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Revision 1

Calculation of Nonradiological Preliminary Remediation Goals in Soil for a Casual User Scenario for the 100 Aras and 300 Area Remedial Investigation/Feasibility Study Reports

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
under Contract DE-AC06-08RL14788

P.O. Box 1600
Richland, Washington 99352

Approved for Public Release;
Further Dissemination Unlimited

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Terms

ATSDR	Agency for Toxic Substances and Disease Registry
CalEPA	California Environmental Protection Agency
CLARC	Cleanup Level and Risk Calculations Database
COPC	Contaminant of Potential Concern
CSF	Cancer Slope Factor
EPA	U.S. Environmental Protection Agency
HEAST	EPA's Health Effects Assessment Summary Table
IRIS	EPA's Integrated Risk Information System
IUR	Inhalation Unit Risk
MRL	Minimum Risk Levels
NCEA	National Center of Environmental Assessment
NJDEP	New Jersey Department of Environmental Protection
OEHHA	CALEPA's Office of Environmental Health Hazard Assessment
PRG	Preliminary Remediation Goal
PPRTVs	EPA's Provisional Peer Reviewed Toxicity Values
RAGS	EPA's Risk Assessment Guidance For Superfund
RAIS	Oak Ridge National Laboratory Risk Assessment Information System
RfC	Reference Concentration
RfD	Reference Dose
RME	Reasonable Maximum Exposure
STSC	Superfund Health Risk Technical Support Center

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1 Purpose

This Environmental Calculation documents assumptions and methods for development of non-radiological soil Preliminary Remediation Goals (PRGs) for the casual recreational user exposure scenario for use in the 100 Areas and 300 Area Remedial Investigation/Feasibility Study (RI/FS) Reports. PRGs are concentration goals for a specific medium that are intended to protect specified receptors from exposure to contaminants through identified exposure pathways.

2 Background

As described in DOE/RL-2008-46, *Integrated 100 Area Remedial Investigation/Feasibility Study Work Plan* and DOE/RL-2009-30, *300 Area Remedial Investigation/Feasibility Study Work Plan for the 300-FF-1, 300-FF-2, and 300-FF-5 Operable Units*, the 100 Areas and the 300 Area contains multiple source and groundwater operable units (OUs), that are part of the Hanford Site River Corridor, which encompasses approximately 570 km^2 (220 mi^2) adjacent to the Columbia River. Cleanup levels corresponding to the casual recreational user exposure scenario in the River Corridor were calculated in DOE/RL-2007-21, *River Corridor Baseline Risk Assessment (RCBRA)*. For the purposes of developing non-radiological PRGs within this Environmental Calculation document, the following target objective is used:

- Prevent unacceptable risk to human health from exposure to soils and/or debris contaminated with nonradiological contaminants less than 4.6 m (15 ft) below ground surface (bgs). PRGs for individual carcinogenic substances correspond to an upper bound of the estimated excess lifetime cancer risk of one in one million (1×10^{-6}). PRGs for individual noncarcinogenic substances are set at concentrations that are anticipated to result in no acute or chronic toxic effects on human health; this level corresponds to a Hazard Quotient (HQ) of one.

This target objective has been developed only for the purpose of calculating PRGs that are presented in this Environmental Calculation. This target objective is not intended to supersede Remedial Action Objectives (RAOs) being developed in the 100 Areas RI/FS reports or the 300 Area RI/FS Report. This Environmental Calculation document will be revised as needed to incorporate updates to these PRGs that may result from changes in RAOs occurring during development of the 100 and 300 Area RI/FS Reports.

2.1 Exposure Routes

The potentially exposed population for this exposure scenario includes both adults and children. Adults and children may be exposed to surface soil contaminants via dermal absorption, incidental soil ingestion, and inhalation of dust or volatile organic compounds (VOCs). This scenario is focused primarily on activities such as walking and picnicking near the river, where paths and benches are likely to exist.

Potentially complete exposure routes associated with the direct contact exposure pathway for the casual recreational user exposure scenario are as follows:

- Incidental ingestion of soil
- Inhalation of vapors and dust in soil
- Dermal contact with soil

2.2 References

For the soil direct contact exposure pathway, contaminant PRGs are quantified using standard equations and procedures as specified in the following:

- EPA/540/1-89/002, *Risk Assessment Guidance for Superfund: Volume I—Human Health Evaluation Manual (Part A), Interim Final*;
- EPA/540/R-92/003, *Risk Assessment Guidance for Superfund: Volume I – Human Health Evaluation Manual (Part B, Development of Risk-based Preliminary Remediation Goals): Interim*;
- EPA/540/R/99/005, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)*;
- EPA-540-R-070-002, *Risk Assessment Guidance for Superfund: Volume 1—Human Health Evaluation Manual (Part F, Supplemental Guidance for Inhalation Risk Assessment*);
- EPA/630/R-03/003F, *Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens;*
- EPA/540/R-96/018, *Soil Screening Guidance: User's Guide Second Edition;*
- OSWER 9355.4-24, *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites;*
- OSWER Directive 9285.6-03 , *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual Supplemental Guidance "Standard Default Exposure Factors" Interim Final*;
- EPA, 2012, "Regional Screening Levels for Chemical Contaminants at Superfund Sites," (http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/equations.htm)

3 Methodology

The casual recreational user PRGs were calculated using the PRG equations referenced in Section 2.2 using a combination of default and site-specific exposure assumptions that represent a plausible exposure setting for characterizing human health risks to a child and adult casual recreational user. PRGs for direct contact with soil are based on an acceptable target cancer risk level of 1×10^{-6} for carcinogens or a hazard quotient of 1 for noncarcinogens.

The direct contact exposure pathway is considered potentially complete for the casual recreational user scenario. Exposure routes associated with the direct contact exposure pathway include incidental soil ingestion, dermal contact with soil, and inhalation of vapors and dust in soil. The following subsection presents exposure-route-specific equations used to calculate total PRGs for constituents with carcinogenic and noncarcinogenic effects, mutagenic effects, and vinyl chloride.

There is reason to surmise that some chemicals with a mutagenic mode of action, which would be expected to cause irreversible changes to DNA, would exhibit a greater effect in early-life versus later-life exposure. Cancer risk to children in the context of EPA/630/R-03/003F U.S. Environmental Protection Agency's cancer guidelines includes both early-life exposures that may result in the occurrence of cancer during childhood and early-life exposures that may contribute to cancers later in life. In keeping with this guidance, separate cancer PRG equations are presented for mutagens. The mutagen vinyl chloride has a unique set of equations that are also presented.

Table 1. Summary of Exposure Assumptions Used to Calculate Preliminary Remediation Goals for the Casual Recreational User.

Exposure Route/Exposure Factor	Symbol	Value	Units	Source
Dermal Absorption Fraction	ABS_d	Chemical-Specific	unitless	See Table 7
Skin Adherence Factor - Adult	AF_a	0.07	mg/cm^2	EPA/540/R-99/005
Skin Adherence Factor - Child	AF_{ccu}	0.2	mg/cm^2	EPA/540/R-99/005
Averaging Time - Carcinogenic	AT_{ca}	25,550	days	= 365 days/year x 70 years
Averaging Time - Noncarcinogenic, Child Casual Recreational User	AT_{nc_cu}	2,190	days	= 365 days/year x 6 years
Body Weight- Adult	BW_a	70	kg	OSWER Directive 9285.6-03
Body Weight – Child	BW_{ccu}	15	kg	OSWER Directive 9285.6-03
Cancer Slope Factor - oral	CSF_o	Chemical-Specific	$(mg/kg\text{-}day)^{-1}$	See Table 7
Age-adjusted dermal contact rate, Casual Recreational User	DFS_{adj_cu}	361	(mg-year)/(kg-day)	Equations 9 and 14
Age-adjusted dermal contact rate – mutagens, Casual Recreational User	$DFSM_{adj_cu}$	1,445	(mg-year)/(kg-day)	Equation 12
Exposure Duration -Adult + Child	ED_{a+ccu}	30	years	OSWER Directive 9285.6-03
Exposure Duration - Child Casual Recreational User	ED_{ccu}	6	years	OSWER Directive 9285.6-03
Exposure Duration - 0-2 years	ED_{0-2}	2	years	EPA/630/R-03/003F
Exposure Duration - 2-6 years	ED_{2-6}	4	years	EPA/630/R-03/003F
Exposure Duration - 6-16 years	ED_{6-16}	10	years	EPA/630/R-03/003F
Exposure Duration -16-30 years	ED_{16-30}	14	years	EPA/630/R-03/003F
Exposure Frequency - Casual Recreational User	EF_{cu}	30	days/year	DOE/RL-2007-21 Rev. 0, Table 3-16
Exposure Time - Casual Recreational User	ET_{cu}	6	hours/day	PNNL 2001; Table 4.9
Gastro-Intestinal Absorption Fraction	GIABS	Chemical-Specific	unitless	See Table 7
Soil Ingestion Rate – Adult	IRS_a	100	mg/day	OSWER Directive 9285.6-03.

Table 1. Summary of Exposure Assumptions Used to Calculate Preliminary Remediation Goals for the Casual Recreational User.

Exposure Route/Exposure Factor	Symbol	Value	Units	Source
Age-adjusted soil ingestion rate, Casual Recreational User	IRS_{adj_cu}	114	mg-yr/kg-day	Equation 2 and 7
Age-adjusted soil ingestion rate – mutagens, Casual Recreational User	$IRSM_{adj_cu}$	489.5	mg-yr/kg-day	Equation 5
Soil Ingestion Rate - Child Casual Recreational User	IRS_{ccu}	200	mg/day	OSWER Directive 9285.6-03.
Inhalation Unit Risk	IUR	Chemical-Specific	$(\mu g/m^3)^{-1}$	See Table 7
Particulate Emission Factor	PEF	7.30E+10	m^3/kg	Equation 22
PRG – casual recreational user, carcinogen, incidental soil ingestion	$PRG_{cu_ca_ing}$	Chemical-Specific	mg/kg	Equation 1
PRG – casual recreational user, non-carcinogen, incidental soil ingestion	$PRG_{cu_nc_ing}$	Chemical-Specific	mg/kg	Equation 3
PRG – casual recreational user, mutagen, incidental soil ingestion	$PRG_{cu_mu_ing}$	Chemical-Specific	mg/kg	Equation 4
PRG – casual recreational user, vinyl chloride, incidental soil ingestion	$PRG_{cu_vc_ing}$	Chemical-Specific	mg/kg	Equation 6
PRG – casual recreational user, carcinogen, dermal contact	$PRG_{cu_ca_dc}$	Chemical-Specific	mg/kg	Equation 8
PRG – casual recreational user, non-carcinogen, dermal contact	$PRG_{cu_nc_dc}$	Chemical-Specific	mg/kg	Equation 10
PRG – casual recreational user, mutagen, dermal contact	$PRG_{cu_mu_dc}$	Chemical-Specific	mg/kg	Equation 11
PRG – casual recreational user, vinyl chloride, dermal contact	$PRG_{cu_vc_dc}$	Chemical-Specific	mg/kg	Equation 13
PRG – casual recreational user, carcinogen, inhalation	$PRG_{cu_ca_inh}$	Chemical-Specific	mg/kg	Equation 15
PRG – casual recreational user, non-carcinogen, inhalation	$PRG_{cu_nc_inh}$	Chemical-Specific	mg/kg	Equation 16

Table 1. Summary of Exposure Assumptions Used to Calculate Preliminary Remediation Goals for the Casual Recreational User.

Exposure Route/Exposure Factor	Symbol	Value	Units	Source
PRG – casual recreational user, mutagen, inhalation	$PRG_{cu_mu_inh}$	Chemical-Specific	mg/kg	Equation 17
PRG – casual recreational user, vinyl chloride, inhalation	$PRG_{cu_vc_inh}$	Chemical-Specific	mg/kg	Equation 18
PRG – casual recreational user, carcinogen, total	$PRG_{cu_ca_total}$	Chemical-Specific	mg/kg	Equation 26
PRG – casual recreational user, non-carcinogen, total	$PRG_{cu_nc_total}$	Chemical-Specific	mg/kg	Equation 27
PRG – casual recreational user, mutagen, total	$PRG_{cu_mu_total}$	Chemical-Specific	mg/kg	Equation 28
PRG – casual recreational user, vinyl chloride, total	$PRG_{cu_vc_total}$	Chemical-Specific	mg/kg	Equation 29
Reference Concentration	RfC	Chemical-Specific	mg/m^3	See Table 7
Reference Dose - oral	RfD_o	Chemical-Specific	mg/kg-day	See Table 7
Skin Surface Area- Adult	SA_a	5700	cm^2/day	Assumes dermal exposure to soil is to the head, hands, forearms, and lower legs. EPA/540/R/99/005, Section 3.2.2.1, Exhibit 3-5.
Skin Surface Area – Child Casual Recreational User	SA_{ccu}	2800	cm^2/day	Assumes dermal exposure to soil is to the head, hands, forearms, lower legs and feet. EPA/540/R/99/005, Section 3.2.2.1, Exhibit 3-5.
Target Hazard Quotient	THQ	1	unitless	OSWER 9355.4-24
Target Risk	TR	1 in 1,000,000	unitless	OSWER 9355.4-24
Unit Conversion Factor	UCF1	1.00E-06	kg/mg	1 kg = 1.0E+06 mg
Unit Conversion Factor	UCF2	1.00E+03	µg/mg	1 mg = 1.0E+03 µg
Volatilization Factor	VF	Chemical-Specific	m^3/kg	Equation 19

Notes:

DOE/RL-2007-21, *Risk Assessment Report for the 100 Area and 300 Area Component of the River Corridor Baseline Risk Assessment*

Table 1. Summary of Exposure Assumptions Used to Calculate Preliminary Remediation Goals for the Casual Recreational User.

Exposure Route/Exposure Factor	Symbol	Value	Units	Source

OSWER 9355.4-24, *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites*

OSWER Directive 9285.6-03 , *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual Supplemental Guidance "Standard Default Exposure Factors"*

EPA/540/R-92/003, *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual (Part B, Development of Risk-Based Preliminary Remediation Goals)*

EPA/540/R/99/005, *Risk Assessment Guidance for Superfund Volume I: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment)*

EPA-540-R-070-002*, Risk Assessment Guidance for Superfund: Volume 1—Human Health Evaluation Manual (Part F, Supplemental Guidance for Inhalation Risk Assessment*)

EPA/630/R-03/003F, *Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens*

PNNL, *2001 Columbia River Recreation Survey – Implications for the Hanford Site*

3.1 PRG Equations for Incidental Soil Ingestion

The bases for the equations used to calculate PRGs associated with the incidental soil ingestion route are summarized in Table 2. All of the parameters used to calculate PRGs for incidental soil ingestion route are presented and defined in Table 1. Equations are provided in the following subsections.

Table 2. Calculated Values and Reference Bases Used for the Incidental Soil Ingestion Route

Effect	Symbol for Calculated Value	Reference
Carcinogen	$PRG_{cu_ca_ing}$ IRS_{adj_cu}	EPA, 2012
Noncarcinogen	$PRG_{cu_nc_ing}$	EPA, 2012
Mutagen	$PRG_{cu_mu_ing}$ $IRSM_{adj_cu}$	EPA, 2012
Vinyl Chloride	$PRG_{cu_vc_ing}$ IRS_{adj_cu}	EPA, 2012

Notes:
PRG= Preliminary Remediation Goal
IRS_{adj_cu} = age-adjusted soil ingestion rate.
$IRSM_{adj_cu}$ = mutagenic age-adjusted soil ingestion rate
EPA, 2012, "Regional Screening Levels for Chemical Contaminants at Superfund Sites"

3.1.1 Incidental Soil Ingestion - Carcinogenic Effects

The following equations are used to calculate the carcinogenic PRG for incidental soil ingestion:

$$PRG_{cu_ca_ing} = \frac{TR \times AT_{ca}}{CSF_o \times IRS_{adj_cu} \times EF_{cu} \times UCF1} \quad (1)$$

Where:

$$IRS_{adj_cu} = \left(\frac{ED_{ccu} \times IRS_{ccu}}{BW_{ccu}}\right) + \left(\frac{\left(ED_{a+ccu} - ED_{ccu}\right) \times IRS_a}{BW_a}\right) \quad (2)$$

3.1.2 Incidental Soil Ingestion - Noncarcinogenic Effects

The following equations are used to calculate the noncarcinogenic PRG for incidental soil ingestion:

$$PRG_{cu_nc_ing} = \frac{THQ \times AT_{nc_ccu} \times BW_{ccu}}{\frac{1}{RfD_o} \times IRS_{ccu} \times EF_{cu} \times ED_{ccu} \times UCF1} \quad (3)$$

3.1.3 Incidental Soil Ingestion - Mutagenic Effects

The following equations are used to calculate the mutagenic mode of action PRG for incidental soil ingestion:

$$PRG_{cu_mu_ing} = \frac{TR \times AT_{ca}}{CSF_o \times IRSM_{adj_cu} \times EF_{cu} \times UCF1} \quad (4)$$

Where:

$$IRSM_{adj_cu} = \frac{ED_{0-2} \times IRS_{ccu} \times 10}{BW_{ccu}} + \frac{ED_{2-6} \times IRS_{ccu} \times 3}{BW_{ccu}} + \frac{ED_{6-16} \times IRS_a \times 3}{BW_a} + \frac{ED_{16-30} \times IRS_a \times 1}{BW_a} \quad (5)$$

3.1.4 Incidental Soil Ingestion - Vinyl Chloride

The following equations are used to calculate the vinyl chloride PRG for incidental soil ingestion:

$$PRG_{cu_vc_ing} = \frac{TR}{\left(\frac{CSF_o \times IRS_{adj_cu} \times EF_{cu} \times UCF1}{AT_{ca}} + \frac{CSF_o \times IRS_{ccu} \times UCF1}{BW_{ccu}}\right)} \quad (6)$$

Where:

$$IRS_{adj_cu} = \left(\frac{ED_{ccu} \times IRS_{ccu}}{BW_{ccu}}\right) + \left(\frac{(ED_{a+ccu} - ED_{ccu}) \times IRS_a}{BW_a}\right) \quad (7)$$

3.2 PRG Equations for Dermal Contact with Soil

The bases for the equations used to calculate PRGs associated with the dermal contact with soil route are summarized in Table 3. All of the parameters used to calculate PRGs for the dermal contact with soil route are presented and defined in Table 1. Equations are provided in the following subsections.

Table 3. Calculated Values and Reference Bases Used for the Dermal Contact with Soil Route

Effect	Calculated Value	Reference
Carcinogen	$PRG_{cu_ca_dc}$ DFS_{adj_cu}	EPA, 2012
Noncarcinogen	$PRG_{cu_nc_dc}$	EPA, 2012
Mutagen	$PRG_{cu_mu_dc}$ $DFSM_{adj_cu}$	EPA, 2012
Vinyl Chloride	$PRG_{cu_vc_dc}$ DFS_{adj_cu}	EPA, 2012

Notes:

PRG= Preliminary Remediation Goal

DFS_{adj_cu} = age-adjusted dermal contact rate

$DFSM_{adj_cu}$ = age-adjusted dermal contact rate for mutagens

EPA, 2012, "Regional Screening Levels for Chemical Contaminants at Superfund Sites"

3.2.1 Dermal Contact with Soil - Carcinogenic Effects

The following equations are used to calculate the carcinogenic PRG for the dermal contact route:

$$PRG_{cu_ca_dc} = \frac{TR \times AT_{ca}}{\left(\frac{CSF_o}{GIABS}\right) \times EF_{cu} \times DFS_{adj_cu} \times ABS_d \times UCF1} \tag{8}$$

Where:

$$DFS_{adj_cu} = \left(\frac{ED_{ccu} \times SA_{ccu} \times AF_{ccu}}{BW_{ccu}}\right) + \left(\frac{(ED_{a+ccu} - ED_{ccu}) \times SA_a \times AF_a}{BW_a}\right) \tag{9}$$

3.2.2 Dermal Contact with Soil - Noncarcinogenic Effects

The following equations are used to calculate the noncarcinogenic PRG for the dermal contact route:

$$PRG_{cu_nc_dc} = \frac{THQ \times AT_{nc_cu} \times BW_{ccu}}{\left(\frac{1}{RfD_o} \times GIABS\right) \times SA_{ccu} \times AF_{ccu} \times EF_{cu} \times ED_{ccu} \times ABS_d \times UCF1} \tag{10}$$

3.2.3 Dermal Contact with Soil - Mutagenic Effects

The following equations are used to calculate the mutagenic mode of action PRG for the dermal contact route:

$$PRG_{cu_mu_dc} = \frac{TR \times AT_{ca}}{\frac{CSF_o}{GIABS} \times DFSM_{adj_cu} \times EF_{cu} \times ABS_d \times UCF1} \tag{11}$$

Where:

$$DFSM_{adj_cu} = \frac{ED_{0-2} \times SA_{ccu} \times AF_{ccu} \times 10}{BW_{ccu}} + \frac{ED_{2-6} \times SA_{ccu} \times AF_{ccu} \times 3}{BW_{ccu}} + \frac{ED_{6-16} \times SA_a \times AF_a \times 3}{BW_a} + \frac{ED_{16-30} \times SA_a \times AF_a \times 1}{BW_a} \tag{12}$$

3.2.4 Dermal Contact with Soil - Vinyl Chloride

The following equations are used to calculate the vinyl chloride PRG for the dermal contact route:

$$PRG_{cu_vc_dc} = \frac{TR}{\left(\frac{\frac{CSF_o}{GIABS} \times DSF_{adj_cu} \times EF_{cu} \times ABS_d \times UCF1}{AT_{ca}} + \frac{\frac{CSF_o}{GIABS} \times SA_{ccu} \times AF_{ccu} \times ABS_d \times UCF1}{BW_{ccu}}\right)} \tag{13}$$

Where:

$$DFS_{adj_cu} = \left(\frac{ED_{ccu} \times SA_{ccu} \times AF_{ccu}}{BW_{ccu}}\right) + \left(\frac{(ED_{a+ccu} - ED_{ccu}) \times SA_a \times AF_a}{BW_a}\right) \tag{14}$$

3.3 PRG Equations for the Inhalation of Vapors and Dust in Soil

The bases for the equations used to calculate PRGs associated with the inhalation of vapors and dust in soil are summarized in Table 4. All of the parameters used to calculate PRGs for the inhalation of vapors and dust in soil route are presented and defined in Table 1. Equations are provided in the following subsections.

Table 4. Calculated Values and Reference Bases Used for the Inhalation of Vapors and Dust in Soil Route

Effect	Calculated Value	Reference
Carcinogen	$PRG_{cu_ca_inh}$	EPA, 2012
Noncarcinogen	$PRG_{cu_nc_inh}$	EPA, 2012
Mutagen	$PRG_{cu_mu_inh}$	EPA, 2012
Vinyl Chloride	$PRG_{cu_vc_inh}$	EPA, 2012
Particulate Emission Factor	PEF Q/C	OSWER Directive 9355.4-24
Volatilization Factor	VF Q/C D_A	OSWER Directive 9355.4-24
Wind-Speed Distribution Function	F(x)	EPA/600/8-85/002

Notes:

PRG= Preliminary Remediation Goal

PEF= particulate emission factor

VF= volatilization factor

D_A= apparent diffusivity

Q/C= inverse of mean concentration at center of a source

F(x) = Windspeed Distribution Function

OSWER 9355.4-24, *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites*

EPA-540-R-070-002, *Risk Assessment Guidance for Superfund: Volume 1—Human Health Evaluation Manual (Part F, Supplemental Guidance for Inhalation Risk Assessment*)

EPA/600/8 85/002, *Rapid Assessment of Exposure to Particulate Emissions from Surface Contamination Sites*

EPA, 2012, "Regional Screening Levels for Chemical Contaminants at Superfund Sites"

3.3.1 Inhalation of Vapors and Dust in Soil - Carcinogenic Effects

The following equation is used to calculate the carcinogenic PRG for the inhalation route:

$$PRG_{cu_ca_inh} = \frac{TR \times AT_{ca} \times 24\frac{hours}{day}}{IUR \times UCF2 \times EF_{cu} \times ED_{a+ccu} \times ET_{cu} \times \left(\frac{1}{VF} + \frac{1}{PEF}\right)} \quad (15)$$

3.3.2 Inhalation of Vapors and Dust in Soil - Noncarcinogenic Effects

The following equation is used to calculate the noncarcinogenic PRG for the inhalation route:

$$PRG_{cu_nc_inh} = \frac{THQ \times AT_{nc_cu} \times 24\frac{hours}{day}}{EF_{cu} \times ED_{ccu} \times ET_{cu} \times \frac{1}{RfC} \times \left(\frac{1}{VF} + \frac{1}{PEF}\right)} \quad (16)$$

3.3.3 Inhalation of Vapors and Dust in Soil - Mutagenic Effects

The following equation is used to calculate the mutagenic mode of action PRG for the inhalation route:

$$PRG_{cu_mu_inh} = \frac{TR \times AT_{ca} \times 24\frac{hours}{day}}{UCF2 \times ET_{cu} \times EF_{cu} \times \left[\left(ED_{0-2} \times IUR \times 10\right) + \left(ED_{2-6} \times IUR \times 3\right) + \left(ED_{6-16} \times IUR \times 3\right) + \left(ED_{16-30} \times IUR \times 1\right)\right] \times \left(\frac{1}{VF} + \frac{1}{PEF}\right)} \quad (17)$$

3.3.4 Inhalation of Vapors and Dust in Soil - Vinyl Chloride

The following equation is used to calculate the vinyl chloride PRG for the inhalation route:

$$PRG_{cu_vc_inh} = \frac{TR}{\left(\frac{IUR \times ED_{a+ccu} \times EF_{cu} \times ET_{cu} \times UCF2}{AT_{ca} \times 24\frac{hours}{day} \times VF}\right) + \left(\frac{IUR}{VF} \times UCF2\right)} \quad (18)$$

3.3.5 Volatilization Factor and Particulate Emission Factor Calculation

The following presents the equations used to calculate the volatilization factors and the particulate emission factor for use in calculating inhalation PRGs for a casual recreational user exposure scenario. Definitions of variables and input values are provided in Table 5. Volatilization factors are only calculated for volatile organic compounds. Contaminants identified as volatile meet the definition of a volatile organic compound in WAC 173-340-200, “Definitions,” and were identified from the Ecology CLARC database (Ecology 2013).

Table 5. Summary of Input Parameters Used to Calculate Wind Volatilization and Wind Particulate Emission Factors for the Casual Recreational User Exposure Scenario.

Input Parameter	Symbol	Value	Units	Source
A Constant	A	11.3161	unitless	OSWER Directive 9355.4-24; Exhibit D-2 for Boise Idaho.
Site Area	A_s	0.5	acres	OSWER Directive 9355.4-24
B Constant	B	19.6437	unitless	OSWER Directive 9355.4-24; Exhibit D-2 for Boise Idaho.
C Constant	C	224.8172	unitless	OSWER Directive 9355.4-24; Exhibit D-2 for Boise Idaho.
Apparent diffusivity	D_A	Chemical-Specific	cm^2/s	Equation 21
Diffusivity in air	D_i	Chemical-Specific	cm^2/s	see Table 6
Diffusivity in water	D_w	Chemical-Specific	cm^2/s	see Table 6
Wind speed distribution function	F(x)	7.21E-03	unitless	Equation 24
Fraction organic carbon in soil	f_{oc}	0.001	g/g	DOE/RL-96-17
Henry's law constant	H'	Chemical-Specific	dimensionless	see Table 6
Soil-water partition coefficient	K_d	Chemical-Specific	L/kg	=for organic analytes $K_d=f_{oc}$ x K_{oc}, for inorganic analytes, the inorganic K_d is used
Soil organic carbon/water partition coefficient	K_{oc}	Chemical-Specific	L/kg	see Table 6
Soil porosity	n	0.434	unitless	= 1 – (ρ_b/ρ_s); EPA/540/R-96/018
Particulate Emission Factor	PEF	7.30E+10	m^3/kg	Equation 22
Inverse of mean concentration at center of a source	Q/C	71.22808	g/m^2-s per kg/m^3	Equations 20 and 23
Exposure Time	T	9.50E+08	s	EPA/540/R-96/018
Annual average wind speed	u_m	3.4	m/s	PNNL-15160, Table 5.1

Table 5. Summary of Input Parameters Used to Calculate Wind Volatilization and Wind Particulate Emission Factors for the Casual Recreational User Exposure Scenario.

Input Parameter	Symbol	Value	Units	Source
Wind speed at anemometer height equivalent to corrected threshold friction velocity	u_t	11.32	m/s	OSWER Directive 9355.4-24
Fraction of vegetative cover	V	0.5	unitless	OSWER Directive 9355.4-24
Volatilization Factor	VF	Chemical-Specific	m^3/kg	Equation 19
	x	2.95E+00	unitless	Equation 25
Air-filled soil porosity	Θ_a	0.284	L_{air}/L_{soil}	EPA/540/R-96/018; $=n-\Theta_w$
Water-filled soil porosity	Θ_w	0.15	L_{water}/L_{soil}	EPA/540/R-96/018
Dry soil bulk density	ρ_b	1.5	kg/L	EPA/540/R-96/018

Notes:

DOE/RL-96-17, *Remedial Design Report/Remedial Action Work Plan for the 100 Area*

EPA/540/R-96/018, *Soil Screening Guidance: User's Guide Second Edition*

OSWER 9355.4-24, *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites*

PNNL-15160, 2005, *Hanford Site Climatological Summary 2004 with Historical Data*

3.3.5.1 Volatilization Factors

For volatile analytes, the analyte specific volatilization factor is calculated with the following equations:

$$VF = \frac{\frac{Q}{C} \times \left(3.14 \times D_A \times T\right)^{\frac{1}{2}} \times 10^{-4} \left(\frac{m^2}{cm^2}\right)}{2 \times \rho_b \times D_A} \tag{19}$$

Where:

$$\frac{Q}{C} = A \times \exp\left[\frac{\left(\ln[A_s] - B\right)^2}{C}\right] \tag{20}$$

And:

$$D_A = \left[\frac{\left(\theta_a^{\frac{10}{3}} \times D_i \times H' + \theta_w^{\frac{10}{3}} \times D_w\right)}{\frac{n^2}{\rho_b \times k_{oc} \times f_{oc} + \theta_w + \theta_a \times H'}}\right] \tag{21}$$

3.3.5.2 Particulate Emission Factor

The particulate emission factor is calculated using the following equations:

$$PEF = \frac{Q}{C} \times \frac{3{,}600}{0.036 \times (1 - V) \times \left(\frac{u_m}{u_t}\right)^3 \times F(x)} \tag{22}$$

Where:

$$\frac{Q}{C} = A \times \exp\left[\frac{\left(\ln(A_s) - B\right)^2}{C}\right] \tag{23}$$

And:

$$F(x) = 0.18\,(8\,x^3 + 12\,x)\exp -(\,x^2\,) \tag{24}$$

And:

$$x = 0.886\left(\frac{u_t}{u_m}\right) \tag{25}$$

3.3.6 Total PRG Equations

The following presents the equations used to calculate the total PRGs for all exposure routes combined. The bases for the equations are provided in EPA/540/R-92/003.

3.3.6.1 Carcinogenic Effects

$$PRG_{cu_ca_total} = \frac{1}{\left(\left(\frac{1}{PRG_{cu_ca_ing}}\right)+\left(\frac{1}{PRG_{cu_ca_dc}}\right)+\left(\frac{1}{PRG_{cu_ca_inh}}\right)\right)} \tag{26}$$

3.3.6.2 Noncarcinogenic Effects

$$PRG_{cu_nc_total} = \frac{1}{\left(\left(\frac{1}{PRG_{cu_nc_ing}}\right)+\left(\frac{1}{PRG_{cu_nc_dc}}\right)+\left(\frac{1}{PRG_{cu_nc_inh}}\right)\right)} \tag{27}$$

3.3.6.3 Mutagenic Effects

$$PRG_{cu_mu_total} = \frac{1}{\left(\left(\frac{1}{PRG_{cu_mu_ing}}\right)+\left(\frac{1}{PRG_{cu_mu_dc}}\right)+\left(\frac{1}{PRG_{cu_mu_inh}}\right)\right)} \tag{28}$$

3.3.6.4 Vinyl Chloride

$$PRG_{cu_vc_total} = \frac{1}{\left(\left(\frac{1}{PRG_{cu_vc_ing}}\right)+\left(\frac{1}{PRG_{cu_vc_dc}}\right)+\left(\frac{1}{PRG_{cu_vc_inh}}\right)\right)} \tag{29}$$

4 Assumptions and Inputs

Assumptions and inputs associated with the casual recreational user exposure scenario and human health toxicity values used in the human health PRG calculations are described below.

4.1 Assumptions and Inputs

The exposure assumptions and chemical-specific parameters used to calculate PRGs for the casual recreational user exposure scenario are presented in Tables 1 through 6. Other key assumptions are as follows:

- The PRGs for the casual recreational user exposure scenario are based on a site-specific exposure scenario used to estimate risks in DOE/RL-2007-21. This scenario reflects a reasonably anticipated future use when the River Corridor is open for recreational use.
- The potentially exposed population for this exposure scenario includes both adults and children. This scenario is focused primarily on activities such as walking and picnicking near the river, where paths and benches are likely to exist.
- The exposure routes involved with the casual recreational user exposure scenario are incidental soil ingestion, inhalation of volatiles and dust from soil, and dermal contact with soil.
- Exposure assumptions used to calculate the casual recreational user PRGs for carcinogens, noncarcinogens, mutagens, and vinyl chloride are listed in Table 1. The sources for each of the assumptions are also listed in Table 1.
- With the exception of the exposure frequency and exposure time, the exposure assumptions used to calculate the casual recreational user PRGs are the same as those that would be used to provide a Reasonable Maximum Exposure (RME) for the residential exposure scenario as defined in OSWER Directive 9285.6-03, *Risk Assessment Guidance For Superfund Volume I: Human Health Evaluation Manual Supplemental Guidance, "Standard Default Exposure Factors"*.
- The site-specific exposure frequency of 30 days per year for the casual recreational user scenario is based on a site-specific seasonal usage as described in DOE/RL-2007-21.
- The site-specific exposure time of 6 hours per day for the casual recreational user scenario is based on the assumption of recreational use at the Hanford Site as described in PNNL, *2001 Columbia River Recreation Survey – Implications for the Hanford Site Integrated Assessment*.
- Input parameters used to calculate the volatilization and particulate emission factors are listed in Table 5. The input parameters used in these equations are considered generic default values and the sources for each of the input parameters are listed in Table 5.
- Chemical-specific values used to calculate volatilization and particulate emission factors are listed in Table 6. The sources for each of the chemical-specific values are also listed in Table 6.

4.2 Toxicity Values

The analyte-specific toxicity values presented Table 7 are determined using the recommended reference hierarchy as described in Cook, 2003, *Human Health Toxicity Values in Superfund Risk Assessments*. The hierarchy is summarized below.

- Tier 1 – The EPA Integrated Risk Information System (IRIS)
- Tier 2 – The EPA Provisional Peer Reviewed Toxicity Values (PPRTVs)
- Tier 3 – Other Toxicity Values

Table 6: Summary of Chemical-Specific Input Parameters and Volatilization Factors

