TABLE 6-1
CANCER TOXICITY DATA FOR COPCs - ORAL/DERMAL
LOWER PASSAIC RIVER STUDY AREA, NEW JERSEY
BASELINE HUMAN HEALTH RISK ASSESSMENT

Chemical of Potential Concern	CAS Number	Oral Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$	Oral Absorption Efficiency for Dermal (a)	Absorbed Dermal Cancer Slope Factor (b) $(mg/kg\text{-}day)^{-1}$	Study Animal	Study Method	Weight of Evidence/ Cancer Guideline Description (c)	Classification System	Oral CSF/WOE		CSF Tier (n)
									Source(s)	Date	
PCDDs/PCDFs											
TCDD-TEQ	TCDD-TEQ	1.30E+05 (d)	--	1.30E+05 (d)	Mouse	Oral: Gavage	(o)	(o)	CalEPA	10/2013	Tier 3
PCBs											
PCBs, total (high risk & persistence/upper bound)	1336-36-3	2.00E+00	--	2.00E+00	Rat	Oral: Diet	B2	1986	IRIS	10/2013	Tier 1
PCBs, total (high risk & persistence/central estimate)	1336-36-3	1.00E+00	--	1.00E+00	Rat	Oral: Diet	B2	1986	IRIS	10/2013	Tier 1
PCBs, total (low risk & persistence/upper bound)	1336-36-3	4.00E-01	--	4.00E-01	Rat	Oral: Diet	B2	1986	IRIS	10/2013	Tier 1
PCBs, total (low risk & persistence/central estimate)	1336-36-3	3.00E-01	--	3.00E-01	Rat	Oral: Diet	B2	1986	IRIS	10/2013	Tier 1
PCBs, total (lowest risk & persistence/upper bound)	1336-36-3	7.00E-02	--	7.00E-02	Rat	Oral: Diet	B2	1986	IRIS	10/2013	Tier 1
PCBs, total (lowest risk & persistence/central estimate)	1336-36-3	4.00E-02	--	4.00E-02	Rat	Oral: Diet	B2	1986	IRIS	10/2013	Tier 1
PCB-TEQ	PCB-TEQ	1.30E+05 (d)	--	1.30E+05 (d)	(d)	(d)	(d)	(d)	(d)	(d)	Tier 3
Inorganics											
Aluminum	7429-90-5	NA	--	NA	NA	NA	Inadequate Information	2005	PPRTV	2/2007	NA
Antimony	7440-36-0	NA	0.15	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic, organic	7440-38-2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic, inorganic	7440-38-2	1.50E+00	--	1.50E+00	Human	Oral: Drinking Water	A	1986	IRIS	10/2013	Tier 1
Cadmium, diet	7440-43-9	NA	0.025	NA	NA	NA	B1	1986	IRIS	10/2013	NA
Cadmium, water	7440-43-9	NA	0.05	NA	NA	NA	B1	1986	IRIS	10/2013	NA
Chromium, total	7440-47-3	NA	0.013	NA	NA	NA	D	1986	IRIS	10/2013	NA
Chromium, hexavalent	18540-29-9	5.00E-01 (m,r)	0.025	2.00E+01 (m,r)	Mouse	Oral: Drinking Water	D [oral (p)]; A [inhalation]	1986	NJDEP	4/2009	Tier 3
Cobalt	7440-48-4	NA	--	NA	NA	NA	Likely Carcinogenic (inhalation)	2005	PPRTV	8/2008	NA
Copper	7440-50-8	NA	--	NA	NA	NA	NA	NA	NA	NA	NA
Lead	7439-92-1	NA	--	NA	NA	NA	B2	1986	IRIS	10/2013	NA
Manganese, diet	7439-96-5	NA	NA	NA	NA	NA	D	1986	IRIS	10/2013	NA
Manganese, nondiet	7439-96-5	NA	0.04	NA	NA	NA	D	1986	IRIS	10/2013	NA
Mercury, inorganic	7487-94-7	NA	0.07	NA	NA	NA	D	1986	IRIS	10/2013	NA
Methyl Mercury	22967-92-6	NA	NA	NA	NA	NA	C	1986	IRIS	10/2013	NA
Selenium	7782-49-2	NA	--	NA	NA	NA	D	1986	IRIS	10/2013	NA
Silver	7440-22-4	NA	0.04	NA	NA	NA	D	1986	IRIS	10/2013	NA
Thallium	7440-28-0	NA	--	NA	NA	NA	Inadequate Information	2005	PPRTV	10/2012	NA
Vanadium	7440-62-2	NA	0.026	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	7440-66-6	NA	--	NA	NA	NA	Inadequate Information	2005	IRIS	10/2013	NA
Pesticides											
2,4-DDD	53-19-0	2.40E-01 (e)	--	2.40E-01 (e)	(e)	(e)	(e)	(e)	(e)	(e)	Surrogate
2,4-DDE	3424-82-6	3.40E-01 (f)	--	3.40E-01 (f)	(f)	(f)	(f)	(f)	(f)	(f)	Surrogate
2,4-DDT	789-02-6	3.40E-01 (g)	--	3.40E-01 (g)	(g)	(g)	(g)	(g)	(g)	(g)	Surrogate
4,4'-DDD	72-54-8	2.40E-01	--	2.40E-01	Mouse	Oral: diet	B2	1986	IRIS	10/2013	Tier 1
4,4'-DDE	72-55-9	3.40E-01	--	3.40E-01	Mouse	Oral: diet	B2	1986	IRIS	10/2013	Tier 1
4,4'-DDT	50-29-3	3.40E-01	--	3.40E-01	Mouse	Oral: diet	B2	1986	IRIS	10/2013	Tier 1
Aldrin	309-00-2	1.70E+01	--	1.70E+01	Mouse	Oral: diet	B2	1986	IRIS	10/2013	Tier 1
cis-Chlordane	5103-71-9	3.50E-01	--	3.50E-01	Mouse	Oral: diet	B2	1986	IRIS	10/2013	Tier 1
cis-Nonachlor	5103-73-1	3.50E-01 (h)	--	3.50E-01 (h)	(h)	(h)	(h)	(h)	(h)	(h)	Surrogate
Dieldrin	60-57-1	1.60E+01	--	1.60E+01	Mouse	Oral: diet	B2	1986	IRIS	10/2013	Tier 1

