ days}{yr}\right) \times ED_{res}(26\ yr) \times EV_{res\text{-}a}\left(\frac{1\ event}{day}\right) \times SA_{res\text{-}a}\left(19{,}652\ cm^2\right)}$$

  - Inhalation

$$SL_{res\text{-}wat\text{-}inhna}\left(\frac{\mu g}{L}\right) = \frac{THQ \times AT_{res\text{-}a}\left(\frac{365\ days}{yr} \times ED_{res}(26\ yr)\right)}{\left(\frac{1}{RfC\left(\frac{mg}{m^3}\right)}\right) \times \left(\frac{mg}{1000\ \mu g}\right) \times EF_{res\text{-}a}\left(\frac{350\ days}{yr}\right) \times ED_{res}(26\ yr) \times ET_{res\text{-}a}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times K\left(\frac{0.5\ L}{m^3}\right)}$$

- Total

$$SL_{res\text{-}wat\text{-}totna}\left(\frac{\mu g}{L}\right) = \frac{1}{\frac{1}{SL_{res\text{-}wat\text{-}ingna}} + \frac{1}{SL_{res\text{-}wat\text{-}inhna}} + \frac{1}{SL_{res\text{-}wat\text{-}derna}}}$$

- **Carcinogenic**
  - Ingestion

$$SL_{res\text{-}wat\text{-}ingc}\left(\frac{\mu g}{L}\right) = \frac{TR \times AT_{res}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{CSF_O\left(\frac{mg}{kg-day}\right)^{-1} \times \left(\frac{mg}{1000\ \mu g}\right) \times IFW_{res\text{-}adj}\left(\frac{327.95\ L}{kg}\right)}$$

where:

$$IFW_{res\text{-}adj}\left(\frac{327.95\ L}{kg}\right) = \left[\frac{EF_{res\text{-}c}\left(\frac{350\ days}{yr}\right) \times ED_{res\text{-}c}(6\ yr) \times IRW_{res\text{-}c}\left(\frac{0.78\ L}{day}\right)}{BW_{res\text{-}c}(15\ kg)} + \frac{EF_{res\text{-}a}\left(\frac{350\ days}{yr}\right) \times ED_{res\text{-}a}(20\ yr) \times IRW_{res\text{-}a}\left(\frac{2.5\ L}{day}\right)}{BW_{res\text{-}a}(80\ kg)}\right]$$

- Dermal

For Inorganics:

$$SL_{res\text{-}wat\text{-}derc}\left(\frac{\mu g}{L}\right) = \frac{DA_{event}\left(\frac{\mu g}{cm^2\text{-}event}\right) \times \left(\frac{1000\ cm^3}{L}\right)}{K_p\left(\frac{cm}{hr}\right) \times ET_{event\text{-}res\text{-}adj}\left(\frac{0.671\ hrs}{event}\right)}$$

For Organics:

IF $ET_{event\text{-}res\text{-}adj}\left(\frac{0.671\ hrs}{event}\right) \leq t^*\ (hrs)$, then:

$$SL_{res\text{-}wat\text{-}derc}\left(\frac{\mu g}{L}\right) = \frac{DA_{event}\left(\frac{\mu g}{cm^2\text{-}event}\right) \times \left(\frac{1000\ cm^3}{L}\right)}{2 \times FA \times K_p\left(\frac{cm}{hr}\right) \times \sqrt{\frac{6 \times \tau_{event}\left(\frac{hrs}{event}\right) \times ET_{event\text{-}res\text{-}adj}\left(\frac{0.671\ hrs}{event}\right)}{\pi}}}$$

or:

IF $ET_{event\text{-}res\text{-}adj}\left(\frac{0.671\ hrs}{event}\right) > t^*\ (hrs)$, then:

$$SL_{res\text{-}wat\text{-}derc}\left(\frac{\mu g}{L}\right) = \frac{DA_{event}\left(\frac{\mu g}{cm^2\text{-}event}\right) \times \left(\frac{1000\ cm^3}{L}\right)}{FA \times K_p\left(\frac{cm}{hr}\right) \times \left[\frac{ET_{event\text{-}res\text{-}adj}\left(\frac{0.671\ hrs}{event}\right)}{1\ +\ B} + 2 \times \tau_{event}\left(\frac{hrs}{event}\right) \times \left(\frac{1\ +\ 3B\ +\ 3B^2}{(1\ +\ B)^2}\right)\right]}$$

where:

$$ET_{event\text{-}res\text{-}adj}\left(\frac{0.671\ hrs}{event}\right) = \left(\frac{\left(ED_{res\text{-}c}(6\ yr) \times ET_{event\text{-}res\text{-}c}\left(\frac{0.54\ hrs}{event}\right)\right) + \left(ED_{res\text{-}a}(20\ yr) \times ET_{event\text{-}res\text{-}a}\left(\frac{0.71\ hrs}{event}\right)\right)}{ED_{res}(26\ yr)}\right)$$

and:

$$DA_{event}\left(\frac{\mu g}{cm^2\text{-}event}\right) = \frac{TR \times AT_{res}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{\left(\frac{CSF_o\left(\frac{mg}{kg\text{-}day}\right)^{-1}}{GIABS}\right) \times \left(\frac{mg}{1000\ \mu g}\right) \times DFW_{res\text{-}adj}\left(\frac{2,610,650\ cm^2\text{-}event}{kg}\right)}$$

where:

$$DFW_{res\text{-}adj}\left(\frac{2,610,650\ cm^2\text{-}event}{kg}\right) = \left(\begin{array}{l}\frac{EF_{res\text{-}c}\left(\frac{350\ days}{yr}\right) \times ED_{res\text{-}c}(6\ yr) \times EV_{res\text{-}c}\left(\frac{1\ event}{day}\right) \times SA_{res\text{-}c}\left(6,365\ cm^2\right)}{BW_{res\text{-}c}(15\ kg)} + \\ \frac{EF_{res\text{-}a}\left(\frac{350\ days}{yr}\right) \times ED_{res\text{-}a}(20\ yr) \times EV_{res\text{-}a}\left(\frac{1\ event}{day}\right) \times SA_{res\text{-}a}\left(19,652\ cm^2\right)}{BW_{res\text{-}a}(80\ kg)}\end{array}\right)$$

- Inhalation

$$SL_{res\text{-}wat\text{-}inhc}\left(\frac{\mu g}{L}\right) = \frac{TR \times AT_{res}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{IUR\left(\frac{\mu g}{m^3}\right)^{-1} \times EF_{res}\left(\frac{350\ days}{yr}\right) \times ED_{res}(26\ yr) \times ET_{res}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times K\left(\frac{0.5\ L}{m^3}\right)}$$

- Total

$$SL_{res\text{-}wat\text{-}totc}\left(\frac{\mu g}{L}\right) = \frac{1}{\frac{1}{SL_{res\text{-}wat\text{-}ingc}} + \frac{1}{SL_{res\text{-}wat\text{-}inhc}} + \frac{1}{SL_{res\text{-}wat\text{-}derc}}}$$

- **Mutagenic**
  - Ingestion

$$SL_{res\text{-}wat\text{-}ingmu}\left(\frac{\mu g}{L}\right) = \frac{TR \times AT_{res}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{CSF_o\left(\frac{mg}{kg-day}\right)^{-1} \times \left(\frac{mg}{1000\ \mu g}\right) \times IFWM_{res\text{-}adj}\left(\frac{1{,}019.9\ L}{kg}\right)}$$

where:

$$IFWM_{res\text{-}adj}\left(\frac{1{,}019.9\ L}{kg}\right) = \left[\begin{array}{l} \frac{EF_{0\text{-}2}\left(\frac{350\ days}{yr}\right) \times ED_{0\text{-}2}(2\ yr) \times IRW_{0\text{-}2}\left(\frac{0.78\ L}{day}\right) \times 10}{BW_{0\text{-}2}(15\ kg)} + \\ \frac{EF_{2\text{-}6}\left(\frac{350\ days}{yr}\right) \times ED_{2\text{-}6}(4\ yr) \times IRW_{2\text{-}6}\left(\frac{0.78\ L}{day}\right) \times 3}{BW_{2\text{-}6}(15\ kg)} + \\ \frac{EF_{6\text{-}16}\left(\frac{350\ days}{yr}\right) \times ED_{6\text{-}16}(10\ yr) \times IRW_{6\text{-}16}\left(\frac{2.5\ L}{day}\right) \times 3}{BW_{6\text{-}16}(80\ kg)} + \\ \frac{EF_{16\text{-}26}\left(\frac{350\ days}{yr}\right) \times ED_{16\text{-}26}(10\ yr) \times IRW_{16\text{-}26}\left(\frac{2.5\ L}{day}\right) \times 1}{BW_{16\text{-}26}(80\ kg)} \end{array}\right]$$

- Dermal

For Inorganics:

$$SL_{res\text{-}wat\text{-}dermu}\left(\frac{\mu g}{L}\right) = \frac{DA_{event}\left(\frac{\mu g}{cm^2\text{-}event}\right) \times \left(\frac{1000\ cm^3}{L}\right)}{K_p\left(\frac{cm}{hr}\right) \times ET_{event\text{-}res\text{-}madj}\left(\frac{0.671\ hrs}{event}\right)}$$

For Organics:

IF $ET_{event\text{-}res\text{-}madj}\left(\frac{0.671\ hrs}{event}\right) \leq t^*\ (hrs)$, then:

$$SL_{res\text{-}wat\text{-}dermu}\left(\frac{\mu g}{L}\right) = \frac{DA_{event}\left(\frac{\mu g}{cm^2\text{-}event}\right) \times \left(\frac{1000\ cm^3}{L}\right)}{2 \times FA \times K_p\left(\frac{cm}{hr}\right) \times \sqrt{\frac{6 \times \tau_{event}\left(\frac{hrs}{event}\right) \times ET_{event\text{-}res\text{-}madj}\left(\frac{0.671\ hrs}{event}\right)}{\pi}}}$$

or:

IF $ET_{event\text{-}res\text{-}madj}\left(\frac{0.671\ hrs}{event}\right) > t^*\ (hrs)$, then:

$$SL_{res\text{-}wat\text{-}dermu}\left(\frac{\mu g}{L}\right) = \frac{DA_{event}\left(\frac{\mu g}{cm^2\text{-}event}\right) \times \left(\frac{1000\ cm^3}{L}\right)}{FA \times K_p\left(\frac{cm}{hr}\right) \times \left[\frac{ET_{event\text{-}res\text{-}madj}\left(\frac{0.671\ hrs}{event}\right)}{1+B} + 2 \times \tau_{event}\left(\frac{hrs}{event}\right) \times \left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right]}$$

where:

$$ET_{event\text{-}res\text{-}madj}\left(\frac{0.671\ hrs}{event}\right) = \frac{\left(\begin{array}{l}\left(ED_{0\text{-}2}(2\ yr) \times ET_{event\text{-}(0\text{-}2)}\left(\frac{0.54\ hrs}{event}\right)\right) + \left(ED_{2\text{-}6}(4\ yr) \times ET_{event\text{-}(2\text{-}6)}\left(\frac{0.54\ hrs}{event}\right)\right) + \\ \left(ED_{6\text{-}16}(10\ yr) \times ET_{event\text{-}(6\text{-}16)}\left(\frac{0.71\ hrs}{event}\right)\right) + \left(ED_{16\text{-}26}(10\ yr) \times ET_{event\text{-}(16\text{-}26)}\left(\frac{0.71\ hrs}{event}\right)\right)\end{array}\right)}{ED_{0\text{-}2}(2\ yr) + ED_{2\text{-}6}(4\ yr) + ED_{6\text{-}16}(10\ yr) + ED_{16\text{-}26}(10\ yr)}$$

and:

$$DA_{event}\left(\frac{\mu g}{cm^2\text{-}event}\right) = \frac{TR \times AT_{res}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{\left(\frac{CSF_o\left(\frac{mg}{kg\text{-}day}\right)^{-1}}{GIABS}\right) \times \left(\frac{mg}{1000\ \mu g}\right) \times DFWM_{res\text{-}adj}\left(\frac{8,191,633\ cm^2\text{-}event}{kg}\right)}$$

where:

$$DFWM_{res\text{-}adj}\left(\frac{8,191,633\ cm^2\text{-}event}{kg}\right) = \left(\begin{array}{l}\frac{EF_{0\text{-}2}\left(\frac{350\ days}{yr}\right) \times ED_{0\text{-}2}(2\ yr) \times EV_{0\text{-}2}\left(\frac{1\ event}{day}\right) \times SA_{0\text{-}2}\left(6,365\ cm^2\right) \times 10}{BW_{0\text{-}2}(15\ kg)} + \\ \frac{EF_{2\text{-}6}\left(\frac{350\ days}{yr}\right) \times ED_{2\text{-}6}(4\ yr) \times EV_{2\text{-}6}\left(\frac{1\ event}{day}\right) \times SA_{2\text{-}6}\left(6,365\ cm^2\right) \times 3}{BW_{2\text{-}6}(15\ kg)} + \\ \frac{EF_{6\text{-}16}\left(\frac{350\ days}{yr}\right) \times ED_{6\text{-}16}(10\ yr) \times EV_{6\text{-}16}\left(\frac{1\ event}{day}\right) \times SA_{6\text{-}16}\left(19,652\ cm^2\right) \times 3}{BW_{6\text{-}16}(80\ kg)} + \\ \frac{EF_{16\text{-}26}\left(\frac{350\ days}{yr}\right) \times ED_{16\text{-}26}(10\ yr) \times EV_{16\text{-}26}\left(\frac{1\ event}{day}\right) \times SA_{16\text{-}26}\left(19,652\ cm^2\right) \times 1}{BW_{16\text{-}26}(80\ kg)}\end{array}\right)$$

- Inhalation

$$SL_{res\text{-}wat\text{-}inhmu}\left(\frac{\mu g}{L}\right) = \frac{TR \times AT_{res}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{IUR\left(\frac{\mu g}{m^3}\right)^{-1} \times K\left(\frac{0.5\ L}{m^3}\right) \times \left[\begin{array}{l} \left(EF_{0\text{-}2}\left(\frac{350\ days}{yr}\right) \times ED_{0\text{-}2}(2\ yr) \times ET_{0\text{-}2}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times 10\right) + \\ \left(EF_{2\text{-}6}\left(\frac{350\ days}{yr}\right) \times ED_{2\text{-}6}(4\ yr) \times ET_{2\text{-}6}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times 3\right) + \\ \left(EF_{6\text{-}16}\left(\frac{350\ days}{yr}\right) \times ED_{6\text{-}16}(10\ yr) \times ET_{6\text{-}16}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times 3\right) + \\ \left(EF_{16\text{-}26}\left(\frac{350\ days}{yr}\right) \times ED_{16\text{-}26}(10\ yr) \times ET_{16\text{-}26}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times 1\right) \end{array}\right]}$$

- Total

$$SL_{res\text{-}wat\text{-}totmu}\left(\frac{\mu g}{L}\right) = \frac{1}{\frac{1}{SL_{res\text{-}wat\text{-}ingmu}} + \frac{1}{SL_{res\text{-}wat\text{-}inhmu}} + \frac{1}{SL_{res\text{-}wat\text{-}dermu}}}$$

- **Vinyl Chloride**
  - Ingestion

$$SL_{res\text{-}wat\text{-}ingvc}\left(\frac{\mu g}{L}\right) = \frac{TR}{\left(\begin{array}{l}\left(\dfrac{CSF_o\left(\dfrac{mg}{kg-day}\right)^{-1} \times \left(\dfrac{mg}{1000\ \mu g}\right) \times IFW_{res\text{-}adj}\left(\dfrac{327.95\ L}{kg}\right)}{AT_{res}\left(\dfrac{365\ days}{yr} \times LT(70\ yrs)\right)}\right) + \\ \left(\dfrac{CSF_o\left(\dfrac{mg}{kg-day}\right)^{-1} \times \left(\dfrac{mg}{1000\ \mu g}\right) \times IRW_{res\text{-}c}\left(\dfrac{0.78\ L}{day}\right)}{BW_{res\text{-}c}\,(15\ kg)}\right)\end{array}\right)}$$

where:

$$IFW_{res\text{-}adj}\left(\frac{327.95\ L}{kg}\right) = \left[\begin{array}{l}\dfrac{EF_{res\text{-}c}\left(\dfrac{350\ days}{yr}\right) \times ED_{res\text{-}c}\,(6\ yr) \times IRW_{res\text{-}c}\left(\dfrac{0.78\ L}{day}\right)}{BW_{res\text{-}c}\,(15\ kg)} + \\ \dfrac{EF_{res\text{-}a}\left(\dfrac{350\ days}{yr}\right) \times ED_{res\text{-}a}\,(20\ yr) \times IRW_{res\text{-}a}\left(\dfrac{2.5\ L}{day}\right)}{BW_{res\text{-}a}\,(80\ kg)}\end{array}\right]$$

- Dermal

IF $ET_{event\text{-}res\text{-}adj}\left(\frac{0.671\ hrs}{event}\right) \leq t^*\ (hrs)$, then:

$$SL_{res\text{-}wat\text{-}dervc}\left(\frac{\mu g}{L}\right) = \frac{DA_{vc\text{-}event}\left(\frac{\mu g}{cm^2\text{-}event}\right) \times \left(\frac{1000\ cm^3}{L}\right)}{2 \times FA \times K_p\left(\frac{cm}{hr}\right) \times \sqrt{\frac{6 \times \tau_{event}\left(\frac{hrs}{event}\right) \times ET_{event\text{-}res\text{-}adj}\left(\frac{0.671\ hrs}{event}\right)}{\pi}}}$$

or,

IF $ET_{event\text{-}res\text{-}adj}\left(\frac{0.671\ hrs}{event}\right) > t^*\ (hrs)$, then:

$$SL_{res\text{-}wat\text{-}dervc}\left(\frac{\mu g}{L}\right) = \frac{DA_{vc\text{-}event}\left(\frac{\mu g}{cm^2\text{-}event}\right) \times \left(\frac{1000\ cm^3}{L}\right)}{FA \times K_p\left(\frac{cm}{hr}\right) \times \left[\frac{ET_{event\text{-}res\text{-}adj}\left(\frac{0.671\ hrs}{event}\right)}{1 + B} + 2 \times \tau_{event}\left(\frac{hrs}{event}\right) \times \left(\frac{1 + 3B + 3B^2}{(1 + B)^2}\right)\right]}$$

where:

$$ET_{event\text{-}res\text{-}adj}\left(\frac{0.671\ hrs}{event}\right) = \left(\frac{\left(ED_{res\text{-}c}(6\ yr) \times ET_{event\text{-}res\text{-}c}\left(\frac{0.54\ hrs}{event}\right)\right) + \left(ED_{res\text{-}a}(20\ yr) \times ET_{event\text{-}res\text{-}a}\left(\frac{0.71\ hrs}{event}\right)\right)}{ED_{res}(26\ yr)}\right)$$

and:

$$DA_{vc\text{-}event}\left(\frac{\mu g}{cm^2\text{-}event}\right) = \frac{TR}{\left(\frac{CSF_o\left(\frac{mg}{kg\text{-}day}\right)^{-1}}{GIABS}\right) \times \left(\frac{mg}{1000\ \mu g}\right) \times \left[\left(\frac{DFW_{res\text{-}adj}\left(\frac{2,610,650\ cm^2\text{-}event}{kg}\right)}{AT_{res}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}\right) + \left(\frac{EV_{res\text{-}c}\left(\frac{1\ event}{day}\right) \times SA_{res\text{-}c}\left(6,365\ cm^2\right)}{BW_{res\text{-}c}(15\ kg)}\right)\right]}$$

where:

$$DFW_{res\text{-}adj}\left(\frac{2,610,650\ cm^2\text{-}event}{kg}\right) = \left(\begin{array}{l}\frac{EF_{res\text{-}c}\left(\frac{350\ days}{yr}\right) \times ED_{res\text{-}c}(6\ yr) \times EV_{res\text{-}c}\left(\frac{1\ event}{day}\right) \times SA_{res\text{-}c}\left(6,365\ cm^2\right)}{BW_{res\text{-}c}(15\ kg)} + \\ \frac{EF_{res\text{-}a}\left(\frac{350\ days}{yr}\right) \times ED_{res\text{-}a}(20\ yr) \times EV_{res\text{-}a}\left(\frac{1\ event}{day}\right) \times SA_{res\text{-}a}\left(19,652\ cm^2\right)}{BW_{res\text{-}a}(80\ kg)}\end{array}\right)$$

- Inhalation

$$SL_{res\text{-}wat\text{-}inhvc}\left(\frac{\mu g}{L}\right) = \frac{TR}{\left(\begin{array}{c}\left(\frac{IUR\left(\frac{\mu g}{m^3}\right)^{-1} \times EF_{res}\left(\frac{350\ days}{yr}\right) \times ED_{res}(26\ yr) \times ET_{res}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times K\left(\frac{0.5\ L}{m^3}\right)}{AT_{res}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}\right) + \\ \left(IUR\left(\frac{\mu g}{m^3}\right)^{-1} \times K\left(\frac{0.5\ L}{m^3}\right)\right)\end{array}\right)}$$

- Total

$$SL_{res\text{-}wat\text{-}totvc}\left(\frac{\mu g}{L}\right) = \frac{1}{\frac{1}{SL_{res\text{-}wat\text{-}ingvc}} + \frac{1}{SL_{res\text{-}wat\text{-}inhvc}} + \frac{1}{SL_{res\text{-}wat\text{-}dervc}}}$$