CAS#	Analyte	Diffusivity in Aira (Di) (cm^2/s)	Source	Diffusivity in Watera (Dw) (cm^2/s)	Source	Dimensionless Henry's Law Constant[a] (H')	Source	Soil-Carbon Partition Coefficient[a] (Koc) (L/kg)	Soil/Water Distribution Coefficient Kd Organic (L/kg) = Koc x foc	Source	Inorganic Kd[a] (cm^3/g)	Source	RDR/RAWP Soil/Water Distribution Coefficients[a] (Kd) (DOE/RL-96-17)	Final Kd[a] (cm^3/g)	Source	Apparent Diffusivity (DA) (cm^2/s)	Volatile?[d]	Volatilization Factor (VF) (m^3/kg)
630-20-6	1,1,1,2-Tetrachloroethane	4.82E-02	EPA 2012	9.10E-06	EPA 2012	1.02E-01	EPA 2012	8.60E+01	8.60E+02	EPA 2012	--	--	--	8.60E+02	EPA 2012	1.29E-03	V	3.63E+03
71-55-6	1,1,1-Trichloroethane	6.48E-02	EPA 2012	9.80E-06	EPA 2012	7.05E-01	CLARC 2013	1.35E+02	1.35E+01	CLARC 2013	--	--	--	1.35E+01	CLARC 2013	6.61E-03	V	1.60E+03
79-34-5	1,1,2,2-Tetrachloroethane	4.89E-02	EPA 2012	9.29E-06	EPA 2012	1.41E-02	CLARC 2013	7.90E+01	7.90E+02	CLARC 2013	--	--	--	7.90E+02	CLARC 2013	2.03E-04	V	9.11E+03
79-00-5	1,1,2-Trichloroethane	6.88E-02	EPA 2012	1.00E-05	EPA 2012	3.74E-02	CLARC 2013	7.50E+01	7.50E+02	CLARC 2013	--	--	--	7.50E+02	CLARC 2013	7.32E-04	V	4.79E+03
75-34-3	1,1-Dichloroethane	8.36E-02	EPA 2012	1.06E-05	EPA 2012	2.30E-01	CLARC 2013	5.30E+01	5.30E+02	CLARC 2013	--	--	--	5.30E+02	CLARC 2013	5.22E-03	V	1.80E+03
75-35-4	1,1-Dichloroethene	8.63E-02	EPA 2012	1.10E-05	EPA 2012	1.07E+00	CLARC 2013	6.50E+01	6.50E+02	CLARC 2013	--	--	--	6.50E+02	CLARC 2013	1.34E-02	V	1.13E+03
96-18-4	1,2,3-Trichloropropane	5.75E-02	EPA 2012	9.24E-06	EPA 2012	1.40E-02	EPA 2012	1.16E+02	1.16E+01	EPA 2012	--	--	--	1.16E+01	EPA 2012	1.97E-04	V	9.24E+03
95-94-3	1,2,4,5-Tetrachlorobenzene	3.19E-02	EPA 2012	8.75E-06	EPA 2012	4.09E-02	EPA 2012	2.22E+03	2.22E+00	EPA 2012	--	--	--	2.22E+00	EPA 2012	2.99E-05	--	--
120-82-1	1,2,4-Trichlorobenzene	3.98E-02	EPA 2012	8.40E-06	EPA 2012	5.82E-02	CLARC 2013	1.66E+03	1.66E+00	CLARC 2013	--	--	1.66E+00	1.65E+00	DOE/RL-96-17	6.94E-05	V	1.58E+04
96-12-8	1,2-Dibromo-3-chloropropane	3.21E-02	EPA 2012	8.90E-06	EPA 2012	6.01E-03	EPA 2012	1.16E+02	1.16E+01	EPA 2012	--	--	--	1.16E+01	EPA 2012	4.77E-05	V	1.88E+04
106-93-4	1,2-Dibromoethane	4.30E-02	EPA 2012	1.04E-05	EPA 2012	2.66E-02	EPA 2012	6.60E+01	6.60E+02	CLARC 2013	--	--	--	6.60E+02	CLARC 2013	3.57E-04	V	6.87E+03
95-50-1	1,2-Dichlorobenzene	5.62E-02	EPA 2012	8.92E-06	EPA 2012	7.79E-02	CLARC 2013	3.79E+02	3.79E+01	CLARC 2013	--	--	3.79E-01	3.79E+01	DOE/RL-96-17	4.72E-04	V	1.57E+03
107-06-2	1,2-Dichloroethane	8.57E-02	EPA 2012	1.10E-05	EPA 2012	4.01E-02	CLARC 2013	3.80E+01	3.80E+02	CLARC 2013	--	--	--	3.80E+02	CLARC 2013	1.26E-03	V	3.66E+03
540-59-0	1,2-Dichloroethene (Total)	8.76E-02	EPA 2012	1.12E-05	EPA 2012	1.67E-01	EPA 2012	3.96E+01	3.96E+02	EPA 2012	--	--	--	3.96E+02	EPA 2012	4.56E-03	V	1.92E+03
78-87-5	1,2-Dichloropropane	7.33E-02	EPA 2012	9.73E-06	EPA 2012	1.15E-01	EPA 2012	4.70E+01	4.70E+02	CLARC 2013	--	--	--	4.70E+02	CLARC 2013	2.68E-03	V	2.51E+03
541-73-1	1,3-Dichlorobenzene	5.58E-02	ORNL 2013	8.85E-06	ORNL 2013	1.08E-01	ORNL 2013	3.75E+02	3.75E+01	ORNL 2013	--	--	4.34E-01	4.34E+01	DOE/RL-96-17	5.79E-04	V	5.39E+03
106-46-7	1,4-Dichlorobenzene	5.50E-02	EPA 2012	8.68E-06	EPA 2012	9.96E-02	CLARC 2013	6.16E+02	6.16E+01	CLARC 2013	--	--	6.16E-01	6.16E+01	DOE/RL-96-17	3.98E-04	V	6.50E+03
123-91-1	1,4-Dioxane	8.74E-02	EPA 2012	1.05E-05	EPA 2012	1.96E-04	EPA 2012	2.63E+00	2.63E+00	EPA 2012	--	--	--	2.63E+00	EPA 2012	9.54E-06	V	4.20E+04
71-36-3	1-Butanol	9.00E-02	EPA 2012	1.01E-05	EPA 2012	3.61E-04	CLARC 2013	6.92E+00	6.92E+01	CLARC 2013	--	--	--	6.92E+01	CLARC 2013	1.68E-05	V	3.17E+04
71-23-8	1-Propanol	1.04E-01	ORNL 2013	1.14E-05	ORNL 2013	3.03E-04	ORNL 2013	1.90E+00	1.90E+03	ORNL 2013	--	--	--	1.90E+03	ORNL 2013	1.72E-05	V	3.13E+04
93-65-2	2-(2-methyl-4-chlorophenoxy) propionic acid	5.30E-02	EPA 2012	6.10E-06	EPA 2012	3.66E-08	EPA 2012	4.85E+01	4.85E+02	EPA 2012	--	--	--	4.85E+02	EPA 2012	2.65E-07	--	--
39635-31-9	2,3,7,4,6,5,5-Heptachlorobiphenyl	3.53E-02	EPA 2012	4.12E-06	EPA 2012	5.64E-03	EPA 2012	3.50E+05	3.50E+02	EPA 2012	--	--	--	3.50E+02	EPA 2012	3.04E-08	--	--
69782-90-7	2,3,7,4,6,5'-Hexachlorobiphenyl	3.75E-02	EPA 2012	4.38E-06	EPA 2012	6.62E-03	EPA 2012	2.14E+05	2.14E+02	EPA 2012	--	--	--	2.14E+02	EPA 2012	6.20E-08	--	--
38380-08-4	2,3,7,4,6,5-Hexachlorobiphenyl	3.75E-02	EPA 2012	4.38E-06	EPA 2012	5.85E-03	EPA 2012	2.14E+05	2.14E+02	EPA 2012	--	--	--	2.14E+02	EPA 2012	5.48E-08	--	--
32598-14-4	2,3,3',4,4'-Pentachlorobiphenyl	4.01E-02	EPA 2012	4.68E-06	EPA 2012	1.16E-02	EPA 2012	1.31E+05	1.31E+02	EPA 2012	--	--	--	1.31E+02	EPA 2012	1.89E-07	--	--
52663-72-6	2,3',4,4',5,5'-Hexachlorobiphenyl	3.75E-02	EPA 2012	4.38E-06	EPA 2012	6.62E-03	EPA 2012	2.09E+05	2.09E+02	EPA 2012	--	--	--	2.09E+02	EPA 2012	6.33E-08	--	--
74472-37-0	2,3,4,4',5-Pentachlorobiphenyl	4.01E-02	EPA 2012	4.68E-06	EPA 2012	7.77E-03	EPA 2012	1.31E+05	1.31E+02	EPA 2012	--	--	--	1.31E+02	EPA 2012	1.27E-07	--	--
65510-44-3	2',3,4,4',5-Pentachlorobiphenyl	4.01E-02	EPA 2012	4.68E-06	EPA 2012	7.77E-03	EPA 2012	1.31E+05	1.31E+02	EPA 2012	--	--	--	1.31E+02	EPA 2012	1.27E-07	--	--
31508-00-6	2',3,4,4',5-Pentachlorobiphenyl	4.01E-02	EPA 2012	4.68E-06	EPA 2012	1.16E-02	EPA 2012	1.28E+05	1.28E+02	EPA 2012	--	--	--	1.28E+02	EPA 2012	1.97E-07	--	--
58-90-2	2,3,4,6-Tetrachlorophenol	5.03E-02	EPA 2012	5.88E-06	EPA 2012	3.61E-04	EPA 2012	2.80E+02	2.80E+01	CLARC 2013	--	--	--	2.80E+01	CLARC 2013	2.65E-05	--	--
93-76-5	2,4,5-T(2,4,5-Trichlorophenoxyacetic acid)	4.72E-02	EPA 2012	5.51E-06	EPA 2012	1.91E-06	EPA 2012	1.07E+02	1.07E+01	EPA 2012	--	--	4.90E-02	4.90E+02	DOE/RL-96-17	2.67E-07	--	--
93-72-1	2,4,5-TP(2-(2,4,5-Trichlorophenoxy)propionic acid)Silvex	4.55E-02	EPA 2012	5.32E-06	EPA 2012	3.70E-07	EPA 2012	1.75E+02	1.75E+01	EPA 2012	--	--	9.00E-02	9.00E+02	DOE/RL-96-17	1.93E-07	--	--
95-95-4	2,4,5-Trichlorophenol	3.14E-02	EPA 2012	8.09E-06	EPA 2012	1.78E-04	CLARC 2013	1.60E+03	1.60E+02	CLARC 2013	--	--	--	1.60E+02	DOE/RL-96-17	2.86E-05	V	2.86E+05
88-06-2	2,4,6-Trichlorophenol	3.14E-02	EPA 2012	8.09E-06	EPA 2012	3.19E-04	CLARC 2013	3.81E+02	3.81E+01	CLARC 2013	--	--	3.81E-01	3.81E+01	DOE/RL-96-17	1.22E-06	V	1.18E+05
94-75-7	2,4-D(2,4-Dichlorophenoxyacetic acid)	5.20E-02	EPA 2012	6.07E-06	EPA 2012	1.45E-06	EPA 2012	2.96E+01	2.96E+02	EPA 2012	--	--	2.94E-02	2.94E+02	DOE/RL-96-17	3.29E-07	--	--
94-82-6	2,4-DB(4-(2,4-Dichlorophenoxy)butanoic acid)	4.80E-02	EPA 2012	5.61E-06	EPA 2012	2.40E-07	EPA 2012	9.84E+01	9.84E+02	EPA 2012	--	--	1.00E-01	1.00E+03	DOE/RL-96-17	1.81E-07	--	--
120-83-2	2,4-Dichlorophenol	4.86E-02	EPA 2012	8.68E-06	EPA 2012	1.30E-04	CLARC 2013	1.47E+02	1.47E+01	CLARC 2013	--	--	1.47E-01	1.47E+01	DOE/RL-96-17	1.59E-06	V	1.03E+05
105-67-9	2,4-Dimethylphenol	6.22E-02	EPA 2012	8.31E-06	EPA 2012	8.20E-05	CLARC 2013	2.09E+02	2.09E+01	CLARC 2013	--	--	2.09E-01	2.09E+01	DOE/RL-96-17	1.05E-06	V	1.27E+05
51-28-5	2,4-Dinitrophenol	4.07E-02	EPA 2012	9.08E-06	EPA 2012	1.96E-06	EPA 2012	1.00E+02	1.00E+01	CLARC 2013	--	--	1.00E-05	1.00E+01	DOE/RL-96-17	9.70E-07	--	--
121-14-2	2,4-Dinitrotoluene	3.75E-02	EPA 2012	7.90E-06	EPA 2012	3.80E-06	CLARC 2013	9.55E+01	9.55E+02	CLARC 2013	--	--	9.55E-02	9.55E+02	DOE/RL-96-17	2.95E-07	--	--
606-20-2	2,6-Dinitrotoluene	3.70E-02	EPA 2012	7.76E-06	EPA 2012	3.06E-05	CLARC 2013	6.92E+01	6.92E+02	CLARC 2013	--	--	6.92E-02	6.92E+02	DOE/RL-96-17	6.48E-07	--	--
53-96-3	2-Acetylaminofluorene	5.18E-02	EPA 2012	6.03E-06	EPA 2012	1.85E-08	EPA 2012	2.21E+02	2.21E+01	EPA 2012	--	--	--	2.21E+01	EPA 2012	1.60E-08	--	--
78-93-3	2-Butanone	9.14E-02	EPA 2012	1.02E-05	EPA 2012	2.33E-03	EPA 2012	4.51E+00	4.51E+03	EPA 2012	--	--	--	4.51E+03	EPA 2012	1.09E-04	V	1.24E+04
111-76-2	2-Butoxyethanol	8.28E-02	EPA 2012	8.14E-06	EPA 2012	5.54E-05	EPA 2012	2.82E+00	2.82E+00	EPA 2012	--	--	--	2.82E+00	EPA 2012	2.62E-06	V	9.00E+04
91-58-7	2-Chloronaphthalene	4.47E-02	EPA 2012	7.73E-06	EPA 2012	1.31E-02	EPA 2012	2.48E+03	2.48E+00	EPA 2012	--	--	2.98E+00	2.98E+00	DOE/RL-96-17	1.01E-05	V	4.08E+04
95-57-8	2-Chlorophenol	6.61E-02	EPA 2012	9.48E-06	EPA 2012	1.60E-02	CLARC 2013	3.88E+02	3.88E+01	CLARC 2013	--	--	3.88E-01	3.88E+01	DOE/RL-96-17	1.15E-04	V	1.21E+04
591-78-6	2-Hexanone	7.04E-02	EPA 2012	8.44E-06	EPA 2012	1.81E-03	EPA 2012	1.50E+01	1.50E+02	EPA 2012	--	--	--	1.50E+02	EPA 2012	1.24E-04	V	1.16E+04
94-74-6	2-Methyl-4 chlorophenoxyacetic acid	5.54E-02	EPA 2012	6.48E-06	EPA 2012	5.44E-08	EPA 2012	2.96E+01	2.96E+02	EPA 2012	--	--	--	2.96E+02	EPA 2012	3.18E-07	--	--
91-57-6	2-methylnaphthalene	5.24E-02	EPA 2012	7.78E-06	EPA 2012	2.12E-02	EPA 2012	2.48E+03	2.48E+00	EPA 2012	--	--	2.98E+00	2.98E+00	DOE/RL-96-17	1.92E-05	V	2.96E+04
95-48-7	2-Methylphenol (cresol, o-)	7.28E-02	EPA 2012	9.32E-06	EPA 2012	4.92E-05	EPA 2012	9.12E+01	9.12E+02	CLARC 2013	--	--	4.34E-01	4.34E+01	DOE/RL-96-17	4.68E-07	V	1.89E+05
91-59-8	2-Naphthylamine	6.45E-02	EPA 2012	1.04E-05	EPA 2012	3.31E-06	EPA 2012	2.48E+03	2.48E+00	EPA 2012	--	--	--	2.48E+00	EPA 2012	3.00E-08	--	--
88-74-4	2-Nitroaniline	5.19E-02	EPA 2012	7.41E-06	EPA 2012	2.41E-06	EPA 2012	1.11E+02	1.11E+01	EPA 2012	--	--	5.27E-02	5.27E+02	DOE/RL-96-17	3.52E-07	--	--
88-75-5	2-Nitrophenol	6.05E-02	ORNL 2013	9.17E-06	ORNL 2013	3.12E-04	ORNL 2013	1.97E+02	1.97E+02	ORNL 2013	--	--	3.09E-01	3.09E+01	DOE/RL-96-17	4.26E-06	--	--
108-10-1	2-Pentanone, 4-Methyl	6.88E-02	EPA 2012	8.35E-06	EPA 2012	5.64E-03	EPA 2012	1.26E+01	1.26E+02	EPA 2012	--	--	--	1.26E+02	EPA 2012	1.85E-04	V	9.53E+03
32774-16-6	3,3',4,4',5,5'-Hexachlorobiphenyl	3.75E-02	EPA 2012	4.38E-06	EPA 2012	6.62E-03	EPA 2012	2.09E+05	2.09E+02	EPA 2012	--	--	--	2.09E+02	EPA 2012	6.33E-08	--	--
57465-28-8	3,3',4,4',5-Pentachlorobiphenyl	4.01E-02	EPA 2012	4.68E-06	EPA 2012	7.77E-03	EPA 2012	1.28E+05	1.28E+02	EPA 2012	--	--	--	1.28E+02	EPA 2012	1.30E-07	--	--
32598-13-3	3,3',4,4'-Tetrachlorobiphenyl	4.32E-02	EPA 2012	5.04E-06	EPA 2012	3.84E-04	EPA 2012	7.81E+04	7.81E+01	EPA 2012	--	--	--	7.81E+01	EPA 2012	1.17E-08	--	--
91-94-1	3,3'-Dichlorobenzidine	4.75E-02	EPA 2012	5.55E-06	EPA 2012	3.31E-08	CLARC 2013	7.24E+02	7.24E+01	CLARC 2013	--	--	7.24E-01	7.24E+01	DOE/RL-96-17	4.32E-08	--	--
119-93-7	3,3'-Dimethylbenzidine	5.34E-02	EPA 2012	6.24E-06	EPA 2012	3.31E-08	EPA 2012	3.19E+03	3.19E+03	EPA 2012	--	--	--	3.19E+03	EPA 2012	1.20E-08	--	--
70362-50-4	3,4',5- Tetrachlorobiphenyl	4.32E-02	EPA 2012	5.04E-06	EPA 2012	9.12E-03	EPA 2012	7.81E+04	7.81E+01	EPA 2012	--	--	--	7.81E+01	EPA 2012	2.69E-07	--	--
65794-96-9	3/4 Methylphenol (cresol, mxp)										--	--	--				--	--
56-49-5	3-Methylcholanthrene	2.41E-02	EPA 2012	6.14E-06	EPA 2012	2.14E-04	EPA 2012	9.62E+05	9.62E+02	EPA 2012	--	--	--	9.62E+02	EPA 2012	3.26E-10	--	--
99-09-2	3-Nitroaniline	5.19E-02	ORNL 2013	7.41E-06	ORNL 2013	3.23E-07	ORNL 2013	1.09E+02	1.09E+01	ORNL 2013	--	--	5.16E-02	5.16E+02	DOE/RL-96-17	3.16E-07	--	--
72-54-8	4,4'-DDD (Dichlorodiphenyldichloroethane)	4.06E-02	EPA 2012	4.74E-06	EPA 2012	1.64E-04	CLARC 2013	4.58E+04	4.58E+01	CLARC 2013	--	--	4.58E+01	4.58E+01	DOE/RL-96-17	8.39E-09	--	--
72-55-9	4,4'-DDE (Dichlorodiphenyldichloroethylene)	4.06E-02	EPA 2012	4.76E-06	EPA 2012	4.61E-04	EPA 2012	8.64E+04	8.64E+01	CLARC 2013	--	--	8.64E+01	8.64E+01	DOE/RL-96-17	2.20E-08	--	--
50-29-3	4,4'-DDT (Dichlorodiphenyltrichloroethane)	3.78E-02	EPA 2012	4.43E-06	EPA 2012	3.32E-04	CLARC 2013	6.78E+05	6.78E+02	CLARC 2013	--	--	6.78E+02	6.78E+02	DOE/RL-96-17	1.03E-09	--	--
534-52-1	4,6-Dinitro-2-methylphenol	5.59E-02	EPA 2012	6.53E-06	EPA 2012	5.72E-05	EPA 2012	7.54E+02	7.54E+01	EPA 2012	--	--	6.02E-01	6.02E+01	DOE/RL-96-17	3.02E-07	--	--
1912-02-1	4-Amino-3,5,6-trichloropicolinic acid	4.90E-02	EPA 2012	5.72E-06	EPA 2012	2.18E-12	EPA 2012	3.88E+01	3.88E+02	EPA 2012	--	--	--	3.88E+02	EPA 2012	2.62E-07	--	--
92-67-1	4-Aminobiphenyl	6.21E-02	EPA 2012	7.26E-06	EPA 2012	7.07E-06	EPA 2012	2.47E+03	2.47E+00	EPA 2012	--	--	--	2.47E+00	EPA 2012	2.70E-08	--	--
101-55-3	4-Bromophenylphenyl ether	2.78E-02	ORNL 2013	7.37E-06	ORNL 2013	4.78E-03	ORNL 2013	3.08E+03	3.08E+00	ORNL 2013	--	--	4.16E+00	4.16E+00	DOE/RL-96-17	1.67E-06	--	--
59-50-7	4-Chloro-3-methylphenol	6.96E-02	EPA 2012	8.12E-06	EPA 2012	1.00E-04	EPA 2012	4.92E+02	4.92E+01	EPA 2012	--	--	--	4.92E+01	EPA 2012	7.15E-07	--	--
106-47-8	4-Chloroaniline	7.04E-02	EPA 2012	1.03E-05	EPA 2012	1.36E-05	CLARC 2013	6.61E+01	6.61E+02	CLARC 2013	--	--	7.25E-02	7.25E+02	DOE/RL-96-17	6.75E-07	V	1.58E+05
7005-72-3	4-Chlorophenylphenyl ether	2.68E-02	ORNL 2013	6.96E-06	ORNL 2013	9.77E-03	ORNL 2013	3.08E+03	3.08E+00	ORNL 2013	--	--	--	3.08E+00	ORNL 2013	4.41E-06	--	--
106-44-5	4-Methylphenol (cresol, p-)	7.34E-02	EPA 2012	9.24E-06	EPA 2012	5.09E-05	EPA 2012	3.00E+02	3.00E+01	CLARC 2013	--	--	4.34E-01	4.34E+01	DOE/RL-96-17	4.05E-07	V	2.04E+05
100-01-6	4-Nitroaniline	6.37E-02	EPA 2012	9.75E-06	EPA 2012	5.15E-08	EPA 2012	1.09E+02	1.09E+01	EPA 2012	--	--	5.16E-02	5.16E+02	DOE/RL-96-17	4.10E-07	--	--
100-02-7	4-Nitrophenol	6.41E-02	ORNL 2013	9.94E-06	ORNL 2013	1.70E-08	ORNL 2013	2.91E+02	2.91E+01	ORNL 2013	--	--	3.09E-01	3.09E+01	DOE/RL-96-17	1.54E-07	--	--
99-55-8	5-Nitro-o-toluidine	6.67E-02	EPA 2012	7.79E-06	EPA 2012	7.93E-07	EPA 2012	1.79E+02	1.79E+01	EPA 2012	--	--	--	1.79E+01	EPA 2012	1.88E-07	--	--
83-32-9	Acenaphthene	5.08E-02	EPA 2012	8.33E-06	EPA 2012	6.36E-03	CLARC 2013	4.90E+03	4.90E+00	CLARC 2013	--	--	4.90E+00	4.90E+00	DOE/RL-96-17	3.44E-06	V	6.99E+04
208-96-8	Acenaphthylene	4.56E-02	ORNL 2013	6.98E-06	ORNL 2013	4.66E-03	ORNL 2013	5.03E+03	5.03E+00	ORNL 2013	--	--	6.12E+00	6.12E+00	DOE/RL-96-17	1.80E-06	--	--
67-64-1	Acetone	1.09E-01	EPA 2012	1.26E-05	EPA 2012	1.56E-03	EPA 2012	5.75E-01	5.75E+00	CLARC 2013	--	--	6.02E-04	6.02E+00	DOE/RL-96-17	8.97E-05	V	1.37E+04
75-05-8	Acetonitrile	1.34E-01	EPA 2012	1.41E-05	EPA 2012	1.41E-03	EPA 2012	4.67E+00	4.67E+03	EPA 2012	--	--	--	4.67E+03	EPA 2012	9.68E-05	V	1.32E+04
98-86-2	Acetophenone	6.52E-02	EPA 2012	8.72E-06	EPA 2012	4.25E-04	EPA 2012	5.19E+01	5.19E+02	EPA 2012	--	--	--	5.19E+02	EPA 2012	1.01E-05	V	4.08E+04
107-02-8	Acrolein	1.12E-01	EPA 2012	1.22E-05	EPA 2012	4.99E-03	EPA 2012	1.00E+00	1.00E+03	EPA 2012	--	--	--	1.00E+03	EPA 2012	2.92E-04	V	7.53E+03
79-06-1	Acrylamide	1.10E-01	EPA 2012	1.33E-05	EPA 2012	6.95E-08	EPA 2012	5.69E+00	5.69E+03	EPA 2012	--	--	--	5.69E+03	EPA 2012	8.03E-07	V	1.45E+05
107-13-1	Acrylonitrile	1.14E-01	EPA 2012	1.23E-05	EPA 2012	5.64E-03	EPA 2012	8.51E+00	8.51E+03	EPA 2012	--	--	--	8.51E+03	EPA 2012	3.13E-04	V	7.33E+03
309-00-2	Aldrin	3.72E-02	EPA 2012	4.35E-06	EPA 2012	6.97E-03	CLARC 2013	4.87E+04	4.87E+01	CLARC 2013	--	--	4.87E-01	4.87E+01	DOE/RL-96-17	2.94E-07	V	2.43E+05
107-05-1	Allyl chloride	9.36E-02	EPA 2012	1.08E-05	EPA 2012	4.50E-01	EPA 2012	1.96E+01	1.96E+02	EPA 2012	--	--	--	1.96E+02	EPA 2012	9.98E-03	V	1.30E+03
319-84-6	Alpha-BHC	4.33E-02	EPA 2012	5.06E-06	EPA 2012	4.35E-04	CLARC 2013	1.76E+03	1.76E+00	CLARC 2013	--	--	1.76E+00	1.76E+00	DOE/RL-96-17	5.57E-07	--	--
5103-71-9	Alpha-Chlordane	3.44E-02	EPA 2012	4.02E-06	EPA 2012	1.99E-03	CLARC 2013	5.13E+04	5.13E+01	CLARC 2013	--	--	5.13E-01	5.13E+01	DOE/RL-96-17	7.20E-08	--	--
7429-90-5	Aluminum					0.00E+00	CLARC 2013				1.50E+03	ORNL 2013		1.50E+03	ORNL 2013		--	--
62-53-3	Aniline	8.30E-02	EPA 2012	1.01E-05	EPA 2012	8.28E-05	EPA 2012	7.02E+01	7.02E+02	EPA 2012	--	--	--	7.02E+02	EPA 2012	2.52E-06	V	8.16E+04
120-12-7	Anthracene	3.90E-02	EPA 2012	7.85E-06	EPA 2012	2.47E-03	CLARC 2013	2.35E+04	2.35E+01	CLARC 2013	--	--	2.35E-01	2.35E+01	DOE/RL-96-17	2.37E-07	--	--
7440-36-0	Antimony					0.00E+00	CLARC 2013				4.50E+01	CLARC 2013	3.76E+00	3.76E+00	DOE/RL-96-17		--	--
140-57-8	Aramite	2.03E-02	EPA 2012	5.03E-06	EPA 2012	7.77E-06	EPA 2012	5.55E+03	5.55E+00	EPA 2012	--	--	--	5.55E+00	EPA 2012	7.13E-09	--	--
12674-11-2	Aroclor-1016	4.68E-02	EPA 2012	5.48E-06	EPA 2012	8.18E-03	EPA 2012	1.07E+05	1.07E+02	CLARC 2013	--	--	1.07E+02	1.07E+02	DOE/RL-96-17	1.91E-07	--	--
11104-28-2	Aroclor-1221	5.78E-02	EPA 2012	6.75E-06	EPA 2012	3.01E-02	EPA 2012	8.40E+03	8.40E+00	EPA 2012	--	--	1.03E+01	1.03E+01	DOE/RL-96-17	8.90E-06	V	4.35E+04
11141-16-5	Aroclor-1232	5.78E-02	EPA 2012	6.75E-06	EPA 2012	3.01E-02	EPA 2012	8.40E+03	8.40E+00	EPA 2012	--	--	1.03E+01	1.03E+01	DOE/RL-96-17	8.90E-06	V	4.35E+04
53469-21-9	Aroclor-1242	4.32E-02	EPA 2012	5.04E-06	EPA 2012	7.77E-03	EPA 2012	7.81E+04	7.81E+01	EPA 2012	--	--	4.48E+01	4.48E+01	DOE/RL-96-17	3.04E-07	--	--
12672-29-6	Aroclor-1248	4.32E-02	EPA 2012	5.04E-06	EPA 2012	1.80E-02	EPA 2012	7.65E+04	7.65E+01	EPA 2012	--	--	4.39E+01	4.39E+01	DOE/RL-96-17	9.41E-07	--	--
11097-69-1	Aroclor-1254	4.01E-02	EPA 2012	4.68E-06	EPA 2012	1.16E-02	EPA 2012	1.31E+05	1.31E+02	EPA 2012	--	--	7.56E+01	7.56E+01	DOE/RL-96-17	3.27E-07	--	--
11096-82-5	Aroclor-1260	3.53E-02	EPA 2012	4.12E-06	EPA 2012	1.37E-02	EPA 2012	3.22E+05	8.22E+02	CLARC 2013	--	--	8.22E+02	8.22E+02	DOE/RL-96-17	3.14E-08	--	--
37324-23-5	Aroclor-1262	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11100-14-4	Aroclor-1268	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
7440-38-2	Arsenic	--	--	--	--	0.00E+00	CLARC 2013	--	--	--	2.90E+01	CLARC 2013	3.00E+00	2.90E+01	CLARC 2013	--	--	--
103-33-3	Azobenzene	3.59E-02	EPA 2012	7.47E-06	EPA 2012	5.52E-04	EPA 2012	3.76E+03	3.76E+00	EPA 2012	--	--	--	3.76E+00	EPA 2012	2.85E-07	V	2.43E+05
7440-39-3	Barium					0.00E+00	C

Table 6: Summary of Chemical-Specific Input Parameters and Volatilization Factors

CAS#	Analyte	Diffusivity in Aira (Di) (cm^2/s)	Source	Diffusivity in Watera (Dw) (cm^2/s)	Source	Dimensionless Henry's Law Constant[a] (H')	Source	Soil-Carbon Partition Coefficient[a] (Koc) (L/kg)	Soil/Water Distribution Coefficient Kd Organic (L/kg) = Koc x foc	Source	Inorganic Kd[c] (cm^3/g)	Source	RDR/RAWP Soil/Water Distribution Coefficients[b] (Kd) (DOE/RL-96-17)	Final Kd[c] (cm3/g)	Source	Apparent Diffusivity (DA) (cm^2/s)	Volatile?[d]	Volatilization Factor (VF) (m^3/kg)
77-47-4	Hexachlorocyclopentadiene	2.72E-02	EPA 2012	7.72E-06	EPA 2012	1.11E+00	CLARC 2013	2.00E+05	2.00E+02	CLARC 2013	--	--	2.00E+02	2.00E+02	DOE/RL-96-17	8.04E-06	V	4.57E+04
67-72-1	Hexachloroethane	3.21E-02	EPA 2012	8.89E-06	EPA 2012	1.59E-01	CLARC 2013	1.78E+03	1.78E+00	CLARC 2013	--	--	1.78E+00	1.78E+00	DOE/RL-96-17	1.42E-04	V	1.09E+04
70-30-4	Hexachlorophene	3.46E-02	EPA 2012	4.04E-06	EPA 2012	2.24E-11	EPA 2012	6.69E+05	6.69E+02	EPA 2012	--	--	--	6.69E+02	EPA 2012	3.94E-11	--	--
110-54-3	Hexane	7.31E-02	EPA 2012	8.17E-06	EPA 2012	7.40E+01	CLARC 2013	3.41E+03	3.41E+00	CLARC 2013	--	--	--	3.41E+00	CLARC 2013	1.65E-02	V	1.01E+03
18540-29-9	Hexavalent Chromium	--	--	--	--	0.00E+00	CLARC 2013	--	--	--	--	1.90E+01	CLARC 2013	0.00E+00	8.00E-01	ECF-Hanford-11-0165	--	--
302-01-2	Hydrazine	--	--	--	--	--	--	--	--	--	--	--	1.43E-02	1.43E-02	DOE/RL-96-17	--	--	--
193-39-5	Indeno(1,2,3-cd)pyrene	4.48E-02	EPA 2012	5.23E-06	EPA 2012	6.56E-05	CLARC 2013	3.47E+06	3.47E+03	CLARC 2013	--	--	3.47E+03	3.47E+03	DOE/RL-96-17	5.47E-11	--	--
7439-89-6	Iron	--	--	--	--	0.00E+00	CLARC 2013	--	--	--	--	2.50E+01	ORNL 2013	--	2.50E+01	ORNL 2013	--	--
78-83-1	Isobutyl alcohol	8.97E-02	EPA 2012	1.00E-05	EPA 2012	4.00E-04	EPA 2012	2.92E+00	2.92E-03	EPA 2012	--	--	--	2.92E-03	EPA 2012	1.92E-05	V	2.96E+04
78-59-1	Isophorone	5.29E-02	EPA 2012	7.53E-06	EPA 2012	2.72E-04	CLARC 2013	4.68E+01	4.68E-02	CLARC 2013	--	--	4.68E-02	4.68E-02	DOE/RL-96-17	5.51E-06	V	5.53E+04
98-82-8	Isopropylbenzene	6.03E-02	EPA 2012	7.86E-06	EPA 2012	4.70E-01	EPA 2012	6.98E+02	6.98E-01	EPA 2012	--	--	--	6.98E-01	EPA 2012	1.70E-03	V	3.14E+03
143-50-0	Kepone	1.96E-02	EPA 2012	4.91E-06	EPA 2012	2.20E-06	EPA 2012	1.75E+04	1.75E+01	EPA 2012	--	--	--	1.75E+01	EPA 2012	1.90E-09	--	--
7439-92-1	Lead	--	--	--	--	0.00E+00	CLARC 2013	--	--	--	--	1.00E+04	CLARC 2013	3.00E+01	3.00E+01	DOE/RL-96-17	--	--
7439-93-2	Lithium	--	--	--	--	--	--	--	--	--	--	3.00E+02	ORNL 2013	5.00E+01	5.00E+01	DOE/RL-96-17	--	--
7439-95-4	Magnesium	--	--	--	--	--	--	--	--	--	--	4.50E+00	ORNL 2013	--	4.50E+00	ORNL 2013	--	--
7439-96-5	Manganese	--	--	--	--	0.00E+00	CLARC 2013	--	--	--	--	6.50E+01	ORNL 2013	5.00E+01	5.00E+01	DOE/RL-96-17	--	--
99-65-0	m-Dinitrobenzene	4.85E-02	EPA 2012	9.21E-06	EPA 2012	2.00E-06	EPA 2012	3.52E+02	3.52E-01	EPA 2012	--	--	--	3.52E-01	EPA 2012	1.41E-07	--	--
7439-97-6	Mercury	--	--	--	--	--	--	--	--	--	--	5.20E+01	CLARC 2013	3.00E+01	3.00E+01	DOE/RL-96-17	--	--
126-98-7	Methacrylonitrile	9.64E-02	EPA 2012	1.08E-05	EPA 2012	1.01E-02	EPA 2012	1.31E+01	1.31E-02	EPA 2012	--	--	--	1.31E-02	EPA 2012	4.52E-04	V	6.10E+03
67-56-1	Methanol	1.58E-01	EPA 2012	1.45E-05	EPA 2012	1.86E-04	EPA 2012	1.00E+00	1.00E-03	EPA 2012	--	--	--	1.00E-03	EPA 2012	1.66E-05	V	3.19E+04
72-43-5	Methoxychlor	2.21E-02	EPA 2012	5.59E-06	EPA 2012	6.48E-04	CLARC 2013	8.00E+04	8.00E+01	CLARC 2013	--	--	8.00E+01	8.00E+01	DOE/RL-96-17	9.95E-09	--	--
80-62-6	Methyl methacrylate	7.50E-02	EPA 2012	9.21E-06	EPA 2012	1.36E-02	EPA 2012	9.14E+00	9.14E-03	EPA 2012	--	--	--	9.14E-03	EPA 2012	4.68E-04	V	6.00E+03
66-27-3	Methyl methanesulfonate	7.89E-02	EPA 2012	1.06E-05	EPA 2012	1.65E-04	EPA 2012	4.33E+00	4.33E-03	EPA 2012	--	--	--	4.33E-03	EPA 2012	7.28E-06	--	--
298-00-0	Methyl parathion	2.50E-02	EPA 2012	6.44E-06	EPA 2012	4.09E-06	EPA 2012	7.29E+02	7.29E-01	EPA 2012	--	--	--	7.29E-01	EPA 2012	5.59E-08	--	--
75-09-2	Methylene chloride	9.98E-02	EPA 2012	1.25E-05	EPA 2012	8.98E-02	CLARC 2013	1.00E+01	1.00E-02	CLARC 2013	--	--	1.00E-02	1.00E-02	DOE/RL-96-17	3.77E-03	V	2.11E+03
7439-98-7	Molybdenum	--	--	--	--	0.00E+00	CLARC 2013	--	--	--	2.00E+01	ORNL 2013	2.00E+01	2.00E+01	DOE/RL-96-17	--	--	--
108-38-3	m-Xylene	6.84E-02	EPA 2012	8.44E-06	EPA 2012	3.01E-01	CLARC 2013	1.96E+02	1.96E-01	CLARC 2013	--	--	--	1.96E-01	CLARC 2013	3.11E-03	V	2.33E+03
91-20-3	Naphthalene	6.05E-02	EPA 2012	8.38E-06	EPA 2012	1.98E-02	EPA 2012	1.19E+03	1.19E+00	CLARC 2013	--	--	1.19E+00	1.19E+00	DOE/RL-96-17	4.94E-05	V	1.85E+04
104-51-8	n-Butylbenzene	5.28E-02	EPA 2012	7.33E-06	EPA 2012	6.50E-01	EPA 2012	1.48E+03	1.48E+00	EPA 2012	--	--	--	1.48E+00	EPA 2012	1.07E-03	V	3.98E+03
7440-02-0	Nickel	--	--	--	--	0.00E+00	CLARC 2013	--	--	--	--	6.50E+01	CLARC 2013	6.50E+01	6.50E+01	DOE/RL-96-17	--	--
14797-55-8	Nitrate	--	--	--	--	--	--	--	--	--	--	--	--	0.00E+00	0.00E+00	DOE/RL-96-17	--	--
14797-65-0	Nitrite	--	--	--	--	--	--	--	--	--	--	--	--	0.00E+00	0.00E+00	DOE/RL-96-17	--	--
98-95-3	Nitrobenzene	6.81E-02	EPA 2012	9.45E-06	EPA 2012	9.84E-04	CLARC 2013	1.19E+02	1.19E-01	CLARC 2013	--	--	1.19E-01	1.19E-01	DOE/RL-96-17	1.66E-05	V	3.19E+04
NO3-N	Nitrogen in Nitrate	--	--	--	--	--	--	--	--	--	--	--	0.00E+00	0.00E+00	DOE/RL-96-17	--	--	--
NO2-N	Nitrogen in Nitrite	--	--	--	--	--	--	--	--	--	--	--	0.00E+00	0.00E+00	DOE/RL-96-17	--	--	--
NO2+NO3-N	Nitrogen in Nitrite and Nitrate	--	--	--	--	--	--	--	--	--	--	--	0.00E+00	0.00E+00	DOE/RL-96-17	--	--	--
930-55-2	Nitrosopyrrolidine	8.00E-02	EPA 2012	1.01E-05	EPA 2012	2.00E-06	EPA 2012	9.19E+01	9.19E-02	EPA 2012	--	--	--	9.19E-02	EPA 2012	3.78E-07	V	2.11E+05
55-18-5	n-Nitrosodiethylamine	7.38E-02	EPA 2012	9.13E-06	EPA 2012	1.48E-04	EPA 2012	8.29E+01	8.29E-02	EPA 2012	--	--	--	8.29E-02	EPA 2012	3.51E-06	V	6.92E+04
62-75-9	n-Nitrosodimethylamine	9.88E-02	EPA 2012	1.15E-05	EPA 2012	7.44E-05	EPA 2012	2.28E+01	2.28E-02	EPA 2012	--	--	--	2.28E-02	EPA 2012	3.78E-06	V	5.67E+04
924-16-3	n-Nitrosodi-n-butylamine	6.48E-02	EPA 2012	7.58E-06	EPA 2012	5.40E-04	EPA 2012	9.15E+02	9.15E-01	EPA 2012	--	--	--	9.15E-01	EPA 2012	1.89E-06	V	9.44E+04
621-64-7	n-Nitrosodi-n-dipropylamine	5.64E-02	EPA 2012	7.76E-06	EPA 2012	9.23E-05	CLARC 2013	2.40E+01	2.40E-02	CLARC 2013	--	--	2.40E-02	2.40E-02	DOE/RL-96-17	2.64E-06	--	--
86-30-6	n-Nitrosodiphenylamine	5.59E-02	EPA 2012	6.53E-06	EPA 2012	2.05E-04	CLARC 2013	1.29E+03	1.29E+00	CLARC 2013	--	--	1.29E+00	1.29E+00	DOE/RL-96-17	4.69E-07	--	--
10595-95-6	n-Nitrosomethylethylamine	9.60E-02	EPA 2012	1.12E-05	EPA 2012	5.89E-05	EPA 2012	4.35E+01	4.35E-02	EPA 2012	--	--	--	4.35E-02	EPA 2012	2.58E-06	--	--
59-89-2	n-Nitrosomorpholine	7.98E-02	EPA 2012	9.33E-06	EPA 2012	1.00E-06	EPA 2012	2.25E+01	2.25E-02	EPA 2012	--	--	--	2.25E-02	EPA 2012	5.18E-07	--	--
100-75-4	n-Nitrosopiperidine	6.96E-02	EPA 2012	9.18E-06	EPA 2012	3.45E-05	EPA 2012	1.68E+02	1.68E-01	EPA 2012	--	--	--	1.68E-01	EPA 2012	6.98E-07	--	--
95-47-6	o-Xylene	6.89E-02	EPA 2012	8.52E-06	EPA 2012	2.13E-01	CLARC 2013	2.41E+02	2.41E-01	CLARC 2013	--	--	2.41E-01	2.41E-01	CLARC 2013	2.05E-03	V	2.88E+03
56-38-2	Parathion	2.29E-02	EPA 2012	5.82E-06	EPA 2012	1.22E-05	EPA 2012	2.42E+03	2.42E+00	EPA 2012	--	--	--	2.42E+00	EPA 2012	2.06E-08	--	--
60-11-7	p-Dimethylaminoazobenzene	5.13E-02	EPA 2012	6.00E-06	EPA 2012	9.57E-06	EPA 2012	2.03E+03	2.03E+00	EPA 2012	--	--	--	2.03E+00	EPA 2012	3.02E-08	--	--
608-93-5	Pentachlorobenzene	2.34E-02	EPA 2012	7.95E-06	EPA 2012	2.87E-02	EPA 2012	3.21E+04	3.21E+01	CLARC 2013	--	--	3.21E+01	3.21E+01	CLARC 2013	1.40E-06	--	--
76-01-7	Pentachloroethane	3.15E-02	EPA 2012	8.57E-06	EPA 2012	7.93E-02	EPA 2012	1.36E+02	1.36E-01	EPA 2012	--	--	--	1.36E-01	EPA 2012	5.30E-04	V	5.63E+03
82-68-8	Pentachloronitrobenzene (PCNB)	2.63E-02	EPA 2012	6.92E-06	EPA 2012	1.81E-03	EPA 2012	6.00E+03	6.00E+00	EPA 2012	--	--	--	6.00E+00	EPA 2012	4.23E-07	--	--
87-86-5	Pentachlorophenol	2.85E-02	EPA 2012	8.01E-06	EPA 2012	1.30E-05	CLARC 2013	5.92E+02	5.92E-01	CLARC 2013	--	--	5.92E-01	5.92E-01	DOE/RL-96-17	7.58E-08	--	--
62-44-2	Phenacetin	5.98E-02	EPA 2012	6.98E-06	EPA 2012	8.71E-09	EPA 2012	4.10E+01	4.10E-02	EPA 2012	--	--	--	4.10E-02	EPA 2012	3.15E-07	--	--
85-01-8	Phenanthrene	3.45E-02	ORNL 2013	6.69E-06	ORNL 2013	1.73E-03	ORNL 2013	1.67E+04	1.67E+01	ORNL 2013	--	--	2.35E+01	2.35E+01	DOE/RL-96-17	1.37E-07	V	3.51E+05
108-95-2	Phenol	8.34E-02	EPA 2012	1.03E-05	EPA 2012	1.83E-05	CLARC 2013	2.88E+01	2.88E-02	CLARC 2013	--	--	2.88E-02	2.88E-02	DOE/RL-96-17	1.07E-06	V	1.25E+05
298-02-2	Phorate	2.33E-02	EPA 2012	5.90E-06	EPA 2012	1.79E-04	EPA 2012	4.60E+02	4.60E-01	EPA 2012	--	--	--	4.60E-01	EPA 2012	4.64E-07	--	--
14265-44-2	Phosphate	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
7723-14-0	Phosphorus	--	--	--	--	--	--	--	--	--	--	3.50E+00	ORNL 2013	--	3.50E+00	ORNL 2013	--	--
PO4-P	Phosphorus in phosphate	--	--	--	--	--	--	--	--	--	--	3.50E+00	ORNL 2013	--	3.50E+00	ORNL 2013	--	--
7440-09-7	Potassium	--	--	--	--	--	--	--	--	--	--	5.50E+00	ORNL 2013	--	5.50E+00	ORNL 2013	--	--
106-50-3	p-Phenylenediamine	8.37E-02	EPA 2012	9.78E-06	EPA 2012	3.63E-08	EPA 2012	3.38E+01	3.38E-02	EPA 2012	--	--	--	3.38E-02	EPA 2012	4.65E-07	--	--
23950-58-5	Pronamide	4.71E-02	EPA 2012	5.50E-06	EPA 2012	3.99E-07	EPA 2012	4.05E+02	4.05E-01	EPA 2012	--	--	--	4.05E-01	EPA 2012	7.12E-08	--	--
129-00-0	Pyrene	2.78E-02	EPA 2012	7.25E-06	EPA 2012	4.51E-04	CLARC 2013	6.80E+04	6.80E+01	CLARC 2013	--	--	6.80E+01	6.80E+01	DOE/RL-96-17	1.05E-08	V	1.27E+06
110-86-1	Pyridine	9.31E-02	EPA 2012	1.09E-05	EPA 2012	4.50E-04	EPA 2012	7.17E+01	7.17E-02	EPA 2012	--	--	--	7.17E-02	EPA 2012	1.34E-05	V	3.54E+04
94-59-7	Safrol	4.42E-02	EPA 2012	7.59E-06	EPA 2012	3.71E-04	EPA 2012	2.07E+02	2.07E-01	EPA 2012	--	--	--	2.07E-01	EPA 2012	3.00E-06	--	--
7782-49-2	Selenium	--	--	--	--	0.00E+00	CLARC 2013	--	--	--	--	5.00E+00	CLARC 2013	5.00E+00	5.00E+00	DOE/RL-96-17	--	--
7440-21-3	Silicon	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
7440-22-4	Silver	--	--	--	--	0.00E+00	CLARC 2013	--	--	--	--	8.30E+00	CLARC 2013	9.00E+01	9.00E+01	DOE/RL-96-17	--	--
7440-23-5	Sodium	--	--	--	--	--	--	--	--	--	--	1.00E+02	ORNL 2013	--	1.00E+02	ORNL 2013	--	--
7440-24-6	Strontium	--	--	--	--	0.00E+00	CLARC 2013	--	--	--	--	3.50E+01	ORNL 2013	2.50E+01	2.50E+01	DOE/RL-96-17	--	--
100-42-5	Styrene	7.11E-02	EPA 2012	8.78E-06	EPA 2012	1.13E-01	CLARC 2013	9.12E+02	9.12E-01	CLARC 2013	--	--	--	9.12E-01	CLARC 2013	4.14E-04	V	6.37E+03
14808-79-8	Sulfate	--	--	--	--	--	--	--	--	--	--	--	--	0.00E+00	0.00E+00	DOE/RL-96-17	--	--
18496-25-8	Sulfide	--	--	--	--	--	--	--	--	--	--	--	--	0.00E+00	0.00E+00	DOE/RL-96-17	--	--
99-35-4	sym-Trinitrobenzene	2.90E-02	EPA 2012	7.69E-06	EPA 2012	2.66E-07	EPA 2012	1.68E+03	1.68E+00	EPA 2012	--	--	--	1.68E+00	EPA 2012	2.76E-08	--	--
127-18-4	Tetrachloroethene	5.05E-02	EPA 2012	9.46E-06	EPA 2012	7.54E-01	CLARC 2013	2.65E+02	2.65E-01	CLARC 2013	--	--	--	2.65E-01	CLARC 2013	3.99E-03	V	2.48E+03
3689-24-5	Tetraethyl dithiopyrophosphate (Sulfotepp)	2.12E-02	EPA 2012	5.28E-06	EPA 2012	1.62E-04	EPA 2012	2.66E+02	2.66E-01	EPA 2012	--	--	--	2.66E-01	EPA 2012	6.53E-07	--	--
7440-28-0	Thallium	--	--	--	--	0.00E+00	CLARC 2013	--	--	--	7.10E+01	CLARC 2013	--	7.10E+01	CLARC 2013	--	--	--
7440-31-5	Tin	--	--	--	--	0.00E+00	CLARC 2013	--	--	--	2.50E+02	ORNL 2013	1.30E+02	1.30E+02	DOE/RL-96-17	--	--	--
7440-32-6	Titanium	--	--	--	--	--	--	--	--	--	1.00E+03	ORNL 2013	--	1.00E+03	ORNL 2013	--	--	--
108-88-3	Toluene	7.78E-02	EPA 2012	9.20E-06	EPA 2012	2.72E-01	CLARC 2013	1.40E+02	1.40E-01	CLARC 2013	--	--	1.40E-01	1.40E-01	DOE/RL-96-17	3.87E-03	V	2.08E+03
1336-36-3	Total PCBs	4.32E-02	EPA 2012	5.04E-06	EPA 2012	7.77E-03	EPA 2012	3.06E+05	3.06E+02	CLARC 2013	--	--	2.06E+02	2.06E+02	DOE/RL-96-17	5.79E-08	--	--
TPH	Total petroleum hydrocarbons	--	--	--	--	--	--	--	--	--	--	--	5.00E+01	5.00E+01	DOE/RL-96-17	--	--	--
TPHDIESEL	Total petroleum hydrocarbons - diesel range	--	--	--	--	--	--	--	--	--	--	--	5.00E+01	5.00E+01	DOE/RL-96-17	--	--	--
TPHGASOLINE	Total petroleum hydrocarbons – gasoline range	--	--	--	--	--	--	--	--	--	--	--	5.00E+01	5.00E+01	DOE/RL-96-17	--	--	--
TPHKEROSENE	Total petroleum hydrocarbons – kerosene range	--	--	--	--	--	--	--	--	--	--	--	5.00E+01	5.00E+01	DOE/RL-96-17	--	--	--
TPHOIL	Total petroleum hydrocarbons – motor oil (high boiling)	--	--	--	--	--	--	--	--	--	--	--	5.00E+01	5.00E+01	DOE/RL-96-17	--	--	--
TOTALPCB	Total Polychlorinated Biphenyls	4.32E-02	EPA 2012	5.04E-06	EPA 2012	7.77E-03	EPA 2012	3.06E+05	3.06E+02	CLARC 2013	--	--	2.06E+02	2.06E+02	DOE/RL-96-17	5.79E-08	--	--
8001-35-2	Toxaphene	3.42E-02	EPA 2012	4.00E-06	EPA 2012	2.46E-04	CLARC 2013	9.58E+04	9.58E+01	CLARC 2013	--	--	9.58E+01	9.58E+01	DOE/RL-96-17	4.94E-09	--	--
156-60-5	trans-1,2-Dichloroethylene	8.76E-02	EPA 2012	1.12E-05	EPA 2012	3.85E-01	CLARC 2013	3.80E+01	3.80E-02	CLARC 2013	--	--	--	3.80E-02	CLARC 2013	8.52E-03	V	1.40E+03
10061-02-6	trans-1,3-Dichloropropene	7.63E-02	EPA 2012	1.01E-05	EPA 2012	7.26E-01	CLARC 2013	2.70E+01	2.70E-02	CLARC 2013	--	--	--	2.70E-02	CLARC 2013	1.12E-02	V	1.23E+03
5103-74-2	trans-Chlordane	3.44E-02	EPA 2012	4.02E-06	EPA 2012	1.99E-03	CLARC 2013	5.13E+04	5.13E+01	CLARC 2013	--	--	5.10E+01	5.10E+01	DOE/RL-96-17	7.20E-08	--	--
126-73-8	Tributyl phosphate	2.12E-02	EPA 2012	5.23E-06	EPA 2012	5.76E-05	EPA 2012	2.35E+03	2.35E+00	EPA 2012	--	--	1.89E+00	1.89E+00	DOE/RL-96-17	4.94E-08	--	--
79-01-6	Trichloroethene	8.87E-02	EPA 2012	1.02E-05	EPA 2012	4.22E-01	CLARC 2013	9.40E+01	9.40E-02	CLARC 2013	--	--	--	9.40E-02	CLARC 2013	5.64E-03	V	1.73E+03
75-69-4	Trichlorofluoromethane	6.54E-02	EPA 2012	1.00E-05	EPA 2012	3.97E+00	EPA 2012	4.39E+01	4.39E-02	EPA 2012	--	--	--	4.39E-02	EPA 2012	1.54E-02	V	1.04E+03
7440-61-1	Uranium	--	--	--	--	0.00E+00	CLARC 2013	--	--	--	4.50E+02	ORNL 2013	2.00E+00	2.00E+00	DOE/RL-96-17	--	--	--
7440-62-2	Vanadium	--	--	--	--	0.00E+00	CLARC 2013	--	--	--	1.00E+03	CLARC 2013	1.00E+03	1.00E+03	DOE/RL-96-17	--	--	--
108-05-4	Vinyl acetate	8.49E-02	EPA 2012	1.00E-05	EPA 2012	2.10E-02	CLARC 2013	5.25E+00	5.25E-03	CLARC 2013	--	--	--	5.25E-03	CLARC 2013	8.76E-04	V	4.40E+03
75-01-4	Vinyl chloride	1.07E-01	EPA 2012	1.26E-05	EPA 2012	1.11E+00	CLARC 2013	1.86E+01	1.86E-02	CLARC 2013	--	--	--	1.86E-02	CLARC 2013	1.93E-02	V	9.34E+02
1330-20-7	Xylenes (total)	8.47E-02	EPA 2012	9.96E-06	EPA 2012	2.79E-01	CLARC 2013	2.23E+02	2.23E-01	CLARC 2013	--	--	2.23E-01	2.23E-01	DOE/RL-96-17	3.26E-03	V	2.27E+03
7440-66-6	Zinc	--	--	--	--	0.00E+00	CLARC 2013	--	--	--	6.20E+01	CLARC 2013	3.00E+01	3.00E+01	DOE/RL-96-17	--	--	--
7440-67-7	Zirconium	--	--	--	--	--	--	--	--	--	3.00E+03	ORNL 2013	--	3.00E+03	ORNL 2013	--	--	--

DOE/RL-96-17 Rev. 6, Remedial Design Report/Remedial Action Work Plan (RDR/RAWP) for the 100 Area

Ecology, 2013 Cleanup Levels and Risk Calculations (CLARC) Database

EPA, 2012 "Regional Screening Levels for Chemical Contaminants at Superfund Sites"

ORNL, 2013 "Risk Assessment Information System", housed at the Oak Ridge National Laboratory

a. Chemical-specific parameters (Diffusivity, H', Koc, and Kd) were obtained from the following sources, in order of preference, as available:

1. Ecology, 2013 Cleanup Levels and Risk Calculations (CLARC) Database, Washington State Department of Ecology, Olympia, Washington, available on the internet at <https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx>.
2. EPA, 2012 "Regional Screening Levels for Chemical Contaminants at Superfund Sites", screening level/preliminary remediation goal website, updated November 2012
3. ORNL, 2013 Risk Assessment Information System, Oak Ridge National Laboratory, Oak Ridge, Tennessee, available on the internet at < http://rais.ornl.gov/ >.

b. Table 6-3, DOE/RL-96-17 Rev. 6, Remedial Design Report/Remedial Action Work Plan (RDR/RAWP) for the 100 Area

c. Final Kd selected per the following order of preference: DOE/RL-96-17, Ecology, 2013, EPA 2012, ORNL, 2013

d. Is defined as volatile based on WAC 173-340-200 "Definitions" "Volatiles" or designated in the CLARC database (2013)

e. The following summarizes differences between the table above and the cited references:

Alpha-Chlordane (5103-71-9): Uses the diffusivity information for chlordane (12789-03-6) in the EPA Regional Screening Level Table and Henry's Constant and Koc for chlordane (57-74-9) in CLARC 2013

Arsenic (7440-38-2) references the CLARC (2013) Kd instead of DOE/RL-96-17

Chlordane (57-74-9): Uses the diffusivity information for chlordane (12789-03-6) in the EPA Regional Screening Level Table and the Kd for Chlordane (alpha-, gamma-) in DOE/RL-96-17

Chromium (7440-47-3) : uses the Henry Constant for Chromium (III) (16065-83-1) in CLARC 2013

gamma-Chlordane (5566-34-7): Uses the diffusivity information for chlordane (12789-03-6) in the EPA Regional Screening Level Table and Henry's Constant and Koc for chlordane (57-74-9) in CLARC 2013

Hexavalent Chromium (18540-29-9) references the Kd from BCF-Hanford-11-0165 instead of DOE/RL-96-17

trans-Chlordane (5103-74-2): Uses the diffusivity information for chlordane (12789-03-6) in the EPA Regional Screening Level Table; Henry's Constant and Koc for chlordane (57-74-9) in CLARC 2013; and the Kd for Chlordane (alpha-, gamma-) in DOE/RL 96-17

Endosulfan I (959-98-8): Uses the diffusivity information for Endosulfan (115-29-7) in the EPA Regional Screening Level Table and the Henry's Constant and Koc for Endosulfan (115-29-7) in CLARC 2013

Endosulfan II (33213-65-9): Uses the diffusivity information for Endosulfan (115-29-7) in the EPA Regional Screening Level Table and the Henry's Constant and Koc for Endosulfan (115-29-7) in CLARC 2013

Mercury (7439-97-6): References Mercuric Chloride (an other Mercury Salts) (7487-94-7) – no diffusivity or Henry's constant.

