

**TABLE D1.1 : EXPOSURE POINT CONCENTRATION GROUNDWATER VAPOR INTRUSION
FUTURE INDUSTRIAL/COMMERCIAL WORKER- IA-2
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO**

Scenario Timeframe: Future
Media: Groundwater
Exposure Medium: Vapor

Exposure Point	Analyte Group	Chemical of Potential Concern	Units	Detection Frequency	Number of High Censored Results	Arithmetic Mean ^a	95 UCL Distribution	Maximum Concentration (Qualifier)	Exposure Point Concentration			
									Value	Units	Statistic ^a	Method ^b
Indoor Air (Vapor Intrusion)	VOC	Acetone	µg/m³	--	--	--	--	--	2.51E-04	µg/m³	--	1
	VOC	C10-C20	µg/m³	--	--	--	--	--	--	--	--	--
	VOC	C20-C34	µg/m³	--	--	--	--	--	--	--	--	--
	VOC	C6-C12	µg/m³	--	--	--	--	--	--	--	--	--
	Metal	Mercury	µg/m³	--	--	--	--	--	7.52E-05	µg/m³	--	1

Abbreviations:

--	Not applicable, no estimate provided
VOC	Volatile Organic Compounds
µg/m³	Micrograms per cubic meter
95UCL	One-sided 95 percent upper confidence limit of the mean
(a)	The EPC is the lesser of the UCL and the maximum detected result. The maximum detected result is the default when there are fewer than six detected results.
(b)	All methods follow EPA (2002, 2013).
(c)	Arithmetic mean is KM mean when detection frequency is not 100% or maximum likelihood estimation mean when KM mean was not available.

Notes:

Method (Statistic) Codes are defined as follows:

(1) Johnson and Ettinger Modeling Results

References:

EPA. 2002. "Calculating Exposure Point Concentrations at Hazardous Waste Sites." OSWER 9285.6-10. Office of Emergency and Remedial Response. Washington, D.C. December.

EPA. 2013. "ProUCL Version 5.00.00 Technical Guide (Draft)." Prepared by Singh, A. and A.K. Singh. EPA/600/R-07/041. September

Available online at: <http://www.epa.gov/osp/hst/tsc/software.htm>

J.L. Wilson, S.H. Conrad, W.R. Mason, W. Pepilnski, and E. Hagan, 1990, Laboratory Investigation of Residual Liquid Organics, United States Environmental Protection Agency, EPA/600/6-90/004.

Available online at: http://www.epa.gov/athens/learn2model/part-two/onsite/JnE_ite.html

TABLE D1.2 : EXPOSURE POINT CONCENTRATION GROUNDWATER TRENCH AIR SUMMARY
FUTURE CONSTRUCTION WORKER- IA-2
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

Scenario Timeframe:	Future
Media:	Groundwater
Exposure Medium:	Vapor

Exposure Point	Analyte Group	Chemical of Potential Concern	Units	Detection Frequency	Number of High Censored Results	Arithmetic Mean ^c	95 UCL Distribution	Maximum Concentration (Qualifier)	Exposure Point Concentration			
									Value	Units	Statistic ^a	Method ^b
Trench Air (Vapor Intrusion)	VOC	Acetone	µg/m³	—	—	—	—	—	2.49E-04	µg/m³	—	1
	VOC	C10-C20	µg/m³	—	—	—	—	—	—	—	—	—
	VOC	C20-C34	µg/m³	—	—	—	—	—	—	—	—	—
	VOC	C8-C12	µg/m³	—	—	—	—	—	—	—	—	—
	Metal	Mercury	µg/m³	—	—	—	—	—	4.46E-03	µg/m³	—	1

Abbreviations:

—	Not applicable, no estimate provided because there were fewer than six detected results
EPC	Exposure Point Concentration
KM	Kaplan-Meier
VOC	Volatile Organic Compounds
µg/m³	Micrograms per cubic meter
95UCL	One-sided 95 percent upper confidence limit of the mean
(a)	The EPC is the lesser of the UCL and the maximum detected result. The maximum detected result is the default when there are fewer than six detected results.
(b)	All methods follow EPA (2002, 2013).
(c)	Arithmetic mean is KM mean when detection frequency is not 100% or maximum likelihood estimation mean when KM mean was not available.

Notes:

Method (Statistic) Codes are defined as follows:

- (1) Virginia Department of Environmental Quality EPC methodology

References:

EPA. 2002. "Calculating Exposure Point Concentrations at Hazardous Waste Sites." OSWER 9285.6-10. Office of Emergency and Remedial Response. Washington, D.C. December.
EPA. 2013. "ProUCL Version 5.00.00 Technical Guide (Draft)." Prepared by Singh, A. and A.K. Singh. EPA/600/R-07/041. September
Available online at: <http://www.epa.gov/osp/hstl/tsc/software.htm>
Virginia Department of Environmental Quality (VDEQ). 2013. Voluntary Remediation Program Risk Assessment Guidance. May. On-Line Address:
<http://www.deq.virginia.gov/Programs/LandProtection/Revitalization/RemediationProgram/VoluntaryRemediationProgram/VVRPRiskAssessmentGuidance.aspx>

TABLE D1.3: EXPOSURE POINT CONCENTRATION VAPOR INTRUSION SUMMARY
FUTURE COMMERCIAL/INDUSTRIAL- IA-2
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

Scenario Timeframe: Future	
Media:	Subsurface Soil
Exposure Medium:	Vapor

Exposure Point	Analyte Group	Chemical of Potential Concern	Units	Detection Frequency	Number of High Censored Results	Arithmetic Mean ^c	95 UCL Distribution		Maximum Concentration (Qualifier)	Exposure Point Concentration			
										Value	Units	Statistic ^a	Method ^b
Indoor Air (Vapor Intrusion)	VOC	1,2,4-Trichlorobenzene	µg/m³	—	—	—	—	—	—	1.11E-04	µg/m³	—	1
	VOC	2-Butanone	µg/m³	—	—	—	—	—	—	4.75E-02	µg/m³	—	1
	VOC	2-Hexanone	µg/m³	—	—	—	—	—	—	1.56E-03	µg/m³	—	1
	VOC	Acetone	µg/m³	—	—	—	—	—	—	3.04E-01	µg/m³	—	1
	VOC	C10-C20	µg/m³	—	—	—	—	—	—	—	µg/m³	—	—
	VOC	C20-C34	µg/m³	—	—	—	—	—	—	—	µg/m³	—	—
	VOC	C6-C12	µg/m³	—	—	—	—	—	—	—	µg/m³	—	—
	VOC	Carbon Disulfide	µg/m³	—	—	—	—	—	—	1.57E-02	µg/m³	—	1
	SVOC	Chrysene	µg/m³	—	—	—	—	—	—	1.77E-06	µg/m³	—	1
	VOC	Methylene Chloride	µg/m³	—	—	—	—	—	—	1.93E-01	µg/m³	—	1
	SVOC	Naphthalene	µg/m³	—	—	—	—	—	—	5.45E-04	µg/m³	—	1
	SVOC	Phenanthrene	µg/m³	—	—	—	—	—	—	—	µg/m³	—	—
	SVOC	Pyrene	µg/m³	—	—	—	—	—	—	4.95E-07	µg/m³	—	1

Abbreviations:

—	Not applicable, no estimate provided
VOC	Volatile Organic Compounds
µg/m³	Micrograms per cubic meter
95UCL	One-sided 95 percent upper confidence limit of the mean
(a)	The EPC is the lesser of the UCL and the maximum detected result. The maximum detected result is the default when there are fewer than six detected results.
(b)	All methods follow EPA (2002, 2013).
(c)	Arithmetic mean is KM mean when detection frequency is not 100% or maximum likelihood estimation mean when KM mean was not available.

Notes:

Method (Statistic) Codes are defined as follows:

(1) Johnson and Ettinger Modeling Results

References:

- EPA. 2002. "Calculating Exposure Point Concentrations at Hazardous Waste Sites." OSWER 9285.6-10. Office of Emergency and Remedial Response. Washington, D.C. December.
- EPA. 2013. "ProUCL Version 5.00.00 Technical Guide (Draft)." Prepared by Singh, A. and A.K. Singh. EPA/600/R-07/041. September
- Available online at: <http://www.epa.gov/osp/hstl/tsc/software.htm>
- J.L. Wilson, S.H. Conrad, W.R. Mason, W. Peplinski, and E. Hegan, 1990, Laboratory Investigation of Residual Liquid Organics, United States Environmental Protection Agency, EPA/600/6-90/004.
- Available online at: http://www.epa.gov/athens/learn2model/part-two/onsite/JnE_lite.html

TABLE D1.4 : EXPOSURE POINT CONCENTRATION SUBSURFACE SOIL SUMMARY
FUTURE INDUSTRIAL/COMMERCIAL & CONSTRUCTION WORKER- IA-2
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

Scenario Timeframe: Future
Media: Subsurface Soil
Exposure Medium: Soil, Vapor

Exposure Point	Analyte Group	Chemical of Potential Concern	Units	Detection Frequency	High Censored Results	Arithmetic Mean ^c	95 UCL Distribution	Maximum Concentration (Qualifier)	Exposure Point Concentration			
									Value	Units	Statistic ^a	Method ^b
Soil and Ambient Air	SVOC	1-Methylnaphthalene	mg/kg	—	—	—	—	2.500E-02	2.50E-02	mg/kg	—	1
	VOC	2-Butanone	mg/kg	—	—	—	—	3.000E-03	3.00E-03	mg/kg	—	1
	VOC	2-Methylnaphthalene	mg/kg	—	—	—	—	2.200E-02	2.20E-02	mg/kg	—	1
	VOC	Acetone	mg/kg	—	—	—	—	3.100E-02	3.10E-02	mg/kg	—	1
	VOC	C10-C20	mg/kg	—	—	—	—	6.700E+01	6.70E+01	mg/kg	—	1
	VOC	C20-C34	mg/kg	—	—	—	—	1.200E+02	1.20E+02	mg/kg	—	1
	VOC	C6-C12	mg/kg	—	—	—	—	5.500E-02	5.50E-02	mg/kg	—	1
	SVOC	Chrysene	mg/kg	—	—	—	—	1.100E-02	1.10E-02	mg/kg	—	1
	VOC	Methylene Chloride	mg/kg	—	—	—	—	5.600E-03	5.60E-03	mg/kg	—	1
	SVOC	Phenanthrene	mg/kg	—	—	—	—	2.700E-02	2.70E-02	mg/kg	—	1

Abbreviations:

—	Not applicable, no estimate provided because there were fewer than six detected results
SVOC	Semi Volatile Organic Compounds
VOC	Volatile Organic Compounds
mg/kg	Milligram per kilogram
95UCL	One-sided 95 percent upper confidence limit of the mean
(a)	The EPC is the lesser of the UCL and the maximum detected result. The maximum detected result is the default when there are fewer than six detected results.
(b)	All methods follow EPA (2002, 2009).
(c)	Arithmetic mean is KM mean when detection frequency is not 100% or maximum likelihood estimation mean when KM mean was not available.

Notes:

Program not used because sample size was less than six detected results

Method (Statistic) Codes are defined as follows (some method codes may not be used in the table):

(1) Maximum Detected Concentration

References:

EPA. 2002. "Calculating Exposure Point Concentrations at Hazardous Waste Sites." OSWER 9285.6-10. Office of Emergency and Remedial Response. Washington, D.C. December.
EPA. 2013. "ProUCL Version 5.00.00 Technical Guide (Draft)." Prepared by Singh, A. and A.K. Singh. EPA/600/R-07/041. September
Available online at: <http://www.epa.gov/osp/hst/tsc/software.htm>

TABLE D2.1 : EXPOSURE POINT CONCENTRATION GROUNDWATER VAPOR INTRUSION SUMMARY
FUTURE INDUSTRIAL/COMMERCIAL WORKER- IA-4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

Scenario Timeframe: Future	
Media:	Groundwater
Exposure Medium:	Vapor

Exposure Point	Analyte Group	Chemical of Potential Concern	Units	Detection Frequency	Number of High Censored Results	Arithmetic Mean ^c	95 UCL Distribution	Maximum Concentration (Qualifier)	Exposure Point Concentration			
									Value	Units	Statistic ^a	Method ^b
Indoor Air (Vapor Intrusion)	VOC	1,1,1-Trichloroethane	µg/m³	—	—	—	—	—	7.61E-02	µg/m³	—	1
	VOC	1,1-Dichloroethane	µg/m³	—	—	—	—	—	1.61E-02	µg/m³	—	1
	VOC	1,1-Dichloroethene	µg/m³	—	—	—	—	—	5.82E-03	µg/m³	—	1
	VOC	2-Butanone	µg/m³	—	—	—	—	—	1.55E-04	µg/m³	—	1
	SVOC	Acenaphthene	µg/m³	—	—	—	—	—	1.84E-03	µg/m³	—	1
	VOC	Acetone	µg/m³	—	—	—	—	—	1.00E-03	µg/m³	—	1
	SVOC	Benzo[b]fluoranthene	µg/m³	—	—	—	—	—	5.94E-06	µg/m³	—	1
	VOC	Bromodichloromethane	µg/m³	—	—	—	—	—	6.56E-05	µg/m³	—	1
	VOC	C10-C20	µg/m³	—	—	—	—	—	—	µg/m³	—	—
	VOC	C20-C34	µg/m³	—	—	—	—	—	—	µg/m³	—	—
	VOC	Carbon Disulfide	µg/m³	—	—	—	—	—	8.25E-04	µg/m³	—	1
	VOC	Chloroethane	µg/m³	—	—	—	—	—	5.70E-04	µg/m³	—	1
	VOC	Chloroform	µg/m³	—	—	—	—	—	2.82E-04	µg/m³	—	1
	SVOC	Chrysene	µg/m³	—	—	—	—	—	2.25E-05	µg/m³	—	1
	SVOC	Fluorene	µg/m³	—	—	—	—	—	9.96E-04	µg/m³	—	1
	VOC	Gasoline Range Organics	µg/m³	—	—	—	—	—	—	µg/m³	—	—
	SVOC	Naphthalene	µg/m³	—	—	—	—	—	7.02E-04	µg/m³	—	1
	SVOC	Pyrene	µg/m³	—	—	—	—	—	1.18E-03	µg/m³	—	1
	VOC	Toluene	µg/m³	—	—	—	—	—	2.27E-04	µg/m³	—	1

Abbreviations:

—	Not applicable, no estimate provided
SVOC	Semivolatile Organic Compounds
VOC	Volatile Organic Compounds
µg/m³	Micrograms per cubic meter
95UCL	One-sided 95 percent upper confidence limit of the mean
(a)	The EPC is the lesser of the UCL and the maximum detected result. The maximum detected result is the default when there are fewer than six detected results.
(b)	All methods follow EPA (2002, 2013).
(c)	Arithmetic mean is KM mean when detection frequency is not 100% or maximum likelihood estimation mean when KM mean was not available.

Notes:

Method (Statistic) Codes are defined as follows:

- (1) Johnson and Ettinger Modeling Results

References:

- EPA. 2002. "Calculating Exposure Point Concentrations at Hazardous Waste Sites." OSWER 9285.6-10. Office of Emergency and Remedial Response. Washington, D.C. December.
- EPA. 2013. "ProUCL Version 5.00.00 Technical Guide (Draft)." Prepared by Singh, A. and A.K. Singh. EPA/600/R-07/041. September
- Available online at: <http://www.epa.gov/osp/hst/tsc/software.htm>
- J.L. Wilson, S.H. Conrad, W.R. Mason, W. Peplinski, and E. Hagan, 1990, Laboratory Investigation of Residual Liquid Organics, United States Environmental Protection Agency, EPA.600/6-90/004.
- Available online at: http://www.epa.gov/athens/learn2model/part-two/onsite/JnE_lite.html

TABLE D2.2 : EXPOSURE POINT CONCENTRATION GROUNDWATER TRENCH AIR SUMMARY
FUTURE CONSTRUCTION WORKER- IA-4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

Scenario Timeframe: Future
Media: Groundwater
Exposure Medium: Vapor

Exposure Point	Analyte Group	Chemical of Potential Concern	Units	Detection Frequency	Number of High Censored Results	Arithmetic Mean ^a	95 UCL Distribution		Maximum Concentration (Qualifier)	Exposure Point Concentration			
										Value	Units	Statistic ^a	Method ^b
Trench Air (Vapor Intrusion)	VOC	1,1,1-Trichloroethane	µg/m³	—	—	—	—	—	—	2.21E+00	µg/m³	—	1
	VOC	1,1-Dichloroethane	µg/m³	—	—	—	—	—	—	2.61E-01	µg/m³	—	1
	VOC	1,1-Dichloroethane	µg/m³	—	—	—	—	—	—	1.49E-01	µg/m³	—	1
	VOC	2-Butanone	µg/m³	—	—	—	—	—	—	1.30E-04	µg/m³	—	1
	SVOC	Acenaphthene	µg/m³	—	—	—	—	—	—	2.50E-03	µg/m³	—	1
	VOC	Acetone	µg/m³	—	—	—	—	—	—	9.80E-04	µg/m³	—	1
	SVOC	Benzo[b]fluoranthene	µg/m³	—	—	—	—	—	—	2.31E-03	µg/m³	—	1
	VOC	Bromodichloromethane	µg/m³	—	—	—	—	—	—	4.41E-04	µg/m³	—	1
	VOC	C10-C20	µg/m³	—	—	—	—	—	—	—	µg/m³	—	—
	VOC	C20-C34	µg/m³	—	—	—	—	—	—	—	µg/m³	—	—
	VOC	Carbon Disulfide	µg/m³	—	—	—	—	—	—	3.90E-02	µg/m³	—	1
	VOC	Chloroethane	µg/m³	—	—	—	—	—	—	2.55E-02	µg/m³	—	1
	VOC	Chloroform	µg/m³	—	—	—	—	—	—	5.50E-03	µg/m³	—	1
	SVOC	Chrysene	µg/m³	—	—	—	—	—	—	2.06E-03	µg/m³	—	1
	SVOC	Fluorene	µg/m³	—	—	—	—	—	—	7.49E-04	µg/m³	—	1
	VOC	Gasoline Range Organics	µg/m³	—	—	—	—	—	—	—	µg/m³	—	—
	SVOC	Naphthalene	µg/m³	—	—	—	—	—	—	2.71E-03	µg/m³	—	1
	SVOC	Pyrene	µg/m³	—	—	—	—	—	—	5.28E-04	µg/m³	—	1
	VOC	Toluene	µg/m³	—	—	—	—	—	—	5.33E-03	µg/m³	—	1

Abbreviations:

—	Not applicable, no estimate provided because there were fewer than six detected results
EPC	Exposure Point Concentration
KM	Kaplan-Meier
SVOC	Semivolatile Organic Compounds
VOC	Volatile Organic Compounds
µg/m³	Micrograms per cubic meter
95UCL	One-sided 95 percent upper confidence limit of the mean
(a)	The EPC is the lesser of the UCL and the maximum detected result. The maximum detected result is the default when there are fewer than six detected results.
(b)	All methods follow EPA (2002, 2013).
(c)	Arithmetic mean is KM mean when detection frequency is not 100% or maximum likelihood estimation mean when KM mean was not available.

Notes:

Method (Statistic) Codes are defined as follows:

(1) Virginia Department of Environmental Quality EPC methodology

References:

EPA. 2002. "Calculating Exposure Point Concentrations at Hazardous Waste Sites." OSWER 9285.6-10. Office of Emergency and Remedial Response. Washington, D.C. December.
EPA. 2013. "ProUCL Version 5.00.00 Technical Guide (Draft)." Prepared by Singh, A. and A.K. Singh. EPA/600/R-07/041. September
Available online at: <http://www.epa.gov/osp/hsti/tsc/software.htm>
Virginia Department of Environmental Quality (VDEQ). 2013. Voluntary Remediation Program Risk Assessment Guidance. May. On-Line Address:
<http://www.deq.virginia.gov/Programs/LandProtectionRevitalization/RemediationProgram/VoluntaryRemediationProgram/VRPRiskAssessmentGuidance.aspx>

TABLE D2.3 : EXPOSURE POINT CONCENTRATION VAPOR INTRUSION SUMMARY
FUTURE COMMERCIAL/INDUSTRIAL- IA-4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

Scenario Timeframe: Future	
Media:	Subsurface Soil
Exposure Medium:	Vapor

Exposure Point	Analyte Group	Chemical of Potential Concern	Units	Detection Frequency	Number of High Censored Results	Arithmetic Mean ^a	95 UCL Distribution	Maximum Concentration (Qualifier)	Exposure Point Concentration			
									Value	Units	Statistic ^a	Method ^b
Indoor Air (Vapor Intrusion)	VOC	1,1-Dichloroethane	µg/m³	—	—	—	—	—	2.83E-01	µg/m³	—	1
	VOC	1,2-Dichloroethane	µg/m³	—	—	—	—	—	1.90E-03	µg/m³	—	1
	VOC	2-Butanone	µg/m³	—	—	—	—	—	2.07E-01	µg/m³	—	1
	VOC	4-Methyl-2-pentanone	µg/m³	—	—	—	—	—	1.66E-02	µg/m³	—	1
	SVOC	Acenaphthene	µg/m³	—	—	—	—	—	3.31E+00	µg/m³	—	1
	VOC	Acetone	µg/m³	—	—	—	—	—	3.23E-01	µg/m³	—	1
	SVOC	Benzene	µg/m³	—	—	—	—	—	1.12E-03	µg/m³	—	1
	VOC	Benzo[b]fluoranthene	µg/m³	—	—	—	—	—	1.07E-05	µg/m³	—	1
	VOC	Carbon Disulfide	µg/m³	—	—	—	—	—	2.22E-01	µg/m³	—	1
	VOC	Chrysene	µg/m³	—	—	—	—	—	1.19E-04	µg/m³	—	1
	VOC	Ethylbenzene	µg/m³	—	—	—	—	—	3.64E-02	µg/m³	—	1
	VOC	Fluorene	µg/m³	—	—	—	—	—	7.82E-01	µg/m³	—	1
	VOC	Isopropylbenzene	µg/m³	—	—	—	—	—	2.29E-02	µg/m³	—	1
	SVOC	Mercury	µg/m³	—	—	—	—	—	4.32E-02	µg/m³	—	1
	SVOC	Methylene Chloride	µg/m³	—	—	—	—	—	4.91E-01	µg/m³	—	1
	VOC	Naphthalene	µg/m³	—	—	—	—	—	5.02E+00	µg/m³	—	1
	SVOC	Pyrene	µg/m³	—	—	—	—	—	2.20E-02	µg/m³	—	1
	SVOC	Toluene	µg/m³	—	—	—	—	—	3.12E-01	µg/m³	—	1
	VOC	xylene (total)	µg/m³	—	—	—	—	—	4.47E-02	µg/m³	—	1

Abbreviations:

—	Not applicable, no estimate provided
SVOC	Semivolatile Organic Compounds
VOC	Volatile Organic Compounds
µg/m³	Micrograms per cubic meter
95UCL	One-sided 95 percent upper confidence limit of the mean
(a)	The EPC is the lesser of the UCL and the maximum detected result. The maximum detected result is the default when there are fewer than six detected results.
(b)	All methods follow EPA (2002, 2013).
(c)	Arithmetic mean is KM mean when detection frequency is not 100% or maximum likelihood estimation mean when KM mean was not available.

Notes:

Method (Statistic) Codes are defined as follows:

(1) Johnson and Ettinger Modeling Results

References:

- EPA. 2002. "Calculating Exposure Point Concentrations at Hazardous Waste Sites." OSWER 9285.6-10. Office of Emergency and Remedial Response. Washington, D.C. December.
- EPA. 2013. "ProUCL Version 5.00.00 Technical Guide (Draft)." Prepared by Singh, A. and A.K. Singh. EPA/600/R-07/041. September
- Available online at: <http://www.epa.gov/osp/hstl/tsc/software.htm>
- J.L. Wilson, S.H. Conrad, W.R. Mason, W. Peplinski, and E. Hagan, 1990, Laboratory Investigation of Residual Liquid Organics, United States Environmental Protection Agency, EPA.600/6-90/004.
- Available online at: http://www.epa.gov/athens/learn2model/part-two/onsite/JnE_lite.html

TABLE D2.4 : EXPOSURE POINT CONCENTRATION SUBSURFACE SOIL SUMMARY
FUTURE INDUSTRIAL/COMMERCIAL & CONSTRUCTION WORKER- IA-4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

Scenario Timeframe: Future
Medium: Subsurface Soil
Exposure Medium: Soil, Vapor

Exposure Point	Analyte Group	Chemical of Potential Concern	Units	Detection Frequency	Number of High Censored Results	Arithmetic Mean ^a	95 UCL Distribution		Maximum Concentration (Qualifier)	Exposure Point Concentration			
										Value	Units	Statistic ^a	Method ^b
Soil, Indoor Air, or Ambient Air	VOC	1,1-Dichloroethane	mg/kg	1/10	0	—	—	—	1.200E-02	1.20E-02	mg/kg	MAX	1
	VOC	1,2-Dichloroethane	mg/kg	2/10	0	6.400E-04	7.133E-04	NP	6.80E-04	6.80E-04	mg/kg	MAX	1
	SVOC	1-Methylnaphthalene	mg/kg	41/60	0	3.950E-01	2.314E+00	NP	3.650E+00	2.31E+00	mg/kg	95 UCL	3
	VOC	2-Butanone	mg/kg	3/10	0	1.450E-02	2.200E-02	NP	3.600E-02	3.60E-02	mg/kg	MAX	1
	SVOC	2-Methylnaphthalene	mg/kg	54/66	0	5.160E-01	1.963E+00	NP	1.300E+01	1.96E+00	mg/kg	95 UCL	8
	VOC	4-Methyl-2-pentanone	mg/kg	1/10	0	—	—	—	5.900E-03	5.90E-03	mg/kg	MAX	1
	SVOC	Acenaphthene	mg/kg	50/66	0	2.655E+00	1.004E+01	NP	6.220E+01	1.00E+01	mg/kg	95 UCL	8
	SVOC	Acenaphthylene	mg/kg	25/66	0	3.990E-02	1.150E-01	NP	7.810E-01	1.15E-01	mg/kg	95 UCL	5
	VOC	Acetone	mg/kg	8/10	0	6.300E-02	8.600E-02	NP	1.700E-01	8.60E-02	mg/kg	95 UCL	4
	SVOC	Anthracene	mg/kg	55/66	0	5.318E+00	1.959E+01	NP	1.200E+02	1.96E+01	mg/kg	95 UCL	8
	PCB	Aroclor 1254	mg/kg	1/10	0	—	—	—	2.100E-02	2.10E-02	mg/kg	MAX	1
	PCB	Aroclor 1260	mg/kg	1/10	0	—	—	—	4.000E-02	4.00E-02	mg/kg	MAX	1
	Metal	Arsenic	mg/kg	10/10	0	1.749E+01	2.274E+01	N	4.310E+01	2.27E+01	mg/kg	95 UCL	2
	Metal	Barium	mg/kg	10/10	0	6.730E+01	8.462E+01	N	1.390E+02	1.02E+02	mg/kg	95 UCL	2
	VOC	Benzene	mg/kg	3/16	0	3.233E-04	3.954E-04	NP	4.000E-04	4.00E-04	mg/kg	MAX	1
	SVOC	Benzo[a]anthracene	mg/kg	61/66	0	1.290E+01	4.511E+01	NP	2.300E+02	4.51E+01	mg/kg	95 UCL	8
	SVOC	Benzo[a]pyrene	mg/kg	59/66	0	1.046E+01	3.648E+01	NP	1.900E+02	3.65E+01	mg/kg	95 UCL	8
	SVOC	Benzo[b]fluoranthene	mg/kg	41/60	0	1.070E+01	6.010E+01	NP	2.100E+02	6.01E+01	mg/kg	95 UCL	3
	SVOC	Benzo[g,h,i]perylene	mg/kg	61/66	0	5.720E+00	1.950E+01	NP	9.800E+01	1.95E+01	mg/kg	95 UCL	8
	SVOC	Benzo[k]fluoranthene	mg/kg	58/66	0	8.205E+00	2.870E+01	NP	1.700E+02	2.87E+01	mg/kg	95 UCL	8
	VOC	C10-C20	mg/kg	6/10	0	4.817E+02	4.985E+03	NP	4.400E+03	4.40E+03	mg/kg	MAX	1
	VOC	C20-C34	mg/kg	9/10	0	2.068E+03	2.094E+04	NP	1.900E+04	1.90E+04	mg/kg	MAX	1
	Metal	Cadmium	mg/kg	8/10	0	4.510E-01	6.030E-01	NP	1.000E+00	6.03E-01	mg/kg	95 UCL	4
	VOC	Carbon Disulfide	mg/kg	4/10	0	1.710E-03	3.080E-03	NP	1.000E-02	1.00E-02	mg/kg	MAX	1
	Metal	Chromium	mg/kg	10/10	0	1.240E+01	1.354E+01	N	1.600E+01	1.35E+01	mg/kg	95 UCL	2
	SVOC	Chrysene	mg/kg	61/66	0	1.334E+01	4.796E+01	NP	2.500E+02	4.80E+01	mg/kg	95 UCL	8
	SVOC	Dibenz[a,h]anthracene	mg/kg	47/66	0	1.778E+00	6.140E+00	NP	3.400E+01	6.14E+00	mg/kg	95 UCL	8
	VOC	Ethylbenzene	mg/kg	1/10	0	—	—	—	1.300E-02	1.30E-02	mg/kg	MAX	1
	SVOC	Fluoranthene	mg/kg	62/66	0	2.993E+01	1.081E+02	NP	6.500E+02	1.08E+02	mg/kg	95 UCL	8
	SVOC	Fluorene	mg/kg	46/66	0	2.286E+00	8.472E+00	NP	5.100E+01	8.47E+00	mg/kg	95 UCL	8
	SVOC	Indeno[1,2,3-cd]pyrene	mg/kg	57/66	0	5.593E+00	1.894E+01	NP	9.300E+01	1.89E+01	mg/kg	95 UCL	8
	VOC	Isopropylbenzene	mg/kg	1/10	0	—	—	—	8.200E-03	8.20E-03	mg/kg	MAX	1
	Metal	Lead	mg/kg	10/10	0	2.062E+01	4.075E+01	NP	5.720E+01	4.08E+01	mg/kg	95 UCL	7
	Metal	Mercury	mg/kg	7/10	0	3.370E-02	4.430E-02	NP	5.900E-02	4.43E-02	mg/kg	95 UCL	6
	VOC	Methylene Chloride	mg/kg	10/10	0	7.070E-03	8.320E-03	N	1.100E-02	8.32E-03	mg/kg	95 UCL	2
	SVOC	Naphthalene	mg/kg	49/66	0	4.490E-01	1.704E+00	NP	1.100E+01	1.70E+00	mg/kg	95 UCL	8
	SVOC	Phenanthrene	mg/kg	64/66	0	2.482E+01	9.027E+01	NP	5.100E+02	9.03E+01	mg/kg	95 UCL	8
	SVOC	Pyrene	mg/kg	63/66	0	2.457E+01	8.765E+01	NP	4.500E+02	8.77E+01	mg/kg	95 UCL	8
	Metal	Selenium	mg/kg	2/10	0	2.550E-01	4.870E-01	NP	5.700E-01	5.70E-01	mg/kg	MAX	1
	VOC	Toluene	mg/kg	8/10	0	2.330E-03	1.410E-02	NP	1.900E-02	1.41E-02	mg/kg	95 UCL	8
	VOC	Xylenes (total)	mg/kg	2/10	0	2.340E-03	2.260E-02	NP	1.600E-02	1.60E-02	mg/kg	MAX	1

Abbreviations:

—	Not applicable or no estimate provided because there were six or fewer detected results
KM	Kaplan-Meier
MAX	Maximum Detected Concentration
N	Normal Distribution
NP	Nonparametric Distribution
SVOC	Semivolatile Organic Compounds
VOC	Volatile Organic Compounds
mg/kg	Milligram per kilogram
95 UCL	95 One-sided upper confidence limit of the mean
(a)	The EPC is the lesser of the UCL and the maximum detected result. The maximum detected result is the default when there are fewer than six detected results.
(b)	All methods follow EPA (2002, 2013).
(c)	Arithmetic mean is KM mean when detection frequency is not 100% or maximum likelihood estimation mean when KM mean was not available.