FOIA_07123_0003064_0001

TABLE 6-1
CANCER TOXICITY DATA FOR COPCs - ORAL/DERMAL
LOWER PASSAIC RIVER STUDY AREA, NEW JERSEY
BASELINE HUMAN HEALTH RISK ASSESSMENT

Chemical of Potential Concern	CAS Number	Oral Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$	Oral Absorption Efficiency for Dermal (a)	Absorbed Dermal Cancer Slope Factor (b) $(mg/kg\text{-}day)^{-1}$	Study Animal	Study Method	Weight of Evidence/ Cancer Guideline Description (c)	Classification System	Oral CSF/WOE		CSF Tier (n)
									Source(s)	Date	
Gamma-Chlordane	5566-34-7	3.50E-01	--	3.50E-01	Mouse	Oral: diet	B2	1986	IRIS	10/2013	Tier 1
Heptachlor Epoxide	1024-57-3	9.10E+00	--	9.10E+00	Mouse	Oral: diet	Likely Carcinogenic	2005	IRIS	10/2013	Tier 1
Oxychlordane	27304-13-8	3.50E-01 (h)	--	3.50E-01 (h)	(h)	(h)	(h)	(h)	(h)	(h)	Surrogate
trans-Nonachlor	39765-80-5	3.50E-01 (h)	--	3.50E-01 (h)	(h)	(h)	(h)	(h)	(h)	(h)	Surrogate
PAHs											
Benzo(a)anthracene	56-55-3	7.30E-01 (i,r)	--	7.30E-01 (i,r)	Mouse	Oral: diet	B2	1986	IRIS	10/2013	Tier 1
Benzo(a)pyrene	50-32-8	7.30E+00 (r)	--	7.30E+00 (r)	Mouse	Oral: diet	B2	1986	IRIS	10/2013	Tier 1
Benzo(b)fluoranthene	205-99-2	7.30E-01 (i,r)	--	7.30E-01 (i,r)	Mouse	Oral: diet	B2	1986	IRIS	10/2013	Tier 1
Benzo(k)fluoranthene	207-08-9	7.30E-02 (i,r)	--	7.30E-02 (i,r)	Mouse	Oral: diet	B2	1986	IRIS	10/2013	Tier 1
C2-Benzanthracene/chrysenes	BACC2	7.30E-03 (j,r)	--	7.30E-03 (j,r)	(j,r)	(j,r)	(j,r)	(j,r)	(j,r)	(j,r)	Surrogate
C2-Naphthalene	NPHC2	NA	--	NA	NA	NA	NA	NA	NA	NA	NA
C3-Naphthalene	NPHC3	NA	--	NA	NA	NA	NA	NA	NA	NA	NA
C4-Naphthalene	NPHC4	NA	--	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	218-01-9	7.30E-03 (i,r)	--	7.30E-03 (i,r)	Mouse	Oral: diet	B2	1986	IRIS	10/2013	Tier 1
Dibenz(a,h)anthracene	53-70-3	7.30E+00 (i,r)	--	7.30E+00 (i,r)	Mouse	Oral: diet	B2	1986	IRIS	10/2013	Tier 1
Indeno(1,2,3-cd)pyrene	193-39-5	7.30E-01 (i,r)	--	7.30E-01 (i,r)	Mouse	Oral: diet	B2	1986	IRIS	10/2013	Tier 1
Naphthalene	91-20-3	NA	--	NA	NA	NA	C	1986	IRIS	10/2013	NA
SVOCs											
1,1-Biphenyl	92-52-4	8.00E-03	--	8.00E-03	Mouse	Oral: diet	Suggestive Evidence	2005	IRIS	10/2013	Tier 1
bis(2-Ethylhexyl) phthalate	117-81-7	1.40E-02	--	1.40E-02	Mouse	Oral: diet	B2	1986	IRIS	10/2013	Tier 1