Total Polychlorinated Biphenyls (TOTALPCB): Uses the parameter information for Polychlorinated Biphenyls (high risk) (1336-36-3) in the EPA Regional Screening Level Table

cis-1,3-Dichloropropene (10061-01-5): Uses the diffusivity information for 1,3-dichloropropene (542-75-6) in the EPA Regional Screening Level Table and the Koc and Henry's Constant for 1,3-dichloropropene (542-75-6) in CLARC 2013

trans-1,3-Dichloropropene (10061-02-6): Uses the diffusivity information for 1,3-dichloropropene (542-75-6) in the EPA Regional Screening Level Table and the Koc and Henry's Constant for 1,3-dichloropropene (542-75-6) in CLARC 2013

Uranium (7440-61-1): Uses the parameter information for Uranium (Soluble Salts) and/or Uranium, soluble Compounds as available

Tier 1 – IRIS
The preferred source of toxicity data is EPA's IRIS database (http://www.epa.gov/iris/index.html). Expert toxicologists at EPA have derived the values in this database and have undergone a thorough review and validation both within and outside EPA. If a toxicity value is available in IRIS, that value is used in preference to any other value.
Tier 2 – PPRTVs
If a toxicity value is not available in IRIS, the next source is EPA's PPRTVs. This source includes toxicity values that have been developed by the Office of Research and Development/National Center for Environmental Assessment/Superfund Health Risk Technical Support Center (STSC). This database is not available to the general public, but is accessible to EPA risk assessors via EPA's intranet. These values are also published at the EPA Regional Screening Levels website (EPA, 2012).
Tier 3 – Other Toxicity Values
Tier 3 includes additional EPA and non-EPA sources of toxicity information, including:

- The California EPA (CalEPA)'s Toxicity Criteria Database contains toxicity values that are peer reviewed and address both cancer and non-cancer effects.
- The Agency for Toxic Substances and Disease Registry (ATSDR)'s Minimal Risk Levels (MRLs) for Hazard Substances are peer-reviewed estimates of the daily human exposure to hazardous substances that is likely to be without appreciable risk of adverse non-cancer health effects over a specified duration of exposure.
- Toxicity values in EPA/540/R-97/036, *Health Effects Assessment Summary Tables (HEAST)*.

When Tier 1, Tier 2, or Tier 3 toxicity values are not available for a COPC, the toxicity values from the National Center for Environmental Assessment (NCEA) are used. NCEA values can be found in RAIS (ORNL, 2010).

A derived RfD for nitrate was calculated from the RfD reported in IRIS (1.6 mg/kg-day) for nitrate as nitrogen (NO3--N) using the mass fraction of nitrogen in nitrate. The mass fraction of nitrogen in nitrate = mol wt N/mol wt NO3- = (14 g/mol)/(62 g/mol) = 0.226. The derived RfD for nitrate = (1.6 mg NO3- -N/kg-day) x (1 mg NO3-/0.226 mg NO3--N) = 7.1 mg NO3-/kg-day.

A derived RfD for nitrite was calculated from the RfD reported in IRIS (0.1 mg/kg-day) for nitrite as nitrogen (NO2--N) using the mass fraction of nitrogen in nitrite. The mass fraction of nitrogen in nitrite = mol wt N/mol wt NO2- = (14 g/mol)/(46 g/mol) = 0.304. The derived RfD for nitrite = (0.1 mg NO2--N/kg-day) x (1 mg NO2-/0.304 mg NO2--N) = 0.3 mg NO2-/kg-day.

Toxic equivalence factors were used to calculate toxicity values for dioxins, furans, and carcinogenic polyaromatic hydrocarbons as described in WAC 173-340-708(8)(D)(iii)(A)).

5 Software Applications

All supporting calculations are performed on electronic spreadsheets using Microsoft Excel[1] for nonradiological PRGs. The methodology and equations are described in Section 3.0, the exposure assumptions and inputs are provided in Section 4.0, and results for nonradiological PRG calculations are presented in Section 6.0.

[1] Excel is a trademark of Microsoft Corporation, Redmond, Washington.

Table 7: Summary of Toxicity Values used to Calculate PRGs for the Casual Recreational User Exposure Scenario

		Ingestion Toxicity Values				Inhalation Toxicity Values				Chemical-Specific Parameters			
		Carcinogen		Noncarcinogen		Carcinogen		Noncarcinogen					
CAS #	Analyte Name	Oral Cancer Slope Factora (CSFo) ([mg/kg-day]-1)	Sourceb	Oral Reference Dosea (RfDo) (mg/kg-day)	Sourceb	Inhalation Unit Riska (IUR) ([µg/m3]-1)	Sourceb	Inhalation Reference Concentrationa (RfC) (mg/m3)	Sourceb	Volatilec	Mutagena	GIABSd (unitless)	ABSde (unitless)
630-20-6	1,1,1,2-Tetrachloroethane	2.60E-02	I	3.00E-02	I	7.40E-06	I	--	--	V	--	1.00E+00	--
71-55-6	1,1,1-Trichloroethane	--	--	2.00E+00	I	--	--	5.00E+00	I	V	--	1.00E+00	--
79-34-5	1,1,2,2-Tetrachloroethane	2.00E-01	I	2.00E-02	I	5.80E-05	C	--	--	V	--	1.00E+00	--
79-00-5	1,1,2-Trichloroethane	5.70E-02	I	4.00E-03	I	1.60E-05	I	2.00E-04	X	V	--	1.00E+00	--
75-34-3	1,1-Dichloroethane	5.70E-03	C	2.00E-01	P	1.60E-06	C	--	--	V	--	1.00E+00	--
75-35-4	1,1-Dichloroethene	--	--	5.00E-02	I	--	--	2.00E-01	I	V	--	1.00E+00	--
96-18-4	1,2,3-Trichloropropane	3.00E+01	I	4.00E-03	I	--	--	3.00E-04	I	V	M	1.00E+00	--
95-94-3	1,2,4,5-Tetrachlorobenzene	--	--	3.00E-04	I	--	--	--	--	--	--	1.00E+00	1.00E-01
120-82-1	1,2,4-Trichlorobenzene	2.90E-02	P	1.00E-02	I	--	--	2.00E-03	P	V	--	1.00E+00	--
96-12-8	1,2-Dibromo-3-chloropropane	8.00E-01	P	2.00E-04	P	6.00E-03	P	2.00E-04	I	V	M	1.00E+00	--
106-93-4	1,2-Dibromoethane	2.00E+00	I	9.00E-03	I	6.00E-04	I	9.00E-03	I	V	--	1.00E+00	--
95-50-1	1,2-Dichlorobenzene	--	--	9.00E-02	I	--	--	2.00E-01	H	V	--	1.00E+00	--
107-06-2	1,2-Dichloroethane	9.10E-02	I	6.00E-03	X	2.60E-05	I	7.00E-03	P	V	--	1.00E+00	--
540-59-0	1,2-Dichloroethene (Total)	--	--	9.00E-03	H	--	--	--	--	V	--	1.00E+00	--
78-87-5	1,2-Dichloropropane	3.60E-02	C	9.00E-02	A	1.00E-05	C	4.00E-03	I	V	--	1.00E+00	--
541-73-1	1,3-Dichlorobenzene	--	--	--	--	--	--	--	--	V	--	1.00E+00	--
106-46-7	1,4-Dichlorobenzene	5.40E-03	C	7.00E-02	A	1.10E-05	C	8.00E-01	I	V	--	1.00E+00	--
123-91-1	1,4-Dioxane	1.00E-01	I	3.00E-02	I	7.70E-06	C	3.00E+00	C	V	--	1.00E+00	1.00E-01
71-36-3	1-Butanol	--	--	1.00E-01	I	--	--	--	--	V	--	1.00E+00	--
71-23-8	1-Propanol	--	--	--	--	--	--	--	--	V	--	--	--
93-65-2	2-(2-methyl-4-chlorophenoxy) propionic acid	--	--	1.00E-03	I	--	--	--	--	--	--	1.00E+00	--
39635-31-9	*2,3,3',4,4',5,5'*-Heptachlorobiphenyl	3.90E+00	WAC	3.30E-05	E	1.14E-03	WAC	1.30E-03	E	--	--	1.00E+00	3.00E-02
69782-90-7	*2,3,3',4,4',5'*-Hexachlorobiphenyl	3.90E+00	WAC	3.30E-05	E	1.14E-03	WAC	1.30E-03	E	--	--	1.00E+00	3.00E-02
38380-08-4	*2,3,3',4,4',5*-Hexachlorobiphenyl	3.90E+00	WAC	3.30E-05	E	1.14E-03	WAC	1.30E-03	E	--	--	1.00E+00	3.00E-02
32598-14-4	*2,3,3',4,4'*-Pentachlorobiphenyl	3.90E+00	WAC	3.30E-05	E	1.14E-03	WAC	1.30E-03	E	--	--	1.00E+00	3.00E-02
52663-72-6	*2,3',4,4',5,5'*-Hexachlorobiphenyl	3.90E+00	WAC	3.30E-05	E	1.14E-03	WAC	1.30E-03	E	--	--	1.00E+00	3.00E-02
74472-37-0	*2,3,4,4',5*-Pentachlorobiphenyl	3.90E+00	WAC	3.30E-05	E	1.14E-03	WAC	1.30E-03	E	--	--	1.00E+00	3.00E-02
65510-44-3	*2',3,4,4',5*-Pentachlorobiphenyl	3.90E+00	WAC	3.30E-05	E	1.14E-03	WAC	1.30E-03	E	--	--	1.00E+00	3.00E-02
31508-00-6	*2,3',4,4',5*-Pentachlorobiphenyl	3.90E+00	WAC	3.30E-05	E	1.14E-03	WAC	1.30E-03	E	--	--	1.00E+00	3.00E-02
58-90-2	2,3,4,6-Tetrachlorophenol	--	--	3.00E-02	I	--	--	--	--	--	--	1.00E+00	1.00E-01
93-76-5	2,4,5-T(2,4,5-Trichlorophenoxyacetic acid)	--	--	1.00E-02	I	--	--	--	--	--	--	1.00E+00	--
93-72-1	2,4,5-TP(2-(2,4,5-Trichlorophenoxy)propionic acid)Silvex	--	--	8.00E-03	I	--	--	--	--	--	--	1.00E+00	--
95-95-4	2,4,5-Trichlorophenol	--	--	1.00E-01	I	--	--	--	--	V	--	1.00E+00	1.00E-01
88-06-2	2,4,6-Trichlorophenol	1.10E-02	I	1.00E-03	P	3.10E-06	I	--	--	V	--	1.00E+00	1.00E-01
94-75-7	2,4-D(2,4-Dichlorophenoxyacetic acid)	--	--	1.00E-02	I	--	--	--	--	--	--	1.00E+00	5.00E-02
94-82-6	2,4-DB(4-(2,4-Dichlorophenoxy)butanoic acid)	--	--	8.00E-03	I	--	--	--	--	--	--	1.00E+00	--
120-83-2	2,4-Dichlorophenol	--	--	3.00E-03	I	--	--	--	--	V	--	1.00E+00	1.00E-01
105-67-9	2,4-Dimethylphenol	--	--	2.00E-02	I	--	--	--	--	V	--	1.00E+00	1.00E-01
51-28-5	2,4-Dinitrophenol	--	--	2.00E-03	I	--	--	--	--	--	--	1.00E+00	1.00E-01
121-14-2	2,4-Dinitrotoluene	3.10E-01	C	2.00E-03	I	8.90E-05	C	--	--	--	--	1.00E+00	1.02E-01
606-20-2	2,6-Dinitrotoluene	--	--	1.00E-03	P	--	--	--	--	--	--	1.00E+00	9.90E-02
53-96-3	2-Acetylaminofluorene	3.80E+00	C	--	--	1.30E-03	C	--	--	--	--	1.00E+00	1.00E-01
78-93-3	2-Butanone	--	--	6.00E-01	I	--	--	5.00E+00	I	V	--	1.00E+00	--
111-76-2	2-Butoxyethanol	--	--	1.00E-01	I	--	--	1.60E+00	I	V	--	1.00E+00	--
91-58-7	2-Chloronaphthalene	--	--	8.00E-02	I	--	--	--	--	V	--	1.00E+00	--
95-57-8	2-Chlorophenol	--	--	5.00E-03	I	--	--	--	--	V	--	1.00E+00	--
591-78-6	2-Hexanone	--	--	5.00E-03	I	--	--	3.00E-02	I	V	--	1.00E+00	--
94-74-6	2-Methyl-4 chlorophenoxyacetic acid	--	--	5.00E-04	I	--	--	--	--	--	--	1.00E+00	--
91-57-6	2-methylnaphthalene	--	--	4.00E-03	I	--	--	--	--	V	--	1.00E+00	1.30E-01
95-48-7	2-Methylphenol (cresol, o-)	--	--	5.00E-02	I	--	--	6.00E-01	C	V	--	1.00E+00	1.00E-01
91-59-8	2-Naphthylamine	1.80E+00	C	--	--	--	--	--	--	--	--	1.00E+00	1.00E-01
88-74-4	2-Nitroaniline	--	--	1.00E-02	X	--	--	5.00E-05	X	--	--	1.00E+00	1.00E-01
88-75-5	2-Nitrophenol	--	--	--	--	--	--	--	--	--	--	--	1.00E-01
108-10-1	2-Pentanone, 4-Methyl	--	--	8.00E-02	H	--	--	3.00E+00	I	V	--	1.00E+00	--
32774-16-6	*3,3',4,4',5,5'*-Hexachlorobiphenyl	3.90E+03	WAC	3.30E-08	E	1.14E+00	WAC	1.30E-06	E	--	--	1.00E+00	3.00E-02
57465-28-8	*3,3',4,4',5*-Pentachlorobiphenyl	1.30E+04	WAC	1.00E-08	E	3.80E+00	WAC	4.00E-07	E	--	--	1.00E+00	3.00E-02
32598-13-3	*3,3',4,4'*-Tetrachlorobiphenyl	1.30E+01	WAC	1.00E-05	E	3.80E-03	WAC	4.00E-04	E	--	--	1.00E+00	3.00E-02
91-94-1	3,3'-Dichlorobenzidine	4.50E-01	I	--	--	3.40E-04	C	--	--	--	--	1.00E+00	1.00E-01
119-93-7	3,3'-Dimethylbenzidine	1.10E+01	P	--	--	--	--	--	--	--	--	1.00E+00	1.00E-01
70362-50-4	*3,4,4',5*- Tetrachlorobiphenyl	3.90E+01	WAC	3.30E-06	E	1.14E-02	WAC	1.30E-04	E	--	--	1.00E+00	3.00E-02
65794-96-9	3+4 Methylphenol (cresol, m+p)	--	--	--	--	--	--	--	--	--	--	--	--
56-49-5	3-Methylcholanthrene	2.20E+01	C	--	--	6.30E-03	C	--	--	--	M	1.00E+00	1.00E-01
99-09-2	3-Nitroaniline	2.10E-02	NCEA	3.00E-04	NCEA	--	--	1.00E-03	NCEA	--	--	1.00E+00	1.00E-01
72-54-8	4,4'-DDD (Dichlorodiphenyldichloroethane)	2.40E-01	I	--	--	6.90E-05	C	--	--	--	--	1.00E+00	1.00E-01
72-55-9	4,4'-DDE (Dichlorodiphenyldichloroethylene)	3.40E-01	I	--	--	9.70E-05	C	--	--	--	--	1.00E+00	1.00E-01
50-29-3	4,4'-DDT (Dichlorodiphenyltrichloroethane)	3.40E-01	I	5.00E-04	I	9.70E-05	I	--	--	--	--	1.00E+00	3.00E-02
534-52-1	4,6-Dinitro-2-methylphenol	--	--	8.00E-05	X	--	--	--	--	--	--	1.00E+00	1.00E-01
1918-02-1	4-Amino-3,5,6-trichloropicolinic acid	--	--	7.00E-02	I	--	--	--	--	--	--	1.00E+00	--
92-67-1	4-Aminobiphenyl	2.10E+01	C	--	--	6.00E-03	C	--	--	--	--	1.00E+00	1.00E-01
101-55-3	4-Bromophenylphenyl ether	--	--	--	--	--	--	--	--	--	--	--	1.00E-01
59-50-7	4-Chloro-3-methylphenol	--	--	1.00E-01	A	--	--	--	--	--	--	1.00E+00	1.00E-01
106-47-8	4-Chloroaniline	2.00E-01	P	4.00E-03	I	--	--	--	--	V	--	1.00E+00	1.00E-01
7005-72-3	4-Chlorophenylphenyl ether	--	--	--	--	--	--	--	--	--	--	--	1.00E-01
106-44-5	4-Methylphenol (cresol, p-)	--	--	1.00E-01	A	--	--	6.00E-01	C	V	--	1.00E+00	1.00E-01
100-01-6	4-Nitroaniline	2.00E-02	P	4.00E-03	P	--	--	6.00E-03	P	--	--	1.00E+00	1.00E-01
100-02-7	4-Nitrophenol	--	--	--	--	--	--	--	--	--	--	--	1.00E-01
99-55-8	5-Nitro-o-toluidine	9.00E-03	P	2.00E-02	X	--	--	--	--	--	--	1.00E+00	1.00E-01
83-32-9	Acenaphthene	--	--	6.00E-02	I	--	--	--	--	V	--	1.00E+00	1.30E-01
208-96-8	Acenaphthylene	--	--	--	--	--	--	--	--	--	--	--	1.30E-01
67-64-1	Acetone	--	--	9.00E-01	I	--	--	3.10E+01	A	V	--	1.00E+00	--
75-05-8	Acetonitrile	--	--	--	--	--	--	6.00E-02	I	V	--	1.00E+00	--
98-86-2	Acetophenone	--	--	1.00E-01	I	--	--	--	--	V	--	1.00E+00	--
107-02-8	Acrolein	--	--	5.00E-04	I	--	--	2.00E-05	I	V	--	1.00E+00	--
79-06-1	Acrylamide	5.00E-01	I	2.00E-03	I	1.00E-04	I	6.00E-03	I	V	--	1.00E+00	--
107-13-1	Acrylonitrile	5.40E-01	I	4.00E-02	A	6.80E-05	I	2.00E-03	I	V	--	1.00E+00	--
309-00-2	Aldrin	1.70E+01	I	3.00E-05	I	4.90E-03	I	--	--	V	--	1.00E+00	1.00E-01
107-05-1	Allyl chloride	2.10E-02	C	--	--	6.00E-06	C	1.00E-03	I	V	--	1.00E+00	--
319-84-6	Alpha-BHC	6.30E+00	I	8.00E-03	A	1.80E-03	I	--	--	--	--	1.00E+00	1.00E-01
5103-71-9	Alpha-Chlordane	3.50E-01	I	5.00E-04	I	1.00E-04	I	7.00E-04	I	--	--	1.00E+00	4.00E-02
7429-90-5	Aluminum	--	--	1.00E+00	P	--	--	5.00E-03	P	--	--	1.00E+00	--
62-53-3	Aniline	5.70E-03	I	7.00E-03	P	1.60E-06	C	1.00E-03	I	V	--	1.00E+00	1.00E-01
120-12-7	Anthracene	--	--	3.00E-01	I	--	--	--	--	V	--	1.00E+00	1.30E-01
7440-36-0	Antimony	--	--	4.00E-04	I	--	--	--	--	--	--	1.50E-01	--
140-57-8	Aramite	2.50E-02	I	5.00E-02	H	7.10E-06	I	--	--	--	--	1.00E+00	1.00E-01
12674-11-2	Aroclor-1016	7.00E-02	S	7.00E-05	I	2.00E-05	S	--	--	--	--	1.00E+00	1.40E-01
11104-28-2	Aroclor-1221	2.00E+00	S	--	--	5.70E-04	S	--	--	V	--	1.00E+00	1.40E-01
11141-16-5	Aroclor-1232	2.00E+00	S	--	--	5.70E-04	S	--	--	V	--	1.00E+00	1.40E-01
53469-21-9	Aroclor-1242	2.00E+00	S	--	--	5.70E-04	S	--	--	--	--	1.00E+00	1.40E-01
12672-29-6	Aroclor-1248	2.00E+00	S	--	--	5.70E-04	S	--	--	--	--	1.00E+00	1.40E-01
11097-69-1	Aroclor-1254	2.00E+00	S	2.00E-05	I	5.70E-04	S	--	--	--	--	1.00E+00	1.40E-01
11096-82-5	Aroclor-1260	2.00E+00	S	--	--	5.70E-04	S	--	--	--	--	1.00E+00	1.40E-01
37324-23-5	Aroclor-1262	--	--	--	--	--	--	--	--	--	--	--	1.40E-01
11100-14-4	Aroclor-1268	--	--	--	--	--	--	--	--	--	--	--	1.40E-01
7440-38-2	Arsenic	1.50E+00	I	3.00E-04	I	4.30E-03	I	1.50E-05	C	--	--	1.00E+00	3.00E-02
103-33-3	Azobenzene	1.10E-01	I	--	--	3.10E-05	I	--	--	V	--	1.00E+00	--
7440-39-3	Barium	--	--	2.00E-01	I	--	--	5.00E-04	H	--	--	7.00E-02	--
71-43-2	Benzene	5.50E-02	I	4.00E-03	I	7.80E-06	I	3.00E-02	I	V	--	1.00E+00	--
56-55-3	Benzo(a)anthracene	7.30E-01	WAC	--	--	1.10E-04	WAC	--	--	--	M	1.00E+00	1.30E-01
50-32-8	Benzo(a)pyrene	7.30E+00	I	--	--	1.10E-03	C	--	--	--	M	1.00E+00	1.30E-01
205-99-2	Benzo(b)fluoranthene	7.30E-01	WAC	--	--	1.10E-04	WAC	--	--	--	M	1.00E+00	1.30E-01
191-24-2	Benzo(g,h,i)perylene	--	--	--	--	--	--	--	--	--	--	--	1.30E-01
207-08-9	Benzo(k)fluoranthene	7.30E-01	WAC	--	--	1.10E-04	WAC	--	--	--	M	1.00E+00	1.30E-01
65-85-0	Benzoic acid	--	--	4.00E+00	I	--	--	--	--	--	--	1.00E+00	1.00E-01
100-51-6	Benzyl alcohol	--	--	1.00E-01	P	--	--	--	--	V	--	1.00E+00	1.00E-01
7440-41-7	Beryllium	--	--	2.00E-03	I	2.40E-03	I	2.00E-05	I	--	--	7.00E-03	--
319-85-7	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	1.80E+00	I	--	--	5.30E-04	I	--	--	--	--	1.00E+00	1.00E-01
108-60-1	Bis(2-chloro-1-methylethyl)ether	7.00E-02	H	4.00E-02	I	1.00E-05	H	--	--	V	--	1.00E+00	--
111-91-1	Bis(2-Chloroethoxy)methane	--	--	3.00E-03	P	--	--	--	--	--	--	1.00E+00	1.00E-01
111-44-4	Bis(2-chloroethyl) ether	1.10E+00	I	--	--	3.30E-04	I	--	--	V	--	1.00E+00	--
117-81-7	Bis(2-ethylhexyl) phthalate	1.40E-02	I	2.00E-02	I	2.40E-06	C	--	--	--	--	1.00E+00	1.00E-01
7440-69-9	Bismuth	--	--	--	--	--	--	--	--	--	--	--	--
7440-42-8	Boron	--	--	2.00E-01	I	--	--	2.00E-02	H	--	--	1.00E+00	--
24959-67-9	Bromide	--	--	--	--	--	--	--	--	--	--	--	--
75-27-4	Bromodichloromethane	6.20E-02	I	2.00E-02	I	3.70E-05	C	--	--	V	--	1.00E+00	--
75-25-2	Bromoform	7.90E-03	I	2.00E-02	I	1.10E-06	I	--	--	V	--	1.00E+00	--
74-83-9	Bromomethane	--	--	1.40E-03	I	--	--	5.00E-03	I	V	--	1.00E+00	--
85-68-7	Butylbenzylphthalate	1.90E-03	P	2.00E-01	I	--	--	--	--	--	--	1.00E+00	1.00E-01
7440-43-9	Cadmium	--	--	1.00E-03	I	1.80E-03	I	2.00E-05	C	--	--	2.50E-02	1.00E-03
7440-70-2	Calcium	--	--	--	--	--	--	--	--	--	--	--	--
86-74-8	Carbazole	2.00E-02	NCEA	--	--	--	--	--	--	--	--	1.00E+00	1.00E-01
75-15-0	Carbon disulfide	--	--	1.00E-01	I	--	--	7.00E-01	I	V	--	1.00E+00	--
56-23-5	Carbon tetrachloride	7.00E-02	I	4.00E-03	I	6.00E-06	I	1.00E-01	I	V	--	1.00E+00	--
57-74-9	Chlordane	3.50E-01	I	5.00E-04	I	1.00E-04	I	7.00E-04	I	--	--	1.00E+00	4.00E-02
16887-00-6	Chloride	--	--	--	--	--	--	--	--	--	--	--	--
108-90-7	Chlorobenzene	--	--	2.00E-02	I	--	--	5.00E-02	P	V	--	1.00E+00	--

Table 7: Summary of Toxicity Values used to Calculate PRGs for the Casual Recreational User Exposure Scenario

		Ingestion Toxicity Values				Inhalation Toxicity Values				Chemical-Specific Parameters			
		Carcinogen		Noncarcinogen		Carcinogen		Noncarcinogen					
CAS #	Analyte Name	Oral Cancer Slope Factora (CSFo) ([mg/kg-day]-1)	Sourceb	Oral Reference Dosea (RfDo) (mg/kg-day)	Sourceb	Inhalation Unit Riska (IUR) ([µg/m3]-1)	Sourceb	Inhalation Reference Concentrationa (RfC) (mg/m3)	Sourceb	Volatilec	Mutagena	GIABSd (unitless)	ABSde (unitless)
510-15-6	Chlorobenzilate	1.10E-01	C	2.00E-02	I	3.10E-05	C	--	--	--	--	1.00E+00	1.00E-01
75-00-3	Chloroethane	--	--	--	--	--	--	1.00E+01	I	V	--	1.00E+00	--
67-66-3	Chloroform	3.10E-02	C	1.00E-02	I	2.30E-05	I	9.80E-02	A	V	--	1.00E+00	--
74-87-3	Chloromethane	--	--	--	--	--	--	9.00E-02	I	V	--	1.00E+00	--
126-99-8	Chloroprene	--	--	2.00E-02	H	3.00E-04	I	2.00E-02	I	V	--	1.00E+00	--
7440-47-3	Chromium	--	--	1.50E+00	I	--	--	--	--	--	--	1.30E-02	--
218-01-9	Chrysene	7.30E-02	WAC	--	--	1.10E-05	WAC	--	--	--	M	1.00E+00	1.30E-01
156-59-2	cis-1,2-Dichloroethylene	--	--	2.00E-03	I	--	--	--	--	V	--	1.00E+00	--
10061-01-5	cis-1,3-Dichloropropene	1.00E-01	I	3.00E-02	I	4.00E-06	I	2.00E-02	I	V	--	1.00E+00	1.00E-01
7440-48-4	Cobalt	--	--	3.00E-04	P	9.00E-03	P	6.00E-06	P	--	--	1.00E+00	--
PCB1242/1016	Co-elution of Aroclor 1242 and Aroclor 1016	--	--	--	--	--	--	--	--	--	--	--	--
7440-50-8	Copper	--	--	4.00E-02	H	--	--	--	--	--	--	1.00E+00	--
57-12-5	Cyanide	--	--	6.00E-04	I	--	--	8.00E-04	S	V	--	1.00E+00	--
110-82-7	Cyclohexane	--	--	--	--	--	--	6.00E+00	I	V	--	1.00E+00	--
108-94-1	Cyclohexanone	--	--	5.00E+00	I	--	--	7.00E-01	P	V	--	1.00E+00	--
75-99-0	Dalapon	--	--	3.00E-02	I	--	--	--	--	V	--	1.00E+00	--
124-18-5	Decane	--	--	--	--	--	--	--	--	--	--	--	--
319-86-8	Delta-BHC	--	--	--	--	--	--	--	--	--	--	--	1.00E-01
2303-16-4	Diallate	6.10E-02	H	--	--	--	--	--	--	--	--	1.00E+00	1.00E-01
53-70-3	Dibenz[a,h]anthracene	7.30E-01	WAC	--	--	1.10E-04	WAC	--	--	--	M	1.00E+00	1.30E-01
132-64-9	Dibenzofuran	--	--	1.00E-03	X	--	--	--	--	V	--	1.00E+00	1.00E-01
124-48-1	Dibromochloromethane	8.40E-02	I	2.00E-02	I	2.70E-05	C	--	--	V	--	1.00E+00	--
74-95-3	Dibromomethane	--	--	1.00E-02	H	--	--	4.00E-03	X	V	--	1.00E+00	--
1918-00-9	Dicamba	--	--	3.00E-02	I	--	--	--	--	--	--	1.00E+00	--
75-71-8	Dichlorodifluoromethane	--	--	2.00E-01	I	--	--	1.00E-01	X	V	--	1.00E+00	--
120-36-5	Dichloroprop	--	--	--	--	--	--	--	--	--	--	--	1.00E-01
60-57-1	Dieldrin	1.60E+01	I	5.00E-05	I	4.60E-03	I	--	--	--	--	1.00E+00	1.00E-01
60-29-7	Diethyl ether	--	--	2.00E-01	I	--	--	--	--	V	--	1.00E+00	--
84-66-2	Diethylphthalate	--	--	8.00E-01	I	--	--	--	--	--	--	1.00E+00	1.00E-01
60-51-5	Dimethoate	--	--	2.00E-04	I	--	--	--	--	--	--	1.00E+00	1.00E-01
131-11-3	Dimethyl phthalate	--	--	--	--	--	--	--	--	--	--	--	1.00E-01
84-74-2	Di-n-butylphthalate	--	--	1.00E-01	I	--	--	--	--	--	--	1.00E+00	1.00E-01
117-84-0	Di-n-octylphthalate	--	--	1.20E-02	P	--	--	--	--	--	--	1.00E+00	1.00E-01
88-85-7	Dinoseb(2-secButyl-4,6-dinitrophenol)	--	--	1.00E-03	I	--	--	--	--	--	--	1.00E+00	1.00E-01
298-04-4	Disulfoton	--	--	4.00E-05	I	--	--	--	--	--	--	1.00E+00	1.00E-01
959-98-8	Endosulfan I	--	--	6.00E-03	I	--	--	--	--	--	--	1.00E+00	1.00E-01
33213-65-9	Endosulfan II	--	--	6.00E-03	I	--	--	--	--	--	--	1.00E+00	1.00E-01
1031-07-8	Endosulfan sulfate	--	--	--	--	--	--	--	--	--	--	--	1.00E-01
72-20-8	Endrin	--	--	3.00E-04	I	--	--	--	--	--	--	1.00E+00	1.00E-01
7421-93-4	Endrin Aldehyde	--	--	--	--	--	--	--	--	--	--	--	1.00E-01
53494-70-5	Endrin ketone	--	--	--	--	--	--	--	--	--	--	--	1.00E-01
64-17-5	Ethanol	--	--	--	--	--	--	--	--	V	--	--	--
141-78-6	Ethyl acetate	--	--	9.00E-01	I	--	--	--	--	V	--	1.00E+00	--
97-63-2	Ethyl methacrylate	--	--	9.00E-02	H	--	--	3.00E-01	P	V	--	1.00E+00	--
100-41-4	Ethylbenzene	1.10E-02	C	1.00E-01	I	2.50E-06	C	1.00E+00	I	V	--	1.00E+00	--
107-21-1	Ethylene glycol	--	--	2.00E+00	I	--	--	4.00E-01	C	V	--	1.00E+00	--
206-44-0	Fluoranthene	--	--	4.00E-02	I	--	--	--	--	--	--	1.00E+00	1.30E-01
86-73-7	Fluorene	--	--	4.00E-02	I	--	--	--	--	V	--	1.00E+00	1.30E-01
16984-48-8	Fluoride	--	--	6.00E-02	I	--	--	1.30E-02	C	--	--	1.00E+00	--
58-89-9	Gamma-BHC (Lindane)	1.10E+00	C	3.00E-04	I	3.10E-04	C	--	--	--	--	1.00E+00	4.00E-02
5566-34-7	Gamma-Chlordane	3.50E-01	I	5.00E-04	I	1.00E-04	I	7.00E-04	I	--	--	1.00E+00	4.00E-02
76-44-8	Heptachlor	4.50E+00	I	5.00E-04	I	1.30E-03	I	--	--	--	--	1.00E+00	1.00E-01
1024-57-3	Heptachlor epoxide	9.10E+00	I	1.30E-05	I	2.60E-03	I	--	--	V	--	1.00E+00	1.00E-01
118-74-1	Hexachlorobenzene	1.60E+00	I	8.00E-04	I	4.60E-04	I	--	--	--	--	1.00E+00	1.00E-01
87-68-3	Hexachlorobutadiene	7.80E-02	I	1.00E-03	P	2.20E-05	I	--	--	V	--	1.00E+00	1.00E-01
77-47-4	Hexachlorocyclopentadiene	--	--	6.00E-03	I	--	--	2.00E-04	I	V	--	1.00E+00	1.00E-01
67-72-1	Hexachloroethane	4.00E-02	I	7.00E-04	I	1.10E-05	C	3.00E-02	I	V	--	1.00E+00	1.00E-01
70-30-4	Hexachlorophene	--	--	3.00E-04	I	--	--	--	--	--	--	1.00E+00	1.00E-01
110-54-3	Hexane	--	--	6.00E-02	H	--	--	7.00E-01	I	V	--	1.00E+00	--
18540-29-9	Hexavalent Chromium	--	--	3.00E-03	I	8.40E-02	S	1.00E-04	I	--	--	2.50E-02	--
302-01-2	Hydrazine	3.00E+00	I	--	--	4.90E-03	I	3.00E-05	P	--	--	1.00E+00	--
193-39-5	Indeno(1,2,3-cd)pyrene	7.30E-01	WAC	--	--	1.10E-04	WAC	--	--	--	M	1.00E+00	1.30E-01
7439-89-6	Iron	--	--	7.00E-01	P	--	--	--	--	--	--	1.00E+00	--
78-83-1	Isobutyl alcohol	--	--	3.00E-01	I	--	--	--	--	V	--	1.00E+00	--
78-59-1	Isophorone	9.50E-04	I	2.00E-01	I	--	--	2.00E+00	C	V	--	1.00E+00	1.00E-01
98-82-8	Isopropylbenzene	--	--	1.00E-01	I	--	--	4.00E-01	I	V	--	1.00E+00	--
143-50-0	Kepone	1.00E+01	I	3.00E-04	I	4.60E-03	C	--	--	--	--	1.00E+00	1.00E-01
7439-92-1	Lead	--	--	--	--	--	--	--	--	--	--	1.00E+00	--
7439-93-2	Lithium	--	--	2.00E-03	P	--	--	--	--	--	--	1.00E+00	--
7439-95-4	Magnesium	--	--	--	--	--	--	--	--	--	--	--	--
7439-96-5	Manganese	--	--	1.40E-01	S	--	--	5.00E-05	I	--	--	1.00E+00	--
99-65-0	m-Dinitrobenzene	--	--	1.00E-04	I	--	--	--	--	--	--	1.00E+00	1.00E-01
7439-97-6	Mercury	--	--	3.00E-04	I	--	--	3.00E-04	S	--	--	7.00E-02	--
126-98-7	Methacrylonitrile	--	--	1.00E-04	I	--	--	3.00E-02	P	V	--	1.00E+00	--
67-56-1	Methanol	--	--	5.00E-01	I	--	--	4.00E+00	C	V	--	1.00E+00	--
72-43-5	Methoxychlor	--	--	5.00E-03	I	--	--	--	--	--	--	1.00E+00	1.00E-01
80-62-6	Methyl methacrylate	--	--	1.40E+00	I	--	--	7.00E-01	I	V	--	1.00E+00	--
66-27-3	Methyl methanesulfonate	9.90E-02	C	--	--	2.80E-05	C	--	--	--	--	1.00E+00	1.00E-01
298-00-0	Methyl parathion	--	--	2.50E-04	I	--	--	--	--	--	--	1.00E+00	1.00E-01
75-09-2	Methylene chloride	2.00E-03	I	6.00E-03	I	1.00E-08	I	6.00E-01	I	V	--	1.00E+00	--
7439-98-7	Molybdenum	--	--	5.00E-03	I	--	--	--	--	--	--	1.00E+00	--
108-38-3	m-Xylene	--	--	2.00E-01	S	--	--	1.00E-01	S	V	--	1.00E+00	--
91-20-3	Naphthalene	--	--	2.00E-02	I	3.40E-05	C	3.00E-03	I	V	--	1.00E+00	1.30E-01
104-51-8	n-Butylbenzene	--	--	5.00E-02	P	--	--	--	--	V	--	1.00E+00	--
7440-02-0	Nickel	--	--	2.00E-02	I	2.60E-04	C	9.00E-05	A	--	--	4.00E-02	--
14797-55-8	Nitrate	--	--	7.10E+00	I	--	--	--	--	--	--	1.00E+00	--
14797-65-0	Nitrite	--	--	3.00E-01	I	--	--	--	--	--	--	1.00E+00	--
98-95-3	Nitrobenzene	--	--	2.00E-03	I	4.00E-05	I	9.00E-03	I	V	--	1.00E+00	--
NO3-N	Nitrogen in Nitrate	--	--	1.60E+00	I	--	--	--	--	--	--	1.00E+00	--
NO2-N	Nitrogen in Nitrite	--	--	1.00E-01	I	--	--	--	--	--	--	1.00E+00	--
NO2+NO3-N	Nitrogen in Nitrite and Nitrate	--	--	1.60E+00	I	--	--	--	--	--	--	1.00E+00	--
930-55-2	Nitrosopyrrolidine	2.10E+00	I	--	--	6.10E-04	I	--	--	V	--	1.00E+00	1.00E-01
55-18-5	n-Nitrosodiethylamine	1.50E+02	I	--	--	4.30E-02	I	--	--	V	M	1.00E+00	1.00E-01
62-75-9	n-Nitrosodimethylamine	5.10E+01	I	8.00E-06	P	1.40E-02	I	4.00E-05	X	V	M	1.00E+00	1.00E-01
924-16-3	n-Nitrosodi-n-butylamine	5.40E+00	I	--	--	1.60E-03	I	--	--	V	--	1.00E+00	--
621-64-7	n-Nitrosodi-n-dipropylamine	7.00E+00	I	--	--	2.00E-03	C	--	--	--	--	1.00E+00	1.00E-01
86-30-6	n-Nitrosodiphenylamine	4.90E-03	I	--	--	2.60E-06	C	--	--	--	--	1.00E+00	1.00E-01
10595-95-6	n-Nitrosomethylethylamine	2.20E+01	I	--	--	6.30E-03	C	--	--	--	--	1.00E+00	1.00E-01
59-89-2	n-Nitrosomorpholine	6.70E+00	C	--	--	1.90E-03	C	--	--	--	--	1.00E+00	1.00E-01
100-75-4	n-Nitrosopiperidine	9.40E+00	C	--	--	2.70E-03	C	--	--	--	--	1.00E+00	1.00E-01
95-47-6	o-Xylene	--	--	2.00E-01	S	--	--	1.00E-01	S	V	--	1.00E+00	--
56-38-2	Parathion	--	--	6.00E-03	H	--	--	--	--	--	--	1.00E+00	1.00E-01
60-11-7	p-Dimethylaminoazobenzene	4.60E+00	C	--	--	1.30E-03	C	--	--	--	--	1.00E+00	1.00E-01
608-93-5	Pentachlorobenzene	--	--	8.00E-04	I	--	--	--	--	--	--	1.00E+00	1.00E-01
76-01-7	Pentachloroethane	9.00E-02	P	--	--	--	--	--	--	V	--	1.00E+00	--
82-68-8	Pentachloronitrobenzene (PCNB)	2.60E-01	H	3.00E-03	I	--	--	--	--	--	--	1.00E+00	1.00E-01
87-86-5	Pentachlorophenol	4.00E-01	I	5.00E-03	I	5.10E-06	C	--	--	--	--	1.00E+00	2.50E-01
62-44-2	Phenacetin	2.20E-03	C	--	--	6.30E-07	C	--	--	--	--	1.00E+00	1.00E-01
85-01-8	Phenanthrene	--	--	--	--	--	--	--	--	V	--	--	1.30E-01
108-95-2	Phenol	--	--	3.00E-01	I	--	--	2.00E-01	C	V	--	1.00E+00	1.00E-01
298-02-2	Phorate	--	--	2.00E-04	H	--	--	--	--	--	--	1.00E+00	1.00E-01
14265-44-2	Phosphate	--	--	--	--	--	--	--	--	--	--	--	--
7723-14-0	Phosphorus	--	--	--	--	--	--	--	--	--	--	--	--
PO4-P	Phosphorus in phosphate	--	--	--	--	--	--	--	--	--	--	--	--
7440-09-7	Potassium	--	--	--	--	--	--	--	--	--	--	--	--
106-50-3	p-Phenylenediamine	--	--	1.90E-01	H	--	--	--	--	--	--	1.00E+00	1.00E-01
23950-58-5	Pronamide	--	--	7.50E-02	I	--	--	--	--	--	--	1.00E+00	1.00E-01
129-00-0	Pyrene	--	--	3.00E-02	I	--	--	--	--	V	--	1.00E+00	1.30E-01
110-86-1	Pyridine	--	--	1.00E-03	I	--	--	--	--	V	--	1.00E+00	--
94-59-7	Safrol	2.20E-01	C	--	--	6.30E-05	C	--	--	--	M	1.00E+00	1.00E-01
7782-49-2	Selenium	--	--	5.00E-03	I	--	--	2.00E-02	C	--	--	1.00E+00	--
7440-21-3	Silicon	--	--	--	--	--	--	--	--	--	--	--	--
7440-22-4	Silver	--	--	5.00E-03	I	--	--	--	--	--	--	4.00E-02	--
7440-23-5	Sodium	--	--	--	--	--	--	--	--	--	--	--	--
7440-24-6	Strontium	--	--	6.00E-01	I	--	--	--	--	--	--	1.00E+00	--
100-42-5	Styrene	--	--	2.00E-01	I	--	--	1.00E+00	I	V	--	1.00E+00	--
14808-79-8	Sulfate	--	--	--	--	--	--	--	--	--	--	--	--
18496-25-8	Sulfide	--	--	--	--	--	--	--	--	--	--	--	--
99-35-4	sym-Trinitrobenzene	--	--	3.00E-02	I	--	--	--	--	--	--	1.00E+00	1.90E-02
127-18-4	Tetrachloroethene	2.10E-03	I	6.00E-03	I	2.60E-07	I	4.00E-02	I	V	--	1.00E+00	--
3689-24-5	Tetraethyl dithiopyrophosphate (Sulfotepp)	--	--	5.00E-04	I	--	--	--	--	--	--	1.00E+00	1.00E-01
7440-28-0	Thallium	--	--	--	--	--	--	--	--	--	--	1.00E+00	--
7440-31-5	Tin	--	--	6.00E-01	H	--	--	--	--	--	--	1.00E+00	--
7440-32-6	Titanium	--	--	--	--	--	--	--	--	--	--	--	--
108-88-3	Toluene	--	--	8.00E-02	I	--	--	5.00E+00	I	V	--	1.00E+00	--