- **Trichloroethylene**
  - Ingestion

$$SL_{res\text{-}wat\text{-}ingtce}\left(\frac{\mu g}{L}\right) = \frac{TR \times AT_{res}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{CSF_o\left(\frac{mg}{kg-day}\right)^{-1} \times \left(\frac{mg}{1000\ \mu g}\right) \times \left(\begin{array}{l}\left(CAF_o(0.804) \times IFW_{res\text{-}adj}\left(\frac{327.95\ L}{kg}\right)\right) + \\ \left(MAF_o(0.202) \times IFWM_{res\text{-}adj}\left(\frac{1{,}019.9\ L}{kg}\right)\right)\end{array}\right)}$$

where:

$$IFW_{res\text{-}adj}\left(\frac{327.95\ L}{kg}\right) = \left[\begin{array}{l}\frac{EF_{res\text{-}c}\left(\frac{350\ days}{yr}\right) \times ED_{res\text{-}c}(6\ yr) \times IRW_{res\text{-}c}\left(\frac{0.78\ L}{day}\right)}{BW_{res\text{-}c}(15\ kg)} + \\ \frac{EF_{res\text{-}a}\left(\frac{350\ days}{yr}\right) \times ED_{res\text{-}a}(20\ yr) \times IRW_{res\text{-}a}\left(\frac{2.5\ L}{day}\right)}{BW_{res\text{-}a}(80\ kg)}\end{array}\right]$$

and:

$$IFWM_{res\text{-}adj}\left(\frac{1{,}019.9\ L}{kg}\right) = \left[\begin{array}{l}\frac{EF_{0\text{-}2}\left(\frac{350\ days}{yr}\right) \times ED_{0\text{-}2}(2\ yr) \times IRW_{0\text{-}2}\left(\frac{0.78\ L}{day}\right) \times 10}{BW_{0\text{-}2}(15\ kg)} + \\ \frac{EF_{2\text{-}6}\left(\frac{350\ days}{yr}\right) \times ED_{2\text{-}6}(4\ yr) \times IRW_{2\text{-}6}\left(\frac{0.78\ L}{day}\right) \times 3}{BW_{2\text{-}6}(15\ kg)} + \\ \frac{EF_{6\text{-}16}\left(\frac{350\ days}{yr}\right) \times ED_{6\text{-}16}(10\ yr) \times IRW_{6\text{-}16}\left(\frac{2.5\ L}{day}\right) \times 3}{BW_{6\text{-}16}(80\ kg)} + \\ \frac{EF_{16\text{-}26}\left(\frac{350\ days}{yr}\right) \times ED_{16\text{-}26}(10\ yr) \times IRW_{16\text{-}26}\left(\frac{2.5\ L}{day}\right) \times 1}{BW_{16\text{-}26}(80\ kg)}\end{array}\right]$$

- Dermal

$$\text{IF } ET_{event\text{-}res\text{-}madj}\left(\frac{0.671\ hrs}{event}\right) \le t^*\ (hrs), \text{ then:}$$

$$SL_{res\text{-}wat\text{-}dertce}\left(\frac{\mu g}{L}\right) = \frac{DA_{tce\text{-}event}\left(\frac{\mu g}{cm^2\text{-}event}\right) \times \left(\frac{1000\ cm^3}{L}\right)}{2 \times FA \times K_p\left(\frac{cm}{hr}\right) \times \sqrt{\frac{6 \times \tau_{event}\left(\frac{hrs}{event}\right) \times ET_{event\text{-}res\text{-}madj}\left(\frac{0.671\ hrs}{event}\right)}{\pi}}}$$

or:

$$\text{IF } ET_{event\text{-}res\text{-}madj}\left(\frac{0.671\ hrs}{event}\right) > t^*\ (hrs), \text{ then:}$$

$$SL_{res\text{-}wat\text{-}dertce}\left(\frac{\mu g}{L}\right) = \frac{DA_{tce\text{-}event}\left(\frac{\mu g}{cm^2\text{-}event}\right) \times \left(\frac{1000\ cm^3}{L}\right)}{FA \times K_p\left(\frac{cm}{hr}\right) \times \left[\frac{ET_{event\text{-}res\text{-}madj}\left(\frac{0.671\ hrs}{event}\right)}{1 + B} + 2 \times \tau_{event}\left(\frac{hrs}{event}\right) \times \left(\frac{1 + 3B + 3B^2}{(1 + B)^2}\right)\right]}$$

where:

$$ET_{event\text{-}res\text{-}madj}\left(\frac{0.671\ hrs}{event}\right) = \frac{\left(\begin{array}{l}\left(ED_{0\text{-}2}(2\ yr) \times ET_{event\text{-}(0\text{-}2)}\left(\frac{0.54\ hrs}{event}\right)\right) + \left(ED_{2\text{-}6}(4\ yr) \times ET_{event\text{-}(2\text{-}6)}\left(\frac{0.54\ hrs}{event}\right)\right) + \\ \left(ED_{6\text{-}16}(10\ yr) \times ET_{event\text{-}(6\text{-}16)}\left(\frac{0.71\ hrs}{event}\right)\right) + \left(ED_{16\text{-}26}(10\ yr) \times ET_{event\text{-}(16\text{-}26)}\left(\frac{0.71\ hrs}{event}\right)\right)\end{array}\right)}{ED_{0\text{-}2}(2\ yr) + ED_{2\text{-}6}(4\ yr) + ED_{6\text{-}16}(10\ yr) + ED_{16\text{-}26}(10\ yr)}$$

and:

$$DA_{tce\text{-}event}\left(\frac{\mu g}{cm^2\text{-}event}\right) = \frac{TR \times AT_{res}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{\left(\frac{CSF_o\left(\frac{mg}{kg\text{-}day}\right)^{-1}}{GIABS}\right) \times \left(\frac{mg}{1000\ \mu g}\right) \times \left[\begin{array}{l}\left(CAF_o(0.804) \times DFW_{res\text{-}adj}\left(\frac{2,610,650\ cm^2\text{-}event}{kg}\right)\right) + \\ \left(MAF_o(0.202) \times DFWM_{res\text{-}adj}\left(\frac{8,191,633\ cm^2\text{-}event}{kg}\right)\right)\end{array}\right]}$$

where:

$$DFW_{res\text{-}adj}\left(\frac{2,610,650\ cm^2\text{-}event}{kg}\right) = \left(\begin{array}{l}\frac{EF_{res\text{-}c}\left(\frac{350\ days}{yr}\right) \times ED_{res\text{-}c}(6\ yr) \times EV_{res\text{-}c}\left(\frac{1\ event}{day}\right) \times SA_{res\text{-}c}\left(6,365\ cm^2\right)}{BW_{res\text{-}c}\ (15\ kg)} + \\ \frac{EF_{res\text{-}a}\left(\frac{350\ days}{yr}\right) \times ED_{res\text{-}a}(20\ yr) \times EV_{res\text{-}a}\left(\frac{1\ event}{day}\right) \times SA_{res\text{-}a}\left(19,652\ cm^2\right)}{BW_{res\text{-}a}\ (80\ kg)}\end{array}\right)$$

and:

$$DFWM_{res\text{-}adj}\left(\frac{8,191,633\ cm^2\text{-}event}{kg}\right) = \left(\begin{array}{l}\frac{EF_{0\text{-}2}\left(\frac{350\ days}{yr}\right) \times ED_{0\text{-}2}(2\ yr) \times EV_{0\text{-}2}\left(\frac{1\ event}{day}\right) \times SA_{0\text{-}2}\left(6,365\ cm^2\right) \times 10}{BW_{0\text{-}2}\ (15\ kg)} + \\ \frac{EF_{2\text{-}6}\left(\frac{350\ days}{yr}\right) \times ED_{2\text{-}6}(4\ yr) \times EV_{2\text{-}6}\left(\frac{1\ event}{day}\right) \times SA_{2\text{-}6}\left(6,365\ cm^2\right) \times 3}{BW_{2\text{-}6}\ (15\ kg)} + \\ \frac{EF_{6\text{-}16}\left(\frac{350\ days}{yr}\right) \times ED_{6\text{-}16}(10\ yr) \times EV_{6\text{-}16}\left(\frac{1\ event}{day}\right) \times SA_{6\text{-}16}\left(19,652\ cm^2\right) \times 3}{BW_{6\text{-}16}\ (80\ kg)} + \\ \frac{EF_{16\text{-}26}\left(\frac{350\ days}{yr}\right) \times ED_{16\text{-}26}(10\ yr) \times EV_{16\text{-}26}\left(\frac{1\ event}{day}\right) \times SA_{16\text{-}26}\left(19,652\ cm^2\right) \times 1}{BW_{16\text{-}26}\ (80\ kg)}\end{array}\right)$$

- Inhalation

$$SL_{res\text{-}wat\text{-}inhtce}\left(\frac{\mu g}{L}\right) = \frac{TR \times AT_{res}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{IUR\left(\frac{\mu g}{m^3}\right)^{-1} \times K\left(\frac{0.5\ L}{m^3}\right) \times \left[\begin{array}{l} \left(EF_{res}\left(\frac{350\ days}{yr}\right) \times ED_{res}(26\ yr) \times ET_{res}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times CAF_i(0.756)\right) + \\ \left(EF_{0\text{-}2}\left(\frac{350\ days}{yr}\right) \times ED_{0\text{-}2}(2\ yr) \times ET_{0\text{-}2}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times MAF_i(0.244) \times 10\right) + \\ \left(EF_{2\text{-}6}\left(\frac{350\ days}{yr}\right) \times ED_{2\text{-}6}(4\ yr) \times ET_{2\text{-}6}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times MAF_i(0.244) \times 3\right) + \\ \left(EF_{6\text{-}16}\left(\frac{350\ days}{yr}\right) \times ED_{6\text{-}16}(10\ yr) \times ET_{6\text{-}16}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times MAF_i(0.244) \times 3\right) + \\ \left(EF_{16\text{-}26}\left(\frac{350\ days}{yr}\right) \times ED_{16\text{-}26}(10\ yr) \times ET_{16\text{-}26}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times MAF_i(0.244) \times 1\right) \end{array}\right]}$$

- Total

$$SL_{res\text{-}wat\text{-}tottce}\left(\frac{\mu g}{L}\right) = \frac{1}{\frac{1}{SL_{res\text{-}wat\text{-}ingtce}} + \frac{1}{SL_{res\text{-}wat\text{-}inhtce}} + \frac{1}{SL_{res\text{-}wat\text{-}dertce}}}$$

- **Supporting Equations**
  - Child

$$ED_{res\text{-}c}(6\ yr) = ED_{0\text{-}2}(2\ yr) + ED_{2\text{-}6}(4\ yr)$$

$$BW_{res\text{-}c}(15\ kg) = \frac{ED_{0\text{-}2}(2\ yr) \times BW_{0\text{-}2}(15\ kg) + ED_{2\text{-}6}(4\ yr) \times BW_{2\text{-}6}(15\ kg)}{ED_{0\text{-}2}(2\ yr) + ED_{2\text{-}6}(4\ yr)}$$

$$EF_{res\text{-}c}\left(\frac{350\ days}{yr}\right) = \frac{ED_{0\text{-}2}(2\ yr) \times EF_{0\text{-}2}\left(\frac{350\ days}{yr}\right) + ED_{2\text{-}6}(4\ yr) \times EF_{2\text{-}6}\left(\frac{350\ days}{yr}\right)}{ED_{0\text{-}2}(2\ yr) + ED_{2\text{-}6}(4\ yr)}$$

$$ET_{res\text{-}c}\left(\frac{24\ hrs}{day}\right) = \frac{ED_{0\text{-}2}(2\ yr) \times ET_{0\text{-}2}\left(\frac{24\ hrs}{day}\right) + ED_{2\text{-}6}(4\ yr) \times ET_{2\text{-}6}\left(\frac{24\ hrs}{day}\right)}{ED_{0\text{-}2}(2\ yr) + ED_{2\text{-}6}(4\ yr)}$$

$$ET_{event\text{-}res\text{-}c}\left(\frac{0.54\ hrs}{event}\right) = \frac{ED_{0\text{-}2}(2\ yr) \times ET_{event\text{-}(0\text{-}2)}\left(\frac{0.54\ hrs}{event}\right) + ED_{2\text{-}6}(4\ yr) \times ET_{event\text{-}(2\text{-}6)}\left(\frac{0.54\ hrs}{event}\right)}{ED_{0\text{-}2}(2\ yr) + ED_{2\text{-}6}(4\ yr)}$$

$$EV_{res\text{-}c}\left(\frac{1\ event}{day}\right) = \frac{ED_{0\text{-}2}(2\ yr) \times EV_{0\text{-}2}\left(\frac{1\ event}{day}\right) + ED_{2\text{-}6}(4\ yr) \times EV_{2\text{-}6}\left(\frac{1\ event}{day}\right)}{ED_{0\text{-}2}(2\ yr) + ED_{2\text{-}6}(4\ yr)}$$

$$SA_{res\text{-}c}\left(6{,}365\ cm^2\right) = \frac{ED_{0\text{-}2}(2\ yr) \times SA_{0\text{-}2}\left(6{,}365\ cm^2\right) + ED_{2\text{-}6}(4\ yr) \times SA_{2\text{-}6}\left(6{,}365\ cm^2\right)}{ED_{0\text{-}2}(2\ yr) + ED_{2\text{-}6}(4\ yr)}$$

$$IRW_{res\text{-}c}\left(\frac{0.78\ L}{day}\right) = \frac{ED_{0\text{-}2}(2\ yr) \times IRW_{0\text{-}2}\left(\frac{0.78\ L}{day}\right) + ED_{2\text{-}6}(4\ yr) \times IRW_{2\text{-}6}\left(\frac{0.78\ L}{day}\right)}{ED_{0\text{-}2}(2\ yr) + ED_{2\text{-}6}(4\ yr)}$$

- Adult

$$ED_{res\text{-}a}(20\ yr) = ED_{6\text{-}16}(10\ yr) + ED_{16\text{-}26}(10\ yr)$$

$$BW_{res\text{-}a}(80\ kg) = \frac{ED_{6\text{-}16}(10\ yr) \times BW_{6\text{-}16}(80\ kg) + ED_{16\text{-}26}(10\ yr) \times BW_{16\text{-}26}(80\ kg)}{ED_{6\text{-}16}(10\ yr) + ED_{16\text{-}26}(10\ yr)}$$

$$EF_{res\text{-}a}\left(\frac{350\ days}{yr}\right) = \frac{ED_{6\text{-}16}(10\ yr) \times EF_{6\text{-}16}\left(\frac{350\ days}{yr}\right) + ED_{16\text{-}26}(10\ yr) \times EF_{16\text{-}26}\left(\frac{350\ days}{yr}\right)}{ED_{6\text{-}16}(10\ yr) + ED_{16\text{-}26}(10\ yr)}$$

$$ET_{res\text{-}a}\left(\frac{24\ hrs}{day}\right) = \frac{ED_{6\text{-}16}(10\ yr) \times ET_{6\text{-}16}\left(\frac{24\ hrs}{day}\right) + ED_{16\text{-}26}(10\ yr) \times ET_{16\text{-}26}\left(\frac{24\ hrs}{day}\right)}{ED_{6\text{-}16}(10\ yr) + ED_{16\text{-}26}(10\ yr)}$$

$$ET_{event\text{-}res\text{-}a}\left(\frac{0.71\ hrs}{event}\right) = \frac{ED_{6\text{-}16}(10\ yr) \times ET_{event\text{-}(6\text{-}16)}\left(\frac{0.71\ hrs}{event}\right) + ED_{16\text{-}26}(10\ yr) \times ET_{event\text{-}(16\text{-}26)}\left(\frac{0.71\ hrs}{event}\right)}{ED_{6\text{-}16}(10\ yr) + ED_{16\text{-}26}(10\ yr)}$$

$$EV_{res\text{-}a}\left(\frac{1\ event}{day}\right) = \frac{ED_{6\text{-}16}(10\ yr) \times EV_{6\text{-}16}\left(\frac{1\ event}{day}\right) + ED_{16\text{-}26}(10\ yr) \times EV_{16\text{-}26}\left(\frac{1\ event}{day}\right)}{ED_{6\text{-}16}(10\ yr) + ED_{16\text{-}26}(10\ yr)}$$

$$SA_{res\text{-}a}\left(19,652\ cm^2\right) = \frac{ED_{6\text{-}16}(10\ yr) \times SA_{6\text{-}16}\left(19,652\ cm^2\right) + ED_{16\text{-}26}(10\ yr) \times SA_{16\text{-}26}\left(19,652\ cm^2\right)}{ED_{6\text{-}16}(10\ yr) + ED_{16\text{-}26}(10\ yr)}$$

$$IRW_{res\text{-}a}\left(\frac{2.5\ L}{day}\right) = \frac{ED_{6\text{-}16}(10\ yr) \times IRW_{6\text{-}16}\left(\frac{2.5\ L}{day}\right) + ED_{16\text{-}26}(10\ yr) \times IRW_{16\text{-}26}\left(\frac{2.5\ L}{day}\right)}{ED_{6\text{-}16}(10\ yr) + ED_{16\text{-}26}(10\ yr)}$$

- Age-adjusted

$$ED_{res}(26\ yr) = ED_{0-2}(2\ yr) + ED_{2-6}(4\ yr) + ED_{6-16}(10\ yr) + ED_{16-26}(10\ yr)$$

$$EF_{res}\left(\frac{350\ days}{yr}\right) = \frac{\left(\begin{array}{c} ED_{0-2}(2\ yr) \times EF_{0-2}\left(\frac{350\ days}{yr}\right) + ED_{2-6}(4\ yr) \times EF_{2-6}\left(\frac{350\ days}{yr}\right) + \\ ED_{6-16}(10\ yr) \times EF_{6-16}\left(\frac{350\ days}{yr}\right) + ED_{16-26}(10\ yr) \times EF_{16-26}\left(\frac{350\ days}{yr}\right) \end{array}\right)}{ED_{0-2}(2\ yr) + ED_{2-6}(4\ yr) + ED_{6-16}(10\ yr) + ED_{16-26}(10\ yr)}$$

$$ET_{res}\left(\frac{24\ hrs}{day}\right) = \frac{\left(\begin{array}{c} ED_{0-2}(2\ yr) \times ET_{0-2}\left(\frac{24\ hrs}{day}\right) + ED_{2-6}(4\ yr) \times ET_{2-6}\left(\frac{24\ hrs}{day}\right) + \\ ED_{6-16}(10\ yr) \times ET_{6-16}\left(\frac{24\ hrs}{day}\right) + ED_{16-26}(10\ yr) \times ET_{16-26}\left(\frac{24\ hrs}{day}\right) \end{array}\right)}{ED_{0-2}(2\ yr) + ED_{2-6}(4\ yr) + ED_{6-16}(10\ yr) + ED_{16-26}(10\ yr)}$$

Resident Air

This land use is for developing residential default screening levels that are presented in the RSL Generic Tables.

- Noncarcinogenic
  - Inhalation

$$SL_{res-air-inhn}\left(\frac{\mu g}{m^3}\right) = \frac{THQ \times AT_{res-a}\left(\frac{365\ days}{yr} \times ED_{res}(26\ yr)\right)}{\left(\frac{1}{RfC\left(\frac{mg}{m^3}\right)}\right) \times \left(\frac{mg}{1000\ \mu g}\right) \times EF_{res}\left(\frac{350\ days}{yr}\right) \times ED_{res}(26\ yr) \times ET_{res}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right)}$$

- Noncarcinogenic - Refractory Ceramic Fibers
  - Inhalation

$$SL_{res\text{-}air\text{-}inhrcf}\left(\frac{f}{m^3}\right) = \frac{THQ \times AT_{res\text{-}a}\left(\frac{365\ days}{yr} \times ED_{res}(26\ yr)\right)}{\left(\frac{1}{RfC\left(\frac{f}{m^3}\right)}\right) \times EF_{res}\left(\frac{350\ days}{yr}\right) \times ED_{res}(26\ yr) \times ET_{res}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right)}$$

- Carcinogenic
  - Inhalation

$$SL_{res\text{-}air\text{-}inhc}\left(\frac{\mu g}{m^3}\right) = \frac{TR \times AT_{res}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{IUR\left(\frac{\mu g}{m^3}\right)^{-1} \times EF_{res}\left(\frac{350\ days}{yr}\right) \times ED_{res}(26\ yr) \times ET_{res}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right)}$$

- Mutagenic
  - Inhalation

$$SL_{res\text{-}air\text{-}inhmu}\left(\frac{\mu g}{m^3}\right) = \frac{TR \times AT_{res}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{IUR\left(\frac{\mu g}{m^3}\right)^{-1} \times \left[\begin{array}{l} \left(EF_{0\text{-}2}\left(\frac{350\ days}{yr}\right) \times ED_{0\text{-}2}(2\ yr) \times ET_{0\text{-}2}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times 10\right) + \\ \left(EF_{2\text{-}6}\left(\frac{350\ days}{yr}\right) \times ED_{2\text{-}6}(4\ yr) \times ET_{2\text{-}6}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times 3\right) + \\ \left(EF_{6\text{-}16}\left(\frac{350\ days}{yr}\right) \times ED_{6\text{-}16}(10\ yr) \times ET_{6\text{-}16}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times 3\right) + \\ \left(EF_{16\text{-}26}\left(\frac{350\ days}{yr}\right) \times ED_{16\text{-}26}(10\ yr) \times ET_{16\text{-}26}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times 1\right) \end{array}\right]}$$

- Vinyl Chloride
  - Inhalation

$$SL_{res\text{-}air\text{-}inhvc}\left(\frac{\mu g}{m^3}\right) = \frac{TR}{IUR\left(\frac{\mu g}{m^3}\right)^{-1} + \left(\frac{IUR\left(\frac{\mu g}{m^3}\right)^{-1} \times EF_{res}\left(\frac{350\ days}{yr}\right) \times ED_{res}(26\ yr) \times ET_{res}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right)}{AT_{res}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}\right)}$$

- Trichloroethylene
  - Inhalation

$$SL_{res\text{-}air\text{-}inhtce}\left(\frac{\mu g}{m^3}\right) = \frac{TR \times AT_{res}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{IUR\left(\frac{\mu g}{m^3}\right)^{-1} \times \left[\begin{array}{l} \left(EF_{res}\left(\frac{350\ days}{yr}\right) \times ED_{res}(26\ yr) \times ET_{res}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times CAF_i(0.756)\right) + \\ \left(EF_{0\text{-}2}\left(\frac{350\ days}{yr}\right) \times ED_{0\text{-}2}(2\ yr) \times ET_{0\text{-}2}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times MAF_i(0.244) \times 10\right) + \\ \left(EF_{2\text{-}6}\left(\frac{350\ days}{yr}\right) \times ED_{2\text{-}6}(4\ yr) \times ET_{2\text{-}6}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times MAF_i(0.244) \times 3\right) + \\ \left(EF_{6\text{-}16}\left(\frac{350\ days}{yr}\right) \times ED_{6\text{-}16}(10\ yr) \times ET_{6\text{-}16}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times MAF_i(0.244) \times 3\right) + \\ \left(EF_{16\text{-}26}\left(\frac{350\ days}{yr}\right) \times ED_{16\text{-}26}(10\ yr) \times ET_{16\text{-}26}\left(\frac{24\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times MAF_i(0.244) \times 1\right) \end{array}\right]$$

Composite Worker

Composite Worker Soil

This land use is for developing industrial default screening levels that are presented in the RSL Generic Tables.

