
Wastewater Treatment Facility Health Risk Assessment Tables

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*** SCREEN3 MODEL RUN ***
*** VERSION DATED 96043 ***

C:\Documents and Settings\asako\Desktop\SCREEN3\WRF.scr

SIMPLE TERRAIN INPUTS:

SOURCE TYPE = VOLUME
EMISSION RATE (G/S) = 1.00000
SOURCE HEIGHT (M) = 5.0000
INIT. LATERAL DIMEN (M) = 12.1920
INIT. VERTICAL DIMEN (M) = 10.0000
RECEPTOR HEIGHT (M) = 0.0000
URBAN/RURAL OPTION = RURAL

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.

BOUY. FLUX = 0.000 M**4/S**3; MOM. FLUX = 0.000 M**4/S**2.

*** FULL METEOROLOGY ***

*** SCREEN DISCRETE DISTANCES ***

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
40.	1995.	6	1.0	1.0	10000.0	5.00	13.57	10.50	NO

DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

*** SUMMARY OF SCREEN MODEL RESULTS ***

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	1995.	40.	0.

** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **

Vista Canyon Ranch Project
Evaluation of Health Impacts from the Water Reclamation Facility

Table HRA-1
Maximum Individual Cancer Risk (MICR) at Maximally Exposed Individual (MEI)

Receptor	Pollutant	CPF	C _{AIR,ANN}	DBR	A	EF	ED	AT	Mult Factor	MICR	Threshold	Over?
Residential	1,1,1-Trichloroethane	0.00E+00	9.18E-03	302	1	350	70	25550	0.00	0.0	10	NO
Residential	Benzene	1.00E-01	1.96E-03	302	1	350	70	25550	28.96	0.1	10	NO
Residential	Chloroform	1.90E-02	8.37E-03	302	1	350	70	25550	5.50	0.0	10	NO
Residential	Ethyl Benzene	8.70E-03	1.38E-03	302	1	350	70	25550	2.52	0.0	10	NO
Residential	Methyl Ethyl Ketone	0.00E+00	5.22E-03	302	1	350	70	25550	0.00	0.0	10	NO
Residential	Methylene Chloride	3.50E-03	1.13E-02	302	1	350	70	25550	1.01	0.0	10	NO
Residential	Methyl Isobutyl Ketone	0.00E+00	4.75E-03	302	1	350	70	25550	0.00	0.0	10	NO
Residential	Tetrachloroethylene	7.00E-03	1.32E-02	302	1	350	70	25550	2.03	0.0	10	NO
Residential	Toluene	0.00E+00	7.24E-03	302	1	350	70	25550	0.00	0.0	10	NO
Residential	Xylene	0.00E+00	6.77E-03	302	1	350	70	25550	0.00	0.0	10	NO
Total										0.1	10	NO

Exposure factors used to calculate cancer risk:

CPF (Inhalation) Cancer Potency Factor (mg/kg-day)¹. Zero values indicate no established cancer potency factor.

C_{AIR,ANN} Modeled annual concentration (µg/m³). The SCREEN3 model results in a unitary concentration of 1995 µg/m³ at 40 meters. This value was multiplied by 0.08 to convert from a 1-hour average to an annual average and multiplied by the corresponding grams/second emission rate for each pollutant.

DBR Daily breathing rate (L/kg (body weight) per day).

DBR Sources:

1. California Air Resources Board and Office of Environmental Health Hazard Assessment, *Recommended Interim Risk Management Policy for Inhalation-Based Residential Cancer Risk*, (2003).

2. California Environmental Protection Agency, Office of Environmental Health Hazard Assessment, *Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*, (2003).

A Inhalation absorption factor (default = 1).

EF Exposure frequency (days/year).

ED Exposure duration (years).

AT Average time period over which exposure is averaged in days (days).

Mult Factor Multiplying Factor = $CPF \times (DBR \times A \times EF \times ED \times 10^6 / AT) \times 10^6$.