Table 7: Summary of Toxicity Values used to Calculate PRGs for the Casual Recreational User Exposure Scenario

		Ingestion Toxicity Values				Inhalation Toxicity Values				Chemical-Specific Parameters			
		Carcinogen		Noncarcinogen		Carcinogen		Noncarcinogen					
CAS #	Analyte Name	Oral Cancer Slope Factora (CSFo) ([mg/kg-day]-1)	Sourceb	Oral Reference Dosea (RfDo) (mg/kg-day)	Sourceb	Inhalation Unit Riska (IUR) ([µg/m3]-1)	Sourceb	Inhalation Reference Concentrationa (RfC) (mg/m3)	Sourceb	Volatilec	Mutagena	GIABSd (unitless)	ABSde (unitless)
1336-36-3	Total PCBs	2.00E+00	I	--	--	5.70E-04	I	--	--	--	--	1.00E+00	1.40E-01
TPH	Total petroleum hydrocarbons	--	--	--	--	--	--	--	--	--	--	--	--
TPHDIESEL	Total petroleum hydrocarbons - diesel range	--	--	--	--	--	--	--	--	--	--	--	--
TPHGASOLINE	Total petroleum hydrocarbons - gasoline range	--	--	--	--	--	--	--	--	--	--	--	--
TPHKEROSENE	Total petroleum hydrocarbons - kerosene range	--	--	--	--	--	--	--	--	--	--	--	--
TPHOILH	Total petroleum hydrocarbons - motor oil (high boiling)	--	--	--	--	--	--	--	--	--	--	--	--
TOTALPCB	Total Polychlorinated Biphenyls	2.00E+00	I	--	--	5.70E-04	I	--	--	--	--	1.00E+00	1.40E-01
8001-35-2	Toxaphene	1.10E+00	I	--	--	3.20E-04	I	--	--	--	--	1.00E+00	1.00E-01
156-60-5	trans-1,2-Dichloroethylene	--	--	2.00E-02	I	--	--	6.00E-02	P	V	--	1.00E+00	--
10061-02-6	trans-1,3-Dichloropropene	1.00E-01	I	3.00E-02	I	4.00E-06	I	2.00E-02	I	V	--	1.00E+00	1.00E-01
5103-74-2	trans-Chlordane	3.50E-01	I	5.00E-04	I	1.00E-04	I	7.00E-04	I	--	--	1.00E+00	4.00E-02
126-73-8	Tributyl phosphate	9.00E-03	P	1.00E-02	P	--	--	--	--	--	--	1.00E+00	--
79-01-6	Trichloroethene	4.60E-02	I	5.00E-04	I	4.10E-06	I	2.00E-03	I	V	--	1.00E+00	--
75-69-4	Trichloromonofluoromethane	--	--	3.00E-01	I	--	--	7.00E-01	H	V	--	1.00E+00	--
7440-61-1	Uranium	--	--	3.00E-03	I	--	--	4.00E-05	NCEA	--	--	1.00E+00	--
7440-62-2	Vanadium	--	--	5.00E-03	S	--	--	--	--	--	--	1.00E+00	--
108-05-4	Vinyl acetate	--	--	1.00E+00	H	--	--	2.00E-01	I	V	--	1.00E+00	--
75-01-4	Vinyl chloride	7.20E-01	I	3.00E-03	I	4.40E-06	I	1.00E-01	I	V	M	1.00E+00	--
1330-20-7	Xylenes (total)	--	--	2.00E-01	I	--	--	1.00E-01	I	V	--	1.00E+00	--
7440-66-6	Zinc	--	--	3.00E-01	I	--	--	--	--	--	--	1.00E+00	--
7440-67-7	Zirconium	--	--	--	--	--	--	--	--	--	--	1.00E+00	--

a. Source = U.S. Environmental Protection Agency web site "Regional Screening Levels for Chemical Contaminants at Superfund Sites" (EPA, November 2012) (http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm).

b. Reference key:

A = The Agency for Toxic Substances and Disease Registry (ATSDR)
C = The California Environmental Protection Agency (CalEPA)
E = Environmental Criteria and Assessment Office
H = Health Effects Assessment Summary Tables (HEAST)
I = EPA's Integrated Risk Information System (IRIS)
NCEA = National Center for Environmental Assessment (NCEA)
P = Provisional Peer Reviewed Toxicity Values (PPRTV)
S = Special case chemical; basis for value discussed on EPA Regional Screening Levels web site (EPA, 2012)
WAC = Value calculated using a toxicity equivalency factor (TEF) as provided by WAC 173-340-708(8), "Human Health Risk Assessment Procedures, Carcinogenic Potency Factor" and WAC 173-340-900, "Tables"
X = PPRTV Appendix

c. Is defined as volatile based on WAC 173-340-200 "Definitions" "Volatiles" or designated in the CLARC database (2013)

d. Chemical-specific parameters (GIABS and ABSd) were obtained from the following sources, in order of preference, as available:

1. EPA, 2012 "Regional Screening Levels for Chemical Contaminants at Superfund Sites", screening level/preliminary remediation goal website, updated November 2012
2. ORNL, 2013 Risk Assessment Information System, Oak Ridge National Laboratory, Oak Ridge, Tennessee, available on the internet at < http://rais.ornl.gov/ >.

f. Chemical-specific parameter ABSd was obtained from Exhibit 3-4, EPA/540/R/99/005 OSWER 9285.7-02EP, Risk Assement Guidance for Superfund Volume I: Human Health Evaluation manual (Part E, Supplemental Guidance for Dermal Risk Assessment)

g. The following summarizes ingestion toxicity differences between the table above and the EPA Regional Screening Level Table (November 2012)

2,3,3',4,4',5,5'-Heptachlorobiphenyl (39635-31-9): CPF is calculated using TCDD (1746-01-6) SFO multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
2,3,3',4,4',5-Hexachlorobiphenyl (38380-08-4): CPF is calculated using TCDD (1746-01-6) SFO multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
2,3,3',4,4',5'-Hexachlorobiphenyl (69782-90-7): CPF is calculated using TCDD (1746-01-6) SFO multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
2,3,3',4,4'-Pentachlorobiphenyl (32598-14-4): CPF is calculated using TCDD (1746-01-6) SFO multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
2,3',4,4',5,5'-Hexachlorobiphenyl (52663-72-6): CPF is calculated using TCDD (1746-01-6) SFO multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
2,3',4,4',5-Pentachlorobiphenyl (31508-00-6): CPF is calculated using TCDD (1746-01-6) SFO multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
2',3,4,4',5-Pentachlorobiphenyl (65510-44-3): CPF is calculated using TCDD (1746-01-6) SFO multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
2,3,4,4',5-Pentachlorobiphenyl (74472-37-0): CPF is calculated using TCDD (1746-01-6) SFO multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
3,3',4,4',5,5'-Hexachlorobiphenyl (32774-16-6): CPF is calculated using TCDD (1746-01-6) SFO multiplied by a TEF of 0.03 Per WAC 173-340-708(f)
3,3',4,4',5-Pentachlorobiphenyl (57465-28-8): CPF is calculated using TCDD (1746-01-6) SFO multiplied by a TEF of 0.1 Per WAC 173-340-708(f)
3,3',4,4'-Tetrachlorobiphenyl (32598-13-3): CPF is calculated using TCDD (1746-01-6) SFO multiplied by a TEF of 0.0001 Per WAC 173-340-708(f)
3,4,4',5- Tetrachlorobiphenyl (70362-50-4): CPF is calculated using TCDD (1746-01-6) SFO multiplied by a TEF of 0.0003 Per WAC 173-340-708(f)
3-Nitroaniline (99-09-2): Uses the toxicity information obtained from Risk Assessment Information System
Alpha-Chlordane (5103-71-9): Uses the toxicity information for chlordane (12789-03-6) in the EPA Regional Screening Level Table
Benzo(a)anthracene (56-55-3): CPF is calculated using the benzo(a)pyrene CFO multiplied by a TEF of 0.1 per WAC 173-340-708(8)(e)
Benzo(a)pyrene (50-32-8): CPF is calculated using the benzo(a)pyrene CFO multiplied by a TEF of 1 per WAC 173-340-708(8)(e)
Benzo(b)fluoranthene (205-99-2): CPF is calculated using the benzo(a)pyrene CFO multiplied by a TEF of 0.1 per WAC 173-340-708(8)(e)
Benzo(k)fluoranthene (207-08-9): CPF is calculated using the benzo(a)pyrene CFO multiplied by a TEF of 0.1 per WAC 173-340-708(8)(e)
Cadmium (7440-43-9): Uses the toxicity information for Cadmium (Diet) (7440-49-9) in the EPA Regional Screening Level Table
Carbazole (86-74-8): Uses the toxicity information obtained from Risk Assessment Information System
Chlordane (57-74-9): Uses the toxicity information for chlordane (12789-03-6) in the EPA Regional Screening Level Table
Chromium (7440-47-3): Uses the toxicity information for Chromium (III), Insoluble salts (16065-83-1) in the EPA Regional Screening Level Table
Chrysene (218-01-9): CPF is calculated using the benzo(a)pyrene CFO multiplied by a TEF of 0.01 per WAC 173-340-708(8)(e)
cis-1,3-Dichloropropene (10061-01-5): Uses the toxicity information for 1,3-dichloropropene (542-75-6) in the EPA Regional Screening Level Table
Dibenz[a,h]anthracene (53-70-3): CPF is calculated using the benzo(a)pyrene CFO multiplied by a TEF of 0.1 per WAC 173-340-708(8)(e)
Endosulfan I (959-98-8): Uses the toxicity information for Endosulfan (115-29-7) in the EPA Regional Screening Level Table
Endosulfan II (33213-65-9): Uses the toxicity information for Endosulfan (115-29-7) in the EPA Regional Screening Level Table
Fluoride (16984-48-8): Uses the toxicity information for Fluorine (Soluble Fluoride) (7782-41-4) in the EPA Regional Screening Level Table
gamma-Chlordane (5566-34-7): Uses the toxicity information for chlordane (12789-03-6) in the EPA Regional Screening Level Table
Hexavalent Chromium (18540-29-9): The oral carcinogenic potency factor provided in the EPA Regional Screening Level Table is not included in this table
Indeno(1,2,3-cd)pyrene (193-39-5): CPF is calculated using the benzo(a)pyrene CFO multiplied by a TEF of 0.1 per WAC 173-340-708(8)(e)
Manganese (7439-96-5): Uses the toxicity information for Manganese (Diet) (7439-96-5) in the EPA Regional Screening Level Table
Mercury (7439-97-6): Uses the toxicity information for Mercuric Chloride (an other Mercury Salts) (7487-94-7) in the EPA Regional Screening Level Table
Nitrate (14797-55-8): Uses derived toxicity information based on a conversion factor of 0.226 NO3-N/NO3 and the toxicity information provided for Nitrate (14797-55-8) in the form of nitrate as nitrogen in the EPA Regional Screening Level Table
Nitrite (14797-65-0): Uses derived toxicity information based on a conversion factor of 0.304 NO2-N/NO2 and the toxicity information provided for Nitrite (14797-55-8) in the form of nitrite as nitrogen in the EPA Regional Screening Level Table
Nitrogen in Nitrate (NO3-N): Uses toxicity information for Nitrate (14797-55-8) in the form of nitrate as nitrogen in the EPA Regional Screening Level Table
Nitrogen in Nitrite (NO2-N): Uses toxicity information for Nitrite (14797-55-8) in the form of nitrite as nitrogen in the EPA Regional Screening Level Table
Nitrogen in Nitrite and Nitrate (NO2+NO3-N): Uses toxicity information for Nitrate (14797-55-8) in the form of nitrate as nitrogen in the EPA Regional Screening Level Table; However no toxicity information is provided for Nitrate + Nitrite (as N) (NA) in the EPA Regional Screening Level Table
Phosphate (14265-44-2): No toxicity information provided for non-specific phosphates
Phosphorus (7723-14-0): Total phosphorous result; Phosphorous, White (7723-14-0) is not applicable; no toxicity information provided for non-specific phosphates
Phosphorus in phosphate (PO4-P): No toxicity information provided for non-specific phosphates
Thallium (7440-28-0): Does not reference the toxicity value listed in the EPA Regional Screening Level Table
Total PCBs (1336-36-3): Uses the toxicity information for Polychlorinated Biphenyls (high risk) (1336-36-3) in the EPA Regional Screening Level Table
Total Polychlorinated Biphenyls (TOTALPCB): Uses the toxicity information for Polychlorinated Biphenyls (high risk) (1336-36-3) in the EPA Regional Screening Level Table
trans-1,3-Dichloropropene (10061-02-6): Uses the toxicity information for 1,3-dichloropropene (542-75-6) in the EPA Regional Screening Level Table
trans-Chlordane (5103-74-2): Uses the toxicity information for chlordane (12789-03-6) in the EPA Regional Screening Level Table
Uranium (7440-61-1): Uses the toxicity information for Uranium (Soluble Salts) (NA) in the EPA Regional Screening Level Table
Vanadium (7440-62-2): Uses the toxicity information for Vanadium and Compounds (NA) I the EPA Regional Screening Level Table
Zirconium (7440-67-7): Does not reference the toxicity value listed in the EPA Regional Screening Level Table

f. The following summarizes inhalation toxicity differences between the table above and the EPA Regional Screening Level Table (November 2012) and/or RAIS

2,3,3',4,4',5,5'-Heptachlorobiphenyl (39635-31-9): CPF is calculated using TCDD (1746-01-6) IUR multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
2,3,3',4,4',5-Hexachlorobiphenyl (38380-08-4): CPF is calculated using TCDD (1746-01-6) IUR multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
2,3,3',4,4',5'-Hexachlorobiphenyl (69782-90-7): CPF is calculated using TCDD (1746-01-6) IUR multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
2,3,3',4,4'-Pentachlorobiphenyl (32598-14-4): CPF is calculated using TCDD (1746-01-6) IUR multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
2,3',4,4',5,5'-Hexachlorobiphenyl (52663-72-6): CPF is calculated using TCDD (1746-01-6) IUR multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
2,3',4,4',5-Pentachlorobiphenyl (31508-00-6): CPF is calculated using TCDD (1746-01-6) IUR multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
2',3,4,4',5-Pentachlorobiphenyl (65510-44-3): CPF is calculated using TCDD (1746-01-6) IUR multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
2,3,4,4',5-Pentachlorobiphenyl (74472-37-0): CPF is calculated using TCDD (1746-01-6) IUR multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
2-Naphthylamine (91-59-8): EPA, 2012 lists "0" for IUR; assume it is "--" (divide by zero issue)
3,3',4,4',5,5'-Hexachlorobiphenyl (32774-16-6): CPF is calculated using TCDD (1746-01-6) IUR multiplied by a TEF of 0.03 Per WAC 173-340-708(f)
3,3',4,4',5-Pentachlorobiphenyl (57465-28-8): CPF is calculated using TCDD (1746-01-6) IUR multiplied by a TEF of 0.1 Per WAC 173-340-708(f)
3,3',4,4'-Tetrachlorobiphenyl (32598-13-3): CPF is calculated using TCDD (1746-01-6) IUR multiplied by a TEF of 0.0001 Per WAC 173-340-708(f)
3,4,4',5- Tetrachlorobiphenyl (70362-50-4): CPF is calculated using TCDD (1746-01-6) IUR multiplied by a TEF of 0.0003 Per WAC 173-340-708(f)
3-Nitroaniline (99-09-2): Uses the toxicity information obtained from Risk Assessment Information System
Alpha-Chlordane (5103-71-9): Uses the toxicity information for chlordane (12789-03-6) in the EPA Regional Screening Level Table
Benzo(a)anthracene (56-55-3): CPF is calculated using the benzo(a)pyrene IUR multiplied by a TEF of 0.1 per WAC 173-340-708(8)(e)
Benzo(a)pyrene (50-32-8): CPF is calculated using the benzo(a)pyrene IUR multiplied by a TEF of 1 per WAC 173-340-708(8)(e)
Benzo(b)fluoranthene (205-99-2): CPF is calculated using the benzo(a)pyrene IUR multiplied by a TEF of 0.1 per WAC 173-340-708(8)(e)
Benzo(k)fluoranthene (207-08-9): CPF is calculated using the benzo(a)pyrene IUR multiplied by a TEF of 0.1 per WAC 173-340-708(8)(e)
Cadmium (7440-43-9): Uses the toxicity information for Cadmium (Diet) (7440-43-9) in the EPA Regional Screening Level Table
Chlordane (57-74-9): Uses the toxicity information for chlordane (12789-03-6) in the EPA Regional Screening Level Table
Chromium (7440-47-3): Uses the toxicity information for Chromium (III), Insoluble salts (16065-83-1) in the EPA Regional Screening Level Table
Chrysene (218-01-9): CPF is calculated using the benzo(a)pyrene IUR multiplied by a TEF of 0.01 per WAC 173-340-708(8)(e)
cis-1,3-Dichloropropene (10061-01-5): Uses the toxicity information for 1,3-dichloropropene (542-75-6) in the EPA Regional Screening Level Table
Dibenz[a,h]anthracene (53-70-3): CPF is calculated using the benzo(a)pyrene IUR multiplied by a TEF of 0.1 per WAC 173-340-708(8)(e)
Endosulfan I (959-98-8): Uses the toxicity information for Endosulfan (115-29-7) in the EPA Regional Screening Level Table
Endosulfan II (33213-65-9): Uses the toxicity information for Endosulfan (115-29-7) in the EPA Regional Screening Level Table
Fluoride (16984-48-8): Uses the toxicity information for Fluorine (Soluble Fluoride) (7782-41-4) in the EPA Regional Screening Level Table
gamma-Chlordane (5566-34-7): Uses the toxicity information for chlordane (12789-03-6) in the EPA Regional Screening Level Table
Indeno(1,2,3-cd)pyrene (193-39-5): CPF is calculated using the benzo(a)pyrene IUR multiplied by a TEF of 0.1 per WAC 173-340-708(8)(e)
Manganese (7439-96-5): Uses the toxicity information for Manganese (Diet) (7439-96-5) in the EPA Regional Screening Level Table
Mercury (7439-97-6): Uses the toxicity information for Mercuric Chloride (and other Mercury Salts) (7487-94-7) in the EPA Regional Screening Level Table
Nitrate (14797-55-8): Uses derived toxicity information based on a conversion factor of 0.226 NO3-N/NO3 and the toxicity information provided for Nitrate (14797-55-8) in the form of nitrate as nitrogen in the EPA Regional Screening Level Table
Nitrite (14797-65-0): Uses derived toxicity information based on a conversion factor of 0.304 NO2-N/NO2 and the toxicity information provided for Nitrite (14797-55-8) in the form of nitrite as nitrogen in the EPA Regional Screening Level Table
Nitrogen in Nitrate (NO3-N): Uses toxicity information for Nitrate (14797-55-8) in the form of nitrate as nitrogen in the EPA Regional Screening Level Table
Nitrogen in Nitrite (NO2-N): Uses toxicity information for Nitrite (14797-55-8) in the form of nitrite as nitrogen in the EPA Regional Screening Level Table
Nitrogen in Nitrite and Nitrate (NO2+NO3-N): Uses toxicity information for Nitrate (14797-55-8) in the form of nitrate as nitrogen in the EPA Regional Screening Level Table; However no toxicity information is provided for Nitrate + Nitrite (as N) (NA) in the EPA Regional Screening Level Table
Phosphate (14265-44-2): No toxicity information provided for non-specific phosphates
Phosphorus (7723-14-0): Total phosphorous result; Phosphorous, White (7723-14-0) is not applicable; no toxicity information provided for non-specific phosphates
Phosphorus in phosphate (PO4-P): No toxicity information provided for non-specific phosphates
Total PCBs (1336-36-3): Uses the toxicity information for Polychlorinated Biphenyls (high risk) (1336-36-3) in the EPA Regional Screening Level Table
Total Polychlorinated Biphenyls (TOTALPCB): Uses the toxicity information for Polychlorinated Biphenyls (high risk) (1336-36-3) in the EPA Regional Screening Level Table
trans-1,3-Dichloropropene (10061-02-6): Uses the toxicity information for 1,3-dichloropropene (542-75-6) in the EPA Regional Screening Level Table
trans-Chlordane (5103-74-2): Uses the toxicity information for chlordane (12789-03-6) in the EPA Regional Screening Level Table
Uranium (7440-61-1): Uses the toxicity information obtained from Risk Assessment Information System
Vanadium (7440-62-2): Uses the toxicity information for Vanadium and Compounds (NA) I the EPA Regional Screening Level Table

6 Calculation

Calculate casual recreational user PRGs using the methodology presented in Section 3. PRG calculations are validated by comparison with hand calculations. Hand calculations are included Appendix A.

The detailed calculations are in a Microsoft Excel workbook named < ECF-Hanford-10-0445 100 and 300 Area Calculation of Nonradionuclide PRGs for the Casual User Scenario.xlsx>. The worksheets used to calculate the nonradiological PRGs for the casual recreational user exposure scenario are provided in Appendix B.

Table 8: Worksheets Used to Calculate Nonradiological PRGs for the Casual Recreational User Exposure Scenario

Appendix B, Table B-1	Summary of Incidental Soil Ingestion PRG values for Carcinogens and Noncarcinogens
Appendix B, Table A-2	Summary of Dermal Contact PRG values for Carcinogens and Noncarcinogens
Appendix B, Table A-3	Summary of Inhalation PRG values for Carcinogens and Noncarcinogens
Appenddix B, Table A-4	Summary of Input Parameters used to Calculate the Particulate Emission Factor

7 Results/Conclusions

A summary of the PRGs for the casual recreational user scenario are presented in Table 9.

Table 9. Summary of Casual Recreational User Preliminary Remediation Goals for Carcinogens and Noncarcinogens

		Carcinogenic Preliminary Remediation Goals			Noncarcinogenic Preliminary Remediation Goals			Total Preliminary Remediation Goals		
CAS #	Analyte	Ingestion PRG mg/kg	Dermal Contact PRG mg/kg	Inhalation PRG mg/kg	Ingestion PRG mg/kg	Dermal Contact PRG mg/kg	Inhalation PRG mg/kg	Total PRG (Carcinogens) mg/kg	Total PRG (noncarcinogens) mg/kg	Final PRG mg/kg
630-20-6	1,1,1,2-Tetrachloroethane	2.87E+02	--	5.57E+01	2.74E+04	--	--	4.66E+01	2.74E+04	4.66E+01
71-55-6	1,1,1-Trichloroethane	--	--	--	1.83E+06	--	3.88E+05	--	3.20E+05	3.20E+05
79-34-5	1,1,2,2-Tetrachloroethane	3.73E+01	--	1.78E+01	1.83E+04	--	--	1.21E+01	1.83E+04	1.21E+01
79-00-5	1,1,2-Trichloroethane	1.31E+02	--	3.40E+01	3.65E+03	--	4.66E+01	2.70E+01	4.61E+01	2.70E+01
75-34-3	1,1-Dichloroethane	1.31E+03	--	1.27E+02	1.83E+05	--	--	1.16E+02	1.83E+05	1.16E+02
75-35-4	1,1-Dichloroethene	--	--	--	4.56E+04	--	1.09E+04	--	8.80E+03	8.80E+03
96-18-4	1,2,3-Trichloropropane	5.80E-02	--	--	3.65E+03	--	1.35E+02	5.80E-02	1.30E+02	5.80E-02
95-94-3	1,2,4,5-Tetrachlorobenzene	--	--	--	2.74E+02	9.78E+02	--	--	2.14E+02	2.14E+02
120-82-1	1,2,4-Trichlorobenzene	2.57E+02	--	--	9.13E+03	--	1.52E+03	2.57E+02	1.30E+03	2.57E+02
96-12-8	1,2-Dibromo-3-chloropropane	2.17E+00	--	1.40E-01	1.83E+02	--	1.83E+02	1.32E-01	9.13E+01	1.32E-01
106-93-4	1,2-Dibromoethane	3.73E+00	--	1.30E+00	8.21E+03	--	3.01E+03	9.64E-01	2.20E+03	9.64E-01
95-50-1	1,2-Dichlorobenzene	--	--	--	8.21E+04	--	5.81E+04	--	3.40E+04	3.40E+04
107-06-2	1,2-Dichloroethane	8.19E+01	--	1.60E+01	5.48E+03	--	1.25E+03	1.34E+01	1.01E+03	1.34E+01
540-59-0	1,2-Dichloroethene (Total)	--	--	--	8.21E+03	--	--	--	8.21E+03	8.21E+03
78-87-5	1,2-Dichloropropane	2.07E+02	--	2.85E+01	8.21E+04	--	4.89E+02	2.51E+01	4.86E+02	2.51E+01
541-73-1	1,3-Dichlorobenzene	--	--	--	--	--	--	--	--	--
106-46-7	1,4-Dichlorobenzene	1.38E+03	--	6.71E+01	6.39E+04	--	2.53E+05	6.40E+01	5.10E+04	6.40E+01
123-91-1	1,4-Dioxane	7.45E+01	2.36E+02	6.19E+02	2.74E+04	9.78E+04	6.13E+06	5.19E+01	2.13E+04	5.19E+01
71-36-3	1-Butanol	--	--	--	9.13E+04	--	--	--	9.13E+04	9.13E+04
71-23-8	1-Propanol	--	--	--	--	--	--	--	--	--
93-65-2	2-(2-methyl-4-chlorophenoxy) propionic acid	--	--	--	9.13E+02	--	--	--	9.13E+02	9.13E+02
39635-31-9	2,3,3',4,4',5,5'-Heptachlorobiphenyl	1.91E+00	2.02E+01	7.27E+06	3.01E+01	3.58E+02	4.62E+09	1.75E+00	2.78E+01	1.75E+00
69782-90-7	2,3,3',4,4',5'-Hexachlorobiphenyl	1.91E+00	2.02E+01	7.27E+06	3.01E+01	3.58E+02	4.62E+09	1.75E+00	2.78E+01	1.75E+00
38380-08-4	2,3,3',4,4',5-Hexachlorobiphenyl	1.91E+00	2.02E+01	7.27E+06	3.01E+01	3.58E+02	4.62E+09	1.75E+00	2.78E+01	1.75E+00
32598-14-4	2,3,3',4,4'-Pentachlorobiphenyl	1.91E+00	2.02E+01	7.27E+06	3.01E+01	3.58E+02	4.62E+09	1.75E+00	2.78E+01	1.75E+00
52663-72-6	2,3',4,4',5,5'-Hexachlorobiphenyl	1.91E+00	2.02E+01	7.27E+06	3.01E+01	3.58E+02	4.62E+09	1.75E+00	2.78E+01	1.75E+00
74472-37-0	2,3,4,4',5-Pentachlorobiphenyl	1.91E+00	2.02E+01	7.27E+06	3.01E+01	3.58E+02	4.62E+09	1.75E+00	2.78E+01	1.75E+00
65510-44-3	2',3,4,4',5-Pentachlorobiphenyl	1.91E+00	2.02E+01	7.27E+06	3.01E+01	3.58E+02	4.62E+09	1.75E+00	2.78E+01	1.75E+00
31508-00-6	2,3',4,4',5-Pentachlorobiphenyl	1.91E+00	2.02E+01	7.27E+06	3.01E+01	3.58E+02	4.62E+09	1.75E+00	2.78E+01	1.75E+00
58-90-2	2,3,4,6-Tetrachlorophenol	--	--	--	2.74E+04	9.78E+04	--	--	2.14E+04	2.14E+04
93-76-5	2,4,5-T(2,4,5-Trichlorophenoxyacetic acid)	--	--	--	9.13E+03	--	--	--	9.13E+03	9.13E+03
93-72-1	2,4,5-TP(2-(2,4,5-Trichlorophenoxy)propionic acid)S	--	--	--	7.30E+03	--	--	--	7.30E+03	7.30E+03
95-95-4	2,4,5-Trichlorophenol	--	--	--	9.13E+04	3.26E+05	--	--	7.13E+04	7.13E+04
88-06-2	2,4,6-Trichlorophenol	6.77E+02	2.15E+03	4.31E+03	9.13E+02	3.26E+03	--	4.60E+02	7.13E+02	4.60E+02
94-75-7	2,4-D(2,4-Dichlorophenoxyacetic acid)	--	--	--	9.13E+03	6.52E+04	--	--	8.00E+03	8.00E+03
94-82-6	2,4-DB(4-(2,4-Dichlorophenoxy)butanoic acid)	--	--	--	7.30E+03	--	--	--	7.30E+03	7.30E+03
120-83-2	2,4-Dichlorophenol	--	--	--	2.74E+03	9.78E+03	--	--	2.14E+03	2.14E+03
105-67-9	2,4-Dimethylphenol	--	--	--	1.83E+04	6.52E+04	--	--	1.43E+04	1.43E+04
51-28-5	2,4-Dinitrophenol	--	--	--	1.83E+03	6.52E+03	--	--	1.43E+03	1.43E+03
121-14-2	2,4-Dinitrotoluene	2.40E+01	7.47E+01	9.31E+07	1.83E+03	6.39E+03	--	1.82E+01	1.42E+03	1.82E+01
606-20-2	2,6-Dinitrotoluene	--	--	--	9.13E+02	3.29E+03	--	--	7.14E+02	7.14E+02
53-96-3	2-Acetylaminofluorene	1.96E+00	6.21E+00	6.37E+06	--	--	--	1.49E+00	--	1.49E+00
78-93-3	2-Butanone	--	--	--	5.48E+05	--	3.03E+06	--	4.64E+05	4.64E+05
111-76-2	2-Butoxyethanol	--	--	--	9.13E+04	--	6.23E+06	--	8.99E+04	8.99E+04
91-58-7	2-Chloronaphthalene	--	--	--	7.30E+04	--	--	--	7.30E+04	7.30E+04
95-57-8	2-Chlorophenol	--	--	--	4.56E+03	--	--	--	4.56E+03	4.56E+03
591-78-6	2-Hexanone	--	--	--	4.56E+03	--	1.70E+04	--	3.60E+03	3.60E+03
94-74-6	2-Methyl-4 chlorophenoxyacetic acid	--	--	--	4.56E+02	--	--	--	4.56E+02	4.56E+02
91-57-6	2-methylnaphthalene	--	--	--	3.65E+03	1.00E+04	--	--	2.68E+03	2.68E+03
95-48-7	2-Methylphenol (cresol, o-)	--	--	--	4.56E+04	1.63E+05	5.53E+06	--	3.54E+04	3.54E+04
91-59-8	2-Naphthylamine	4.14E+00	1.31E+01	--	--	--	--	3.15E+00	--	3.15E+00
88-74-4	2-Nitroaniline	--	--	--	9.13E+03	3.26E+04	1.78E+08	--	7.13E+03	7.13E+03
88-75-5	2-Nitrophenol	--	--	--	--	--	--	--	--	--
108-10-1	2-Pentanone, 4-Methyl	--	--	--	7.30E+04	--	1.39E+06	--	6.94E+04	6.94E+04
32774-16-6	3,3',4,4',5,5'-Hexachlorobiphenyl	1.91E-03	2.02E-02	7.27E+03	3.01E-02	3.58E-01	4.62E+06	1.75E-03	2.78E-02	1.75E-03
57465-28-8	3,3',4,4',5-Pentachlorobiphenyl	5.73E-04	6.05E-03	2.18E+03	9.13E-03	1.09E-01	1.42E+06	5.24E-04	8.42E-03	5.24E-04
32598-13-3	3,3',4,4'-Tetrachlorobiphenyl	5.73E-01	6.05E+00	2.18E+06	9.13E+00	1.09E+02	1.42E+09	5.24E-01	8.42E+00	5.24E-01
91-94-1	3,3'-Dichlorobenzidine	1.66E+01	5.25E+01	2.44E+07	--	--	--	1.26E+01	--	1.26E+01
119-93-7	3,3'-Dimethylbenzidine	6.77E-01	2.15E+00	--	--	--	--	5.15E-01	--	5.15E-01
70362-50-4	3,4,4',5- Tetrachlorobiphenyl	1.91E-01	2.02E+00	7.27E+05	3.01E+00	3.58E+01	4.62E+08	1.75E-01	2.78E+00	1.75E-01
65794-96-9	3+4 Methylphenol (cresol, m+p)	--	--	--	--	--	--	--	--	--

Table 9. Summary of Casual Recreational User Preliminary Remediation Goals for Carcinogens and Noncarcinogens

		Carcinogenic Preliminary Remediation Goals			Noncarcinogenic Preliminary Remediation Goals			Total Preliminary Remediation Goals		
CAS #	Analyte	Ingestion PRG mg/kg	Dermal Contact PRG mg/kg	Inhalation PRG mg/kg	Ingestion PRG mg/kg	Dermal Contact PRG mg/kg	Inhalation PRG mg/kg	Total PRG (Carcinogens) mg/kg	Total PRG (noncarcinogens) mg/kg	Final PRG mg/kg
56-49-5	3-Methylcholanthrene	7.91E-02	2.68E-01	5.19E+05	--	--	--	6.11E-02	--	6.11E-02
99-09-2	3-Nitroaniline	3.55E+02	1.12E+03	--	2.74E+02	9.78E+02	3.55E+09	2.70E+02	2.14E+02	2.14E+02
72-54-8	4,4'-DDD (Dichlorodiphenyldichloroethane)	3.11E+01	9.84E+01	1.20E+08	--	--	--	2.36E+01	--	2.36E+01
72-55-9	4,4'-DDE (Dichlorodiphenyldichloroethylene)	2.19E+01	6.94E+01	8.54E+07	--	--	--	1.67E+01	--	1.67E+01
50-29-3	4,4'-DDT (Dichlorodiphenyltrichloroethane)	2.19E+01	2.31E+02	8.54E+07	4.56E+02	5.43E+03	--	2.00E+01	4.21E+02	2.00E+01
534-52-1	4,6-Dinitro-2-methylphenol	--	--	--	7.30E+01	2.61E+02	--	--	5.70E+01	5.70E+01
1918-02-1	4-Amino-3,5,6-trichloropicolinic acid	--	--	--	6.39E+04	--	--	--	6.39E+04	6.39E+04
92-67-1	4-Aminobiphenyl	3.55E-01	1.12E+00	1.38E+06	--	--	--	2.70E-01	--	2.70E-01
101-55-3	4-Bromophenylphenyl ether	--	--	--	--	--	--	--	--	--
59-50-7	4-Chloro-3-methylphenol	--	--	--	9.13E+04	3.26E+05	--	--	7.13E+04	7.13E+04
106-47-8	4-Chloroaniline	3.73E+01	1.18E+02	--	3.65E+03	1.30E+04	--	2.83E+01	2.85E+03	2.83E+01
7005-72-3	4-Chlorophenylphenyl ether	--	--	--	--	--	--	--	--	--
106-44-5	4-Methylphenol (cresol, p-)	--	--	--	9.13E+04	3.26E+05	5.95E+06	--	7.04E+04	7.04E+04
100-01-6	4-Nitroaniline	3.73E+02	1.18E+03	--	3.65E+03	1.30E+04	2.13E+10	2.83E+02	2.85E+03	2.83E+02
100-02-7	4-Nitrophenol	--	--	--	--	--	--	--	--	--
99-55-8	5-Nitro-o-toluidine	8.28E+02	2.62E+03	--	1.83E+04	6.52E+04	--	6.29E+02	1.43E+04	6.29E+02
83-32-9	Acenaphthene	--	--	--	5.48E+04	1.50E+05	--	--	4.01E+04	4.01E+04
208-96-8	Acenaphthylene	--	--	--	--	--	--	--	--	--
67-64-1	Acetone	--	--	--	8.21E+05	--	2.07E+07	--	7.90E+05	7.90E+05
75-05-8	Acetonitrile	--	--	--	--	--	3.85E+04	--	3.85E+04	3.85E+04
98-86-2	Acetophenone	--	--	--	9.13E+04	--	--	--	9.13E+04	9.13E+04
107-02-8	Acrolein	--	--	--	4.56E+02	--	7.39E+00	--	7.27E+00	7.27E+00
79-06-1	Acrylamide	1.49E+01	--	1.64E+02	1.83E+03	--	4.23E+04	1.37E+01	1.75E+03	1.37E+01
107-13-1	Acrylonitrile	1.38E+01	--	1.22E+01	3.65E+04	--	7.14E+02	6.49E+00	7.00E+02	6.49E+00
309-00-2	Aldrin	4.38E-01	1.39E+00	5.64E+00	2.74E+01	9.78E+01	--	3.15E-01	2.14E+01	3.15E-01
107-05-1	Allyl chloride	3.55E+02	--	2.46E+01	--	--	6.32E+01	2.30E+01	6.32E+01	2.30E+01
319-84-6	Alpha-BHC	1.18E+00	3.75E+00	4.60E+06	7.30E+03	2.61E+04	--	8.99E-01	5.70E+03	8.99E-01
5103-71-9	Alpha-Chlordane	2.13E+01	1.69E+02	8.28E+07	4.56E+02	4.07E+03	2.49E+09	1.89E+01	4.10E+02	1.89E+01
7429-90-5	Aluminum	--	--	--	9.13E+05	--	1.78E+10	--	9.12E+05	9.12E+05
62-53-3	Aniline	1.31E+03	4.14E+03	5.79E+03	6.39E+03	2.28E+04	3.97E+03	8.48E+02	2.21E+03	8.48E+02
120-12-7	Anthracene	--	--	--	2.74E+05	7.52E+05	--	--	2.01E+05	2.01E+05
7440-36-0	Antimony	--	--	--	3.65E+02	--	--	--	3.65E+02	3.65E+02
140-57-8	Aramite	2.98E+02	9.44E+02	1.17E+09	4.56E+04	1.63E+05	--	2.27E+02	3.56E+04	2.27E+02
12674-11-2	Aroclor-1016	1.06E+02	2.41E+02	4.14E+08	6.39E+01	1.63E+02	--	7.38E+01	4.59E+01	4.59E+01
11104-28-2	Aroclor-1221	3.73E+00	8.43E+00	8.66E+00	--	--	--	1.99E+00	--	1.99E+00
11141-16-5	Aroclor-1232	3.73E+00	8.43E+00	8.66E+00	--	--	--	1.99E+00	--	1.99E+00
53469-21-9	Aroclor-1242	3.73E+00	8.43E+00	1.45E+07	--	--	--	2.58E+00	--	2.58E+00
12672-29-6	Aroclor-1248	3.73E+00	8.43E+00	1.45E+07	--	--	--	2.58E+00	--	2.58E+00
11097-69-1	Aroclor-1254	3.73E+00	8.43E+00	1.45E+07	1.83E+01	4.66E+01	--	2.58E+00	1.31E+01	2.58E+00
11096-82-5	Aroclor-1260	3.73E+00	8.43E+00	1.45E+07	--	--	--	2.58E+00	--	2.58E+00
37324-23-5	Aroclor-1262	--	--	--	--	--	--	--	--	--
11100-14-4	Aroclor-1268	--	--	--	--	--	--	--	--	--
7440-38-2	Arsenic	4.97E+00	5.25E+01	1.93E+06	2.74E+02	3.26E+03	5.33E+07	4.54E+00	2.53E+02	4.54E+00
103-33-3	Azobenzene	6.77E+01	--	8.88E+02	--	--	--	6.29E+01	--	6.29E+01
7440-39-3	Barium	--	--	--	1.83E+05	--	1.78E+09	--	1.82E+05	1.82E+05
71-43-2	Benzene	1.35E+02	--	2.59E+01	3.65E+03	--	2.60E+03	2.18E+01	1.52E+03	2.18E+01
56-55-3	Benzo(a)anthracene	2.38E+00	6.21E+00	2.97E+07	--	--	--	1.72E+00	--	1.72E+00
50-32-8	Benzo(a)pyrene	2.38E-01	6.21E-01	2.97E+06	--	--	--	1.72E-01	--	1.72E-01
205-99-2	Benzo(b)fluoranthene	2.38E+00	6.21E+00	2.97E+07	--	--	--	1.72E+00	--	1.72E+00
191-24-2	Benzo(g,h,i)perylene	--	--	--	--	--	--	--	--	--
207-08-9	Benzo(k)fluoranthene	2.38E+00	6.21E+00	2.97E+07	--	--	--	1.72E+00	--	1.72E+00
65-85-0	Benzoic acid	--	--	--	3.65E+06	1.30E+07	--	--	2.85E+06	2.85E+06
100-51-6	Benzyl alcohol	--	--	--	9.13E+04	3.26E+05	--	--	7.13E+04	7.13E+04
7440-41-7	Beryllium	--	--	3.45E+06	1.83E+03	--	7.10E+07	3.45E+06	1.82E+03	1.82E+03
319-85-7	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC	4.14E+00	1.31E+01	1.56E+07	--	--	--	3.15E+00	--	3.15E+00
108-60-1	Bis(2-chloro-1-methylethyl)ether	1.06E+02	--	2.16E+02	3.65E+04	--	--	7.13E+01	3.65E+04	7.13E+01
111-91-1	Bis(2-Chloroethoxy)methane	--	--	--	2.74E+03	9.78E+03	--	--	2.14E+03	2.14E+03
111-44-4	Bis(2-chloroethyl) ether	6.77E+00	--	1.24E+01	--	--	--	4.38E+00	--	4.38E+00
117-81-7	Bis(2-ethylhexyl) phthalate	5.32E+02	1.69E+03	3.45E+09	1.83E+04	6.52E+04	--	4.05E+02	1.43E+04	4.05E+02
7440-69-9	Bismuth	--	--	--	--	--	--	--	--	--
7440-42-8	Boron	--	--	--	1.83E+05	--	7.10E+10	--	1.82E+05	1.82E+05