- **Noncarcinogenic**
  - Ingestion

$$SL_{com\text{-}sol\text{-}ingn}\left(\frac{mg}{kg}\right) = \frac{THQ \times AT_{com\text{-}a}\left(\frac{365\ days}{yr} \times ED_{com}(25\ yr)\right) \times BW_{com}(80\ kg)}{\left(\frac{RBA}{RfD_o\left(\frac{mg}{kg-day}\right)}\right) \times \left(\frac{10^{-6}\ kg}{mg}\right) \times EF_{com}\left(\frac{250\ days}{yr}\right) \times ED_{com}(25\ yr) \times IRS_{com}\left(\frac{100\ mg}{day}\right)}$$

  - Dermal

$$SL_{com\text{-}sol\text{-}dern}\left(\frac{mg}{kg}\right) = \frac{THQ \times AT_{com\text{-}a}\left(\frac{365\ days}{yr} \times ED_{com}(25\ yr)\right) \times BW_{com}(80\ kg)}{\left(\frac{1}{RfD_o\left(\frac{mg}{kg-day}\right) \times GIABS}\right) \times \left(\frac{10^{-6}\ kg}{mg}\right) \times EF_{com}\left(\frac{250\ days}{yr}\right) \times ED_{com}(25\ yr) \times SA_{com}\left(\frac{3{,}527\ cm^2}{day}\right) \times AF_{com}\left(\frac{0.12\ mg}{cm^2}\right) \times ABS_d}$$

  - Inhalation

$$SL_{com\text{-}sol\text{-}inhn}\left(\frac{mg}{kg}\right) = \frac{THQ \times AT_{com\text{-}a}\left(\frac{365\ days}{yr} \times ED_{com}(25\ yr)\right)}{\left(\frac{1}{RfC\left(\frac{mg}{m^3}\right)}\right) \times EF_{com}\left(\frac{250\ days}{yr}\right) \times ED_{com}(25\ yr) \times ET_{com}\left(\frac{8\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times \left(\frac{1}{VF_{ulim}\left(\frac{m^3}{kg}\right)} + \frac{1}{PEF\left(\frac{m^3}{kg}\right)}\right)}$$

  - Total

$$SL_{com\text{-}sol\text{-}totn}\left(\frac{mg}{kg}\right) = \frac{1}{\frac{1}{PRG_{com\text{-}sol\text{-}ingn}} + \frac{1}{PRG_{com\text{-}sol\text{-}inhn}} + \frac{1}{PRG_{com\text{-}sol\text{-}dern}}}$$

- **Carcinogenic**
  - Ingestion

$$SL_{com\text{-}sol\text{-}ingc}\left(\frac{mg}{kg}\right) = \frac{TR \times AT_{com}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right) \times BW_{com}\,(80\ kg)}{CSF_o\left(\frac{mg}{kg-day}\right)^{-1} \times \left(\frac{10^{-6}\ kg}{mg}\right) \times RBA \times EF_{com}\left(\frac{250\ days}{yr}\right) \times ED_{com}\,(25\ yr) \times IRS_{com}\left(\frac{100\ mg}{day}\right)}$$

  - Dermal

$$SL_{com\text{-}sol\text{-}derc}\left(\frac{mg}{kg}\right) = \frac{TR \times AT_{com}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right) \times BW_{com}\,(80\ kg)}{\left(\frac{CSF_o\left(\frac{mg}{kg-day}\right)^{-1}}{GIABS}\right) \times \left(\frac{10^{-6}\ kg}{mg}\right) \times EF_{com}\left(\frac{250\ days}{yr}\right) \times ED_{com}\,(25\ yr) \times SA_{com}\left(\frac{3{,}527\ cm^2}{day}\right) \times AF_{com}\left(\frac{0.12\ mg}{cm^2}\right) \times ABS_d}$$

  - Inhalation

$$SL_{com\text{-}sol\text{-}inhc}\left(\frac{mg}{kg}\right) = \frac{TR \times AT_{com}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{IUR\left(\frac{\mu g}{m^3}\right)^{-1} \times \left(\frac{1000\ \mu g}{mg}\right) \times EF_{com}\left(\frac{250\ days}{yr}\right) \times ED_{com}\,(25\ yr) \times ET_{com}\left(\frac{8\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times \left(\frac{1}{VF_{ulim}\left(\frac{m^3}{kg}\right)} + \frac{1}{PEF\left(\frac{m^3}{kg}\right)}\right)}$$

  - Total

$$SL_{com\text{-}sol\text{-}totc}\left(\frac{mg}{kg}\right) = \frac{1}{\frac{1}{PRG_{com\text{-}sol\text{-}ingc}} + \frac{1}{PRG_{com\text{-}sol\text{-}inhc}} + \frac{1}{PRG_{com\text{-}sol\text{-}derc}}}$$

Composite Worker Air

This land use is for developing industrial default screening levels that are presented in the RSL Generic Tables.

- **Noncarcinogenic**
  The air land use equation, presented here, contains the following exposure routes:
  - Inhalation

$$SL_{com\text{-}air\text{-}inhn}\left(\frac{\mu g}{m^3}\right) = \frac{THQ \times AT_{com\text{-}a}\left(\frac{365\ days}{yr} \times ED_{com}(25\ yr)\right)}{\left(\frac{1}{RfC\left(\frac{mg}{m^3}\right)}\right) \times \left(\frac{mg}{1000\ \mu g}\right) \times EF_{com}\left(\frac{250\ days}{yr}\right) \times ED_{com}(25\ yr) \times ET_{com}\left(\frac{8\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right)}$$

- **Noncarcinogenic - Refractory Ceramic Fibers**
  - Inhalation

$$SL_{com\text{-}air\text{-}inhrcf}\left(\frac{f}{m^3}\right) = \frac{THQ \times AT_{com\text{-}a}\left(\frac{365\ days}{yr} \times ED_{com}(25\ yr)\right)}{\left(\frac{1}{RfC\left(\frac{f}{m^3}\right)}\right) \times EF_{com}\left(\frac{250\ days}{yr}\right) \times ED_{com}(25\ yr) \times ET_{com}\left(\frac{8\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right)}$$

- **Carcinogenic**
  The air land use equation, presented here, contains the following exposure routes:
  - Inhalation

$$SL_{com\text{-}air\text{-}inhc}\left(\frac{\mu g}{m^3}\right) = \frac{TR \times AT_{com}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{IUR\left(\frac{\mu g}{m^3}\right)^{-1} \times EF_{com}\left(\frac{250\ days}{yr}\right) \times ED_{com}(25\ yr) \times ET_{com}\left(\frac{8\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right)}$$

Outdoor Worker

Outdoor Worker Soil

The outdoor worker soil land use is not provided in the RSL Generic Tables but RSLs can be created by using the Calculator.

- **Noncarcinogenic**
  - Ingestion

$$SL_{out\text{-}sol\text{-}ingn}\left(\frac{mg}{kg}\right) = \frac{THQ \times AT_{out\text{-}a}\left(\frac{365\ days}{yr} \times ED_{out}(25\ yr)\right) \times BW_{out}(80\ kg)}{\left(\frac{RBA}{RfD_o\left(\frac{mg}{kg-day}\right)}\right) \times \left(\frac{10^{-6}\ kg}{mg}\right) \times EF_{out}\left(\frac{225\ days}{yr}\right) \times ED_{out}(25\ yr) \times IRS_{out}\left(\frac{100\ mg}{day}\right)}$$

  - Dermal

$$SL_{out\text{-}sol\text{-}dern}\left(\frac{mg}{kg}\right) = \frac{THQ \times AT_{out\text{-}a}\left(\frac{365\ days}{yr} \times ED_{out}(25\ yr)\right) \times BW_{out}(80\ kg)}{\left(\frac{1}{RfD_o\left(\frac{mg}{kg-day}\right) \times GIABS}\right) \times \left(\frac{10^{-6}\ kg}{mg}\right) \times EF_{out}\left(\frac{225\ days}{yr}\right) \times ED_{out}(25\ yr) \times SA_{out}\left(\frac{3{,}527\ cm^2}{day}\right) \times AF_{out}\left(\frac{0.12\ mg}{cm^2}\right) \times ABS_d}$$

  - Inhalation

$$SL_{out\text{-}sol\text{-}inhn}\left(\frac{mg}{kg}\right) = \frac{THQ \times AT_{out\text{-}a}\left(\frac{365\ days}{yr} \times ED_{out}(25\ yr)\right)}{\left(\frac{1}{RfC\left(\frac{mg}{m^3}\right)}\right) \times EF_{out}\left(\frac{225\ days}{yr}\right) \times ED_{out}(25\ yr) \times ET_{out}\left(\frac{8\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times \left(\frac{1}{VF_{ulim}\left(\frac{m^3}{kg}\right)} + \frac{1}{PEF\left(\frac{m^3}{kg}\right)}\right)}$$

  - Total

$$SL_{out\text{-}sol\text{-}totn}\left(\frac{mg}{kg}\right) = \frac{1}{\frac{1}{PRG_{out\text{-}sol\text{-}ingn}} + \frac{1}{PRG_{out\text{-}sol\text{-}inhn}} + \frac{1}{PRG_{out\text{-}sol\text{-}dern}}}$$

- **Carcinogenic**
  - Ingestion

$$SL_{out\text{-}sol\text{-}ingc}\left(\frac{mg}{kg}\right) = \frac{TR \times AT_{out}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right) \times BW_{out}\,(80\ kg)}{CSF_o\left(\frac{mg}{kg-day}\right)^{-1} \times \left(\frac{10^{-6}\ kg}{mg}\right) \times RBA \times EF_{out}\left(\frac{225\ days}{yr}\right) \times ED_{out}\,(25\ yr) \times IRS_{out}\left(\frac{100\ mg}{day}\right)}$$

  - Dermal

$$SL_{out\text{-}sol\text{-}derc}\left(\frac{mg}{kg}\right) = \frac{TR \times AT_{out}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right) \times BW_{out}\,(80\ kg)}{\left(\frac{CSF_o\left(\frac{mg}{kg-day}\right)^{-1}}{GIABS}\right) \times \left(\frac{10^{-6}\ kg}{mg}\right) \times EF_{out}\left(\frac{225\ days}{yr}\right) \times ED_{out}\,(25\ yr) \times SA_{out}\left(\frac{3{,}527\ cm^2}{day}\right) \times AF_{out}\left(\frac{0.12\ mg}{cm^2}\right) \times ABS_d}$$

  - Inhalation

$$SL_{out\text{-}sol\text{-}inhc}\left(\frac{mg}{kg}\right) = \frac{TR \times AT_{out}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{IUR\left(\frac{\mu g}{m^3}\right)^{-1} \times \left(\frac{1000\ \mu g}{mg}\right) \times EF_{out}\left(\frac{225\ days}{yr}\right) \times ED_{out}\,(25\ yr) \times ET_{out}\left(\frac{8\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times \left(\frac{1}{VF_{ulim}\left(\frac{m^3}{kg}\right)} + \frac{1}{PEF\left(\frac{m^3}{kg}\right)}\right)}$$

  - Total

$$SL_{out\text{-}sol\text{-}totc}\left(\frac{mg}{kg}\right) = \frac{1}{\frac{1}{PRG_{out\text{-}sol\text{-}ingc}} + \frac{1}{PRG_{out\text{-}sol\text{-}inhc}} + \frac{1}{PRG_{out\text{-}sol\text{-}derc}}}$$

Outdoor Worker Air

The outdoor worker air land use is not provided in the RSL Generic Tables but RSLs can be created by using the Calculator.

- **Noncarcinogenic**
  The air land use equation, presented here, contains the following exposure routes:
  - Inhalation

$$SL_{out\text{-}air\text{-}inhn}\left(\frac{\mu g}{m^3}\right) = \frac{THQ \times AT_{out\text{-}a}\left(\frac{365\ days}{yr} \times ED_{out}(25\ yr)\right)}{\left(\frac{1}{RfC\left(\frac{mg}{m^3}\right)}\right) \times \left(\frac{mg}{1000\ \mu g}\right) \times EF_{out}\left(\frac{225\ days}{yr}\right) \times ED_{out}(25\ yr) \times ET_{out}\left(\frac{8\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right)}$$

- **Noncarcinogenic - Refractory Ceramic Fibers**
  - Inhalation

$$SL_{out\text{-}air\text{-}inhrcf}\left(\frac{f}{m^3}\right) = \frac{THQ \times AT_{out\text{-}a}\left(\frac{365\ days}{yr} \times ED_{out}(25\ yr)\right)}{\left(\frac{1}{RfC\left(\frac{f}{m^3}\right)}\right) \times EF_{out}\left(\frac{225\ days}{yr}\right) \times ED_{out}(25\ yr) \times ET_{out}\left(\frac{8\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right)}$$

- **Carcinogenic**
  The air land use equation, presented here, contains the following exposure routes:
  - Inhalation

$$SL_{out\text{-}air\text{-}inhc}\left(\frac{\mu g}{m^3}\right) = \frac{TR \times AT_{out}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{IUR\left(\frac{\mu g}{m^3}\right)^{-1} \times EF_{out}\left(\frac{225\ days}{yr}\right) \times ED_{out}(25\ yr) \times ET_{out}\left(\frac{8\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right)}$$

Indoor Worker

Indoor Worker Soil

The indoor worker soil land use is not provided in the Generic Tables but RSLs can be created by using the Calculator.

- **Noncarcinogenic**
  - Ingestion

$$SL_{ind-sol-ingn}\left(\frac{mg}{kg}\right) = \frac{THQ \times AT_{ind-a}\left(\frac{365\ days}{yr} \times ED_{ind}\,(25\ yr)\right) \times BW_{ind}\,(80\ kg)}{\left(\frac{RBA}{RfD_o\left(\frac{mg}{kg-day}\right)}\right) \times \left(\frac{10^{-6}\ kg}{mg}\right) \times EF_{ind}\left(\frac{250\ days}{yr}\right) \times ED_{ind}\,(25\ yr) \times IRS_{ind}\left(\frac{50\ mg}{day}\right)}$$

  - Inhalation

$$SL_{ind-sol-inhn}\left(\frac{mg}{kg}\right) = \frac{THQ \times AT_{ind-a}\left(\frac{365\ days}{yr} \times ED_{ind}\,(25\ yr)\right)}{\left(\frac{1}{RfC\left(\frac{mg}{m^3}\right)}\right) \times EF_{ind}\left(\frac{250\ days}{yr}\right) \times ED_{ind}\,(25\ yr) \times ET_{ind}\left(\frac{8\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times \left(\frac{1}{VF_{ulim}\left(\frac{m^3}{kg}\right)} + \frac{1}{PEF\left(\frac{m^3}{kg}\right)}\right)}$$

  - Total

$$SL_{ind-sol-totn}\left(\frac{mg}{kg}\right) = \frac{1}{\frac{1}{PRG_{ind-sol-ingn}} + \frac{1}{PRG_{ind-sol-inhn}}}$$

- **Carcinogenic**
  - Ingestion

$$SL_{ind\text{-}sol\text{-}ingc}\left(\frac{mg}{kg}\right) = \frac{TR \times AT_{ind}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right) \times BW_{ind}\,(80\ kg)}{CSF_o\left(\frac{mg}{kg-day}\right)^{-1} \times \left(\frac{10^{-6}\ kg}{mg}\right) \times RBA \times EF_{ind}\left(\frac{250\ days}{yr}\right) \times ED_{ind}\,(25\ yr) \times IRS_{ind}\left(\frac{50\ mg}{day}\right)}$$

  - Inhalation

$$SL_{ind\text{-}sol\text{-}inhc}\left(\frac{mg}{kg}\right) = \frac{TR \times AT_{ind}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{IUR\left(\frac{\mu g}{m^3}\right)^{-1} \times \left(\frac{1000\ \mu g}{mg}\right) \times EF_{ind}\left(\frac{250\ days}{yr}\right) \times ED_{ind}\,(25\ yr) \times ET_{ind}\left(\frac{8\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times \left(\frac{1}{VF_{ulim}\left(\frac{m^3}{kg}\right)} + \frac{1}{PEF\left(\frac{m^3}{kg}\right)}\right)}$$

  - Total

$$SL_{ind\text{-}sol\text{-}totc}\left(\frac{mg}{kg}\right) = \frac{1}{\frac{1}{PRG_{ind\text{-}sol\text{-}ingc}} + \frac{1}{PRG_{ind\text{-}sol\text{-}inhc}}}$$

Indoor Worker Air

The indoor worker air land use is not provided in the RSL Generic Tables but RSLs can be created by using the Calculator.

- **Noncarcinogenic**
  The air land use equation, presented here, contains the following exposure routes:
  - Inhalation

$$SL_{ind\text{-}air\text{-}inhn}\left(\frac{\mu g}{m^3}\right) = \frac{THQ \times AT_{ind\text{-}a}\left(\frac{365\ days}{yr} \times ED_{ind}\,(25\ yr)\right)}{\left(\frac{1}{RfC\left(\frac{mg}{m^3}\right)}\right) \times \left(\frac{mg}{1000\ \mu g}\right) \times EF_{ind}\left(\frac{250\ days}{yr}\right) \times ED_{ind}\,(25\ yr) \times ET_{ind}\left(\frac{8\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right)}$$

- **Noncarcinogenic - Refractory Ceramic Fibers**
  - Inhalation

$$SL_{ind\text{-}air\text{-}inhrcf}\left(\frac{f}{m^3}\right) = \frac{THQ \times AT_{ind\text{-}a}\left(\frac{365\ days}{yr} \times ED_{ind}(25\ yr)\right)}{\left(\frac{1}{RfC\left(\frac{f}{m^3}\right)}\right) \times EF_{ind}\left(\frac{250\ days}{yr}\right) \times ED_{ind}(25\ yr) \times ET_{ind}\left(\frac{8\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right)}$$

- **Carcinogenic**

  The air land use equation, presented here, contains the following exposure routes:
  - Inhalation

$$SL_{ind\text{-}air\text{-}inhc}\left(\frac{\mu g}{m^3}\right) = \frac{TR \times AT_{ind}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{IUR\left(\frac{\mu g}{m^3}\right)^{-1} \times EF_{ind}\left(\frac{250\ days}{yr}\right) \times ED_{ind}(25\ yr) \times ET_{ind}\left(\frac{8\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right)}$$

Construction Worker

Construction Worker Soil Exposure for Standard Vehicle Traffic

The construction worker soil land use is not provided in the Generic Tables but RSLs can be created by using the Calculator.

- **Noncarcinogenic**
  - Ingestion

$$SL_{con\text{-}sol\text{-}ingn}\left(\frac{mg}{kg}\right) = \frac{THQ \times AT_{con\text{-}a}\left(EW_{con}\left(\frac{50\ wks}{yr}\right) \times \left(\frac{7\ days}{wk}\right) \times ED_{con}(1\ yr)\right) \times BW_{con}(80\ kg)}{\left(\frac{RBA}{RfD_o\left(\frac{mg}{kg-day}\right)}\right) \times \left(\frac{10^{-6}\ kg}{mg}\right) \times EF_{con}\left(EW_{con}\left(\frac{50\ wks}{yr}\right) \times DW_{con}\left(\frac{5\ days}{wk}\right)\right) \times ED_{con}(1\ yr) \times IRS_{con}\left(\frac{330\ mg}{day}\right)}$$

  - Dermal

$$SL_{con\text{-}sol\text{-}dern}\left(\frac{mg}{kg}\right) = \frac{THQ \times AT_{con\text{-}a}\left(EW_{con}\left(\frac{50\ wks}{yr}\right) \times \left(\frac{7\ days}{wk}\right) \times ED_{con}(1\ yr)\right) \times BW_{con}(80\ kg)}{\left(\frac{1}{RfD_o\left(\frac{mg}{kg-day}\right) \times GIABS}\right) \times \left(\frac{10^{-6}\ kg}{mg}\right) \times EF_{con}\left(EW_{con}\left(\frac{50\ wks}{yr}\right) \times DW_{con}\left(\frac{5\ days}{wk}\right)\right) \times ED_{con}(1\ yr) \times SA_{con}\left(\frac{3{,}527\ cm^2}{day}\right) \times AF_{con}\left(\frac{0.3\ mg}{cm^2}\right) \times ABS_d}$$

  - Inhalation

$$SL_{con\text{-}sol\text{-}inhn}\left(\frac{mg}{kg}\right) = \frac{THQ \times AT_{con\text{-}a}\left(EW_{con}\left(\frac{50\ wks}{yr}\right) \times \left(\frac{7\ days}{wk}\right) \times ED_{con}(1\ yr)\right)}{\left(\frac{1}{RfC\left(\frac{mg}{m^3}\right)}\right) \times EF_{con}\left(EW_{con}\left(\frac{50\ wks}{yr}\right) \times DW_{con}\left(\frac{5\ days}{wk}\right)\right) \times ED_{con}(1\ yr) \times ET_{con}\left(\frac{8\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times \left(\frac{1}{VF_{ulim}\left(\frac{m^3}{kg}\right)} + \frac{1}{PEF_{sc}\left(\frac{m^3}{kg}\right)}\right)}$$

  - Total

$$SL_{con\text{-}sol\text{-}totn}\left(\frac{mg}{kg}\right) = \frac{1}{\frac{1}{PRG_{con\text{-}sol\text{-}ingn}} + \frac{1}{PRG_{con\text{-}sol\text{-}inhn}} + \frac{1}{PRG_{con\text{-}sol\text{-}dern}}}$$

- **Carcinogenic**
  - Ingestion

$$SL_{con\text{-}sol\text{-}ingc}\left(\frac{mg}{kg}\right) = \frac{TR \times AT_{con}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right) \times BW_{con}(80\ kg)}{CSF_o\left(\frac{mg}{kg\text{-}day}\right)^{-1} \times \left(\frac{10^{-6}\ kg}{mg}\right) \times RBA \times EF_{con}\left(EW_{con}\left(\frac{50\ wks}{yr}\right) \times DW_{con}\left(\frac{5\ days}{wk}\right)\right) \times ED_{con}(1\ yr) \times IRS_{con}\left(\frac{330\ mg}{day}\right)}$$

  - Dermal

$$SL_{con\text{-}sol\text{-}derc}\left(\frac{mg}{kg}\right) = \frac{TR \times AT_{con}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right) \times BW_{con}(80\ kg)}{\left(\frac{CSF_o\left(\frac{mg}{kg\text{-}day}\right)^{-1}}{GIABS}\right) \times \left(\frac{10^{-6}\ kg}{mg}\right) \times EF_{con}\left(EW_{con}\left(\frac{50\ wks}{yr}\right) \times DW_{con}\left(\frac{5\ days}{wk}\right)\right) \times ED_{con}(1\ yr) \times SA_{con}\left(\frac{3{,}527\ cm^2}{day}\right) \times AF_{con}\left(\frac{0.3\ mg}{cm^2}\right) \times ABS_d}$$

  - Inhalation

$$SL_{con\text{-}sol\text{-}inhc}\left(\frac{mg}{kg}\right) = \frac{TR \times AT_{con}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{IUR\left(\frac{\mu g}{m^3}\right)^{-1} \times \left(\frac{1000\ \mu g}{mg}\right) \times EF_{con}\left(EW_{con}\left(\frac{50\ wks}{yr}\right) \times DW_{con}\left(\frac{5\ days}{wk}\right)\right) \times ED_{con}(1\ yr) \times ET_{con}\left(\frac{8\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times \left(\frac{1}{VF_{ulim}\left(\frac{m^3}{kg}\right)} + \frac{1}{PEF_{sc}\left(\frac{m^3}{kg}\right)}\right)}$$

  - Total

$$SL_{con\text{-}sol\text{-}totc}\left(\frac{mg}{kg}\right) = \frac{1}{\frac{1}{PRG_{con\text{-}sol\text{-}ingc}} + \frac{1}{PRG_{con\text{-}sol\text{-}inhc}} + \frac{1}{PRG_{con\text{-}sol\text{-}derc}}}$$

Construction Worker Soil Exposure for Other Construction Activities

The construction worker soil land use is not provided in the Generic Tables but RSLs can be created by using the Calculator.