Notes:

Method (Statistic) Codes are defined as follows (some method codes may not be used in the table):

- (1) Maximum detected concentration
- (2) 95 percent UCL calculated using the Student's-t to estimate the UCL
- (3) 99 percent UCL calculated using the KM Chebyshev to estimate the UCL
- (4) 95 percent UCL calculated using the KM(Percentile Bootstrap) to estimate the UCL
- (5) 95 percent UCL calculated using the KM Chebyshev to estimate the UCL
- (6) 95 percent UCL calculated using KM(t) to estimate the UCL
- (7) 95 percent Chebyshev (Mean,Sd) to estimate UCL
- (8) 97.5 percent KM(Chebyshev) to estimate UCL

References:

EPA. 2002. "Calculating Exposure Point Concentrations at Hazardous Waste Sites." OSWER 9285.6-10. Office of Emergency and Remedial Response. Washington, D.C. December.
EPA. 2013. "ProUCL Version 5.00.00 Technical Guide (Draft)." Prepared by Singh, A. and A.K. Singh. EPA/600/R-07/041. September
Available online at: <http://www.epa.gov/ocsp/hst/tsc/software.htm>

TABLE D2.5 : EXPOSURE POINT CONCENTRATION SURFACE SOIL SUMMARY
FUTURE INDUSTRIAL/COMMERCIAL- IA-4
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

Scenario Timeframe: Future
Medium: Surface Soil
Exposure Medium: Soil, Vapor

Exposure Point	Analyte Group	Chemical of Potential Concern	Units	Detection Frequency	Number of High Censored Results	Arithmetic Mean ^c	95 UCL Distribution	Maximum Concentration (Qualifier)	Exposure Point Concentration				
									Value	Units	Statistic ^a	Method ^b	
Soil, Indoor Air, or Ambient Air	SVOC	1-Methylnaphthalene	mg/kg	21/21	0	5.160E-01	1.482E+00	NP	3.650E+00	1.48E+00	mg/kg	95 UCL	3
	SVOC	2-Methylnaphthalene	mg/kg	27/29	0	6.930E-01	3.492E+00	NP	5.700E+00	3.49E+00	mg/kg	95 UCL	2
	SVOC	Acenaphthene	mg/kg	28/29	0	3.739E+00	1.995E+01	NP	3.400E+01	2.00E+01	mg/kg	95 UCL	2
	SVOC	Acenaphthylene	mg/kg	20/29	0	8.760E-02	4.600E-01	NP	7.810E-01	4.60E-01	mg/kg	95 UCL	2
	SVOC	Anthracene	mg/kg	28/28	0	7.539E+00	3.905E+01	NP	6.200E+01	3.91E+01	mg/kg	95 UCL	2
	Metal	Arsenic	mg/kg	1/1	0	1.400E+01	—	—	1.400E+01	1.40E+01	mg/kg	MAX	1
	Metal	Barium	mg/kg	1/1	0	5.260E+01	—	—	5.260E+01	5.26E+01	mg/kg	MAX	1
	SVOC	Benzo[a]anthracene	mg/kg	28/29	0	2.041E+01	1.059E+02	NP	2.000E+02	1.06E+02	mg/kg	95 UCL	2
	SVOC	Benzo[a]pyrene	mg/kg	28/29	0	1.636E+01	8.408E+01	NP	1.600E+02	8.41E+01	mg/kg	95 UCL	2
	SVOC	Benzo[b]fluoranthene	mg/kg	20/21	0	1.463E+01	7.828E+01	NP	1.000E+02	7.83E+01	mg/kg	95 UCL	2
	SVOC	Benzo[g,h,i]perylene	mg/kg	29/29	0	9.154E+00	3.209E+01	NP	7.800E+01	3.21E+01	mg/kg	95 UCL	4
	SVOC	Benzo[k]fluoranthene	mg/kg	28/29	0	1.217E+01	5.811E+01	NP	8.240E+01	5.81E+01	mg/kg	95 UCL	2
	VOC	C10-C20	mg/kg	1/1	0	6.300E+01	—	—	6.300E+01	6.30E+01	mg/kg	MAX	1
	VOC	C20-C34	mg/kg	1/1	0	1.400E+02	—	—	1.400E+02	1.40E+02	mg/kg	MAX	1
	Metal	Cadmium	mg/kg	1/1	0	5.000E-01	—	—	5.000E-01	5.00E-01	mg/kg	MAX	1
	Metal	Chromium	mg/kg	1/1	0	1.020E+01	—	—	1.020E+01	1.02E+01	mg/kg	MAX	1
	SVOC	Chrysene	mg/kg	28/29	0	2.071E+01	1.120E+02	NP	2.300E+02	1.12E+02	mg/kg	95 UCL	2
	SVOC	Dibenz[a,h]anthracene	mg/kg	27/29	0	2.700E+00	1.328E+01	NP	2.090E+01	1.33E+01	mg/kg	95 UCL	2
	SVOC	Fluoranthene	mg/kg	29/29	0	4.349E+01	1.538E+02	NP	3.600E+02	1.54E+02	mg/kg	95 UCL	4
	SVOC	Fluorene	mg/kg	27/29	0	3.248E+00	1.729E+01	NP	3.000E+01	1.73E+01	mg/kg	95 UCL	2
	SVOC	Indeno[1,2,3-cd]pyrene	mg/kg	28/29	0	9.083E+00	4.497E+01	NP	7.200E+01	4.50E+01	mg/kg	95 UCL	2
	Metal	Lead	mg/kg	1/1	0	1.210E+01	—	—	1.210E+01	1.21E+01	mg/kg	MAX	1
	VOC	Methylene Chloride	mg/kg	1/1	0	5.300E-03	—	—	5.300E-03	5.30E-03	mg/kg	MAX	1
	SVOC	Naphthalene	mg/kg	27/29	0	6.180E-01	3.172E+00	NP	5.100E+00	3.17E+00	mg/kg	95 UCL	2
	SVOC	Phenanthrene	mg/kg	29/29	0	3.734E+01	1.380E+02	NP	3.600E+02	1.38E+02	mg/kg	95 UCL	4
	SVOC	Pyrene	mg/kg	29/29	0	3.866E+01	1.440E+02	NP	4.000E+02	1.44E+02	mg/kg	95 UCL	4
	VOC	Toluene	mg/kg	1/1	0	3.700E-04	—	—	3.700E-04	3.70E-04	mg/kg	MAX	1

Abbreviations:

—	Not applicable or no estimate provided because there were six or fewer detected results
KM	Kaplan-Meier
MAX	Maximum Detected Concentration
NP	Nonparametric Distribution
SVOC	Semivolatile Organic Compounds
VOC	Volatile Organic Compounds
mg/kg	Milligram per kilogram
95 UCL	One-sided 95 percent upper confidence limit of the mean
(a)	The EPC is the lesser of the UCL and the maximum detected result. The maximum detected result is the default when there are fewer than six detected results.
(b)	All methods follow EPA (2002, 2013).
(c)	Arithmetic mean is KM mean when detection frequency is not 100% or maximum likelihood estimation mean when KM mean was not available.

Notes:

Method (Statistic) Codes are defined as follows (some method codes may not be used in the table):

- (1) Maximum detected concentration
- (2) 99 percent UCL calculated using KM (Chebyshev) to estimate the UCL
- (3) 95 percent UCL calculated using Chebyshev (Mean, Sd) to estimate the UCL
- (4) 97.5 percent UCL calculated using Chebyshev (Mean, Sd) to estimate UCL

References:

EPA. 2002. "Calculating Exposure Point Concentrations at Hazardous Waste Sites." OSWER 9285.6-10. Office of Emergency and Remedial Response. Washington, D.C. December.
EPA. 2013. "ProUCL Version 5.00.00 Technical Guide (Draft)." Prepared by Singh, A. and A.K. Singh. EPA/600/R-07/041. September
Available online at: <http://www.epa.gov/osp/hstl/tsc/software.htm>

**TABLE D3.1 : EXPOSURE POINT CONCENTRATION GROUNDWATER VAPOR INTRUSION SUMMARY
FUTURE INDUSTRIAL/COMMERCIAL WORKER- IA-5**

PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

Scenario Timeframe: Future
Media: Groundwater
Exposure Medium: Vapor

Exposure Point	Analyte Group	Chemical of Potential Concern	Units	Detection Frequency	High Censored Results	Arithmetic Mean ^c	95 UCL Distribution		Maximum Concentration (Qualifier)	Exposure Point Concentration			
										Value	Units	Statistic ^a	Method ^b
Indoor Air (Vapor Intrusion)	VOC	cis-1,2-Dichloroethene	µg/m³	—	—	—	—	—	—	4.55E-03	µg/m³	—	1
	VOC	Gasoline Range Organics	µg/m³	—	—	—	—	—	—	—	µg/m³	—	1
	VOC	Tetrachloroethene	µg/m³	—	—	—	—	—	—	8.90E-04	µg/m³	—	1
	VOC	trans-1,2-Dichloroethene	µg/m³	—	—	—	—	—	—	6.65E-04	µg/m³	—	1
	VOC	Trichloroethene	µg/m³	—	—	—	—	—	—	1.01E-02	µg/m³	—	1
	VOC	Vinyl Chloride	µg/m³	—	—	—	—	—	—	5.93E-03	µg/m³	—	1

Abbreviations:

—	Not applicable, no estimate provided
VOC	Volatile Organic Compounds
µg/m³	Micrograms per cubic meter
95UCL	One-sided 95 percent upper confidence limit of the mean
(a)	The EPC is the lesser of the UCL and the maximum detected result. The maximum detected result is the default when there are fewer than six detected results.
(b)	All methods follow EPA (2002, 2013).
(c)	Arithmetic mean is KM mean when detection frequency is not 100% or maximum likelihood estimation mean when KM mean was not available.

Notes:

Method (Statistic) Codes are defined as follows:

(1) Johnson and Ettinger Modeling Results

References:

- EPA. 2002. "Calculating Exposure Point Concentrations at Hazardous Waste Sites." OSWER 9285.6-10. Office of Emergency and Remedial Response. Washington, D.C. December.
- EPA. 2013. "ProUCL Version 5.00.00 Technical Guide (Draft)." Prepared by Singh, A. and A.K. Singh. EPA/600/R-07/041. September
- Available online at: <http://www.epa.gov/osp/hst/tsc/software.htm>
- J.L. Wilson, S.H. Conrad, W.R. Mason, W. Peplinski, and E. Hagan, 1990, Laboratory Investigation of Residual Liquid Organics, United States Environmental Protection Agency, EPA/600/6-90/004.
- Available online at: http://www.epa.gov/athens/learn2model/part-two/onsite/JnE_lite.html

TABLE D3.2 : EXPOSURE POINT CONCENTRATION GROUNDWATER TRENCH AIR SUMMARY
FUTURE CONSTRUCTION WORKER- IA-5
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

Scenario Timeframe: Future
Media: Groundwater
Exposure Medium: Vapor

Exposure Point	Analyte Group	Chemical of Potential Concern	Units	Detection Frequency	Number of High Censored Results	Arithmetic Mean ^c	95 UCL Distribution	Maximum Concentration (Qualifier)	Exposure Point Concentration			
									Value	Units	Statistic ^a	Method ^b
Trench Air (Vapor Intrusion)	VOC	cis-1,2-Dichloroethene	µg/m³	—	—	—	—	—	4.31E+01	µg/m³	—	1
	VOC	Gasoline Range Organics	µg/m³	—	—	—	—	—	—	µg/m³	—	1
	VOC	Tetrachloroethene	µg/m³	—	—	—	—	—	4.07E+00	µg/m³	—	1
	VOC	trans-1,2-Dichloroethene	µg/m³	—	—	—	—	—	6.29E+00	µg/m³	—	1
	VOC	Trichloroethene	µg/m³	—	—	—	—	—	5.91E+01	µg/m³	—	1
	VOC	Vinyl Chloride	µg/m³	—	—	—	—	—	1.26E+01	µg/m³	—	1

Abbreviations:

—	Not applicable, no estimate provided because there were fewer than six detected results
EPC	Exposure Point Concentration
KM	Kaplan-Meier
VOC	Volatile Organic Compounds
µg/m³	Micrograms per cubic meter
95UCL	One-sided 95 percent upper confidence limit of the mean
(a)	The EPC is the lesser of the UCL and the maximum detected result. The maximum detected result is the default when there are fewer than six detected results.
(b)	All methods follow EPA (2002, 2013).
(c)	Arithmetic mean is KM mean when detection frequency is not 100% or maximum likelihood estimation mean when KM mean was not available.

Notes:

Method (Statistic) Codes are defined as follows:

(1) Virginia Department of Environmental Quality EPC methodology

References:

EPA. 2002. "Calculating Exposure Point Concentrations at Hazardous Waste Sites." OSWER 9285.6-10. Office of Emergency and Remedial Response. Washington, D.C. December.
EPA. 2013. "ProUCL Version 5.00.00 Technical Guide (Draft)." Prepared by Singh, A. and A.K. Singh. EPA/600/R-07/041. September
Available online at: <http://www.epa.gov/osp/hst/lsc/software.htm>
Virginia Department of Environmental Quality (VDEQ). 2013. Voluntary Remediation Program Risk Assessment Guidance. May. On-Line Address:
<http://www.deq.virginia.gov/Programs/LandProtectionRevitalization/RemediationProgram/VoluntaryRemediationProgram/VRPRiskAssessmentGuidance.aspx>

TABLE D3.3 : EXPOSURE POINT CONCENTRATION VAPOR INTRUSION SUMMARY
FUTURE COMMERCIAL/INDUSTRIAL- IA-5
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

Scenario Timeframe: Future	
Media:	Subsurface Soil
Exposure Medium:	Vapor

Exposure Point	Analyte Group	Chemical of Potential Concern	Units	Detection Frequency	Number of High Censored Results	Arithmetic Mean ^a	95 UCL Distribution	Maximum Concentration (Qualifier)	Exposure Point Concentration			
									Value	Units	Statistic ^a	Method ^b
Indoor Air (Vapor Intrusion)	VOC	1,2-Dichloroethane	µg/m³	—	—	—	—	—	4.19E-03	µg/m³	—	1
	VOC	2-Butanone	µg/m³	—	—	—	—	—	3.47E-02	µg/m³	—	1
	SVOC	Acenaphthene	µg/m³	—	—	—	—	—	3.21E-04	µg/m³	—	1
	VOC	Acetone	µg/m³	—	—	—	—	—	1.15E-01	µg/m³	—	1
	SVOC	Benzo[b]fluoranthene	µg/m³	—	—	—	—	—	4.53E-08	µg/m³	—	1
	VOC	Carbon Disulfide	µg/m³	—	—	—	—	—	2.83E-02	µg/m³	—	1
	SVOC	Chrysene	µg/m³	—	—	—	—	—	1.25E-06	µg/m³	—	1
	Metal	Mercury	µg/m³	—	—	—	—	—	6.43E-02	µg/m³	—	1
	VOC	Methylene Chloride	µg/m³	—	—	—	—	—	7.47E-01	µg/m³	—	1

Abbreviations:

—	Not applicable, no estimate provided
SVOC	Semivolatile Organic Compounds
VOC	Volatile Organic Compounds
µg/m³	Micrograms per cubic meter
95UCL	One-sided 95 percent upper confidence limit of the mean
(a)	The EPC is the lesser of the UCL and the maximum detected result. The maximum detected result is the default when there are fewer than six detected results.
(b)	All methods follow EPA (2002, 2013).
(c)	Arithmetic mean is KM mean when detection frequency is not 100% or maximum likelihood estimation mean when KM mean was not available.

Notes:

Method (Statistic) Codes are defined as follows:

(1) Johnson and Ettinger Modeling Results

References:

- EPA. 2002. "Calculating Exposure Point Concentrations at Hazardous Waste Sites." OSWER 9285.6-10. Office of Emergency and Remedial Response. Washington, D.C. December.
- EPA. 2013. "ProUCL Version 5.00.00 Technical Guide (Draft)." Prepared by Singh, A. and A.K. Singh. EPA/600/R-07/041. September
- Available online at: <http://www.epa.gov/osp/hstl/tsc/software.htm>
- J.L. Wilson, S.H. Conrad, W.R. Mason, W. Peplinski, and E. Hagan, 1990, Laboratory Investigation of Residual Liquid Organics, United States Environmental Protection Agency, EPA.600/6-90/004.
- Available online at: http://www.epa.gov/athens/learn2model/part-two/onsite/JnE_lite.html

**TABLE D3.4 : EXPOSURE POINT CONCENTRATION SUBSURFACE SOIL SUMMARY
FUTURE INDUSTRIAL/COMMERCIAL & CONSTRUCTION WORKER- IA-5**

PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

Scenario Timeframe:	Future
Medium:	Subsurface Soil
Exposure Medium:	Soil, Vapor

Exposure Point	Analyte Group	Chemical of Potential Concern	Units	Detection Frequency	Number of High Censored Results	Arithmetic Mean ^c	95 UCL Distribution	Maximum Concentration (Qualifier)	Exposure Point Concentration			
									Value	Units	Statistic ^a	Method ^b
Soil, Indoor Air, or Ambient Air	VOC	1,2-Dichloroethane	mg/kg	—	—	—	—	1.50E-03	1.50E-03	mg/kg	—	1
	SVOC	1-Methylnaphthalene	mg/kg	—	—	—	—	6.50E-03	6.50E-03	mg/kg	—	1
	SVOC	2-Methylnaphthalene	mg/kg	—	—	—	—	1.20E-02	1.20E-02	mg/kg	—	1
	SVOC	Acenaphthene	mg/kg	—	—	—	—	6.00E-03	6.00E-03	mg/kg	—	1
	VOC	Acetone	mg/kg	—	—	—	—	1.80E-02	1.80E-02	mg/kg	—	1
	SVOC	Anthracene	mg/kg	—	—	—	—	1.00E-02	1.00E-02	mg/kg	—	1
	Metal	Arsenic	mg/kg	—	—	—	—	1.51E+01	1.51E+01	mg/kg	—	1
	Metal	Barium	mg/kg	—	—	—	—	6.46E+01	6.46E+01	mg/kg	—	1
	SVOC	Benzo[a]anthracene	mg/kg	—	—	—	—	3.70E-02	3.70E-02	mg/kg	—	1
	SVOC	Benzo[a]pyrene	mg/kg	—	—	—	—	3.00E-02	3.00E-02	mg/kg	—	1
	SVOC	Benzo[b]fluoranthene	mg/kg	—	—	—	—	4.50E-02	4.50E-02	mg/kg	—	1
	SVOC	Benzo[g,h,i]perylene	mg/kg	—	—	—	—	2.40E-02	2.40E-02	mg/kg	—	1
	SVOC	Benzo[k]fluoranthene	mg/kg	—	—	—	—	2.10E-02	2.10E-02	mg/kg	—	1
	Metal	Cadmium	mg/kg	—	—	—	—	2.90E-01	2.90E-01	mg/kg	—	1
	VOC	Carbon Disulfide	mg/kg	—	—	—	—	8.90E-04	8.90E-04	mg/kg	—	1
	Metal	Chromium	mg/kg	—	—	—	—	1.36E+01	1.36E+01	mg/kg	—	1
	SVOC	Chrysene	mg/kg	—	—	—	—	4.50E-02	4.50E-02	mg/kg	—	1
	SVOC	Fluoranthene	mg/kg	—	—	—	—	9.70E-02	9.70E-02	mg/kg	—	1
	SVOC	Indeno[1,2,3-cd]pyrene	mg/kg	—	—	—	—	1.80E-02	1.80E-02	mg/kg	—	1
	Metal	Lead	mg/kg	—	—	—	—	1.49E+01	1.49E+01	mg/kg	—	1
	Metal	Mercury	mg/kg	—	—	—	—	3.00E-02	3.00E-02	mg/kg	—	1
	VOC	Methylene Chloride	mg/kg	—	—	—	—	2.90E-02	2.90E-02	mg/kg	—	1
	SVOC	Phenanthrene	mg/kg	—	—	—	—	6.40E-02	6.40E-02	mg/kg	—	1
	SVOC	Pyrene	mg/kg	—	—	—	—	6.60E-02	6.60E-02	mg/kg	—	1
	Metal	Selenium	mg/kg	—	—	—	—	5.50E-01	5.50E-01	mg/kg	—	1

Abbreviations:

—	Not applicable, no estimate provided because there were fewer than six detected results
EPA	U.S. Environmental Protection Agency
HHRA	Human Health Risk Assessment
KM	Kaplan-Meier
MAX	Maximum Detected Concentration
NP	Nonparametric Distribution
VOC	Volatile Organic Compounds
RAGS	Risk Assessment Guidance for Superfund
µg/L	Micrograms per liter
95UCL	One-sided 95 percent upper confidence limit of the mean
(a)	The EPC is the lesser of the UCL and the maximum detected result. The maximum detected result is the default when there are fewer than six detected results.
(b)	All methods follow EPA (2002, 2013).
(c)	Arithmetic mean is KM mean when detection frequency is not 100% or maximum likelihood estimation mean when KM mean was not available.

Notes:

Program not used because sample size was less than six detected results

Method (Statistic) Codes are defined as follows (some method codes may not be used in the table):

- (1) Maximum detected concentration

References:

EPA. 2002. "Calculating Exposure Point Concentrations at Hazardous Waste Sites." OSWER 9285.6-10. Office of Emergency and Remedial Response. Washington, D.C. December.
EPA. 2013. "ProUCL Version 5.00.00 Technical Guide (Draft)." Prepared by Singh, A. and A.K. Singh. EPA/600/R-07/041. September
Available online at: <http://www.epa.gov/osp/hst/tsc/software.htm>

TABLE D3.5 : EXPOSURE POINT CONCENTRATION SURFACE SOIL SUMMARY
FUTURE INDUSTRIAL/COMMERCIAL- IA-5
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

Scenario Timeframe:	Future
Medium:	Surface Soil
Exposure Medium:	Soil, Vapor

Exposure Point	Analyte Group	Chemical of Potential Concern	Units	Detection Frequency	Number of High Censored Results	Arithmetic Mean ^c	95 UCL Distribution	Maximum Concentration (Qualifier)	Exposure Point Concentration			
									Value	Units	Statistic ^a	Method ^b
Soil, Indoor Air, or Ambient Air	VOC	1,2-Dichloroethane	mg/kg	--	--	--	--	1.50E-03	1.50E-03	mg/kg	--	1
	SVOC	1-Methylnaphthalene	mg/kg	--	--	--	--	6.50E-03	6.50E-03	mg/kg	--	1
	SVOC	2-Methylnaphthalene	mg/kg	--	--	--	--	1.20E-02	1.20E-02	mg/kg	--	1
	SVOC	Acenaphthene	mg/kg	--	--	--	--	6.00E-03	6.00E-03	mg/kg	--	1
	VOC	Acetone	mg/kg	--	--	--	--	1.80E-02	1.80E-02	mg/kg	--	1
	SVOC	Anthracene	mg/kg	--	--	--	--	1.00E-02	1.00E-02	mg/kg	--	1
	Metal	Arsenic	mg/kg	--	--	--	--	1.51E+01	1.51E+01	mg/kg	--	1
	Metal	Barium	mg/kg	--	--	--	--	6.00E+01	6.00E+01	mg/kg	--	1
	SVOC	Benzo[a]anthracene	mg/kg	--	--	--	--	3.70E-02	3.70E-02	mg/kg	--	1
	SVOC	Benzo[a]pyrene	mg/kg	--	--	--	--	3.00E-02	3.00E-02	mg/kg	--	1
	SVOC	Benzo[b]fluoranthene	mg/kg	--	--	--	--	4.50E-02	4.50E-02	mg/kg	--	1
	SVOC	Benzo[g,h,i]perylene	mg/kg	--	--	--	--	2.40E-02	2.40E-02	mg/kg	--	1
	SVOC	Benzo[k]fluoranthene	mg/kg	--	--	--	--	2.10E-02	2.10E-02	mg/kg	--	1
	Metal	Cadmium	mg/kg	--	--	--	--	2.90E-01	2.90E-01	mg/kg	--	1
	VOC	Carbon Disulfide	mg/kg	--	--	--	--	8.90E-04	8.90E-04	mg/kg	--	1
	Metal	Chromium	mg/kg	--	--	--	--	1.36E+01	1.36E+01	mg/kg	--	1
	SVOC	Chrysene	mg/kg	--	--	--	--	4.50E-02	4.50E-02	mg/kg	--	1
	SVOC	Fluoranthene	mg/kg	--	--	--	--	9.70E-02	9.70E-02	mg/kg	--	1
	SVOC	Indeno[1,2,3-cd]pyrene	mg/kg	--	--	--	--	1.80E-02	1.80E-02	mg/kg	--	1
	Metal	Lead	mg/kg	--	--	--	--	1.49E+01	1.49E+01	mg/kg	--	1
	Metal	Mercury	mg/kg	--	--	--	--	2.10E-02	2.10E-02	mg/kg	--	1
	VOC	Methylene Chloride	mg/kg	--	--	--	--	2.90E-02	2.90E-02	mg/kg	--	1
	SVOC	Phenanthrene	mg/kg	--	--	--	--	6.40E-02	6.40E-02	mg/kg	--	1
	SVOC	Pyrene	mg/kg	--	--	--	--	6.60E-02	6.60E-02	mg/kg	--	1
	Metal	Selenium	mg/kg	--	--	--	--	5.50E-01	5.50E-01	mg/kg	--	1

Abbreviations:

--	Not applicable, no estimate provided because there were fewer than six detected results
EPA	U.S. Environmental Protection Agency
HHRA	Human Health Risk Assessment
KM	Kaplan-Meier
MAX	Maximum Detected Concentration
NP	Nonparametric Distribution
VOC	Volatile Organic Compounds
RAGS	Risk Assessment Guidance for Superfund
µg/L	Micrograms per liter
95UCL	One-sided 95 percent upper confidence limit of the mean
(a)	The EPC is the lesser of the UCL and the maximum detected result. The maximum detected result is the default when there are fewer than six detected results.
(b)	All methods follow EPA (2002, 2013).
(c)	Arithmetic mean is KM mean when detection frequency is not 100% or maximum likelihood estimation mean when KM mean was not available.