Table 9. Summary of Casual Recreational User Preliminary Remediation Goals for Carcinogens and Noncarcinogens

		Carcinogenic Preliminary Remediation Goals			Noncarcinogenic Preliminary Remediation Goals			Total Preliminary Remediation Goals		
CAS #	Analyte	Ingestion PRG mg/kg	Dermal Contact PRG mg/kg	Inhalation PRG mg/kg	Ingestion PRG mg/kg	Dermal Contact PRG mg/kg	Inhalation PRG mg/kg	Total PRG (Carcinogens) mg/kg	Total PRG (noncarcinogens) mg/kg	Final PRG mg/kg
24959-67-9	Bromide	--	--	--	--	--	--	--	--	--
75-27-4	Bromodichloromethane	1.20E+02	--	1.16E+01	1.83E+04	--	--	1.06E+01	1.83E+04	1.06E+01
75-25-2	Bromoform	9.43E+02	--	9.94E+02	1.83E+04	--	--	4.84E+02	1.83E+04	4.84E+02
74-83-9	Bromomethane	--	--	--	1.28E+03	--	3.38E+02	--	2.67E+02	2.67E+02
85-68-7	Butylbenzylphthalate	3.92E+03	1.24E+04	--	1.83E+05	6.52E+05	--	2.98E+03	1.43E+05	2.98E+03
7440-43-9	Cadmium	--	--	4.60E+06	9.13E+02	8.15E+03	7.10E+07	4.60E+06	8.21E+02	8.21E+02
7440-70-2	Calcium	--	--	--	--	--	--	--	--	--
86-74-8	Carbazole	3.73E+02	1.18E+03	--	--	--	--	2.83E+02	--	2.83E+02
75-15-0	Carbon disulfide	--	--	--	9.13E+04	--	3.25E+04	--	2.40E+04	2.40E+04
56-23-5	Carbon tetrachloride	1.06E+02	--	2.78E+01	3.65E+03	--	7.15E+03	2.20E+01	2.42E+03	2.20E+01
57-74-9	Chlordane	2.13E+01	1.69E+02	8.28E+07	4.56E+02	4.07E+03	2.49E+09	1.89E+01	4.10E+02	1.89E+01
16887-00-6	Chloride	--	--	--	--	--	--	--	--	--
108-90-7	Chlorobenzene	--	--	--	1.83E+04	--	7.75E+03	--	5.44E+03	5.44E+03
510-15-6	Chlorobenzilate	6.77E+01	2.15E+02	2.67E+08	1.83E+04	6.52E+04	--	5.15E+01	1.43E+04	5.15E+01
75-00-3	Chloroethane	--	--	--	--	--	5.74E+05	--	5.74E+05	5.74E+05
67-66-3	Chloroform	2.40E+02	--	1.10E+01	9.13E+03	--	1.06E+04	1.05E+01	4.91E+03	1.05E+01
74-87-3	Chloromethane	--	--	--	--	--	4.86E+03	--	4.86E+03	4.86E+03
126-99-8	Chloroprene	--	--	3.73E-01	1.83E+04	--	9.60E+02	3.73E-01	9.12E+02	3.73E-01
7440-47-3	Chromium	--	--	--	1.37E+06	--	--	--	1.37E+06	1.37E+06
218-01-9	Chrysene	2.38E+01	6.21E+01	2.97E+08	--	--	--	1.72E+01	--	1.72E+01
156-59-2	cis-1,2-Dichloroethylene	--	--	--	1.83E+03	--	--	--	1.83E+03	1.83E+03
10061-01-5	cis-1,3-Dichloropropene	7.45E+01	2.36E+02	3.49E+01	2.74E+04	9.78E+04	1.19E+03	2.16E+01	1.13E+03	2.16E+01
7440-48-4	Cobalt	--	--	9.20E+05	2.74E+02	--	2.13E+07	9.20E+05	2.74E+02	2.74E+02
PCB1242/1016	Co-elution of Aroclor 1242 and Aroclor 1016	--	--	--	--	--	--	--	--	--
7440-50-8	Copper	--	--	--	3.65E+04	--	--	--	3.65E+04	3.65E+04
57-12-5	Cyanide	--	--	--	5.48E+02	--	2.04E+03	--	4.32E+02	4.32E+02
110-82-7	Cyclohexane	--	--	--	--	--	2.78E+05	--	2.78E+05	2.78E+05
108-94-1	Cyclohexanone	--	--	--	4.56E+06	--	1.21E+06	--	9.57E+05	9.57E+05
75-99-0	Dalapon	--	--	--	2.74E+04	--	--	--	2.74E+04	2.74E+04
124-18-5	Decane	--	--	--	--	--	--	--	--	--
319-86-8	Delta-BHC	--	--	--	--	--	--	--	--	--
2303-16-4	Diallate	1.22E+02	3.87E+02	--	--	--	--	9.29E+01	--	9.29E+01
53-70-3	Dibenz[a,h]anthracene	2.38E+00	6.21E+00	2.97E+07	--	--	--	1.72E+00	--	1.72E+00
132-64-9	Dibenzofuran	--	--	--	9.13E+02	3.26E+03	--	--	7.13E+02	7.13E+02
124-48-1	Dibromochloromethane	8.87E+01	--	2.83E+01	1.83E+04	--	--	2.15E+01	1.83E+04	2.15E+01
74-95-3	Dibromomethane	--	--	--	9.13E+03	--	9.09E+02	--	8.27E+02	8.27E+02
1918-00-9	Dicamba	--	--	--	2.74E+04	--	--	--	2.74E+04	2.74E+04
75-71-8	Dichlorodifluoromethane	--	--	--	1.83E+05	--	4.43E+03	--	4.32E+03	4.32E+03
120-36-5	Dichloroprop	--	--	--	--	--	--	--	--	--
60-57-1	Dieldrin	4.66E-01	1.48E+00	1.80E+06	4.56E+01	1.63E+02	--	3.54E-01	3.56E+01	3.54E-01
60-29-7	Diethyl ether	--	--	--	1.83E+05	--	--	--	1.83E+05	1.83E+05
84-66-2	Diethylphthalate	--	--	--	7.30E+05	2.61E+06	--	--	5.70E+05	5.70E+05
60-51-5	Dimethoate	--	--	--	1.83E+02	6.52E+02	--	--	1.43E+02	1.43E+02
131-11-3	Dimethyl phthalate	--	--	--	--	--	--	--	--	--
84-74-2	Di-n-butylphthalate	--	--	--	9.13E+04	3.26E+05	--	--	7.13E+04	7.13E+04
117-84-0	Di-n-octylphthalate	--	--	--	1.10E+04	3.91E+04	--	--	8.55E+03	8.55E+03
88-85-7	Dinoseb(2-secButyl-4,6-dinitrophenol)	--	--	--	9.13E+02	3.26E+03	--	--	7.13E+02	7.13E+02
298-04-4	Disulfoton	--	--	--	3.65E+01	1.30E+02	--	--	2.85E+01	2.85E+01
959-98-8	Endosulfan I	--	--	--	5.48E+03	1.96E+04	--	--	4.28E+03	4.28E+03
33213-65-9	Endosulfan II	--	--	--	5.48E+03	1.96E+04	--	--	4.28E+03	4.28E+03
1031-07-8	Endosulfan sulfate	--	--	--	--	--	--	--	--	--
72-20-8	Endrin	--	--	--	2.74E+02	9.78E+02	--	--	2.14E+02	2.14E+02
7421-93-4	Endrin Aldehyde	--	--	--	--	--	--	--	--	--
53494-70-5	Endrin ketone	--	--	--	--	--	--	--	--	--
64-17-5	Ethanol	--	--	--	--	--	--	--	--	--
141-78-6	Ethyl acetate	--	--	--	8.21E+05	--	--	--	8.21E+05	8.21E+05
97-63-2	Ethyl methacrylate	--	--	--	8.21E+04	--	7.29E+04	--	3.86E+04	3.86E+04
100-41-4	Ethylbenzene	6.77E+02	--	1.04E+02	9.13E+04	--	1.11E+05	8.99E+01	5.01E+04	8.99E+01
107-21-1	Ethylene glycol	--	--	--	1.83E+06	--	2.52E+06	--	1.06E+06	1.06E+06
206-44-0	Fluoranthene	--	--	--	3.65E+04	1.00E+05	--	--	2.68E+04	2.68E+04
86-73-7	Fluorene	--	--	--	3.65E+04	1.00E+05	--	--	2.68E+04	2.68E+04

Table 9. Summary of Casual Recreational User Preliminary Remediation Goals for Carcinogens and Noncarcinogens

		Carcinogenic Preliminary Remediation Goals			Noncarcinogenic Preliminary Remediation Goals			Total Preliminary Remediation Goals		
CAS #	Analyte	Ingestion PRG mg/kg	Dermal Contact PRG mg/kg	Inhalation PRG mg/kg	Ingestion PRG mg/kg	Dermal Contact PRG mg/kg	Inhalation PRG mg/kg	Total PRG (Carcinogens) mg/kg	Total PRG (noncarcinogens) mg/kg	Final PRG mg/kg
16984-48-8	Fluoride	--	--	--	5.48E+04	--	4.62E+10	--	5.47E+04	5.47E+04
58-89-9	Gamma-BHC (Lindane)	6.77E+00	5.36E+01	2.67E+07	2.74E+02	2.44E+03	--	6.02E+00	2.46E+02	6.02E+00
5566-34-7	gamma-Chlordane	2.13E+01	1.69E+02	8.28E+07	4.56E+02	4.07E+03	2.49E+09	1.89E+01	4.10E+02	1.89E+01
76-44-8	Heptachlor	1.66E+00	5.25E+00	6.37E+06	4.56E+02	1.63E+03	--	1.26E+00	3.56E+02	1.26E+00
1024-57-3	Heptachlor epoxide	8.19E-01	2.59E+00	5.90E+01	1.19E+01	4.24E+01	--	6.16E-01	9.27E+00	6.16E-01
118-74-1	Hexachlorobenzene	4.66E+00	1.48E+01	1.80E+07	7.30E+02	2.61E+03	--	3.54E+00	5.70E+02	3.54E+00
87-68-3	Hexachlorobutadiene	9.55E+01	3.03E+02	2.25E+02	9.13E+02	3.26E+03	--	5.49E+01	7.13E+02	5.49E+01
77-47-4	Hexachlorocyclopentadiene	--	--	--	5.48E+03	1.96E+04	4.45E+02	--	4.03E+02	4.03E+02
67-72-1	Hexachloroethane	1.86E+02	5.90E+02	1.12E+02	6.39E+02	2.28E+03	1.59E+04	6.26E+01	4.84E+02	6.26E+01
70-30-4	Hexachlorophene	--	--	--	2.74E+02	9.78E+02	--	--	2.14E+02	2.14E+02
110-54-3	Hexane	--	--	--	5.48E+04	--	3.44E+04	--	2.11E+04	2.11E+04
18540-29-9	Hexavalent Chromium	--	--	9.86E+04	2.74E+03	--	3.55E+08	9.86E+04	2.74E+03	2.74E+03
302-01-2	Hydrazine	2.48E+00	--	1.69E+06	--	--	1.07E+08	2.48E+00	1.07E+08	2.48E+00
193-39-5	Indeno(1,2,3-cd)pyrene	2.38E+00	6.21E+00	2.97E+07	--	--	--	1.72E+00	--	1.72E+00
7439-89-6	Iron	--	--	--	6.39E+05	--	--	--	6.39E+05	6.39E+05
78-83-1	Isobutyl alcohol	--	--	--	2.74E+05	--	--	--	2.74E+05	2.74E+05
78-59-1	Isophorone	7.84E+03	2.48E+04	--	1.83E+05	6.52E+05	5.38E+06	5.96E+03	1.39E+05	5.96E+03
98-82-8	Isopropylbenzene	--	--	--	9.13E+04	--	6.12E+04	--	3.66E+04	3.66E+04
143-50-0	Kepone	7.45E-01	2.36E+00	1.80E+06	2.74E+02	9.78E+02	--	5.66E-01	2.14E+02	5.66E-01
7439-92-1	Lead	--	--	--	--	--	--	--	--	--
7439-93-2	Lithium	--	--	--	1.83E+03	--	--	--	1.83E+03	1.83E+03
7439-95-4	Magnesium	--	--	--	--	--	--	--	--	--
7439-96-5	Manganese	--	--	--	1.28E+05	--	1.78E+08	--	1.28E+05	1.28E+05
99-65-0	m-Dinitrobenzene	--	--	--	9.13E+01	3.26E+02	--	--	7.13E+01	7.13E+01
7439-97-6	Mercury	--	--	--	2.74E+02	--	1.07E+09	--	2.74E+02	2.74E+02
126-98-7	Methacrylonitrile	--	--	--	9.13E+01	--	8.91E+03	--	9.03E+01	9.03E+01
67-56-1	Methanol	--	--	--	4.56E+05	--	6.20E+06	--	4.25E+05	4.25E+05
72-43-5	Methoxychlor	--	--	--	4.56E+03	1.63E+04	--	--	3.56E+03	3.56E+03
80-62-6	Methyl methacrylate	--	--	--	1.28E+06	--	2.04E+05	--	1.76E+05	1.76E+05
66-27-3	Methyl methanesulfonate	7.53E+01	2.38E+02	2.96E+08	--	--	--	5.72E+01	--	5.72E+01
298-00-0	Methyl parathion	--	--	--	2.28E+02	8.15E+02	--	--	1.78E+02	1.78E+02
75-09-2	Methylene chloride	3.73E+03	--	2.40E+04	5.48E+03	--	6.17E+04	3.23E+03	5.03E+03	3.23E+03
7439-98-7	Molybdenum	--	--	--	4.56E+03	--	--	--	4.56E+03	4.56E+03
108-38-3	m-Xylene	--	--	--	1.83E+05	--	1.13E+04	--	1.07E+04	1.07E+04
91-20-3	Naphthalene	--	--	6.16E+01	1.83E+04	5.01E+04	2.69E+03	6.16E+01	2.24E+03	6.16E+01
104-51-8	n-Butylbenzene	--	--	--	4.56E+04	--	--	--	4.56E+04	4.56E+04
7440-02-0	Nickel	--	--	3.19E+07	1.83E+04	--	3.20E+08	3.19E+07	1.82E+04	1.82E+04
14797-55-8	Nitrate	--	--	--	6.48E+06	--	--	--	6.48E+06	6.48E+06
14797-65-0	Nitrite	--	--	--	2.74E+05	--	--	--	2.74E+05	2.74E+05
98-95-3	Nitrobenzene	--	--	9.05E+01	1.83E+03	--	1.40E+04	9.05E+01	1.61E+03	9.05E+01
NO3-N	Nitrogen in Nitrate	--	--	--	1.46E+06	--	--	--	1.46E+06	1.46E+06
NO2-N	Nitrogen in Nitrite	--	--	--	9.13E+04	--	--	--	9.13E+04	9.13E+04
NO2+NO3-N	Nitrogen in Nitrite and Nitrate	--	--	--	1.46E+06	--	--	--	1.46E+06	1.46E+06
930-55-2	Nitrosopyrrolidine	3.55E+00	1.12E+01	3.92E+01	--	--	--	2.52E+00	--	2.52E+00
55-18-5	n-Nitrosodiethylamine	1.16E-02	3.93E-02	7.22E-02	--	--	--	7.97E-03	--	7.97E-03
62-75-9	n-Nitrosodimethylamine	3.41E-02	1.16E-01	2.13E-01	7.30E+00	2.61E+01	1.30E+02	2.34E-02	5.46E+00	2.34E-02
924-16-3	n-Nitrosodi-n-butylamine	1.38E+00	--	6.70E+00	--	--	--	1.14E+00	--	1.14E+00
621-64-7	n-Nitrosodi-n-dipropylamine	1.06E+00	3.37E+00	4.14E+06	--	--	--	8.09E-01	--	8.09E-01
86-30-6	n-Nitrosodiphenylamine	1.52E+03	4.82E+03	3.19E+09	--	--	--	1.16E+03	--	1.16E+03
10595-95-6	n-Nitrosomethylethylamine	3.39E-01	1.07E+00	1.31E+06	--	--	--	2.57E-01	--	2.57E-01
59-89-2	n-Nitrosomorpholine	1.11E+00	3.52E+00	4.36E+06	--	--	--	8.45E-01	--	8.45E-01
100-75-4	n-Nitrosopiperidine	7.93E-01	2.51E+00	3.07E+06	--	--	--	6.03E-01	--	6.03E-01
95-47-6	o-Xylene	--	--	--	1.83E+05	--	1.39E+04	--	1.29E+04	1.29E+04
56-38-2	Parathion	--	--	--	5.48E+03	1.96E+04	--	--	4.28E+03	4.28E+03
60-11-7	p-Dimethylaminoazobenzene	1.62E+00	5.13E+00	6.37E+06	--	--	--	1.23E+00	--	1.23E+00
608-93-5	Pentachlorobenzene	--	--	--	7.30E+02	2.61E+03	--	--	5.70E+02	5.70E+02
76-01-7	Pentachloroethane	8.28E+01	--	--	--	--	--	8.28E+01	--	8.28E+01
82-68-8	Pentachloronitrobenzene (PCNB)	2.87E+01	9.08E+01	--	2.74E+03	9.78E+03	--	2.18E+01	2.14E+03	2.18E+01
87-86-5	Pentachlorophenol	1.86E+01	2.36E+01	1.62E+09	4.56E+03	6.52E+03	--	1.04E+01	2.68E+03	1.04E+01
62-44-2	Phenacetin	3.39E+03	1.07E+04	1.31E+10	--	--	--	2.57E+03	--	2.57E+03
85-01-8	Phenanthrene	--	--	--	--	--	--	--	--	--

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		Carcinogenic Preliminary Remediation Goals			Noncarcinogenic Preliminary Remediation Goals			Total Preliminary Remediation Goals		
CAS #	Analyte	Ingestion PRG mg/kg	Dermal Contact PRG mg/kg	Inhalation PRG mg/kg	Ingestion PRG mg/kg	Dermal Contact PRG mg/kg	Inhalation PRG mg/kg	Total PRG (Carcinogens) mg/kg	Total PRG (noncarcinogens) mg/kg	Final PRG mg/kg
108-95-2	Phenol	--	--	--	2.74E+05	9.78E+05	1.22E+06	--	1.82E+05	1.82E+05
298-02-2	Phorate	--	--	--	1.83E+02	6.52E+02	--	--	1.43E+02	1.43E+02
14265-44-2	Phosphate	--	--	--	--	--	--	--	--	--
7723-14-0	Phosphorus	--	--	--	--	--	--	--	--	--
PO4-P	Phosphorus in phosphate	--	--	--	--	--	--	--	--	--
7440-09-7	Potassium	--	--	--	--	--	--	--	--	--
106-50-3	p-Phenylenediamine	--	--	--	1.73E+05	6.19E+05	--	--	1.35E+05	1.35E+05
23950-58-5	Pronamide	--	--	--	6.84E+04	2.44E+05	--	--	5.35E+04	5.35E+04
129-00-0	Pyrene	--	--	--	2.74E+04	7.52E+04	--	--	2.01E+04	2.01E+04
110-86-1	Pyridine	--	--	--	9.13E+02	--	--	--	9.13E+02	9.13E+02
94-59-7	Safrol	7.91E+00	2.68E+01	5.19E+07	--	--	--	6.11E+00	--	6.11E+00
7782-49-2	Selenium	--	--	--	4.56E+03	--	7.10E+10	--	4.56E+03	4.56E+03
7440-21-3	Silicon	--	--	--	--	--	--	--	--	--
7440-22-4	Silver	--	--	--	4.56E+03	--	--	--	4.56E+03	4.56E+03
7440-23-5	Sodium	--	--	--	--	--	--	--	--	--
7440-24-6	Strontium	--	--	--	5.48E+05	--	--	--	5.48E+05	5.48E+05
100-42-5	Styrene	--	--	--	1.83E+05	--	3.10E+05	--	1.15E+05	1.15E+05
14808-79-8	Sulfate	--	--	--	--	--	--	--	--	--
18496-25-8	Sulfide	--	--	--	--	--	--	--	--	--
99-35-4	sym-Trinitrobenzene	--	--	--	2.74E+04	5.15E+05	--	--	2.60E+04	2.60E+04
127-18-4	Tetrachloroethene	3.55E+03	--	8.96E+02	5.48E+03	--	3.99E+03	7.16E+02	2.31E+03	7.16E+02
3689-24-5	Tetraethyl dithiopyrophosphate (Sulfotepp)	--	--	--	4.56E+02	1.63E+03	--	--	3.56E+02	3.56E+02
7440-28-0	Thallium	--	--	--	--	--	--	--	--	--
7440-31-5	Tin	--	--	--	5.48E+05	--	--	--	5.48E+05	5.48E+05
7440-32-6	Titanium	--	--	--	--	--	--	--	--	--
108-88-3	Toluene	--	--	--	7.30E+04	--	5.07E+05	--	6.38E+04	6.38E+04
1336-36-3	Total PCBs	3.73E+00	8.43E+00	1.45E+07	--	--	--	2.58E+00	--	2.58E+00
TPH	Total petroleum hydrocarbons	--	--	--	--	--	--	--	--	--
TPHDIESEL	Total petroleum hydrocarbons - diesel range	--	--	--	--	--	--	--	--	--
TPHGASOLINE	Total petroleum hydrocarbons - gasoline range	--	--	--	--	--	--	--	--	--
TPHKEROSENE	Total petroleum hydrocarbons - kerosene range	--	--	--	--	--	--	--	--	--
TPH/OILH	Total petroleum hydrocarbons - motor oil (high boi	--	--	--	--	--	--	--	--	--
TOTALPCB	Total Polychlorinated Biphenyls	3.73E+00	8.43E+00	1.45E+07	--	--	--	2.58E+00	--	2.58E+00
8001-35-2	Toxaphene	6.77E+00	2.15E+01	2.59E+07	--	--	--	5.15E+00	--	5.15E+00
156-60-5	trans-1,2-Dichloroethylene	--	--	--	1.83E+04	--	4.10E+03	--	3.35E+03	3.35E+03
10061-02-6	trans-1,3-Dichloropropene	7.45E+01	2.36E+02	3.49E+01	2.74E+04	9.78E+04	1.19E+03	2.16E+01	1.13E+03	2.16E+01
5103-74-2	trans-Chlordane	2.13E+01	1.69E+02	8.28E+07	4.56E+02	4.07E+03	2.49E+09	1.89E+01	4.10E+02	1.89E+01
126-73-8	Tributyl phosphate	8.28E+02	--	--	9.13E+03	--	--	8.28E+02	9.13E+03	8.28E+02
79-01-6	Trichloroethene	1.62E+02	--	4.78E+01	4.56E+02	--	1.68E+02	3.69E+01	1.23E+02	3.69E+01
75-69-4	Trichloromonofluoromethane	--	--	--	2.74E+05	--	3.56E+04	--	3.15E+04	3.15E+04
7440-61-1	Uranium	--	--	--	2.74E+03	--	1.42E+08	--	2.74E+03	2.74E+03
7440-62-2	Vanadium	--	--	--	4.56E+03	--	--	--	4.56E+03	4.56E+03
108-05-4	Vinyl acetate	--	--	--	9.13E+05	--	4.28E+04	--	4.09E+04	4.09E+04
75-01-4	Vinyl chloride	1.03E-01	--	2.10E-01	2.74E+03	--	4.55E+03	6.92E-02	1.71E+03	6.92E-02
1330-20-7	Xylenes (total)	--	--	--	1.83E+05	--	1.10E+04	--	1.04E+04	1.04E+04
7440-66-6	Zinc	--	--	--	2.74E+05	--	--	--	2.74E+05	2.74E+05
7440-67-7	Zirconium	--	--	--	--	--	--	--	--	--

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Appendix A

Hand Calculations

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Linda Carr ①
4/17/13

Nonradiological PRGs for Casual User
ECF-Hanford-0445, Rev.1

- Incidental Soil Ingestion - Carcinogenic

$$PRG = \frac{TR * AT_{ca}}{CSF_o * IRS_{adj_cu} * EF_{cu} * UCF1}$$

where, $$IRS_{adj-cu} = \left(\frac{ED_{ccu} * IRS_{ccu}}{BW_{ccu}}\right) + \left(\frac{\left(ED_{a+ccu} - ED_{ccu}\right) * IRS_a}{BW_a}\right)$$

$$IRS_{adj_cu} = \frac{6yr * 200\frac{mg}{d}}{15\,kg} + \left[\frac{(30yr-6yr) * 100\frac{mg}{d}}{70\,kg}\right] = 114\,\frac{mg \cdot yr}{kg \cdot d}$$

→ Carbon Tetrachloride

$$PRG_{cw_ca_ing} = \frac{10^{-6} * 25{,}550d}{7.0E^{-2}\frac{kg \cdot d}{mg} * 114\frac{mg \cdot yr}{kg \cdot d} * 30\frac{d}{y} * 10^{-6}\frac{kg}{mg}}$$

$$= 106.7\,\frac{mg}{kg}$$ ✓

Nonradiological PRGs for Ecological

ECF-Hanford-0445, Rev.1

Linda Carr (2)
4/17/13

Incidental Soil Ingestion - Noncarcinogenic

$$PRG_{cu_nc_ing} = \frac{THQ * AT_{nc_ccu} * BW_{ccu}}{\frac{1}{RFD_o} * IRS_{ccu} * EF_{cu} * ED_{ccu} * UCF1}$$

→ Trichloroethene

$$PRG_{cu_nc_ing} = \frac{1 * 2{,}190\,d * 15\,kg}{\frac{1}{5.0E^{-4}\,\frac{mg}{kg \cdot d}} * 200\,\frac{mg}{d} * 30\,\frac{d}{yr} * 6\,yr * 10^{-6}\,\frac{kg}{mg}} = 456\,\frac{mg}{kg}$$ ✓

Incidental Soil Ingestion - Mutagenic

$$PRG_{cu_mu_ing} = \frac{TR * AT_{ca}}{CSF_o * IRSM_{adj_cu} * EF_{cu} * UCF1}$$

where,

$$IRSM_{adj_cu} = \frac{ED_{0-2} * IRS_{ccu} * 10}{BW_{ccu}} + \frac{ED_{2-6} * IRS_{ccu} * 3}{BW_{ccu}} + \frac{ED_{6-16} * IRS_{a} * 3}{BW_{a}} + \frac{ED_{16-30} * IRS_{a} * 1}{BW_{a}}$$

$$IRSM_{adj_cu} = \frac{2\,y * 200\,\frac{mg}{d} * 10}{15\,kg} + \frac{4\,y * 200\,\frac{mg}{d} * 3}{15\,kg} + \frac{10\,y * 100\,\frac{mg}{d} * 3}{70\,kg} + \frac{14\,yr * 100\,\frac{mg}{d} * 1}{70\,kg}$$

$$= 266.7\,\frac{y \cdot mg}{d \cdot kg} + 160\,\frac{y \cdot mg}{d \cdot kg} + 42.9\,\frac{y \cdot mg}{d \cdot kg} + 20\,\frac{y \cdot mg}{d \cdot kg} = 489.6\,\frac{mg \cdot y}{kg \cdot d}$$ ✓

Nonradiological PRGs for Carcinogens
ECF-Hanford-0445, Rev.1

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4/17/13

→ Chrysene

$$PRG_{cu_mu_ing} = \frac{10^{-6} * 25{,}550\,d}{.073\,\frac{kg\cdot d}{mg} * 489.6\,\frac{mg\cdot y}{kg\cdot d} * 30\,\frac{d}{y} * 10^{-6}\,\frac{kg}{mg}} = 2.38E+1\,\frac{mg}{kg}$$ ✓

• Incidental Soil Ingestion - Vinyl Chloride

$$PRG_{cu_vc_ing} = \frac{TR}{\left(\frac{CSF_o * IRS_{adj_cu} * EF_{cu} * UCF1}{AT_{ca}} + \frac{CSF_o * IRS_{ccu} * UCF1}{BW_{ccu}}\right)}$$

where,

$$IRS_{adj_cu} = \left(\frac{ED_{ccu} * IRS_{ccu}}{BW_{ccu}}\right) + \left(\frac{\left(ED_{a+ccu} - ED_{ccu}\right) * IRS_a}{BW_a}\right)$$

→ Vinyl Chloride

$$PRG_{cu_vc_ing} = \frac{10^{-6}}{\left[\frac{0.72\,\frac{kg\cdot d}{mg} * 114\,\frac{mg\cdot yr}{kg\cdot d} * 30\,\frac{d}{y} * 10^{-6}\,\frac{kg}{mg}}{25{,}550\,d}\right] + \left[\frac{0.72\,\frac{kg\cdot d}{mg} * 200\,\frac{mg}{d} * 10^{-6}\,\frac{kg}{mg}}{15\,kg}\right]}$$

$$= \frac{10^{-6}}{\left(9.64E^{-8}\,\frac{kg\cdot y}{mg} + 9.6E\text{-}6\,\frac{kg}{mg}\right)} = 1.03E^{-1}\,\frac{mg}{kg}$$ ✓

Nonradiological PRGs for Central Waste
ECF-Hanford-0445, Rev.1

Linda Carr (4)
4/17/13

- Dermal Contact with Soil-Carcinogenic

$$PRG_{cu_ca_dc} = \frac{TR * AT_{ca}}{\left(\frac{CSF_o}{GIABS}\right) * EF_{cw} * DFS_{adj_cu} * ABS_d * UCF1}$$

where,

$$DFS_{adj_cu} = \left(\frac{ED_{ccw} * SA_{ccw} * AF_{ccw}}{BW_{cw}}\right) + \left(\frac{(ED_{a+ccw} - ED_{ccw}) * SA_a * AF_a}{BW_a}\right)$$

→ Pentachlorophenol

$$DFS_{adj_cu} = \left(\frac{6yr * 2800\frac{cm^2}{d} * 0.2\frac{mg}{cm^2}}{15kg}\right) + \left(\frac{(30yr - 6yr) * 5700\frac{cm^2}{d} * 0.07\frac{mg}{cm^2}}{70kg}\right)$$

$$= 224\frac{y.mg}{d.kg} + 136.8\frac{y.mg}{d.kg} = 361\frac{mg.y}{kg.d} \checkmark$$

$$PRG_{cu_ca_dc} = \frac{10^{-6} * 25,550\,d}{\left(\frac{0.40\frac{kg.d}{mg}}{1}\right) * 30\frac{d}{y} * 361\frac{mg.y}{kg.d} * 2.50E^{-1} * 10^{-6}\frac{kg}{mg}}$$

$$= \frac{0.02555\,d}{1.08E^{-3}\frac{kg.d}{mg}} = 23.6\frac{mg}{kg} \checkmark$$

Nonradiological PRGs for Cascade Use
ECF-Hanford-0445, Rev.1

Linda Carr (5)
4/17/13

- Dermal Contact with Soil - Noncarcinogen

$$PRG_{cu_nc_dc} = \frac{THQ * AT_{nc_cu} * BW_{ccu}}{\left(\frac{1}{RFD_o} * GIABS\right) * SA_{ccu} * AF_{ccu} * EF_{cu} * ED_{ccu} * ABS_d * UCF1}$$

→ Alpha Chlordane

$$PRG_{cu_nc_dc} = \frac{1 * 2{,}190\,d * 15\,kg}{\left(\frac{1}{5.0E^{-4}\,\frac{mg}{kg.d}} * 1\right) * 2800\,\frac{cm^2}{d} * 0.2\,\frac{mg}{cm^2} * 30\,\frac{d}{y} * 6\,y * 4.0E^{-2} * 10^{-6}}$$

$$= 4.07E+03\,\frac{mg}{kg}$$ ✓

- Dermal Contact with Soil - Mutagenic Effects

$$PRG_{cu_mu_dc} = \frac{TR * AT_{ca}}{\frac{CSF_o}{GIABS} * DFSM_{adj_cu} * EF_{cu} * ABS_d * UCF1}$$

where,

$$FSM_{adj_cu} = \frac{ED_{0-2} * SA_{ccu} * AF_{ccu} * 10}{BW_{ccu}} + \frac{ED_{2-6} * SA_{ccu} * AF_{ccu} * 3}{BW_{ccu}} + \frac{ED_{6-16} * SA_a * AF_a * 3}{BW_a} + \frac{ED_{16-30} * SA_a * AF_a * 1}{BW_a}$$

Nonradiological PRGs for Carcinogens
ECF-Hanford-0445, Rev.1

Linda Carr (6)
4/18/13

$$DFSM_{adj\text{-}cw} = \frac{2y * 2800\frac{cm^2}{d} * 0.2\frac{mg}{cm^2} * 10}{15\,kg} + \frac{4y * 2800\frac{cm^2}{d} * 0.2\frac{mg}{cm^2} * 3}{15\,kg} \ldots$$

$$\ldots + \frac{10yr * 5700\frac{cm^2}{d} * 0.07\frac{mg}{cm^2} * 3}{70\,kg} + \frac{14y * 5700\frac{cm^2}{d} * 0.07\frac{mg}{cm^2} * 1}{70\,kg}$$

$$= 747\frac{mg.y}{kg.d} + 448\frac{mg.y}{kg.d} + 171\frac{mg.y}{kg.d} + 79.8\frac{mg.y}{kg.d} = 1446\frac{mg.y}{kg.d}$$ ✓

→ Chrysene

$$PRG_{cw\text{-}mu\text{-}dc} = \frac{10^{-6} * 25{,}550\,d}{\frac{7.30E\text{-}02\frac{kg.d}{mg}}{1} * 1446\frac{mg.y}{kg.d} * 30\frac{d}{y} * 0.13 * 10^{-6}\frac{kg}{mg}}$$

$$= 62.1\frac{mg}{kg}$$ ✓

Nonradiological PRGs for Carbon Tet
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4/18/13

- Inhalation of Vapors and Dust in Soil - Carcinogenic

$$PRG_{cv_ca_inh} = \frac{TR * AT_{ca} * 24\frac{hrs}{d}}{IUR * UCF2 * EF_{cv} * ED_{a+ccv} * ET_{cv} * \left(\frac{1}{VF} + \frac{1}{PEF}\right)}$$

where,

$$VF = \frac{\frac{Q}{C} * (3.14 * D_A * T)^{\frac{1}{2}} * 10^{-4}\left(\frac{m^2}{cm^2}\right)}{2 * \rho_b * D_A}$$

and, $$\frac{Q}{C} = A * \exp\left[\frac{(\ln[A_s] - B)^2}{C}\right]$$

and,

$$D_A = \left[\frac{\left(\theta_a^{\frac{10}{3}} * D_i * H' + \theta_w^{\frac{10}{3}} * D_w\right)}{n^2}}{\rho_b * K_{oc} * f_{oc} + \theta_w + \theta_a * H'}\right]$$

→ Carbon Tetrachloride

$$D_A = \frac{\left(0.284\frac{L\,air}{L\,Soil}\right)^{\frac{10}{3}} * 0.0571\frac{cm^2}{s} * 1.25 + \left(0.15\frac{L\,water}{L\,Soil}\right)^{\frac{10}{3}} * 9.78E^{-6}\frac{cm^2}{s}}{.434^2}}{1.5\frac{kg}{L} * .152\frac{L}{kg} + 0.15\frac{L\,water}{L\,Soil} + 0.284\frac{L\,air}{L\,soil} * 1.25}$$

$$= \frac{0.00107}{\frac{.1884}{.733}} = 0.00775\frac{cm^2}{s} \checkmark$$

$$\frac{Q}{C} = 11.3161 * \exp\left[\frac{(\ln(0.5ac) - 19.6437)^2}{224.8172}\right] = 71.25 \frac{g/m^2 s}{kg/m^3}$$

$$VF = \frac{71.25 \frac{g/m^2 s}{kg/m^3} \left(3.14 * 7.93E^{-3} \frac{cm^2}{s} * 9.5E+08\, s\right)^{1/2} * 10^{-4} \frac{m^2}{cm^2}}{2 * 1.5 \frac{kg}{L} * 7.93E^{-3} \frac{cm^2}{s}}$$

$$= 1.46E+03 \frac{m^3}{kg} \checkmark$$

- Particulate Emission Factor

$$PEF = \frac{Q}{C} * \frac{3,600}{0.036 * (1-V) * \left(\frac{U_m}{U_t}\right)^3 * F(x)}$$

where,

$$\frac{Q}{C} = A * \exp\left[\frac{(\ln(A_s) - B)^2}{C}\right]$$

and $F(x) = 0.18(8x^3 + 12x)\exp(-x^2)$

and $x = 0.886\left(\frac{U_t}{U_m}\right)$

→ Calculating Particulate Emission Factor

$$x = 0.886\left(\frac{11.32 \frac{m}{s}}{3.4 \frac{m}{s}}\right) = 2.95$$

$$F(x) = 0.18\left[8(2.95)^3 + 12(2.95)\right]\exp\left[-(2.95)^2\right] = 7.204E^{-3}$$

$$\frac{Q}{C} = 11.3161 * \exp\left[\frac{[\ln(0.5\,acr) - 19.6437]^2}{224.8172}\right] = 71.25$$

$$PEF = 71.25 \frac{g/m^2 \cdot s}{kg \cdot m^3} * \frac{3600}{0.036 * (1-0.5) * \left(\frac{3.4\,m/s}{11.32\,m/s}\right)^3 * 7.204E^{-3}}$$

$$= 7.30E+10\ m^3/kg \checkmark$$

→ Calculating Carbon tetrachloride Inhalation PRG_Carcinogen

$$PRG_{cu_ca_inh} = \frac{10^{-6} * 25{,}550\,d * 24\,\frac{h}{d}}{6.0E-6\,\frac{m^3}{ug} * 1000\,\frac{ug}{mg} * 30\,\frac{d}{y} * 30\,y * 6\,\frac{h}{d} * \left(\frac{1}{1.46E+3\,\frac{m^3}{Kg}} + \frac{1}{7.3E+10\,\frac{m^3}{Kg}}\right)}$$

$$= 27.5\,\frac{mg}{kg} \checkmark$$

* Inhalation of Vapors and Dust in Soil_Noncarcinogenic

$$PRG_{cu_nc_inh} = \frac{THQ * AT_{nc_cu} * 24\,\frac{h}{d}}{EF_{cu} * ED_{ocu} * ET_{cu} * \frac{1}{RFC} * \left(\frac{1}{VF} + \frac{1}{PEF}\right)}$$

→ Calculating Carbon tetrachloride – Noncarcinogen

$$PRG_{cu_nc_inh} = \frac{1 * 2190\,d * 24\,\frac{h}{d}}{30\,\frac{d}{y} * 6\,y * 6\,\frac{h}{d} * \frac{1}{0.10\,\frac{mg}{m^3}} * \left(\frac{1}{1.46E^3\,\frac{m^3}{kg}} + \frac{1}{7.3E+10\,\frac{m^3}{Kg}}\right)} = 7.11E+03\,\frac{mg}{kg} \checkmark$$

- Inhalation of Vapors and Dust in Soil_ Mutagenic Effects

$$RG_{cv_mu_inh} = \frac{TR * AT_{cv} * 24\frac{h}{d}}{UCF2 * ET_{cv} * EF_{cv} * \left[\left(ED_{0-2} * IUR * 10\right) + \left(ED_{2-6} * IUR * 3\right) + \left(ED_{6-16} * IUR * 3\right) + \left(ED_{16-30} * IUR * 1\right)\right] * \left(\frac{1}{VF} + \frac{1}{PEF}\right)}$$

→ Calculating Chrysene Inhalation PRG_ Mutagen

$$PRG = \frac{10^{-6} * 25{,}550d * 24\frac{h}{d}}{1000\frac{ug}{mg} * 6\frac{h}{d} * 30\frac{d}{y}\left[\left(2y * 1.1E^{-5}\frac{m^3}{ug} * 10\right) + \left(4y * 1.1E^{-5}\frac{m^3}{ug} * 3\right) + \left(10y * 1.1E^{-5}\frac{m^3}{ug} * 3\right) + \left(14y * 1.1E^{-5}\frac{mg}{ug} * 1\right)\right] * \left(\frac{1}{7.3E10\frac{m^3}{kg}}\right)}$$

$$= \frac{0.613h}{2.47E\text{-}6\frac{ug.h.kg}{mg.y.m^3} * \left(2.2E^{-4} + 1.32E^{-4} + 3.3E^{-4} + 1.54E^{-4}\right)\frac{y.m^3}{kg}}$$

$$= 2.97E^{+8}\frac{mg}{kg}$$ ✓

- Inhalation of Vapors and Dust in Soil_ Vinyl Chloride

$$PRG_{cv_vc_inh} = \frac{TR}{\left[\frac{IUR * ED_{a+cv} * EF_{cv} * ET_{cv} * UCF2}{AT_{ca} * 24\frac{h}{d} * VF}\right] + \left[\frac{IUR}{VF} * UCF2\right]}$$

Nonradiological PRGs for Casual User
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Linda Carr (11)
4/18/13

→ Calculating Inhalation PRG for Vinyl Chloride

$$PRG = \frac{10^{-6}}{\left[\frac{4.4E\text{-}6\ \frac{m^3}{ug} * 30y * 30\frac{d}{y} * 6\frac{h}{d} * 1000\frac{ug}{mg}}{25{,}550d * 24\frac{h}{d} * 928\frac{m^3}{Kg}}\right] + \left[\frac{4.4E\text{-}6\ \frac{m^3}{ug}}{928\frac{m^3}{Kg}} * 1000\frac{ug}{mg}\right]}$$

$$= 2.09E^{-1}\ \frac{mg}{Kg}$$ ✓

- Total PRG Equations

Carcinogenic Effects

$$PRG_{cu_ca_total} = \frac{1}{\left[\left(\frac{1}{PRG_{cu_ca_ing}}\right) + \left(\frac{1}{PRG_{cu_ca_dc}}\right) + \left(\frac{1}{PRG_{cu_ca_inh}}\right)\right]}$$

→ Carbon tetrachloride

$$PRG_{cu_ca_total} = \frac{1}{\left(\frac{1}{1.06E^{+2}\ \frac{mg}{Kg}}\right) + \left(\frac{1}{2.78E^{+1}\ \frac{mg}{Kg}}\right)} = 2.20E^{+1}\ \frac{mg}{Kg}$$ ✓

Noncarcinogenic Effects

$$PRG_{cu_nc_total} = \frac{1}{\left[\left(\frac{1}{PRG_{cu_nc_ing}}\right) + \left(\frac{1}{PRG_{cu_nc_dc}}\right) + \left(\frac{1}{PRG_{cu_nc_inh}}\right)\right]}$$

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→ Trichloroethene

$$PRG_{cu_nc_total} = \frac{1}{\left(\frac{1}{4.56E+2\ \frac{mg}{kg}}\right) + \left(\frac{1}{1.68E+2\ \frac{mg}{kg}}\right)} = 1.23E+2\ \frac{mg}{kg}$$ ✓

Mutagenic Effects

$$PRG_{cu_mu_total} = \frac{1}{\left(\frac{1}{PRG_{cu_mu_ing}}\right) + \left(\frac{1}{PRG_{cu_mu_dc}}\right) + \left(\frac{1}{PRG_{cu_mu_inh}}\right)}$$

→ Chrysene

$$PRG_{cu_mu_total} = \frac{1}{\left(\frac{1}{23.8\ \frac{mg}{kg}}\right) + \left(\frac{1}{2.97E+8\ \frac{mg}{kg}}\right) + \left(\frac{1}{62.1\ \frac{mg}{kg}}\right)} = 17.2\ \frac{mg}{kg}$$ ✓

Vinyl Chloride

$$PRG_{cu_vc_total} = \frac{1}{\left(\frac{1}{PRG_{cu_vc_ing}}\right) + \left(\frac{1}{PRG_{cuvc_dc}}\right) + \left(\frac{1}{PRG_{cu_vc_inh}}\right)}$$

$$= \frac{1}{\left(\frac{1}{1.03E^{-1}\ \frac{mg}{kg}}\right) + \left(\frac{1}{2.10E^{-1}\ \frac{mg}{kg}}\right)} = 6.91E^{-2}\ \frac{mg}{kg}$$ ✓

Appendix B

Worksheets Used to Calculate Nonradiological PRGs for the Casual Recreational User Exposure Scenario

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B-1: Summary of Incidental Soil Ingestion PRG values for Carcinogens and Noncarcinogens