- **Noncarcinogenic**
  - Ingestion

$$SL_{con\text{-}sol\text{-}ingnsa}\left(\frac{mg}{kg}\right) = \frac{THQ \times AT_{con\text{-}a}\left(EW_{con}\left(\frac{50\ wks}{yr}\right) \times \left(\frac{7\ days}{wk}\right) \times ED_{con}(1\ yr)\right) \times BW_{con}(80\ kg)}{\left(\frac{RBA}{RfD_o\left(\frac{mg}{kg-day}\right)}\right) \times \left(\frac{10^{-6}\ kg}{mg}\right) \times EF_{con}\left(EW_{con}\left(\frac{50\ wks}{yr}\right) \times DW_{con}\left(\frac{5\ days}{wk}\right)\right) \times ED_{con}(1\ yr) \times IRS_{con}\left(\frac{330\ mg}{day}\right)}$$

  - Dermal

$$SL_{con\text{-}sol\text{-}dernsa}\left(\frac{mg}{kg}\right) = \frac{THQ \times AT_{con\text{-}a}\left(EW_{con}\left(\frac{50\ wks}{yr}\right) \times \left(\frac{7\ days}{wk}\right) \times ED_{con}(1\ yr)\right) \times BW_{con}(80\ kg)}{\left(\frac{1}{RfD_o\left(\frac{mg}{kg-day}\right) \times GIABS}\right) \times \left(\frac{10^{-6}\ kg}{mg}\right) \times EF_{con}\left(EW_{con}\left(\frac{50\ wks}{yr}\right) \times DW_{con}\left(\frac{5\ days}{wk}\right)\right) \times ED_{con}(1\ yr) \times SA_{con}\left(\frac{3{,}527\ cm^2}{day}\right) \times AF_{con}\left(\frac{0.3\ mg}{cm^2}\right) \times ABS_d}$$

  - Inhalation

$$SL_{con\text{-}sol\text{-}inhnsa}\left(\frac{mg}{kg}\right) = \frac{THQ \times AT_{con\text{-}a}\left(EW_{con}\left(\frac{50\ wks}{yr}\right) \times \left(\frac{7\ days}{wk}\right) \times ED_{con}(1\ yr)\right)}{\left(\frac{1}{RfC\left(\frac{mg}{m^3}\right)}\right) \times EF_{con}\left(EW_{con}\left(\frac{50\ wks}{yr}\right) \times DW_{con}\left(\frac{5\ days}{wk}\right)\right) \times ED_{con}(1\ yr) \times ET_{con}\left(\frac{8\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times \left(\frac{1}{VF_{ulim}\left(\frac{m^3}{kg}\right)} + \frac{1}{PEF'_{sc}\left(\frac{m^3}{kg}\right)}\right)}$$

  - Total

$$SL_{con\text{-}sol\text{-}totnsa}\left(\frac{mg}{kg}\right) = \frac{1}{\frac{1}{PRG_{con\text{-}sol\text{-}ingnsa}} + \frac{1}{PRG_{con\text{-}sol\text{-}inhnsa}} + \frac{1}{PRG_{con\text{-}sol\text{-}dernsa}}}$$

- **Carcinogenic**
  - Ingestion

$$SL_{con\text{-}sol\text{-}ingcsa}\left(\frac{mg}{kg}\right) = \frac{TR \times AT_{con}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right) \times BW_{con}(80\ kg)}{CSF_o\left(\frac{mg}{kg-day}\right)^{-1} \times \left(\frac{10^{-6}\ kg}{mg}\right) \times RBA \times EF_{con}\left(EW_{con}\left(\frac{50\ wks}{yr}\right) \times DW_{con}\left(\frac{5\ days}{wk}\right)\right) \times ED_{con}(1\ yr) \times IRS_{con}\left(\frac{330\ mg}{day}\right)}$$

  - Dermal

$$SL_{con\text{-}sol\text{-}dercsa}\left(\frac{mg}{kg}\right) = \frac{TR \times AT_{con}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right) \times BW_{con}(80\ kg)}{\left(\frac{CSF_o\left(\frac{mg}{kg-day}\right)^{-1}}{GIABS}\right) \times \left(\frac{10^{-6}\ kg}{mg}\right) \times EF_{con}\left(EW_{con}\left(\frac{50\ wks}{yr}\right) \times DW_{con}\left(\frac{5\ days}{wk}\right)\right) \times ED_{con}(1\ yr) \times SA_{con}\left(\frac{3{,}527\ cm^2}{day}\right) \times AF_{con}\left(\frac{0.3\ mg}{cm^2}\right) \times ABS_d}$$

  - Inhalation

$$SL_{con\text{-}sol\text{-}inhcsa}\left(\frac{mg}{kg}\right) = \frac{TR \times AT_{con}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{IUR\left(\frac{\mu g}{m^3}\right)^{-1} \times \left(\frac{1000\ \mu g}{mg}\right) \times EF_{con}\left(EW_{con}\left(\frac{50\ wks}{yr}\right) \times DW_{con}\left(\frac{5\ days}{wk}\right)\right) \times ED_{con}(1\ yr) \times ET_{con}\left(\frac{8\ hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times \left(\frac{1}{VF_{ulim}\left(\frac{m^3}{kg}\right)} + \frac{1}{PEF'_{sc}\left(\frac{m^3}{kg}\right)}\right)}$$

  - Total

$$SL_{con\text{-}sol\text{-}totcsa}\left(\frac{mg}{kg}\right) = \frac{1}{\frac{1}{PRG_{con\text{-}sol\text{-}ingcsa}} + \frac{1}{PRG_{con\text{-}sol\text{-}inhcsa}} + \frac{1}{PRG_{con\text{-}sol\text{-}dercsa}}}$$

Recreator

Recreator Soil/Sediment

The recreator soil land use is not provided in the Generic Tables but RSLs can be created by using the Calculator.

- **Noncarcinogenic - Child**
  - Ingestion

$$SL_{rec-sol-ingnc}\left(\frac{mg}{kg}\right) = \frac{THQ \times AT_{rec-c}\left(\frac{365\ days}{yr} \times ED_{rec-c}(6\ yr)\right) \times BW_{rec-c}(15\ kg)}{\left(\frac{RBA}{RfD_o\left(\frac{mg}{kg-day}\right)}\right) \times \left(\frac{10^{-6}\ kg}{mg}\right) \times EF_{rec-c}\left(\frac{days}{yr}\right) \times ED_{rec-c}(6\ yr) \times IRS_{rec-c}\left(\frac{mg}{day}\right)}$$

  - Dermal

$$SL_{rec-sol-dernc}\left(\frac{mg}{kg}\right) = \frac{THQ \times AT_{rec-c}\left(\frac{365\ days}{yr} \times ED_{rec-c}(6\ yr)\right) \times BW_{rec-c}(15\ kg)}{\left(\frac{1}{RfD_o\left(\frac{mg}{kg-day}\right) \times GIABS}\right) \times \left(\frac{10^{-6}\ kg}{mg}\right) \times EF_{rec-c}\left(\frac{days}{yr}\right) \times ED_{rec-c}(6\ yr) \times SA_{rec-c}\left(\frac{cm^2}{day}\right) \times AF_{rec-c}\left(\frac{mg}{cm^2}\right) \times ABS_d}$$

  - Inhalation

$$SL_{rec-sol-inhnc}\left(\frac{mg}{kg}\right) = \frac{THQ \times AT_{rec-c}\left(\frac{365\ days}{yr} \times ED_{rec-c}(6\ yr)\right)}{\left(\frac{1}{RfC\left(\frac{mg}{m^3}\right)}\right) \times EF_{rec-c}\left(\frac{days}{yr}\right) \times ED_{rec-c}(6\ yr) \times ET_{rec-c}\left(\frac{hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times \left(\frac{1}{VF_{ulim}\left(\frac{m^3}{kg}\right)} + \frac{1}{PEF\left(\frac{m^3}{kg}\right)}\right)}$$

  - Total

$$SL_{rec-sol-totnc}\left(\frac{mg}{kg}\right) = \frac{1}{\frac{1}{SL_{rec-sol-ingnc}} + \frac{1}{SL_{rec-sol-inhnc}} + \frac{1}{SL_{rec-sol-dernc}}}$$

- **Noncarcinogenic - Adult**
  - Ingestion

$$SL_{rec-sol-ingna}\left(\frac{mg}{kg}\right) = \frac{THQ \times AT_{rec-a}\left(\frac{365\ days}{yr} \times ED_{rec}(26\ yr)\right) \times BW_{rec-a}(80\ kg)}{\left(\frac{RBA}{RfD_o\left(\frac{mg}{kg-day}\right)}\right) \times \left(\frac{10^{-6}\ kg}{mg}\right) \times EF_{rec-a}\left(\frac{days}{yr}\right) \times ED_{rec}(26\ yr) \times IRS_{rec-a}\left(\frac{mg}{day}\right)}$$

  - Dermal

$$SL_{rec-sol-derna}\left(\frac{mg}{kg}\right) = \frac{THQ \times AT_{rec-a}\left(\frac{365\ days}{yr} \times ED_{rec}(26\ yr)\right) \times BW_{rec-a}(80\ kg)}{\left(\frac{1}{RfD_o\left(\frac{mg}{kg-day}\right) \times GIABS}\right) \times \left(\frac{10^{-6}\ kg}{mg}\right) \times EF_{rec-a}\left(\frac{days}{yr}\right) \times ED_{rec}(26\ yr) \times SA_{rec-a}\left(\frac{cm^2}{day}\right) \times AF_{rec-a}\left(\frac{mg}{cm^2}\right) \times ABS_d}$$

  - Inhalation

$$SL_{rec-sol-inhna}\left(\frac{mg}{kg}\right) = \frac{THQ \times AT_{rec-a}\left(\frac{365\ days}{yr} \times ED_{rec}(26\ yr)\right)}{\left(\frac{1}{RfC\left(\frac{mg}{m^3}\right)}\right) \times EF_{rec-a}\left(\frac{days}{yr}\right) \times ED_{rec}(26\ yr) \times ET_{rec-a}\left(\frac{hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times \left(\frac{1}{VF_{ulim}\left(\frac{m^3}{kg}\right)} + \frac{1}{PEF\left(\frac{m^3}{kg}\right)}\right)}$$

  - Total

$$SL_{rec-sol-totna}\left(\frac{mg}{kg}\right) = \frac{1}{\frac{1}{SL_{rec-sol-ingna}} + \frac{1}{SL_{rec-sol-inhna}} + \frac{1}{SL_{rec-sol-derna}}}$$

- **Carcinogenic**
  - Ingestion

$$SL_{rec\text{-}sol\text{-}ingc}\left(\frac{mg}{kg}\right) = \frac{TR \times AT_{rec}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{CSF_o\left(\frac{mg}{kg-day}\right)^{-1} \times \left(\frac{10^{-6}\ kg}{mg}\right) \times RBA \times IFS_{rec\text{-}adj}\left(\frac{mg}{kg}\right)}$$

where:

$$IFS_{rec\text{-}adj}\left(\frac{mg}{kg}\right) = \left[\frac{EF_{rec\text{-}c}\left(\frac{days}{yr}\right) \times ED_{rec\text{-}c}(6\ yr) \times IRS_{rec\text{-}c}\left(\frac{mg}{day}\right)}{BW_{rec\text{-}c}(15\ kg)} + \frac{EF_{rec\text{-}a}\left(\frac{days}{yr}\right) \times ED_{rec\text{-}a}(20\ yr) \times IRS_{rec\text{-}a}\left(\frac{mg}{day}\right)}{BW_{rec\text{-}a}(80\ kg)}\right]$$

  - Dermal

$$SL_{rec\text{-}sol\text{-}derc}\left(\frac{mg}{kg}\right) = \frac{TR \times AT_{rec}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{\left(\frac{CSF_o\left(\frac{mg}{kg-day}\right)^{-1}}{GIABS}\right) \times \left(\frac{10^{-6}\ kg}{mg}\right) \times DFS_{rec\text{-}adj}\left(\frac{mg}{kg}\right) \times ABS_d}$$

where:

$$DFS_{rec\text{-}adj}\left(\frac{mg}{kg}\right) = \left[\frac{EF_{rec\text{-}c}\left(\frac{days}{yr}\right) \times ED_{rec\text{-}c}(6\ yr) \times SA_{rec\text{-}c}\left(\frac{cm^2}{day}\right) \times AF_{rec\text{-}c}\left(\frac{mg}{cm^2}\right)}{BW_{rec\text{-}c}(15\ kg)} + \frac{EF_{rec\text{-}a}\left(\frac{days}{yr}\right) \times ED_{rec\text{-}a}(20\ yr) \times SA_{rec\text{-}a}\left(\frac{cm^2}{day}\right) \times AF_{rec\text{-}a}\left(\frac{mg}{cm^2}\right)}{BW_{rec\text{-}a}(80\ kg)}\right]$$

  - Inhalation

$$SL_{rec\text{-}sol\text{-}inhc}\left(\frac{mg}{kg}\right) = \frac{TR \times AT_{rec}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{IUR\left(\frac{\mu g}{m^3}\right)^{-1} \times \left(\frac{1000\ \mu g}{mg}\right) \times EF_{rec}\left(\frac{days}{yr}\right) \times ED_{rec}(26\ yr) \times ET_{rec}\left(\frac{hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times \left(\frac{1}{VF_{ulim}\left(\frac{m^3}{kg}\right)} + \frac{1}{PEF\left(\frac{m^3}{kg}\right)}\right)}$$

- Total

$$SL_{rec-sol-totc}\left(\frac{mg}{kg}\right) = \frac{1}{\frac{1}{SL_{rec-sol-ingc}} + \frac{1}{SL_{rec-sol-inhc}} + \frac{1}{SL_{rec-sol-derc}}}$$

- **Mutagenic**
  - Ingestion

$$SL_{rec\text{-}sol\text{-}ingmu}\left(\frac{mg}{kg}\right) = \frac{TR \times AT_{rec}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{CSF_o\left(\frac{mg}{kg-day}\right)^{-1} \times \left(\frac{10^{-6}\ kg}{mg}\right) \times RBA \times IFSM_{rec\text{-}adj}\left(\frac{mg}{kg}\right)}$$

where:

$$IFSM_{rec\text{-}adj}\left(\frac{mg}{kg}\right) = \left[\begin{array}{l} \frac{EF_{0\text{-}2}\left(\frac{days}{yr}\right) \times ED_{0\text{-}2}(2\ yr) \times IRS_{0\text{-}2}\left(\frac{mg}{day}\right) \times 10}{BW_{0\text{-}2}(15\ kg)} + \\ \frac{EF_{2\text{-}6}\left(\frac{days}{yr}\right) \times ED_{2\text{-}6}(4\ yr) \times IRS_{2\text{-}6}\left(\frac{mg}{day}\right) \times 3}{BW_{2\text{-}6}(15\ kg)} + \\ \frac{EF_{6\text{-}16}\left(\frac{days}{yr}\right) \times ED_{6\text{-}16}(10\ yr) \times IRS_{6\text{-}16}\left(\frac{mg}{day}\right) \times 3}{BW_{6\text{-}16}(80\ kg)} + \\ \frac{EF_{16\text{-}26}\left(\frac{days}{yr}\right) \times ED_{16\text{-}26}(10\ yr) \times IRS_{16\text{-}26}\left(\frac{mg}{day}\right) \times 1}{BW_{16\text{-}26}(80\ kg)} \end{array}\right]$$

- Dermal

$$SL_{rec\text{-}sol\text{-}dermu}\left(\frac{mg}{kg}\right) = \frac{TR \times AT_{rec}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{\left(\frac{CSF_o\left(\frac{mg}{kg-day}\right)^{-1}}{GIABS}\right) \times \left(\frac{10^{-6}\ kg}{mg}\right) \times DFSM_{rec\text{-}adj}\left(\frac{mg}{kg}\right) \times ABS_d}$$

where:

$$DFSM_{rec\text{-}adj}\left(\frac{mg}{kg}\right) = \left[\begin{array}{l} \frac{EF_{0\text{-}2}\left(\frac{days}{yr}\right) \times ED_{0\text{-}2}(2\ yr) \times SA_{0\text{-}2}\left(\frac{cm^2}{day}\right) \times AF_{0\text{-}2}\left(\frac{mg}{cm^2}\right) \times 10}{BW_{0\text{-}2}(15\ kg)} + \\ \frac{EF_{2\text{-}6}\left(\frac{days}{yr}\right) \times ED_{2\text{-}6}(4\ yr) \times SA_{2\text{-}6}\left(\frac{cm^2}{day}\right) \times AF_{2\text{-}6}\left(\frac{mg}{cm^2}\right) \times 3}{BW_{2\text{-}6}(15\ kg)} + \\ \frac{EF_{6\text{-}16}\left(\frac{days}{yr}\right) \times ED_{6\text{-}16}(10\ yr) \times SA_{6\text{-}16}\left(\frac{cm^2}{day}\right) \times AF_{6\text{-}16}\left(\frac{mg}{cm^2}\right) \times 3}{BW_{6\text{-}16}(80\ kg)} + \\ \frac{EF_{16\text{-}26}\left(\frac{days}{yr}\right) \times ED_{16\text{-}26}(10\ yr) \times SA_{16\text{-}26}\left(\frac{cm^2}{day}\right) \times AF_{16\text{-}26}\left(\frac{mg}{cm^2}\right) \times 1}{BW_{16\text{-}26}(80\ kg)} \end{array}\right]$$

- Inhalation

$$SL_{rec\text{-}sol\text{-}inhmu}\left(\frac{mg}{kg}\right) = \frac{TR \times AT_{rec}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{IUR\left(\frac{\mu g}{m^3}\right)^{-1} \times \left(\frac{1000\ \mu g}{mg}\right) \times \left(\frac{1}{VF_{ulim}\left(\frac{m^3}{kg}\right)} + \frac{1}{PEF\left(\frac{m^3}{kg}\right)}\right) \times \left[\begin{array}{l} \left(EF_{0\text{-}2}\left(\frac{days}{yr}\right) \times ED_{0\text{-}2}(2\ yr) \times ET_{0\text{-}2}\left(\frac{hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times 10\right) + \\ \left(EF_{2\text{-}6}\left(\frac{days}{yr}\right) \times ED_{2\text{-}6}(4\ yr) \times ET_{2\text{-}6}\left(\frac{hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times 3\right) + \\ \left(EF_{6\text{-}16}\left(\frac{days}{yr}\right) \times ED_{6\text{-}16}(10\ yr) \times ET_{6\text{-}16}\left(\frac{hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times 3\right) + \\ \left(EF_{16\text{-}26}\left(\frac{days}{yr}\right) \times ED_{16\text{-}26}(10\ yr) \times ET_{16\text{-}26}\left(\frac{hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times 1\right) \end{array}\right]}$$

- Total

$$SL_{rec-sol-totmu}\left(\frac{mg}{kg}\right) = \frac{1}{\frac{1}{SL_{rec-sol-ingmu}} + \frac{1}{SL_{rec-sol-inhmu}} + \frac{1}{SL_{rec-sol-dermu}}}$$

- **Vinyl Chloride**
  - Ingestion

$$SL_{rec\text{-}sol\text{-}ingvc}\left(\frac{mg}{kg}\right) = \frac{TR}{\left(\left(\frac{CSF_o\left(\frac{mg}{kg-day}\right)^{-1} \times \left(\frac{10^{-6}\ kg}{mg}\right) \times RBA \times IFS_{rec\text{-}adj}\left(\frac{mg}{kg}\right)}{AT_{rec}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}\right) + \left(\frac{CSF_o\left(\frac{mg}{kg-day}\right)^{-1} \times \left(\frac{10^{-6}\ kg}{mg}\right) \times RBA \times IRS_{rec\text{-}c}\left(\frac{mg}{day}\right)}{BW_{rec\text{-}c}\,(15\ kg)}\right)\right)}$$

where:

$$IFS_{rec\text{-}adj}\left(\frac{mg}{kg}\right) = \left[\frac{EF_{rec\text{-}c}\left(\frac{days}{yr}\right) \times ED_{rec\text{-}c}\,(6\ yr) \times IRS_{rec\text{-}c}\left(\frac{mg}{day}\right)}{BW_{rec\text{-}c}\,(15\ kg)} + \frac{EF_{rec\text{-}a}\left(\frac{days}{yr}\right) \times ED_{rec\text{-}a}\,(20\ yr) \times IRS_{rec\text{-}a}\left(\frac{mg}{day}\right)}{BW_{rec\text{-}a}\,(80\ kg)}\right]$$