Notes:

Program not used because sample size was less than six detected results

Method (Statistic) Codes are defined as follows (some method codes may not be used in the table):

(1) Maximum detected concentration

References:

EPA. 2002. "Calculating Exposure Point Concentrations at Hazardous Waste Sites." OSWER 9285.6-10. Office of Emergency and Remedial Response. Washington, D.C. December.
EPA. 2013. "ProUCL Version 5.00.00 Technical Guide (Draft)." Prepared by Singh, A. and A.K. Singh. EPA/600/R-07/041. September
Available online at: <http://www.epa.gov/osp/hst/tsc/software.htm>

TABLE D4.1 : EXPOSURE POINT CONCENTRATION GROUNDWATER VAPOR INTRUSION SUMMARY
FUTURE INDUSTRIAL/COMMERCIAL WORKER- IA-14
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

Scenario Timeframe:	Future
Media:	Groundwater
Exposure Medium:	Vapor

Exposure Point	Analyte Group	Chemical of Potential Concern	Units	Detection Frequency	Number of High Censored Results	Arithmetic Mean ^a	95 UCL Distribution	Maximum Concentration (Qualifier)	Exposure Point Concentration			
									Value	Units	Statistic ^a	Method ^b
Indoor Air (Vapor Intrusion)	SVOC	Benzofluranthene	µg/m³	—	—	—	—	—	9.11E-07	µg/m³	—	1
	VOC	C20-C34	µg/m³	—	—	—	—	—	—	µg/m³	—	1
	SVOC	Chrysene	µg/m³	—	—	—	—	—	2.93E-06	µg/m³	—	1
	SVOC	Fluoranthene	µg/m³	—	—	—	—	—	—	µg/m³	—	1
	SVOC	Phenanthrene	µg/m³	—	—	—	—	—	—	µg/m³	—	1
	SVOC	Pyrene	µg/m³	—	—	—	—	—	7.45E-06	µg/m³	—	1

Abbreviations:

—	Not applicable, no estimate provided
SVOC	Semivolatile Organic Compounds
VOC	Volatile Organic Compounds
µg/m³	Micrograms per cubic meter
95UCL	One-sided 95 percent upper confidence limit of the mean
(a)	The EPC is the lesser of the UCL and the maximum detected result. The maximum detected result is the default when there are fewer than six detected results.
(b)	All methods follow EPA (2002, 2013).
(c)	Arithmetic mean is KM mean when detection frequency is not 100% or maximum likelihood estimation mean when KM mean was not available.

Notes:

Method (Statistic) Codes are defined as follows:

(1) Johnson and Ettinger Modeling Results

References:

- EPA. 2002. "Calculating Exposure Point Concentrations at Hazardous Waste Sites." OSWER 9285.6-10. Office of Emergency and Remedial Response. Washington, D.C. December.
- EPA. 2013. "ProUCL Version 5.00.00 Technical Guide (Draft)." Prepared by Singh, A. and A.K. Singh. EPA/600/R-07/041. September
- Available online at: <http://www.epa.gov/osp/hst/tsc/software.htm>
- J.L. Wilson, S.H. Conrad, W.R. Mason, W. Peplinski, and E. Hagan, 1990, Laboratory Investigation of Residual Liquid Organics, United States Environmental Protection Agency, EPA/600/6-90/004.
- Available online at: http://www.epa.gov/athens/learn2model/part-two/onsite/JnE_lite.html

TABLE D4.2 : EXPOSURE POINT CONCENTRATION GROUNDWATER TRENCH AIR SUMMARY
FUTURE CONSTRUCTION WORKER- IA-14
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

Scenario Timeframe:	Future
Media:	Groundwater
Exposure Medium:	Vapor

Exposure Point	Analyte Group	Chemical of Potential Concern	Units	Detection Frequency	Number of High Censored Results	Arithmetic Mean ^a	95 UCL Distribution	Maximum Concentration (Qualifier)	Exposure Point Concentration			
									Value	Units	Statistic ^a	Method ^b
Trench Air (Vapor Intrusion)	SVOC	Benzo[b]fluoranthene	µg/m³	—	—	—	—	—	1.84E-05	µg/m³	—	1
	VOC	C20-C34	µg/m³	—	—	—	—	—	—	µg/m³	—	1
	SVOC	Chrysene	µg/m³	—	—	—	—	—	1.85E-05	µg/m³	—	1
	SVOC	Fluoranthene	µg/m³	—	—	—	—	—	6.14E-06	µg/m³	—	1
	SVOC	Phenanthrene	µg/m³	—	—	—	—	—	6.48E-06	µg/m³	—	1
	SVOC	Pyrene	µg/m³	—	—	—	—	—	3.35E-06	µg/m³	—	1

Abbreviations:

—	Not applicable, no estimate provided because there were fewer than six detected results
EPC	Exposure Point Concentration
KM	Kaplan-Meier
SVOC	Semivolatile Organic Compounds
VOC	Volatile Organic Compounds
µg/m³	Micrograms per cubic meter
95UCL	One-sided 95 percent upper confidence limit of the mean
(a)	The EPC is the lesser of the UCL and the maximum detected result. The maximum detected result is the default when there are fewer than six detected results.
(b)	All methods follow EPA (2002, 2013).
(c)	Arithmetic mean is KM mean when detection frequency is not 100% or maximum likelihood estimation mean when KM mean was not available.

Notes:

Method (Statistic) Codes are defined as follows:

- (1) Virginia Department of Environmental Quality EPC methodology

References:

EPA. 2002. "Calculating Exposure Point Concentrations at Hazardous Waste Sites." OSWER 9285.6-10. Office of Emergency and Remedial Response. Washington, D.C. December.
EPA. 2013. "ProUCL Version 5.00.00 Technical Guide (Draft)." Prepared by Singh, A. and A.K. Singh. EPA/600/R-07/041. September
Available online at: <http://www.epa.gov/osp/hst/lsc/software.htm>
Virginia Department of Environmental Quality (VDEQ). 2013. Voluntary Remediation Program Risk Assessment Guidance. May. On-Line Address:
<http://www.deq.virginia.gov/Programs/LandProtectionRevitalization/RemediationProgram/VoluntaryRemediationProgram/VRPRiskAssessmentGuidance.aspx>

TABLE D4.3: EXPOSURE POINT CONCENTRATION VAPOR INTRUSION SUMMARY
FUTURE COMMERCIAL/INDUSTRIAL- IA-14
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

Scenario Timeframe: Future	
Media:	Subsurface Soil
Exposure Medium:	Vapor

Exposure Point	Analyte Group	Chemical of Potential Concern	Units	Detection Frequency	Number of High Censored Results	Arithmetic Mean ^c	95 UCL Distribution		Maximum Concentration (Qualifier)	Exposure Point Concentration			
										Value	Units	Statistic ^a	Method ^b
Indoor Air (Vapor Intrusion)	SVOC	2-Butanone	µg/m³	—	—	—	—	—	—	3.33E-03	µg/m³	—	1
	VOC	Acetone	µg/m³	—	—	—	—	—	—	3.66E-02	µg/m³	—	1
	VOC	Benzene	µg/m³	—	—	—	—	—	—	1.39E-02	µg/m³	—	1
	VOC	Bromomethane	µg/m³	—	—	—	—	—	—	9.76E-03	µg/m³	—	1
	VOC	Carbon Disulfide	µg/m³	—	—	—	—	—	—	3.00E-02	µg/m³	—	1
	SVOC	Chrysene	µg/m³	—	—	—	—	—	—	4.61E-08	µg/m³	—	1
	SVOC	Fluorene	µg/m³	—	—	—	—	—	—	1.02E-05	µg/m³	—	1
	VOC	Methylene Chloride	µg/m³	—	—	—	—	—	—	9.06E-02	µg/m³	—	1
	SVOC	Naphthalene	µg/m³	—	—	—	—	—	—	1.02E-03	µg/m³	—	1
	SVOC	Pyrene	µg/m³	—	—	—	—	—	—	3.48E-07	µg/m³	—	1
	VOC	Toluene	µg/m³	—	—	—	—	—	—	1.57E-03	µg/m³	—	1

Abbreviations:

—	Not applicable, no estimate provided
SVOC	Semivolatile Organic Compounds
VOC	Volatile Organic Compounds
µg/m³	Micrograms per cubic meter
95UCL	One-sided 95 percent upper confidence limit of the mean
(a)	The EPC is the lesser of the UCL and the maximum detected result. The maximum detected result is the default when there are fewer than six detected results.
(b)	All methods follow EPA (2002, 2013).
(c)	Arithmetic mean is KM mean when detection frequency is not 100% or maximum likelihood estimation mean when KM mean was not available.

Notes:

Method (Statistic) Codes are defined as follows:

(1) Johnson and Ettinger Modeling Results

References:

- EPA. 2002. "Calculating Exposure Point Concentrations at Hazardous Waste Sites." OSWER 9285.6-10. Office of Emergency and Remedial Response. Washington, D.C. December.
- EPA. 2013. "ProUCL Version 5.00.00 Technical Guide (Draft)." Prepared by Singh, A. and A.K. Singh. EPA/600/R-07/041. September
- Available online at: <http://www.epa.gov/osp/hstl/tsc/software.htm>
- J.L. Wilson, S.H. Conrad, W.R. Mason, W. Peplinski, and E. Hagan, 1990, Laboratory Investigation of Residual Liquid Organics, United States Environmental Protection Agency, EPA.600/6-90/004.
- Available online at: http://www.epa.gov/athens/learn2model/part-two/onsite/JnE_lite.html

TABLE D5.1 : EXPOSURE POINT CONCENTRATION GROUNDWATER VAPOR INTRUSION SUMMARY
FUTURE INDUSTRIAL/COMMERCIAL WORKER- IA-10
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

Scenario Timeframe: Future	
Media:	Groundwater
Exposure Medium:	Vapor

Exposure Point	Analyte Group	Chemical of Potential Concern	Units	Detection Frequency	Number of High Censored Results	Arithmetic Mean ^c	95 UCL Distribution	Maximum Concentration (Qualifier)	Exposure Point Concentration			
									Value	Units	Statistic ^a	Method ^b
Indoor Air (Vapor Intrusion)	VOC	Carbon Disulfide	µg/m ³	—	—	—	—	—	5.37E-04	µg/m ³	—	1

Abbreviations:

—	Not applicable, no estimate provided
VOC	Volatile Organic Compounds
µg/m ³	Micrograms per cubic meter
95UCL	One-sided 95 percent upper confidence limit of the mean
(a)	The EPC is the lesser of the UCL and the maximum detected result. The maximum detected result is the default when there are fewer than six detected results.
(b)	All methods follow EPA (2002, 2013).
(c)	Arithmetic mean is KM mean when detection frequency is not 100% or maximum likelihood estimation mean when KM mean was not available.

Notes:

Method (Statistic) Codes are defined as follows:
(1) Johnson and Ettinger Modeling Results

References:

EPA. 2002. "Calculating Exposure Point Concentrations at Hazardous Waste Sites." OSWER 9285.6-10. Office of Emergency and Remedial Response. Washington, D.C. December.
EPA. 2013. "ProUCL Version 5.00.00 Technical Guide (Draft)." Prepared by Singh, A. and A.K. Singh. EPA/600/R-07/041. September
Available online at: <http://www.epa.gov/ospl/hstl/tsc/software.htm>
J.L. Wilson, S.H. Conrad, W.R. Mason, W. Peplinski, and E. Hagen, 1990, Laboratory Investigation of Residual Liquid Organics, United States Environmental Protection Agency, EPA/600/6-90/004.
Available online at: http://www.epa.gov/athens/learn2model/part-two/onsite/JnE_lite.html

TABLE D5.2 : EXPOSURE POINT CONCENTRATION GROUNDWATER TRENCH AIR SUMMARY
FUTURE CONSTRUCTION WORKER- IA-10
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

Scenario Timeframe: Future	
Media:	Groundwater
Exposure Medium:	Vapor

Exposure Point	Analyte Group	Chemical of Potential Concern	Units	Detection Frequency	Number of High Censored Results	Arithmetic Mean ^c	95 UCL Distribution	Maximum Concentration (Qualifier)	Exposure Point Concentration			
									Value	Units	Statistic ^a	Method ^b
Trench Air (Vapor Intrusion)	VOC	Carbon Disulfide	µg/m ³	—	—	—	—	—	2.54E-02	µg/m ³	—	1

Abbreviations:

—	Not applicable, no estimate provided because there were fewer than six detected results
EPC	Exposure Point Concentration
KM	Kaplan-Meier
VOC	Volatile Organic Compounds
µg/m ³	Micrograms per cubic meter
95UCL	One-sided 95 percent upper confidence limit of the mean
(a)	The EPC is the lesser of the UCL and the maximum detected result. The maximum detected result is the default when there are fewer than six detected results.
(b)	All methods follow EPA (2002, 2013).
(c)	Arithmetic mean is KM mean when detection frequency is not 100% or maximum likelihood estimation mean when KM mean was not available.

Notes:

Method (Statistic) Codes are defined as follows:
(1) Virginia Department of Environmental Quality EPC methodology

References:

EPA. 2002. "Calculating Exposure Point Concentrations at Hazardous Waste Sites." OSWER 9285.6-10. Office of Emergency and Remedial Response. Washington, D.C. December.
EPA. 2013. "ProUCL Version 5.00.00 Technical Guide (Draft)." Prepared by Singh, A. and A.K. Singh. EPA/600/R-07/041. September
Available online at: <http://www.epa.gov/osp/hst/tsc/software.htm>
Virginia Department of Environmental Quality (VDEQ). 2013. Voluntary Remediation Program Risk Assessment Guidance. May. On-Line Address:
<http://www.deq.virginia.gov/Programs/LandProtectionRevitalization/RemediationProgram/VoluntaryRemediationProgram/VRPRiskAssessmentGuidance.aspx>

**TABLE D5.3 : EXPOSURE POINT CONCENTRATION VAPOR INTRUSION SUMMARY
FUTURE COMMERCIAL/INDUSTRIAL- IA-10**

PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

Scenario Timeframe: Future
Media: Subsurface Soil
Exposure Medium: Vapor

Exposure Point	Analyte Group	Chemical of Potential Concern	Units	Detection Frequency	Number of High Censored Results	Arithmetic Mean ^c	95 UCL Distribution	Maximum Concentration (Qualifier)	Exposure Point Concentration			
									Value	Units	Statistic ^a	Method ^b
Indoor Air (Vapor Intrusion)	VOC	1,2-Dichloroethane	µg/m³	—	—	—	—	—	8.70E-03	µg/m³	—	1
	VOC	2-Butanone	µg/m³	—	—	—	—	—	1.18E-01	µg/m³	—	1
	VOC	Acetone	µg/m³	—	—	—	—	—	1.87E-01	µg/m³	—	1
	VOC	Benzene	µg/m³	—	—	—	—	—	2.23E-03	µg/m³	—	1
	SVOC	Benzo[b]fluoranthene	µg/m³	—	—	—	—	—	2.12E-08	µg/m³	—	1
	VOC	Carbon Disulfide	µg/m³	—	—	—	—	—	1.47E-02	µg/m³	—	1
	VOC	Chloroethane	µg/m³	—	—	—	—	—	2.51E-02	µg/m³	—	1
	SVOC	Chrysene	µg/m³	—	—	—	—	—	1.71E-07	µg/m³	—	1
	Metal	Mercury	µg/m³	—	—	—	—	—	2.35E-02	µg/m³	—	1
	VOC	Methylene Chloride	µg/m³	—	—	—	—	—	1.28E+00	µg/m³	—	1
	VOC	Pyrene	µg/m³	—	—	—	—	—	5.76E-07	µg/m³	—	1
	VOC	Toluene	µg/m³	—	—	—	—	—	4.79E-03	µg/m³	—	1

Abbreviations:

—	Not applicable, no estimate provided
SVOC	Semivolatile Organic Compounds
VOC	Volatile Organic Compounds
µg/m³	Micrograms per cubic meter
95UCL	One-sided 95 percent upper confidence limit of the mean
(a)	The EPC is the lesser of the UCL and the maximum detected result. The maximum detected result is the default when there are fewer than six detected results.
(b)	All methods follow EPA (2002, 2013).
(c)	Arithmetic mean is KM mean when detection frequency is not 100% or maximum likelihood estimation mean when KM mean was not available.

Notes:

Method (Statistic) Codes are defined as follows:

(1) Johnson and Ettinger Modeling Results

References:

EPA. 2002. "Calculating Exposure Point Concentrations at Hazardous Waste Sites." OSWER 9285.6-10. Office of Emergency and Remedial Response. Washington, D.C. December.
EPA. 2013. "ProUCL Version 5.00.00 Technical Guide (Draft)." Prepared by Singh, A. and A.K. Singh. EPA/600/R-07/041. September
Available online at: <http://www.epa.gov/osp/hstl/tsc/software.htm>
J.L. Wilson, S.H. Conrad, W.R. Mason, W. Peplinski, and E. Hagan, 1990, Laboratory Investigation of Residual Liquid Organics, United States Environmental Protection Agency, EPA/600/6-90/004.
Available online at: http://www.epa.gov/athens/learn2model/part-two/onsite/JnE_lite.html

TABLE D5.4: EXPOSURE POINT CONCENTRATION SUBSURFACE SOIL SUMMARY
FUTURE INDUSTRIAL/COMMERCIAL & CONSTRUCTION WORKER- IA-10
PROPERTY-SPECIFIC RISK ASSESSMENT
RACER TRUST ONTARIO STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

Scenario Timeframe: Future
Medium: Subsurface Soil
Exposure Medium: Soil, Vapor

Exposure Point	Analyte Group	Chemical of Potential Concern	Units	Detection Frequency	Number of High Censored Results	Arithmetic Mean ^a	95 UCL Distribution	Maximum Concentration (Qualifier)	Exposure Point Concentration			
									Value	Units	Statistic ^a	Method ^b
Soil, Indoor Air, or Ambient Air	VOC	1,2-Dichloroethane	mg/kg	--	--	--	--	6.700E-04	6.70E-04	mg/kg	--	1
	SVOC	1-Methylnaphthalene	mg/kg	--	--	--	--	4.100E-02	4.10E-02	mg/kg	--	1
	SVOC	2-Butanone	mg/kg	--	--	--	--	3.300E-03	3.30E-03	mg/kg	--	1
	SVOC	2-Methylnaphthalene	mg/kg	--	--	--	--	3.900E-02	3.90E-02	mg/kg	--	1
	VOC	Acetone	mg/kg	--	--	--	--	4.300E-02	4.30E-02	mg/kg	--	1
	PCB	Aroclor 1242	mg/kg	--	--	--	--	2.400E-02	2.40E-02	mg/kg	--	1
	Metal	Arsenic	mg/kg	--	--	--	--	1.760E+01	1.76E+01	mg/kg	--	1
	Metal	Barium	mg/kg	--	--	--	--	5.480E+01	5.48E+01	mg/kg	--	1
	VOC	Benzene	mg/kg	--	--	--	--	3.200E-04	3.20E-04	mg/kg	--	1
	SVOC	Benzo[b]fluoranthene	mg/kg	--	--	--	--	3.600E-02	3.60E-02	mg/kg	--	1
	SVOC	Benzo[g,h,i]perylene	mg/kg	--	--	--	--	1.800E-02	1.80E-02	mg/kg	--	1
	VOC	Carbon Disulfide	mg/kg	--	--	--	--	2.100E-03	2.10E-03	mg/kg	--	1
	Metal	Chromium	mg/kg	--	--	--	--	1.090E+01	1.09E+01	mg/kg	--	1
	SVOC	Chrysene	mg/kg	--	--	--	--	1.600E-02	1.60E-02	mg/kg	--	1
	SVOC	Fluoranthene	mg/kg	--	--	--	--	1.800E-02	1.80E-02	mg/kg	--	1
	Metal	Lead	mg/kg	--	--	--	--	1.550E+01	1.55E+01	mg/kg	--	1
	Metal	Mercury	mg/kg	--	--	--	--	2.400E-02	2.40E-02	mg/kg	--	1
	VOC	Methylene Chloride	mg/kg	--	--	--	--	4.600E-02	4.60E-02	mg/kg	--	1
	SVOC	Phenanthrene	mg/kg	--	--	--	--	3.600E-02	3.60E-02	mg/kg	--	1
	SVOC	Pyrene	mg/kg	--	--	--	--	1.500E-02	1.50E-02	mg/kg	--	1
	Metal	Selenium	mg/kg	--	--	--	--	5.300E-01	5.30E-01	mg/kg	--	1
	VOC	Toluene	mg/kg	--	--	--	--	3.500E-04	3.50E-04	mg/kg	--	1

Abbreviations:

--	Not applicable, no estimate provided because there were six or fewer detected results
EPA	U.S. Environmental Protection Agency
KM	Kaplan-Meier
SVOC	Semivolatile Organic Compounds
VOC	Volatile Organic Compounds
mg/kg	Micrograms per kilogram
95UCL	One-sided 95 percent upper confidence limit of the mean
(a)	The EPC is the lesser of the UCL and the maximum detected result. The maximum detected result is the default when there are fewer than six detected results.
(b)	All methods follow EPA (2002, 2009).
(c)	Arithmetic mean is KM mean when detection frequency is not 100% or maximum likelihood estimation mean when KM mean was not available.

Notes:

Program not used because sample size was less than six detected results

Method (Statistic) Codes are defined as follows:

(1) Maximum detected concentration

References:

EPA. 2002. "Calculating Exposure Point Concentrations at Hazardous Waste Sites." OSWER 9285.6-10. Office of Emergency and Remedial Response. Washington, D.C. December.
EPA. 2013. "ProUCL Version 5.00.00 Technical Guide (Draft)." Prepared by Singh, A. and A.K. Singh. EPA/600/R-07/041. September
Available online at: <http://www.epa.gov/osp/hsti/tsc/software.htm>

TABLE D6.1: CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
FUTURE - COMMERCIAL/INDUSTRIAL WORKER- IA 2
PROPERTY-SPECIFIC RISK ASSESSMENT
FORMER GM STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations				Noncancer Hazard Quotient		
					Value	Units	Intake		Cancer Risk	Intake		Hazard Quotient	
							Value	Units		Value	Units		
Subsurface Soil	Subsurface Soil	Subsurface Soil	Ingestion	1-Methylnaphthalene	2.5E-02	mg/kg	4.4E-09	mg/(kg-day)	1.3E-10	1.2E-08	mg/(kg-day)	1.7E-07	
				2-Butanone	3.0E-03	mg/kg	5.2E-10	mg/(kg-day)	--	1.5E-09	mg/(kg-day)	2.4E-09	
				2-Methylnaphthalene	2.2E-02	mg/kg	3.8E-09	mg/(kg-day)	--	1.1E-08	mg/(kg-day)	2.7E-06	
				Acetone	3.1E-02	mg/kg	5.4E-09	mg/(kg-day)	--	1.5E-08	mg/(kg-day)	1.7E-06	
				C10-C20	6.7E+01	mg/kg	1.2E-05	mg/(kg-day)	--	3.3E-05	mg/(kg-day)	8.2E-04	
				C20-C34	1.2E+02	mg/kg	2.1E-05	mg/(kg-day)	--	5.9E-05	mg/(kg-day)	2.0E-03	
				C8-C12	5.5E-02	mg/kg	9.8E-09	mg/(kg-day)	--	2.7E-08	mg/(kg-day)	6.7E-07	
				Chrysene	1.1E-02	mg/kg	1.9E-09	mg/(kg-day)	1.4E-11	5.4E-09	mg/(kg-day)	--	
				Methylene Chloride	5.8E-03	mg/kg	9.8E-10	mg/(kg-day)	2.0E-12	2.7E-09	mg/(kg-day)	4.8E-07	
				Phenanthrene	2.7E-02	mg/kg	4.7E-09	mg/(kg-day)	--	1.3E-08	mg/(kg-day)	4.4E-06	
				Exposure Route Total					1.4E-10			2.8E-03	
			Dermal Contact	1-Methylnaphthalene	2.5E-02	mg/kg	7.5E-09	mg/(kg-day)	2.17E-10	2.1E-08	mg/(kg-day)	3.0E-07	
				2-Butanone	3.0E-03	mg/kg	6.9E-10	mg/(kg-day)	--	1.9E-09	mg/(kg-day)	3.2E-09	
				2-Methylnaphthalene	2.2E-02	mg/kg	6.6E-09	mg/(kg-day)	--	1.8E-08	mg/(kg-day)	4.6E-06	
				Acetone	3.1E-02	mg/kg	7.1E-09	mg/(kg-day)	--	2.0E-08	mg/(kg-day)	2.2E-08	
				C10-C20	6.7E+01	mg/kg	1.5E-05	mg/(kg-day)	--	4.3E-05	mg/(kg-day)	1.1E-03	
				C20-C34	1.2E+02	mg/kg	2.8E-05	mg/(kg-day)	--	7.7E-05	mg/(kg-day)	2.8E-03	
				C8-C12	5.5E-02	mg/kg	1.3E-06	mg/(kg-day)	--	3.6E-06	mg/(kg-day)	8.9E-07	
				Chrysene	1.1E-02	mg/kg	3.3E-09	mg/(kg-day)	2.4E-11	9.2E-09	mg/(kg-day)	--	
				Methylene Chloride	5.8E-03	mg/kg	1.3E-09	mg/(kg-day)	2.6E-12	3.6E-09	mg/(kg-day)	6.0E-07	
				Phenanthrene	2.7E-02	mg/kg	8.1E-09	mg/(kg-day)	--	2.3E-08	mg/(kg-day)	7.8E-06	
				Exposure Route Total					2.7E-11			3.7E-03	
	Particulates and Vapor	Ambient Air	Inhalation	1-Methylnaphthalene	2.5E-02	mg/kg	2.0E-05	µg/m³	--	5.7E-08	mg/m³	--	
				2-Butanone	3.0E-03	mg/kg	1.5E-05	µg/m³	--	4.2E-08	mg/m³	8.4E-09	
				2-Methylnaphthalene	2.2E-02	mg/kg	1.8E-05	µg/m³	--	5.1E-08	mg/m³	--	
				Acetone	3.1E-02	mg/kg	1.4E-04	µg/m³	--	4.0E-07	mg/m³	1.3E-06	
				C10-C20	6.7E+01	mg/kg	5.8E-06	µg/m³	--	1.6E-08	mg/m³	7.7E-08	
				C20-C34	1.2E+02	mg/kg	1.0E-05	µg/m³	--	2.9E-08	mg/m³	--	
				C8-C12	5.5E-02	mg/kg	4.7E-09	µg/m³	--	1.3E-11	mg/m³	6.3E-11	
				Chrysene	1.1E-02	mg/kg	8.2E-08	µg/m³	9.0E-13	2.3E-10	mg/m³	--	
				Methylene Chloride	5.8E-03	mg/kg	1.4E-04	µg/m³	1.4E-12	3.9E-07	mg/m³	6.6E-07	
				Phenanthrene	2.7E-02	mg/kg	2.3E-09	µg/m³	--	6.5E-12	mg/m³	--	
				Exposure Route Total					2.3E-12			7.5E-07	
	Vapor Intrusion	Indoor Air	Inhalation	1,2,4-Trichlorobenzene	1.1E-04	µg/m³	9.1E-06	µg/m³	--	2.5E-08	mg/m³	1.3E-05	
				2-Butanone	4.8E-02	µg/m³	3.9E-03	µg/m³	--	1.1E-05	mg/m³	2.2E-06	
				2-Hexanone	1.8E-03	µg/m³	1.3E-04	µg/m³	--	3.6E-07	mg/m³	1.2E-05	
				Acetone	3.0E-01	µg/m³	2.5E-02	µg/m³	--	6.9E-05	mg/m³	2.2E-06	
				C10-C20	--	µg/m³	--	µg/m³	--	--	mg/m³	--	
				C20-C34	--	µg/m³	--	µg/m³	--	--	mg/m³	--	
				C8-C12	--	µg/m³	--	µg/m³	--	--	mg/m³	--	
				Carbon Disulfide	1.8E-02	µg/m³	1.3E-03	µg/m³	--	3.6E-06	mg/m³	5.1E-06	
				Chrysene	1.8E-06	µg/m³	1.4E-07	µg/m³	1.6E-12	4.0E-10	mg/m³	--	
				Methylene Chloride	1.9E-01	µg/m³	1.6E-02	µg/m³	1.6E-10	4.4E-05	mg/m³	7.3E-05	
				Naphthalene	5.5E-04	µg/m³	4.4E-05	µg/m³	1.5E-09	1.2E-07	mg/m³	4.1E-05	
				Phenanthrene	--	µg/m³	--	µg/m³	--	--	mg/m³	--	
				Pyrene	5.0E-07	µg/m³	4.0E-06	µg/m³	--	1.1E-10	mg/m³	--	
				Exposure Route Total					1.7E-09			1.5E-04	
				Exposure Point Total					1.8E-09			6.8E-03	
				Exposure Medium Total					1.8E-09			6.8E-03	
Groundwater	Vapor Intrusion	Indoor Air	Inhalation	Acetone	2.5E-04	µg/m³	2.0E-05	µg/m³	--	5.7E-08	mg/m³	1.9E-09	
				C10-C20	--	µg/m³	--	µg/m³	--	--	mg/m³	--	
				C20-C34	--	µg/m³	--	µg/m³	--	--	mg/m³	--	
				Gasoline Range Organics	--	µg/m³	--	µg/m³	--	--	mg/m³	--	
				Mercury	7.5E-05	µg/m³	6.1E-06	µg/m³	--	1.7E-08	mg/m³	5.7E-05	
			Exposure Route Total					0.0E+00			5.7E-05		
			Exposure Point Total					0.0E+00			5.7E-05		
			Exposure Medium Total					0.0E+00			5.7E-05		
			Subsurface Soil Including Vapor Intrusion + Groundwater Medium Total								Total Risk	2E-09	Total Hazard

Abbreviations:

—	Not applicable or available
EPA	U.S. Environmental Protection Agency
mg/kg	Milligram per kilogram
mg/(kg-day)	Milligram per kilogram day
mg/m³	Milligrams per cubic meter
µg/m³	Micrograms per cubic meter

Equations:

Intake equations are listed in Table D6	
Hazard Quotient	= Intake/Reference Doses _{Oral or Inhalation}
Cancer Risk	= Intake/Oral Slope Factor or Inhalation Unit Risk
Exposure Route Total	= Σ Chemical of Potential Concern Cancer Risk or Hazard Quotient
Exposure Point Total	= Σ Exposure Route Total
Exposure Medium Total	= Σ Exposure Point Total
Subsurface Soil Including Vapor Intrusion+ Groundwater Medium Total	= Σ Exposure Medium Total

References:

Ohio Environmental Protection Agency (Ohio EPA). 2008. "Support Document for the Development of Generic Numerical Standards and Risk Assessment Procedures."
The Voluntary Action Program (VAP). August. On-Line Address: <http://epa.ohio.gov/portals/30/vap/docs/support%20doc%20version.pdf>