Hexachlorobenzene	118-74-1	1.60E+00	--	1.60E+00	Rat	Oral: diet	B2	1986	IRIS	10/2013	Tier 1
TPH											
TPH C9-C18	TPHC9-C18	NA	--	NA	NA	NA	NA	NA	NA	NA	NA
TPH C19-C40	TPHC19-C40	NA	--	NA	NA	NA	NA	NA	NA	NA	NA
VOCs											
Benzene	71-43-2	5.50E-02 (k)	--	5.50E-02 (k)	Human	Occupational: Inhalation	A	1986	IRIS	10/2013	Tier 1
Chloroform	67-66-3	NA (l)	--	NA (l)	NA	NA	B2	1986	NA	NA	NA
Trichloroethene	79-01-6	4.60E-02 (r)	--	4.60E-02 (r)	Human	Epidemiological: Inhalation	Carcinogenic	2005	IRIS	10/2013	Tier 1

See next page for notes.

FOIA_07123_0003064_0002

TABLE 6-1
CANCER TOXICITY DATA FOR COPCs - ORAL/DERMAL
LOWER PASSAIC RIVER STUDY AREA, NEW JERSEY
BASELINE HUMAN HEALTH RISK ASSESSMENT

Chemical of Potential Concern	CAS Number	Oral Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$	Oral Absorption Efficiency for Dermal (a)	Absorbed Dermal Cancer Slope Factor (b) $(mg/kg\text{-}day)^{-1}$	Study Animal	Study Method	Weight of Evidence/ Cancer Guideline Description (c)	Classification System	Oral CSF/WOE		CSF Tier (n)
									Source(s)	Date	

Notes:
"--" - No adjustment necessary.
$ABS_{(GI)}$ - Fraction of contaminant absorbed in gastrointestinal tract (dimensionless).
CalEPA - California Environmental Protection Agency. Toxicity Criteria Database. http://www.oehha.ca.gov/risk/ChemicalDB/index.asp.
CAS - Chemical Abstracts Service.
COPC - Constituent of Potential Concern.
CSF - Cancer Slope Factor.
IRIS - Integrated Risk Information System, an online computer database of toxicological information (USEPA, 2013a).
mg/kg-day - Milligrams per Kilogram per day.
NA - Not available.
NJDEP - New Jersey Department of Environmental Protection.
NTP - National Toxicology Program.
PAH - Polycyclic Aromatic Hydrocarbons.
PCB - Polychlorinated Biphenyls.
PCDD - Polychlorinated dibenzodioxins.
PCDF - Polychlorinated dibenzofurans.
PPRTV - Provisional Peer Reviewed Toxicity Value.
RPF - Relative Potency Factor.
RSL - Regional Screening Level, derived by USEPA for chemicals in soil, water, air, & fish (USEPA, 2013b,c).
SVOC - Semi-Volatile Organic Compounds.
TCDD - 2,3,7,8-Tetrachlorodibenzo-p-dioxin.
TEQ - Toxicity Equivalence.
TPH - Total Petroleum Hydrocarbons.
USEPA - United States Environmental Protection Agency.
VOC - Volatile Organic Compounds.
WOE - Weight-of-Evidence.