  - Dermal

$$SL_{rec\text{-}sol\text{-}dervc}\left(\frac{mg}{kg}\right) = \frac{TR}{\left(\left(\frac{\frac{CSF_o\left(\frac{mg}{kg-day}\right)^{-1}}{GIABS} \times \left(\frac{10^{-6}\ kg}{mg}\right) \times DFS_{rec\text{-}adj}\left(\frac{mg}{kg}\right) \times ABS_d}{AT_{rec}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}\right) + \left(\frac{\frac{CSF_o\left(\frac{mg}{kg-day}\right)^{-1}}{GIABS} \times \left(\frac{10^{-6}\ kg}{mg}\right) \times SA_{rec\text{-}c}\left(\frac{cm^2}{day}\right) \times AF_{rec\text{-}c}\left(\frac{mg}{cm^2}\right) \times ABS_d}{BW_{rec\text{-}c}\,(15\ kg)}\right)\right)}$$

where:

$$DFS_{rec\text{-}adj}\left(\frac{mg}{kg}\right) = \left[\frac{EF_{rec\text{-}c}\left(\frac{days}{yr}\right) \times ED_{rec\text{-}c}\,(6\ yr) \times SA_{rec\text{-}c}\left(\frac{cm^2}{day}\right) \times AF_{rec\text{-}c}\left(\frac{mg}{cm^2}\right)}{BW_{rec\text{-}c}\,(15\ kg)} + \frac{EF_{rec\text{-}a}\left(\frac{days}{yr}\right) \times ED_{rec\text{-}a}\,(20\ yr) \times SA_{rec\text{-}a}\left(\frac{cm^2}{day}\right) \times AF_{rec\text{-}a}\left(\frac{mg}{cm^2}\right)}{BW_{rec\text{-}a}\,(80\ kg)}\right]$$

- Inhalation

$$SL_{rec\text{-}sol\text{-}inhvc}\left(\frac{mg}{kg}\right) = \frac{TR}{\left(\frac{IUR\left(\frac{\mu g}{m^3}\right)^{-1} \times \left(\frac{1000\ \mu g}{mg}\right) \times EF_{rec}\left(\frac{days}{yr}\right) \times ED_{rec}(26\ yr) \times ET_{rec}\left(\frac{hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right)}{AT_{rec}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right) \times VF_{ulim}\left(\frac{m^3}{kg}\right)}\right) + \left(\frac{IUR\left(\frac{\mu g}{m^3}\right)^{-1}}{VF_{ulim}\left(\frac{m^3}{kg}\right)} \times \left(\frac{1000\ \mu g}{mg}\right)\right)}$$

- Total

$$SL_{rec\text{-}sol\text{-}totvc}\left(\frac{mg}{kg}\right) = \frac{1}{\frac{1}{SL_{rec\text{-}sol\text{-}ingvc}} + \frac{1}{SL_{rec\text{-}sol\text{-}inhvc}} + \frac{1}{SL_{rec\text{-}sol\text{-}dervc}}}$$

- **Trichloroethylene**
  - Ingestion

$$SL_{rec\text{-}sol\text{-}ingtce}\left(\frac{mg}{kg}\right) = \frac{TR \times AT_{rec}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{CSF_o\left(\frac{mg}{kg\text{-}day}\right)^{-1} \times \left(\frac{10^{-6}\ kg}{mg}\right) \times RBA \times \left(\begin{array}{l}\left(CAF_o(0.804) \times IFS_{rec\text{-}adj}\left(\frac{mg}{kg}\right)\right) + \\ \left(MAF_o(0.202) \times IFSM_{rec\text{-}adj}\left(\frac{mg}{kg}\right)\right)\end{array}\right)}$$

where:

$$IFS_{rec\text{-}adj}\left(\frac{mg}{kg}\right) = \left[\begin{array}{l}\frac{EF_{rec\text{-}c}\left(\frac{days}{yr}\right) \times ED_{rec\text{-}c}(6\ yr) \times IRS_{rec\text{-}c}\left(\frac{mg}{day}\right)}{BW_{rec\text{-}c}(15\ kg)} + \\ \frac{EF_{rec\text{-}a}\left(\frac{days}{yr}\right) \times ED_{rec\text{-}a}(20\ yr) \times IRS_{rec\text{-}a}\left(\frac{mg}{day}\right)}{BW_{rec\text{-}a}(80\ kg)}\end{array}\right]$$

and:

$$IFSM_{rec\text{-}adj}\left(\frac{mg}{kg}\right) = \left[\begin{array}{l}\frac{EF_{0\text{-}2}\left(\frac{days}{yr}\right) \times ED_{0\text{-}2}(2\ yr) \times IRS_{0\text{-}2}\left(\frac{mg}{day}\right) \times 10}{BW_{0\text{-}2}(15\ kg)} + \\ \frac{EF_{2\text{-}6}\left(\frac{days}{yr}\right) \times ED_{2\text{-}6}(4\ yr) \times IRS_{2\text{-}6}\left(\frac{mg}{day}\right) \times 3}{BW_{2\text{-}6}(15\ kg)} + \\ \frac{EF_{6\text{-}16}\left(\frac{days}{yr}\right) \times ED_{6\text{-}16}(10\ yr) \times IRS_{6\text{-}16}\left(\frac{mg}{day}\right) \times 3}{BW_{6\text{-}16}(80\ kg)} + \\ \frac{EF_{16\text{-}26}\left(\frac{days}{yr}\right) \times ED_{16\text{-}26}(10\ yr) \times IRS_{16\text{-}26}\left(\frac{mg}{day}\right) \times 1}{BW_{16\text{-}26}(80\ kg)}\end{array}\right]$$

- Dermal

$$SL_{rec\text{-}sol\text{-}dertce}\left(\frac{mg}{kg}\right) = \frac{TR \times AT_{rec}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{\left(\frac{CSF_o\left(\frac{mg}{kg-day}\right)^{-1}}{GIABS}\right) \times \left(\frac{10^{-6}\ kg}{mg}\right) \times \left(\begin{array}{l}\left(CAF_o(0.804) \times DFS_{rec\text{-}adj}\left(\frac{mg}{kg}\right) \times ABS_d\right) + \\ \left(MAF_o(0.202) \times DFSM_{rec\text{-}adj}\left(\frac{mg}{kg}\right) \times ABS_d\right)\end{array}\right)}$$

where:

$$DFS_{rec\text{-}adj}\left(\frac{mg}{kg}\right) = \left[\begin{array}{l}\frac{EF_{rec\text{-}c}\left(\frac{days}{yr}\right) \times ED_{rec\text{-}c}(6\ yr) \times SA_{rec\text{-}c}\left(\frac{cm^2}{day}\right) \times AF_{rec\text{-}c}\left(\frac{mg}{cm^2}\right)}{BW_{rec\text{-}c}(15\ kg)} + \\ \frac{EF_{rec\text{-}a}\left(\frac{days}{yr}\right) \times ED_{rec\text{-}a}(20\ yr) \times SA_{rec\text{-}a}\left(\frac{cm^2}{day}\right) \times AF_{rec\text{-}a}\left(\frac{mg}{cm^2}\right)}{BW_{rec\text{-}a}(80\ kg)}\end{array}\right]$$

and:

$$DFSM_{rec\text{-}adj}\left(\frac{mg}{kg}\right) = \left[\begin{array}{l}\frac{EF_{0\text{-}2}\left(\frac{days}{yr}\right) \times ED_{0\text{-}2}(2\ yr) \times SA_{0\text{-}2}\left(\frac{cm^2}{day}\right) \times AF_{0\text{-}2}\left(\frac{mg}{cm^2}\right) \times 10}{BW_{0\text{-}2}(15\ kg)} + \\ \frac{EF_{2\text{-}6}\left(\frac{days}{yr}\right) \times ED_{2\text{-}6}(4\ yr) \times SA_{2\text{-}6}\left(\frac{cm^2}{day}\right) \times AF_{2\text{-}6}\left(\frac{mg}{cm^2}\right) \times 3}{BW_{2\text{-}6}(15\ kg)} + \\ \frac{EF_{6\text{-}16}\left(\frac{days}{yr}\right) \times ED_{6\text{-}16}(10\ yr) \times SA_{6\text{-}16}\left(\frac{cm^2}{day}\right) \times AF_{6\text{-}16}\left(\frac{mg}{cm^2}\right) \times 3}{BW_{6\text{-}16}(80\ kg)} + \\ \frac{EF_{16\text{-}26}\left(\frac{days}{yr}\right) \times ED_{16\text{-}26}(10\ yr) \times SA_{16\text{-}26}\left(\frac{cm^2}{day}\right) \times AF_{16\text{-}26}\left(\frac{mg}{cm^2}\right) \times 1}{BW_{16\text{-}26}(80\ kg)}\end{array}\right]$$

- Inhalation

$$SL_{rec\text{-}sol\text{-}inhtce}\left(\frac{mg}{kg}\right) = \frac{TR \times AT_{rec}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{IUR\left(\frac{\mu g}{m^3}\right)^{-1} \times \left(\frac{1000\ \mu g}{mg}\right) \times \left(\frac{1}{VF_{ulim}\left(\frac{m^3}{kg}\right)} + \frac{1}{PEF\left(\frac{m^3}{kg}\right)}\right) \times \left[\begin{array}{l} \left(EF_{rec}\left(\frac{days}{yr}\right) \times ED_{rec}(26\ yr) \times ET_{rec}\left(\frac{hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times CAF_i(0.756)\right) + \\ \left(EF_{0\text{–}2}\left(\frac{days}{yr}\right) \times ED_{0\text{–}2}(2\ yr) \times ET_{0\text{–}2}\left(\frac{hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times MAF_i(0.244) \times 10\right) + \\ \left(EF_{2\text{–}6}\left(\frac{days}{yr}\right) \times ED_{2\text{–}6}(4\ yr) \times ET_{2\text{–}6}\left(\frac{hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times MAF_i(0.244) \times 3\right) + \\ \left(EF_{6\text{–}16}\left(\frac{days}{yr}\right) \times ED_{6\text{–}16}(10\ yr) \times ET_{6\text{–}16}\left(\frac{hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times MAF_i(0.244) \times 3\right) + \\ \left(EF_{16\text{–}26}\left(\frac{days}{yr}\right) \times ED_{16\text{–}26}(10\ yr) \times ET_{16\text{–}26}\left(\frac{hrs}{day}\right) \times \left(\frac{1\ day}{24\ hrs}\right) \times MAF_i(0.244) \times 1\right) \end{array}\right]}$$

- Total

$$SL_{rec\text{-}sol\text{-}tottce}\left(\frac{mg}{kg}\right) = \frac{1}{\frac{1}{SL_{rec\text{-}sol\text{-}ingtce}} + \frac{1}{SL_{rec\text{-}sol\text{-}inhtce}} + \frac{1}{SL_{rec\text{-}sol\text{-}dertce}}}$$

- **Supporting Equations**
  - Child

$$ED_{rec-c}(6\ yr) = ED_{0-2}(2\ yr) + ED_{2-6}(4\ yr)$$

$$BW_{rec-c}(15\ kg) = \frac{ED_{0-2}(2\ yr) \times BW_{0-2}(15\ kg) + ED_{2-6}(4\ yr) \times BW_{2-6}(15\ kg)}{ED_{0-2}(2\ yr) + ED_{2-6}(4\ yr)}$$

$$EF_{rec-c}\left(\frac{days}{yr}\right) = \frac{ED_{0-2}(2\ yr) \times EF_{0-2}\left(\frac{days}{yr}\right) + ED_{2-6}(4\ yr) \times EF_{2-6}\left(\frac{days}{yr}\right)}{ED_{0-2}(2\ yr) + ED_{2-6}(4\ yr)}$$

$$ET_{rec-c}\left(\frac{hrs}{day}\right) = \frac{ED_{0-2}(2\ yr) \times ET_{0-2}\left(\frac{hrs}{day}\right) + ED_{2-6}(4\ yr) \times ET_{2-6}\left(\frac{hrs}{day}\right)}{ED_{0-2}(2\ yr) + ED_{2-6}(4\ yr)}$$

$$AF_{rec-c}\left(\frac{mg}{cm^2}\right) = \frac{ED_{0-2}(2\ yr) \times AF_{0-2}\left(\frac{mg}{cm^2}\right) + ED_{2-6}(4\ yr) \times AF_{2-6}\left(\frac{mg}{cm^2}\right)}{ED_{0-2}(2\ yr) + ED_{2-6}(4\ yr)}$$

  - Adult

$$ED_{rec-a}(20\ yr) = ED_{6-16}(10\ yr) + ED_{16-26}(10\ yr)$$

$$BW_{rec-a}(80\ kg) = \frac{ED_{6-16}(10\ yr) \times BW_{6-16}(80\ kg) + ED_{16-26}(10\ yr) \times BW_{16-26}(80\ kg)}{ED_{6-16}(10\ yr) + ED_{16-26}(10\ yr)}$$

$$EF_{rec-a}\left(\frac{days}{yr}\right) = \frac{ED_{6-16}(10\ yr) \times EF_{6-16}\left(\frac{days}{yr}\right) + ED_{16-26}(10\ yr) \times EF_{16-26}\left(\frac{days}{yr}\right)}{ED_{6-16}(10\ yr) + ED_{16-26}(10\ yr)}$$

$$ET_{rec-a}\left(\frac{hrs}{day}\right) = \frac{ED_{6-16}(10\ yr) \times ET_{6-16}\left(\frac{hrs}{day}\right) + ED_{16-26}(10\ yr) \times ET_{16-26}\left(\frac{hrs}{day}\right)}{ED_{6-16}(10\ yr) + ED_{16-26}(10\ yr)}$$

$$AF_{rec-a}\left(\frac{mg}{cm^2}\right) = \frac{ED_{6-16}(10\ yr) \times AF_{6-16}\left(\frac{mg}{cm^2}\right) + ED_{16-26}(10\ yr) \times AF_{16-26}\left(\frac{mg}{cm^2}\right)}{ED_{6-16}(10\ yr) + ED_{16-26}(10\ yr)}$$

- Age-adjusted

$$ED_{rec}(26\ yr) = ED_{0-2}(2\ yr) + ED_{2-6}(4\ yr) + ED_{6-16}(10\ yr) + ED_{16-26}(10\ yr)$$

$$EF_{rec}\left(\frac{days}{yr}\right) = \frac{\left(\begin{array}{c} ED_{0-2}(2\ yr) \times EF_{0-2}\left(\frac{days}{yr}\right) + ED_{2-6}(4\ yr) \times EF_{2-6}\left(\frac{days}{yr}\right) + \\ ED_{6-16}(10\ yr) \times EF_{6-16}\left(\frac{days}{yr}\right) + ED_{16-26}(10\ yr) \times EF_{16-26}\left(\frac{days}{yr}\right) \end{array}\right)}{ED_{0-2}(2\ yr) + ED_{2-6}(4\ yr) + ED_{6-16}(10\ yr) + ED_{16-26}(10\ yr)}$$

$$ET_{rec}\left(\frac{hrs}{day}\right) = \frac{\left(\begin{array}{c} ED_{0-2}(2\ yr) \times ET_{0-2}\left(\frac{hrs}{day}\right) + ED_{2-6}(4\ yr) \times ET_{2-6}\left(\frac{hrs}{day}\right) + \\ ED_{6-16}(10\ yr) \times ET_{6-16}\left(\frac{hrs}{day}\right) + ED_{16-26}(10\ yr) \times ET_{16-26}\left(\frac{hrs}{day}\right) \end{array}\right)}{ED_{0-2}(2\ yr) + ED_{2-6}(4\ yr) + ED_{6-16}(10\ yr) + ED_{16-26}(10\ yr)}$$

Recreator Surface Water

The recreator surface water land use is not provided in the Generic Tables but RSLs can be created by using the Calculator.

- **Noncarcinogenic - Child**
  - Ingestion

$$SL_{rec\text{-}wat\text{-}ingnc}\left(\frac{\mu g}{L}\right) = \frac{THQ \times AT_{rec\text{-}c}\left(\frac{365\ days}{yr}\right) \times ED_{rec\text{-}c}(6\ yr) \times BW_{rec\text{-}c}(15\ kg)}{\left(\frac{1}{RfD_o\left(\frac{mg}{kg-day}\right)}\right) \times \left(\frac{mg}{1000\ \mu g}\right) \times EF_{rec\text{-}c}\left(\frac{days}{yr}\right) \times ED_{rec\text{-}c}(6\ yr) \times EV_{rec\text{-}c}\left(\frac{event}{day}\right) \times ET_{event\text{-}rec\text{-}c}\left(\frac{hrs}{event}\right) \times IRW_{rec\text{-}c}\left(\frac{0.12\ L}{hr}\right)}$$

  - Dermal

For Inorganics:

$$SL_{rec\text{-}wat\text{-}dernc}\left(\frac{\mu g}{L}\right) = \frac{DA_{event}\left(\frac{\mu g}{cm^2-event}\right) \times \left(\frac{1000\ cm^3}{L}\right)}{K_p\left(\frac{cm}{hr}\right) \times ET_{event\text{-}rec\text{-}c}\left(\frac{hrs}{event}\right)}$$

For Organics:

IF $ET_{event\text{-}rec\text{-}c}\left(\frac{hrs}{event}\right) \leq t^*\ (hrs)$, then:

$$SL_{rec\text{-}wat\text{-}dernc}\left(\frac{\mu g}{L}\right) = \frac{DA_{event}\left(\frac{\mu g}{cm^2-event}\right) \times \left(\frac{1000\ cm^3}{L}\right)}{2 \times FA \times K_p\left(\frac{cm}{hr}\right) \times \sqrt{\frac{6 \times \tau_{event}\left(\frac{hrs}{event}\right) \times ET_{event\text{-}rec\text{-}c}\left(\frac{hrs}{event}\right)}{\pi}}}$$

or:

IF $ET_{event\text{-}rec\text{-}c}\left(\frac{hrs}{event}\right) > t^*\ (hrs)$, then:

$$SL_{rec\text{-}wat\text{-}dernc}\left(\frac{\mu g}{L}\right) = \frac{DA_{event}\left(\frac{\mu g}{cm^2-event}\right) \times \left(\frac{1000\ cm^3}{L}\right)}{FA \times K_p\left(\frac{cm}{hr}\right) \times \left[\frac{ET_{event\text{-}rec\text{-}c}\left(\frac{hrs}{event}\right)}{1+B} + 2 \times \tau_{event}\left(\frac{hrs}{event}\right) \times \left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right]}$$

where:

$$DA_{event}\left(\frac{\mu g}{cm^2-event}\right) = \frac{THQ \times AT_{rec\text{-}c}\left(\frac{365\ days}{yr}\right) \times ED_{rec\text{-}c}(6\ yr) \times BW_{rec\text{-}c}(15\ kg)}{\left(\frac{1}{RfD_o\left(\frac{mg}{kg-day}\right) \times GIABS}\right) \times \left(\frac{mg}{1000\ \mu g}\right) \times EF_{rec\text{-}c}\left(\frac{days}{yr}\right) \times ED_{rec\text{-}c}(6\ yr) \times EV_{rec\text{-}c}\left(\frac{event}{day}\right) \times SA_{rec\text{-}c}\left(6,365\ cm^2\right)}$$

  - Total

$$SL_{rec\text{-}wat\text{-}totnc}\left(\frac{\mu g}{L}\right) = \frac{1}{\frac{1}{SL_{rec\text{-}wat\text{-}ingnc}} + \frac{1}{SL_{rec\text{-}wat\text{-}dernc}}}$$

- **Noncarcinogenic - Adult**
  - Ingestion

$$SL_{rec\text{-}wat\text{-}ingna}\left(\frac{\mu g}{L}\right) = \frac{THQ \times AT_{rec\text{-}a}\left(\frac{365\ days}{yr} \times ED_{rec}(26\ yr)\right) \times BW_{rec\text{-}a}(80\ kg)}{\left(\frac{1}{RfD_o\left(\frac{mg}{kg-day}\right)}\right) \times \left(\frac{mg}{1000\ \mu g}\right) \times EF_{rec\text{-}a}\left(\frac{days}{yr}\right) \times ED_{rec}(26\ yr) \times EV_{rec\text{-}a}\left(\frac{event}{day}\right) \times ET_{event\text{-}rec\text{-}a}\left(\frac{hrs}{event}\right) \times IRW_{rec\text{-}a}\left(\frac{0.11\ L}{hr}\right)}$$

  - Dermal

For Inorganics:

$$SL_{rec\text{-}wat\text{-}derna}\left(\frac{\mu g}{L}\right) = \frac{DA_{event}\left(\frac{\mu g}{cm^2-event}\right) \times \left(\frac{1000\ cm^3}{L}\right)}{K_p\left(\frac{cm}{hr}\right) \times ET_{event\text{-}rec\text{-}a}\left(\frac{hrs}{event}\right)}$$

For Organics:

IF $ET_{event\text{-}rec\text{-}a}\left(\frac{hrs}{event}\right) \leq t^*$ (hrs), then:

$$SL_{rec\text{-}wat\text{-}derna}\left(\frac{\mu g}{L}\right) = \frac{DA_{event}\left(\frac{\mu g}{cm^2-event}\right) \times \left(\frac{1000\ cm^3}{L}\right)}{2 \times FA \times K_p\left(\frac{cm}{hr}\right) \times \sqrt{\frac{6 \times \tau_{event}\left(\frac{hrs}{event}\right) \times ET_{event\text{-}rec\text{-}a}\left(\frac{hrs}{event}\right)}{\pi}}}$$

or:

IF $ET_{event\text{-}rec\text{-}a}\left(\frac{hrs}{event}\right) > t^*$ (hrs), then:

$$SL_{rec\text{-}wat\text{-}derna}\left(\frac{\mu g}{L}\right) = \frac{DA_{event}\left(\frac{\mu g}{cm^2-event}\right) \times \left(\frac{1000\ cm^3}{L}\right)}{FA \times K_p\left(\frac{cm}{hr}\right) \times \left[\frac{ET_{event\text{-}rec\text{-}a}\left(\frac{hrs}{event}\right)}{1+B} + 2 \times \tau_{event}\left(\frac{hrs}{event}\right) \times \left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right]}$$

where:

$$DA_{event}\left(\frac{\mu g}{cm^2-event}\right) = \frac{THQ \times AT_{rec\text{-}a}\left(\frac{365\ days}{yr} \times ED_{rec}(26\ yr)\right) \times BW_{rec\text{-}a}(80\ kg)}{\left(\frac{1}{RfD_o\left(\frac{mg}{kg-day}\right) \times GIABS}\right) \times \left(\frac{mg}{1000\ \mu g}\right) \times EF_{rec\text{-}a}\left(\frac{days}{yr}\right) \times ED_{rec}(26\ yr) \times EV_{rec\text{-}a}\left(\frac{event}{day}\right) \times SA_{rec\text{-}a}\left(19,652\ cm^2\right)}$$

  - Total

$$SL_{rec\text{-}wat\text{-}totna}\left(\frac{\mu g}{L}\right) = \frac{1}{\frac{1}{SL_{rec\text{-}wat\text{-}ingna}} + \frac{1}{SL_{rec\text{-}wat\text{-}derna}}}$$