TABLE D6.2: CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
FUTURE - CONSTRUCTION WORKER- I+A 2
PROPERTY-SPECIFIC RISK ASSESSMENT
FORMER GM STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations			Noncancer Hazard Quotient		
							Intake		Cancer Risk	Intake		Hazard Quotient
					Value	Units	Value	Units		Value	Units	
Subsurface Soil	Subsurface Soil	Subsurface Soil	Ingestion	1-Methylnaphthalene	2.5E-02	mg/kg	3.4E-10	mg/(kg-day)	9.7E-12	2.3E-08	mg/(kg-day)	3.4E-07
				2-Butanone	3.0E-03	mg/kg	4.0E-11	mg/(kg-day)	—	2.8E-09	mg/(kg-day)	1.4E-09
				2-Methylnaphthalene	2.2E-02	mg/kg	3.0E-10	mg/(kg-day)	—	2.1E-08	mg/(kg-day)	5.2E-06
				Acetone	3.1E-02	mg/kg	4.2E-10	mg/(kg-day)	—	2.9E-08	mg/(kg-day)	1.1E-08
				C10-C20	6.7E+01	mg/kg	9.0E-07	mg/(kg-day)	—	6.3E-05	mg/(kg-day)	1.6E-03
				C20-C34	1.2E+02	mg/kg	1.6E-06	mg/(kg-day)	—	1.1E-04	mg/(kg-day)	3.8E-03
				C6-C12	5.5E-02	mg/kg	7.4E-10	mg/(kg-day)	—	5.2E-08	mg/(kg-day)	1.3E-06
				Chrysene	1.1E-02	mg/kg	1.5E-10	mg/(kg-day)	1.1E-12	1.0E-08	mg/(kg-day)	—
				Methylene Chloride	5.6E-03	mg/kg	7.5E-11	mg/(kg-day)	1.5E-13	5.3E-09	mg/(kg-day)	8.8E-08
				Phenanthrene	2.7E-02	mg/kg	3.6E-10	mg/(kg-day)	—	2.5E-08	mg/(kg-day)	8.5E-09
			Exposure Route Total						1.1E-11			5.3E-03
			Dermal Contact	1-Methylnaphthalene	2.5E-02	mg/kg	2.2E-10	mg/(kg-day)	6.3E-12	1.5E-08	mg/(kg-day)	2.2E-07
				2-Butanone	3.0E-03	mg/kg	2.0E-11	mg/(kg-day)	—	1.4E-09	mg/(kg-day)	7.0E-10
				2-Methylnaphthalene	2.2E-02	mg/kg	1.9E-10	mg/(kg-day)	—	1.3E-08	mg/(kg-day)	3.3E-06
				Acetone	3.1E-02	mg/kg	2.1E-10	mg/(kg-day)	—	1.4E-08	mg/(kg-day)	5.3E-09
				C10-C20	6.7E+01	mg/kg	4.5E-07	mg/(kg-day)	—	3.1E-05	mg/(kg-day)	7.8E-04
				C20-C34	1.2E+02	mg/kg	8.0E-07	mg/(kg-day)	—	5.6E-05	mg/(kg-day)	1.9E-03
				C6-C12	5.5E-02	mg/kg	3.7E-10	mg/(kg-day)	—	2.6E-08	mg/(kg-day)	6.4E-07
				Chrysene	1.1E-02	mg/kg	9.5E-11	mg/(kg-day)	6.9E-13	6.6E-09	mg/(kg-day)	—
				Methylene Chloride	5.6E-03	mg/kg	3.7E-11	mg/(kg-day)	1.9E-08	2.6E-09	mg/(kg-day)	4.3E-08
				Phenanthrene	2.7E-02	mg/kg	2.3E-10	mg/(kg-day)	—	1.6E-08	mg/(kg-day)	5.4E-09
			Exposure Route Total						1.9E-08			2.6E-03
	Particulates and Vapor	Ambient Air	Inhalation	1-Methylnaphthalene	2.5E-02	mg/kg	2.0E-06	µg/m³	—	1.4E-07	mg/m³	—
				2-Butanone	3.0E-03	mg/kg	1.4E-06	µg/m³	—	1.0E-07	mg/m³	1.0E-07
				2-Methylnaphthalene	2.2E-02	mg/kg	1.8E-06	µg/m³	—	1.2E-07	mg/m³	—
				Acetone	3.1E-02	mg/kg	1.4E-05	µg/m³	—	9.7E-07	mg/m³	3.1E-08
				C10-C20	6.7E+01	mg/kg	7.8E-06	µg/m³	—	5.5E-07	mg/m³	2.6E-06
				C20-C34	1.2E+02	mg/kg	1.4E-05	µg/m³	—	9.8E-07	mg/m³	—
				C6-C12	5.5E-02	mg/kg	6.4E-09	µg/m³	—	4.5E-10	mg/m³	2.1E-09
				Chrysene	1.1E-02	mg/kg	9.1E-09	µg/m³	1.0E-13	6.4E-10	mg/m³	—
				Methylene Chloride	5.6E-03	mg/kg	1.3E-05	µg/m³	1.3E-13	9.4E-07	mg/m³	9.4E-04
				Phenanthrene	2.7E-02	mg/kg	3.2E-09	µg/m³	—	2.2E-10	mg/m³	—
			Exposure Route Total						2.3E-13			9.5E-04
			Exposure Point Total						1.9E-08			8.9E-03
			Exposure Medium Total						1.9E-08			8.9E-03
Groundwater	Vapor Intrusion	Trench Air	Inhalation	Acetone	2.5E-04	µg/m³	1.9E-07	µg/m³	—	1.4E-08	mg/m³	4.4E-10
				C10-C20	—	µg/m³	—	µg/m³	—	—	mg/m³	—
				C20-C34	—	µg/m³	—	µg/m³	—	—	mg/m³	—
				Gasoline Range Organics	—	µg/m³	—	µg/m³	—	—	mg/m³	—
				Mercury	4.5E-03	µg/m³	3.5E-06	µg/m³	—	2.4E-07	mg/m³	8.1E-04
		Exposure Route Total						0.0E+00			8.1E-04	
		Exposure Point Total						0.0E+00			8.1E-04	
	Exposure Medium Total						0.0E+00			8.1E-04		
Groundwater + Subsurface Soil Medium Total								Total Risk	2E-08	Total Hazard	1E-02	

Abbreviations:

—	Not applicable or available
EPA	U.S. Environmental Protection Agency
mg/kg	Milligram per kilogram
mg/(kg-day)	Milligram per kilogram day
mg/m³	Milligrams per cubic meter
µg/m³	Micrograms per cubic meter

Equations:

Intake equations are listed in Table D6

Hazard Quotient

= Intake/Reference Doses_{Oral or Inhalation}

Cancer Risk

= Intake/Oral Slope Factor or Inhalation Unit Risk

Exposure Route Total

=ΣChemical of Potential Concern Cancer Risk or Hazard Quotient

Exposure Point Total

=ΣExposure Route Total

Exposure Medium Total

=ΣExposure Point Total

Subsurface Soil Including Vapor Intrusion+ Groundwater Medium Total

=Σ Exposure Medium Total

References:

Ohio Environmental Protection Agency (Ohio EPA). 2008. "Support Document for the Development of Generic Numerical Standards and Risk Assessment Procedures." The Voluntary Action Program (VAP). August. On-Line Address: <http://epa.ohio.gov/portals/30/vap/docs/support%20doc%20version.pdf>

TABLE D7.1: CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
FUTURE - COMMERCIAL/INDUSTRIAL WORKER - INVESTIGATION AREA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
FORMER GM STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations			Noncancer Hazard Quotient		
					Value	Units	Intake		Cancer Risk	Intake		Hazard Quotient
							Value	Units		Value	Units	
Surface Soil	Surface Soil	Surface Soil	Ingestion	1-Methylnaphthalene	1.5E+00	mg/kg	2.8E-07	mg/(kg-day)	7.9E-08	7.3E-07	mg/(kg-day)	1.0E-05
				2-Methylnaphthalene	3.5E+00	mg/kg	6.1E-07	mg/(kg-day)	--	1.7E-06	mg/(kg-day)	4.3E-04
				Acenaphthene	2.0E+01	mg/kg	3.5E-06	mg/(kg-day)	--	6.9E-06	mg/(kg-day)	1.6E-04
				Acenaphthylene	4.8E-01	mg/kg	8.0E-06	mg/(kg-day)	--	2.3E-07	mg/(kg-day)	3.9E-06
				Anthracene	3.9E+01	mg/kg	6.9E-06	mg/(kg-day)	--	1.9E-05	mg/(kg-day)	6.4E-05
				Arsenic	1.4E+01	mg/kg	1.9E-06	mg/(kg-day)	2.9E-08	4.1E-06	mg/(kg-day)	1.4E-02
				Ben[a]a	5.3E+01	mg/kg	9.2E-06	mg/(kg-day)	--	2.8E-05	mg/(kg-day)	1.3E-04
				Benzo[a]anthracene	1.1E+02	mg/kg	1.9E-05	mg/(kg-day)	1.4E-05	6.2E-05	mg/(kg-day)	--
				Benzo[a]pyrene	8.4E+01	mg/kg	1.5E-05	mg/(kg-day)	1.1E-04	4.1E-05	mg/(kg-day)	--
				Benzo[b]fluoranthene	7.8E+01	mg/kg	1.4E-05	mg/(kg-day)	1.0E-05	3.8E-05	mg/(kg-day)	--
				Benzo[k]fluoranthene	3.2E+01	mg/kg	5.6E-06	mg/(kg-day)	--	1.6E-05	mg/(kg-day)	--
				Benzo[k]fluoranthene	5.8E+01	mg/kg	1.0E-05	mg/(kg-day)	7.4E-07	2.8E-05	mg/(kg-day)	--
				C10-C20	6.3E+01	mg/kg	1.1E-05	mg/(kg-day)	--	3.1E-05	mg/(kg-day)	7.7E-04
				C20-C34	1.4E+02	mg/kg	2.4E-05	mg/(kg-day)	--	6.8E-05	mg/(kg-day)	2.3E-03
				Cadmium	5.0E-01	mg/kg	9.7E-08	mg/(kg-day)	--	2.4E-07	mg/(kg-day)	2.4E-04
				Chromium	1.0E+01	mg/kg	1.8E-06	mg/(kg-day)	--	5.0E-06	mg/(kg-day)	1.7E-03
				Chrysene	1.1E+02	mg/kg	2.0E-05	mg/(kg-day)	1.4E-07	5.5E-05	mg/(kg-day)	--
				Dibenz[a,h]anthracene	1.3E+01	mg/kg	2.3E-06	mg/(kg-day)	1.7E-05	6.5E-06	mg/(kg-day)	--
				Fluoranthene	1.5E+02	mg/kg	2.7E-05	mg/(kg-day)	--	7.5E-05	mg/(kg-day)	1.6E-03
				Fluorene	1.7E+01	mg/kg	3.0E-06	mg/(kg-day)	--	8.5E-06	mg/(kg-day)	2.1E-04
				Indeno[1,2,3-cd]pyrene	4.5E+01	mg/kg	7.8E-06	mg/(kg-day)	6.7E-08	2.2E-05	mg/(kg-day)	--
				Lead	1.2E+01	mg/kg	2.1E-06	mg/(kg-day)	--	5.9E-06	mg/(kg-day)	--
				Methylene Chloride	5.3E-03	mg/kg	9.3E-10	mg/(kg-day)	1.9E-12	2.8E-05	mg/(kg-day)	4.3E-07
				Naphthalene	3.2E+00	mg/kg	5.5E-07	mg/(kg-day)	--	1.8E-06	mg/(kg-day)	7.8E-05
				Phenanthrene	1.4E+02	mg/kg	2.4E-05	mg/(kg-day)	--	6.8E-05	mg/(kg-day)	2.3E-04
				Pyrene	1.4E+02	mg/kg	2.5E-05	mg/(kg-day)	--	7.0E-05	mg/(kg-day)	2.3E-03
				Toluene	3.7E-04	mg/kg	6.9E-11	mg/(kg-day)	--	1.8E-10	mg/(kg-day)	2.3E-08
				Exposure Route Total					1.8E-04			2.4E-02
			Dermal Contact	1-Methylnaphthalene	1.5E+00	mg/kg	4.4E-07	mg/(kg-day)	1.3E-08	1.2E-06	mg/(kg-day)	1.8E-05
				2-Methylnaphthalene	3.5E+00	mg/kg	1.0E-06	mg/(kg-day)	--	1.9E-05	mg/(kg-day)	7.9E-04
				Acenaphthene	2.0E+01	mg/kg	6.0E-06	mg/(kg-day)	--	1.7E-06	mg/(kg-day)	2.8E-04
				Acenaphthylene	4.8E-01	mg/kg	1.4E-07	mg/(kg-day)	--	3.9E-07	mg/(kg-day)	6.4E-06
				Anthracene	3.9E+01	mg/kg	1.2E-05	mg/(kg-day)	--	3.3E-05	mg/(kg-day)	1.1E-04
				Arsenic	1.4E+01	mg/kg	5.8E-07	mg/(kg-day)	8.7E-07	1.8E-06	mg/(kg-day)	6.4E-03
				Ben[a]a	5.3E+01	mg/kg	1.2E-06	mg/(kg-day)	--	3.4E-06	mg/(kg-day)	1.7E-05
				Benzo[a]anthracene	1.1E+02	mg/kg	3.2E-05	mg/(kg-day)	2.3E-05	8.9E-05	mg/(kg-day)	--
				Benzo[a]pyrene	8.4E+01	mg/kg	2.5E-05	mg/(kg-day)	1.9E-04	7.1E-05	mg/(kg-day)	--
				Benzo[b]fluoranthene	7.8E+01	mg/kg	3.3E-05	mg/(kg-day)	1.7E-05	6.8E-05	mg/(kg-day)	--
				Benzo[k]fluoranthene	3.2E+01	mg/kg	5.6E-06	mg/(kg-day)	--	2.7E-05	mg/(kg-day)	--
				Benzo[k]fluoranthene	5.8E+01	mg/kg	1.7E-05	mg/(kg-day)	1.3E-08	4.9E-05	mg/(kg-day)	--
				C10-C20	6.3E+01	mg/kg	1.5E-05	mg/(kg-day)	--	4.1E-05	mg/(kg-day)	1.0E-03
				C20-C34	1.4E+02	mg/kg	3.2E-05	mg/(kg-day)	--	9.0E-05	mg/(kg-day)	3.0E-03
				Cadmium	5.0E-01	mg/kg	1.2E-06	mg/(kg-day)	--	3.2E-06	mg/(kg-day)	3.2E-06
				Chromium	1.0E+01	mg/kg	2.4E-07	mg/(kg-day)	--	6.6E-07	mg/(kg-day)	2.2E-04
				Chrysene	1.1E+02	mg/kg	3.4E-05	mg/(kg-day)	2.9E-07	0.0E+00	mg/(kg-day)	--
				Dibenz[a,h]anthracene	1.3E+01	mg/kg	4.0E-06	mg/(kg-day)	2.9E-05	1.1E-05	mg/(kg-day)	--
				Fluoranthene	1.5E+02	mg/kg	4.8E-05	mg/(kg-day)	--	1.3E-04	mg/(kg-day)	3.2E-03
				Fluorene	1.7E+01	mg/kg	5.2E-06	mg/(kg-day)	--	1.5E-05	mg/(kg-day)	3.6E-04
				Indeno[1,2,3-cd]pyrene	4.5E+01	mg/kg	1.3E-05	mg/(kg-day)	9.8E-06	3.8E-05	mg/(kg-day)	--
				Lead	1.2E+01	mg/kg	--	mg/(kg-day)	--	--	mg/(kg-day)	--
				Methylene Chloride	5.3E-03	mg/kg	1.2E-06	mg/(kg-day)	2.4E-12	3.4E-06	mg/(kg-day)	5.7E-07
				Naphthalene	3.2E+00	mg/kg	9.9E-07	mg/(kg-day)	--	2.7E-06	mg/(kg-day)	1.3E-04
				Phenanthrene	1.4E+02	mg/kg	4.1E-05	mg/(kg-day)	--	1.2E-04	mg/(kg-day)	5.9E-04
				Pyrene	1.4E+02	mg/kg	4.3E-05	mg/(kg-day)	--	1.2E-04	mg/(kg-day)	4.0E-03
				Toluene	3.7E-04	mg/kg	6.9E-11	mg/(kg-day)	--	2.4E-10	mg/(kg-day)	3.0E-08
				Exposure Route Total					2.7E-04			1.9E-02
Particulates and Vapor	Ambient Air	Inhalation	1-Methylnaphthalene	1.5E+00	mg/kg	1.2E-03	µg/m³	--	3.4E-06	mg/m³	--	--
			2-Methylnaphthalene	3.5E+00	mg/kg	2.8E-03	µg/m³	--	8.1E-06	mg/m³	--	--
			Acenaphthene	2.0E+01	mg/kg	8.9E-03	µg/m³	--	1.9E-05	mg/m³	--	--
			Acenaphthylene	4.8E-01	mg/kg	1.8E-04	µg/m³	--	4.4E-07	mg/m³	--	--
			Anthracene	3.9E+01	mg/kg	3.6E-03	µg/m³	--	1.0E-05	mg/m³	--	--
			Arsenic	1.4E+01	mg/kg	1.2E-06	µg/m³	5.2E-06	3.4E-08	mg/m³	--	--
			Ben[a]a	5.3E+01	mg/kg	4.5E-06	µg/m³	--	1.3E-08	mg/m³	2.6E-05	--
			Benzo[a]anthracene	1.1E+02	mg/kg	1.6E-03	µg/m³	1.7E-07	4.4E-06	mg/m³	--	--
			Benzo[a]pyrene	8.4E+01	mg/kg	1.8E-04	µg/m³	2.0E-07	5.0E-07	mg/m³	--	--
			Benzo[b]fluoranthene	7.8E+01	mg/kg	1.8E-04	µg/m³	2.0E-08	5.1E-07	mg/m³	--	--
			Benzo[k]fluoranthene	3.2E+01	mg/kg	2.8E-06	µg/m³	--	7.7E-08	mg/m³	--	--
			Benzo[k]fluoranthene	5.8E+01	mg/kg	1.3E-04	µg/m³	1.9E-08	3.7E-07	mg/m³	--	--
			C10-C20	6.3E+01	mg/kg	5.4E-06	µg/m³	--	1.5E-08	mg/m³	7.2E-08	--
			C20-C34	1.4E+02	mg/kg	1.2E-05	µg/m³	--	3.4E-08	mg/m³	--	--
			Cadmium	5.0E-01	mg/kg	4.3E-08	µg/m³	7.7E-11	1.2E-10	mg/m³	--	--
			Chromium	1.0E+01	mg/kg	8.9E-07	µg/m³	7.4E-08	2.5E-08	mg/m³	2.5E-05	--
			Chrysene	1.1E+02	mg/kg	8.4E-04	µg/m³	8.2E-06	2.3E-06	mg/m³	--	--
			Dibenz[a,h]anthracene	1.3E+01	mg/kg	1.2E-05	µg/m³	1.5E-08	3.5E-08	mg/m³	--	--
			Fluoranthene	1.5E+02	mg/kg	2.7E-03	µg/m³	--	7.5E-06	mg/m³	--	--
			Fluorene	1.7E+01	mg/kg	2.9E-03	µg/m³	--	8.3E-06	mg/m³	--	--
			Indeno[1,2,3-cd]pyrene	4.5E+01	mg/kg	6.0E-05	µg/m³	8.7E-08	1.7E-07	mg/m³	--	--
			Lead	1.2E+01	mg/kg	1.0E-06	µg/m³	--	2.9E-09	mg/m³	--	--
			Methylene Chloride	5.3E-03	mg/kg	1.3E-04	µg/m³	1.3E-12	3.7E-07	mg/m³	6.2E-07	--
			Naphthalene	3.2E+00	mg/kg	3.3E-03	µg/m³	1.1E-07	9.2E-08	mg/m³	3.1E-03	--
			Phenanthrene	1.4E+02	mg/kg	1.2E-05	µg/m³	--	3.3E-08	mg/m³	--	--
			Pyrene	1.4E+02	mg/kg	2.9E-03	µg/m³	--	8.2E-08	mg/m³	--	--
			Toluene	3.7E-04	mg/kg	4.2E-08	µg/m³	--	1.2E-08	mg/m³	--	--
			Exposure Route Total						5.8E-06			3.1E-03
			Exposure Point Total						4.3E-04			4.8E-02
			Exposure Medium Total						4.3E-04			4.8E-02

TABLE D7.1: CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
FUTURE - COMMERCIAL/INDUSTRIAL WORKER - INVESTIGATION AREA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
FORMER GM STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations			Noncancer Hazard Quotient		
					Value	Units	Intake		Cancer Risk	Intake		Hazard Quotient
							Value	Units		Value	Units	
Subsurface Soil	Subsurface Soil	Subsurface Soil	Ingestion	1,1-Dichloroethane	1.2E-02	mg/kg	2.1E-09	mg/(kg-day)	1.2E-11	5.9E-09	mg/(kg-day)	2.9E-08
				1,2-Dichloroethane	6.8E-04	mg/kg	1.2E-10	mg/(kg-day)	1.1E-11	3.3E-10	mg/(kg-day)	—
				1-Methylnaphthalene	2.3E+00	mg/kg	4.0E-07	mg/(kg-day)	1.2E-08	1.1E-06	mg/(kg-day)	1.6E-05
				2-Gulonene	3.6E-02	mg/kg	6.3E-06	mg/(kg-day)	—	1.9E-06	mg/(kg-day)	2.9E-08
				2-Methylnaphthalene	2.0E+00	mg/kg	3.4E-07	mg/(kg-day)	—	6.6E-07	mg/(kg-day)	2.4E-04
				4-Methylnaphthalene	5.9E-02	mg/kg	1.0E-06	mg/(kg-day)	—	2.9E-06	mg/(kg-day)	3.8E-06
				Acenaphthene	1.0E+01	mg/kg	1.8E-06	mg/(kg-day)	—	4.9E-06	mg/(kg-day)	6.2E-05
				Acenaphthylene	1.2E+01	mg/kg	2.0E-06	mg/(kg-day)	—	6.6E-06	mg/(kg-day)	6.4E-07
				Acetone	9.6E-02	mg/kg	1.5E-08	mg/(kg-day)	—	4.2E-08	mg/(kg-day)	4.7E-08
				Anthracene	2.0E+01	mg/kg	3.4E-08	mg/(kg-day)	—	6.6E-08	mg/(kg-day)	3.2E-05
				Aroclor 1254	2.1E-02	mg/kg	3.7E-09	mg/(kg-day)	7.3E-09	1.0E-09	mg/(kg-day)	6.1E-04
				Aroclor 1260	4.0E-02	mg/kg	7.0E-09	mg/(kg-day)	1.4E-08	2.0E-09	mg/(kg-day)	8.6E-04
				Arsenic	2.3E+01	mg/kg	4.0E-06	mg/(kg-day)	6.0E-06	1.1E-05	mg/(kg-day)	3.7E-02
				Barium	1.0E+02	mg/kg	1.8E-05	mg/(kg-day)	—	5.0E-05	mg/(kg-day)	2.6E-04
				Benzene	4.0E-04	mg/kg	7.0E-11	mg/(kg-day)	3.8E-12	2.0E-10	mg/(kg-day)	4.8E-08
				Benzofluoranthene	4.5E+01	mg/kg	7.9E-06	mg/(kg-day)	5.8E-06	2.2E-05	mg/(kg-day)	—
				Benzofluorene	3.6E+01	mg/kg	6.4E-06	mg/(kg-day)	4.7E-05	1.8E-05	mg/(kg-day)	—
				Benzofluoranthene	6.0E+01	mg/kg	1.1E-05	mg/(kg-day)	7.7E-06	2.8E-05	mg/(kg-day)	—
				Benzofluorene	2.0E+01	mg/kg	3.4E-06	mg/(kg-day)	—	9.5E-06	mg/(kg-day)	—
				Benzofluoranthene	2.9E+01	mg/kg	5.0E-06	mg/(kg-day)	3.7E-07	1.4E-05	mg/(kg-day)	—
				C10-C20	4.4E+03	mg/kg	7.7E-04	mg/(kg-day)	—	2.2E-03	mg/(kg-day)	6.4E-02
				C20-C34	1.8E+04	mg/kg	3.3E-03	mg/(kg-day)	—	9.3E-03	mg/(kg-day)	3.1E-01
				Cadmium	6.0E-01	mg/kg	1.1E-07	mg/(kg-day)	—	3.0E-07	mg/(kg-day)	3.0E-04
				Carbon Dioxide	1.0E-02	mg/kg	1.7E-09	mg/(kg-day)	—	4.9E-09	mg/(kg-day)	4.9E-08
				Chromium	1.4E+01	mg/kg	2.4E-06	mg/(kg-day)	—	6.6E-06	mg/(kg-day)	2.2E-03
				Chrysene	4.8E+01	mg/kg	6.4E-06	mg/(kg-day)	6.1E-08	2.3E-05	mg/(kg-day)	—
				Dibenzofluoranthene	6.1E+00	mg/kg	1.1E-06	mg/(kg-day)	7.8E-08	3.0E-06	mg/(kg-day)	—
				Ethylbenzene	1.3E-02	mg/kg	2.3E-09	mg/(kg-day)	2.9E-11	6.4E-09	mg/(kg-day)	6.4E-08
				Fluoranthene	1.1E+02	mg/kg	1.9E-05	mg/(kg-day)	—	6.3E-05	mg/(kg-day)	1.3E-03
				Fluorene	6.5E+00	mg/kg	1.5E-06	mg/(kg-day)	—	4.1E-06	mg/(kg-day)	1.0E-04
				Indeno(1,2,3-cd)pyrene	1.9E+01	mg/kg	3.3E-06	mg/(kg-day)	2.4E-06	6.3E-06	mg/(kg-day)	—
				Isopropylbenzene	9.2E-03	mg/kg	1.4E-09	mg/(kg-day)	—	4.0E-09	mg/(kg-day)	4.0E-08
				Lead	4.1E+01	mg/kg	7.1E-08	mg/(kg-day)	—	2.0E-08	mg/(kg-day)	—
				Mercury	4.4E-02	mg/kg	7.7E-09	mg/(kg-day)	—	2.2E-09	mg/(kg-day)	—
				Methylene Chloride	9.3E-03	mg/kg	1.5E-09	mg/(kg-day)	2.9E-12	4.1E-09	mg/(kg-day)	6.8E-07
				Naphthalene	1.7E+00	mg/kg	3.0E-07	mg/(kg-day)	—	6.3E-07	mg/(kg-day)	4.2E-05
				Phenanthrene	9.0E+01	mg/kg	1.6E-05	mg/(kg-day)	—	4.4E-05	mg/(kg-day)	1.5E-04
				Pyrene	8.8E+01	mg/kg	1.5E-05	mg/(kg-day)	—	4.3E-05	mg/(kg-day)	1.4E-03
				Selenium	5.7E-01	mg/kg	1.0E-07	mg/(kg-day)	—	2.8E-07	mg/(kg-day)	—
				Toluene	1.4E-02	mg/kg	2.6E-09	mg/(kg-day)	—	6.6E-09	mg/(kg-day)	3.5E-06
				Xylenes (total)	1.6E-02	mg/kg	2.8E-09	mg/(kg-day)	—	7.8E-09	mg/(kg-day)	3.4E-08
				Exposure Route Total					7.7E-05			4.1E-01
			Dermal Contact	1,1-Dichloroethane	1.2E-02	mg/kg	2.8E-09	mg/(kg-day)	1.8E-11	7.7E-09	mg/(kg-day)	3.9E-08
				1,2-Dichloroethane	6.8E-04	mg/kg	1.8E-10	mg/(kg-day)	1.4E-11	4.4E-10	mg/(kg-day)	—
				1-Methylnaphthalene	2.3E+00	mg/kg	6.9E-07	mg/(kg-day)	2.0E-08	1.9E-06	mg/(kg-day)	2.8E-05
				2-Gulonene	3.6E-02	mg/kg	6.3E-06	mg/(kg-day)	—	2.3E-06	mg/(kg-day)	3.9E-08
				2-Methylnaphthalene	2.0E+00	mg/kg	5.9E-07	mg/(kg-day)	—	1.8E-06	mg/(kg-day)	4.1E-04
				4-Methylnaphthalene	5.9E-02	mg/kg	1.4E-06	mg/(kg-day)	—	3.8E-06	mg/(kg-day)	4.8E-08
				Acenaphthene	1.0E+01	mg/kg	3.0E-06	mg/(kg-day)	—	6.4E-06	mg/(kg-day)	1.4E-04
				Acenaphthylene	1.2E+01	mg/kg	3.4E-06	mg/(kg-day)	—	6.7E-06	mg/(kg-day)	1.6E-06
				Acetone	9.6E-02	mg/kg	2.0E-08	mg/(kg-day)	—	6.6E-08	mg/(kg-day)	6.2E-08
				Anthracene	2.0E+01	mg/kg	3.9E-06	mg/(kg-day)	—	1.6E-05	mg/(kg-day)	5.5E-05
				Aroclor 1254	2.1E-02	mg/kg	6.9E-09	mg/(kg-day)	1.4E-08	1.9E-09	mg/(kg-day)	9.5E-04
				Aroclor 1260	4.0E-02	mg/kg	1.3E-08	mg/(kg-day)	2.8E-08	3.9E-09	mg/(kg-day)	1.9E-03
				Arsenic	2.3E+01	mg/kg	1.9E-06	mg/(kg-day)	2.4E-06	4.4E-06	mg/(kg-day)	1.5E-02
				Barium	1.0E+02	mg/kg	2.4E-06	mg/(kg-day)	—	6.6E-06	mg/(kg-day)	3.3E-05
				Benzene	4.0E-04	mg/kg	9.2E-11	mg/(kg-day)	5.1E-12	2.8E-10	mg/(kg-day)	6.9E-08
				Benzofluoranthene	4.5E+01	mg/kg	1.4E-05	mg/(kg-day)	9.9E-06	3.8E-05	mg/(kg-day)	—
				Benzofluorene	3.6E+01	mg/kg	1.1E-05	mg/(kg-day)	8.0E-05	3.1E-05	mg/(kg-day)	—
				Benzofluoranthene	6.0E+01	mg/kg	1.8E-05	mg/(kg-day)	1.3E-05	5.0E-05	mg/(kg-day)	—
				Benzofluorene	2.0E+01	mg/kg	5.8E-06	mg/(kg-day)	—	1.6E-05	mg/(kg-day)	—
				Benzofluoranthene	2.9E+01	mg/kg	6.6E-06	mg/(kg-day)	6.3E-07	2.4E-05	mg/(kg-day)	—
				C10-C20	4.4E+03	mg/kg	1.0E-03	mg/(kg-day)	—	2.8E-03	mg/(kg-day)	7.1E-02
				C20-C34	1.8E+04	mg/kg	4.4E-03	mg/(kg-day)	—	1.2E-02	mg/(kg-day)	4.1E-01
				Cadmium	6.0E-01	mg/kg	1.4E-09	mg/(kg-day)	—	3.9E-09	mg/(kg-day)	3.9E-06
				Carbon Dioxide	1.0E-02	mg/kg	2.3E-09	mg/(kg-day)	—	6.6E-09	mg/(kg-day)	6.6E-08
				Chromium	1.4E+01	mg/kg	3.1E-07	mg/(kg-day)	—	8.7E-07	mg/(kg-day)	2.9E-04
				Chrysene	4.8E+01	mg/kg	1.4E-05	mg/(kg-day)	1.0E-07	4.0E-05	mg/(kg-day)	—
				Dibenzofluoranthene	6.1E+00	mg/kg	1.8E-06	mg/(kg-day)	1.3E-05	5.2E-06	mg/(kg-day)	—
				Ethylbenzene	1.3E-02	mg/kg	3.0E-09	mg/(kg-day)	3.3E-11	8.4E-09	mg/(kg-day)	8.4E-08
				Fluoranthene	1.1E+02	mg/kg	3.2E-05	mg/(kg-day)	—	6.1E-05	mg/(kg-day)	2.3E-03
				Fluorene	6.5E+00	mg/kg	2.5E-06	mg/(kg-day)	—	7.1E-06	mg/(kg-day)	1.8E-04
				Indeno(1,2,3-cd)pyrene	1.9E+01	mg/kg	5.7E-06	mg/(kg-day)	4.1E-06	1.6E-05	mg/(kg-day)	—
				Isopropylbenzene	9.2E-03	mg/kg	1.9E-09	mg/(kg-day)	—	5.3E-09	mg/(kg-day)	5.3E-08
				Lead	4.1E+01	mg/kg	—	mg/(kg-day)	—	—	mg/(kg-day)	—
				Mercury	4.4E-02	mg/kg	1.0E-09	mg/(kg-day)	—	2.9E-09	mg/(kg-day)	—
				Methylene Chloride	9.3E-03	mg/kg	1.9E-09	mg/(kg-day)	3.8E-12	5.4E-09	mg/(kg-day)	6.0E-07
				Naphthalene	1.7E+00	mg/kg	6.1E-07	mg/(kg-day)	—	1.4E-06	mg/(kg-day)	7.2E-05
				Phenanthrene	9.0E+01	mg/kg	2.7E-05	mg/(kg-day)	—	7.8E-05	mg/(kg-day)	2.5E-04
				Pyrene	8.8E+01	mg/kg	2.6E-05	mg/(kg-day)	—	7.4E-05	mg/(kg-day)	2.5E-03
				Selenium	5.7E-01	mg/kg	1.3E-09	mg/(kg-day)	—	3.7E-09	mg/(kg-day)	7.4E-08
				Toluene	1.4E-02	mg/kg	3.3E-09	mg/(kg-day)	—	6.1E-09	mg/(kg-day)	4.8E-07
				Xylenes (total)	1.6E-02	mg/kg	3.7E-09	mg/(kg-day)	—	1.0E-08	mg/(kg-day)	4.8E-08
				Exposure Route Total					1.2E-04			5.0E-01