		Carcinogena		Noncarcinogena			Preliminary Remediation Goals – Ingestion	
CAS #	Analyte Name	Oral Cancer Slope Factor (CSFo) ([mg/kg-day]-1)	Referenceb	Oral Reference Dose (RfDo) (mg/kg-day)	Referenceb	Mutagena	Carcinogen (mg/kg)	Noncarcinogen (mg/kg)
630-20-6	1,1,1,2-Tetrachloroethane	2.60E-02	I	3.00E-02	I	--	2.87E+02	2.74E+04
71-55-6	1,1,1-Trichloroethane	--	--	2.00E+00	I	--	--	1.83E+06
79-34-5	1,1,2,2-Tetrachloroethane	2.00E-01	I	2.00E-02	I	--	3.73E+01	1.83E+04
79-00-5	1,1,2-Trichloroethane	5.70E-02	I	4.00E-03	I	--	1.31E+02	3.65E+03
75-34-3	1,1-Dichloroethane	5.70E-03	C	2.00E-01	P	--	1.31E+03	1.83E+05
75-35-4	1,1-Dichloroethene	--	--	5.00E-02	I	--	--	4.56E+04
96-18-4	1,2,3-Trichloropropane	3.00E+01	I	4.00E-03	I	M	5.80E-02	3.65E+03
95-94-3	1,2,4,5-Tetrachlorobenzene	--	--	3.00E-04	I	--	--	2.74E+02
120-82-1	1,2,4-Trichlorobenzene	2.90E-02	P	1.00E-02	I	--	2.57E+02	9.13E+03
96-12-8	1,2-Dibromo-3-chloropropane	8.00E-01	P	2.00E-04	P	M	2.17E+00	1.83E+02
106-93-4	1,2-Dibromoethane	2.00E+00	I	9.00E-03	I	--	3.73E+00	8.21E+03
95-50-1	1,2-Dichlorobenzene	--	--	9.00E-02	I	--	--	8.21E+04
107-06-2	1,2-Dichloroethane	9.10E-02	I	6.00E-03	X	--	8.19E+01	5.48E+03
540-59-0	1,2-Dichloroethene (Total)	--	--	9.00E-03	H	--	--	8.21E+03
78-87-5	1,2-Dichloropropane	3.60E-02	C	9.00E-02	A	--	2.07E+02	8.21E+04
541-73-1	1,3-Dichlorobenzene	--	--	--	--	--	--	--
106-46-7	1,4-Dichlorobenzene	5.40E-03	C	7.00E-02	A	--	1.38E+03	6.39E+04
123-91-1	1,4-Dioxane	1.00E-01	I	3.00E-02	I	--	7.45E+01	2.74E+04
71-36-3	1-Butanol	--	--	1.00E-01	I	--	--	9.13E+04
71-23-8	1-Propanol	--	--	--	--	--	--	--
93-65-2	2-(2-methyl-4-chlorophenoxy) propionic acid	--	--	1.00E-03	I	--	--	9.13E+02
39635-31-9	2,3,3',4,4',5,5'-Heptachlorobiphenyl	3.90E+00	WAC	3.30E-05	E	--	1.91E+00	3.01E+01
69782-90-7	2,3,3',4,4',5'-Hexachlorobiphenyl	3.90E+00	WAC	3.30E-05	E	--	1.91E+00	3.01E+01
38380-08-4	2,3,3',4,4',5-Hexachlorobiphenyl	3.90E+00	WAC	3.30E-05	E	--	1.91E+00	3.01E+01
32598-14-4	2,3,3',4,4'-Pentachlorobiphenyl	3.90E+00	WAC	3.30E-05	E	--	1.91E+00	3.01E+01
52663-72-6	2,3',4,4',5,5'-Hexachlorobiphenyl	3.90E+00	WAC	3.30E-05	E	--	1.91E+00	3.01E+01
74472-37-0	2,3,4,4',5-Pentachlorobiphenyl	3.90E+00	WAC	3.30E-05	E	--	1.91E+00	3.01E+01
65510-44-3	2',3,4,4',5-Pentachlorobiphenyl	3.90E+00	WAC	3.30E-05	E	--	1.91E+00	3.01E+01
31508-00-6	2,3',4,4',5-Pentachlorobiphenyl	3.90E+00	WAC	3.30E-05	E	--	1.91E+00	3.01E+01
58-90-2	2,3,4,6-Tetrachlorophenol	--	--	3.00E-02	I	--	--	2.74E+04
93-76-5	2,4,5-T(2,4,5-Trichlorophenoxyacetic acid)	--	--	1.00E-02	I	--	--	9.13E+03
93-72-1	2,4,5-TP(2-(2,4,5-Trichlorophenoxy)propionic acid)Silvex	--	--	8.00E-03	I	--	--	7.30E+03
95-95-4	2,4,5-Trichlorophenol	--	--	1.00E-01	I	--	--	9.13E+04
88-06-2	2,4,6-Trichlorophenol	1.10E-02	I	1.00E-03	P	--	6.77E+02	9.13E+02
94-75-7	2,4-D(2,4-Dichlorophenoxyacetic acid)	--	--	1.00E-02	I	--	--	9.13E+03
94-82-6	2,4-DB(4-(2,4-Dichlorophenoxy)butanoic acid)	--	--	8.00E-03	I	--	--	7.30E+03
120-83-2	2,4-Dichlorophenol	--	--	3.00E-03	I	--	--	2.74E+03
105-67-9	2,4-Dimethylphenol	--	--	2.00E-02	I	--	--	1.83E+04
51-28-5	2,4-Dinitrophenol	--	--	2.00E-03	I	--	--	1.83E+03
121-14-2	2,4-Dinitrotoluene	3.10E-01	C	2.00E-03	I	--	2.40E+01	1.83E+03
606-20-2	2,6-Dinitrotoluene	--	--	1.00E-03	P	--	--	9.13E+02
53-96-3	2-Acetylaminofluorene	3.80E+00	C	--	--	--	1.96E+00	--
78-93-3	2-Butanone	--	--	6.00E-01	I	--	--	5.48E+05
111-76-2	2-Butoxyethanol	--	--	1.00E-01	I	--	--	9.13E+04
91-58-7	2-Chloronaphthalene	--	--	8.00E-02	I	--	--	7.30E+04
95-57-8	2-Chlorophenol	--	--	5.00E-03	I	--	--	4.56E+03
591-78-6	2-Hexanone	--	--	5.00E-03	I	--	--	4.56E+03
94-74-6	2-Methyl-4 chlorophenoxyacetic acid	--	--	5.00E-04	I	--	--	4.56E+02
91-57-6	2-methylnaphthalene	--	--	4.00E-03	I	--	--	3.65E+03
95-48-7	2-Methylphenol (cresol, o-)	--	--	5.00E-02	I	--	--	4.56E+04
91-59-8	2-Naphthylamine	1.80E+00	C	--	--	--	4.14E+00	--
88-74-4	2-Nitroaniline	--	--	1.00E-02	X	--	--	9.13E+03
88-75-5	2-Nitrophenol	--	--	--	--	--	--	--
108-10-1	2-Pentanone, 4-Methyl	--	--	8.00E-02	H	--	--	7.30E+04
32774-16-6	3,3',4,4',5,5'-Hexachlorobiphenyl	3.90E+03	WAC	3.30E-08	E	--	1.91E-03	3.01E-02
57465-28-8	3,3',4,4',5-Pentachlorobiphenyl	1.30E+04	WAC	1.00E-08	E	--	5.73E-04	9.13E-03
32598-13-3	3,3',4,4'-Tetrachlorobiphenyl	1.30E+01	WAC	1.00E-05	E	--	5.73E-01	9.13E+00
91-94-1	3,3'-Dichlorobenzidine	4.50E-01	I	--	--	--	1.66E+01	--
119-93-7	3,3'-Dimethylbenzidine	1.10E+01	P	--	--	--	6.77E-01	--
70362-50-4	3,4,4',5- Tetrachlorobiphenyl	3.90E+01	WAC	3.30E-06	E	--	1.91E-01	3.01E+00
65794-96-9	3+4 Methylphenol (cresol, m+p)	--	--	--	--	--	--	--
56-49-5	3-Methylcholanthrene	2.20E+01	C	--	--	M	7.91E-02	--
99-09-2	3-Nitroaniline	2.10E-02	NCEA	3.00E-04	NCEA	--	3.55E+02	2.74E+02
72-54-8	4,4'-DDD (Dichlorodiphenyldichloroethane)	2.40E-01	I	--	--	--	3.11E+01	--
72-55-9	4,4'-DDE (Dichlorodiphenyldichloroethylene)	3.40E-01	I	--	--	--	2.19E+01	--
50-29-3	4,4'-DDT (Dichlorodiphenyltrichloroethane)	3.40E-01	I	5.00E-04	I	--	2.19E+01	4.56E+02
534-52-1	4,6-Dinitro-2-methylphenol	--	--	8.00E-05	X	--	--	7.30E+01
1918-02-1	4-Amino-3,5,6-trichloropicolinic acid	--	--	7.00E-02	I	--	--	6.39E+04
92-67-1	4-Aminobiphenyl	2.10E+01	C	--	--	--	3.55E-01	--
101-55-3	4-Bromophenylphenyl ether	--	--	--	--	--	--	--
59-50-7	4-Chloro-3-methylphenol	--	--	1.00E-01	A	--	--	9.13E+04
106-47-8	4-Chloroaniline	2.00E-01	P	4.00E-03	I	--	3.73E+01	3.65E+03
7005-72-3	4-Chlorophenylphenyl ether	--	--	--	--	--	--	--

B-1: Summary of Incidental Soil Ingestion PRG values for Carcinogens and Noncarcinogens

		Carcinogena		Noncarcinogena			Preliminary Remediation Goals – Ingestion	
CAS #	Analyte Name	Oral Cancer Slope Factor (CSFo) ([mg/kg-day]-1)	Referenceb	Oral Reference Dose (RfDo) (mg/kg-day)	Referenceb	Mutagena	Carcinogen (mg/kg)	Noncarcinogen (mg/kg)
106-44-5	4-Methylphenol (cresol, p-)	--	--	1.00E-01	A	--	--	9.13E+04
100-01-6	4-Nitroaniline	2.00E-02	P	4.00E-03	P	--	3.73E+02	3.65E+03
100-02-7	4-Nitrophenol	--	--	--	--	--	--	--
99-55-8	5-Nitro-o-toluidine	9.00E-03	P	2.00E-02	X	--	8.28E+02	1.83E+04
83-32-9	Acenaphthene	--	--	6.00E-02	I	--	--	5.48E+04
208-96-8	Acenaphthylene	--	--	--	--	--	--	--
67-64-1	Acetone	--	--	9.00E-01	I	--	--	8.21E+05
75-05-8	Acetonitrile	--	--	--	--	--	--	--
98-86-2	Acetophenone	--	--	1.00E-01	I	--	--	9.13E+04
107-02-8	Acrolein	--	--	5.00E-04	I	--	--	4.56E+02
79-06-1	Acrylamide	5.00E-01	I	2.00E-03	I	--	1.49E+01	1.83E+03
107-13-1	Acrylonitrile	5.40E-01	I	4.00E-02	A	--	1.38E+01	3.65E+04
309-00-2	Aldrin	1.70E+01	I	3.00E-05	I	--	4.38E-01	2.74E+01
107-05-1	Allyl chloride	2.10E-02	C	--	--	--	3.55E+02	--
319-84-6	Alpha-BHC	6.30E+00	I	8.00E-03	A	--	1.18E+00	7.30E+03
5103-71-9	Alpha-Chlordane	3.50E-01	I	5.00E-04	I	--	2.13E+01	4.56E+02
7429-90-5	Aluminum	--	--	1.00E+00	P	--	--	9.13E+05
62-53-3	Aniline	5.70E-03	I	7.00E-03	P	--	1.31E+03	6.39E+03
120-12-7	Anthracene	--	--	3.00E-01	I	--	--	2.74E+05
7440-36-0	Antimony	--	--	4.00E-04	I	--	--	3.65E+02
140-57-8	Aramite	2.50E-02	I	5.00E-02	H	--	2.98E+02	4.56E+04
12674-11-2	Aroclor-1016	7.00E-02	S	7.00E-05	I	--	1.06E+02	6.39E+01
11104-28-2	Aroclor-1221	2.00E+00	S	--	--	--	3.73E+00	--
11141-16-5	Aroclor-1232	2.00E+00	S	--	--	--	3.73E+00	--
53469-21-9	Aroclor-1242	2.00E+00	S	--	--	--	3.73E+00	--
12672-29-6	Aroclor-1248	2.00E+00	S	--	--	--	3.73E+00	--
11097-69-1	Aroclor-1254	2.00E+00	S	2.00E-05	I	--	3.73E+00	1.83E+01
11096-82-5	Aroclor-1260	2.00E+00	S	--	--	--	3.73E+00	--
37324-23-5	Aroclor-1262	--	--	--	--	--	--	--
11100-14-4	Aroclor-1268	--	--	--	--	--	--	--
7440-38-2	Arsenic	1.50E+00	I	3.00E-04	I	--	4.97E+00	2.74E+02
103-33-3	Azobenzene	1.10E-01	I	--	--	--	6.77E+01	--
7440-39-3	Barium	--	--	2.00E-01	I	--	--	1.83E+05
71-43-2	Benzene	5.50E-02	I	4.00E-03	I	--	1.35E+02	3.65E+03
56-55-3	Benzo(a)anthracene	7.30E-01	WAC	--	--	M	2.38E+00	--
50-32-8	Benzo(a)pyrene	7.30E+00	I	--	--	M	2.38E-01	--
205-99-2	Benzo(b)fluoranthene	7.30E-01	WAC	--	--	M	2.38E+00	--
191-24-2	Benzo(g,h,i)perylene	--	--	--	--	--	--	--
207-08-9	Benzo(k)fluoranthene	7.30E-01	WAC	--	--	M	2.38E+00	--
65-85-0	Benzoic acid	--	--	4.00E+00	I	--	--	3.65E+06
100-51-6	Benzyl alcohol	--	--	1.00E-01	P	--	--	9.13E+04
7440-41-7	Beryllium	--	--	2.00E-03	I	--	--	1.83E+03
319-85-7	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	1.80E+00	I	--	--	--	4.14E+00	--
108-60-1	Bis(2-chloro-1-methylethyl)ether	7.00E-02	H	4.00E-02	I	--	1.06E+02	3.65E+04
111-91-1	Bis(2-Chloroethoxy)methane	--	--	3.00E-03	P	--	--	2.74E+03
111-44-4	Bis(2-chloroethyl) ether	1.10E+00	I	--	--	--	6.77E+00	--
117-81-7	Bis(2-ethylhexyl) phthalate	1.40E-02	I	2.00E-02	I	--	5.32E+02	1.83E+04
7440-69-9	Bismuth	--	--	--	--	--	--	--
7440-42-8	Boron	--	--	2.00E-01	I	--	--	1.83E+05
24959-67-9	Bromide	--	--	--	--	--	--	--
75-27-4	Bromodichloromethane	6.20E-02	I	2.00E-02	I	--	1.20E+02	1.83E+04
75-25-2	Bromoform	7.90E-03	I	2.00E-02	I	--	9.43E+02	1.83E+04
74-83-9	Bromomethane	--	--	1.40E-03	I	--	--	1.28E+03
85-68-7	Butylbenzylphthalate	1.90E-03	P	2.00E-01	I	--	3.92E+03	1.83E+05
7440-43-9	Cadmium	--	--	1.00E-03	I	--	--	9.13E+02
7440-70-2	Calcium	--	--	--	--	--	--	--
86-74-8	Carbazole	2.00E-02	NCEA	--	--	--	3.73E+02	--
75-15-0	Carbon disulfide	--	--	1.00E-01	I	--	--	9.13E+04
56-23-5	Carbon tetrachloride	7.00E-02	I	4.00E-03	I	--	1.06E+02	3.65E+03
57-74-9	Chlordane	3.50E-01	I	5.00E-04	I	--	2.13E+01	4.56E+02
16887-00-6	Chloride	--	--	--	--	--	--	--
108-90-7	Chlorobenzene	--	--	2.00E-02	I	--	--	1.83E+04
510-15-6	Chlorobenzilate	1.10E-01	C	2.00E-02	I	--	6.77E+01	1.83E+04
75-00-3	Chloroethane	--	--	--	--	--	--	--
67-66-3	Chloroform	3.10E-02	C	1.00E-02	I	--	2.40E+02	9.13E+03
74-87-3	Chloromethane	--	--	--	--	--	--	--
126-99-8	Chloroprene	--	--	2.00E-02	H	--	--	1.83E+04
7440-47-3	Chromium	--	--	1.50E+00	I	--	--	1.37E+06
218-01-9	Chrysene	7.30E-02	WAC	--	--	M	2.38E+01	--
156-59-2	cis-1,2-Dichloroethylene	--	--	2.00E-03	I	--	--	1.83E+03
10061-01-5	cis-1,3-Dichloropropene	1.00E-01	I	3.00E-02	I	--	7.45E+01	2.74E+04
7440-48-4	Cobalt	--	--	3.00E-04	P	--	--	2.74E+02
PCB1242/1016	Co-elution of Aroclor 1242 and Aroclor 1016	--	--	--	--	--	--	--

B-1: Summary of Incidental Soil Ingestion PRG values for Carcinogens and Noncarcinogens

		Carcinogena		Noncarcinogena			Preliminary Remediation Goals – Ingestion	
CAS #	Analyte Name	Oral Cancer Slope Factor (CSFo) ([mg/kg-day]-1)	Referenceb	Oral Reference Dose (RfDo) (mg/kg-day)	Referenceb	Mutagena	Carcinogen (mg/kg)	Noncarcinogen (mg/kg)
7440-50-8	Copper	--	--	4.00E-02	H	--	--	3.65E+04
57-12-5	Cyanide	--	--	6.00E-04	I	--	--	5.48E+02
110-82-7	Cyclohexane	--	--	--	--	--	--	--
108-94-1	Cyclohexanone	--	--	5.00E+00	I	--	--	4.56E+06
75-99-0	Dalapon	--	--	3.00E-02	I	--	--	2.74E+04
124-18-5	Decane	--	--	--	--	--	--	--
319-86-8	Delta-BHC	--	--	--	--	--	--	--
2303-16-4	Diallate	6.10E-02	H	--	--	--	1.22E+02	--
53-70-3	Dibenz[a,h]anthracene	7.30E-01	WAC	--	--	M	2.38E+00	--
132-64-9	Dibenzofuran	--	--	1.00E-03	X	--	--	9.13E+02
124-48-1	Dibromochloromethane	8.40E-02	I	2.00E-02	I	--	8.87E+01	1.83E+04
74-95-3	Dibromomethane	--	--	1.00E-02	H	--	--	9.13E+03
1918-00-9	Dicamba	--	--	3.00E-02	I	--	--	2.74E+04
75-71-8	Dichlorodifluoromethane	--	--	2.00E-01	I	--	--	1.83E+05
120-36-5	Dichloroprop	--	--	--	--	--	--	--
60-57-1	Dieldrin	1.60E+01	I	5.00E-05	I	--	4.66E-01	4.56E+01
60-29-7	Diethyl ether	--	--	2.00E-01	I	--	--	1.83E+05
84-66-2	Diethylphthalate	--	--	8.00E-01	I	--	--	7.30E+05
60-51-5	Dimethoate	--	--	2.00E-04	I	--	--	1.83E+02
131-11-3	Dimethyl phthalate	--	--	--	--	--	--	--
84-74-2	Di-n-butylphthalate	--	--	1.00E-01	I	--	--	9.13E+04
117-84-0	Di-n-octylphthalate	--	--	1.20E-02	P	--	--	1.10E+04
88-85-7	Dinoseb(2-secButyl-4,6-dinitrophenol)	--	--	1.00E-03	I	--	--	9.13E+02
298-04-4	Disulfoton	--	--	4.00E-05	I	--	--	3.65E+01
959-98-8	Endosulfan I	--	--	6.00E-03	I	--	--	5.48E+03
33213-65-9	Endosulfan II	--	--	6.00E-03	I	--	--	5.48E+03
1031-07-8	Endosulfan sulfate	--	--	--	--	--	--	--
72-20-8	Endrin	--	--	3.00E-04	I	--	--	2.74E+02
7421-93-4	Endrin Aldehyde	--	--	--	--	--	--	--
53494-70-5	Endrin ketone	--	--	--	--	--	--	--
64-17-5	Ethanol	--	--	--	--	--	--	--
141-78-6	Ethyl acetate	--	--	9.00E-01	I	--	--	8.21E+05
97-63-2	Ethyl methacrylate	--	--	9.00E-02	H	--	--	8.21E+04
100-41-4	Ethylbenzene	1.10E-02	C	1.00E-01	I	--	6.77E+02	9.13E+04
107-21-1	Ethylene glycol	--	--	2.00E+00	I	--	--	1.83E+06
206-44-0	Fluoranthene	--	--	4.00E-02	I	--	--	3.65E+04
86-73-7	Fluorene	--	--	4.00E-02	I	--	--	3.65E+04
16984-48-8	Fluoride	--	--	6.00E-02	I	--	--	5.48E+04
58-89-9	Gamma-BHC (Lindane)	1.10E+00	C	3.00E-04	I	--	6.77E+00	2.74E+02
5566-34-7	gamma-Chlordane	3.50E-01	I	5.00E-04	I	--	2.13E+01	4.56E+02
76-44-8	Heptachlor	4.50E+00	I	5.00E-04	I	--	1.66E+00	4.56E+02
1024-57-3	Heptachlor epoxide	9.10E+00	I	1.30E-05	I	--	8.19E-01	1.19E+01
118-74-1	Hexachlorobenzene	1.60E+00	I	8.00E-04	I	--	4.66E+00	7.30E+02
87-68-3	Hexachlorobutadiene	7.80E-02	I	1.00E-03	P	--	9.55E+01	9.13E+02
77-47-4	Hexachlorocyclopentadiene	--	--	6.00E-03	I	--	--	5.48E+03
67-72-1	Hexachloroethane	4.00E-02	I	7.00E-04	I	--	1.86E+02	6.39E+02
70-30-4	Hexachlorophene	--	--	3.00E-04	I	--	--	2.74E+02
110-54-3	Hexane	--	--	6.00E-02	H	--	--	5.48E+04
18540-29-9	Hexavalent Chromium	--	--	3.00E-03	I	--	--	2.74E+03
302-01-2	Hydrazine	3.00E+00	I	--	--	--	2.48E+00	--
193-39-5	Indeno(1,2,3-cd)pyrene	7.30E-01	WAC	--	--	M	2.38E+00	--
7439-89-6	Iron	--	--	7.00E-01	P	--	--	6.39E+05
78-83-1	Isobutyl alcohol	--	--	3.00E-01	I	--	--	2.74E+05
78-59-1	Isophorone	9.50E-04	I	2.00E-01	I	--	7.84E+03	1.83E+05
98-82-8	Isopropylbenzene	--	--	1.00E-01	I	--	--	9.13E+04
143-50-0	Kepone	1.00E+01	I	3.00E-04	I	--	7.45E-01	2.74E+02
7439-92-1	Lead	--	--	--	--	--	--	--
7439-93-2	Lithium	--	--	2.00E-03	P	--	--	1.83E+03
7439-95-4	Magnesium	--	--	--	--	--	--	--
7439-96-5	Manganese	--	--	1.40E-01	S	--	--	1.28E+05
99-65-0	m-Dinitrobenzene	--	--	1.00E-04	I	--	--	9.13E+01
7439-97-6	Mercury	--	--	3.00E-04	I	--	--	2.74E+02
126-98-7	Methacrylonitrile	--	--	1.00E-04	I	--	--	9.13E+01
67-56-1	Methanol	--	--	5.00E-01	I	--	--	4.56E+05
72-43-5	Methoxychlor	--	--	5.00E-03	I	--	--	4.56E+03
80-62-6	Methyl methacrylate	--	--	1.40E+00	I	--	--	1.28E+06
66-27-3	Methyl methanesulfonate	9.90E-02	C	--	--	--	7.53E+01	--
298-00-0	Methyl parathion	--	--	2.50E-04	I	--	--	2.28E+02
75-09-2	Methylene chloride	2.00E-03	I	6.00E-03	I	--	3.73E+03	5.48E+03
7439-98-7	Molybdenum	--	--	5.00E-03	I	--	--	4.56E+03
108-38-3	m-Xylene	--	--	2.00E-01	S	--	--	1.83E+05
91-20-3	Naphthalene	--	--	2.00E-02	I	--	--	1.83E+04
104-51-8	n-Butylbenzene	--	--	5.00E-02	P	--	--	4.56E+04

B-1: Summary of Incidental Soil Ingestion PRG values for Carcinogens and Noncarcinogens

		Carcinogena		Noncarcinogena			Preliminary Remediation Goals – Ingestion	
CAS #	Analyte Name	Oral Cancer Slope Factor (CSFo) ([mg/kg-day]-1)	Referenceb	Oral Reference Dose (RfDo) (mg/kg-day)	Referenceb	Mutagena	Carcinogen (mg/kg)	Noncarcinogen (mg/kg)
7440-02-0	Nickel	--	--	2.00E-02	I	--	--	1.83E+04
14797-55-8	Nitrate	--	--	7.10E+00	I	--	--	6.48E+06
14797-65-0	Nitrite	--	--	3.00E-01	I	--	--	2.74E+05
98-95-3	Nitrobenzene	--	--	2.00E-03	I	--	--	1.83E+03
NO3-N	Nitrogen in Nitrate	--	--	1.60E+00	I	--	--	1.46E+06
NO2-N	Nitrogen in Nitrite	--	--	1.00E-01	I	--	--	9.13E+04
NO2+NO3-N	Nitrogen in Nitrite and Nitrate	--	--	1.60E+00	I	--	--	1.46E+06
930-55-2	Nitrosopyrrolidine	2.10E+00	I	--	--	--	3.55E+00	--
55-18-5	n-Nitrosodiethylamine	1.50E+02	I	--	--	M	1.16E-02	--
62-75-9	n-Nitrosodimethylamine	5.10E+01	I	8.00E-06	P	M	3.41E-02	7.30E+00
924-16-3	n-Nitrosodi-n-butylamine	5.40E+00	I	--	--	--	1.38E+00	--
621-64-7	n-Nitrosodi-n-dipropylamine	7.00E+00	I	--	--	--	1.06E+00	--
86-30-6	n-Nitrosodiphenylamine	4.90E-03	I	--	--	--	1.52E+03	--
10595-95-6	n-Nitrosomethylethylamine	2.20E+01	I	--	--	--	3.39E-01	--
59-89-2	n-Nitrosomorpholine	6.70E+00	C	--	--	--	1.11E+00	--
100-75-4	n-Nitrosopiperidine	9.40E+00	C	--	--	--	7.93E-01	--
95-47-6	o-Xylene	--	--	2.00E-01	S	--	--	1.83E+05
56-38-2	Parathion	--	--	6.00E-03	H	--	--	5.48E+03
60-11-7	p-Dimethylaminoazobenzene	4.60E+00	C	--	--	--	1.62E+00	--
608-93-5	Pentachlorobenzene	--	--	8.00E-04	I	--	--	7.30E+02
76-01-7	Pentachloroethane	9.00E-02	P	--	--	--	8.28E+01	--
82-68-8	Pentachloronitrobenzene (PCNB)	2.60E-01	H	3.00E-03	I	--	2.87E+01	2.74E+03
87-86-5	Pentachlorophenol	4.00E-01	I	5.00E-03	I	--	1.86E+01	4.56E+03
62-44-2	Phenacetin	2.20E-03	C	--	--	--	3.39E+03	--
85-01-8	Phenanthrene	--	--	--	--	--	--	--
108-95-2	Phenol	--	--	3.00E-01	I	--	--	2.74E+05
298-02-2	Phorate	--	--	2.00E-04	H	--	--	1.83E+02
14265-44-2	Phosphate	--	--	--	--	--	--	--
7723-14-0	Phosphorus	--	--	--	--	--	--	--
PO4-P	Phosphorus in phosphate	--	--	--	--	--	--	--
7440-09-7	Potassium	--	--	--	--	--	--	--
106-50-3	p-Phenylenediamine	--	--	1.90E-01	H	--	--	1.73E+05
23950-58-5	Pronamide	--	--	7.50E-02	I	--	--	6.84E+04
129-00-0	Pyrene	--	--	3.00E-02	I	--	--	2.74E+04
110-86-1	Pyridine	--	--	1.00E-03	I	--	--	9.13E+02
94-59-7	Safrol	2.20E-01	C	--	--	M	7.91E+00	--
7782-49-2	Selenium	--	--	5.00E-03	I	--	--	4.56E+03
7440-21-3	Silicon	--	--	--	--	--	--	--
7440-22-4	Silver	--	--	5.00E-03	I	--	--	4.56E+03
7440-23-5	Sodium	--	--	--	--	--	--	--
7440-24-6	Strontium	--	--	6.00E-01	I	--	--	5.48E+05
100-42-5	Styrene	--	--	2.00E-01	I	--	--	1.83E+05
14808-79-8	Sulfate	--	--	--	--	--	--	--
18496-25-8	Sulfide	--	--	--	--	--	--	--
99-35-4	sym-Trinitrobenzene	--	--	3.00E-02	I	--	--	2.74E+04
127-18-4	Tetrachloroethene	2.10E-03	I	6.00E-03	I	--	3.55E+03	5.48E+03
3689-24-5	Tetraethyl dithiopyrophosphate (Sulfotepp)	--	--	5.00E-04	I	--	--	4.56E+02
7440-28-0	Thallium	--	--	--	--	--	--	--
7440-31-5	Tin	--	--	6.00E-01	H	--	--	5.48E+05
7440-32-6	Titanium	--	--	--	--	--	--	--
108-88-3	Toluene	--	--	8.00E-02	I	--	--	7.30E+04
1336-36-3	Total PCBs	2.00E+00	I	--	--	--	3.73E+00	--
TPH	Total petroleum hydrocarbons	--	--	--	--	--	--	--
TPHDIESEL	Total petroleum hydrocarbons - diesel range	--	--	--	--	--	--	--
TPHGASOLINE	Total petroleum hydrocarbons - gasoline range	--	--	--	--	--	--	--
TPHKEROSENE	Total petroleum hydrocarbons - kerosene range	--	--	--	--	--	--	--
TPH/OILH	Total petroleum hydrocarbons - motor oil (high boiling)	--	--	--	--	--	--	--
TOTALPCB	Total Polychlorinated Biphenyls	2.00E+00	I	--	--	--	3.73E+00	--
8001-35-2	Toxaphene	1.10E+00	I	--	--	--	6.77E+00	--
156-60-5	trans-1,2-Dichloroethylene	--	--	2.00E-02	I	--	--	1.83E+04
10061-02-6	trans-1,3-Dichloropropene	1.00E-01	I	3.00E-02	I	--	7.45E+01	2.74E+04
5103-74-2	trans-Chlordane	3.50E-01	I	5.00E-04	I	--	2.13E+01	4.56E+02
126-73-8	Tributyl phosphate	9.00E-03	P	1.00E-02	P	--	8.28E+02	9.13E+03
79-01-6	Trichloroethene	4.60E-02	I	5.00E-04	I	--	1.62E+02	4.56E+02
75-69-4	Trichloromonofluoromethane	--	--	3.00E-01	I	--	--	2.74E+05
7440-61-1	Uranium	--	--	3.00E-03	I	--	--	2.74E+03
7440-62-2	Vanadium	--	--	5.00E-03	S	--	--	4.56E+03
108-05-4	Vinyl acetate	--	--	1.00E+00	H	--	--	9.13E+05
75-01-4	Vinyl chloride	7.20E-01	I	3.00E-03	I	M	1.03E-01	2.74E+03
1330-20-7	Xylenes (total)	--	--	2.00E-01	I	--	--	1.83E+05
7440-66-6	Zinc	--	--	3.00E-01	I	--	--	2.74E+05
7440-67-7	Zirconium	--	--	--	--	--	--	--

a. Source = U.S. Environmental Protection Agency web site "Regional Screening Levels for Chemical Contaminants at Superfund Sites" (EPA, November 2012) (http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm).

B-1: Summary of Incidental Soil Ingestion PRG values for Carcinogens and Noncarcinogens

		Carcinogena		Noncarcinogena			Preliminary Remediation Goals – Ingestion	
CAS #	Analyte Name	Oral Cancer Slope Factor (CSFo) ([mg/kg-day]-1)	Referenceb	Oral Reference Dose (RfDo) (mg/kg-day)	Referenceb	Mutagena	Carcinogen (mg/kg)	Noncarcinogen (mg/kg)

b. Reference key:

A = The Agency for Toxic Substances and Disease Registry (ATSDR)
C = The California Environmental Protection Agency Office of Environmental Health Hazard Assessment's (CalEPA)
E = Environmental Criteria and Assessment Office
H = Health Effects Assessment Summary Tables (HEAST)
I = EPA's Integrated Risk Information System (IRIS)
NCEA = National Center for Environmental Assessment
P = Provisional Peer Reviewed Toxicity Values (PPRTV)
S = Special case chemical; basis for value discussed on EPA Regional Screening Levels web site (EPA, 2012)
WAC = Value calculated using a toxicity equivalency factor (TEF) as provided by WAC 173-340-708(8), "Human Health Risk Assessment Procedures, Carcinogenic Potency Factor" and WAC 173-340-900, "Tables"
X = PPRTV Appendix

d. The following summarizes differences between the table above and the EPA Regional Screening Level Table (November 2012)

2,3,3',4,4',5,5'-Heptachlorobiphenyl (39635-31-9): CPF is calculated using TCDD (1746-01-6) SFO multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
2,3,3',4,4',5-Hexachlorobiphenyl (38380-08-4): CPF is calculated using TCDD (1746-01-6) SFO multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
2,3,3',4,4',5'-Hexachlorobiphenyl (69782-90-7): CPF is calculated using TCDD (1746-01-6) SFO multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
2,3,3',4,4'-Pentachlorobiphenyl (32598-14-4): CPF is calculated using TCDD (1746-01-6) SFO multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
2,3',4,4',5,5'-Hexachlorobiphenyl (52663-72-6): CPF is calculated using TCDD (1746-01-6) SFO multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
2,3',4,4',5-Pentachlorobiphenyl (31508-00-6): CPF is calculated using TCDD (1746-01-6) SFO multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
2',3,4,4',5-Pentachlorobiphenyl (65510-44-3): CPF is calculated using TCDD (1746-01-6) SFO multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
2,3,4,4',5-Pentachlorobiphenyl (74472-37-0): CPF is calculated using TCDD (1746-01-6) SFO multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
3,3',4,4',5,5'-Hexachlorobiphenyl (32774-16-6): CPF is calculated using TCDD (1746-01-6) SFO multiplied by a TEF of 0.03 Per WAC 173-340-708(f)
3,3',4,4',5-Pentachlorobiphenyl (57465-28-8): CPF is calculated using TCDD (1746-01-6) SFO multiplied by a TEF of 0.1 Per WAC 173-340-708(f)
3,3',4,4'-Tetrachlorobiphenyl (32598-13-3): CPF is calculated using TCDD (1746-01-6) SFO multiplied by a TEF of 0.0001 Per WAC 173-340-708(f)
3,4,4',5- Tetrachlorobiphenyl (70362-50-4): CPF is calculated using TCDD (1746-01-6) SFO multiplied by a TEF of 0.0003 Per WAC 173-340-708(f)
3-Nitroaniline (99-09-2): Uses the toxicity information obtained from Risk Assessment Information System
Alpha-Chlordane (5103-71-9): Uses the toxicity information for chlordane (12789-03-6) in the EPA Regional Screening Level Table
Benzo(a)anthracene (56-55-3): CPF is calculated using the benzo(a)pyrene CFO multiplied by a TEF of 0.1 per WAC 173-340-708(8)(e)
Benzo(a)pyrene (50-32-8): CPF is calculated using the benzo(a)pyrene CFO multiplied by a TEF of 1 per WAC 173-340-708(8)(e)
Benzo(b)fluoranthene (205-99-2): CPF is calculated using the benzo(a)pyrene CFO multiplied by a TEF of 0.1 per WAC 173-340-708(8)(e)
Benzo(k)fluoranthene (207-08-9): CPF is calculated using the benzo(a)pyrene CFO multiplied by a TEF of 0.1 per WAC 173-340-708(8)(e)
Cadmium (7440-43-9): Uses the toxicity information for Cadmium (Diet) (7440-49-9) in the EPA Regional Screening Level Table
Carbazole (86-74-8): Uses the toxicity information obtained from Risk Assessment Information System
Chlordane (57-74-9): Uses the toxicity information for chlordane (12789-03-6) in the EPA Regional Screening Level Table
Chromium (7440-47-3): Uses the toxicity information for Chromium (III), Insoluble salts (16065-83-1) in the EPA Regional Screening Level Table
Chrysene (218-01-9): CPF is calculated using the benzo(a)pyrene CFO multiplied by a TEF of 0.01 per WAC 173-340-708(8)(e)
cis-1,3-Dichloropropene (10061-01-5): Uses the toxicity information for 1,3-dichloropropene (542-75-6) in the EPA Regional Screening Level Table
Dibenz[a,h]anthracene (53-70-3): CPF is calculated using the benzo(a)pyrene CFO multiplied by a TEF of 0.1 per WAC 173-340-708(8)(e)
Endosulfan I (959-98-8): Uses the toxicity information for Endosulfan (115-29-7) in the EPA Regional Screening Level Table
Endosulfan II (33213-65-9): Uses the toxicity information for Endosulfan (115-29-7) in the EPA Regional Screening Level Table
Fluoride (16984-48-8): Uses the toxicity information for Fluorine (Soluble Fluoride) (7782-41-4) in the EPA Regional Screening Level Table
gamma-Chlordane (5566-34-7): Uses the toxicity information for chlordane (12789-03-6) in the EPA Regional Screening Level Table
Hexavalent Chromium (18540-29-9): The oral carcinogenic potency factor provided in the EPA Regional Screening Level Table is not included in this table
Indeno(1,2,3-cd)pyrene (193-39-5): CPF is calculated using the benzo(a)pyrene CFO multiplied by a TEF of 0.1 per WAC 173-340-708(8)(e)
Manganese (7439-96-5): Uses the toxicity information for Manganese (Diet) (7439-96-5) in the EPA Regional Screening Level Table
Mercury (7439-97-6): Uses the toxicity information for Mercuric Chloride (an other Mercury Salts) (7487-94-7) in the EPA Regional Screening Level Table

Nitrate (14797-55-8): Uses derived toxicity information based on a conversion factor of 0.226 NO3-N/NO3 and the toxicity information provided for Nitrate (14797-55-8) in the form of nitrate as nitrogen in the EPA Regional Screening Level Table
Nitrite (14797-65-0): Uses derived toxicity information based on a conversion factor of 0.304 NO2-N/NO2 and the toxicity information provided for Nitrite (14797-55-8) in the form of nitrite as nitrogen in the EPA Regional Screening Level Table

Nitrogen in Nitrate (NO3-N): Uses toxicity information for Nitrate (14797-55-8) in the form of nitrate as nitrogen in the EPA Regional Screening Level Table
Nitrogen in Nitrite (NO2-N): Uses toxicity information for Nitrite (14797-55-8) in the form of nitrite as nitrogen in the EPA Regional Screening Level Table
Nitrogen in Nitrite and Nitrate (NO2+NO3-N): Uses toxicity information for Nitrate (14797-55-8) in the form of nitrate as nitrogen in the EPA Regional Screening Level Table; However no toxicity information is provided for Nitrate + Nitrite (as N) (NA) in the
Phosphate (14265-44-2): No toxicity information provided for non-specific phosphates
Phosphorus (7723-14-0): Total phosphorous result; Phosphorous, White (7723-14-0) is not applicable; no toxicity information provided for non-specific phosphates
Phosphorus in phosphate (PO4-P): No toxicity information provided for non-specific phosphates
Thallium (7440-28-0): Does not reference the toxicity value listed in the EPA Regional Screening Level Table
Total PCBs (1336-36-3): Uses the toxicity information for Polychlorinated Biphenyls (high risk) (1336-36-3) in the EPA Regional Screening Level Table
Total Polychlorinated Biphenyls (TOTALPCB): Uses the toxicity information for Polychlorinated Biphenyls (high risk) (1336-36-3) in the EPA Regional Screening Level Table
trans-1,3-Dichloropropene (10061-02-6): Uses the toxicity information for 1,3-dichloropropene (542-75-6) in the EPA Regional Screening Level Table
trans-Chlordane (5103-74-2): Uses the toxicity information for chlordane (12789-03-6) in the EPA Regional Screening Level Table
Uranium (7440-61-1): Uses the toxicity information for Uranium (Soluble Salts) (NA) in the EPA Regional Screening Level Table
Vanadium (7440-62-2): Uses the toxicity information for Vanadium and Compounds (NA) I the EPA Regional Screening Level Table
Zirconium (7440-67-7): Does not reference the toxicity value listed in the EPA Regional Screening Level Table