- **Carcinogenic**
  - Ingestion

$$SL_{rec-wat-ingc}\left(\frac{\mu g}{L}\right) = \frac{TR \times AT_{rec}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{CSF_o\left(\frac{mg}{kg-day}\right)^{-1} \times \left(\frac{mg}{1000\ \mu g}\right) \times IFW_{rec-adj}\left(\frac{L}{kg}\right)}$$

where:

$$IFW_{rec-adj}\left(\frac{L}{kg}\right) = \left[\frac{EF_{rec-c}\left(\frac{days}{yr}\right) \times ED_{rec-c}(6\ yr) \times EV_{rec-c}\left(\frac{event}{day}\right) \times ET_{event-rec-c}\left(\frac{hrs}{event}\right) \times IRW_{rec-c}\left(\frac{0.12\ L}{hr}\right)}{BW_{rec-c}(15\ kg)} + \frac{EF_{rec-a}\left(\frac{days}{yr}\right) \times ED_{rec-a}(20\ yr) \times EV_{rec-a}\left(\frac{event}{day}\right) \times ET_{event-rec-a}\left(\frac{hrs}{event}\right) \times IRW_{rec-a}\left(\frac{0.11\ L}{hr}\right)}{BW_{rec-a}(80\ kg)}\right]$$

- Dermal

For Inorganics:

$$SL_{rec-wat-derc}\left(\frac{\mu g}{L}\right) = \frac{DA_{event}\left(\frac{\mu g}{cm^2-event}\right) \times \left(\frac{1000\ cm^3}{L}\right)}{K_p\left(\frac{cm}{hr}\right) \times ET_{event-rec-adj}\left(\frac{hrs}{event}\right)}$$

For Organics:

IF $ET_{event-rec-adj}\left(\frac{hrs}{event}\right) \leq t^*\,(hrs)$, then:

$$SL_{rec-wat-derc}\left(\frac{\mu g}{L}\right) = \frac{DA_{event}\left(\frac{\mu g}{cm^2-event}\right) \times \left(\frac{1000\ cm^3}{L}\right)}{2 \times FA \times K_p\left(\frac{cm}{hr}\right) \times \sqrt{\frac{6 \times \tau_{event}\left(\frac{hrs}{event}\right) \times ET_{event-rec-adj}\left(\frac{hrs}{event}\right)}{\pi}}}$$

or:

IF $ET_{event-rec-adj}\left(\frac{hrs}{event}\right) > t^*\,(hrs)$, then:

$$SL_{rec-wat-derc}\left(\frac{\mu g}{L}\right) = \frac{DA_{event}\left(\frac{\mu g}{cm^2-event}\right) \times \left(\frac{1000\ cm^3}{L}\right)}{FA \times K_p\left(\frac{cm}{hr}\right) \times \left[\frac{ET_{event-rec-adj}\left(\frac{hrs}{event}\right)}{1+B} + 2 \times \tau_{event}\left(\frac{hrs}{event}\right) \times \left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right]}$$

where:

$$ET_{event-rec-adj}\left(\frac{hrs}{event}\right) = \left(\frac{\left(ED_{rec-c}\,(6\ yr) \times ET_{event-rec-c}\left(\frac{hrs}{event}\right)\right) + \left(ED_{rec-a}\,(20\ yr) \times ET_{event-rec-a}\left(\frac{hrs}{event}\right)\right)}{ED_{rec}\,(26\ yr)}\right)$$

and:

$$DA_{event}\left(\frac{\mu g}{cm^2-event}\right) = \frac{TR \times AT_{rec}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{\left(\frac{CSF_o\left(\frac{mg}{kg-day}\right)^{-1}}{GIABS}\right) \times \left(\frac{mg}{1000\ \mu g}\right) \times DFW_{rec-adj}\left(\frac{cm^2-event}{kg}\right)}$$

where:

$$DFW_{rec-adj}\left(\frac{cm^2-event}{kg}\right) = \left(\begin{array}{l}\frac{EF_{rec-c}\left(\frac{days}{yr}\right) \times ED_{rec-c}\,(6\ yr) \times EV_{rec-c}\left(\frac{event}{day}\right) \times SA_{rec-c}\left(6,365\ cm^2\right)}{BW_{rec-c}\,(15\ kg)} + \\ \frac{EF_{rec-a}\left(\frac{days}{yr}\right) \times ED_{rec-a}\,(20\ yr) \times EV_{rec-a}\left(\frac{event}{day}\right) \times SA_{rec-a}\left(19,652\ cm^2\right)}{BW_{rec-a}\,(80\ kg)}\end{array}\right)$$

- Total

$$SL_{rec\text{-}wat\text{-}totc}\left(\frac{\mu g}{L}\right) = \frac{1}{\frac{1}{SL_{rec\text{-}wat\text{-}ingc}} + \frac{1}{SL_{rec\text{-}wat\text{-}derc}}}$$

- **Mutagenic**
  - Ingestion

$$SL_{rec\text{-}wat\text{-}ingmu}\left(\frac{\mu g}{L}\right) = \frac{TR \times AT_{rec}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{CSF_o\left(\frac{mg}{kg-day}\right)^{-1} \times \left(\frac{mg}{1000\ \mu g}\right) \times IFWM_{rec\text{-}adj}\left(\frac{L}{kg}\right)}$$

where:

$$IFWM_{rec\text{-}adj}\left(\frac{L}{kg}\right) = \left[\begin{array}{l} \frac{EF_{0\text{-}2}\left(\frac{days}{yr}\right) \times ED_{0\text{-}2}(2\ yr) \times EV_{0\text{-}2}\left(\frac{event}{day}\right) \times ET_{event\text{-}(0\text{-}2)}\left(\frac{hrs}{event}\right) \times IRW_{0\text{-}2}\left(\frac{0.12\ L}{hr}\right) \times 10}{BW_{0\text{-}2}\,(15\ kg)} + \\ \frac{EF_{2\text{-}6}\left(\frac{days}{yr}\right) \times ED_{2\text{-}6}(4\ yr) \times EV_{2\text{-}6}\left(\frac{event}{day}\right) \times ET_{event\text{-}(2\text{-}6)}\left(\frac{hrs}{event}\right) \times IRW_{2\text{-}6}\left(\frac{0.12\ L}{hr}\right) \times 3}{BW_{2\text{-}6}\,(15\ kg)} + \\ \frac{EF_{6\text{-}16}\left(\frac{days}{yr}\right) \times ED_{6\text{-}16}(10\ yr) \times EV_{6\text{-}16}\left(\frac{event}{day}\right) \times ET_{event\text{-}(6\text{-}16)}\left(\frac{hrs}{event}\right) \times IRW_{6\text{-}16}\left(\frac{0.124\ L}{hr}\right) \times 3}{BW_{6\text{-}16}\,(80\ kg)} + \\ \frac{EF_{16\text{-}26}\left(\frac{days}{yr}\right) \times ED_{16\text{-}26}(10\ yr) \times EV_{16\text{-}26}\left(\frac{event}{day}\right) \times ET_{event\text{-}(16\text{-}26)}\left(\frac{hrs}{event}\right) \times IRW_{16\text{-}26}\left(\frac{0.098\ L}{hr}\right) \times 1}{BW_{16\text{-}26}\,(80\ kg)} \end{array}\right]$$

- Dermal

For Inorganics:

$$SL_{rec\text{-}wat\text{-}dermu}\left(\frac{\mu g}{L}\right) = \frac{DA_{event}\left(\frac{\mu g}{cm^2\text{-}event}\right) \times \left(\frac{1000\ cm^3}{L}\right)}{K_p\left(\frac{cm}{hr}\right) \times ET_{event\text{-}rec\text{-}madj}\left(\frac{hrs}{event}\right)}$$

For Organics:

IF $ET_{event\text{-}rec\text{-}madj}\left(\frac{hrs}{event}\right) \leq t^*\,(hrs)$, then:

$$SL_{rec\text{-}wat\text{-}dermu}\left(\frac{\mu g}{L}\right) = \frac{DA_{event}\left(\frac{\mu g}{cm^2\text{-}event}\right) \times \left(\frac{1000\ cm^3}{L}\right)}{2 \times FA \times K_p\left(\frac{cm}{hr}\right) \times \sqrt{\frac{6 \times \tau_{event}\left(\frac{hrs}{event}\right) \times ET_{event\text{-}rec\text{-}madj}\left(\frac{hrs}{event}\right)}{\pi}}}$$

or:

IF $ET_{event\text{-}rec\text{-}madj}\left(\frac{hrs}{event}\right) > t^*\,(hrs)$, then:

$$SL_{rec\text{-}wat\text{-}dermu}\left(\frac{\mu g}{L}\right) = \frac{DA_{event}\left(\frac{\mu g}{cm^2\text{-}event}\right) \times \left(\frac{1000\ cm^3}{L}\right)}{FA \times K_p\left(\frac{cm}{hr}\right) \times \left[\frac{ET_{event\text{-}rec\text{-}madj}\left(\frac{hrs}{event}\right)}{1\ +\ B} + 2 \times \tau_{event}\left(\frac{hrs}{event}\right) \times \left(\frac{1\ +\ 3B\ +\ 3B^2}{(1\ +\ B)^2}\right)\right]}$$

where:

$$ET_{event\text{-}rec\text{-}madj}\left(\frac{hrs}{event}\right) = \frac{\left(\begin{array}{l}\left(ED_{0\text{-}2}(2\ yr) \times ET_{event\text{-}(0\text{-}2)}\left(\frac{hrs}{event}\right)\right) + \left(ED_{2\text{-}6}(4\ yr) \times ET_{event\text{-}(2\text{-}6)}\left(\frac{hrs}{event}\right)\right) + \\ \left(ED_{6\text{-}16}(10\ yr) \times ET_{event\text{-}(6\text{-}16)}\left(\frac{hrs}{event}\right)\right) + \left(ED_{16\text{-}26}(10\ yr) \times ET_{event\text{-}(16\text{-}26)}\left(\frac{hrs}{event}\right)\right)\end{array}\right)}{ED_{0\text{-}2}(2\ yr)\ +\ ED_{2\text{-}6}(4\ yr)\ +\ ED_{6\text{-}16}(10\ yr)\ +\ ED_{16\text{-}26}(10\ yr)}$$

and:

$$DA_{event}\left(\frac{\mu g}{cm^2\text{-}event}\right) = \frac{TR \times AT_{rec}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{\left(\frac{CSF_o\left(\frac{mg}{kg\text{-}day}\right)^{-1}}{GIABS}\right) \times \left(\frac{mg}{1000\ \mu g}\right) \times DFWM_{rec\text{-}adj}\left(\frac{cm^2\text{-}event}{kg}\right)}$$

where:

$$DFWM_{rec\text{-}adj}\left(\frac{cm^2\text{-}event}{kg}\right) = \left(\begin{array}{l}\frac{EF_{0\text{-}2}\left(\frac{days}{yr}\right) \times ED_{0\text{-}2}(2\ yr) \times EV_{0\text{-}2}\left(\frac{event}{day}\right) \times SA_{0\text{-}2}\left(6{,}365\ cm^2\right) \times 10}{BW_{0\text{-}2}(15\ kg)} + \\ \frac{EF_{2\text{-}6}\left(\frac{days}{yr}\right) \times ED_{2\text{-}6}(4\ yr) \times EV_{2\text{-}6}\left(\frac{event}{day}\right) \times SA_{2\text{-}6}\left(6{,}365\ cm^2\right) \times 3}{BW_{2\text{-}6}(15\ kg)} + \\ \frac{EF_{6\text{-}16}\left(\frac{days}{yr}\right) \times ED_{6\text{-}16}(10\ yr) \times EV_{6\text{-}16}\left(\frac{event}{day}\right) \times SA_{6\text{-}16}\left(19{,}652\ cm^2\right) \times 3}{BW_{6\text{-}16}(80\ kg)} + \\ \frac{EF_{16\text{-}26}\left(\frac{days}{yr}\right) \times ED_{16\text{-}26}(10\ yr) \times EV_{16\text{-}26}\left(\frac{event}{day}\right) \times SA_{16\text{-}26}\left(19{,}652\ cm^2\right) \times 1}{BW_{16\text{-}26}(80\ kg)}\end{array}\right)$$

- Total

$$SL_{rec-wat-totmu}\left(\frac{\mu g}{L}\right) = \frac{1}{\frac{1}{SL_{rec-wat-ingmu}} + \frac{1}{SL_{rec-wat-dermu}}}$$

- **Vinyl Chloride**
  - Ingestion

$$SL_{rec\text{-}wat\text{-}ingvc}\left(\frac{\mu g}{L}\right) = \frac{TR}{\left(\begin{array}{l}\left(\frac{CSF_o\left(\frac{mg}{kg-day}\right)^{-1} \times \left(\frac{mg}{1000\ \mu g}\right) \times IFW_{rec\text{-}adj}\left(\frac{L}{kg}\right)}{AT_{rec}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}\right) + \\ \left(\frac{CSF_o\left(\frac{mg}{kg-day}\right)^{-1} \times \left(\frac{mg}{1000\ \mu g}\right) \times EV_{rec\text{-}c}\left(\frac{event}{day}\right) \times ET_{event\text{-}rec\text{-}c}\left(\frac{hrs}{event}\right) \times IRW_{rec\text{-}c}\left(\frac{0.12\ L}{hr}\right)}{BW_{rec\text{-}c}\left(15\ kg\right)}\right)\end{array}\right)}$$

where:

$$IFW_{rec\text{-}adj}\left(\frac{L}{kg}\right) = \left[\begin{array}{l}\frac{EF_{rec\text{-}c}\left(\frac{days}{yr}\right) \times ED_{rec\text{-}c}\left(6\ yr\right) \times EV_{rec\text{-}c}\left(\frac{event}{day}\right) \times ET_{event\text{-}rec\text{-}c}\left(\frac{hrs}{event}\right) \times IRW_{rec\text{-}c}\left(\frac{0.12\ L}{hr}\right)}{BW_{rec\text{-}c}\left(15\ kg\right)} + \\ \frac{EF_{rec\text{-}a}\left(\frac{days}{yr}\right) \times ED_{rec\text{-}a}\left(20\ yr\right) \times EV_{rec\text{-}a}\left(\frac{event}{day}\right) \times ET_{event\text{-}rec\text{-}a}\left(\frac{hrs}{event}\right) \times IRW_{rec\text{-}a}\left(\frac{0.11\ L}{hr}\right)}{BW_{rec\text{-}a}\left(80\ kg\right)}\end{array}\right]$$

  - Dermal

IF $ET_{event\text{-}rec\text{-}adj}\left(\frac{hrs}{event}\right) \leq t^*\ (hrs)$, then:

$$SL_{rec\text{-}wat\text{-}dervc}\left(\frac{\mu g}{L}\right) = \frac{DA_{vc\text{-}event}\left(\frac{\mu g}{cm^2-event}\right) \times \left(\frac{1000\ cm^3}{L}\right)}{2 \times FA \times K_p\left(\frac{cm}{hr}\right) \times \sqrt{\frac{6 \times \tau_{event}\left(\frac{hrs}{event}\right) \times ET_{event\text{-}rec\text{-}adj}\left(\frac{hrs}{event}\right)}{\pi}}}$$

or:

IF $ET_{event\text{-}rec\text{-}adj}\left(\frac{hrs}{event}\right) > t^*\ (hrs)$, then:

$$SL_{rec\text{-}wat\text{-}dervc}\left(\frac{\mu g}{L}\right) = \frac{DA_{vc\text{-}event}\left(\frac{\mu g}{cm^2-event}\right) \times \left(\frac{1000\ cm^3}{L}\right)}{FA \times K_p\left(\frac{cm}{hr}\right) \times \left[\frac{ET_{event\text{-}rec\text{-}adj}\left(\frac{hrs}{event}\right)}{1+B} + 2 \times \tau_{event}\left(\frac{hrs}{event}\right) \times \left(\frac{1+3B+3B^2}{(1+B)^2}\right)\right]}$$

where:

$$ET_{event\text{-}rec\text{-}adj}\left(\frac{hrs}{event}\right) = \left(\frac{\left(ED_{rec\text{-}c}(6\ yr) \times ET_{event\text{-}rec\text{-}c}\left(\frac{hrs}{event}\right)\right) + \left(ED_{rec\text{-}a}(20\ yr) \times ET_{event\text{-}rec\text{-}a}\left(\frac{hrs}{event}\right)\right)}{ED_{rec}(26\ yr)}\right)$$

and:

$$DA_{vc\text{-}event}\left(\frac{\mu g}{cm^2-event}\right) = \frac{TR}{\left(\frac{CSF_o\left(\frac{mg}{kg-day}\right)^{-1}}{GIABS}\right) \times \left(\frac{mg}{1000\ \mu g}\right) \times \left[\left(\frac{DFW_{rec\text{-}adj}\left(\frac{cm^2-event}{kg}\right)}{AT_{rec}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}\right) + \left(\frac{EV_{rec\text{-}c}\left(\frac{event}{day}\right) \times SA_{rec\text{-}c}\left(6{,}365\ cm^2\right)}{BW_{rec\text{-}c}\left(15\ kg\right)}\right)\right]}$$

where:

$$DFW_{rec\text{-}adj}\left(\frac{cm^2-event}{kg}\right) = \left(\begin{array}{l}\frac{EF_{rec\text{-}c}\left(\frac{days}{yr}\right) \times ED_{rec\text{-}c}(6\ yr) \times EV_{rec\text{-}c}\left(\frac{event}{day}\right) \times SA_{rec\text{-}c}\left(6{,}365\ cm^2\right)}{BW_{rec\text{-}c}\left(15\ kg\right)} + \\ \frac{EF_{rec\text{-}a}\left(\frac{days}{yr}\right) \times ED_{rec\text{-}a}(20\ yr) \times EV_{rec\text{-}a}\left(\frac{event}{day}\right) \times SA_{rec\text{-}a}\left(19{,}652\ cm^2\right)}{BW_{rec\text{-}a}\left(80\ kg\right)}\end{array}\right)$$

- Total

$$SL_{rec-wat-totvc}\left(\frac{\mu g}{L}\right) = \frac{1}{\frac{1}{SL_{rec-wat-ingvc}} + \frac{1}{SL_{rec-wat-dervc}}}$$

- **Trichloroethylene**
  - Ingestion

$$SL_{rec\text{-}wat\text{-}ingtce}\left(\frac{\mu g}{L}\right) = \frac{TR \times AT_{rec}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{CSF_o\left(\frac{mg}{kg-day}\right)^{-1} \times \left(\frac{mg}{1000\ \mu g}\right) \times \left(\begin{array}{l}\left(CAF_o(0.804) \times IFW_{rec\text{-}adj}\left(\frac{L}{kg}\right)\right) + \\ \left(MAF_o(0.202) \times IFWM_{rec\text{-}adj}\left(\frac{L}{kg}\right)\right)\end{array}\right)}$$

where:

$$IFW_{rec\text{-}adj}\left(\frac{L}{kg}\right) = \left[\frac{EF_{rec\text{-}c}\left(\frac{days}{yr}\right) \times ED_{rec\text{-}c}(6\ yr) \times EV_{rec\text{-}c}\left(\frac{event}{day}\right) \times ET_{event\text{-}rec\text{-}c}\left(\frac{hrs}{event}\right) \times IRW_{rec\text{-}c}\left(\frac{0.12\ L}{hr}\right)}{BW_{rec\text{-}c}(15\ kg)} + \frac{EF_{rec\text{-}a}\left(\frac{days}{yr}\right) \times ED_{rec\text{-}a}(20\ yr) \times EV_{rec\text{-}a}\left(\frac{event}{day}\right) \times ET_{event\text{-}rec\text{-}a}\left(\frac{hrs}{event}\right) \times IRW_{rec\text{-}a}\left(\frac{0.11\ L}{hr}\right)}{BW_{rec\text{-}a}(80\ kg)}\right]$$

and:

$$IFWM_{rec\text{-}adj}\left(\frac{L}{kg}\right) = \left[\begin{array}{l}\frac{EF_{0\text{-}2}\left(\frac{days}{yr}\right) \times ED_{0\text{-}2}(2\ yr) \times EV_{0\text{-}2}\left(\frac{event}{day}\right) \times ET_{event\text{-}(0\text{-}2)}\left(\frac{hrs}{event}\right) \times IRW_{0\text{-}2}\left(\frac{0.12\ L}{hr}\right) \times 10}{BW_{0\text{-}2}(15\ kg)} + \\ \frac{EF_{2\text{-}6}\left(\frac{days}{yr}\right) \times ED_{2\text{-}6}(4\ yr) \times EV_{2\text{-}6}\left(\frac{event}{day}\right) \times ET_{event\text{-}(2\text{-}6)}\left(\frac{hrs}{event}\right) \times IRW_{2\text{-}6}\left(\frac{0.12\ L}{hr}\right) \times 3}{BW_{2\text{-}6}(15\ kg)} + \\ \frac{EF_{6\text{-}16}\left(\frac{days}{yr}\right) \times ED_{6\text{-}16}(10\ yr) \times EV_{6\text{-}16}\left(\frac{event}{day}\right) \times ET_{event\text{-}(6\text{-}16)}\left(\frac{hrs}{event}\right) \times IRW_{6\text{-}16}\left(\frac{0.124\ L}{hr}\right) \times 3}{BW_{6\text{-}16}(80\ kg)} + \\ \frac{EF_{16\text{-}26}\left(\frac{days}{yr}\right) \times ED_{16\text{-}26}(10\ yr) \times EV_{16\text{-}26}\left(\frac{event}{day}\right) \times ET_{event\text{-}(16\text{-}26)}\left(\frac{hrs}{event}\right) \times IRW_{16\text{-}26}\left(\frac{0.098\ L}{hr}\right) \times 1}{BW_{16\text{-}26}(80\ kg)}\end{array}\right]$$

- Dermal

IF $ET_{event\text{-}rec\text{-}madj}\left(\frac{hrs}{event}\right) \leq t^*\,(hrs)$, then:

$$SL_{rec\text{-}wat\text{-}dertce}\left(\frac{\mu g}{L}\right) = \frac{DA_{tce\text{-}event}\left(\frac{\mu g}{cm^2\text{-}event}\right) \times \left(\frac{1000\ cm^3}{L}\right)}{2 \times FA \times K_p\left(\frac{cm}{hr}\right) \times \sqrt{\frac{6 \times \tau_{event}\left(\frac{hrs}{event}\right) \times ET_{event\text{-}rec\text{-}madj}\left(\frac{hrs}{event}\right)}{\pi}}}$$

or:

IF $ET_{event\text{-}rec\text{-}madj}\left(\frac{hrs}{event}\right) > t^*\,(hrs)$, then:

$$SL_{rec\text{-}wat\text{-}dertce}\left(\frac{\mu g}{L}\right) = \frac{DA_{tce\text{-}event}\left(\frac{\mu g}{cm^2\text{-}event}\right) \times \left(\frac{1000\ cm^3}{L}\right)}{FA \times K_p\left(\frac{cm}{hr}\right) \times \left[\frac{ET_{event\text{-}rec\text{-}madj}\left(\frac{hrs}{event}\right)}{1\ +\ B} + 2 \times \tau_{event}\left(\frac{hrs}{event}\right) \times \left(\frac{1\ +\ 3B\ +\ 3B^2}{(1\ +\ B)^2}\right)\right]}$$

where:

$$ET_{event\text{-}rec\text{-}madj}\left(\frac{hrs}{event}\right) = \frac{\left(\begin{array}{l}\left(ED_{0\text{-}2}\,(2\ yr) \times ET_{event\text{-}(0\text{-}2)}\left(\frac{hrs}{event}\right)\right)\ +\ \left(ED_{2\text{-}6}\,(4\ yr) \times ET_{event\text{-}(2\text{-}6)}\left(\frac{hrs}{event}\right)\right)\ +\\ \left(ED_{6\text{-}16}\,(10\ yr) \times ET_{event\text{-}(6\text{-}16)}\left(\frac{hrs}{event}\right)\right)\ +\ \left(ED_{16\text{-}26}\,(10\ yr) \times ET_{event\text{-}(16\text{-}26)}\left(\frac{hrs}{event}\right)\right)\end{array}\right)}{ED_{0\text{-}2}\,(2\ yr)\ +\ ED_{2\text{-}6}\,(4\ yr)\ +\ ED_{6\text{-}16}\,(10\ yr)\ +\ ED_{16\text{-}26}\,(10\ yr)}$$

and:

$$DA_{tce\text{-}event}\left(\frac{\mu g}{cm^2\text{-}event}\right) = \frac{TR \times AT_{rec}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right)}{\left(\frac{CSF_o\left(\frac{mg}{kg\text{-}day}\right)^{-1}}{GIABS}\right) \times \left(\frac{mg}{1000\ \mu g}\right) \times \left[\begin{array}{l}\left(CAF_o\,(0.804) \times DFW_{rec\text{-}adj}\left(\frac{cm^2\text{-}event}{kg}\right)\right)\ +\\ \left(MAF_o\,(0.202) \times DFWM_{rec\text{-}adj}\left(\frac{cm^2\text{-}event}{kg}\right)\right)\end{array}\right]}$$

where:

$$DFW_{rec\text{-}adj}\left(\frac{cm^2\text{-}event}{kg}\right) = \left(\begin{array}{l}\frac{EF_{rec\text{-}c}\left(\frac{days}{yr}\right) \times ED_{rec\text{-}c}\,(6\ yr) \times EV_{rec\text{-}c}\left(\frac{event}{day}\right) \times SA_{rec\text{-}c}\left(6{,}365\ cm^2\right)}{BW_{rec\text{-}c}\,(15\ kg)}\ +\\ \frac{EF_{rec\text{-}a}\left(\frac{days}{yr}\right) \times ED_{rec\text{-}a}\,(20\ yr) \times EV_{rec\text{-}a}\left(\frac{event}{day}\right) \times SA_{rec\text{-}a}\left(19{,}652\ cm^2\right)}{BW_{rec\text{-}a}\,(80\ kg)}\end{array}\right)$$

and:

$$DFWM_{rec\text{-}adj}\left(\frac{cm^2\text{-}event}{kg}\right) = \left(\begin{array}{l}\frac{EF_{0\text{-}2}\left(\frac{days}{yr}\right) \times ED_{0\text{-}2}\,(2\ yr) \times EV_{0\text{-}2}\left(\frac{event}{day}\right) \times SA_{0\text{-}2}\left(6{,}365\ cm^2\right) \times 10}{BW_{0\text{-}2}\,(15\ kg)}\ +\\ \frac{EF_{2\text{-}6}\left(\frac{days}{yr}\right) \times ED_{2\text{-}6}\,(4\ yr) \times EV_{2\text{-}6}\left(\frac{event}{day}\right) \times SA_{2\text{-}6}\left(6{,}365\ cm^2\right) \times 3}{BW_{2\text{-}6}\,(15\ kg)}\ +\\ \frac{EF_{6\text{-}16}\left(\frac{days}{yr}\right) \times ED_{6\text{-}16}\,(10\ yr) \times EV_{6\text{-}16}\left(\frac{event}{day}\right) \times SA_{6\text{-}16}\left(19{,}652\ cm^2\right) \times 3}{BW_{6\text{-}16}\,(80\ kg)}\ +\\ \frac{EF_{16\text{-}26}\left(\frac{days}{yr}\right) \times ED_{16\text{-}26}\,(10\ yr) \times EV_{16\text{-}26}\left(\frac{event}{day}\right) \times SA_{16\text{-}26}\left(19{,}652\ cm^2\right) \times 1}{BW_{16\text{-}26}\,(80\ kg)}\end{array}\right)$$

- Total

$$SL_{rec\text{-}wat\text{-}tottce}\left(\frac{\mu g}{L}\right) = \frac{1}{\frac{1}{SL_{rec\text{-}wat\text{-}ingtce}} + \frac{1}{SL_{rec\text{-}wat\text{-}dertce}}}$$

- **Supporting Equations**
  - Child

$$ED_{rec-c}(6\ yr) = ED_{0-2}(2\ yr) + ED_{2-6}(4\ yr)$$

$$BW_{rec-c}(15\ kg) = \frac{ED_{0-2}(2\ yr) \times BW_{0-2}(15\ kg) + ED_{2-6}(4\ yr) \times BW_{2-6}(15\ kg)}{ED_{0-2}(2\ yr) + ED_{2-6}(4\ yr)}$$

$$EF_{rec-c}\left(\frac{days}{yr}\right) = \frac{ED_{0-2}(2\ yr) \times EF_{0-2}\left(\frac{days}{yr}\right) + ED_{2-6}(4\ yr) \times EF_{2-6}\left(\frac{days}{yr}\right)}{ED_{0-2}(2\ yr) + ED_{2-6}(4\ yr)}$$

$$ET_{event-rec-c}\left(\frac{hrs}{event}\right) = \frac{ED_{0-2}(2\ yr) \times ET_{event-rec}\left(\frac{hrs}{event}\right) + ED_{2-6}(4\ yr) \times ET_{event-(2-6)}\left(\frac{hrs}{event}\right)}{ED_{0-2}(2\ yr) + ED_{2-6}(4\ yr)}$$

$$EV_{rec-c}\left(\frac{event}{day}\right) = \frac{ED_{0-2}(2\ yr) \times EV_{0-2}\left(\frac{event}{day}\right) + ED_{2-6}(4\ yr) \times EV_{2-6}\left(\frac{event}{day}\right)}{ED_{0-2}(2\ yr) + ED_{2-6}(4\ yr)}$$

$$SA_{rec-c}\left(6{,}365\ cm^2\right) = \frac{ED_{0-2}(2\ yr) \times SA_{0-2}\left(6{,}365\ cm^2\right) + ED_{2-6}(4\ yr) \times SA_{2-6}\left(6{,}365\ cm^2\right)}{ED_{0-2}(2\ yr) + ED_{2-6}(4\ yr)}$$

$$IRW_{rec-c}\left(\frac{0.12\ L}{hr}\right) = \frac{ED_{0-2}(2\ yr) \times IRW_{0-2}\left(\frac{0.12\ L}{hr}\right) + ED_{2-6}(4\ yr) \times IRW_{2-6}\left(\frac{0.12\ L}{hr}\right)}{ED_{0-2}(2\ yr) + ED_{2-6}(4\ yr)}$$

- Adult

$$ED_{rec-a}(20\ yr) = ED_{6-16}(10\ yr) + ED_{16-26}(10\ yr)$$

$$BW_{rec-a}(80\ kg) = \frac{ED_{6-16}(10\ yr) \times BW_{6-16}(80\ kg) + ED_{16-26}(10\ yr) \times BW_{16-26}(80\ kg)}{ED_{6-16}(10\ yr) + ED_{16-26}(10\ yr)}$$

$$EF_{rec-a}\left(\frac{days}{yr}\right) = \frac{ED_{6-16}(10\ yr) \times EF_{6-16}\left(\frac{days}{yr}\right) + ED_{16-26}(10\ yr) \times EF_{16-26}\left(\frac{days}{yr}\right)}{ED_{6-16}(10\ yr) + ED_{16-26}(10\ yr)}$$

$$ET_{event-rec-a}\left(\frac{hrs}{event}\right) = \frac{ED_{6-16}(10\ yr) \times ET_{event-(6-16)}\left(\frac{hrs}{event}\right) + ED_{16-26}(10\ yr) \times ET_{event-(16-26)}\left(\frac{hrs}{event}\right)}{ED_{6-16}(10\ yr) + ED_{16-26}(10\ yr)}$$

$$EV_{rec-a}\left(\frac{event}{day}\right) = \frac{ED_{6-16}(10\ yr) \times EV_{6-16}\left(\frac{event}{day}\right) + ED_{16-26}(10\ yr) \times EV_{16-26}\left(\frac{event}{day}\right)}{ED_{6-16}(10\ yr) + ED_{16-26}(10\ yr)}$$

$$SA_{rec-a}\left(19,652\ cm^2\right) = \frac{ED_{6-16}(10\ yr) \times SA_{6-16}\left(19,652\ cm^2\right) + ED_{16-26}(10\ yr) \times SA_{16-26}\left(19,652\ cm^2\right)}{ED_{6-16}(10\ yr) + ED_{16-26}(10\ yr)}$$

$$IRW_{rec-a}\left(\frac{0.11\ L}{hr}\right) = \frac{ED_{6-16}(10\ yr) \times IRW_{6-16}\left(\frac{0.124\ L}{hr}\right) + ED_{16-26}(10\ yr) \times IRW_{16-26}\left(\frac{0.098\ L}{hr}\right)}{ED_{6-16}(10\ yr) + ED_{16-26}(10\ yr)}$$

- Age-adjusted

$$ED_{rec}(26\ yr) = ED_{0-2}(2\ yr) + ED_{2-6}(4\ yr) + ED_{6-16}(10\ yr) + ED_{16-26}(10\ yr)$$

$$EF_{rec}\left(\frac{days}{yr}\right) = \frac{\left(\begin{array}{l} ED_{0-2}(2\ yr) \times EF_{0-2}\left(\frac{days}{yr}\right) + ED_{2-6}(4\ yr) \times EF_{2-6}\left(\frac{days}{yr}\right) + \\ ED_{6-16}(10\ yr) \times EF_{6-16}\left(\frac{days}{yr}\right) + ED_{16-26}(10\ yr) \times EF_{16-26}\left(\frac{days}{yr}\right) \end{array}\right)}{ED_{0-2}(2\ yr) + ED_{2-6}(4\ yr) + ED_{6-16}(10\ yr) + ED_{16-26}(10\ yr)}$$

Fish Ingestion

The ingestion of fish land use is not provided in the Generic Tables but RSLs can be created by using the Calculator.

- Noncarcinogenic

$$SL_{res\text{-}fsh\text{-}ingn}\left(\frac{mg}{kg}\right) = \frac{THQ \times AT_{res\text{-}a}\left(\frac{365\ days}{yr} \times ED_{res}(26\ yr)\right) \times BW_{res\text{-}a}(80\ kg)}{\left(\frac{1}{RfD_o\left(\frac{mg}{kg-day}\right)}\right) \times \left(\frac{10^{-6}\ kg}{mg}\right) \times EF_{res}\left(\frac{350\ days}{yr}\right) \times ED_{res}(26\ yr) \times IRFI_{res\text{-}a}\left(\frac{mg}{day}\right)}$$

- Carcinogenic

$$SL_{res\text{-}fsh\text{-}ingc}\left(\frac{mg}{kg}\right) = \frac{TR \times AT_{res}\left(\frac{365\ days}{yr} \times LT(70\ yrs)\right) \times BW_{res\text{-}a}(80\ kg)}{CSF_o\left(\frac{mg}{kg-day}\right)^{-1} \times \left(\frac{10^{-6}\ kg}{mg}\right) \times EF_{res}\left(\frac{350\ days}{yr}\right) \times ED_{res}(26\ yr) \times IRFI_{res\text{-}a}\left(\frac{mg}{day}\right)}$$

Soil to Groundwater

This land use is for developing default soil screening levels for the protection of groundwater that are presented in the RSL Generic Tables.

- **Method 1**

$$SSL\left(\frac{mg}{kg}\right) = C_{water}\left(\frac{mg}{L}\right) \times \left[K_d\left(\frac{L}{kg}\right) + \left(\frac{\theta_w\left(\frac{0.3\ L_{water}}{L_{soil}}\right) + \theta_a\left(\frac{L_{air}}{L_{soil}}\right) \times H'}{\rho_b\left(\frac{1.5\ kg}{L}\right)}\right)\right]$$

where:

$$C_{water}\left(\frac{mg}{L}\right) = SL\left(\frac{\mu g}{L}\right) \times \left(\frac{mg}{1000\ \mu g}\right) \times DAF$$

where:

$$SL\left(\frac{\mu g}{L}\right) = MCL\left(\frac{\mu g}{L}\right);\ RSL\left(\frac{\mu g}{L}\right);\ RML\left(\frac{\mu g}{L}\right);\ \text{or}\ PRG\left(\frac{\mu g}{L}\right)$$

$$\theta_a\left(\frac{L_{air}}{L_{soil}}\right) = n\left(\frac{L_{pore}}{L_{soil}}\right) - \theta_w\left(\frac{0.3\ L_{water}}{L_{soil}}\right);\ n\left(\frac{L_{pore}}{L_{soil}}\right) = 1 - \frac{\rho_b\left(\frac{1.5\ kg}{L}\right)}{\rho_s\left(\frac{2.65\ kg}{L}\right)}$$

and:

$$K_d\left(\frac{L}{kg}\right) = f_{oc}\left(\frac{0.002\ g-carbon}{g-soil}\right) \times K_{oc}\left(\frac{L}{kg}\right),\ \text{for organic compounds;}$$

$K_d\left(\frac{L}{kg}\right)$ values for inorganic compounds are listed in the user guide.

- **Method 2**

$$SSL\left(\frac{mg}{kg}\right) = \frac{C_{water}\left(\frac{mg}{L}\right) \times I\left(\frac{0.18\ m}{yr}\right) \times ED(70\ yr)}{\rho_b\left(\frac{1.5\ kg}{L}\right) \times d_s(m)}$$

where:

$$C_{water}\left(\frac{mg}{L}\right) = SL\left(\frac{\mu g}{L}\right) \times \left(\frac{mg}{1{,}000\ \mu g}\right) \times DAF$$

where:

$$SL\left(\frac{\mu g}{L}\right) = MCL\left(\frac{\mu g}{L}\right);\ RSL\left(\frac{\mu g}{L}\right);\ RML\left(\frac{\mu g}{L}\right);\ or\ PRG\left(\frac{\mu g}{L}\right)$$

- **Dilution Factor**

$$\text{Dilution Attenuation Factor (DAF)} = 1 + \frac{K\left(\frac{m}{yr}\right) \times i\left(\frac{m}{m}\right) \times d(m)}{I\left(\frac{0.18\ m}{yr}\right) \times L(m)}$$

where:

$$d(m) = \left(0.0112 \times L^2(m)\right)^{0.5} + d_a(m) \times \left[1 - \exp\left(\frac{-L(m) \times I\left(\frac{0.18\ m}{yr}\right)}{K\left(\frac{m}{yr}\right) \times i\left(\frac{m}{m}\right) \times d_a(m)}\right)\right]$$

Supporting Equations

Wind Particulate Emission Factor

$$PEF\left(\frac{m^3_{air}}{kg_{soil}}\right) = \frac{\frac{Q}{C_{wind}}\left(\frac{\left(\frac{g}{m^2-s}\right)}{\left(\frac{kg}{m^3}\right)}\right) \times \left(\frac{3{,}600\ s}{hr}\right)}{0.036 \times (1\ -\ V) \times \left(\frac{U_m\left(\frac{m}{s}\right)}{U_t\left(\frac{m}{s}\right)}\right)^3 \times F(x)}$$

where:

$$\frac{Q}{C_{wind}}\left(\frac{\left(\frac{g}{m^2-s}\right)}{\left(\frac{kg}{m^3}\right)}\right) = A \times \exp\left[\frac{(\ln(A_s(acre))\ -\ B)^2}{C}\right]$$

and:

if $x < 2$, $F(x) = 1.91207 - 0.0278085 + 0.48113x^2 - 1.09871x^3 + 0.335341x^4$

if $x \geq 2$, $F(x) = 0.18\left(8x^3 + 12x\right)e^{(-x^2)}$

where:

$$x = 0.886 \times \left(\frac{U_t\left(\frac{m}{s}\right)}{U_m\left(\frac{m}{s}\right)}\right)$$

Mechanical Particulate Emission Factor for Construction Worker from Vehicle Traffic on Unpaved Roads

$$PEF_{sc}\left(\frac{m^3_{air}}{kg_{soil}}\right) = \left[\frac{\frac{Q}{C_{sr}}\left(\frac{\left(\frac{g}{m^2-s}\right)}{\left(\frac{kg}{m^3}\right)}\right) \times \frac{1}{F_D(0.18584)} \times T_t(7,200,000\ s) \times A_R\left(m^2\right)}{\frac{2.6 \times \left(\frac{s}{12}\right)^{0.8} \times \left(\frac{W(tons)}{3}\right)^{0.4}}{\left(\frac{M_{dry}}{0.2}\right)^{0.3}} \times \frac{\left(\frac{365\ days}{yr}\right) - p\left(\frac{days}{yr}\right)}{\left(\frac{365\ days}{yr}\right)} \times 281.9 \times \sum VKT\,(km)}\right]$$

where:

$$\frac{Q}{C_{sr}}\left(\frac{\left(\frac{g}{m^2-s}\right)}{\left(\frac{kg}{m^3}\right)}\right) = A \times \exp\left[\frac{(\ln(A_s(acre)) - B)^2}{C}\right]$$

$$A_R\left(m^2\right) = L_R\,(ft) \times W_R\,(20\ ft) \times 0.092903\left(\frac{m^2}{ft^2}\right)$$

$$W(tons) = \frac{\left(number\ of\ cars \times \frac{tons}{car} + number\ of\ trucks \times \frac{tons}{truck}\right)}{total\ vehicles}$$

$$\sum VKT\,(km) = total\ vehicles \times distance\left(\frac{km}{day}\right) \times EW_{con}\left(\frac{50\ wk}{yr}\right) \times DW_{con}\left(\frac{7\ days}{wk}\right)$$

$$T_t(7,200,000\ s) = ED_{con}(1\ year) \times EF_{con}\left(\frac{250\ days}{yr}\right) \times ET_{con}\left(\frac{8\ hrs}{day}\right) \times \left(\frac{3,600\ s}{hr}\right)$$

$$F_D(0.18584) = 0.1852 + \left(\frac{5.3537}{t_c\,(8,400\ hrs)}\right) + \left(\frac{-9.6318}{t_c\,(8,400\ hrs)^2}\right)$$

$$t_c\,(8,400\ hrs) = ED_{con}(1\ year) \times EW_{con}\left(\frac{50\ wk}{yr}\right) \times \left(\frac{7\ days}{wk}\right) \times \left(\frac{24\ hr}{day}\right)$$

Mechanical Particulate Emission Factor for Construction Worker from other than Vehicle Traffic on Unpaved

Road

$$PEF'_{sc}\left(\frac{m^3}{kg}\right) = \frac{Q}{C_{sa}}\left(\frac{\left(\frac{g}{m^2-s}\right)}{\left(\frac{kg}{m^3}\right)}\right) \times \frac{1}{F_D(0.18584)} \times \frac{1}{<J'_T>\left(\frac{g}{m^2-s}\right)}$$

where:

$$\frac{Q}{C_{sa}}\left(\frac{\left(\frac{g}{m^2-s}\right)}{\left(\frac{kg}{m^3}\right)}\right) = A \times \exp\left[\frac{(\ln(A_c(acre)) - B)^2}{C}\right]$$

$$<J'_T>\left(\frac{g}{m^2-s}\right) = \frac{M^{pc}_{wind}(g) + M_{excav}(g) + M_{doz}(g) + M_{grade}(g) + M_{till}(g)}{A_{surf}\left(m^2\right) \times T_t(7,200,000\ s)}$$

$$M^{pc}_{wind}(g) = 0.036 \times (1 - V) \times \left(\frac{U_m\left(\frac{m}{s}\right)}{U_t\left(\frac{m}{s}\right)}\right)^3 \times F(x) \times A_{surf}\left(m^2\right) \times ED_{con}(1\ year) \times \left(\frac{8,760\ hr}{yr}\right)$$

$$M_{excav}(g) = 0.35 \times 0.0016 \times \left(\frac{U_m\left(\frac{m}{s}\right)}{2.2}\right)^{1.3} \times \rho_{soil}\left(\frac{mg}{m^3}\right) \times A_{excav}\left(m^2\right) \times d_{excav}(m) \times NA_{dump} \times \left(\frac{1,000\ g}{kg}\right)$$

$$M_{doz}(g) = 0.75 \times \frac{0.45 \times s_{doz}(\%)^{1.5}}{(M_{m-doz}(\%))^{1.4}} \times \frac{\sum VKT_{doz}(km)}{S_{doz}\left(\frac{km}{hr}\right)} \times \left(\frac{1,000\ g}{kg}\right)$$

$$M_{grade}(g) = 0.60 \times 0.0056 \times S_{grade}\left(\frac{km}{hr}\right)^2 \times \sum VKT_{grade}(km) \times \left(\frac{1,000\ g}{kg}\right)$$

and:

$$M_{till}(g) = 1.1 \times s_{till}(\%)^{0.6} \times A_{c-till}(acres) \times \left(\frac{4047\ m^2}{acre}\right) \times \left(\frac{10^{-4}\ ha}{m^2}\right)\left(\frac{1,000\ g}{kg}\right) \times NA_{till}$$

where: =

$$\sum VKT_{grade}(km) = A_{c-grade}(acres) \times \left(\frac{4047\ m^2}{acre}\right) \times \frac{1}{B_{l-grade}(m)} \times \frac{1}{\left(\frac{1,000\ m}{km}\right)} \times NA_{grade}$$

$$\sum VKT_{doz}(km) = A_{c-doz}(acres) \times \left(\frac{4047\ m^2}{acre}\right) \times \frac{1}{B_{l-doz}(m)} \times \frac{1}{\left(\frac{1,000\ m}{km}\right)} \times NA_{doz}$$

$$T_t(7,200,000\ s) = ED_{con}(1\ year) \times EF_{con}\left(\frac{250\ days}{yr}\right) \times ET_{con}\left(\frac{8\ hrs}{day}\right) \times \left(\frac{3,600\ s}{hr}\right)$$

$$F_D(0.18584) = 0.1852 + \left(\frac{5.3537}{t_c(8,400\ hrs)}\right) + \left(\frac{-9.6318}{t_c(8,400\ hrs)^2}\right)$$

$$t_c(8,400\ hrs) = ED_{con}(1\ year) \times EW_{con}\left(\frac{50\ wk}{}\right) \times \left(\frac{7\ days}{}\right) \times \left(\frac{24\ hr}{}\right)$$