TABLE D7.1: CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
FUTURE - COMMERCIAL/INDUSTRIAL WORKER - INVESTIGATION AREA 4
 PROPERTY-SPECIFIC RISK ASSESSMENT
 FORMER GM STAMPING PLANT
 ONTARIO, RICHLAND COUNTY, OHIO

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations			Noncancer Hazard Quotient					
					Value	Units	Intake		Cancer Risk	Intake		Hazard Quotient			
							Value	Units		Value	Units				
Subsurface Soil	Particulates and Vapor	Ambient Air	Inhalation	1,1-Dichloroethane	1.2E-02	mg/kg	3.1E-04	µg/m³	5.0E-10	6.4E-03	mg/m³	--			
				1,2-Dichloroethane	6.8E-04	mg/kg	7.7E-06	µg/m³	2.0E-10	3.6E-04	mg/m³	5.2E-02			
				1-Methylnaphthalene	2.3E+00	mg/kg	1.9E-03	µg/m³	--	1.2E+00	mg/m³	--			
				2-Bulaneone	3.8E-02	mg/kg	1.8E-04	µg/m³	--	1.9E-02	mg/m³	3.8E-03			
				2-Methylnaphthalene	2.0E+00	mg/kg	1.6E-03	µg/m³	--	1.0E+00	mg/m³	--			
				4-Methyl-2-pentanone	5.9E-03	mg/kg	3.2E-05	µg/m³	--	3.1E-03	mg/m³	1.0E-03			
				Acenaphthene	1.0E+01	mg/kg	3.4E-03	µg/m³	--	6.3E+00	mg/m³	--			
				Acenaphthylene	1.2E+01	mg/kg	3.9E-03	µg/m³	--	6.1E+00	mg/m³	--			
				Acetone	9.6E-02	mg/kg	4.0E-04	µg/m³	--	4.8E-02	mg/m³	1.5E-03			
				Anthracene	2.0E+01	mg/kg	1.8E-03	µg/m³	--	1.0E+01	mg/m³	--			
				Aroclor 1254	2.1E-02	mg/kg	9.1E-07	µg/m³	5.2E-10	1.1E-02	mg/m³	--			
				Aroclor 1260	4.0E-02	mg/kg	1.7E-06	µg/m³	9.8E-10	2.1E-02	mg/m³	--			
				Arsenic	2.3E+01	mg/kg	2.0E-06	µg/m³	8.4E-06	5.5E-06	mg/m³	--			
				Baikal	1.0E+02	mg/kg	8.8E-06	µg/m³	--	2.5E-06	mg/m³	4.9E-05			
				Benzene	4.0E-04	mg/kg	5.6E-06	µg/m³	4.4E-11	2.1E-04	mg/m³	7.1E-03			
				Benzofluoranthene	4.5E+01	mg/kg	6.8E-04	µg/m³	7.4E-08	2.4E+01	mg/m³	--			
				Benzofluorene	3.6E+01	mg/kg	7.7E-05	µg/m³	8.5E-08	1.8E+01	mg/m³	--			
				Benzofluoranthene	6.0E+01	mg/kg	1.4E-04	µg/m³	1.5E-08	3.2E+01	mg/m³	--			
				Benzofluorene	2.0E+01	mg/kg	1.7E-06	µg/m³	--	4.7E-06	mg/m³	--			
				Benzofluoranthene	2.8E+01	mg/kg	6.5E-05	µg/m³	7.2E-09	1.5E+01	mg/m³	--			
				C10-C20	4.4E+03	mg/kg	3.8E-04	µg/m³	--	1.1E+06	mg/m³	5.0E-06			
				C20-C34	1.8E+04	mg/kg	1.6E-03	µg/m³	--	4.8E+06	mg/m³	--			
				Cadmium	6.0E-01	mg/kg	5.2E-06	µg/m³	9.3E-11	1.4E-10	mg/m³	--			
				Carbon Disulfide	1.0E-02	mg/kg	4.9E-04	µg/m³	--	5.3E-03	mg/m³	7.6E-03			
				Chromium	1.4E+01	mg/kg	1.2E-06	µg/m³	9.8E-08	3.3E-08	mg/m³	3.3E-05			
				Chrysene	4.8E+01	mg/kg	3.6E-04	µg/m³	3.9E-09	2.5E+01	mg/m³	--			
				Dibenz[a,h]anthracene	6.1E+00	mg/kg	9.9E-06	µg/m³	6.9E-09	3.3E+00	mg/m³	--			
				Ethylbenzene	1.3E-02	mg/kg	1.1E-04	µg/m³	2.8E-10	6.6E-03	mg/m³	6.6E-03			
				Fluorene	1.1E+02	mg/kg	1.9E-03	µg/m³	--	6.7E+01	mg/m³	--			
				Fluorene	9.5E+00	mg/kg	1.4E-03	µg/m³	--	4.5E+00	mg/m³	--			
				Indeno[1,2,3-cd]pyrene	1.9E+01	mg/kg	2.8E-05	µg/m³	2.8E-09	1.0E+01	mg/m³	--			
				Isopropylbenzene	9.2E-03	mg/kg	6.1E-05	µg/m³	--	4.4E-03	mg/m³	1.1E-02			
				Lead	4.1E+01	mg/kg	3.9E-08	µg/m³	--	6.8E-08	mg/m³	--			
				Mercury	4.4E-02	mg/kg	3.8E-09	µg/m³	--	1.1E-11	mg/m³	3.5E-08			
				Methylene Chloride	9.3E-03	mg/kg	2.1E-04	µg/m³	2.1E-12	4.4E-03	mg/m³	7.4E-03			
				Naphthalene	1.7E+00	mg/kg	1.8E-03	µg/m³	6.0E-08	4.9E-06	mg/m³	1.6E-03			
				Phenanthrene	9.0E+01	mg/kg	7.7E-06	µg/m³	--	2.2E-06	mg/m³	--			
				Pyrene	8.8E+01	mg/kg	1.8E-03	µg/m³	--	4.7E+01	mg/m³	--			
				Selenium	5.7E-01	mg/kg	4.9E-08	µg/m³	--	1.4E-10	mg/m³	8.8E-08			
				Toluene	1.4E-02	mg/kg	1.6E-04	µg/m³	4.2E-11	7.5E-03	mg/m³	3.4E-08			
				Xylenes (total)	1.6E-02	mg/kg	1.3E-04	µg/m³	--	8.5E-03	mg/m³	7.5E-02			
				Exposure Route Total							8.7E-06			1.7E-01	
	Vapor Intrusion	Indoor Air	Inhalation	1,1-Dichloroethane	2.8E-01	µg/m³	2.3E-02	µg/m³	3.7E-08	6.5E-05	mg/m³	--			
				1,2-Dichloroethane	1.6E-03	µg/m³	1.5E-04	µg/m³	4.0E-09	4.3E-07	mg/m³	6.2E-05			
				2-Bulaneone	2.1E-01	µg/m³	1.7E-02	µg/m³	--	4.7E-05	mg/m³	9.5E-06			
				4-Methyl-2-pentanone	1.7E-02	µg/m³	1.3E-03	µg/m³	--	3.8E-06	mg/m³	1.3E-06			
				Acenaphthene	3.3E+00	µg/m³	2.7E-01	µg/m³	--	7.8E-04	mg/m³	--			
				Acetone	3.2E-01	µg/m³	2.6E-02	µg/m³	--	7.4E-05	mg/m³	2.4E-06			
				Benzene	1.1E-03	µg/m³	9.1E-05	µg/m³	7.1E-10	2.8E-07	mg/m³	6.5E-06			
				Benzofluoranthene	1.1E-05	µg/m³	6.7E-07	µg/m³	9.8E-11	2.4E-08	mg/m³	--			
				Carbon Disulfide	2.2E-01	µg/m³	1.8E-02	µg/m³	--	5.1E-05	mg/m³	7.2E-05			
				Chrysene	1.2E-04	µg/m³	9.7E-06	µg/m³	1.1E-10	2.7E-08	mg/m³	--			
				Ethylbenzene	3.8E-02	µg/m³	3.0E-03	µg/m³	7.4E-09	6.3E-06	mg/m³	6.3E-06			
				Fluorene	7.8E-01	µg/m³	6.4E-02	µg/m³	--	1.8E-04	mg/m³	--			
				Isopropylbenzene	2.3E-02	µg/m³	1.9E-03	µg/m³	--	5.2E-06	mg/m³	2.5E-06			
				Mercury	4.3E-02	µg/m³	3.5E-03	µg/m³	--	6.9E-06	mg/m³	3.3E-02			
				Methylene Chloride	4.9E-01	µg/m³	4.0E-02	µg/m³	4.0E-10	1.1E-04	mg/m³	1.9E-04			
				Naphthalene	5.0E+00	µg/m³	4.1E-01	µg/m³	1.4E-05	1.1E-03	mg/m³	3.8E-01			
				Pyrene	2.2E-02	µg/m³	1.8E-03	µg/m³	--	5.0E-06	mg/m³	--			
				Toluene	3.1E-01	µg/m³	2.5E-02	µg/m³	--	7.1E-05	mg/m³	1.4E-05			
				Xylenes (total)	4.5E-02	µg/m³	3.8E-03	µg/m³	--	1.0E-05	mg/m³	1.0E-04			
				Exposure Route Total							1.4E-05			4.2E-01	
				Exposure Point Total							2.2E-04			1.5E+00	
				Exposure Medium Total							2.2E-04			1.5E+00	
Groundwater	Vapor Intrusion	Indoor Air	Inhalation	1,1,1-Trichloroethane	7.6E-02	µg/m³	6.2E-03	µg/m³	--	1.7E-05	mg/m³	3.5E-06			
				1,1-Dichloroethane	1.6E-02	µg/m³	1.3E-03	µg/m³	2.1E-09	3.7E-06	mg/m³	--			
				1,2-Dichloroethane	5.8E-03	µg/m³	4.7E-04	µg/m³	--	1.3E-06	mg/m³	6.6E-06			
				2-Bulaneone	1.6E-04	µg/m³	1.3E-05	µg/m³	--	3.5E-08	mg/m³	7.1E-06			
				Acenaphthene	1.6E-03	µg/m³	1.5E-04	µg/m³	--	4.2E-07	mg/m³	--			
				Acetone	1.0E-03	µg/m³	8.2E-05	µg/m³	--	2.3E-07	mg/m³	7.4E-06			
				Benzofluoranthene	5.9E-06	µg/m³	4.8E-07	µg/m³	5.3E-11	1.4E-08	mg/m³	--			
				Bromodichloromethane	6.8E-05	µg/m³	5.3E-06	µg/m³	2.0E-10	1.5E-08	mg/m³	--			
				C10-C20	--	µg/m³	--	µg/m³	--	--	mg/m³	--			
				C20-C34	--	µg/m³	--	µg/m³	--	--	mg/m³	--			
				Carbon Disulfide	9.3E-04	µg/m³	6.7E-05	µg/m³	--	1.9E-07	mg/m³	2.7E-07			
				Chloroethane	5.7E-04	µg/m³	4.8E-05	µg/m³	--	1.3E-07	mg/m³	1.3E-06			
				Chloroform	2.8E-04	µg/m³	2.3E-05	µg/m³	5.3E-10	6.4E-08	mg/m³	6.6E-07			
				Chrysene	2.3E-05	µg/m³	1.8E-06	µg/m³	2.0E-11	5.1E-09	mg/m³	--			
				Fluorene	1.0E-03	µg/m³	6.1E-05	µg/m³	--	2.3E-07	mg/m³	--			
				Gasoline Range Organics	--	µg/m³	--	µg/m³	--	--	mg/m³	--			
				Naphthalene	7.0E-04	µg/m³	5.7E-05	µg/m³	1.9E-09	1.8E-07	mg/m³	5.3E-05			
				Pyrene	1.2E-03	µg/m³	9.8E-06	µg/m³	--	2.7E-07	mg/m³	--			
				Toluene	2.3E-04	µg/m³	1.9E-05	µg/m³	--	5.2E-08	mg/m³	1.0E-06			
				Exposure Route Total							4.8E-09			6.5E-05	
				Exposure Point Total							4.8E-09			6.5E-05	
				Exposure Medium Total							4.8E-09			6.5E-05	
Surface Soil + Subsurface Vapor Intrusion + Groundwater Medium Total								Total Risk	4E-04	Total Hazard Index		5E-01			
Subsurface Soil Including Vapor Intrusion + Groundwater Medium Total								Total Risk	2E-04	Total Hazard Index		2E-00			

Abbreviations:

-- Not applicable or available

TABLE D7.2: CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
FUTURE - CONSTRUCTION WORKER - INVESTIGATION AREA 4
 PROPERTY-SPECIFIC RISK ASSESSMENT
 FORMER GM STAMPING PLANT
 ONTARIO, RICHLAND COUNTY, OHIO

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations			Noncancer Hazard Quotient		
					Value	Units	Intake		Cancer Risk	Intake		Hazard Quotient
							Value	Units		Value	Units	
Subsurface Soil	Subsurface Soil	Subsurface Soil	Ingestion	1,1-Dichloroethane	1.2E-02	mg/kg	1.6E-10	mg/(kg-day)	9.2E-13	1.1E-08	mg/(kg-day)	5.8E-09
				1,2-Dichloroethane	8.8E-04	mg/kg	9.1E-12	mg/(kg-day)	8.3E-13	6.4E-10	mg/(kg-day)	—
				1-Methylnaphthalene	2.3E+00	mg/kg	3.1E-08	mg/(kg-day)	9.0E-10	2.2E-06	mg/(kg-day)	3.1E-05
				2-Butanone	3.8E-02	mg/kg	4.8E-10	mg/(kg-day)	—	3.4E-08	mg/(kg-day)	1.7E-08
				2-Methylnaphthalene	2.0E+00	mg/kg	2.6E-08	mg/(kg-day)	—	1.8E-06	mg/(kg-day)	4.6E-04
				4-Methyl-2-pentanone	5.9E-03	mg/kg	7.9E-11	mg/(kg-day)	—	5.5E-09	mg/(kg-day)	6.9E-09
				Aconaphthene	1.0E+01	mg/kg	1.3E-07	mg/(kg-day)	—	9.4E-06	mg/(kg-day)	1.6E-05
				Aconaphthylene	1.2E-01	mg/kg	1.5E-09	mg/(kg-day)	—	1.1E-07	mg/(kg-day)	1.8E-07
				Acetone	8.8E-02	mg/kg	1.2E-09	mg/(kg-day)	—	8.1E-08	mg/(kg-day)	3.0E-08
				Anthracene	2.0E+01	mg/kg	2.6E-07	mg/(kg-day)	—	1.8E-05	mg/(kg-day)	6.1E-06
				Aroclor 1254	2.1E-02	mg/kg	2.8E-10	mg/(kg-day)	5.6E-10	2.0E-08	mg/(kg-day)	3.3E-04
				Aroclor 1260	4.0E-02	mg/kg	5.4E-10	mg/(kg-day)	1.1E-09	3.8E-08	mg/(kg-day)	8.3E-04
				Arsenic	2.3E+01	mg/kg	1.8E-07	mg/(kg-day)	2.7E-07	1.3E-05	mg/(kg-day)	4.3E-02
				Barium	1.0E+02	mg/kg	1.4E-06	mg/(kg-day)	—	9.6E-05	mg/(kg-day)	1.4E-03
				Benzene	4.0E-04	mg/kg	5.4E-12	mg/(kg-day)	3.0E-13	3.8E-10	mg/(kg-day)	3.1E-08
				Benzo[a]anthracene	4.5E+01	mg/kg	6.1E-07	mg/(kg-day)	4.4E-07	4.2E-05	mg/(kg-day)	—
				Benzo[a]pyrene	3.6E+01	mg/kg	4.9E-07	mg/(kg-day)	3.6E-06	3.4E-05	mg/(kg-day)	—
				Benzo[b]fluoranthene	6.0E+01	mg/kg	8.1E-07	mg/(kg-day)	5.9E-07	5.6E-05	mg/(kg-day)	—
				Benzo[g,h,i]perylene	2.0E+01	mg/kg	2.6E-07	mg/(kg-day)	—	1.8E-05	mg/(kg-day)	—
				Benzo[k]fluoranthene	2.9E+01	mg/kg	3.9E-07	mg/(kg-day)	2.8E-06	2.7E-05	mg/(kg-day)	—
				C10-C20	4.4E+03	mg/kg	5.9E-05	mg/(kg-day)	—	4.1E-03	mg/(kg-day)	1.0E-01
				C20-C34	1.9E+04	mg/kg	2.5E-04	mg/(kg-day)	—	1.8E-02	mg/(kg-day)	5.9E-01
				Cadmium	6.0E-01	mg/kg	8.1E-09	mg/(kg-day)	—	5.7E-07	mg/(kg-day)	5.7E-04
				Carbon Disulfide	1.0E-02	mg/kg	1.3E-10	mg/(kg-day)	—	9.4E-09	mg/(kg-day)	9.4E-08
				Chromium	1.4E+01	mg/kg	1.8E-07	mg/(kg-day)	—	1.3E-05	mg/(kg-day)	1.4E-03
				Chrysene	4.8E+01	mg/kg	6.4E-07	mg/(kg-day)	4.7E-09	4.5E-05	mg/(kg-day)	—
				Dibenz[a,h]anthracene	6.1E+00	mg/kg	8.2E-08	mg/(kg-day)	6.0E-07	5.8E-06	mg/(kg-day)	—
				Ethylbenzene	1.3E-02	mg/kg	1.7E-10	mg/(kg-day)	1.9E-12	1.2E-08	mg/(kg-day)	1.2E-08
				Fluoranthene	1.1E+02	mg/kg	1.5E-06	mg/(kg-day)	—	1.0E-04	mg/(kg-day)	8.5E-04
				Fluorene	8.5E+00	mg/kg	1.1E-07	mg/(kg-day)	—	8.0E-06	mg/(kg-day)	2.0E-05
				Indeno[1,2,3-cd]pyrene	1.9E+01	mg/kg	2.5E-07	mg/(kg-day)	1.9E-07	1.8E-05	mg/(kg-day)	—
				Isopropylbenzene	8.2E-03	mg/kg	1.1E-10	mg/(kg-day)	—	7.7E-09	mg/(kg-day)	2.6E-08
				Lead	4.1E+01	mg/kg	5.5E-07	mg/(kg-day)	—	3.8E-05	mg/(kg-day)	—
				Mercury	4.4E-02	mg/kg	5.9E-10	mg/(kg-day)	—	4.2E-08	mg/(kg-day)	—
				Methylene Chloride	8.3E-03	mg/kg	1.1E-10	mg/(kg-day)	2.2E-13	7.8E-09	mg/(kg-day)	1.3E-07
				Naphthalene	1.7E+00	mg/kg	2.3E-08	mg/(kg-day)	—	1.6E-06	mg/(kg-day)	8.0E-06
				Phenanthrene	9.0E+01	mg/kg	1.2E-06	mg/(kg-day)	—	8.5E-05	mg/(kg-day)	2.8E-05
				Pyrene	8.8E+01	mg/kg	1.2E-06	mg/(kg-day)	—	8.2E-05	mg/(kg-day)	2.7E-04
				Selenium	5.7E-01	mg/kg	7.6E-09	mg/(kg-day)	—	5.4E-07	mg/(kg-day)	1.1E-04
				Toluene	1.4E-02	mg/kg	1.9E-10	mg/(kg-day)	—	1.3E-08	mg/(kg-day)	1.7E-08
				Xylenes (total)	1.6E-02	mg/kg	2.1E-10	mg/(kg-day)	—	1.5E-08	mg/(kg-day)	3.8E-08
				Exposure Route Total					5.7E-06			7.5E-01
			Dermal Contact	1,1-Dichloroethane	1.2E-02	mg/kg	8.0E-11	mg/(kg-day)	4.5E-13	5.6E-09	mg/(kg-day)	2.8E-09
				1,2-Dichloroethane	8.8E-04	mg/kg	4.5E-12	mg/(kg-day)	4.1E-13	3.2E-10	mg/(kg-day)	—
				1-Methylnaphthalene	2.3E+00	mg/kg	2.0E-08	mg/(kg-day)	5.8E-10	1.4E-06	mg/(kg-day)	2.0E-05
				2-Butanone	3.8E-02	mg/kg	2.4E-10	mg/(kg-day)	—	1.7E-08	mg/(kg-day)	8.4E-09
				2-Methylnaphthalene	2.0E+00	mg/kg	1.7E-08	mg/(kg-day)	—	1.2E-06	mg/(kg-day)	3.0E-04
				4-Methyl-2-pentanone	5.9E-03	mg/kg	3.9E-11	mg/(kg-day)	—	2.7E-09	mg/(kg-day)	3.4E-09
				Aconaphthene	1.0E+01	mg/kg	8.7E-08	mg/(kg-day)	—	6.1E-06	mg/(kg-day)	1.0E-05
				Aconaphthylene	1.2E-01	mg/kg	9.9E-10	mg/(kg-day)	—	7.0E-08	mg/(kg-day)	1.2E-07
				Acetone	8.8E-02	mg/kg	5.7E-10	mg/(kg-day)	—	4.0E-08	mg/(kg-day)	1.6E-08
				Anthracene	2.0E+01	mg/kg	1.7E-07	mg/(kg-day)	—	1.2E-05	mg/(kg-day)	3.9E-06
				Aroclor 1254	2.1E-02	mg/kg	2.0E-10	mg/(kg-day)	3.9E-10	1.4E-08	mg/(kg-day)	2.3E-04
				Aroclor 1260	4.0E-02	mg/kg	3.7E-10	mg/(kg-day)	7.4E-10	2.6E-08	mg/(kg-day)	4.3E-04
				Arsenic	2.3E+01	mg/kg	1.5E-07	mg/(kg-day)	2.3E-07	3.2E-06	mg/(kg-day)	1.1E-02
				Barium	1.0E+02	mg/kg	6.8E-08	mg/(kg-day)	—	4.7E-06	mg/(kg-day)	6.8E-05
				Benzene	4.0E-04	mg/kg	2.7E-12	mg/(kg-day)	1.5E-13	1.9E-10	mg/(kg-day)	1.5E-08
				Benzo[a]anthracene	4.5E+01	mg/kg	3.9E-07	mg/(kg-day)	2.8E-07	2.7E-05	mg/(kg-day)	—
				Benzo[a]pyrene	3.6E+01	mg/kg	3.2E-07	mg/(kg-day)	2.3E-06	2.2E-05	mg/(kg-day)	—
				Benzo[b]fluoranthene	6.0E+01	mg/kg	5.2E-07	mg/(kg-day)	3.8E-07	3.6E-05	mg/(kg-day)	—
				Benzo[g,h,i]perylene	2.0E+01	mg/kg	1.7E-07	mg/(kg-day)	—	1.2E-05	mg/(kg-day)	—
				Benzo[k]fluoranthene	2.9E+01	mg/kg	2.5E-07	mg/(kg-day)	1.8E-06	1.7E-05	mg/(kg-day)	—
				C10-C20	4.4E+03	mg/kg	2.9E-05	mg/(kg-day)	—	2.0E-03	mg/(kg-day)	5.1E-02
				C20-C34	1.9E+04	mg/kg	1.3E-04	mg/(kg-day)	—	8.8E-03	mg/(kg-day)	2.9E-01
				Cadmium	6.0E-01	mg/kg	4.0E-11	mg/(kg-day)	—	2.8E-09	mg/(kg-day)	2.8E-06
				Carbon Disulfide	1.0E-02	mg/kg	6.6E-11	mg/(kg-day)	—	4.6E-09	mg/(kg-day)	4.6E-08
				Chromium	1.4E+01	mg/kg	9.0E-09	mg/(kg-day)	—	6.3E-07	mg/(kg-day)	7.0E-05
				Chrysene	4.8E+01	mg/kg	4.1E-07	mg/(kg-day)	3.0E-09	2.9E-05	mg/(kg-day)	—
				Dibenz[a,h]anthracene	6.1E+00	mg/kg	5.3E-08	mg/(kg-day)	3.9E-07	3.7E-06	mg/(kg-day)	—
				Ethylbenzene	1.3E-02	mg/kg	8.6E-11	mg/(kg-day)	9.5E-13	6.0E-09	mg/(kg-day)	6.0E-09
				Fluoranthene	1.1E+02	mg/kg	9.3E-07	mg/(kg-day)	—	6.5E-05	mg/(kg-day)	5.4E-04
				Fluorene	8.5E+00	mg/kg	7.3E-08	mg/(kg-day)	—	5.1E-06	mg/(kg-day)	1.3E-05
				Indeno[1,2,3-cd]pyrene	1.9E+01	mg/kg	1.6E-07	mg/(kg-day)	1.2E-07	1.1E-05	mg/(kg-day)	—
				Isopropylbenzene	8.2E-03	mg/kg	5.4E-11	mg/(kg-day)	—	3.8E-09	mg/(kg-day)	1.3E-08
				Lead	4.1E+01	mg/kg	—	mg/(kg-day)	—	—	mg/(kg-day)	—
				Mercury	4.4E-02	mg/kg	2.9E-11	mg/(kg-day)	—	2.1E-09	mg/(kg-day)	—
				Methylene Chloride	8.3E-03	mg/kg	5.5E-11	mg/(kg-day)	1.1E-13	3.9E-09	mg/(kg-day)	6.4E-08
				Naphthalene	1.7E+00	mg/kg	1.5E-08	mg/(kg-day)	—	1.0E-06	mg/(kg-day)	5.2E-06
				Phenanthrene	9.0E+01	mg/kg	7.8E-07	mg/(kg-day)	—	5.5E-05	mg/(kg-day)	1.8E-05
				Pyrene	8.8E+01	mg/kg	7.6E-07	mg/(kg-day)	—	5.3E-05	mg/(kg-day)	1.8E-04
				Selenium	5.7E-01	mg/kg	3.8E-10	mg/(kg-day)	—	2.7E-08	mg/(kg-day)	5.3E-08
				Toluene	1.4E-02	mg/kg	9.4E-11	mg/(kg-day)	—	6.6E-09	mg/(kg-day)	8.2E-09
				Xylenes (total)	1.6E-02	mg/kg	1.1E-10	mg/(kg-day)	—	7.4E-09	mg/(kg-day)	1.9E-08
				Exposure Route Total					3.7E-06			3.6E-01