B-2: Summary of Dermal Contact PRG values for Carcinogens and Noncarcinogens

		Carcinogena		Noncarcinogena					Preliminary Remediation Goals – Dermal Contact	
CAS #	Analyte	Oral Cancer Slope Factor (CSFo) ([mg/kg-day]-1)	Referenceb	Oral Reference Dose (RfDo) (mg/kg-day)	Referenceb	Mutagena	GIABSc (unitless)	ABSdd (unitless)	Carcinogens (mg/kg)	Noncarcinogens (mg/kg)
630-20-6	1,1,1,2-Tetrachloroethane	2.60E-02	I	3.00E-02	I	--	1.00E+00	--	--	--
71-55-6	1,1,1-Trichloroethane	--	--	2.00E+00	I	--	1.00E+00	--	--	--
79-34-5	1,1,2,2-Tetrachloroethane	2.00E-01	I	2.00E-02	I	--	1.00E+00	--	--	--
79-00-5	1,1,2-Trichloroethane	5.70E-02	I	4.00E-03	I	--	1.00E+00	--	--	--
75-34-3	1,1-Dichloroethane	5.70E-03	C	2.00E-01	P	--	1.00E+00	--	--	--
75-35-4	1,1-Dichloroethene	--	--	5.00E-02	I	--	1.00E+00	--	--	--
96-18-4	1,2,3-Trichloropropane	3.00E+01	I	4.00E-03	I	M	1.00E+00	--	--	--
95-94-3	1,2,4,5-Tetrachlorobenzene	--	--	3.00E-04	I	--	1.00E+00	1.00E-01	--	9.78E+02
120-82-1	1,2,4-Trichlorobenzene	2.90E-02	P	1.00E-02	I	--	1.00E+00	--	--	--
96-12-8	1,2-Dibromo-3-chloropropane	8.00E-01	P	2.00E-04	P	M	1.00E+00	--	--	--
106-93-4	1,2-Dibromoethane	2.00E+00	I	9.00E-03	I	--	1.00E+00	--	--	--
95-50-1	1,2-Dichlorobenzene	--	--	9.00E-02	I	--	1.00E+00	--	--	--
107-06-2	1,2-Dichloroethane	9.10E-02	I	6.00E-03	X	--	1.00E+00	--	--	--
540-59-0	1,2-Dichloroethene (Total)	--	--	9.00E-03	H	--	1.00E+00	--	--	--
78-87-5	1,2-Dichloropropane	3.60E-02	C	9.00E-02	A	--	1.00E+00	--	--	--
541-73-1	1,3-Dichlorobenzene	--	--	--	--	--	1.00E+00	--	--	--
106-46-7	1,4-Dichlorobenzene	5.40E-03	C	7.00E-02	A	--	1.00E+00	--	--	--
123-91-1	1,4-Dioxane	1.00E-01	I	3.00E-02	I	--	1.00E+00	1.00E-01	2.36E+02	9.78E+04
71-36-3	1-Butanol	--	--	1.00E-01	I	--	1.00E+00	--	--	--
71-23-8	1-Propanol	--	--	--	--	--	--	--	--	--
93-65-2	2-(2-methyl-4-chlorophenoxy) propionic acid	--	--	1.00E-03	I	--	1.00E+00	--	--	--
39635-31-9	2,3,3',4,4',5,5'-Heptachlorobiphenyl	3.90E+00	WAC	3.30E-05	E	--	1.00E+00	3.00E-02	2.02E+01	3.58E+02
69782-90-7	2,3,3',4,4',5'-Hexachlorobiphenyl	3.90E+00	WAC	3.30E-05	E	--	1.00E+00	3.00E-02	2.02E+01	3.58E+02
38380-08-4	2,3,3',4,4',5-Hexachlorobiphenyl	3.90E+00	WAC	3.30E-05	E	--	1.00E+00	3.00E-02	2.02E+01	3.58E+02
32598-14-4	2,3,3',4,4'-Pentachlorobiphenyl	3.90E+00	WAC	3.30E-05	E	--	1.00E+00	3.00E-02	2.02E+01	3.58E+02
52663-72-6	2,3',4,4',5,5'-Hexachlorobiphenyl	3.90E+00	WAC	3.30E-05	E	--	1.00E+00	3.00E-02	2.02E+01	3.58E+02
74472-37-0	2,3,4,4',5-Pentachlorobiphenyl	3.90E+00	WAC	3.30E-05	E	--	1.00E+00	3.00E-02	2.02E+01	3.58E+02
65510-44-3	2',3,4,4',5-Pentachlorobiphenyl	3.90E+00	WAC	3.30E-05	E	--	1.00E+00	3.00E-02	2.02E+01	3.58E+02
31508-00-6	2,3',4,4',5-Pentachlorobiphenyl	3.90E+00	WAC	3.30E-05	E	--	1.00E+00	3.00E-02	2.02E+01	3.58E+02
58-90-2	2,3,4,6-Tetrachlorophenol	--	--	3.00E-02	I	--	1.00E+00	1.00E-01	--	9.78E+04
93-76-5	2,4,5-T(2,4,5-Trichlorophenoxyacetic acid)	--	--	1.00E-02	I	--	1.00E+00	--	--	--
93-72-1	2,4,5-TP(2-(2,4,5-Trichlorophenoxy)propionic acid)Silvex	--	--	8.00E-03	I	--	1.00E+00	--	--	--
95-95-4	2,4,5-Trichlorophenol	--	--	1.00E-01	I	--	1.00E+00	1.00E-01	--	3.26E+05
88-06-2	2,4,6-Trichlorophenol	1.10E-02	I	1.00E-03	P	--	1.00E+00	1.00E-01	2.15E+03	3.26E+03
94-75-7	2,4-D(2,4-Dichlorophenoxyacetic acid)	--	--	1.00E-02	I	--	1.00E+00	5.00E-02	--	6.52E+04
94-82-6	2,4-DB(4-(2,4-Dichlorophenoxy)butanoic acid)	--	--	8.00E-03	I	--	1.00E+00	--	--	--
120-83-2	2,4-Dichlorophenol	--	--	3.00E-03	I	--	1.00E+00	1.00E-01	--	9.78E+03
105-67-9	2,4-Dimethylphenol	--	--	2.00E-02	I	--	1.00E+00	1.00E-01	--	6.52E+04
51-28-5	2,4-Dinitrophenol	--	--	2.00E-03	I	--	1.00E+00	1.00E-01	--	6.52E+03
121-14-2	2,4-Dinitrotoluene	3.10E-01	C	2.00E-03	I	--	1.00E+00	1.02E-01	7.47E+01	6.39E+03
606-20-2	2,6-Dinitrotoluene	--	--	1.00E-03	P	--	1.00E+00	9.90E-02	--	3.29E+03
53-96-3	2-Acetylaminofluorene	3.80E+00	C	--	--	--	1.00E+00	1.00E-01	6.21E+00	--
78-93-3	2-Butanone	--	--	6.00E-01	I	--	1.00E+00	--	--	--
111-76-2	2-Butoxyethanol	--	--	1.00E-01	I	--	1.00E+00	--	--	--
91-58-7	2-Chloronaphthalene	--	--	8.00E-02	I	--	1.00E+00	--	--	--
95-57-8	2-Chlorophenol	--	--	5.00E-03	I	--	1.00E+00	--	--	--
591-78-6	2-Hexanone	--	--	5.00E-03	I	--	1.00E+00	--	--	--
94-74-6	2-Methyl-4 chlorophenoxyacetic acid	--	--	5.00E-04	I	--	1.00E+00	--	--	--
91-57-6	2-Methylnaphthalene	--	--	4.00E-03	I	--	1.00E+00	1.30E-01	--	1.00E+04
95-48-7	2-Methylphenol (cresol, o-)	--	--	5.00E-02	I	--	1.00E+00	1.00E-01	--	1.63E+05
91-59-8	2-Naphthylamine	1.80E+00	C	--	--	--	1.00E+00	1.00E-01	1.31E+01	--
88-74-4	2-Nitroaniline	--	--	1.00E-02	X	--	1.00E+00	1.00E-01	--	3.26E+04
88-75-5	2-Nitrophenol	--	--	--	--	--	--	1.00E-01	--	--
108-10-1	2-Pentanone, 4-Methyl	--	--	8.00E-02	H	--	1.00E+00	--	--	--
32774-16-6	3,3',4,4',5,5'-Hexachlorobiphenyl	3.90E+03	WAC	3.30E-08	E	--	1.00E+00	3.00E-02	2.02E-02	3.58E-01
57465-28-8	3,3',4,4',5-Pentachlorobiphenyl	1.30E+04	WAC	1.00E-08	E	--	1.00E+00	3.00E-02	6.05E-03	1.09E-01
32598-13-3	3,3',4,4'-Tetrachlorobiphenyl	1.30E+01	WAC	1.00E-05	E	--	1.00E+00	3.00E-02	6.05E+00	1.09E+02
91-94-1	3,3'-Dichlorobenzidine	4.50E-01	I	--	--	--	1.00E+00	1.00E-01	5.25E+01	--
119-93-7	3,3'-Dimethylbenzidine	1.10E+01	P	--	--	--	1.00E+00	1.00E-01	2.15E+00	--
70362-50-4	3,4,4',5- Tetrachlorobiphenyl	3.90E+01	WAC	3.30E-06	E	--	1.00E+00	3.00E-02	2.02E+00	3.58E+01
65794-96-9	3+4 Methylphenol (cresol, m+p)	--	--	--	--	--	--	--	--	--
56-49-5	3-Methylcholanthrene	2.20E+01	C	--	--	M	1.00E+00	1.00E-01	2.68E-01	--
99-09-2	3-Nitroaniline	2.10E-02	NCEA	3.00E-04	NCEA	--	1.00E+00	1.00E-01	1.12E+03	9.78E+02
72-54-8	4,4'-DDD (Dichlorodiphenyldichloroethane)	2.40E-01	I	--	--	--	1.00E+00	1.00E-01	9.84E+01	--
72-55-9	4,4'-DDE (Dichlorodiphenyldichloroethylene)	3.40E-01	I	--	--	--	1.00E+00	1.00E-01	6.94E+01	--
50-29-3	4,4'-DDT (Dichlorodiphenyltrichloroethane)	3.40E-01	I	5.00E-04	I	--	1.00E+00	3.00E-02	2.31E+02	5.43E+03
534-52-1	4,6-Dinitro-2-methylphenol	--	--	8.00E-05	X	--	1.00E+00	1.00E-01	--	2.61E+02
1918-02-1	4-Amino-3,5,6-trichloropicolinic acid	--	--	7.00E-02	I	--	1.00E+00	--	--	--
92-67-1	4-Aminobiphenyl	2.10E+01	C	--	--	--	1.00E+00	1.00E-01	1.12E+00	--
101-55-3	4-Bromophenylphenyl ether	--	--	--	--	--	--	1.00E-01	--	--
59-50-7	4-Chloro-3-methylphenol	--	--	1.00E-01	A	--	1.00E+00	1.00E-01	--	3.26E+05
106-47-8	4-Chloroaniline	2.00E-01	P	4.00E-03	I	--	1.00E+00	1.00E-01	1.18E+02	1.30E+04
7005-72-3	4-Chlorophenylphenyl ether	--	--	--	--	--	--	1.00E-01	--	--
106-44-5	4-Methylphenol (cresol, p-)	--	--	1.00E-01	A	--	1.00E+00	1.00E-01	--	3.26E+05

B-2: Summary of Dermal Contact PRG values for Carcinogens and Noncarcinogens

		Carcinogena		Noncarcinogena					Preliminary Remediation Goals – Dermal Contact	
CAS #	Analyte	Oral Cancer Slope Factor (CSFo) ([mg/kg-day]-1)	Referenceb	Oral Reference Dose (RfDo) (mg/kg-day)	Referenceb	Mutagena	GIABSc (unitless)	ABSdd (unitless)	Carcinogens (mg/kg)	Noncarcinogens (mg/kg)
100-01-6	4-Nitroaniline	2.00E-02	P	4.00E-03	P	--	1.00E+00	1.00E-01	1.18E+03	1.30E+04
100-02-7	4-Nitrophenol	--	--	--	--	--	--	1.00E-01	--	--
99-55-8	5-Nitro-o-toluidine	9.00E-03	P	2.00E-02	X	--	1.00E+00	1.00E-01	2.62E+03	6.52E+04
83-32-9	Acenaphthene	--	--	6.00E-02	I	--	1.00E+00	1.30E-01	--	1.50E+05
208-96-8	Acenaphthylene	--	--	--	--	--	--	1.30E-01	--	--
67-64-1	Acetone	--	--	9.00E-01	I	--	1.00E+00	--	--	--
75-05-8	Acetonitrile	--	--	--	--	--	1.00E+00	--	--	--
98-86-2	Acetophenone	--	--	1.00E-01	I	--	1.00E+00	--	--	--
107-02-8	Acrolein	--	--	5.00E-04	I	--	1.00E+00	--	--	--
79-06-1	Acrylamide	5.00E-01	I	2.00E-03	I	--	1.00E+00	--	--	--
107-13-1	Acrylonitrile	5.40E-01	I	4.00E-02	A	--	1.00E+00	--	--	--
309-00-2	Aldrin	1.70E+01	I	3.00E-05	I	--	1.00E+00	1.00E-01	1.39E+00	9.78E+01
107-05-1	Allyl chloride	2.10E-02	C	--	--	--	1.00E+00	--	--	--
319-84-6	Alpha-BHC	6.30E+00	I	8.00E-03	A	--	1.00E+00	1.00E-01	3.75E+00	2.61E+04
5103-71-9	Alpha-Chlordane	3.50E-01	I	5.00E-04	I	--	1.00E+00	4.00E-02	1.69E+02	4.07E+03
7429-90-5	Aluminum	--	--	1.00E+00	P	--	1.00E+00	--	--	--
62-53-3	Aniline	5.70E-03	I	7.00E-03	P	--	1.00E+00	1.00E-01	4.14E+03	2.28E+04
120-12-7	Anthracene	--	--	3.00E-01	I	--	1.00E+00	1.30E-01	--	7.52E+05
7440-36-0	Antimony	--	--	4.00E-04	I	--	1.50E-01	--	--	--
140-57-8	Aramite	2.50E-02	I	5.00E-02	H	--	1.00E+00	1.00E-01	9.44E+02	1.63E+05
12674-11-2	Aroclor-1016	7.00E-02	S	7.00E-05	I	--	1.00E+00	1.40E-01	2.41E+02	1.63E+02
11104-28-2	Aroclor-1221	2.00E+00	S	--	--	--	1.00E+00	1.40E-01	8.43E+00	--
11141-16-5	Aroclor-1232	2.00E+00	S	--	--	--	1.00E+00	1.40E-01	8.43E+00	--
53469-21-9	Aroclor-1242	2.00E+00	S	--	--	--	1.00E+00	1.40E-01	8.43E+00	--
12672-29-6	Aroclor-1248	2.00E+00	S	--	--	--	1.00E+00	1.40E-01	8.43E+00	--
11097-69-1	Aroclor-1254	2.00E+00	S	2.00E-05	I	--	1.00E+00	1.40E-01	8.43E+00	4.66E+01
11096-82-5	Aroclor-1260	2.00E+00	S	--	--	--	1.00E+00	1.40E-01	8.43E+00	--
37324-23-5	Aroclor-1262	--	--	--	--	--	--	1.40E-01	--	--
11100-14-4	Aroclor-1268	--	--	--	--	--	--	1.40E-01	--	--
7440-38-2	Arsenic	1.50E+00	I	3.00E-04	I	--	1.00E+00	3.00E-02	5.25E+01	3.26E+03
103-33-3	Azobenzene	1.10E-01	I	--	--	--	1.00E+00	--	--	--
7440-39-3	Barium	--	--	2.00E-01	I	--	7.00E-02	--	--	--
71-43-2	Benzene	5.50E-02	I	4.00E-03	I	--	1.00E+00	--	--	--
56-55-3	Benzo(a)anthracene	7.30E-01	WAC	--	--	M	1.00E+00	1.30E-01	6.21E+00	--
50-32-8	Benzo(a)pyrene	7.30E+00	I	--	--	M	1.00E+00	1.30E-01	6.21E-01	--
205-99-2	Benzo(b)fluoranthene	7.30E-01	WAC	--	--	M	1.00E+00	1.30E-01	6.21E+00	--
191-24-2	Benzo(g,h,i)perylene	--	--	--	--	--	--	1.30E-01	--	--
207-08-9	Benzo(k)fluoranthene	7.30E-01	WAC	--	--	M	1.00E+00	1.30E-01	6.21E+00	--
65-85-0	Benzoic acid	--	--	4.00E+00	I	--	1.00E+00	1.00E-01	--	1.30E+07
100-51-6	Benzyl alcohol	--	--	1.00E-01	P	--	1.00E+00	1.00E-01	--	3.26E+05
7440-41-7	Beryllium	--	--	2.00E-03	I	--	7.00E-03	--	--	--
319-85-7	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	1.80E+00	I	--	--	--	1.00E+00	1.00E-01	1.31E+01	--
108-60-1	Bis(2-chloro-1-methylethyl)ether	7.00E-02	H	4.00E-02	I	--	1.00E+00	--	--	--
111-91-1	Bis(2-Chloroethoxy)methane	--	--	3.00E-03	P	--	1.00E+00	1.00E-01	--	9.78E+03
111-44-4	Bis(2-chloroethyl) ether	1.10E+00	I	--	--	--	1.00E+00	--	--	--
117-81-7	Bis(2-ethylhexyl) phthalate	1.40E-02	I	2.00E-02	I	--	1.00E+00	1.00E-01	1.69E+03	6.52E+04
7440-69-9	Bismuth	--	--	--	--	--	--	--	--	--
7440-42-8	Boron	--	--	2.00E-01	I	--	1.00E+00	--	--	--
24959-67-9	Bromide	--	--	--	--	--	--	--	--	--
75-27-4	Bromodichloromethane	6.20E-02	I	2.00E-02	I	--	1.00E+00	--	--	--
75-25-2	Bromoform	7.90E-03	I	2.00E-02	I	--	1.00E+00	--	--	--
74-83-9	Bromomethane	--	--	1.40E-03	I	--	1.00E+00	--	--	--
85-68-7	Butylbenzylphthalate	1.90E-03	P	2.00E-01	I	--	1.00E+00	1.00E-01	1.24E+04	6.52E+05
7440-43-9	Cadmium	--	--	1.00E-03	I	--	2.50E-02	1.00E-03	--	8.15E+03
7440-70-2	Calcium	--	--	--	--	--	--	--	--	--
86-74-8	Carbazole	2.00E-02	NCEA	--	--	--	1.00E+00	1.00E-01	1.18E+03	--
75-15-0	Carbon disulfide	--	--	1.00E-01	I	--	1.00E+00	--	--	--
56-23-5	Carbon tetrachloride	7.00E-02	I	4.00E-03	I	--	1.00E+00	--	--	--
57-74-9	Chlordane	3.50E-01	I	5.00E-04	I	--	1.00E+00	4.00E-02	1.69E+02	4.07E+03
16887-00-6	Chloride	--	--	--	--	--	--	--	--	--
108-90-7	Chlorobenzene	--	--	2.00E-02	I	--	1.00E+00	--	--	--
510-15-6	Chlorobenzilate	1.10E-01	C	2.00E-02	I	--	1.00E+00	1.00E-01	2.15E+02	6.52E+04
75-00-3	Chloroethane	--	--	--	--	--	1.00E+00	--	--	--
67-66-3	Chloroform	3.10E-02	C	1.00E-02	I	--	1.00E+00	--	--	--
74-87-3	Chloromethane	--	--	--	--	--	1.00E+00	--	--	--
126-99-8	Chloroprene	--	--	2.00E-02	H	--	1.00E+00	--	--	--
7440-47-3	Chromium	--	--	1.50E+00	I	--	1.30E-02	--	--	--
218-01-9	Chrysene	7.30E-02	WAC	--	--	M	1.00E+00	1.30E-01	6.21E+01	--
156-59-2	cis-1,2-Dichloroethylene	--	--	2.00E-03	I	--	1.00E+00	--	--	--
10061-01-5	cis-1,3-Dichloropropene	1.00E-01	I	3.00E-02	I	--	1.00E+00	1.00E-01	2.36E+02	9.78E+04
7440-48-4	Cobalt	--	--	3.00E-04	P	--	1.00E+00	--	--	--
PCB1242/1016	Co-elution of Aroclor 1242 and Aroclor 1016	--	--	--	--	--	--	--	--	--
7440-50-8	Copper	--	--	4.00E-02	H	--	1.00E+00	--	--	--
57-12-5	Cyanide	--	--	6.00E-04	I	--	1.00E+00	--	--	--

B-2: Summary of Dermal Contact PRG values for Carcinogens and Noncarcinogens

		Carcinogena		Noncarcinogena					Preliminary Remediation Goals – Dermal Contact	
CAS #	Analyte	Oral Cancer Slope Factor (CSFo) ([mg/kg-day]-1)	Referenceb	Oral Reference Dose (RfDo) (mg/kg-day)	Referenceb	Mutagena	GIABSc (unitless)	ABSdd (unitless)	Carcinogens (mg/kg)	Noncarcinogens (mg/kg)
110-82-7	Cyclohexane	--	--	--	--	--	1.00E+00	--	--	--
108-94-1	Cyclohexanone	--	--	5.00E+00	I	--	1.00E+00	--	--	--
75-99-0	Dalapon	--	--	3.00E-02	I	--	1.00E+00	--	--	--
124-18-5	Decane	--	--	--	--	--	--	--	--	--
319-86-8	Delta-BHC	--	--	--	--	--	--	1.00E-01	--	--
2303-16-4	Diallate	6.10E-02	H	--	--	--	1.00E+00	1.00E-01	3.87E+02	--
53-70-3	Dibenz[a,h]anthracene	7.30E-01	WAC	--	--	M	1.00E+00	1.30E-01	6.21E+00	--
132-64-9	Dibenzofuran	--	--	1.00E-03	X	--	1.00E+00	1.00E-01	--	3.26E+03
124-48-1	Dibromochloromethane	8.40E-02	I	2.00E-02	I	--	1.00E+00	--	--	--
74-95-3	Dibromomethane	--	--	1.00E-02	H	--	1.00E+00	--	--	--
1918-00-9	Dicamba	--	--	3.00E-02	I	--	1.00E+00	--	--	--
75-71-8	Dichlorodifluoromethane	--	--	2.00E-01	I	--	1.00E+00	--	--	--
120-36-5	Dichloroprop	--	--	--	--	--	--	1.00E-01	--	--
60-57-1	Dieldrin	1.60E+01	I	5.00E-05	I	--	1.00E+00	1.00E-01	1.48E+00	1.63E+02
60-29-7	Diethyl ether	--	--	2.00E-01	I	--	1.00E+00	--	--	--
84-66-2	Diethylphthalate	--	--	8.00E-01	I	--	1.00E+00	1.00E-01	--	2.61E+06
60-51-5	Dimethoate	--	--	2.00E-04	I	--	1.00E+00	1.00E-01	--	6.52E+02
131-11-3	Dimethyl phthalate	--	--	--	--	--	--	1.00E-01	--	--
84-74-2	Di-n-butylphthalate	--	--	1.00E-01	I	--	1.00E+00	1.00E-01	--	3.26E+05
117-84-0	Di-n-octylphthalate	--	--	1.20E-02	P	--	1.00E+00	1.00E-01	--	3.91E+04
88-85-7	Dinoseb(2-secButyl-4,6-dinitrophenol)	--	--	1.00E-03	I	--	1.00E+00	1.00E-01	--	3.26E+03
298-04-4	Disulfoton	--	--	4.00E-05	I	--	1.00E+00	1.00E-01	--	1.30E+02
959-98-8	Endosulfan I	--	--	6.00E-03	I	--	1.00E+00	1.00E-01	--	1.96E+04
33213-65-9	Endosulfan II	--	--	6.00E-03	I	--	1.00E+00	1.00E-01	--	1.96E+04
1031-07-8	Endosulfan sulfate	--	--	--	--	--	--	1.00E-01	--	--
72-20-8	Endrin	--	--	3.00E-04	I	--	1.00E+00	1.00E-01	--	9.78E+02
7421-93-4	Endrin Aldehyde	--	--	--	--	--	--	1.00E-01	--	--
53494-70-5	Endrin ketone	--	--	--	--	--	--	1.00E-01	--	--
64-17-5	Ethanol	--	--	--	--	--	--	--	--	--
141-78-6	Ethyl acetate	--	--	9.00E-01	I	--	1.00E+00	--	--	--
97-63-2	Ethyl methacrylate	--	--	9.00E-02	H	--	1.00E+00	--	--	--
100-41-4	Ethylbenzene	1.10E-02	C	1.00E-01	I	--	1.00E+00	--	--	--
107-21-1	Ethylene glycol	--	--	2.00E+00	I	--	1.00E+00	--	--	--
206-44-0	Fluoranthene	--	--	4.00E-02	I	--	1.00E+00	1.30E-01	--	1.00E+05
86-73-7	Fluorene	--	--	4.00E-02	I	--	1.00E+00	1.30E-01	--	1.00E+05
16984-48-8	Fluoride	--	--	6.00E-02	I	--	1.00E+00	--	--	--
58-89-9	Gamma-BHC (Lindane)	1.10E+00	C	3.00E-04	I	--	1.00E+00	4.00E-02	5.36E+01	2.44E+03
5566-34-7	gamma-Chlordane	3.50E-01	I	5.00E-04	I	--	1.00E+00	4.00E-02	1.69E+02	4.07E+03
76-44-8	Heptachlor	4.50E+00	I	5.00E-04	I	--	1.00E+00	1.00E-01	5.25E+00	1.63E+03
1024-57-3	Heptachlor epoxide	9.10E+00	I	1.30E-05	I	--	1.00E+00	1.00E-01	2.59E+00	4.24E+01
118-74-1	Hexachlorobenzene	1.60E+00	I	8.00E-04	I	--	1.00E+00	1.00E-01	1.48E+01	2.61E+03
87-68-3	Hexachlorobutadiene	7.80E-02	I	1.00E-03	P	--	1.00E+00	1.00E-01	3.03E+02	3.26E+03
77-47-4	Hexachlorocyclopentadiene	--	--	6.00E-03	I	--	1.00E+00	1.00E-01	--	1.96E+04
67-72-1	Hexachloroethane	4.00E-02	I	7.00E-04	I	--	1.00E+00	1.00E-01	5.90E+02	2.28E+03
70-30-4	Hexachlorophene	--	--	3.00E-04	I	--	1.00E+00	1.00E-01	--	9.78E+02
110-54-3	Hexane	--	--	6.00E-02	H	--	1.00E+00	--	--	--
18540-29-9	Hexavalent Chromium	--	--	3.00E-03	I	--	2.50E-02	--	--	--
302-01-2	Hydrazine	3.00E+00	I	--	--	--	1.00E+00	--	--	--
193-39-5	Indeno(1,2,3-cd)pyrene	7.30E-01	WAC	--	--	M	1.00E+00	1.30E-01	6.21E+00	--
7439-89-6	Iron	--	--	7.00E-01	P	--	1.00E+00	--	--	--
78-83-1	Isobutyl alcohol	--	--	3.00E-01	I	--	1.00E+00	--	--	--
78-59-1	Isophorone	9.50E-04	I	2.00E-01	I	--	1.00E+00	1.00E-01	2.48E+04	6.52E+05
98-82-8	Isopropylbenzene	--	--	1.00E-01	I	--	1.00E+00	--	--	--
143-50-0	Kepone	1.00E+01	I	3.00E-04	I	--	1.00E+00	1.00E-01	2.36E+00	9.78E+02
7439-92-1	Lead	--	--	--	--	--	1.00E+00	--	--	--
7439-93-2	Lithium	--	--	2.00E-03	P	--	1.00E+00	--	--	--
7439-95-4	Magnesium	--	--	--	--	--	--	--	--	--
7439-96-5	Manganese	--	--	1.40E-01	S	--	1.00E+00	--	--	--
99-65-0	m-Dinitrobenzene	--	--	1.00E-04	I	--	1.00E+00	1.00E-01	--	3.26E+02
7439-97-6	Mercury	--	--	3.00E-04	I	--	7.00E-02	--	--	--
126-98-7	Methacrylonitrile	--	--	1.00E-04	I	--	1.00E+00	--	--	--
67-56-1	Methanol	--	--	5.00E-01	I	--	1.00E+00	--	--	--
72-43-5	Methoxychlor	--	--	5.00E-03	I	--	1.00E+00	1.00E-01	--	1.63E+04
80-62-6	Methyl methacrylate	--	--	1.40E+00	I	--	1.00E+00	--	--	--
66-27-3	Methyl methanesulfonate	9.90E-02	C	--	--	--	1.00E+00	1.00E-01	2.38E+02	--
298-00-0	Methyl parathion	--	--	2.50E-04	I	--	1.00E+00	1.00E-01	--	8.15E+02
75-09-2	Methylene chloride	2.00E-03	I	6.00E-03	I	--	1.00E+00	--	--	--
7439-98-7	Molybdenum	--	--	5.00E-03	I	--	1.00E+00	--	--	--
108-38-3	m-Xylene	--	--	2.00E-01	S	--	1.00E+00	--	--	--
91-20-3	Naphthalene	--	--	2.00E-02	I	--	1.00E+00	1.30E-01	--	5.01E+04
104-51-8	n-Butylbenzene	--	--	5.00E-02	P	--	1.00E+00	--	--	--
7440-02-0	Nickel	--	--	2.00E-02	I	--	4.00E-02	--	--	--
14797-55-8	Nitrate	--	--	7.10E+00	I	--	1.00E+00	--	--	--
14797-65-0	Nitrite	--	--	3.00E-01	I	--	1.00E+00	--	--	--

B-2: Summary of Dermal Contact PRG values for Carcinogens and Noncarcinogens

		Carcinogena		Noncarcinogena					Preliminary Remediation Goals – Dermal Contact	
CAS #	Analyte	Oral Cancer Slope Factor (CSFo) ([mg/kg-day]-1)	Referenceb	Oral Reference Dose (RfDo) (mg/kg-day)	Referenceb	Mutagena	GIABSc (unitless)	ABSdd (unitless)	Carcinogens (mg/kg)	Noncarcinogens (mg/kg)
98-95-3	Nitrobenzene	--	--	2.00E-03	I	--	1.00E+00	--	--	--
NO3-N	Nitrogen in Nitrate	--	--	1.60E+00	I	--	1.00E+00	--	--	--
NO2-N	Nitrogen in Nitrite	--	--	1.00E-01	I	--	1.00E+00	--	--	--
NO2+NO3-N	Nitrogen in Nitrite and Nitrate	--	--	1.60E+00	I	--	1.00E+00	--	--	--
930-55-2	Nitrosopyrrolidine	2.10E+00	I	--	--	--	1.00E+00	1.00E-01	1.12E+01	--
55-18-5	n-Nitrosodiethylamine	1.50E+02	I	--	--	M	1.00E+00	1.00E-01	3.93E-02	--
62-75-9	n-Nitrosodimethylamine	5.10E+01	I	8.00E-06	P	M	1.00E+00	1.00E-01	1.16E-01	2.61E+01
924-16-3	n-Nitrosodi-n-butylamine	5.40E+00	I	--	--	--	1.00E+00	--	--	--
621-64-7	n-Nitrosodi-n-dipropylamine	7.00E+00	I	--	--	--	1.00E+00	1.00E-01	3.37E+00	--
86-30-6	n-Nitrosodiphenylamine	4.90E-03	I	--	--	--	1.00E+00	1.00E-01	4.82E+03	--
10595-95-6	n-Nitrosomethylethylamine	2.20E+01	I	--	--	--	1.00E+00	1.00E-01	1.07E+00	--
59-89-2	n-Nitrosomorpholine	6.70E+00	C	--	--	--	1.00E+00	1.00E-01	3.52E+00	--
100-75-4	n-Nitrosopiperidine	9.40E+00	C	--	--	--	1.00E+00	1.00E-01	2.51E+00	--
95-47-6	o-Xylene	--	--	2.00E-01	S	--	1.00E+00	--	--	--
56-38-2	Parathion	--	--	6.00E-03	H	--	1.00E+00	1.00E-01	--	1.96E+04
60-11-7	p-Dimethylaminoazobenzene	4.60E+00	C	--	--	--	1.00E+00	1.00E-01	5.13E+00	--
608-93-5	Pentachlorobenzene	--	--	8.00E-04	I	--	1.00E+00	1.00E-01	--	2.61E+03
76-01-7	Pentachloroethane	9.00E-02	P	--	--	--	1.00E+00	--	--	--
82-68-8	Pentachloronitrobenzene (PCNB)	2.60E-01	H	3.00E-03	I	--	1.00E+00	1.00E-01	9.08E+01	9.78E+03
87-86-5	Pentachlorophenol	4.00E-01	I	5.00E-03	I	--	1.00E+00	2.50E-01	2.36E+01	6.52E+03
62-44-2	Phenacetin	2.20E-03	C	--	--	--	1.00E+00	1.00E-01	1.07E+04	--
85-01-8	Phenanthrene	--	--	--	--	--	--	1.30E-01	--	--
108-95-2	Phenol	--	--	3.00E-01	I	--	1.00E+00	1.00E-01	--	9.78E+05
298-02-2	Phorate	--	--	2.00E-04	H	--	1.00E+00	1.00E-01	--	6.52E+02
14265-44-2	Phosphate	--	--	--	--	--	--	--	--	--
7723-14-0	Phosphorus	--	--	--	--	--	--	--	--	--
PO4-P	Phosphorus in phosphate	--	--	--	--	--	--	--	--	--
7440-09-7	Potassium	--	--	--	--	--	--	--	--	--
106-50-3	p-Phenylenediamine	--	--	1.90E-01	H	--	1.00E+00	1.00E-01	--	6.19E+05
23950-58-5	Pronamide	--	--	7.50E-02	I	--	1.00E+00	1.00E-01	--	2.44E+05
129-00-0	Pyrene	--	--	3.00E-02	I	--	1.00E+00	1.30E-01	--	7.52E+04
110-86-1	Pyridine	--	--	1.00E-03	I	--	1.00E+00	--	--	--
94-59-7	Safrol	2.20E-01	C	--	--	M	1.00E+00	1.00E-01	2.68E+01	--
7782-49-2	Selenium	--	--	5.00E-03	I	--	1.00E+00	--	--	--
7440-21-3	Silicon	--	--	--	--	--	--	--	--	--
7440-22-4	Silver	--	--	5.00E-03	I	--	4.00E-02	--	--	--
7440-23-5	Sodium	--	--	--	--	--	--	--	--	--
7440-24-6	Strontium	--	--	6.00E-01	I	--	1.00E+00	--	--	--
100-42-5	Styrene	--	--	2.00E-01	I	--	1.00E+00	--	--	--
14808-79-8	Sulfate	--	--	--	--	--	--	--	--	--
18496-25-8	Sulfide	--	--	--	--	--	--	--	--	--
99-35-4	sym-Trinitrobenzene	--	--	3.00E-02	I	--	1.00E+00	1.90E-02	--	5.15E+05
127-18-4	Tetrachloroethene	2.10E-03	I	6.00E-03	I	--	1.00E+00	--	--	--
3689-24-5	Tetraethyl dithiopyrophosphate (Sulfotepp)	--	--	5.00E-04	I	--	1.00E+00	1.00E-01	--	1.63E+03
7440-28-0	Thallium	--	--	--	--	--	1.00E+00	--	--	--
7440-31-5	Tin	--	--	6.00E-01	H	--	1.00E+00	--	--	--
7440-32-6	Titanium	--	--	--	--	--	--	--	--	--
108-88-3	Toluene	--	--	8.00E-02	I	--	1.00E+00	--	--	--
1336-36-3	Total PCBs	2.00E+00	I	--	--	--	1.00E+00	1.40E-01	8.43E+00	--
TPH	Total petroleum hydrocarbons	--	--	--	--	--	--	--	--	--
TPHDIESEL	Total petroleum hydrocarbons - diesel range	--	--	--	--	--	--	--	--	--
TPHGASOLINE	Total petroleum hydrocarbons - gasoline range	--	--	--	--	--	--	--	--	--
TPHKEROSENE	Total petroleum hydrocarbons - kerosene range	--	--	--	--	--	--	--	--	--
TPH/OILH	Total petroleum hydrocarbons - motor oil (high boiling)	--	--	--	--	--	--	--	--	--
TOTALPCB	Total Polychlorinated Biphenyls	2.00E+00	I	--	--	--	1.00E+00	1.40E-01	8.43E+00	--
8001-35-2	Toxaphene	1.10E+00	I	--	--	--	1.00E+00	1.00E-01	2.15E+01	--
156-60-5	trans-1,2-Dichloroethylene	--	--	2.00E-02	I	--	1.00E+00	--	--	--
10061-02-6	trans-1,3-Dichloropropene	1.00E-01	I	3.00E-02	I	--	1.00E+00	1.00E-01	2.36E+02	9.78E+04
5103-74-2	trans-Chlordane	3.50E-01	I	5.00E-04	I	--	1.00E+00	4.00E-02	1.69E+02	4.07E+03
126-73-8	Tributyl phosphate	9.00E-03	P	1.00E-02	P	--	1.00E+00	--	--	--
79-01-6	Trichloroethene	4.60E-02	I	5.00E-04	I	--	1.00E+00	--	--	--
75-69-4	Trichloromonofluoromethane	--	--	3.00E-01	I	--	1.00E+00	--	--	--
7440-61-1	Uranium	--	--	3.00E-03	I	--	1.00E+00	--	--	--
7440-62-2	Vanadium	--	--	5.00E-03	S	--	1.00E+00	--	--	--
108-05-4	Vinyl acetate	--	--	1.00E+00	H	--	1.00E+00	--	--	--
75-01-4	Vinyl chloride	7.20E-01	I	3.00E-03	I	M	1.00E+00	--	--	--
1330-20-7	Xylenes (total)	--	--	2.00E-01	I	--	1.00E+00	--	--	--
7440-66-6	Zinc	--	--	3.00E-01	I	--	1.00E+00	--	--	--
7440-67-7	Zirconium	--	--	--	--	--	1.00E+00	--	--	--

a. Source = U.S. Environmental Protection Agency web site "Regional Screening Levels for Chemical Contaminants at Superfund Sites" (EPA, November 2012) (http://www.epa.gov/reg3hwmd/risk/human/rb-

b. Reference key:

A = The Agency for Toxic Substances and Disease Registry (ATSDR)

C = The California Environmental Protection Agency Office of Environmental Health Hazard Assessment's (CalEPA)

E = Environmental Criteria and Assessment Office

B-2: Summary of Dermal Contact PRG values for Carcinogens and Noncarcinogens

CAS #	Analyte	Carcinogena		Noncarcinogena		Mutagena	GIABSc (unitless)	ABSdd (unitless)	Preliminary Remediation Goals – Dermal Contact	
		Oral Cancer Slope Factor (CSFo) ([mg/kg-day]-1)	Referenceb	Oral Reference Dose (RfDo) (mg/kg-day)	Referenceb				Carcinogens (mg/kg)	Noncarcinogens (mg/kg)

H = Health Effects Assessment Summary Tables (HEAST)
I = EPA's Integrated Risk Information System (IRIS)
NCEA = National Center for Environmental Assessment
P = Provisional Peer Reviewed Toxicity Values (PPRTV)
S = Special case chemical; basis for value discussed on EPA Regional Screening Levels web site (EPA, 2012)
WAC = Value calculated using a toxicity equivalency factor (TEF) as provided by WAC 173-340-708(8), "Human Health Risk Assessment Procedures, Carcinogenic Potency Factor" and WAC 173-340-900, "Tables"
X = PPRTV Appendix

c. Chemical-specific parameter GIABS was obtained from the following sources, in order of preference, as available:
1. EPA, 2012 "Regional Screening Levels for Chemical Contaminants at Superfund Sites", screening level/preliminary remediation goal website, updated November 2012
2. ORNL, 2013 Risk Assessment Information System, Oak Ridge National Laboratory, Oak Ridge, Tennessee, available on the internet at < http://rais.ornl.gov/ >.

d. Chemical-specific parameter ABSd was obtained from Exhibit 3-4, EPA/540/R/99/005 OSWER 9285.7-02EP, Risk Assement Guidance for Superfund Volume I: Human Health Evaluation manual (Part E, Supplemental Guidance for Dermal Risk Assessment).
Designation of an analyte as a "semi-volatile organic compound" for RAGS Part E, Exhibit 3-4 is based on the compounds listed in EPA Method 8270C

e. The following summarizes differences between the table above and RAGS Part E
1,4-Dioxane is considered a SVOC (not listed in Method 8270) and has an ABSd of 0.1 (which is consistent with EPA, 2012)
3-methylcholanthrene (56-49-5) is considered an SVOC (instead of a PAH--not one of the 16 priority PAHs) and has an ABSd of 0.1 (which is consistent with EPA, 2012)
Carbazole (86-74-8): is considered an SVOC (not listed in Method 8270; this is instead of a PAH--not one of the 16 priority PAHs) and has an ABSd of 0.1
Dibenzofuran (132-64-9): is considered an SVOC (instead of a PAH--not one of the 16 priority PAHs) and has an ABSd of 0.1

e. The following summarizes differences between the table above and the EPA Regional Screening Level Table (November 2012)
2,3,3',4,4',5,5'-Heptachlorobiphenyl (39635-31-9): CPF is calculated using TCDD (1746-01-6) SFO multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
2,3,3',4,4',5-Hexachlorobiphenyl (38380-08-4): CPF is calculated using TCDD (1746-01-6) SFO multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
2,3,3',4,4',5'-Hexachlorobiphenyl (69782-90-7): CPF is calculated using TCDD (1746-01-6) SFO multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
2,3,3',4,4'-Pentachlorobiphenyl (32598-14-4): CPF is calculated using TCDD (1746-01-6) SFO multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
2,3',4,4',5,5'-Hexachlorobiphenyl (52663-72-6): CPF is calculated using TCDD (1746-01-6) SFO multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
2,3',4,4',5-Pentachlorobiphenyl (31508-00-6): CPF is calculated using TCDD (1746-01-6) SFO multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
2',3,4,4',5-Pentachlorobiphenyl (65510-44-3): CPF is calculated using TCDD (1746-01-6) SFO multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
2,3,4,4',5-Pentachlorobiphenyl (74472-37-0): CPF is calculated using TCDD (1746-01-6) SFO multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
3,3',4,4',5,5'-Hexachlorobiphenyl (32774-16-6): CPF is calculated using TCDD (1746-01-6) SFO multiplied by a TEF of 0.03 Per WAC 173-340-708(f)
3,3',4,4',5-Pentachlorobiphenyl (57465-28-8): CPF is calculated using TCDD (1746-01-6) SFO multiplied by a TEF of 0.1 Per WAC 173-340-708(f)
3,3',4,4'-Tetrachlorobiphenyl (32598-13-3): CPF is calculated using TCDD (1746-01-6) SFO multiplied by a TEF of 0.0001 Per WAC 173-340-708(f)
3,4,4',5- Tetrachlorobiphenyl (70362-50-4): CPF is calculated using TCDD (1746-01-6) SFO multiplied by a TEF of 0.0003 Per WAC 173-340-708(f)
3-Nitroaniline (99-09-2): Uses the toxicity and chemical-specific information obtained from Risk Assessment Information System
Alpha-Chlordane (5103-71-9): Uses the toxicity information for chlordane (12789-03-6) in the EPA Regional Screening Level Table
Benzo(a)anthracene (56-55-3): CPF is calculated using the benzo(a)pyrene CFO multiplied by a TEF of 0.1 per WAC 173-340-708(8)(e)
Benzo(a)pyrene (50-32-8): CPF is calculated using the benzo(a)pyrene CFO multiplied by a TEF of 1 per WAC 173-340-708(8)(e)
Benzo(b)fluoranthene (205-99-2): CPF is calculated using the benzo(a)pyrene CFO multiplied by a TEF of 0.1 per WAC 173-340-708(8)(e)
Benzo(k)fluoranthene (207-08-9): CPF is calculated using the benzo(a)pyrene CFO multiplied by a TEF of 0.1 per WAC 173-340-708(8)(e)
Nitrate (14797-55-8): Uses derived toxicity information based on a conversion factor of 0.226 NO3-N/NO3 and the toxicity information provided for Nitrate (14797-55-8) in the form of nitrate as nitrogen in the EPA Regional Screening Level Table
Nitrite (14797-65-0): Uses derived toxicity information based on a conversion factor of 0.304 NO2-N/NO2 and the toxcity information provided for Nitrite (14797-55-8) in the form of nitrite as nitrogen in the EPA Regional Screening Level Table

Chlordane (57-74-9): Uses the toxicity information for chlordane (12789-03-6) in the EPA Regional Screening Level Table
Chromium (7440-47-3): Uses the toxicity information for Chromium (III), Insoluble salts (16065-83-1) in the EPA Regional Screening Level Table
Nitrogen in Nitrite and Nitrate (NO2+NO3-N): Uses toxicity information for Nitrate (14797-55-8) in the form of nitrate as nitrogen in the EPA Regional Screening Level Table; However no toxicity information is provided for Nitrate + Nitrite (as N)
cis-1,3-Dichloropropene (10061-01-5): Uses the toxicity information for 1,3-dichloropropene (542-75-6) in the EPA Regional Screening Level Table; ABSd value is for cis-1,3-Dichloropropene from RAIS
Dibenz[a,h]anthracene (53-70-3): CPF is calculated using the benzo(a)pyrene CFO multiplied by a TEF of 0.1 per WAC 173-340-708(8)(e)
Endosulfan I (959-98-8): Uses the toxicity information for Endosulfan (115-29-7) in the EPA Regional Screening Level Table
Endosulfan II (33213-65-9): Uses the toxicity information for Endosulfan (115-29-7) in the EPA Regional Screening Level Table
Fluoride (16984-48-8): Uses the toxicity information for Fluorine (Soluble Fluoride) (7782-41-4) in the EPA Regional Screening Level Table
gamma-Chlordane (5566-34-7): Uses the toxicity information for chlordane (12789-03-6) in the EPA Regional Screening Level Table
Hexavalent Chromium (18540-29-9): The oral carcinogenic potency factor provided in the EPA Regional Screening Level Table is not included in this table
Indeno(1,2,3-cd)pyrene (193-39-5): CPF is calculated using the benzo(a)pyrene CFO multiplied by a TEF of 0.1 per WAC 173-340-708(8)(e)
Manganese (7439-96-5): Uses the toxicity information for Manganese (Diet) (7439-96-5) in the EPA Regional Screening Level Table
Mercury (7439-97-6): Uses the toxicity information for Mercuric Chloride (an other Mercury Salts) (7487-94-7) in the EPA Regional Screening Level Table
Nitrate (14797-55-8): Uses derived toxicity information based on a conversion factor of 0.226 NO3-N/NO3 and the toxicity information provided for Nitrate (14797-55-8) in the form of nitrate as nitrogen in the EPA Regional Screening Level Table
Nitrite (14797-65-0): Uses derived toxicity information based on a conversion factor of 0.304 NO2-N/NO2 and the toxcity information provided for Nitrite (14797-55-8) in the form of nitrite as nitrogen in the EPA Regional Screening Level Table
Nitrogen in Nitrate (NO3-N): Uses toxicity information for Nitrate (14797-55-8) in the form of nitrate as nitrogen in the EPA Regional Screening Level Table
Nitrogen in Nitrite (NO2-N): Uses toxicity information for Nitrite (14797-55-8) in the form of nitrite as nitrogen in the EPA Regional Screening Level Table
Nitrogen in Nitrite and Nitrate (NO2+NO3-N): Uses toxicity information for Nitrate (14797-55-8) in the form of nitrate as nitrogen in the EPA Regional Screening Level Table; However no toxicity information is provided for Nitrate + Nitrite (as N) (NA) in the EPA Regional Screening Level Table
Phosphate (14265-44-2): No toxicity information provided for non-specific phosphates
Phosphorus (7723-14-0): Total phosphorous result; Phosphorous, White (7723-14-0) is not applicable; no toxicity information provided for non-specific phosphates
Phosphorus in phosphate (PO4-P): No toxicity information provided for non-specific phosphates
Thallium (7440-28-0): Does not reference the toxicity value listed in the EPA Regional Screening Level Table
Total PCBs (1336-36-3): Uses the toxicity information for Polychlorinated Biphenyls (high risk) (1336-36-3) in the EPA Regional Screening Level Table
Total Polychlorinated Biphenyls (TOTALPCB): Uses the toxicity information for Polychlorinated Biphenyls (high risk) (1336-36-3) in the EPA Regional Screening Level Table
trans-1,3-Dichloropropene (10061-02-6): Uses the toxicity information for 1,3-dichloropropene (542-75-6) in the EPA Regional Screening Level Table; ABSd value is for trans-1,3-Dichloropropene from RAIS
trans-Chlordane (5103-74-2): Uses the toxicity information for chlordane (12789-03-6) in the EPA Regional Screening Level Table
Uranium (7440-61-1): Uses the toxicity and chemical-specific information for Uranium (Soluble Salts) (NA) in the EPA Regional Screening Level Table
Vanadium (7440-62-2): Uses the toxicity and chemical-specific information for Vanadium and Compounds (NA) I the EPA Regional Screening Level Table
Zirconium (7440-67-7): Does not reference the toxicity value listed in the EPA Regional Screening Level Table