(a) USEPA, 2004. Risk Assessment Guidance for Superfund. Volume 1, Part E, Supplemental Guidance for Dermal Risk Assessment. Exhibit 4-1. Where USEPA, 2004 does not recommend adjustments, no value is listed.
(b) Oral CSF divided by ABSGI. Where no adjustment is recommended, Dermal CSF = Oral CSF.
(c) Some chemicals are classified under the 1986 system, while others have been classified under the 2005 system:

1986 Classifications
- Group A Carcinogenic to Humans.
- Group B Probably Carcinogenic to Humans:
  - B1 Based on limited human evidence.
  - B2 Based on animal evidence.
- Group C Possibly Carcinogenic to Humans
- Group D Not Classifiable as to Human Carcinogenicity.
- Group E Evidence of Non-carcinogenicity for Humans

2005 Classifications
- Carcinogenic Carcinogenic to Humans
- Likely Carcinogenic Likely to be Carcinogenic to Humans
- Suggestive Evidence Suggestive Evidence of Carcinogenic Potential
- Inadequate Information Inadequate Information to Assess Carcinogenic Potential
- Not Likely Carcinogenic Not Likely to be Carcinogenic to Humans

(d) Consistent with the heirarchy used in USEPA's development of Regional Screening Levels (USEPA 2013d), the CalEPA cancer slope factor for 2,3,7,8-TCDD is used to evaluate TCDD-TEQ and the potentially dioxin-like PCBs.
(e) The value for 4,4'-DDD was used as a surrogate based on structural similarity.
(f) The value for 4,4'-DDE was used as a surrogate based on structural similarity.
(g) The value for 4,4'-DDT was used as a surrogate based on structural similarity.
(h) The value for chlordane was used as a surrogate based on structural similarity.
(i) Calculated using RPFs as per USEPA Guidance for Quantitative Risk Assessment of PAHs (USEPA, 1993).
(j) The value for chrysene was used as a surrogate based on structural similarity.
(k) IRIS provides a range of CSF for benzene of 1.5E-02 to 5.5E-02 mg/kg-day IRIS states that each value within this range has equal scientific plausibility. The high end of the range is used to be conservative.
(l) The oral reference dose is considered protective of potential carcinogenic effects (USEPA 2013a).
(m) IRIS indicates that there is no evidence that hexavalent chromium is carcinogenic via the oral route and does not provide a CSF. However, because USEPA has used the NJDEP CSF in its RSL tables, the NJDEP value is used here (Derivation of Ingestion-Based Soil Remediation Criterion for Cr+6 Based on the NTP Chronic Bioassay Data for Chromium (NJDEP, 2009)).
(n) USEPA, 2003. Human Health Toxicity Values in Superfund Risk Assessments. OSWER Directive 9285.7-53. December 5, 2003. IRIS values are considered Tier 1, PPRTVs are considered Tier 2, and other values, including ATSDR, CalEPA, PPRTV Appendix Screening Toxicity Values, HEAST and other non-EPA values are considered Tier 3 values. Selection of Tier 3 values followed the heirarchy put forth in USEPA, 2013d. Tier 3 Toxicity Value White Paper, OSWER 9285.7-86, May 16, 2013.
(o) The cancer assessment for 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) is currently underway (USEPA IRIS, 2013a).
(p) The cancer assessment for oral exposure to hexavalent chromium is currently underway (USEPA, 2013a).
(r) Assumed to act via a mutagenic mode of carcinogenic action; therefore, age-dependent adjustment factors are applied to the risk estimates.

FOIA_07123_0003064_0003