TABLE D7.2: CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
FUTURE - CONSTRUCTION WORKER - INVESTIGATION AREA 4
PROPERTY-SPECIFIC RISK ASSESSMENT
FORMER GM STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations			Noncancer Hazard Quotient			
					Value	Units	Intake		Cancer Risk	Intake		Hazard Quotient	
							Value	Units		Value	Units		
Subsurface Soil	Particulate and Vapor	Ambient Air	Inhalation	1,1-Dichloroethane	1.2E-02	mg/kg	3.0E-05	µg/m³	4.8E-11	2.1E-06	mg/m³	--	
				1,2-Dichloroethane	6.8E-04	mg/kg	7.4E-07	µg/m³	1.9E-11	5.2E-06	mg/m³	7.4E-07	
				1-Methylnaphthalene	2.3E+00	mg/kg	1.8E-04	µg/m³	--	1.3E-05	mg/m³	--	
				2-Butanone	3.8E-02	mg/kg	1.7E-05	µg/m³	--	1.2E-06	mg/m³	1.2E-06	
				2-Methylnaphthalene	2.0E+00	mg/kg	1.6E-04	µg/m³	--	1.1E-05	mg/m³	--	
				4-Methyl-2-pentanone	5.9E-03	mg/kg	3.0E-06	µg/m³	--	2.1E-07	mg/m³	2.7E-07	
				Acenaphthene	1.0E+01	mg/kg	3.3E-04	µg/m³	--	2.3E-05	mg/m³	--	
				Acenaphthylene	1.2E-01	mg/kg	3.8E-06	µg/m³	--	2.6E-07	mg/m³	--	
				Acetone	8.6E-02	mg/kg	3.8E-05	µg/m³	--	2.7E-06	mg/m³	8.7E-08	
				Anthracene	2.0E+01	mg/kg	1.7E-04	µg/m³	--	1.2E-05	mg/m³	--	
				Araclor 1254	2.1E-02	mg/kg	9.0E-08	µg/m³	5.1E-11	6.3E-09	mg/m³	--	
				Araclor 1260	4.0E-02	mg/kg	1.7E-07	µg/m³	9.7E-11	1.2E-08	mg/m³	--	
				Arsenic	2.3E+01	mg/kg	2.7E-06	µg/m³	1.1E-05	1.9E-07	mg/m³	--	
				Barium	1.0E+02	mg/kg	1.2E-05	µg/m³	--	8.3E-07	mg/m³	1.7E-04	
				Benzene	4.0E-04	mg/kg	5.4E-07	µg/m³	4.2E-12	3.8E-08	mg/m³	4.2E-07	
				Benzo[a]anthracene	4.5E+01	mg/kg	7.0E-05	µg/m³	7.7E-09	4.9E-06	mg/m³	--	
				Benzo[a]pyrene	3.6E+01	mg/kg	1.1E-05	µg/m³	1.3E-08	8.0E-07	mg/m³	--	
				Benzo[b]fluoranthene	6.0E+01	mg/kg	2.0E-05	µg/m³	2.2E-09	1.4E-06	mg/m³	--	
				Benzo[g,h,i]perylene	2.0E+01	mg/kg	2.3E-06	µg/m³	--	1.6E-07	mg/m³	--	
				Benzo[k]fluoranthene	2.9E+01	mg/kg	9.4E-06	µg/m³	1.0E-09	6.6E-07	mg/m³	--	
				C10-C20	4.4E+03	mg/kg	5.1E-04	µg/m³	--	3.6E-05	mg/m³	1.7E-04	
				C20-C34	1.9E+04	mg/kg	2.2E-03	µg/m³	--	1.6E-04	mg/m³	--	
				Cadmium	6.0E-01	mg/kg	7.0E-08	µg/m³	1.3E-10	4.9E-09	mg/m³	4.9E-04	
				Carbon Disulfide	1.0E-02	mg/kg	4.7E-05	µg/m³	--	3.3E-06	mg/m³	1.6E-06	
				Chromium	1.4E+01	mg/kg	1.6E-06	µg/m³	1.3E-07	1.1E-07	mg/m³	3.7E-06	
				Chrysene	4.8E+01	mg/kg	4.0E-05	µg/m³	4.4E-10	2.8E-06	mg/m³	--	
				Dibenz[a,h]anthracene	6.1E+00	mg/kg	1.2E-06	µg/m³	1.5E-09	8.5E-08	mg/m³	--	
				Ethylbenzene	1.3E-02	mg/kg	1.1E-05	µg/m³	2.7E-11	7.5E-07	mg/m³	8.3E-08	
				Fluoranthene	1.1E+02	mg/kg	1.9E-04	µg/m³	--	1.3E-05	mg/m³	--	
				Fluorene	8.5E+00	mg/kg	1.4E-04	µg/m³	--	9.8E-06	mg/m³	--	
				Indeno[1,2,3-cd]pyrene	1.9E+01	mg/kg	4.5E-06	µg/m³	5.0E-10	3.2E-07	mg/m³	--	
				Isopropylbenzene	8.2E-03	mg/kg	5.9E-06	µg/m³	--	4.1E-07	mg/m³	1.0E-07	
				Lead	4.1E+01	mg/kg	4.8E-06	µg/m³	--	3.3E-07	mg/m³	--	
				Mercury	4.4E-02	mg/kg	5.2E-09	µg/m³	--	3.6E-10	mg/m³	1.2E-06	
				Methylene Chloride	8.3E-03	mg/kg	2.0E-05	µg/m³	2.0E-13	1.4E-06	mg/m³	1.4E-03	
				Naphthalene	1.7E+00	mg/kg	1.7E-04	µg/m³	5.8E-09	1.2E-05	mg/m³	4.0E-03	
				Phenanthrene	9.0E+01	mg/kg	1.1E-05	µg/m³	--	5.6E-05	mg/m³	--	
				Pyrene	8.8E+01	mg/kg	1.8E-04	µg/m³	--	1.3E-05	mg/m³	--	
				Selenium	5.7E-01	mg/kg	6.7E-08	µg/m³	--	4.7E-09	mg/m³	2.3E-07	
				Toluene	1.4E-02	mg/kg	1.6E-05	µg/m³	--	1.1E-06	mg/m³	2.2E-07	
				Xylenes (total)	1.6E-02	mg/kg	1.3E-05	µg/m³	--	9.0E-07	mg/m³	3.0E-06	
				Exposure Route Total							1.2E-05		6.2E-03
				Exposure Point Total							2.1E-05		1.1E+00
				Exposure Medium Total							2.1E-05		1.1E+00
Groundwater	Vapor Intrusion	Trench Air	Inhalation	1,1,1-Trichloroethane	2.2E+00	µg/m³	1.7E-03	µg/m³	--	1.2E-04	mg/m³	2.4E-05	
				1,1-Dichloroethane	2.6E-01	µg/m³	2.0E-04	µg/m³	3.3E-10	1.4E-05	mg/m³	--	
				1,1,1-Dichloroethane	1.5E-01	µg/m³	1.2E-04	µg/m³	--	8.2E-06	mg/m³	1.0E-04	
				2-Butanone	1.3E-04	µg/m³	1.0E-07	µg/m³	--	7.1E-09	mg/m³	7.1E-09	
				Acenaphthene	2.5E-03	µg/m³	2.0E-06	µg/m³	--	1.4E-07	mg/m³	--	
				Acetone	9.8E-04	µg/m³	7.7E-07	µg/m³	--	5.4E-08	mg/m³	1.7E-09	
				Benzo[b]fluoranthene	2.3E-03	µg/m³	1.8E-06	µg/m³	2.0E-10	1.3E-07	mg/m³	--	
				Bromodichloromethane	4.4E-04	µg/m³	3.5E-07	µg/m³	1.3E-11	2.4E-08	mg/m³	--	
				C10-C20	--	µg/m³	--	µg/m³	--	--	mg/m³	--	
				C20-C34	--	µg/m³	--	µg/m³	--	--	mg/m³	--	
				Carbon Disulfide	3.9E-02	µg/m³	3.1E-05	µg/m³	--	2.1E-06	mg/m³	1.0E-06	
				Chloroethane	2.6E-02	µg/m³	2.0E-05	µg/m³	--	1.4E-06	mg/m³	3.5E-07	
				Chloroform	5.5E-03	µg/m³	4.3E-06	µg/m³	9.9E-11	3.0E-07	mg/m³	1.3E-06	
				Chrysene	2.1E-03	µg/m³	1.6E-06	µg/m³	1.8E-11	1.1E-07	mg/m³	--	
				Fluorene	7.5E-04	µg/m³	5.9E-07	µg/m³	--	4.1E-08	mg/m³	--	
				Gasoline Range Organics	--	µg/m³	--	µg/m³	--	--	mg/m³	--	
				Naphthalene	2.7E-03	µg/m³	2.1E-06	µg/m³	7.2E-11	1.5E-07	mg/m³	4.9E-05	
				Pyrene	5.3E-04	µg/m³	4.1E-07	µg/m³	--	2.9E-08	mg/m³	--	
				Toluene	5.3E-03	µg/m³	4.2E-06	µg/m³	--	2.9E-07	mg/m³	5.8E-08	
				Exposure Route Total							7.3E-10		1.6E-04
				Exposure Point Total							7.3E-10		1.6E-04
				Exposure Medium Total							7.3E-10		1.6E-04
Groundwater + Subsurface Soil Medium Total							Total Risk	2E-05	Total Hazard	1E+00			

Abbreviations:

-- Not applicable or available
EPA U.S. Environmental Protection Agency
mg/kg Milligram per kilogram
mg/(kg-day) Milligram per kilogram day
mg/m³ Milligram per cubic meter
µg/m³ Micrograms per cubic meter

Equations:

Intake equations are listed in Table D6
Hazard Quotient = Intake/Reference Dose_{oral or inhalation}
Cancer Risk = Intake/Oral Slope Factor or Inhalation Unit Risk
Exposure Route Total = Σ Chemical of Potential Concern Cancer Risk or Hazard Quotient
Exposure Point Total = Σ Exposure Route Total
Exposure Medium Total = Σ Exposure Point Total
Subsurface Soil Including Vapor Intrusion+ Groundwater Medium Total = Σ Exposure Medium Total

References:

Ohio Environmental Protection Agency (Ohio EPA). 2008. "Support Document for the Development of Generic Numerical Standards and Risk Assessment Procedures."
The Voluntary Action Program (VAP). August. On-Line Address: <http://eepa.ohio.gov/portals/30/vap/docs/support%20doc%20version.pdf>

TABLE D8.1: CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
FUTURE - COMMERCIAL/INDUSTRIAL WORKER- INVESTIGATION AREA 5
PROPERTY-SPECIFIC RISK ASSESSMENT
FORMER GM STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations			Noncancer Hazard Quotient		
					Value	Units	Intake		Cancer Risk	Intake		Hazard Quotient
							Value	Units		Value	Units	
Surface Soil	Surface Soil	Surface Soil	Ingestion	1,2-Dichloroethane	1.5E-03	mg/kg	2.8E-10	mg/(kg-day)	2.4E-11	7.3E-10	mg/(kg-day)	—
				1-Methylnaphthalene	6.5E-03	mg/kg	1.1E-09	mg/(kg-day)	3.3E-11	3.2E-09	mg/(kg-day)	4.5E-08
				2-Methylnaphthalene	1.2E-02	mg/kg	2.1E-09	mg/(kg-day)	—	6.9E-09	mg/(kg-day)	1.5E-06
				Acenaphthene	6.0E-03	mg/kg	1.0E-09	mg/(kg-day)	—	2.9E-09	mg/(kg-day)	4.9E-08
				Acetone	1.8E-02	mg/kg	3.1E-09	mg/(kg-day)	—	8.8E-09	mg/(kg-day)	9.8E-09
				Anthracene	1.0E-02	mg/kg	1.7E-09	mg/(kg-day)	—	4.9E-09	mg/(kg-day)	1.8E-08
				Arsenic	1.5E+01	mg/kg	1.8E-06	mg/(kg-day)	2.4E-06	4.4E-06	mg/(kg-day)	1.5E-02
				Barium	6.0E+01	mg/kg	1.0E-06	mg/(kg-day)	—	2.9E-05	mg/(kg-day)	1.5E-04
				Benzo[a]anthracene	3.7E-02	mg/kg	6.5E-09	mg/(kg-day)	4.7E-09	1.8E-08	mg/(kg-day)	—
				Benzo[a]pyrene	3.0E-02	mg/kg	5.2E-09	mg/(kg-day)	3.8E-08	1.5E-08	mg/(kg-day)	—
				Benzo[b]fluoranthene	4.5E-02	mg/kg	7.9E-09	mg/(kg-day)	5.7E-09	2.2E-08	mg/(kg-day)	—
				Benzo[g,h,i]perylene	2.4E-02	mg/kg	4.2E-09	mg/(kg-day)	—	1.2E-08	mg/(kg-day)	—
				Benzo[k]fluoranthene	2.1E-02	mg/kg	3.7E-09	mg/(kg-day)	2.7E-10	1.0E-08	mg/(kg-day)	—
				Cadmium	2.9E-01	mg/kg	5.1E-08	mg/(kg-day)	—	1.4E-07	mg/(kg-day)	1.4E-04
				Carbon Disulfide	8.9E-04	mg/kg	1.8E-10	mg/(kg-day)	—	4.4E-10	mg/(kg-day)	4.4E-09
				Chromium	1.4E+01	mg/kg	2.4E-06	mg/(kg-day)	—	6.7E-06	mg/(kg-day)	2.2E-03
				Chrysene	4.5E-02	mg/kg	7.9E-09	mg/(kg-day)	5.7E-11	2.2E-08	mg/(kg-day)	—
				Fluoranthene	9.7E-02	mg/kg	1.7E-08	mg/(kg-day)	—	4.7E-08	mg/(kg-day)	1.2E-06
				Indeno[1,2,3-cd]pyrene	1.8E-02	mg/kg	3.1E-09	mg/(kg-day)	2.3E-09	8.8E-09	mg/(kg-day)	—
				Lead	1.5E+01	mg/kg	2.8E-06	mg/(kg-day)	—	7.3E-06	mg/(kg-day)	—
				Mercury	2.1E-02	mg/kg	3.7E-09	mg/(kg-day)	—	1.0E-08	mg/(kg-day)	—
				Methylene Chloride	2.9E-02	mg/kg	5.1E-09	mg/(kg-day)	1.0E-11	1.4E-08	mg/(kg-day)	2.4E-06
				Phenanthrene	6.4E-02	mg/kg	1.1E-08	mg/(kg-day)	—	3.1E-08	mg/(kg-day)	1.0E-07
				Pyrene	6.8E-02	mg/kg	1.2E-08	mg/(kg-day)	—	3.2E-08	mg/(kg-day)	1.1E-06
				Selenium	5.5E-01	mg/kg	9.8E-08	mg/(kg-day)	—	2.7E-07	mg/(kg-day)	5.4E-05
				Exposure Route Total					2.4E-06			1.7E-02
			Dermal Contact	1,2-Dichloroethane	1.5E-03	mg/kg	3.5E-10	mg/(kg-day)	3.1E-11	9.7E-10	mg/(kg-day)	—
				1-Methylnaphthalene	6.5E-03	mg/kg	1.9E-09	mg/(kg-day)	5.7E-11	6.5E-09	mg/(kg-day)	7.8E-08
				2-Methylnaphthalene	1.2E-02	mg/kg	3.8E-09	mg/(kg-day)	—	1.0E-08	mg/(kg-day)	2.5E-06
				Acenaphthene	6.0E-03	mg/kg	1.8E-09	mg/(kg-day)	—	5.0E-09	mg/(kg-day)	8.4E-08
				Acetone	1.8E-02	mg/kg	4.2E-09	mg/(kg-day)	—	1.2E-08	mg/(kg-day)	1.3E-08
				Anthracene	1.0E-02	mg/kg	3.0E-09	mg/(kg-day)	—	8.4E-09	mg/(kg-day)	2.8E-08
				Arsenic	1.5E+01	mg/kg	1.0E-06	mg/(kg-day)	1.8E-06	2.9E-06	mg/(kg-day)	9.8E-03
				Barium	6.0E+01	mg/kg	1.4E-06	mg/(kg-day)	—	3.9E-06	mg/(kg-day)	1.9E-05
				Benzo[a]anthracene	3.7E-02	mg/kg	1.1E-08	mg/(kg-day)	8.1E-09	3.1E-08	mg/(kg-day)	—
				Benzo[a]pyrene	3.0E-02	mg/kg	9.0E-09	mg/(kg-day)	6.8E-06	2.5E-08	mg/(kg-day)	—
				Benzo[b]fluoranthene	4.5E-02	mg/kg	1.3E-08	mg/(kg-day)	9.8E-09	3.8E-08	mg/(kg-day)	—
				Benzo[g,h,i]perylene	2.4E-02	mg/kg	7.2E-09	mg/(kg-day)	—	2.0E-08	mg/(kg-day)	—
				Benzo[k]fluoranthene	2.1E-02	mg/kg	6.3E-09	mg/(kg-day)	4.8E-10	1.8E-08	mg/(kg-day)	—
				Cadmium	2.9E-01	mg/kg	6.7E-10	mg/(kg-day)	—	1.9E-09	mg/(kg-day)	1.9E-06
				Carbon Disulfide	8.9E-04	mg/kg	2.1E-10	mg/(kg-day)	—	5.7E-10	mg/(kg-day)	5.7E-09
				Chromium	1.4E+01	mg/kg	3.1E-07	mg/(kg-day)	—	8.8E-07	mg/(kg-day)	2.9E-04
				Chrysene	4.5E-02	mg/kg	1.3E-08	mg/(kg-day)	9.8E-11	3.8E-08	mg/(kg-day)	—
				Fluoranthene	9.7E-02	mg/kg	2.9E-08	mg/(kg-day)	—	8.1E-08	mg/(kg-day)	2.0E-06
				Indeno[1,2,3-cd]pyrene	1.8E-02	mg/kg	5.4E-09	mg/(kg-day)	3.9E-09	1.5E-08	mg/(kg-day)	—
				Lead	1.5E+01	mg/kg	—	mg/(kg-day)	—	—	mg/(kg-day)	—
				Mercury	2.1E-02	mg/kg	4.8E-10	mg/(kg-day)	—	1.4E-09	mg/(kg-day)	—
				Methylene Chloride	2.9E-02	mg/kg	6.7E-09	mg/(kg-day)	1.3E-11	1.9E-08	mg/(kg-day)	3.1E-06
				Phenanthrene	6.4E-02	mg/kg	1.9E-08	mg/(kg-day)	—	5.4E-08	mg/(kg-day)	1.8E-07
				Pyrene	6.8E-02	mg/kg	2.0E-08	mg/(kg-day)	—	5.5E-08	mg/(kg-day)	1.8E-06
				Selenium	5.5E-01	mg/kg	1.3E-08	mg/(kg-day)	—	3.6E-08	mg/(kg-day)	7.1E-06
				Exposure Route Total					1.7E-06			1.0E-02
	Particulates and Vapor	Ambient Air	Inhalation	1,2-Dichloroethane	1.5E-03	mg/kg	1.7E-05	µg/m³	4.4E-10	4.8E-08	mg/m³	6.8E-06
				1-Methylnaphthalene	6.5E-03	mg/kg	5.3E-06	µg/m³	—	1.5E-08	mg/m³	—
				2-Methylnaphthalene	1.2E-02	mg/kg	9.9E-06	µg/m³	—	2.8E-08	mg/m³	—
				Acenaphthene	6.0E-03	mg/kg	2.0E-06	µg/m³	—	5.7E-09	mg/m³	—
				Acetone	1.8E-02	mg/kg	8.4E-05	µg/m³	—	2.3E-07	mg/m³	7.8E-09
				Anthracene	1.0E-02	mg/kg	9.2E-07	µg/m³	—	2.6E-09	mg/m³	—
				Arsenic	1.5E+01	mg/kg	1.3E-06	µg/m³	5.8E-06	3.8E-09	mg/m³	—
				Barium	6.0E+01	mg/kg	5.1E-06	µg/m³	—	1.4E-08	mg/m³	2.9E-05
				Benzo[a]anthracene	3.7E-02	mg/kg	5.8E-07	µg/m³	8.1E-11	1.8E-09	mg/m³	—
				Benzo[a]pyrene	3.0E-02	mg/kg	6.4E-08	µg/m³	7.0E-11	1.8E-10	mg/m³	—
				Benzo[b]fluoranthene	4.5E-02	mg/kg	1.0E-07	µg/m³	1.2E-11	2.9E-10	mg/m³	—
				Benzo[g,h,i]perylene	2.4E-02	mg/kg	2.1E-09	µg/m³	—	6.8E-12	mg/m³	—
				Benzo[k]fluoranthene	2.1E-02	mg/kg	4.8E-08	µg/m³	5.2E-12	4.8E-03	mg/m³	—
				Cadmium	2.9E-01	mg/kg	2.5E-06	µg/m³	4.5E-11	7.0E-11	mg/m³	—
				Carbon Disulfide	8.9E-04	mg/kg	4.4E-05	µg/m³	—	1.2E-07	mg/m³	1.8E-07
				Chromium	1.4E+01	mg/kg	1.2E-06	µg/m³	9.8E-06	3.3E-09	mg/m³	3.3E-05
				Chrysene	4.5E-02	mg/kg	3.4E-07	µg/m³	3.7E-12	9.4E-10	mg/m³	—
				Fluoranthene	9.7E-02	mg/kg	1.7E-06	µg/m³	—	4.7E-09	mg/m³	—
				Indeno[1,2,3-cd]pyrene	1.8E-02	mg/kg	2.4E-08	µg/m³	2.7E-12	6.8E-11	mg/m³	—
				Lead	1.5E+01	mg/kg	1.3E-06	µg/m³	—	3.8E-09	mg/m³	—
				Mercury	2.1E-02	mg/kg	1.8E-09	µg/m³	—	6.0E-12	mg/m³	1.7E-08
				Methylene Chloride	2.9E-02	mg/kg	7.3E-04	µg/m³	7.3E-12	2.0E-06	mg/m³	3.4E-06
				Phenanthrene	6.4E-02	mg/kg	5.9E-06	µg/m³	—	1.8E-08	mg/m³	—
				Pyrene	6.8E-02	mg/kg	1.3E-06	µg/m³	—	3.7E-09	mg/m³	—
				Selenium	5.5E-01	mg/kg	4.7E-08	µg/m³	—	1.3E-10	mg/m³	6.8E-09
				Exposure Route Total					5.7E-06			7.2E-05
				Exposure Point Total					9.8E-06			2.7E-02
				Exposure Medium Total					9.8E-06			2.7E-02

TABLE D8.1: CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
FUTURE - COMMERCIAL/INDUSTRIAL WORKER- INVESTIGATION AREA 5
PROPERTY-SPECIFIC RISK ASSESSMENT
FORMER GM STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations			Noncancer Hazard Quotient		
							Intake		Cancer Risk	Intake		Hazard Quotient
					Value	Units	Value	Units		Value	Units	
Subsurface Soil	Subsurface Soil	Subsurface Soil	Ingestion	1,2-Dichloroethane	1.5E-03	mg/kg	2.8E-10	mg/(kg-day)	2.4E-11	7.3E-10	mg/(kg-day)	—
				1-Methylnaphthalene	6.5E-03	mg/kg	1.1E-09	mg/(kg-day)	3.3E-11	3.2E-09	mg/(kg-day)	4.5E-08
				2-Methylnaphthalene	1.2E-02	mg/kg	2.1E-09	mg/(kg-day)	—	6.9E-09	mg/(kg-day)	1.5E-06
				Acenaphthene	6.0E-03	mg/kg	1.0E-09	mg/(kg-day)	—	2.9E-09	mg/(kg-day)	4.9E-08
				Acetone	1.8E-02	mg/kg	3.1E-09	mg/(kg-day)	—	8.8E-09	mg/(kg-day)	9.8E-09
				Anthracene	1.0E-02	mg/kg	1.7E-09	mg/(kg-day)	—	4.9E-09	mg/(kg-day)	1.8E-08
				Arsenic	1.5E+01	mg/kg	1.8E-06	mg/(kg-day)	2.4E-06	4.4E-06	mg/(kg-day)	1.5E-02
				Barium	6.5E+01	mg/kg	1.1E-05	mg/(kg-day)	—	3.2E-05	mg/(kg-day)	1.8E-04
				Benzo[a]anthracene	3.7E-02	mg/kg	6.5E-09	mg/(kg-day)	4.7E-09	1.8E-08	mg/(kg-day)	—
				Benzo[a]pyrene	3.0E-02	mg/kg	5.2E-09	mg/(kg-day)	3.8E-08	1.5E-08	mg/(kg-day)	—
				Benzo[b]fluoranthene	4.5E-02	mg/kg	7.9E-09	mg/(kg-day)	5.7E-09	2.2E-08	mg/(kg-day)	—
				Benzo[g,h,i]perylene	2.4E-02	mg/kg	4.2E-09	mg/(kg-day)	—	1.2E-08	mg/(kg-day)	—
				Benzo[k]fluoranthene	2.1E-02	mg/kg	3.7E-09	mg/(kg-day)	2.7E-10	1.0E-08	mg/(kg-day)	—
				Cadmium	2.9E-01	mg/kg	5.1E-08	mg/(kg-day)	—	1.4E-07	mg/(kg-day)	1.4E-04
				Carbon Disulfide	8.9E-04	mg/kg	1.8E-10	mg/(kg-day)	—	4.4E-10	mg/(kg-day)	4.4E-09
				Chromium	1.4E+01	mg/kg	2.4E-06	mg/(kg-day)	—	6.7E-06	mg/(kg-day)	2.2E-03
				Chrysene	4.5E-02	mg/kg	7.9E-09	mg/(kg-day)	5.7E-11	2.2E-08	mg/(kg-day)	—
				Fluoranthene	9.7E-02	mg/kg	1.7E-08	mg/(kg-day)	—	4.7E-08	mg/(kg-day)	1.2E-06
				Indeno[1,2,3-cd]pyrene	1.8E-02	mg/kg	3.1E-09	mg/(kg-day)	2.3E-09	8.8E-09	mg/(kg-day)	—
				Lead	1.5E+01	mg/kg	2.8E-06	mg/(kg-day)	—	7.3E-06	mg/(kg-day)	—
				Mercury	3.0E-02	mg/kg	5.2E-09	mg/(kg-day)	—	1.5E-08	mg/(kg-day)	—
				Methylene Chloride	2.9E-02	mg/kg	5.1E-09	mg/(kg-day)	1.0E-11	1.4E-08	mg/(kg-day)	2.4E-06
				Phenanthrene	6.4E-02	mg/kg	1.1E-08	mg/(kg-day)	—	3.1E-08	mg/(kg-day)	1.0E-07
				Pyrene	6.8E-02	mg/kg	1.2E-08	mg/(kg-day)	—	3.2E-08	mg/(kg-day)	1.1E-06
				Selenium	5.5E-01	mg/kg	9.8E-08	mg/(kg-day)	—	2.7E-07	mg/(kg-day)	5.4E-05
				Exposure Route Total					2.4E-06			1.7E-02
			Dermal Contact	1,2-Dichloroethane	1.5E-03	mg/kg	3.5E-10	mg/(kg-day)	3.1E-11	9.7E-10	mg/(kg-day)	—
				1-Methylnaphthalene	6.5E-03	mg/kg	1.9E-09	mg/(kg-day)	5.7E-11	5.5E-09	mg/(kg-day)	7.8E-08
				2-Methylnaphthalene	1.2E-02	mg/kg	3.6E-09	mg/(kg-day)	—	1.0E-08	mg/(kg-day)	2.5E-06
				Acenaphthene	6.0E-03	mg/kg	1.8E-09	mg/(kg-day)	—	5.0E-09	mg/(kg-day)	8.4E-08
				Acetone	1.8E-02	mg/kg	4.2E-09	mg/(kg-day)	—	1.2E-08	mg/(kg-day)	1.3E-08
				Anthracene	1.0E-02	mg/kg	3.0E-09	mg/(kg-day)	—	8.4E-09	mg/(kg-day)	2.8E-08
				Arsenic	1.5E+01	mg/kg	1.0E-06	mg/(kg-day)	1.8E-06	2.9E-06	mg/(kg-day)	9.8E-03
				Barium	6.5E+01	mg/kg	1.5E-06	mg/(kg-day)	—	4.2E-06	mg/(kg-day)	2.1E-05
				Benzo[a]anthracene	3.7E-02	mg/kg	1.1E-08	mg/(kg-day)	8.1E-09	3.1E-08	mg/(kg-day)	—
				Benzo[a]pyrene	3.0E-02	mg/kg	9.0E-09	mg/(kg-day)	6.6E-08	2.5E-08	mg/(kg-day)	—
				Benzo[b]fluoranthene	4.5E-02	mg/kg	1.3E-08	mg/(kg-day)	9.8E-09	3.8E-08	mg/(kg-day)	—
				Benzo[g,h,i]perylene	2.4E-02	mg/kg	7.2E-09	mg/(kg-day)	—	2.0E-08	mg/(kg-day)	—
				Benzo[k]fluoranthene	2.1E-02	mg/kg	6.3E-09	mg/(kg-day)	4.6E-10	1.8E-08	mg/(kg-day)	—
				Cadmium	2.9E-01	mg/kg	6.7E-10	mg/(kg-day)	—	1.9E-09	mg/(kg-day)	1.9E-06
				Carbon Disulfide	8.9E-04	mg/kg	2.1E-10	mg/(kg-day)	—	5.7E-10	mg/(kg-day)	5.7E-09
				Chromium	1.4E+01	mg/kg	3.1E-07	mg/(kg-day)	—	8.8E-07	mg/(kg-day)	2.9E-04
				Chrysene	4.5E-02	mg/kg	1.3E-08	mg/(kg-day)	9.8E-11	3.8E-08	mg/(kg-day)	—
				Fluoranthene	9.7E-02	mg/kg	2.9E-08	mg/(kg-day)	—	8.1E-08	mg/(kg-day)	2.0E-06
				Indeno[1,2,3-cd]pyrene	1.8E-02	mg/kg	5.4E-09	mg/(kg-day)	3.9E-09	1.5E-08	mg/(kg-day)	—
				Lead	1.5E+01	mg/kg	—	mg/(kg-day)	—	—	mg/(kg-day)	—
				Mercury	3.0E-02	mg/kg	6.9E-10	mg/(kg-day)	—	1.9E-09	mg/(kg-day)	—
				Methylene Chloride	2.9E-02	mg/kg	6.7E-09	mg/(kg-day)	1.3E-11	1.9E-08	mg/(kg-day)	3.1E-06
				Phenanthrene	6.4E-02	mg/kg	1.9E-08	mg/(kg-day)	—	5.4E-08	mg/(kg-day)	1.8E-07
				Pyrene	6.8E-02	mg/kg	2.0E-08	mg/(kg-day)	—	5.5E-08	mg/(kg-day)	1.8E-06
				Selenium	5.5E-01	mg/kg	1.3E-08	mg/(kg-day)	—	3.6E-08	mg/(kg-day)	7.1E-06
				Exposure Route Total					1.7E-06			1.0E-02
	Particulates and Vapor	Ambient Air	Inhalation	1,2-Dichloroethane	1.5E-03	mg/kg	1.7E-05	µg/m³	—	4.4E-10	mg/m³	6.8E-06
				1-Methylnaphthalene	6.5E-03	mg/kg	5.3E-06	µg/m³	—	1.5E-08	mg/m³	—
				2-Methylnaphthalene	1.2E-02	mg/kg	9.9E-06	µg/m³	—	2.8E-08	mg/m³	—
				Acenaphthene	6.0E-03	mg/kg	2.0E-06	µg/m³	—	5.7E-09	mg/m³	—
				Acetone	1.8E-02	mg/kg	8.4E-05	µg/m³	—	2.3E-07	mg/m³	7.6E-09
				Anthracene	1.0E-02	mg/kg	9.2E-07	µg/m³	—	2.8E-09	mg/m³	—
				Arsenic	1.5E+01	mg/kg	1.3E-06	µg/m³	5.6E-06	3.6E-09	mg/m³	—
				Barium	6.5E+01	mg/kg	5.5E-06	µg/m³	—	1.6E-08	mg/m³	3.1E-05
				Benzo[a]anthracene	3.7E-02	mg/kg	5.6E-07	µg/m³	8.1E-11	1.8E-09	mg/m³	—
				Benzo[a]pyrene	3.0E-02	mg/kg	6.4E-08	µg/m³	7.0E-11	1.8E-10	mg/m³	—
				Benzo[b]fluoranthene	4.5E-02	mg/kg	1.0E-07	µg/m³	1.2E-11	2.9E-10	mg/m³	—
				Benzo[g,h,i]perylene	2.4E-02	mg/kg	2.1E-09	µg/m³	—	5.8E-12	mg/m³	—
				Benzo[k]fluoranthene	2.1E-02	mg/kg	4.8E-08	µg/m³	5.2E-12	1.3E-10	mg/m³	—
				Cadmium	2.9E-01	mg/kg	2.5E-08	µg/m³	4.5E-11	7.0E-11	mg/m³	—
				Carbon Disulfide	8.9E-04	mg/kg	4.4E-05	µg/m³	—	1.2E-07	mg/m³	1.8E-07
				Chromium	1.4E+01	mg/kg	1.2E-06	µg/m³	9.8E-06	3.3E-09	mg/m³	3.3E-05
				Chrysene	4.5E-02	mg/kg	3.4E-07	µg/m³	3.7E-12	9.4E-10	mg/m³	—
				Fluoranthene	9.7E-02	mg/kg	1.7E-06	µg/m³	—	4.7E-09	mg/m³	—
				Indeno[1,2,3-cd]pyrene	1.8E-02	mg/kg	2.4E-08	µg/m³	2.7E-12	6.8E-11	mg/m³	—
				Lead	1.5E+01	mg/kg	1.3E-06	µg/m³	—	3.6E-09	mg/m³	—
				Mercury	3.0E-02	mg/kg	2.6E-09	µg/m³	—	7.2E-12	mg/m³	2.4E-06
				Methylene Chloride	2.9E-02	mg/kg	7.3E-04	µg/m³	7.3E-12	2.0E-06	mg/m³	3.4E-06
				Phenanthrene	6.4E-02	mg/kg	5.5E-09	µg/m³	—	1.5E-11	mg/m³	—
				Pyrene	6.8E-02	mg/kg	1.3E-06	µg/m³	—	3.7E-09	mg/m³	—
				Selenium	5.5E-01	mg/kg	4.7E-08	µg/m³	—	1.3E-10	mg/m³	6.6E-09
				Exposure Route Total					5.7E-06			7.4E-05