B-3: Summary of Inhalation PRG values for Carcinogens and Noncarcinogens

		Carcinogena		Noncarcinogena					Preliminary Remediation Goals – Inhalation	
CAS #	Analyte	Inhalation Unit Risk (IUR) (µg/m3)-1	Referenceb	Inhalation Reference Concentration (RfCi) (mg/m3)	Referenceb	Volatilec	Mutagena	Volatilization Factord (VF) (m3/kg)	Carcinogens (mg/kg)	Noncarcinogens (mg/kg)
630-20-6	1,1,1,2-Tetrachloroethane	7.40E-06	I	--	--	V	--	3.63E+03	5.57E+01	--
71-55-6	1,1,1-Trichloroethane	--	--	5.00E+00	I	V	--	1.60E+03	--	3.88E+05
79-34-5	1,1,2,2-Tetrachloroethane	5.80E-05	C	--	--	V	--	9.11E+03	1.78E+01	--
79-00-5	1,1,2-Trichloroethane	1.60E-05	I	2.00E-04	X	V	--	4.79E+03	3.40E+01	4.66E+01
75-34-3	1,1-Dichloroethane	1.60E-06	C	--	--	V	--	1.80E+03	1.27E+02	--
75-35-4	1,1-Dichloroethene	--	--	2.00E-01	I	V	--	1.12E+03	--	1.09E+04
96-18-4	1,2,3-Trichloropropane	--	--	3.00E-04	I	V	M	9.24E+03	--	1.35E+02
95-94-3	1,2,4,5-Tetrachlorobenzene	--	--	--	--	--	--	--	--	--
120-82-1	1,2,4-Trichlorobenzene	--	--	2.00E-03	P	V	--	1.56E+04	--	1.52E+03
96-12-8	1,2-Dibromo-3-chloropropane	6.00E-03	P	2.00E-04	I	V	M	1.88E+04	1.40E-01	1.83E+02
106-93-4	1,2-Dibromoethane	6.00E-04	I	9.00E-03	I	V	--	6.87E+03	1.30E+00	3.01E+03
95-50-1	1,2-Dichlorobenzene	--	--	2.00E-01	H	V	--	5.97E+03	--	5.81E+04
107-06-2	1,2-Dichloroethane	2.60E-05	I	7.00E-03	P	V	--	3.66E+03	1.60E+01	1.25E+03
540-59-0	1,2-Dichloroethene (Total)	--	--	--	--	V	--	1.92E+03	--	--
78-87-5	1,2-Dichloropropane	1.00E-05	C	4.00E-03	I	V	--	2.51E+03	2.85E+01	4.89E+02
541-73-1	1,3-Dichlorobenzene	--	--	--	--	V	--	5.39E+03	--	--
106-46-7	1,4-Dichlorobenzene	1.10E-05	C	8.00E-01	I	V	--	6.50E+03	6.71E+01	2.53E+05
123-91-1	1,4-Dioxane	7.70E-06	C	3.00E+00	C	V	--	4.20E+04	6.19E+02	6.13E+06
71-36-3	1-Butanol	--	--	--	--	V	--	3.17E+04	--	--
71-23-8	1-Propanol	--	--	--	--	V	--	3.13E+04	--	--
93-65-2	2-(2-methyl-4-chlorophenoxy) propionic acid	--	--	--	--	--	--	--	--	--
39635-31-9	2,3,3',4,4',5,5'-Heptachlorobiphenyl	1.14E-03	WAC	1.30E-03	E	--	--	--	7.27E+06	4.62E+09
69782-90-7	2,3,3',4,4',5'-Hexachlorobiphenyl	1.14E-03	WAC	1.30E-03	E	--	--	--	7.27E+06	4.62E+09
38380-08-4	2,3,3',4,4',5-Hexachlorobiphenyl	1.14E-03	WAC	1.30E-03	E	--	--	--	7.27E+06	4.62E+09
32598-14-4	2,3,3',4,4'-Pentachlorobiphenyl	1.14E-03	WAC	1.30E-03	E	--	--	--	7.27E+06	4.62E+09
52663-72-6	2,3',4,4',5,5'-Hexachlorobiphenyl	1.14E-03	WAC	1.30E-03	E	--	--	--	7.27E+06	4.62E+09
74472-37-0	2,3,4,4',5-Pentachlorobiphenyl	1.14E-03	WAC	1.30E-03	E	--	--	--	7.27E+06	4.62E+09
65510-44-3	2',3,4,4',5-Pentachlorobiphenyl	1.14E-03	WAC	1.30E-03	E	--	--	--	7.27E+06	4.62E+09
31508-00-6	2,3',4,4',5-Pentachlorobiphenyl	1.14E-03	WAC	1.30E-03	E	--	--	--	7.27E+06	4.62E+09
58-90-2	2,3,4,6-Tetrachlorophenol	--	--	--	--	--	--	--	--	--
93-76-5	2,4,5-T(2,4,5-Trichlorophenoxyacetic acid)	--	--	--	--	--	--	--	--	--
93-72-1	2,4,5-TP(2-(2,4,5-Trichlorophenoxy)propionic acid)Silvex	--	--	--	--	--	--	--	--	--
95-95-4	2,4,5-Trichlorophenol	--	--	--	--	V	--	2.86E+05	--	--
88-06-2	2,4,6-Trichlorophenol	3.10E-06	I	--	--	V	--	1.18E+05	4.31E+03	--
94-75-7	2,4-D(2,4-Dichlorophenoxyacetic acid)	--	--	--	--	--	--	--	--	--
94-82-6	2,4-DB(4-(2,4-Dichlorophenoxy)butanoic acid)	--	--	--	--	--	--	--	--	--
120-83-2	2,4-Dichlorophenol	--	--	--	--	V	--	1.03E+05	--	--
105-67-9	2,4-Dimethylphenol	--	--	--	--	V	--	1.27E+05	--	--
51-28-5	2,4-Dinitrophenol	--	--	--	--	--	--	--	--	--
121-14-2	2,4-Dinitrotoluene	8.90E-05	C	--	--	--	--	--	9.31E+07	--
606-20-2	2,6-Dinitrotoluene	--	--	--	--	--	--	--	--	--
53-96-3	2-Acetylaminofluorene	1.30E-03	C	--	--	--	--	--	6.37E+06	--
78-93-3	2-Butanone	--	--	5.00E+00	I	V	--	1.24E+04	--	3.03E+06
111-76-2	2-Butoxyethanol	--	--	1.60E+00	I	V	--	8.00E+04	--	6.23E+06
91-58-7	2-Chloronaphthalene	--	--	--	--	V	--	4.08E+04	--	--
95-57-8	2-Chlorophenol	--	--	--	--	V	--	1.21E+04	--	--
591-78-6	2-Hexanone	--	--	3.00E-02	I	V	--	1.16E+04	--	1.70E+04
94-74-6	2-Methyl-4 chlorophenoxyacetic acid	--	--	--	--	--	--	--	--	--
91-57-6	2-methylnaphthalene	--	--	--	--	V	--	2.96E+04	--	--
95-48-7	2-Methylphenol (cresol, o-)	--	--	6.00E-01	C	V	--	1.89E+05	--	5.53E+06
91-59-8	2-Naphthylamine	--	--	--	--	--	--	--	--	--
88-74-4	2-Nitroaniline	--	--	5.00E-05	X	--	--	--	--	1.78E+08
88-75-5	2-Nitrophenol	--	--	--	--	--	--	--	--	--
108-10-1	2-Pentanone, 4-Methyl	--	--	3.00E+00	I	V	--	9.53E+03	--	1.39E+06
32774-16-6	3,3',4,4',5,5'-Hexachlorobiphenyl	1.14E+00	WAC	1.30E-06	E	--	--	--	7.27E+03	4.62E+06
57465-28-8	3,3',4,4',5-Pentachlorobiphenyl	3.80E+00	WAC	4.00E-07	E	--	--	--	2.18E+03	1.42E+06
32598-13-3	3,3',4,4'-Tetrachlorobiphenyl	3.80E-03	WAC	4.00E-04	E	--	--	--	2.18E+06	1.42E+09
91-94-1	3,3'-Dichlorobenzidine	3.40E-04	C	--	--	--	--	--	2.44E+07	--
119-93-7	3,3'-Dimethylbenzidine	--	--	--	--	--	--	--	--	--
70362-50-4	3,4,4',5- Tetrachlorobiphenyl	1.14E-02	WAC	1.30E-04	E	--	--	--	7.27E+05	4.62E+08
65794-96-9	3+4 Methylphenol (cresol, m+p)	--	--	--	--	--	--	--	--	--
56-49-5	3-Methylcholanthrene	6.30E-03	C	--	--	--	M	--	5.19E+05	--
99-09-2	3-Nitroaniline	--	--	1.00E-03	NCEA	--	--	--	--	3.55E+09
72-54-8	4,4'-DDD (Dichlorodiphenyldichloroethane)	6.90E-05	C	--	--	--	--	--	1.20E+08	--
72-55-9	4,4'-DDE (Dichlorodiphenyldichloroethylene)	9.70E-05	C	--	--	--	--	--	8.54E+07	--
50-29-3	4,4'-DDT (Dichlorodiphenyltrichloroethane)	9.70E-05	I	--	--	--	--	--	8.54E+07	--
534-52-1	4,6-Dinitro-2-methylphenol	--	--	--	--	--	--	--	--	--
1918-02-1	4-Amino-3,5,6-trichloropicolinic acid	--	--	--	--	--	--	--	--	--
92-67-1	4-Aminobiphenyl	6.00E-03	C	--	--	--	--	--	1.38E+06	--
101-55-3	4-Bromophenylphenyl ether	--	--	--	--	--	--	--	--	--
59-50-7	4-Chloro-3-methylphenol	--	--	--	--	--	--	--	--	--
106-47-8	4-Chloroaniline	--	--	--	--	V	--	1.58E+05	--	--
7005-72-3	4-Chlorophenylphenyl ether	--	--	--	--	--	--	--	--	--

B-3: Summary of Inhalation PRG values for Carcinogens and Noncarcinogens

		Carcinogena		Noncarcinogena					Preliminary Remediation Goals – Inhalation	
CAS #	Analyte	Inhalation Unit Risk (IUR) (µg/m3)-1	Referenceb	Inhalation Reference Concentration (RfCi) (mg/m3)	Referenceb	Volatilec	Mutagena	Volatilization Factord (VF) (m3/kg)	Carcinogens (mg/kg)	Noncarcinogens (mg/kg)
106-44-5	4-Methylphenol (cresol, p-)	--	--	6.00E-01	C	V	--	2.04E+05	--	5.95E+06
100-01-6	4-Nitroaniline	--	--	6.00E-03	P	--	--	--	--	2.13E+10
100-02-7	4-Nitrophenol	--	--	--	--	--	--	--	--	--
99-55-8	5-Nitro-o-toluidine	--	--	--	--	--	--	--	--	--
83-32-9	Acenaphthene	--	--	--	--	V	--	6.99E+04	--	--
208-96-8	Acenaphthylene	--	--	--	--	--	--	--	--	--
67-64-1	Acetone	--	--	3.10E+01	A	V	--	1.37E+04	--	2.07E+07
75-05-8	Acetonitrile	--	--	6.00E-02	I	V	--	1.32E+04	--	3.85E+04
98-86-2	Acetophenone	--	--	--	--	V	--	4.08E+04	--	--
107-02-8	Acrolein	--	--	2.00E-05	I	V	--	7.59E+03	--	7.39E+00
79-06-1	Acrylamide	1.00E-04	I	6.00E-03	I	V	--	1.45E+05	1.64E+02	4.23E+04
107-13-1	Acrylonitrile	6.80E-05	I	2.00E-03	I	V	--	7.33E+03	1.22E+01	7.14E+02
309-00-2	Aldrin	4.90E-03	I	--	--	V	--	2.43E+05	5.64E+00	--
107-05-1	Allyl chloride	6.00E-06	C	1.00E-03	I	V	--	1.30E+03	2.46E+01	6.32E+01
319-84-6	Alpha-BHC	1.80E-03	I	--	--	--	--	--	4.60E+06	--
5103-71-9	Alpha-Chlordane	1.00E-04	I	7.00E-04	I	--	--	--	8.28E+07	2.49E+09
7429-90-5	Aluminum	--	--	5.00E-03	P	--	--	--	--	1.78E+10
62-53-3	Aniline	1.60E-06	C	1.00E-03	I	V	--	8.16E+04	5.79E+03	3.97E+03
120-12-7	Anthracene	--	--	--	--	V	--	2.66E+05	--	--
7440-36-0	Antimony	--	--	--	--	--	--	--	--	--
140-57-8	Aramite	7.10E-06	I	--	--	--	--	--	1.17E+09	--
12674-11-2	Aroclor-1016	2.00E-05	S	--	--	--	--	--	4.14E+08	--
11104-28-2	Aroclor-1221	5.70E-04	S	--	--	V	--	4.35E+04	8.66E+00	--
11141-16-5	Aroclor-1232	5.70E-04	S	--	--	V	--	4.35E+04	8.66E+00	--
53469-21-9	Aroclor-1242	5.70E-04	S	--	--	--	--	--	1.45E+07	--
12672-29-6	Aroclor-1248	5.70E-04	S	--	--	--	--	--	1.45E+07	--
11097-69-1	Aroclor-1254	5.70E-04	S	--	--	--	--	--	1.45E+07	--
11096-82-5	Aroclor-1260	5.70E-04	S	--	--	--	--	--	1.45E+07	--
37324-23-5	Aroclor-1262	--	--	--	--	--	--	--	--	--
11100-14-4	Aroclor-1268	--	--	--	--	--	--	--	--	--
7440-38-2	Arsenic	4.30E-03	I	1.50E-05	C	--	--	--	1.93E+06	5.33E+07
103-33-3	Azobenzene	3.10E-05	I	--	--	V	--	2.43E+05	8.88E+02	--
7440-39-3	Barium	--	--	5.00E-04	H	--	--	--	--	1.78E+09
71-43-2	Benzene	7.80E-06	I	3.00E-02	I	V	--	1.78E+03	2.59E+01	2.60E+03
56-55-3	Benzo(a)anthracene	1.10E-04	WAC	--	--	--	M	--	2.97E+07	--
50-32-8	Benzo(a)pyrene	1.10E-03	C	--	--	--	M	--	2.97E+06	--
205-99-2	Benzo(b)fluoranthene	1.10E-04	WAC	--	--	--	M	--	2.97E+07	--
191-24-2	Benzo(g,h,i)perylene	--	--	--	--	--	--	--	--	--
207-08-9	Benzo(k)fluoranthene	1.10E-04	WAC	--	--	--	M	--	2.97E+07	--
65-85-0	Benzoic acid	--	--	--	--	--	--	--	--	--
100-51-6	Benzyl alcohol	--	--	--	--	V	--	1.34E+05	--	--
7440-41-7	Beryllium	2.40E-03	I	2.00E-05	I	--	--	--	3.45E+06	7.10E+07
319-85-7	beta-1,2,3,4,5,6-Hexachlorocyclohexane (beta-BHC)	5.30E-04	I	--	--	--	--	--	1.56E+07	--
108-60-1	Bis(2-chloro-1-methylethyl)ether	1.00E-05	H	--	--	V	--	1.90E+04	2.16E+02	--
111-91-1	Bis(2-Chloroethoxy)methane	--	--	--	--	--	--	--	--	--
111-44-4	Bis(2-chloroethyl) ether	3.30E-04	I	--	--	V	--	3.60E+04	1.24E+01	--
117-81-7	Bis(2-ethylhexyl) phthalate	2.40E-06	C	--	--	--	--	--	3.45E+09	--
7440-69-9	Bismuth	--	--	--	--	--	--	--	--	--
7440-42-8	Boron	--	--	2.00E-02	H	--	--	--	--	7.10E+10
24959-67-9	Bromide	--	--	--	--	--	--	--	--	--
75-27-4	Bromodichloromethane	3.70E-05	C	--	--	V	--	3.78E+03	1.16E+01	--
75-25-2	Bromoform	1.10E-06	I	--	--	V	--	9.63E+03	9.94E+02	--
74-83-9	Bromomethane	--	--	5.00E-03	I	V	--	1.39E+03	--	3.38E+02
85-68-7	Butylbenzylphthalate	--	--	--	--	--	--	--	--	--
7440-43-9	Cadmium	1.80E-03	I	2.00E-05	C	--	--	--	4.60E+06	7.10E+07
7440-70-2	Calcium	--	--	--	--	--	--	--	--	--
86-74-8	Carbazole	--	--	--	--	--	--	--	--	--
75-15-0	Carbon disulfide	--	--	7.00E-01	I	V	--	9.54E+02	--	3.25E+04
56-23-5	Carbon tetrachloride	6.00E-06	I	1.00E-01	I	V	--	1.47E+03	2.78E+01	7.15E+03
57-74-9	Chlordane	1.00E-04	I	7.00E-04	I	--	--	--	8.28E+07	2.49E+09
16887-00-6	Chloride	--	--	--	--	--	--	--	--	--
108-90-7	Chlorobenzene	--	--	5.00E-02	P	V	--	3.19E+03	--	7.75E+03
510-15-6	Chlorobenzilate	3.10E-05	C	--	--	--	--	--	2.67E+08	--
75-00-3	Chloroethane	--	--	1.00E+01	I	V	--	1.18E+03	--	5.74E+05
67-66-3	Chloroform	2.30E-05	I	9.80E-02	A	V	--	2.23E+03	1.10E+01	1.06E+04
74-87-3	Chloromethane	--	--	9.00E-02	I	V	--	1.11E+03	--	4.86E+03
126-99-8	Chloroprene	3.00E-04	I	2.00E-02	I	V	--	9.87E+02	3.73E-01	9.60E+02
7440-47-3	Chromium	--	--	--	--	--	--	--	--	--
218-01-9	Chrysene	1.10E-05	WAC	--	--	--	M	--	2.97E+08	--
156-59-2	cis-1,2-Dichloroethylene	--	--	--	--	V	--	1.89E+03	--	--
10061-01-5	cis-1,3-Dichloropropene	4.00E-06	I	2.00E-02	I	V	--	1.23E+03	3.49E+01	1.19E+03
7440-48-4	Cobalt	9.00E-03	P	6.00E-06	P	--	--	--	9.20E+05	2.13E+07
PCB1242/1016	Co-elution of Aroclor 1242 and Aroclor 1016	--	--	--	--	--	--	--	--	--

B-3: Summary of Inhalation PRG values for Carcinogens and Noncarcinogens

		Carcinogena		Noncarcinogena					Preliminary Remediation Goals – Inhalation	
CAS #	Analyte	Inhalation Unit Risk (IUR) (µg/m3)-1	Referenceb	Inhalation Reference Concentration (RfCi) (mg/m3)	Referenceb	Volatilec	Mutagena	Volatilization Factord (VF) (m3/kg)	Carcinogens (mg/kg)	Noncarcinogens (mg/kg)
7440-50-8	Copper	--	--	--	--	--	--	--	--	--
57-12-5	Cyanide	--	--	8.00E-04	S	V	--	5.24E+04	--	2.04E+03
110-82-7	Cyclohexane	--	--	6.00E+00	I	V	--	9.51E+02	--	2.78E+05
108-94-1	Cyclohexanone	--	--	7.00E-01	P	V	--	3.55E+04	--	1.21E+06
75-99-0	Dalapon	--	--	--	--	V	--	1.60E+05	--	--
124-18-5	Decane	--	--	--	--	--	--	--	--	--
319-86-8	Delta-BHC	--	--	--	--	--	--	--	--	--
2303-16-4	Diallate	--	--	--	--	--	--	--	--	--
53-70-3	Dibenz[a,h]anthracene	1.10E-04	WAC	--	--	--	M	--	2.97E+07	--
132-64-9	Dibenzofuran	--	--	--	--	V	--	1.00E+05	--	--
124-48-1	Dibromochloromethane	2.70E-05	C	--	--	V	--	6.73E+03	2.83E+01	--
74-95-3	Dibromomethane	--	--	4.00E-03	X	V	--	4.67E+03	--	9.09E+02
1918-00-9	Dicamba	--	--	--	--	--	--	--	--	--
75-71-8	Dichlorodifluoromethane	--	--	1.00E-01	X	V	--	9.10E+02	--	4.43E+03
120-36-5	Dichloroprop	--	--	--	--	--	--	--	--	--
60-57-1	Dieldrin	4.60E-03	I	--	--	--	--	--	1.80E+06	--
60-29-7	Diethyl ether	--	--	--	--	V	--	2.96E+03	--	--
84-66-2	Diethylphthalate	--	--	--	--	--	--	--	--	--
60-51-5	Dimethoate	--	--	--	--	--	--	--	--	--
131-11-3	Dimethyl phthalate	--	--	--	--	--	--	--	--	--
84-74-2	Di-n-butylphthalate	--	--	--	--	--	--	--	--	--
117-84-0	Di-n-octylphthalate	--	--	--	--	--	--	--	--	--
88-85-7	Dinoseb(2-secButyl-4,6-dinitrophenol)	--	--	--	--	--	--	--	--	--
298-04-4	Disulfoton	--	--	--	--	--	--	--	--	--
959-98-8	Endosulfan I	--	--	--	--	--	--	--	--	--
33213-65-9	Endosulfan II	--	--	--	--	--	--	--	--	--
1031-07-8	Endosulfan sulfate	--	--	--	--	--	--	--	--	--
72-20-8	Endrin	--	--	--	--	--	--	--	--	--
7421-93-4	Endrin Aldehyde	--	--	--	--	--	--	--	--	--
53494-70-5	Endrin ketone	--	--	--	--	--	--	--	--	--
64-17-5	Ethanol	--	--	--	--	V	--	3.45E+04	--	--
141-78-6	Ethyl acetate	--	--	--	--	V	--	8.63E+03	--	--
97-63-2	Ethyl methacrylate	--	--	3.00E-01	P	V	--	5.00E+03	--	7.29E+04
100-41-4	Ethylbenzene	2.50E-06	C	1.00E+00	I	V	--	2.28E+03	1.04E+02	1.11E+05
107-21-1	Ethylene glycol	--	--	4.00E-01	C	V	--	1.29E+05	--	2.52E+06
206-44-0	Fluoranthene	--	--	--	--	--	--	--	--	--
86-73-7	Fluorene	--	--	--	--	V	--	1.46E+05	--	--
16984-48-8	Fluoride	--	--	1.30E-02	C	--	--	--	--	4.62E+10
58-89-9	Gamma-BHC (Lindane)	3.10E-04	C	--	--	--	--	--	2.67E+07	--
5566-34-7	gamma-Chlordane	1.00E-04	I	7.00E-04	I	--	--	--	8.28E+07	2.49E+09
76-44-8	Heptachlor	1.30E-03	I	--	--	--	--	--	6.37E+06	--
1024-57-3	Heptachlor epoxide	2.60E-03	I	--	--	V	--	1.35E+06	5.90E+01	--
118-74-1	Hexachlorobenzene	4.60E-04	I	--	--	--	--	--	1.80E+07	--
87-68-3	Hexachlorobutadiene	2.20E-05	I	--	--	V	--	4.36E+04	2.25E+02	--
77-47-4	Hexachlorocyclopentadiene	--	--	2.00E-04	I	V	--	4.57E+04	--	4.45E+02
67-72-1	Hexachloroethane	1.10E-05	C	3.00E-02	I	V	--	1.09E+04	1.12E+02	1.59E+04
70-30-4	Hexachlorophene	--	--	--	--	--	--	--	--	--
110-54-3	Hexane	--	--	7.00E-01	I	V	--	1.01E+03	--	3.44E+04
18540-29-9	Hexavalent Chromium	8.40E-02	S	1.00E-04	I	--	--	--	9.86E+04	3.55E+08
302-01-2	Hydrazine	4.90E-03	I	3.00E-05	P	--	--	--	1.69E+06	1.07E+08
193-39-5	Indeno(1,2,3-cd)pyrene	1.10E-04	WAC	--	--	--	M	--	2.97E+07	--
7439-89-6	Iron	--	--	--	--	--	--	--	--	--
78-83-1	Isobutyl alcohol	--	--	--	--	V	--	2.96E+04	--	--
78-59-1	Isophorone	--	--	2.00E+00	C	V	--	5.53E+04	--	5.38E+06
98-82-8	Isopropylbenzene	--	--	4.00E-01	I	V	--	3.14E+03	--	6.12E+04
143-50-0	Kepone	4.60E-03	C	--	--	--	--	--	1.80E+06	--
7439-92-1	Lead	--	--	--	--	--	--	--	--	--
7439-93-2	Lithium	--	--	--	--	--	--	--	--	--
7439-95-4	Magnesium	--	--	--	--	--	--	--	--	--
7439-96-5	Manganese	--	--	5.00E-05	I	--	--	--	--	1.78E+08
99-65-0	m-Dinitrobenzene	--	--	--	--	--	--	--	--	--
7439-97-6	Mercury	--	--	3.00E-04	S	--	--	--	--	1.07E+09
126-98-7	Methacrylonitrile	--	--	3.00E-02	P	V	--	6.10E+03	--	8.91E+03
67-56-1	Methanol	--	--	4.00E+00	C	V	--	3.19E+04	--	6.20E+06
72-43-5	Methoxychlor	--	--	--	--	--	--	--	--	--
80-62-6	Methyl methacrylate	--	--	7.00E-01	I	V	--	6.00E+03	--	2.04E+05
66-27-3	Methyl methanesulfonate	2.80E-05	C	--	--	--	--	--	2.96E+08	--
298-00-0	Methyl parathion	--	--	--	--	--	--	--	--	--
75-09-2	Methylene chloride	1.00E-08	I	6.00E-01	I	V	--	2.11E+03	2.40E+04	6.17E+04
7439-98-7	Molybdenum	--	--	--	--	--	--	--	--	--
108-38-3	m-Xylene	--	--	1.00E-01	S	V	--	2.33E+03	--	1.13E+04
91-20-3	Naphthalene	3.40E-05	C	3.00E-03	I	V	--	1.85E+04	6.16E+01	2.69E+03
104-51-8	n-Butylbenzene	--	--	--	--	V	--	3.96E+03	--	--

B-3: Summary of Inhalation PRG values for Carcinogens and Noncarcinogens

		Carcinogena		Noncarcinogena					Preliminary Remediation Goals – Inhalation	
CAS #	Analyte	Inhalation Unit Risk (IUR) (µg/m3)-1	Referenceb	Inhalation Reference Concentration (RfCi) (mg/m3)	Referenceb	Volatilec	Mutagena	Volatilization Factord (VF) (m3/kg)	Carcinogens (mg/kg)	Noncarcinogens (mg/kg)
7440-02-0	Nickel	2.60E-04	C	9.00E-05	A	--	--	--	3.19E+07	3.20E+08
14797-55-8	Nitrate	--	--	--	--	--	--	--	--	--
14797-65-0	Nitrite	--	--	--	--	--	--	--	--	--
98-95-3	Nitrobenzene	4.00E-05	I	9.00E-03	I	V	--	3.19E+04	9.05E+01	1.40E+04
NO3-N	Nitrogen in Nitrate	--	--	--	--	--	--	--	--	--
NO2-N	Nitrogen in Nitrite	--	--	--	--	--	--	--	--	--
NO2+NO3-N	Nitrogen in Nitrite and Nitrate	--	--	--	--	--	--	--	--	--
930-55-2	Nitrosopyrrolidine	6.10E-04	I	--	--	V	--	2.11E+05	3.92E+01	--
55-18-5	n-Nitrosodiethylamine	4.30E-02	I	--	--	V	M	6.92E+04	7.22E-02	--
62-75-9	n-Nitrosodimethylamine	1.40E-02	I	4.00E-05	X	V	M	6.67E+04	2.13E-01	1.30E+02
924-16-3	n-Nitrosodi-n-butylamine	1.60E-03	I	--	--	V	--	9.44E+04	6.70E+00	--
621-64-7	n-Nitrosodi-n-dipropylamine	2.00E-03	C	--	--	--	--	--	4.14E+06	--
86-30-6	n-Nitrosodiphenylamine	2.60E-06	C	--	--	--	--	--	3.19E+09	--
10595-95-6	n-Nitrosomethylethylamine	6.30E-03	C	--	--	--	--	--	1.31E+06	--
59-89-2	n-Nitrosomorpholine	1.90E-03	C	--	--	--	--	--	4.36E+06	--
100-75-4	n-Nitrosopiperidine	2.70E-03	C	--	--	--	--	--	3.07E+06	--
95-47-6	o-Xylene	--	--	1.00E-01	S	V	--	2.86E+03	--	1.39E+04
56-38-2	Parathion	--	--	--	--	--	--	--	--	--
60-11-7	p-Dimethylaminoazobenzene	1.30E-03	C	--	--	--	--	--	6.37E+06	--
608-93-5	Pentachlorobenzene	--	--	--	--	--	--	--	--	--
76-01-7	Pentachloroethane	--	--	--	--	V	--	5.63E+03	--	--
82-68-8	Pentachloronitrobenzene (PCNB)	--	--	--	--	--	--	--	--	--
87-86-5	Pentachlorophenol	5.10E-06	C	--	--	--	--	--	1.62E+09	--
62-44-2	Phenacetin	6.30E-07	C	--	--	--	--	--	1.31E+10	--
85-01-8	Phenanthrene	--	--	--	--	V	--	3.51E+05	--	--
108-95-2	Phenol	--	--	2.00E-01	C	V	--	1.25E+05	--	1.22E+06
298-02-2	Phorate	--	--	--	--	--	--	--	--	--
14265-44-2	Phosphate	--	--	--	--	--	--	--	--	--
7723-14-0	Phosphorus	--	--	--	--	--	--	--	--	--
PO4-P	Phosphorus in phosphate	--	--	--	--	--	--	--	--	--
7440-09-7	Potassium	--	--	--	--	--	--	--	--	--
106-50-3	p-Phenylenediamine	--	--	--	--	--	--	--	--	--
23950-58-5	Pronamide	--	--	--	--	--	--	--	--	--
129-00-0	Pyrene	--	--	--	--	V	--	1.27E+06	--	--
110-86-1	Pyridine	--	--	--	--	V	--	3.54E+04	--	--
94-59-7	Safrol	6.30E-05	C	--	--	--	M	--	5.19E+07	--
7782-49-2	Selenium	--	--	2.00E-02	C	--	--	--	--	7.10E+10
7440-21-3	Silicon	--	--	--	--	--	--	--	--	--
7440-22-4	Silver	--	--	--	--	--	--	--	--	--
7440-23-5	Sodium	--	--	--	--	--	--	--	--	--
7440-24-6	Strontium	--	--	--	--	--	--	--	--	--
100-42-5	Styrene	--	--	1.00E+00	I	V	--	6.37E+03	--	3.10E+05
14808-79-8	Sulfate	--	--	--	--	--	--	--	--	--
18496-25-8	Sulfide	--	--	--	--	--	--	--	--	--
99-35-4	sym-Trinitrobenzene	--	--	--	--	--	--	--	--	--
127-18-4	Tetrachloroethene	2.60E-07	I	4.00E-02	I	V	--	2.05E+03	8.96E+02	3.99E+03
3689-24-5	Tetraethyl dithiopyrophosphate (Sulfotepp)	--	--	--	--	--	--	--	--	--
7440-28-0	Thallium	--	--	--	--	--	--	--	--	--
7440-31-5	Tin	--	--	--	--	--	--	--	--	--
7440-32-6	Titanium	--	--	--	--	--	--	--	--	--
108-88-3	Toluene	--	--	5.00E+00	I	V	--	2.08E+03	--	5.07E+05
1336-36-3	Total PCBs	5.70E-04	I	--	--	--	--	--	1.45E+07	--
TPH	Total petroleum hydrocarbons	--	--	--	--	--	--	--	--	--
TPHDIESEL	Total petroleum hydrocarbons - diesel range	--	--	--	--	--	--	--	--	--
TPHGASOLINE	Total petroleum hydrocarbons - gasoline range	--	--	--	--	--	--	--	--	--
TPHKEROSENE	Total petroleum hydrocarbons - kerosene range	--	--	--	--	--	--	--	--	--
TPH/OILH	Total petroleum hydrocarbons - motor oil (high boiling)	--	--	--	--	--	--	--	--	--
TOTALPCB	Total Polychlorinated Biphenyls	5.70E-04	I	--	--	--	--	--	1.45E+07	--
8001-35-2	Toxaphene	3.20E-04	I	--	--	--	--	--	2.59E+07	--
156-60-5	trans-1,2-Dichloroethylene	--	--	6.00E-02	P	V	--	1.40E+03	--	4.10E+03
10061-02-6	trans-1,3-Dichloropropene	4.00E-06	I	2.00E-02	I	V	--	1.23E+03	3.49E+01	1.19E+03
5103-74-2	trans-Chlordane	1.00E-04	I	7.00E-04	I	--	--	--	8.28E+07	2.49E+09
126-73-8	Tributyl phosphate	--	--	--	--	--	--	--	--	--
79-01-6	Trichloroethene	4.10E-06	I	2.00E-03	I	V	--	1.73E+03	4.78E+01	1.68E+02
75-69-4	Trichloromonofluoromethane	--	--	7.00E-01	H	V	--	1.04E+03	--	3.56E+04
7440-61-1	Uranium	--	--	4.00E-05	NCEA	--	--	--	--	1.42E+08
7440-62-2	Vanadium	--	--	--	--	--	--	--	--	--
108-05-4	Vinyl acetate	--	--	2.00E-01	I	V	--	4.40E+03	--	4.28E+04
75-01-4	Vinyl chloride	4.40E-06	I	1.00E-01	I	V	M	9.34E+02	2.10E-01	4.55E+03
1330-20-7	Xylenes (total)	--	--	1.00E-01	I	V	--	2.27E+03	--	1.10E+04
7440-66-6	Zinc	--	--	--	--	--	--	--	--	--
7440-67-7	Zirconium	--	--	--	--	--	--	--	--	--

a. Source = U.S. Environmental Protection Agency web site "Regional Screening Levels for Chemical Contaminants at Superfund Sites" (EPA, November 2012) (http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm).

B-3: Summary of Inhalation PRG values for Carcinogens and Noncarcinogens

CAS #	Analyte	Carcinogena		Noncarcinogena		Volatilec	Mutagena	Volatilization Factord (VF) (m3/kg)	Preliminary Remediation Goals – Inhalation	
		Inhalation Unit Risk (IUR) (µg/m3)-1	Referenceb	Inhalation Reference Concentration (RfCi) (mg/m3)	Referenceb				Carcinogens (mg/kg)	Noncarcinogens (mg/kg)

b. Reference key:

A = The Agency for Toxic Substances and Disease Registry (ATSDR)
C = The California Environmental Protection Agency (CalEPA)
E = Environmental Criteria and Assessment Office
H = Health Effects Assessment Summary Tables (HEAST)
I = EPA's Integrated Risk Information System (IRIS)
NCEA = National Center for Environmental Assessment (NCEA)
P = Provisional Peer Reviewed Toxicity Values (PPRTV)
S = Special case chemical; basis for value discussed on EPA Regional Screening Levels web site (EPA, 2012)
WAC = Value calculated using a toxicity equivalency factor (TEF) as provided by WAC 173-340-708(8), "Human Health Risk Assessment Procedures, Carcinogenic Potency Factor" and WAC 173-340-900, "Tables"
X = PPRTV Appendix

c. Is defined as volatile based on WAC 173-340-200 “Definitions” “Volatiles” or designated in the CLARC database (2013)

d. For non-volatile analytes, only the PEF value is used to calculated intake, while the VF factor is omitted from the calculation.

e. The following summarizes differences between the table above and the EPA Regional Screening Level Table (November 2012) and/or RAIS

2,3,3',4,4',5,5'-Heptachlorobiphenyl (39635-31-9): CPF is calculated using TCDD (1746-01-6) IUR multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
2,3,3',4,4',5-Hexachlorobiphenyl (38380-08-4): CPF is calculated using TCDD (1746-01-6) IUR multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
2,3,3',4,4',5'-Hexachlorobiphenyl (69782-90-7): CPF is calculated using TCDD (1746-01-6) IUR multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
2,3,3',4,4'-Pentachlorobiphenyl (32598-14-4): CPF is calculated using TCDD (1746-01-6) IUR multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
2,3',4,4',5,5'-Hexachlorobiphenyl (52663-72-6): CPF is calculated using TCDD (1746-01-6) IUR multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
2,3',4,4',5-Pentachlorobiphenyl (31508-00-6): CPF is calculated using TCDD (1746-01-6) IUR multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
2',3,4,4',5-Pentachlorobiphenyl (65510-44-3): CPF is calculated using TCDD (1746-01-6) IUR multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
2,3,4,4',5-Pentachlorobiphenyl (74472-37-0): CPF is calculated using TCDD (1746-01-6) IUR multiplied by a TEF of 0.00003 Per WAC 173-340-708(f)
2-Naphthylamine (91-59-8): EPA, 2012 lists "0" for IUR; assume it is '"--" (divide by zero issue)
3,3',4,4',5,5'-Hexachlorobiphenyl (32774-16-6): CPF is calculated using TCDD (1746-01-6) IUR multiplied by a TEF of 0.03 Per WAC 173-340-708(f)
3,3',4,4',5-Pentachlorobiphenyl (57465-28-8): CPF is calculated using TCDD (1746-01-6) IUR multiplied by a TEF of 0.1 Per WAC 173-340-708(f)
3,3',4,4'-Tetrachlorobiphenyl (32598-13-3): CPF is calculated using TCDD (1746-01-6) IUR multiplied by a TEF of 0.0001 Per WAC 173-340-708(f)
3,4,4',5- Tetrachlorobiphenyl (70362-50-4): CPF is calculated using TCDD (1746-01-6) IUR multiplied by a TEF of 0.0003 Per WAC 173-340-708(f)
3-Nitroaniline (99-09-2): Uses the toxicity information obtained from Risk Assessment Information System
Alpha-Chlordane (5103-71-9): Uses the toxicity information for chlordane (12789-03-6) in the EPA Regional Screening Level Table
Benzo(a)anthracene (56-55-3): CPF is calculated using the benzo(a)pyrene IUR multiplied by a TEF of 0.1 per WAC 173-340-708(8)(e)
Benzo(a)pyrene (50-32-8): CPF is calculated using the benzo(a)pyrene IUR multiplied by a TEF of 1 per WAC 173-340-708(8)(e)
Benzo(b)fluoranthene (205-99-2): CPF is calculated using the benzo(a)pyrene IUR multiplied by a TEF of 0.1 per WAC 173-340-708(8)(e)
Benzo(k)fluoranthene (207-08-9): CPF is calculated using the benzo(a)pyrene IUR multiplied by a TEF of 0.1 per WAC 173-340-708(8)(e)
Cadmium (7440-43-9): Uses the toxicity information for Cadmium (Diet) (7440-43-9) in the EPA Regional Screening Level Table
Chlordane (57-74-9): Uses the toxicity information for chlordane (12789-03-6) in the EPA Regional Screening Level Table
Chromium (7440-47-3): Uses the toxicity information for Chromium (III), Insoluble salts (16065-83-1) in the EPA Regional Screening Level Table
Chrysene (218-01-9): CPF is calculated using the benzo(a)pyrene IUR multiplied by a TEF of 0.01 per WAC 173-340-708(8)(e)
cis-1,3-Dichloropropene (10061-01-5): Uses the toxicity information for 1,3-dichloropropene (542-75-6) in the EPA Regional Screening Level Table
Dibenz[a,h]anthracene (53-70-3): CPF is calculated using the benzo(a)pyrene IUR multiplied by a TEF of 0.1 per WAC 173-340-708(8)(e)
Endosulfan I (959-98-8): Uses the toxicity information for Endosulfan (115-29-7) in the EPA Regional Screening Level Table
Endosulfan II (33213-65-9): Uses the toxicity information for Endosulfan (115-29-7) in the EPA Regional Screening Level Table
Fluoride (16984-48-8): Uses the toxicity information for Fluorine (Soluble Fluoride) (7782-41-4) in the EPA Regional Screening Level Table
gamma-Chlordane (5566-34-7): Uses the toxicity information for chlordane (12789-03-6) in the EPA Regional Screening Level Table
Indeno(1,2,3-cd)pyrene (193-39-5): CPF is calculated using the benzo(a)pyrene IUR multiplied by a TEF of 0.1 per WAC 173-340-708(8)(e)
Manganese (7439-96-5): Uses the toxicity information for Manganese (Diet) (7439-96-5) in the EPA Regional Screening Level Table
Mercury (7439-97-6): Uses the toxicity information for Mercuric Chloride (and other Mercury Salts) (7487-94-7) in the EPA Regional Screening Level Table
Nitrate (14797-55-8): Uses derived toxicity information based on a conversion factor of 0.226 NO3-N/NO3 and the toxicity information provided for Nitrate (14797-55-8) in the form of nitrate as nitrogen in the EPA Regional Screening Level Table

Nitrate (14797-55-8): Uses derived toxicity information based on a conversion factor of 0.226 NO3-N/NO3 and the toxicity information provided for Nitrate (14797-55-8) in the form of nitrate as nitrogen in the EPA Regional Screening Level Table

Nitrite (14797-65-0): Uses derived toxicity information based on a conversion factor of 0.304 NO2-N/NO2 and the toxcity information provided for Nitrite (14797-55-8) in the form of nitrite as nitrogen in the EPA Regional Screening Level Table

Nitrogen in Nitrite (NO2-N): Uses toxicity information for Nitrite (14797-55-8) in the form of nitrite as nitrogen in the EPA Regional Screening Level Table
Nitrogen in Nitrite and Nitrate (NO2+NO3-N): Uses toxicity information for Nitrate (14797-55-8) in the form of nitrate as nitrogen in the EPA Regional Screening Level Table; However no toxicity information is provided for Nitrate + Nitrite (as N) (NA) in the EPA Regional Screening Level Table

Nitrogen in Nitrite and Nitrate (NO2+NO3-N): Uses toxicity information for Nitrate (14797-55-8) in the form of nitrate as nitrogen in the EPA Regional Screening Level Table; However no toxicity information is provided for Nitrate + Nitrite (as

Phosphorus (7723-14-0): Total phosphorous result; Phosphorous, White (7723-14-0) is not applicable; no toxicity information provided for non-specific phosphates
Phosphorus in phosphate (PO4-P): No toxicity information provided for non-specific phosphates
Total PCBs (1336-36-3): Uses the toxicity information for Polychlorinated Biphenyls (high risk) (1336-36-3) in the EPA Regional Screening Level Table
Total Polychlorinated Biphenyls (TOTALPCB): Uses the toxicity information for Polychlorinated Biphenyls (high risk) (1336-36-3) in the EPA Regional Screening Level Table
trans-1,3-Dichloropropene (10061-02-6): Uses the toxicity information for 1,3-dichloropropene (542-75-6) in the EPA Regional Screening Level Table
trans-Chlordane (5103-74-2): Uses the toxicity information for chlordane (12789-03-6) in the EPA Regional Screening Level Table
Uranium (7440-61-1): Uses the toxicity information obtained from Risk Assessment Information System
Vanadium (7440-62-2): Uses the toxicity information for Vanadium and Compounds (NA) I the EPA Regional Screening Level Table

B-4: Summary of Input Parameters used to Calculate the Particulate Emission Factor				
Factor	Symbol	Value	Unit	Reference
A Constant	A	11.3161	unitless	OSWER Directive 9355.4-24; Exhibit D-2 for Boise Idaho.
Site Area	As	0.5	acres	OSWER Directive 9355.4-24
B Constant	B	19.6437	unitless	OSWER Directive 9355.4-24; Exhibit D-2 for Boise Idaho.
C Constant	C	224.8172	unitless	OSWER Directive 9355.4-24; Exhibit D-2 for Boise Idaho.
Wind speed distribution function	F(x)	7.21E-03	unitless	Equation 34
Particulate Emission Factor	PEF	7.30E+10	m3/kg	Equation 32
Inverse of mean concentration at center of a source	Q/C	71.22808	g/m2-s per kg/m3	Equation 33
Annual average wind speed	um	3.4	m/s	PNNL-15160, Table 5.1
Wind speed at anemometer height equivalent to corrected threshold friction velocity	ut	11.32	m/s	OSWER Directive 9355.4-24
	x	2.95E+00	unitless	Equation 35
Fraction of vegetative cover	V	0.5	unitless	OSWER Directive 9355.4-24

OSWER 9355.4 24, Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites, Solid Waste and Emergency Response

PNNL 15160, 2005, Hanford Site Climatological Summary 2004 with Historical Data