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Table HRA-2
Non-carcinogenic Hazards / Toxicological Endpoints*

Receptor	Pollutant	AREL	C _{AIR,ANN}	HI	RESP	CNS/PNS	CV/BL	IMMUN	KIDN	GI/LV	REPRO	EYES	Threshold	Over?
Residential	1,1,1-Trichloroethane	6.80E+04	9.18E-03	1.35E-07	-	1.35E-07	-	-	-	-	-	-	1	NO
Residential	Benzene	1.30E+03	1.96E-03	1.51E-06	-	-	1.51E-06	1.51E-06	-	-	1.51E-06	-	1	NO
Residential	Chloroform	1.50E+02	8.37E-03	5.58E-05	5.58E-05	5.58E-05	-	-	-	-	5.58E-05	-	1	NO
Residential	Elthyl Benzene	0.00E+00	1.38E-03	-	-	-	-	-	-	-	-	-	1	NO
Residential	Methyl Ethyl Ketone	1.30E+04	5.22E-03	4.02E-07	4.02E-07	-	-	-	-	-	-	4.02E-07	1	NO
Residential	Methylene Chloride	1.40E+04	1.13E-02	8.09E-07	-	8.09E-07	-	-	-	-	-	-	1	NO
Residential	Methyl Isobutyl Ketone	0.00E+00	4.75E-03	-	-	-	-	-	-	-	-	-	1	NO
Residential	Tetrachloroethylene	2.00E+04	1.32E-02	6.58E-07	6.58E-07	6.58E-07	-	-	-	-	-	6.58E-07	1	NO
Residential	Toluene	3.70E+04	7.24E-03	1.96E-07	1.96E-07	1.96E-07	-	-	-	-	1.96E-07	1.96E-07	1	NO
Residential	Xylene	2.20E+04	6.77E-03	3.08E-07	3.08E-07	-	-	-	-	-	-	3.08E-07	1	NO
Total					5.74E-05	5.76E-05	1.51E-06	1.51E-06	-	-	5.75E-05	1.56E-06	1	NO
Receptor	Pollutant	CREL	C _{AIR,ANN}	HI	RESP	CNS/PNS	CV/BL	IMMUN	KIDN	GI/LV	REPRO	EYES	Threshold	Over?
Residential	1,1,1-Trichloroethane	1.00E+03	9.18E-03	9.18E-06	-	9.18E-06	-	-	-	-	-	-	1	NO
Residential	Benzene	6.00E+01	1.96E-03	3.26E-05	-	3.26E-05	3.26E-05	-	-	-	3.26E-05	-	1	NO
Residential	Chloroform	3.00E+02	8.37E-03	2.79E-05	-	-	-	-	2.79E-05	2.79E-05	2.79E-05	-	1	NO
Residential	Elthyl Benzene	2.00E+03	1.38E-03	6.90E-07	6.90E-07	-	-	-	-	-	-	-	1	NO
Residential	Methyl Ethyl Ketone	0.00E+00	5.22E-03	-	-	-	-	-	-	-	-	-	1	NO
Residential	Methylene Chloride	4.00E+02	1.13E-02	2.83E-05	-	2.83E-05	2.83E-05	-	-	-	-	-	1	NO
Residential	Methyl Isobutyl Ketone	0.00E+00	4.75E-03	-	-	-	-	-	-	-	-	-	1	NO
Residential	Tetrachloroethylene	3.50E+01	1.32E-02	3.76E-04	-	-	-	-	3.76E-04	3.76E-04	-	-	1	NO
Residential	Toluene	3.00E+02	7.24E-03	2.41E-05	2.41E-05	2.41E-05	-	-	-	-	2.41E-05	-	1	NO
Residential	Xylene	7.00E+02	6.77E-03	9.67E-06	9.67E-06	9.67E-06	-	-	-	-	-	-	1	NO
Total					3.45E-05	1.04E-04	6.09E-05	-	4.04E-04	4.04E-04	8.47E-05	-	1	NO

Where:

AREL Acute Reference Exposure Level
CREL Chronic Reference Exposure Level
HI Hazard Index

* Key to Toxicological Endpoints

RESP Respiratory System.
CNS/PNS Central/Peripheral Nervous System.
CV/BL Cardiovascular/Blood System.
IMMUN Immune System.
KIDN Kidney.
GI/LV Gastrointestinal System/Liver.
REPRO Reproductive System.
EYES Eye irritation and/or other effects.