TABLE D8.1: CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
FUTURE - COMMERCIAL/INDUSTRIAL WORKER- INVESTIGATION AREA 5
PROPERTY-SPECIFIC RISK ASSESSMENT
FORMER GM STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations			Noncancer Hazard Quotient			
							Intake		Cancer Risk	Intake		Hazard Quotient	
					Value	Units	Value	Units		Value	Units		
Subsurface Soil	Vapor Intrusion	Indoor Air	Inhalation	1,2-Dichloroethene	4.2E-03	µg/m³	3.4E-04	µg/m³	8.9E-09	9.8E-07	mg/m³	1.4E-04	
				2-Butanone	3.5E-02	µg/m³	2.8E-03	µg/m³	—	7.9E-06	mg/m³	1.6E-06	
				Acenaphthene	3.2E-04	µg/m³	2.6E-05	µg/m³	—	7.3E-06	mg/m³	—	
				Acetone	1.2E-01	µg/m³	9.4E-03	µg/m³	—	2.6E-05	mg/m³	8.5E-07	
				Benzo(b)fluoranthene	4.5E-08	µg/m³	3.7E-09	µg/m³	4.1E-13	1.0E-11	mg/m³	—	
				Carbon Disulfide	2.8E-02	µg/m³	2.3E-03	µg/m³	—	6.5E-06	mg/m³	9.2E-06	
				Chrysene	1.3E-06	µg/m³	1.0E-07	µg/m³	1.1E-12	2.9E-10	mg/m³	—	
				Mercury	6.4E-02	µg/m³	5.2E-03	µg/m³	—	1.5E-05	mg/m³	4.9E-02	
				Methylene Chloride	7.5E-01	µg/m³	6.1E-02	µg/m³	6.1E-10	1.7E-04	mg/m³	2.8E-04	
				Exposure Route Total						9.5E-09			4.9E-02
		Exposure Point Total						9.8E-06			7.7E-02		
		Exposure Medium Total						9.8E-06			4.9E-02		
Groundwater	Vapor Intrusion	Indoor Air	Inhalation	cis-1,2-Dichloroethene	4.8E-03	µg/m³	3.7E-04	µg/m³	—	1.0E-06	mg/m³	1.7E-05	
				Gasoline Range Organics	—	µg/m³	—	µg/m³	—	—	mg/m³	—	
				Tetrachloroethene	8.9E-04	µg/m³	7.3E-05	µg/m³	1.9E-11	2.0E-07	mg/m³	5.1E-06	
				trans-1,2-Dichloroethene	6.7E-04	µg/m³	5.4E-05	µg/m³	—	1.5E-07	mg/m³	2.5E-06	
				Trichloroethene	1.0E-02	µg/m³	8.2E-04	µg/m³	3.4E-09	2.3E-06	mg/m³	1.2E-03	
				Vinyl Chloride	5.9E-03	µg/m³	4.8E-04	µg/m³	2.1E-09	1.4E-06	mg/m³	1.4E-05	
				Exposure Route Total						5.5E-09			1.2E-03
				Exposure Point Total						5.5E-09			1.2E-03
		Exposure Medium Total						5.5E-09			1.2E-03		
		Surface Soil + Subsurface Vapor Intrusion + Groundwater Medium Total								Total Risk	1E-05	Total Hazard Index	8E-02
Subsurface Soil Including Vapor Intrusion + Groundwater Medium Total								Total Risk	1E-05	Total Hazard Index	5E-02		

Abbreviations:

—	Not applicable or available
EPA	U.S. Environmental Protection Agency
mg/kg	Milligram per kilogram
mg/(kg-day)	Milligram per kilogram day
mg/m³	Milligrams per cubic meter
µg/m³	Micrograms per cubic meter

Equations:

Intake equations are listed in Table D6

Hazard Quotient

$$= \text{Intake/Reference Dose}_{\text{Oral or Inhalation}}$$

Cancer Risk

$$= \text{Intake/Oral Slope Factor or Inhalation Unit Risk}$$

Exposure Route Total

$$= \sum \text{Chemical of Potential Concern Cancer Risk or Hazard Quotient}$$

Exposure Point Total

$$= \sum \text{Exposure Route Total}$$

Exposure Medium Total

$$= \sum \text{Exposure Point Total}$$

Subsurface Soil Including Vapor Intrusion+ Groundwater Medium Total

$$= \sum \text{Exposure Medium Total}$$

References:

Ohio Environmental Protection Agency (Ohio EPA). 2008. "Support Document for the Development of Generic Numerical Standards and Risk Assessment Procedures." The Voluntary Action Program (VAP). August. On-Line Address: <http://epa.ohio.gov/portals/30/vap/docs/support%20doc%20version.pdf>

TABLE D8.2: CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
FUTURE - CONSTRUCTION WORKER- INVESTIGATION AREA 5
PROPERTY-SPECIFIC RISK ASSESSMENT
FORMER GM STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations			Noncancer Hazard Quotient		
					Value	Units	Intake		Cancer Risk	Intake		Hazard Quotient
							Value	Units		Value	Units	
Subsurface Soil	Subsurface Soil	Subsurface Soil	Ingestion	1,2-Dichloroethane	1.5E-03	mg/kg	2.0E-11	mg/(kg-day)	1.8E-12	1.4E-09	mg/(kg-day)	—
				1-Methylnaphthalene	6.5E-03	mg/kg	8.7E-11	mg/(kg-day)	7.9E-12	6.1E-09	mg/(kg-day)	8.7E-08
				2-Methylnaphthalene	1.2E-02	mg/kg	1.6E-10	mg/(kg-day)	—	1.1E-08	mg/(kg-day)	2.8E-06
				Acenaphthene	6.0E-03	mg/kg	8.1E-11	mg/(kg-day)	—	5.6E-09	mg/(kg-day)	9.4E-09
				Acetone	1.8E-02	mg/kg	2.4E-10	mg/(kg-day)	—	1.7E-08	mg/(kg-day)	6.3E-09
				Anthracene	1.0E-02	mg/kg	1.3E-10	mg/(kg-day)	—	9.4E-09	mg/(kg-day)	3.1E-09
				Arsenic	1.5E+01	mg/kg	1.2E-07	mg/(kg-day)	1.8E-07	8.5E-06	mg/(kg-day)	2.8E-02
				Barium	6.5E+01	mg/kg	8.7E-07	mg/(kg-day)	—	6.1E-05	mg/(kg-day)	8.7E-04
				Benzo[a]anthracene	3.7E-02	mg/kg	5.0E-10	mg/(kg-day)	3.6E-10	3.5E-08	mg/(kg-day)	—
				Benzo[a]pyrene	3.0E-02	mg/kg	4.0E-10	mg/(kg-day)	2.9E-09	2.8E-08	mg/(kg-day)	—
				Benzo[b]fluoranthene	4.5E-02	mg/kg	6.0E-10	mg/(kg-day)	4.4E-10	4.2E-08	mg/(kg-day)	—
				Benzo[g,h,i]perylene	2.4E-02	mg/kg	3.2E-10	mg/(kg-day)	—	2.3E-08	mg/(kg-day)	—
				Benzo[k]fluoranthene	2.1E-02	mg/kg	2.8E-10	mg/(kg-day)	2.1E-11	2.0E-08	mg/(kg-day)	—
				Cadmium	2.9E-01	mg/kg	3.9E-09	mg/(kg-day)	—	2.7E-07	mg/(kg-day)	2.7E-04
				Carbon Disulfide	8.9E-04	mg/kg	1.2E-11	mg/(kg-day)	—	8.4E-10	mg/(kg-day)	8.4E-09
				Chromium	1.4E+01	mg/kg	1.8E-07	mg/(kg-day)	—	1.3E-05	mg/(kg-day)	1.4E-03
				Chrysene	4.5E-02	mg/kg	6.0E-10	mg/(kg-day)	4.4E-12	4.2E-08	mg/(kg-day)	—
				Fluoranthene	9.7E-02	mg/kg	1.3E-09	mg/(kg-day)	—	9.1E-08	mg/(kg-day)	7.6E-07
				Indeno[1,2,3-cd]pyrene	1.8E-02	mg/kg	2.4E-10	mg/(kg-day)	1.8E-10	1.7E-08	mg/(kg-day)	—
				Lead	1.5E+01	mg/kg	2.0E-07	mg/(kg-day)	—	1.4E-05	mg/(kg-day)	—
				Mercury	3.0E-02	mg/kg	4.0E-10	mg/(kg-day)	—	2.8E-08	mg/(kg-day)	—
				Methylene Chloride	2.9E-02	mg/kg	3.9E-10	mg/(kg-day)	7.8E-13	2.7E-08	mg/(kg-day)	4.5E-07
				Phenanthrene	6.4E-02	mg/kg	8.6E-10	mg/(kg-day)	—	6.0E-08	mg/(kg-day)	2.0E-08
				Pyrene	6.6E-02	mg/kg	8.9E-10	mg/(kg-day)	—	6.2E-08	mg/(kg-day)	2.1E-07
				Selenium	5.5E-01	mg/kg	7.38E-09	mg/(kg-day)	—	5.2E-07	mg/(kg-day)	1.0E-04
				Exposure Route Total					1.9E-07			3.1E-02
			Dermal Contact	1,2-Dichloroethane	1.5E-03	mg/kg	1.0E-11	mg/(kg-day)	9.1E-13	7.0E-10	mg/(kg-day)	—
				1-Methylnaphthalene	6.5E-03	mg/kg	5.6E-11	mg/(kg-day)	1.6E-12	3.9E-09	mg/(kg-day)	5.6E-08
				2-Methylnaphthalene	1.2E-02	mg/kg	1.0E-10	mg/(kg-day)	—	7.3E-09	mg/(kg-day)	1.8E-06
				Acenaphthene	6.0E-03	mg/kg	5.2E-11	mg/(kg-day)	—	3.6E-09	mg/(kg-day)	6.0E-09
				Acetone	1.8E-02	mg/kg	1.2E-10	mg/(kg-day)	—	8.4E-09	mg/(kg-day)	3.1E-09
				Anthracene	1.0E-02	mg/kg	8.6E-11	mg/(kg-day)	—	6.0E-09	mg/(kg-day)	2.0E-09
				Arsenic	1.5E+01	mg/kg	3.0E-08	mg/(kg-day)	4.5E-08	2.1E-06	mg/(kg-day)	7.0E-03
				Barium	6.5E+01	mg/kg	4.3E-08	mg/(kg-day)	—	3.0E-06	mg/(kg-day)	4.3E-05
				Benzo[a]anthracene	3.7E-02	mg/kg	3.2E-10	mg/(kg-day)	2.3E-10	2.2E-08	mg/(kg-day)	—
				Benzo[a]pyrene	3.0E-02	mg/kg	2.6E-10	mg/(kg-day)	1.9E-09	1.8E-08	mg/(kg-day)	—
				Benzo[b]fluoranthene	4.5E-02	mg/kg	3.9E-10	mg/(kg-day)	2.8E-10	2.7E-08	mg/(kg-day)	—
				Benzo[g,h,i]perylene	2.4E-02	mg/kg	2.1E-10	mg/(kg-day)	—	1.5E-08	mg/(kg-day)	—
				Benzo[k]fluoranthene	2.1E-02	mg/kg	1.8E-10	mg/(kg-day)	1.3E-11	1.3E-08	mg/(kg-day)	—
				Cadmium	2.9E-01	mg/kg	1.9E-11	mg/(kg-day)	—	1.3E-09	mg/(kg-day)	1.3E-06
				Carbon Disulfide	8.9E-04	mg/kg	5.9E-12	mg/(kg-day)	—	4.1E-10	mg/(kg-day)	4.1E-09
				Chromium	1.4E+01	mg/kg	9.0E-09	mg/(kg-day)	—	6.3E-07	mg/(kg-day)	7.0E-05
				Chrysene	4.5E-02	mg/kg	3.9E-10	mg/(kg-day)	2.8E-12	2.7E-08	mg/(kg-day)	—
				Fluoranthene	9.7E-02	mg/kg	8.4E-10	mg/(kg-day)	—	5.9E-08	mg/(kg-day)	4.9E-07
				Indeno[1,2,3-cd]pyrene	1.8E-02	mg/kg	1.6E-10	mg/(kg-day)	1.1E-10	1.1E-08	mg/(kg-day)	—
				Lead	1.5E+01	mg/kg	—	mg/(kg-day)	—	—	mg/(kg-day)	—
				Mercury	3.0E-02	mg/kg	2.0E-11	mg/(kg-day)	—	1.4E-09	mg/(kg-day)	—
				Methylene Chloride	2.9E-02	mg/kg	1.9E-10	mg/(kg-day)	3.9E-13	1.3E-08	mg/(kg-day)	2.2E-07
				Phenanthrene	6.4E-02	mg/kg	5.5E-10	mg/(kg-day)	—	3.9E-08	mg/(kg-day)	1.3E-08
				Pyrene	6.6E-02	mg/kg	5.7E-10	mg/(kg-day)	—	4.0E-08	mg/(kg-day)	1.3E-07
				Selenium	5.5E-01	mg/kg	3.7E-10	mg/(kg-day)	—	2.6E-08	mg/(kg-day)	5.1E-06
				Exposure Route Total					4.8E-08			7.1E-03

TABLE D8.2: CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
FUTURE - CONSTRUCTION WORKER- INVESTIGATION AREA 5
PROPERTY-SPECIFIC RISK ASSESSMENT
FORMER GM STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations			Noncancer Hazard Quotient				
					Value	Units	Intake		Cancer Risk	Intake		Hazard Quotient		
							Value	Units		Value	Units			
Subsurface Soil	Particulates and Vapor	Ambient Air	Inhalation	1,2-Dichloroethane	1.5E-03	mg/kg	1.6E-06	µg/m³	4.3E-11	1.1E-07	mg/m³	1.6E-06		
				1-Methylnaphthalene	6.5E-03	mg/kg	5.1E-07	µg/m³	—	3.6E-08	mg/m³	—		
				2-Methylnaphthalene	1.2E-02	mg/kg	9.5E-07	µg/m³	—	6.7E-08	mg/m³	—		
				Acenaphthene	6.0E-03	mg/kg	2.0E-07	µg/m³	—	1.4E-08	mg/m³	—		
				Acetone	1.8E-02	mg/kg	8.0E-06	µg/m³	—	5.6E-07	mg/m³	1.8E-08		
				Anthracene	1.0E-02	mg/kg	8.9E-08	µg/m³	—	6.2E-09	mg/m³	—		
				Arsenic	1.5E+01	mg/kg	1.8E-06	µg/m³	7.6E-06	1.2E-07	mg/m³	—		
				Barium	6.5E+01	mg/kg	7.5E-06	µg/m³	—	5.3E-07	mg/m³	1.1E-04		
				Benzo[a]anthracene	3.7E-02	mg/kg	5.7E-08	µg/m³	6.3E-12	4.0E-09	mg/m³	—		
				Benzo[a]pyrene	3.0E-02	mg/kg	9.4E-09	µg/m³	1.0E-11	6.6E-10	mg/m³	—		
				Benzo[b]fluoranthene	4.5E-02	mg/kg	1.5E-08	µg/m³	1.6E-12	1.0E-09	mg/m³	—		
				Benzo[g,h,i]perylene	2.4E-02	mg/kg	2.8E-09	µg/m³	—	2.0E-10	mg/m³	—		
				Benzo[k]fluoranthene	2.1E-02	mg/kg	6.9E-09	µg/m³	7.5E-13	4.8E-10	mg/m³	—		
				Cadmium	2.9E-01	mg/kg	3.4E-08	µg/m³	6.1E-11	2.4E-09	mg/m³	2.4E-04		
				Carbon Disulfide	8.9E-04	mg/kg	4.2E-06	µg/m³	—	2.9E-07	mg/m³	1.4E-07		
				Chromium	1.4E+01	mg/kg	1.6E-06	µg/m³	1.3E-07	1.1E-07	mg/m³	3.7E-06		
				Chrysene	4.5E-02	mg/kg	3.7E-08	µg/m³	4.1E-13	2.6E-09	mg/m³	—		
				Fluoranthene	9.7E-02	mg/kg	1.7E-07	µg/m³	—	1.2E-08	mg/m³	—		
				Indeno[1,2,3-cd]pyrene	1.8E-02	mg/kg	4.3E-09	µg/m³	4.7E-13	3.0E-10	mg/m³	—		
				Lead	1.5E+01	mg/kg	1.7E-06	µg/m³	—	1.2E-07	mg/m³	—		
				Mercury	3.0E-02	mg/kg	3.5E-09	µg/m³	—	2.5E-10	mg/m³	8.2E-07		
				Methylene Chloride	2.9E-02	mg/kg	7.0E-05	µg/m³	7.0E-13	4.9E-06	mg/m³	4.9E-03		
				Phenanthrene	6.4E-02	mg/kg	7.5E-09	µg/m³	—	5.2E-10	mg/m³	—		
				Pyrene	6.6E-02	mg/kg	1.4E-07	µg/m³	—	9.5E-09	mg/m³	—		
				Selenium	5.5E-01	mg/kg	6.4E-08	µg/m³	—	4.5E-09	mg/m³	2.2E-07		
				Exposure Route Total				7.7E-06					5.2E-03	
				Exposure Point Total				8.0E-06					4.3E-02	
				Exposure Medium Total				8.0E-06					4.3E-02	
Groundwater	Vapor Intrusion	Trench Air	Inhalation	cis-1,2-Dichloroethene	4.3E+01	µg/m³	3.4E-02	µg/m³	—	2.4E-03	mg/m³	3.0E-03		
				Gasoline Range Organics	—	µg/m³	—	µg/m³	—	—	mg/m³	—		
				Tetrachloroethene	4.1E+00	µg/m³	3.2E-03	µg/m³	8.3E-10	2.2E-04	mg/m³	5.6E-03		
				trans-1,2-Dichloroethene	6.3E+00	µg/m³	4.9E-03	µg/m³	—	3.4E-04	mg/m³	4.4E-04		
				Trichloroethene	5.9E+01	µg/m³	4.6E-02	µg/m³	1.9E-07	3.2E-03	mg/m³	1.6E+00		
				Vinyl Chloride	1.3E+01	µg/m³	9.9E-03	µg/m³	4.3E-08	6.9E-04	mg/m³	9.0E-03		
				Exposure Route Total				2.3E-07					1.6E+00	
				Exposure Point Total				2.3E-07					1.6E+00	
Exposure Medium Total				2.3E-07					1.6E+00					
Groundwater + Subsurface Soil Medium Total								Total Risk	8E-06	Total Hazard	2E+00			

Abbreviations:

—	Not applicable or available
EPA	U.S. Environmental Protection Agency
mg/kg	Milligram per kilogram
mg/(kg-day)	Milligram per kilogram day
mg/m³	Milligrams per cubic meter
µg/m³	Micrograms per cubic meter

Equations:

Intake equations are listed in Table D6

Hazard Quotient

= Intake/Reference Dose_{Oral} or Intake_{Inhalation}

Cancer Risk

= Intake/Oral Slope Factor or Intake_{Inhalation} Unit Risk

Exposure Route Total

= Σ Chemical of Potential Concern Cancer Risk or Hazard Quotient

Exposure Point Total

= Σ Exposure Route Total

Exposure Medium Total

= Σ Exposure Point Total

Subsurface Soil Including Vapor Intrusion+ Groundwater Medium Total

= Σ Exposure Medium Total

References:

Ohio Environmental Protection Agency (Ohio EPA). 2008. "Support Document for the Development of Generic Numerical Standards and Risk Assessment Procedures."
The Voluntary Action Program (VAP). August. On-Line Address: <http://epa.ohio.gov/portals/30/vap/docs/support%20doc%20version.pdf>

TABLE D9.1: CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
FUTURE - COMMERCIAL/INDUSTRIAL WORKER - INVESTIGATION AREA 10
PROPERTY-SPECIFIC RISK ASSESSMENT
FORMER GM STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations			Noncancer Hazard Quotient		
							Intake		Cancer Risk	Intake		Hazard Quotient
					Value	Units	Value	Units		Value	Units	
Subsurface Soil	Subsurface Soil	Subsurface Soil	Ingestion	1,2-Dichloroethane	6.7E-04	mg/kg	1.2E-10	mg/(kg-day)	1.1E-11	3.3E-10	mg/(kg-day)	-
				1-Methylnaphthalene	4.1E-02	mg/kg	7.2E-09	mg/(kg-day)	2.1E-10	2.0E-08	mg/(kg-day)	2.9E-07
				2-Butanone	3.3E-03	mg/kg	5.8E-10	mg/(kg-day)	-	1.6E-09	mg/(kg-day)	2.7E-09
				2-Methylnaphthalene	3.9E-02	mg/kg	6.8E-09	mg/(kg-day)	-	1.9E-08	mg/(kg-day)	4.8E-06
				Acetone	4.3E-02	mg/kg	7.5E-09	mg/(kg-day)	-	2.1E-08	mg/(kg-day)	2.3E-08
				Aroclor 1242	2.4E-02	mg/kg	4.2E-09	mg/(kg-day)	8.4E-09	1.2E-08	mg/(kg-day)	5.9E-04
				Arsenic	1.8E+01	mg/kg	1.8E-06	mg/(kg-day)	2.8E-06	5.2E-06	mg/(kg-day)	1.7E-02
				Barium	5.5E+01	mg/kg	9.6E-06	mg/(kg-day)	-	2.7E-05	mg/(kg-day)	1.3E-04
				Benzene	3.2E-04	mg/kg	5.6E-11	mg/(kg-day)	3.1E-12	1.6E-10	mg/(kg-day)	3.9E-08
				Benzo[b]fluoranthene	3.6E-02	mg/kg	6.3E-09	mg/(kg-day)	4.6E-09	1.8E-08	mg/(kg-day)	-
				Benzo[g,h,i]perylene	1.8E-02	mg/kg	3.1E-09	mg/(kg-day)	-	8.8E-09	mg/(kg-day)	-
				Carbon Disulfide	2.1E-03	mg/kg	3.7E-10	mg/(kg-day)	-	1.0E-09	mg/(kg-day)	1.0E-08
				Chromium	1.1E+01	mg/kg	1.9E-06	mg/(kg-day)	-	5.3E-06	mg/(kg-day)	1.8E-03
				Chrysene	1.6E-02	mg/kg	2.8E-09	mg/(kg-day)	2.0E-11	7.8E-09	mg/(kg-day)	-
				Fluoranthene	1.8E-02	mg/kg	3.1E-09	mg/(kg-day)	-	8.8E-09	mg/(kg-day)	2.2E-07
				Lead	1.6E+01	mg/kg	2.7E-06	mg/(kg-day)	-	7.6E-06	mg/(kg-day)	-
				Mercury	2.4E-02	mg/kg	4.2E-09	mg/(kg-day)	-	1.2E-08	mg/(kg-day)	-
				Methylene Chloride	4.6E-02	mg/kg	8.0E-09	mg/(kg-day)	1.6E-11	2.3E-08	mg/(kg-day)	3.8E-06
				Phenanthrene	3.6E-02	mg/kg	6.3E-09	mg/(kg-day)	-	1.8E-08	mg/(kg-day)	5.9E-08
				Pyrene	1.5E-02	mg/kg	2.6E-09	mg/(kg-day)	-	7.3E-09	mg/(kg-day)	2.4E-07
				Selenium	5.3E-01	mg/kg	9.3E-08	mg/(kg-day)	-	2.6E-07	mg/(kg-day)	5.2E-05
				Toluene	3.5E-04	mg/kg	6.1E-11	mg/(kg-day)	-	1.7E-10	mg/(kg-day)	2.1E-09
			Exposure Route Total						2.8E-06			2.0E-02
			Dermal Contact	1,2-Dichloroethane	6.7E-04	mg/kg	1.5E-10	mg/(kg-day)	1.4E-11	4.3E-10	mg/(kg-day)	-
				1-Methylnaphthalene	4.1E-02	mg/kg	1.2E-08	mg/(kg-day)	3.6E-10	3.4E-08	mg/(kg-day)	4.9E-07
				2-Butanone	3.3E-03	mg/kg	7.6E-10	mg/(kg-day)	-	2.1E-09	mg/(kg-day)	3.6E-09
				2-Methylnaphthalene	3.9E-02	mg/kg	1.2E-08	mg/(kg-day)	-	3.3E-08	mg/(kg-day)	8.2E-06
				Acetone	4.3E-02	mg/kg	9.9E-09	mg/(kg-day)	-	2.8E-08	mg/(kg-day)	3.1E-08
				Aroclor 1242	2.4E-02	mg/kg	5.5E-09	mg/(kg-day)	1.1E-08	1.5E-08	mg/(kg-day)	7.7E-04
				Arsenic	1.8E+01	mg/kg	1.2E-06	mg/(kg-day)	1.8E-06	3.4E-06	mg/(kg-day)	1.1E-02
				Barium	5.5E+01	mg/kg	1.3E-06	mg/(kg-day)	-	3.5E-06	mg/(kg-day)	1.8E-05
				Benzene	3.2E-04	mg/kg	7.4E-11	mg/(kg-day)	4.1E-12	2.1E-10	mg/(kg-day)	5.2E-08
				Benzo[b]fluoranthene	3.6E-02	mg/kg	1.1E-08	mg/(kg-day)	7.9E-09	3.0E-08	mg/(kg-day)	-
				Benzo[g,h,i]perylene	1.8E-02	mg/kg	5.4E-09	mg/(kg-day)	-	1.5E-08	mg/(kg-day)	-
				Carbon Disulfide	2.1E-03	mg/kg	4.8E-10	mg/(kg-day)	-	1.4E-09	mg/(kg-day)	1.4E-08
				Chromium	1.1E+01	mg/kg	2.5E-07	mg/(kg-day)	-	7.0E-07	mg/(kg-day)	2.3E-04
				Chrysene	1.6E-02	mg/kg	4.8E-09	mg/(kg-day)	3.5E-11	1.3E-08	mg/(kg-day)	-
				Fluoranthene	1.8E-02	mg/kg	5.4E-09	mg/(kg-day)	-	1.5E-08	mg/(kg-day)	3.8E-07
				Lead	1.6E+01	mg/kg	-	mg/(kg-day)	-	-	mg/(kg-day)	-
				Mercury	2.4E-02	mg/kg	5.5E-10	mg/(kg-day)	-	1.5E-09	mg/(kg-day)	-
				Methylene Chloride	4.6E-02	mg/kg	1.1E-08	mg/(kg-day)	2.1E-11	3.0E-08	mg/(kg-day)	5.0E-06
				Phenanthrene	3.6E-02	mg/kg	1.1E-08	mg/(kg-day)	-	3.0E-08	mg/(kg-day)	1.0E-07
				Pyrene	1.5E-02	mg/kg	4.5E-09	mg/(kg-day)	-	1.3E-08	mg/(kg-day)	4.2E-07
				Selenium	5.3E-01	mg/kg	1.2E-08	mg/(kg-day)	-	3.4E-08	mg/(kg-day)	6.8E-06
				Toluene	3.5E-04	mg/kg	8.1E-11	mg/(kg-day)	-	2.3E-10	mg/(kg-day)	2.8E-09
			Exposure Route Total						1.8E-06			1.2E-02