(yr) (wk) (day)

and:

if $x < 2$, $F(x) = 1.91207 - 0.0278085 + 0.48113x^2 - 1.09871x^3 + 0.335341x^4$

if $x \geq 2$, $F(x) = 0.18\left(8x^3 + 12x\right)e^{(-x^2)}$

where:

$$x = 0.886 \times \left(\frac{U_t\left(\frac{m}{s}\right)}{U_m\left(\frac{m}{s}\right)}\right)$$

Wind Volatilization Factors

unlimited source model for chronic exposure

$$VF_{ulim}\left(\frac{m^3_{air}}{kg_{soil}}\right) = \frac{\frac{Q}{C_{vol}}\left(\frac{\left(\frac{g}{m^2-s}\right)}{\left(\frac{kg}{m^3}\right)}\right) \times \left(3.14 \times D_A\left(\frac{cm^2}{s}\right) \times T(s)\right)^{1/2} \times \left(\frac{10^{-4}\ m^2}{cm^2}\right)}{2 \times \rho_b\left(\frac{1.5\ g}{cm^3}\right) \times D_A\left(\frac{cm^2}{s}\right)}$$

where:

$$\frac{Q}{C_{vol}}\left(\frac{\left(\frac{g}{m^2-s}\right)}{\left(\frac{kg}{m^3}\right)}\right) = A \times \exp\left[\frac{\left(\ln(A_s(acre)) - B\right)^2}{C}\right]$$

and:

$$D_A\left(\frac{cm^2}{s}\right) = \frac{\left(\theta_a\left(\frac{0.28\ L_{air}}{L_{soil}}\right)^{10/3} \times D_{ia}\left(\frac{cm^2}{s}\right) \times H' + \theta_w\left(\frac{0.15\ L_{water}}{L_{soil}}\right) \times D_{iw}\left(\frac{cm^2}{s}\right)\right) \Big/ n^2\left(\frac{0.43\ L_{pore}}{L_{soil}}\right)}{\rho_b\left(\frac{1.5\ g}{cm^3}\right) \times K_d\left(\frac{cm^2}{g}\right) + \theta_w\left(\frac{0.15\ L_{water}}{L_{soil}}\right) + \theta_a\left(\frac{0.28\ L_{air}}{L_{soil}}\right) \times H'}$$

where:

$$\theta_a\left(\frac{0.28\ L_{air}}{L_{soil}}\right) = n\left(\frac{0.43\ L_{pore}}{L_{soil}}\right) - \theta_w\left(\frac{0.15\ L_{water}}{L_{soil}}\right) \text{ and: } n\left(\frac{0.43\ L_{pore}}{L_{soil}}\right) = 1 - \frac{\rho_b\left(\frac{1.5\ g}{cm^3}\right)}{\rho_s\left(\frac{2.65\ g}{cm^3}\right)}$$

and:

$$K_d\left(\frac{cm^2}{g}\right) = f_{oc}\left(\frac{0.006\ g-carbon}{g-soil}\right) \times K_{oc}\left(\frac{cm^3}{g}\right) \text{ only for organics.}$$

Diffusivity in Water

$$D_{iw}\left(\frac{cm^2}{s}\right) = 0.0001518 \times \left(\frac{T°C + 273.16}{298.16}\right) \times \left(\frac{MW\left(\frac{g}{mole}\right)}{\rho\left(\frac{g}{cm^3}\right)}\right)^{-0.6}$$

where:

T typically = 25°C

If density is not available use,

$$D_{iw}\left(\frac{cm^2}{s}\right) = 0.000222 \times \left(MW\left(\frac{g}{mole}\right)^{-(2/3)}\right)$$

Diffusivity in Air

$$D_{ia}\left(\frac{cm^2}{s}\right) = \frac{0.00229 \times (T°C + 273.16)^{1.5} \times \sqrt{0.034 + \left(\frac{1}{MW\left(\frac{g}{mole}\right)}\right)} \times MW_{cor}}{\left(\left(\frac{MW\left(\frac{g}{mole}\right)}{2.5 \times \rho\left(\frac{g}{cm^3}\right)}\right)^{0.333} + 1.8\right)^2}$$

where:

T typically = 25°C

$$MW_{cor} = \left(1 - 0.000015 \times MW\left(\frac{g}{mole}\right)^2\right)$$

If MW_{cor} is less than 0.4, then MW_{cor} is set to 0.4.

If density is not available use,

$$D_{ia}\left(\frac{cm^2}{s}\right) = 1.9 \times \left(MW\left(\frac{g}{mole}\right)^{-(2/3)}\right)$$

For dioxins, furans, and dioxin-like PCBs always use,

$$D_{ia}\left(\frac{cm^2}{s}\right) = \left(\frac{154\left(\frac{g}{mole}\right)}{MW\left(\frac{g}{mole}\right)}\right)^{0.5} \times 0.068\left(\frac{cm^2}{s}\right)$$

Mass Limit Volatilization Factor

mass limit model for chronic exposure

$$VF_{mlim}\left(\frac{m^3_{air}}{kg_{soil}}\right) = \frac{\frac{Q}{C_{vol}}\left(\frac{\left(\frac{g}{m^2-s}\right)}{\left(\frac{kg}{m^3}\right)}\right) \times \left(T(yr)\left(3.15 \times \left(\frac{10^7\ s}{yr}\right)\right)\right)}{\rho_b\left(\frac{Mg}{m^3}\right) \times d_s(m) \times \left(\frac{10^6\ g}{Mg}\right)}$$

where:

$$\frac{Q}{C_{vol}}\left(\frac{\left(\frac{g}{m^2-s}\right)}{\left(\frac{kg}{m^3}\right)}\right) = A \times \exp\left[\frac{(\ln(A_s(acre)) - B)^2}{C}\right]$$

Unlimited Source Subchronic Volatilization Factor for Construction Worker

unlimited source model for subchronic exposure

$$VF_{ulim-sc}\left(\frac{m^3_{air}}{kg_{soil}}\right) = \frac{\frac{Q}{C_{sa}}\left(\frac{\left(\frac{g}{m^2-s}\right)}{\left(\frac{kg}{m^3}\right)}\right) \times \frac{1}{F_D(0.18584)} \times \left(3.14 \times D_A\left(\frac{cm^2}{s}\right) \times T(s)\right)^{1/2} \times \left(\frac{10^{-4}\ m^2}{cm^2}\right)}{2 \times \rho_b\left(\frac{1.5\ g}{cm^3}\right) \times D_A\left(\frac{cm^2}{s}\right)}$$

where:

$$\frac{Q}{C_{sa}}\left(\frac{\left(\frac{g}{m^2-s}\right)}{\left(\frac{kg}{m^3}\right)}\right) = A \times \exp\left[\frac{\left(\ln(A_s(acre)) - B\right)^2}{C}\right]$$

$$D_A\left(\frac{cm^2}{s}\right) = \frac{\left(\theta_a\left(\frac{0.28\ L_{air}}{L_{soil}}\right)^{10/3} \times D_{ia}\left(\frac{cm^2}{s}\right) \times H' + \theta_w\left(\frac{0.15\ L_{water}}{L_{soil}}\right) \times D_{iw}\left(\frac{cm^2}{s}\right)\right) \Big/ n^2\left(\frac{0.43\ L_{pore}}{L_{soil}}\right)}{\rho_b\left(\frac{1.5\ g}{cm^3}\right) \times K_d\left(\frac{cm^2}{g}\right) + \theta_w\left(\frac{0.15\ L_{water}}{L_{soil}}\right) + \theta_a\left(\frac{0.28\ L_{air}}{L_{soil}}\right) \times H'}$$

$$\theta_a\left(\frac{0.28\ L_{air}}{L_{soil}}\right) = n\left(\frac{0.43\ L_{pore}}{L_{soil}}\right) - \theta_w\left(\frac{0.15\ L_{water}}{L_{soil}}\right) \text{ and: } n\left(\frac{0.43\ L_{pore}}{L_{soil}}\right) = 1 - \frac{\rho_b\left(\frac{1.5\ g}{cm^3}\right)}{\rho_s\left(\frac{2.65\ g}{cm^3}\right)}$$

$$K_d\left(\frac{cm^2}{g}\right) = f_{oc}\left(\frac{0.006\ g-carbon}{g-soil}\right) \times K_{oc}\left(\frac{cm^3}{g}\right) \text{ only for organics.}$$

$$T(30,240,000\ s) = ED_{con}(1\ year) \times EW_{con}\left(\frac{50\ wk}{yr}\right) \times \left(\frac{7\ days}{wk}\right) \times \left(\frac{24\ hr}{day}\right) \times \left(\frac{3,600\ s}{hr}\right)$$

$$F_D(0.18584) = 0.1852 + \left(\frac{5.3537}{t_c(8,400\ hrs)}\right) + \left(\frac{-9.6318}{t_c(8,400\ hrs)^2}\right)$$

$$t_c(8,400\ hrs) = ED_{con}(1\ year) \times EW_{con}\left(\frac{50\ wk}{yr}\right) \times \left(\frac{7\ days}{wk}\right) \times \left(\frac{24\ hr}{day}\right)$$

Mass Limit Subchronic Volatilization Factor for Construction Worker

mass limit model for subchronic exposure

$$VF_{mlim\text{-}sc}\left(\frac{m^3_{air}}{kg_{soil}}\right) = \frac{\frac{Q}{C_{sa}}\left(\frac{\left(\frac{g}{m^2\text{-}s}\right)}{\left(\frac{kg}{m^3}\right)}\right) \times \frac{1}{F_D(0.18584)} \times T(s)}{\rho_b\left(\frac{Mg}{m^3}\right) \times d_s(m) \times \left(\frac{10^6\ g}{Mg}\right)}$$

where:

$$\frac{Q}{C_{sa}}\left(\frac{\left(\frac{g}{m^2\text{-}s}\right)}{\left(\frac{kg}{m^3}\right)}\right) = A \times \exp\left[\frac{(\ln(A_s(acre)) - B)^2}{C}\right]$$

$$T(30,240,000\ s) = ED_{con}(1\ year) \times EW_{con}\left(\frac{50\ wk}{yr}\right) \times \left(\frac{7\ days}{wk}\right) \times \left(\frac{24\ hr}{day}\right) \times \left(\frac{3,600\ s}{hr}\right)$$

$$F_D(0.18584) = 0.1852 + \left(\frac{5.3537}{t_c(8,400\ hrs)}\right) + \left(\frac{-9.6318}{t_c(8,400\ hrs)^2}\right)$$

$$t_c(8,400\ hrs) = ED_{con}(1\ year) \times EW_{con}\left(\frac{50\ wk}{yr}\right) \times \left(\frac{7\ days}{wk}\right) \times \left(\frac{24\ hr}{day}\right)$$

Dermal Contact with Water Supporting Equations

EPD

EPD boundaries of MW and log K_{ow} :

$$-0.06831 \leq -5.103 \times 10^{-4} \times MW + 0.05616 \times \log K_{ow} \leq 0.5577$$

and:

$$-0.06831 \leq -5.103 \times 10^{-4} \times MW + 0.05616 \times \log K_{ow} \leq 0.1758$$

where:

log K_{ow} = log octanol/water partition coefficient (dimensionless);

MW = Molecular Weight $\left(\frac{g}{mole}\right)$

Kp

$$K_p = 10^{\log K_p}$$

where:

$$\log K_p = -2.805063 + r^2 \times \log K_{ow} - 0.0056118 \times MW$$

where:

log K_p = log dermal permeability coefficient of compound in water $\left(\frac{cm}{hr}\right)$;

$r^2 = 0.6645865$

FA

If $B \leq 0.1$,

$$FA = 0.9589849087 - (0.0163393790 \times \log B) - \left(0.1451565908 \times \log \tau_{event}\left(\frac{hrs}{event}\right)\right) - \left(0.0534664095 \times \log B \times \log \tau_{event}\left(\frac{hrs}{event}\right)\right);$$

If $B > 0.1$ and ≤ 1,

$$FA = 1.051232292 + (0.091016187 \times \log B) - \left(0.286735467 \times \log \tau_{event}\left(\frac{hrs}{event}\right)\right) - \left(0.180504367 \times \log B \times \log \tau_{event}\left(\frac{hrs}{event}\right)\right);$$

If $B > 1$,

$$FA = 0.992336792 + (0.479643809 \times \log B) - \left(0.114381522 \times \log \tau_{event}\left(\frac{hrs}{event}\right)\right) - \left(1.263647642 \times \log B \times \log \tau_{event}\left(\frac{hrs}{event}\right)\right);$$

where:

$$\tau_{event}\left(\frac{hrs}{event}\right) = 10^{\left(\frac{I_{sc}^2(cm)}{6 \times D_{sc}\left(\frac{cm^2}{hr}\right)}\right)}; \quad \log B = 10^{\left(K_p\left(\frac{cm}{hr}\right) \times \frac{\sqrt{MW\left(\frac{g}{mole}\right)}}{2.6}\right)}$$

$MW = \text{Molecular Weight}\left(\frac{g}{mole}\right)$

and:

If $FA \geq 1$, then $FA = 1$;

If $FA < 0$, then $FA = 0$;

Else, FA is rounded to the nearest tenth.

B

$$B = \frac{K_p\left(\frac{cm}{hr}\right)}{K_{p,ve}\left(\frac{cm}{hr}\right)} \approx K_p\left(\frac{cm}{hr}\right) \times \frac{\sqrt{MW\left(\frac{g}{mole}\right)}}{2.6} \text{ (as an approximation)}$$

where:

$$K_{p,ve}\left(\frac{cm}{hr}\right) = \frac{K_{ew} \times D_e\left(\frac{cm^2}{hr}\right)}{L_e\,(cm)}$$

where:

$K_{ew} = 1$ (assuming epidermis behaves essentially as water);

$L_e\,(cm) = 10^{-2}\,(cm)$

$$D_e\left(\frac{cm^2}{hr}\right) = \frac{7.1 \times 10^{-6}\left(\frac{cm^2}{s}\right)}{\sqrt{MW\left(\frac{g}{mole}\right)}} \quad \left(\text{assumes } D_e = 10^{-6}\left(\frac{cm^2}{s}\right) \text{ when } MW = 50\right)$$

Tau

$$\tau_{event}\left(\frac{hrs}{event}\right) = \frac{I_{sc}^2\,(cm)}{6 \times D_{sc}\left(\frac{cm^2}{hr}\right)}$$

where:

$$\log \frac{D_{sc}\left(\frac{cm^2}{hr}\right)}{I_{sc}^2\,(cm)} = -2.80 - 0.0056 \times MW\left(\frac{g}{mole}\right) \text{ or } \frac{D_{sc}\left(\frac{cm^2}{hr}\right)}{I_{sc}^2\,(cm)} = 10^{-2.80\,-\,0.0056 \times MW\left(\frac{g}{mole}\right)}$$

thus:

$$I_{sc}^2\,(cm) = \frac{10^{-2.80\,-\,0.0056 \times MW\left(\frac{g}{mole}\right)}}{D_{sc}\left(\frac{cm^2}{hr}\right)} \text{ and } D_{sc}\left(\frac{cm^2}{hr}\right) = I_{sc}^2\,(cm) \times 10^{-2.80\,-\,0.0056 \times MW\left(\frac{g}{mole}\right)}$$

t*

$$\text{If } B \leq 0.6, \text{ then } t^* \left(\text{hrs}\right) = 2.4 \times \tau_{event} \left(\frac{\text{hrs}}{\text{event}}\right)$$

or:

$$\text{If } B > 0.6, \text{ then } t^* \left(\text{hrs}\right) = 6 \times \tau_{event} \left(\frac{\text{hrs}}{\text{event}}\right) \times \left(b - \sqrt{b^2 - c^2}\right)$$

where:

$$b = \frac{2 \times (1 + B)^2}{\pi} - c \text{ and } c = \frac{1 + 3 \times B + 3 \times B^2}{3 \times (1 + B)}$$

Soil Saturation Limit

$$C_{sat} \left(\frac{mg}{kg}\right) = \frac{S\left(\frac{mg}{L}\right)}{\rho_b \left(\frac{kg}{L}\right)} \times \left(K_d \left(\frac{L}{kg}\right) \times \rho_b \left(\frac{kg}{L}\right) + \theta_w \left(\frac{0.15\ L_{water}}{L_{soil}}\right) + H' \times \theta_a \left(\frac{L_{air}}{L_{soil}}\right)\right)$$

where:

$K_d \left(\frac{L}{kg}\right) = f_{oc} \left(\frac{0.006\ g-carbon}{g-soil}\right) \times K_{oc} \left(\frac{L}{kg}\right)$, for organic compounds;

$K_d \left(\frac{L}{kg}\right)$ values for inorganic compounds are listed in the user guide.

$$\theta_a \left(\frac{L_{air}}{L_{soil}}\right) = n \left(\frac{L_{pore}}{L_{soil}}\right) - \theta_w \left(\frac{0.15\ L_{water}}{L_{soil}}\right) \text{ and: } n \left(\frac{L_{pore}}{L_{soil}}\right) = 1 - \frac{\rho_b \left(\frac{kg}{L}\right)}{\rho_s \left(\frac{kg}{L}\right)}$$

TCE Toxicity Adjustment Factors

$$CAF_o(0.804) = \frac{CSF_o\left(\frac{3.7\times10^{-2}\ mg}{kg-day}\right)^{-1}\ \text{NHL + Liver Oral Slope Factor}}{CSF_o\left(\frac{4.6\times10^{-2}\ mg}{kg-day}\right)^{-1}\ \text{Adult - Based Oral Slope Factor}};\ MAF_o(0.202) = \frac{CSF_o\left(\frac{9.3\times10^{-3}\ mg}{kg-day}\right)^{-1}\ \text{Kidney Oral Slope Factor}}{CSF_o\left(\frac{4.6\times10^{-2}\ mg}{kg-day}\right)^{-1}\ \text{Adult - Based Oral Slope Factor}}$$

$$CAF_i(0.756) = \frac{IUR\left(\frac{3.1\times10^{-6}\ \mu g}{kg-day}\right)^{-1}\ \text{NHL + Liver Unit Risk Estimate}}{IUR\left(\frac{4.1\times10^{-6}\ \mu g}{kg-day}\right)^{-1}\ \text{Adult - Based Unit Risk Estimate}};\ MAF_i(0.244) = \frac{IUR\left(\frac{1.0\times10^{-6}\ \mu g}{kg-day}\right)^{-1}\ \text{Kidney Unit Risk Estimate}}{IUR\left(\frac{4.1\times10^{-6}\ \mu g}{kg-day}\right)^{-1}\ \text{Adult - Based Unit Risk Estimate}}$$

Determination of Henry's Law Constant at Groundwater Temperature other than 25 °C

$$H'T_{gw}\ (K) = \left(\frac{\exp\left[-\frac{\Delta H_{v,gw}\left(\frac{cal}{mol}\right)}{R_c\left(1.9872\left(\frac{cal}{mol-k}\right)\right)}\times\left(\frac{1}{T_{gw}\ (K)}-\frac{1}{T_R\ (298.15\ K)}\right)\right]\times HLC\left(\frac{atm-m^3}{mol-k}\right)}{R\left(8.2057E-05\left(\frac{atm-m^3}{mol-k}\right)\right)\times T_{gw}\ (K)}\right)$$

where:

$$T_{gw}\ (K) = °C + 273.15$$

$$\Delta H_{v,gw}\left(\frac{cal}{mol}\right) = \Delta H_{v,b}\left(\frac{cal}{mol}\right)\times\left[\frac{1 - T_{gw}\ (K)\Big/T_c\ (K)}{1 - T_b\ (K)\Big/T_c\ (K)}\right]^n$$

where:

$$\text{If } T_b\ (K)\Big/T_c\ (K) < 0.57,\ n = 0.3,$$

$$\text{If } T_b\ (K)\Big/T_c\ (K) > 0.71,\ n = 0.41,$$

$$\text{If } \left(0.57 < T_b\ (K)\Big/T_c\ (K) \le 0.71\right),\ n = \left(0.74\times T_b\ (K)\Big/T_c\ (K) - 0.116\right)$$

Determination of Vapor Pressure at Groundwater Temperature other than 25 °C

$$VP'T_{gw}(mmHg) = VP(mmHg) \times \exp\left[- \frac{\Delta H_{v,gw}\left(\frac{cal}{mol}\right)}{R_c \left(1.9872 \left(\frac{cal}{mol-k}\right)\right)} \times \left(\frac{1}{T_{gw}\ (K)} - \frac{1}{T_R\ (298.15\ K)}\right)\right]$$

where:

$$T_{gw}\ (K) = °C + 273.15$$

$$\Delta H_{v,gw}\left(\frac{cal}{mol}\right) = \Delta H_{v,b}\left(\frac{cal}{mol}\right) \times \left[\frac{1 - T_{gw}\ (K) \Big/ T_c\ (K)}{1 - T_b\ (K) \Big/ T_c\ (K)}\right]^n$$

where:

$$\text{If } T_b\ (K) \Big/ T_c\ (K) < 0.57\text{ , } n = 0.3\text{ ,}$$

$$\text{If } T_b\ (K) \Big/ T_c\ (K) > 0.71\text{ , } n = 0.41\text{ ,}$$

$$\text{If } \left(0.57 < T_b\ (K) \Big/ T_c\ (K) \leq 0.71\right)\text{ , } n = \left(0.74 \times T_b\ (K) \Big/ T_c\ (K) - 0.116\right)$$

For assistance/questions please use the Regional Screening Levels (RSLs) contact us <https://epa.gov/risk/forms/regional-screening-levels-rsls-contact-us> page. For general risk assessment questions, separate from the RSLs, please use the link below.

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