TABLE D9.1: CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
FUTURE - COMMERCIAL/INDUSTRIAL WORKER - INVESTIGATION AREA 10
PROPERTY-SPECIFIC RISK ASSESSMENT
FORMER GM STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations			Noncancer Hazard Quotient			
							Intake		Cancer Risk	Intake		Hazard Quotient	
					Value	Units	Value	Units		Value	Units		
Subsurface Soil	Particulates and Vapor	Ambient Air	Inhalation	1,2-Dichloroethane	6.7E-04	mg/kg	7.6E-06	µg/m³	2.0E-10	2.1E-08	mg/m³	3.1E-06	
				1-Methylnaphthalene	4.1E-02	mg/kg	3.4E-05	µg/m³	—	9.4E-08	mg/m³	—	
				2-Butanone	3.3E-03	mg/kg	1.7E-05	µg/m³	—	4.6E-08	mg/m³	9.3E-09	
				2-Methylnaphthalene	3.9E-02	mg/kg	3.2E-05	µg/m³	—	9.0E-08	mg/m³	—	
				Acetone	4.3E-02	mg/kg	2.0E-04	µg/m³	—	5.6E-07	mg/m³	1.8E-08	
				Aroclor 1242	2.4E-02	mg/kg	1.0E-06	µg/m³	5.9E-10	2.9E-09	mg/m³	—	
				Arsenic	1.8E+01	mg/kg	1.5E-06	µg/m³	6.5E-06	4.2E-09	mg/m³	—	
				Barium	5.5E+01	mg/kg	4.7E-06	µg/m³	—	1.3E-08	mg/m³	2.6E-05	
				Benzene	3.2E-04	mg/kg	4.5E-06	µg/m³	3.5E-11	1.3E-08	mg/m³	4.2E-07	
				Benzo[b]fluoranthene	3.6E-02	mg/kg	8.4E-08	µg/m³	9.2E-12	2.4E-10	mg/m³	—	
				Benzo[g,h,i]perylene	1.8E-02	mg/kg	1.5E-09	µg/m³	—	4.3E-12	mg/m³	—	
				Carbon Disulfide	2.1E-03	mg/kg	1.0E-04	µg/m³	—	2.9E-07	mg/m³	4.1E-07	
				Chromium	1.1E+01	mg/kg	9.4E-07	µg/m³	7.9E-08	2.6E-09	mg/m³	2.6E-05	
				Chrysene	1.6E-02	mg/kg	1.2E-07	µg/m³	1.3E-12	3.3E-10	mg/m³	—	
				Fluoranthene	1.8E-02	mg/kg	3.1E-07	µg/m³	—	8.8E-10	mg/m³	—	
				Lead	1.6E+01	mg/kg	1.3E-06	µg/m³	—	3.7E-09	mg/m³	—	
				Mercury	2.4E-02	mg/kg	2.1E-09	µg/m³	—	5.8E-12	mg/m³	1.9E-08	
				Methylene Chloride	4.6E-02	mg/kg	1.2E-03	µg/m³	1.2E-11	3.2E-06	mg/m³	5.4E-06	
				Phenanthrene	3.6E-02	mg/kg	3.1E-09	µg/m³	—	8.7E-12	mg/m³	—	
				Pyrene	1.5E-02	mg/kg	3.0E-07	µg/m³	—	8.5E-10	mg/m³	—	
				Selenium	5.3E-01	mg/kg	4.5E-08	µg/m³	—	1.3E-10	mg/m³	6.4E-09	
				Toluene	3.5E-04	mg/kg	4.0E-06	µg/m³	—	1.1E-08	mg/m³	2.2E-09	
				Exposure Route Total								6.6E-06	
	Vapor Intrusion	Indoor Air	Inhalation	1,2-Dichloroethane	8.7E-03	µg/m³	7.1E-04	µg/m³	1.8E-08	2.0E-06	mg/m³	2.8E-04	
				2-Butanone	1.2E-01	µg/m³	9.6E-03	µg/m³	—	2.7E-05	mg/m³	5.4E-06	
				Acetone	1.9E-01	µg/m³	1.5E-02	µg/m³	—	4.3E-05	mg/m³	1.4E-06	
				Benzene	2.2E-03	µg/m³	1.8E-04	µg/m³	1.4E-09	5.1E-07	mg/m³	1.7E-05	
				Benzo[b]fluoranthene	2.1E-08	µg/m³	1.7E-09	µg/m³	1.9E-13	4.8E-12	mg/m³	—	
				Carbon Disulfide	1.5E-02	µg/m³	1.2E-03	µg/m³	—	3.4E-06	mg/m³	4.8E-06	
				Chloroethane	2.5E-02	µg/m³	2.0E-03	µg/m³	—	5.7E-06	mg/m³	5.7E-07	
				Chrysene	1.7E-07	µg/m³	1.4E-08	µg/m³	1.5E-13	3.9E-11	mg/m³	—	
				Mercury	2.4E-02	µg/m³	1.9E-03	µg/m³	—	5.4E-06	mg/m³	1.8E-02	
				Methylene Chloride	1.3E+00	µg/m³	1.0E-01	µg/m³	1.0E-09	2.9E-04	mg/m³	4.9E-04	
				Pyrene	5.8E-07	µg/m³	4.7E-08	µg/m³	—	1.3E-10	mg/m³	—	
				Toluene	4.8E-03	µg/m³	3.9E-04	µg/m³	—	1.1E-06	mg/m³	2.2E-07	
				Exposure Route Total								2.1E-08	
	Exposure Point Total								1.1E-05		5.1E-02		
	Exposure Medium Total								1.1E-05		5.1E-02		
Groundwater	Groundwater	Indoor Air	Inhalation	Carbon Disulfide	5.4E-04	µg/m³	4.4E-05	µg/m³	—	1.2E-07	mg/m³	1.8E-07	
			Exposure Route Total								0.0E+00		1.8E-07
		Exposure Point Total		0.0E+00									1.8E-07
		Exposure Medium Total		0.0E+00									1.8E-07
Subsurface Soil + Groundwater Medium Total									Total Risk	1E-05	Total Hazard Index	5E-02	

Abbreviations:

— Not applicable or available
EPA U.S. Environmental Protection Agency
mg/kg Milligram per kilogram
mg/(kg-day) Milligram per kilogram day
mg/m³ Milligrams per cubic meter
µg/m³ Micrograms per cubic meter

Equations:

Intake equations are listed in Table D6

Hazard Quotient

= Intake/Reference Doses_{Oral or Inhalation}

Cancer Risk

= Intake/Oral Slope Factor or Inhalation Unit Risk

Exposure Route Total

= Σ Chemical of Potential Concern Cancer Risk or Hazard Quotient

Exposure Point Total

= Σ Exposure Route Total

Exposure Medium Total

= Σ Exposure Point Total

Subsurface Soil Including Vapor Intrusion+ Groundwater Medium Total

= Σ Exposure Medium Total

References:

Ohio Environmental Protection Agency (Ohio EPA). 2008. "Support Document for the Development of Generic Numerical Standards and Risk Assessment Procedures."
The Voluntary Action Program (VAP). August. On-Line Address: <http://epa.ohio.gov/portals/30/vap/docs/support%20doc%20version.pdf>

TABLE D9.2: CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
FUTURE - CONSTRUCTION WORKER - INVESTIGATION AREA 10
PROPERTY-SPECIFIC RISK ASSESSMENT
FORMER GM STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations			Noncancer Hazard Quotient		
							Intake		Cancer Risk	Intake		Hazard Quotient
					Value	Units	Value	Units		Value	Units	
Subsurface Soil	Subsurface Soil	Subsurface Soil	Ingestion	1,2-Dichloroethane	6.7E-04	mg/kg	9.0E-12	mg/(kg-day)	8.2E-13	6.3E-10	mg/(kg-day)	—
				1-Methylnaphthalene	4.1E-02	mg/kg	5.5E-10	mg/(kg-day)	1.6E-11	3.9E-08	mg/(kg-day)	5.5E-07
				2-Butanone	3.3E-03	mg/kg	4.4E-11	mg/(kg-day)	—	3.1E-09	mg/(kg-day)	1.5E-09
				2-Methylnaphthalene	3.9E-02	mg/kg	5.2E-10	mg/(kg-day)	—	3.7E-08	mg/(kg-day)	9.2E-06
				Acetone	4.3E-02	mg/kg	5.8E-10	mg/(kg-day)	—	4.0E-08	mg/(kg-day)	1.5E-08
				Aroclor 1242	2.4E-02	mg/kg	3.2E-10	mg/(kg-day)	6.4E-10	2.3E-08	mg/(kg-day)	3.8E-04
				Arsenic	1.8E+01	mg/kg	1.4E-07	mg/(kg-day)	2.1E-07	9.9E-06	mg/(kg-day)	3.3E-02
				Barium	5.5E+01	mg/kg	7.4E-07	mg/(kg-day)	—	5.1E-05	mg/(kg-day)	7.4E-04
				Benzene	3.2E-04	mg/kg	4.3E-12	mg/(kg-day)	2.4E-13	3.0E-10	mg/(kg-day)	2.5E-08
				Benzo[b]fluoranthene	3.6E-02	mg/kg	4.8E-10	mg/(kg-day)	3.5E-10	3.4E-08	mg/(kg-day)	—
				Benzo[g,h,i]perylene	1.8E-02	mg/kg	2.4E-10	mg/(kg-day)	—	1.7E-08	mg/(kg-day)	—
				Carbon Disulfide	2.1E-03	mg/kg	2.8E-11	mg/(kg-day)	—	2.0E-09	mg/(kg-day)	2.0E-08
				Chromium	1.1E+01	mg/kg	1.5E-07	mg/(kg-day)	—	1.0E-05	mg/(kg-day)	1.1E-03
				Chrysene	1.6E-02	mg/kg	2.1E-10	mg/(kg-day)	1.6E-12	1.5E-08	mg/(kg-day)	—
				Fluoranthene	1.8E-02	mg/kg	2.4E-10	mg/(kg-day)	—	1.7E-08	mg/(kg-day)	1.4E-07
				Lead	1.6E+01	mg/kg	2.1E-07	mg/(kg-day)	—	1.5E-05	mg/(kg-day)	—
				Mercury	2.4E-02	mg/kg	3.2E-10	mg/(kg-day)	—	2.3E-08	mg/(kg-day)	—
				Methylene Chloride	4.6E-02	mg/kg	6.2E-10	mg/(kg-day)	1.2E-12	4.3E-08	mg/(kg-day)	7.2E-07
				Phenanthrene	3.6E-02	mg/kg	4.8E-10	mg/(kg-day)	—	3.4E-08	mg/(kg-day)	1.1E-08
				Pyrene	1.5E-02	mg/kg	2.0E-10	mg/(kg-day)	—	1.4E-08	mg/(kg-day)	4.7E-08
				Selenium	5.3E-01	mg/kg	7.1E-09	mg/(kg-day)	—	5.0E-07	mg/(kg-day)	1.0E-04
				Toluene	3.5E-04	mg/kg	4.7E-12	mg/(kg-day)	—	3.3E-10	mg/(kg-day)	4.1E-10
			Exposure Route Total						2.1E-07			3.5E-02
			Dermal Contact	1,2-Dichloroethane	6.7E-04	mg/kg	4.5E-12	mg/(kg-day)	4.0E-13	3.1E-10	mg/(kg-day)	—
				1-Methylnaphthalene	4.1E-02	mg/kg	3.5E-10	mg/(kg-day)	1.0E-11	2.5E-08	mg/(kg-day)	3.5E-07
				2-Butanone	3.3E-03	mg/kg	2.2E-11	mg/(kg-day)	—	1.5E-09	mg/(kg-day)	7.7E-10
				2-Methylnaphthalene	3.9E-02	mg/kg	3.4E-10	mg/(kg-day)	—	2.4E-08	mg/(kg-day)	5.9E-06
				Acetone	4.3E-02	mg/kg	2.9E-10	mg/(kg-day)	—	2.0E-08	mg/(kg-day)	7.4E-09
				Aroclor 1242	2.4E-02	mg/kg	2.2E-10	mg/(kg-day)	4.5E-10	1.6E-08	mg/(kg-day)	2.6E-04
				Arsenic	1.8E+01	mg/kg	3.5E-08	mg/(kg-day)	5.3E-08	2.5E-06	mg/(kg-day)	8.2E-03
				Barium	5.5E+01	mg/kg	3.6E-08	mg/(kg-day)	—	2.5E-06	mg/(kg-day)	3.6E-05
				Benzene	3.2E-04	mg/kg	2.1E-12	mg/(kg-day)	1.2E-13	1.5E-10	mg/(kg-day)	1.2E-08
				Benzo[b]fluoranthene	3.6E-02	mg/kg	3.1E-10	mg/(kg-day)	2.3E-10	2.2E-08	mg/(kg-day)	—
				Benzo[g,h,i]perylene	1.8E-02	mg/kg	1.6E-10	mg/(kg-day)	—	1.1E-08	mg/(kg-day)	—
				Carbon Disulfide	2.1E-03	mg/kg	1.4E-11	mg/(kg-day)	—	9.8E-10	mg/(kg-day)	9.8E-09
				Chromium	1.1E+01	mg/kg	7.2E-09	mg/(kg-day)	—	5.1E-07	mg/(kg-day)	5.6E-05
				Chrysene	1.6E-02	mg/kg	1.4E-10	mg/(kg-day)	1.0E-12	9.7E-09	mg/(kg-day)	—
				Fluoranthene	1.8E-02	mg/kg	1.6E-10	mg/(kg-day)	—	1.1E-08	mg/(kg-day)	9.1E-08
				Lead	1.6E+01	mg/kg	—	mg/(kg-day)	—	—	mg/(kg-day)	—
				Mercury	2.4E-02	mg/kg	1.6E-11	mg/(kg-day)	—	1.1E-09	mg/(kg-day)	—
				Methylene Chloride	4.6E-02	mg/kg	3.1E-10	mg/(kg-day)	6.1E-13	2.1E-08	mg/(kg-day)	3.6E-07
				Phenanthrene	3.6E-02	mg/kg	3.1E-10	mg/(kg-day)	—	2.2E-08	mg/(kg-day)	7.3E-09
				Pyrene	1.5E-02	mg/kg	1.3E-10	mg/(kg-day)	—	9.1E-09	mg/(kg-day)	3.0E-08
				Selenium	5.3E-01	mg/kg	3.5E-10	mg/(kg-day)	—	2.5E-08	mg/(kg-day)	4.9E-06
				Toluene	3.5E-04	mg/kg	2.3E-12	mg/(kg-day)	—	1.6E-10	mg/(kg-day)	2.0E-10
			Exposure Route Total						5.3E-08			8.5E-03

TABLE D9.2: CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
FUTURE - CONSTRUCTION WORKER - INVESTIGATION AREA 10
PROPERTY-SPECIFIC RISK ASSESSMENT
FORMER GM STAMPING PLANT
ONTARIO, RICHLAND COUNTY, OHIO

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations			Noncancer Hazard Quotient					
							Intake		Cancer Risk	Intake		Hazard Quotient			
					Value	Units	Value	Units		Value	Units				
Subsurface Soil	Particulates and Vapor	Ambient Air	Inhalation	1,2-Dichloroethane	6.7E-04	mg/kg	7.3E-07	µg/m³	1.9E-11	5.1E-08	mg/m³	7.3E-07			
				1-Methylnaphthalene	4.1E-02	mg/kg	3.2E-06	µg/m³	—	2.3E-07	mg/m³	—			
				2-Butanone	3.3E-03	mg/kg	1.6E-06	µg/m³	—	1.1E-07	mg/m³	1.1E-07			
				2-Methylnaphthalene	3.9E-02	mg/kg	3.1E-06	µg/m³	—	2.2E-07	mg/m³	—			
				Acetone	4.3E-02	mg/kg	1.9E-05	µg/m³	—	1.3E-06	mg/m³	4.3E-08			
				Aroclor 1242	2.4E-02	mg/kg	1.0E-07	µg/m³	5.8E-11	7.2E-09	mg/m³	—			
				Arsenic	1.8E+01	mg/kg	2.1E-06	µg/m³	8.8E-06	1.4E-07	mg/m³	—			
				Barium	5.5E+01	mg/kg	6.4E-06	µg/m³	—	4.5E-07	mg/m³	9.0E-05			
				Benzene	3.2E-04	mg/kg	4.3E-07	µg/m³	3.4E-12	3.0E-08	mg/m³	3.4E-07			
				Benzo[b]fluoranthene	3.6E-02	mg/kg	1.2E-08	µg/m³	1.3E-12	8.4E-10	mg/m³	—			
				Benzo[g,h,i]perylene	1.8E-02	mg/kg	2.1E-09	µg/m³	—	1.5E-10	mg/m³	—			
				Carbon Disulfide	2.1E-03	mg/kg	9.9E-06	µg/m³	—	7.0E-07	mg/m³	3.3E-07			
				Chromium	1.1E+01	mg/kg	1.3E-06	µg/m³	1.1E-07	8.9E-08	mg/m³	3.0E-06			
				Chrysene	1.6E-02	mg/kg	1.3E-08	µg/m³	1.5E-13	9.2E-10	mg/m³	—			
				Fluoranthene	1.8E-02	mg/kg	3.2E-08	µg/m³	—	2.2E-09	mg/m³	—			
				Lead	1.6E+01	mg/kg	1.8E-06	µg/m³	—	1.3E-07	mg/m³	—			
				Mercury	2.4E-02	mg/kg	2.8E-09	µg/m³	—	2.0E-10	mg/m³	6.5E-07			
				Methylene Chloride	4.6E-02	mg/kg	1.1E-04	µg/m³	1.1E-12	7.8E-06	mg/m³	7.8E-03			
				Phenanthrene	3.6E-02	mg/kg	4.2E-09	µg/m³	—	2.9E-10	mg/m³	—			
				Pyrene	1.5E-02	mg/kg	3.1E-08	µg/m³	—	2.2E-09	mg/m³	—			
				Selenium	5.3E-01	mg/kg	6.2E-08	µg/m³	—	4.3E-09	mg/m³	2.2E-07			
				Toluene	3.5E-04	mg/kg	3.8E-07	µg/m³	—	2.7E-08	mg/m³	5.4E-09			
				Exposure Route Total								8.9E-06			7.9E-03
				Exposure Point Total								9.2E-06			5.2E-02
	Exposure Medium Total								9.2E-06			5.2E-02			
Groundwater	Groundwater	Trench Air	Inhalation	Carbon Disulfide	2.5E-02	µg/m³	2.0E-05	µg/m³	—	1.4E-06	mg/m³	6.6E-07			
			Exposure Route Total						0.0E+00			6.6E-07			
		Exposure Point Total						0.0E+00			6.6E-07				
	Exposure Medium Total								0.0E+00			6.6E-07			
Groundwater + Subsurface Soil Medium Total								Total Risk	9E-06	Total Hazard	5E-02				

Abbreviations:

—	Not applicable or available
EPA	U.S. Environmental Protection Agency
mg/kg	Milligram per kilogram
mg/(kg-day)	Milligram per kilogram day
mg/m³	Milligrams per cubic meter
µg/m³	Micrograms per cubic meter

Equations:

Intake equations are listed in Table D6

Hazard Quotient

$$= \text{Intake/Reference Doses}_{\text{Oral or Inhalation}}$$

Cancer Risk

$$= \text{Intake/Oral Slope Factor or Inhalation Unit Risk}$$

Exposure Route Total

$$= \sum \text{Chemical of Potential Concern Cancer Risk or Hazard Quotient}$$

Exposure Point Total

$$= \sum \text{Exposure Route Total}$$

Exposure Medium Total

$$= \sum \text{Exposure Point Total}$$

Subsurface Soil Including Vapor Intrusion+ Groundwater Medium Total

$$= \sum \text{Exposure Medium Total}$$

References:

Ohio Environmental Protection Agency (Ohio EPA). 2008. "Support Document for the Development of Generic Numerical Standards and Risk Assessment Procedures."
The Voluntary Action Program (VAP). August. On-Line Address: <http://epa.ohio.gov/portals/30/vap/docs/support%20doc%20version.pdf>

**TABLE D10.1: CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
FUTURE - COMMERCIAL/INDUSTRIAL WORKER- INVESTIGATION AREA 14**

PROPERTY-SPECIFIC RISK ASSESSMENT

FORMER GM STAMPING PLANT

ONTARIO, RICHLAND COUNTY, OHIO

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations			Noncancer Hazard Quotient			
							Intake		Cancer Risk	Intake		Hazard Quotient	
					Value	Units	Value	Units		Value	Units		
Subsurface Soil	Vapor Intrusion	Indoor Air	Inhalation	2-Butanone	3.3E-03	µg/m³	2.7E-04	µg/m³	—	7.6E-07	mg/m³	1.5E-07	
				Acetone	3.7E-02	µg/m³	3.0E-03	µg/m³	—	8.4E-06	mg/m³	2.7E-07	
				Benzene	1.4E-02	µg/m³	1.1E-03	µg/m³	8.8E-09	3.2E-06	mg/m³	1.1E-04	
				Bromomethane	9.8E-03	µg/m³	8.0E-04	µg/m³	—	2.2E-06	mg/m³	4.5E-04	
				Carbon Disulfide	3.0E-02	µg/m³	2.4E-03	µg/m³	—	6.8E-06	mg/m³	9.8E-06	
				Chrysene	4.6E-08	µg/m³	3.8E-09	µg/m³	4.1E-14	1.1E-11	mg/m³	—	
				Fluorene	1.0E-05	µg/m³	8.3E-07	µg/m³	—	2.3E-09	mg/m³	—	
				Methylene Chloride	9.1E-02	µg/m³	7.4E-03	µg/m³	7.4E-11	2.1E-05	mg/m³	3.4E-05	
				Naphthalene	1.0E-03	µg/m³	8.3E-05	µg/m³	2.8E-09	2.3E-07	mg/m³	7.8E-05	
				Pyrene	3.5E-07	µg/m³	2.8E-08	µg/m³	—	7.9E-11	mg/m³	—	
				Toluene	1.6E-03	µg/m³	1.3E-04	µg/m³	—	3.6E-07	mg/m³	7.2E-08	
				Exposure Route Total							1.2E-08		6.7E-04
				Exposure Point Total							1.2E-08		6.7E-04
	Exposure Medium Total							1.2E-08		6.7E-04			
Groundwater	Vapor Intrusion	Indoor Air	Inhalation	Benzo[b]fluoranthene	9.1E-07	µg/m³	7.4E-08	µg/m³	8.2E-12	2.1E-10	mg/m³	—	
				C20-C34	—	µg/m³	—	µg/m³	—	—	mg/m³	—	
				Chrysene	2.9E-06	µg/m³	2.4E-07	µg/m³	3E-12	6.7E-10	mg/m³	—	
				Fluoranthene	—	µg/m³	—	µg/m³	—	—	mg/m³	—	
				Phenanthrene	—	µg/m³	—	µg/m³	—	—	mg/m³	—	
				Pyrene	7.5E-06	µg/m³	6.1E-07	µg/m³	—	1.7E-09	mg/m³	—	
				Exposure Route Total							1.1E-11		0.0E+00
				Exposure Point Total							1.1E-11		0.0E+00
				Exposure Medium Total							1.1E-11		0.0E+00
	Subsurface Soil + Groundwater Medium Total								Total Risk	1E-08	Total Hazard Index	7E-04	

Abbreviations:

—	Not applicable or available
EPA	U.S. Environmental Protection Agency
mg/kg	Milligram per kilogram
mg/(kg-day)	Milligram per kilogram day
mg/m³	Milligrams per cubic meter
µg/m³	Micrograms per cubic meter

Equations:

Intake equations are listed in Table D6

Hazard Quotient	= Intake/Reference Doses _{Oral or Inhalation}
Cancer Risk	= Intake/Oral Slope Factor or Inhalation Unit Risk
Exposure Route Total	= Σ Chemical of Potential Concern Cancer Risk or Hazard Quotient
Exposure Point Total	= Σ Exposure Route Total
Exposure Medium Total	= Σ Exposure Point Total
Subsurface Soil Including Vapor Intrusion+ Groundwater Medium Total	= Σ Exposure Medium Total

References:

Ohio Environmental Protection Agency (Ohio EPA). 2008. "Support Document for the Development of Generic Numerical Standards and Risk Assessment Procedures."
The Voluntary Action Program (VAP). August. On-Line Address: <http://epa.ohio.gov/portals/30/vap/docs/support%20doc%20version.pdf>

**TABLE D10.2: CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS
FUTURE - CONSTRUCTION WORKER- INVESTIGATION AREA 14**

PROPERTY-SPECIFIC RISK ASSESSMENT

FORMER GM STAMPING PLANT

ONTARIO, RICHLAND COUNTY, OHIO

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations			Noncancer Hazard Quotient		
							Intake		Cancer Risk	Intake		Hazard Quotient
					Value	Units	Value	Units		Value	Units	
Groundwater	Vapor Intrusion	Trench Air	Inhalation	Benzo[b]fluoranthene	1.8E-05	µg/m³	1.4E-08	µg/m³	1.6E-12	1.0E-09	mg/m³	—
				C20-C34	—	µg/m³	—	µg/m³	—	—	mg/m³	—
				Chrysene	1.9E-05	µg/m³	1.4E-08	µg/m³	2E-13	1.0E-09	mg/m³	—
				Fluoranthene	6.1E-06	µg/m³	4.8E-09	µg/m³	—	3.4E-10	mg/m³	—
				Phenanthrene	6.5E-06	µg/m³	5.1E-09	µg/m³	—	3.6E-10	mg/m³	—
				Pyrene	3.4E-06	µg/m³	2.6E-09	µg/m³	—	1.8E-10	mg/m³	—
				Exposure Route Total					1.7E-12			0.0E+00
				Exposure Point Total					1.7E-12			0.0E+00
				Exposure Medium Total					1.7E-12			0.0E+00
				Groundwater Medium Total					Total Risk	2E-12	Total Hazard	0E+00

Abbreviations:

—	Not applicable or available
EPA	U.S. Environmental Protection Agency
mg/kg	Milligram per kilogram
mg/(kg-day)	Milligram per kilogram day
mg/m³	Milligrams per cubic meter
µg/m³	Micrograms per cubic meter

Equations:

Intake equations are listed in Table D6

Hazard Quotient

= Intake/Reference Doses_{Oral or Inhalation}

Cancer Risk

= Intake/Oral Slope Factor or Inhalation Unit Risk

Exposure Route Total

=ΣChemical of Potential Concern Cancer Risk or Hazard Quotient

Exposure Point Total

=ΣExposure Route Total

Exposure Medium Total

=ΣExposure Point Total

Subsurface Soil Including Vapor Intrusion+ Groundwater Medium Total

=Σ Exposure Medium Total

References:

Ohio Environmental Protection Agency (Ohio EPA). 2008. "Support Document for the Development of Generic Numerical Standards and Risk Assessment Procedures."

The Voluntary Action Program (VAP). August. On-Line Address: <http://epa.ohio.gov/portals/30/vap/docs/support%20doc%20version.pdf>