

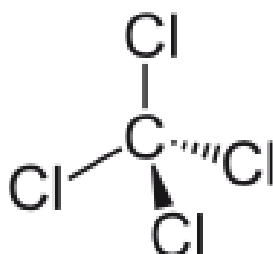


**Final Risk Evaluation for
Carbon Tetrachloride
(Methane, Tetrachloro-)**

Systematic Review Supplemental File:

**Data Quality Evaluation of Environmental Release and
Occupational Exposure Data**

CASRN: 56-23-5



October 2020

This document is a compilation of tables for the data extraction and evaluation for Carbon Tetrachloride (Methane, Tetrachloro-). Each table shows the data point or set or information element that was extracted and evaluated from a data source in accordance with Appendix D of the *Application of Systematic Review in TSCA Risk Evaluations*. If the source contains more than one data set or information element, the review provides an overall confidence score for each data set or information element that is found in the source. Therefore, it is possible that a source may have more than one overall quality/confidence score.

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Explanatory Notes

These explanatory notes provide context to understand the short comments in the data evaluation tables.

Domain	Metric	Description of Comments Field
Reliability	Methodology	Indicates the sampling/analytical methodology, estimation method, or type of publication
Representativeness	Geographic Scope	Indicates the country of the study, publication, or underlying data
	Applicability	Indicates whether the data are for a condition of use within scope of the Risk Evaluation
	Temporal Representativeness	Provides the year of study, publication, or underlying data
	Sample Size	Describes the distribution of the sample or underlying data
Accessibility / Clarity	Metadata Completeness	Describes the completeness of the metadata
Variability and Uncertainty	Metadata Completeness	Indicates if study or publication addresses variability and uncertainty of the data or information

Releases to the Environment

Source Citation:	Geelen, L. M. J., Huijbregts, M. A. J., Den Hollander, H., Ragas, A. M. J., van Jaarsveld, H. A., de Zwart, D.. 2009. Confronting environmental pressure, environmental quality and human health impact indicators of priority air emissions. Atmospheric Environment.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	606363

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Release Source:	the Netherlands Pollutant Release and Transfer Register
Environmental Media:	Air
Release Estimation Method:	measured
Annual Release Quantity (kg/yr):	2.8x103

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	national database
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	OECD Country (Netherlands)
Metric 3:	Applicability	Unacceptable	× 2	8	non-occupation focus, release data is background concentration
Metric 4:	Temporal Representativeness	High	× 2	2	Data from 10 years ago (2008)
Metric 5:	Sample Size	High	× 1	1	national scale
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	only includes yearly release data for national release total
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	does not discuss variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.2.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation: Hurst, D. F., Lin, J. C., Romashkin, P. A., Daube, B. C., Gerbig, C., Matross, D. M., Wofsy, S. C., Hall, B. D., Elkins, J. W.. 2006. Continuing global significance of emissions of Montreal Protocol-restricted halocarbons in the United States and Canada. Journal of Geophysical Research: Atmospheres.

Type of Data Source: Releases to the Environment; Environmental Release Data;
 Hero ID: 608526

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Release Source:	"Contemporary anthropogenic emissions"
Environmental Media:	Air
Release Estimation Method:	thousands of in situ measurements from a small aircraft
Annual Release Quantity (kg/yr):	-0.0003 kg/person/yr

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	thousands of in situ measurements from a small aircraft
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US & Canada
	Metric 3: Applicability	Unacceptable	× 2	8	Data for all scenarios across US and Canada, background concentration
	Metric 4: Temporal Representativeness	Medium	× 2	4	Data greater than 10 years old (2003)
	Metric 5: Sample Size	High	× 1	1	national scale (thousands)
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	very thorough paper
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	addresses both variability and uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 1.9.

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Source Citation:	Hurst, D. F., Lin, J. C., Romashkin, P. A., Daube, B. C., Gerbig, C., Matross, D. M., Wofsy, S. C., Hall, B. D., Elkins, J. W.. 2006. Continuing global significance of emissions of Montreal Protocol-restricted halocarbons in the United States and Canada. Journal of Geophysical Research: Atmospheres.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	608526

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
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** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation: Jiun-Horng, T.,Kuo-Hsiung, L.,Chih-Yu, C.,Nina, L.,Sen-Yi, M.,Hung-Lung, C.. 2008. Volatile organic compound constituents from an integrated iron and steel facility. Journal of Hazardous Materials.

Type of Data Source: Releases to the Environment; Environmental Release Data;

Hero ID: 609426

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	Processing aid
Release Source:	Hot forming process in iron and steel facility
Disposal /Treatment Method:	Stack Gas
Environmental Media:	Air
Release Estimation Method:	Measured from stack then analyzed by US EPA Method 18 integrated bag method
Annual Release Quantity (kg/yr):	2698 ppbv
Number of Sites:	1
Waste Treatment Method:	emission to air

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	Accurate method, may exclude some releases sources at site
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	non-OECD (Taiwan)
	Metric 3: Applicability	High	× 2	2	emission to air
	Metric 4: Temporal Representativeness	High	× 2	2	Data from 10 years ago (2008)
	Metric 5: Sample Size	Medium	× 1	2	Range of sampling not discussed
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	complete data
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Medium	× 1	2	lists uncertainty, limited discussion on variability
Overall Quality Determination [†]		High		1.6	
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Source Citation:	Jiun-Horng, T.,Kuo-Hsiung, L.,Chih-Yu, C.,Nina, L.,Sen-Yi, M.,Hung-Lung, C.. 2008. Volatile organic compound constituents from an integrated iron and steel facility. Journal of Hazardous Materials.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	609426

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation:	Kroeze, C.,Reijnders, L.. 1992. Halocarbons and global warming. Science of the Total Environment.
Type of Data Source	Releases to the Environment; Published Models for Exposures or Releases;
Hero ID	773076

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Environmental Media:	Air
Release Estimation Method:	measured, global data from technical papers
Annual Release Quantity (kg/yr):	kton/yr

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	sources are quality technical papers
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	global data
Metric 3:	Applicability	Unacceptable	× 2	8	global emissions, background concentration
Metric 4:	Temporal Representativeness	Unacceptable	× 2	8	Data is Pre-Montreal Protocol (1990)
Metric 5:	Sample Size	Low	× 1	3	no statistics of sample size
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Medium	× 1	2	Data sources cited but not fully described
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	does not discuss variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 3.0.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, two of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Yokouchi, Y.. 2005. Estimates of ratios of anthropogenic halocarbon emissions from Japan based on aircraft monitoring over Sagami Bay, Japan. Journal of Geophysical Research.

Type of Data Source: Releases to the Environment; Environmental Release Data;
 Hero ID: 1006187

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Release Source:	Sagami Bay, Japan
Environmental Media:	Air
Release Estimation Method:	measured from aircraft
Annual Release Quantity (kg/yr):	Gg/yr

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	brief samping description, but details published in another paper, analyzed at National Institute forEnvironmental Studies
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	Japan
Metric 3:	Applicability	Unacceptable	× 2	8	global emissions, background concentration
Metric 4:	Temporal Representativeness	Medium	× 2	4	Data greater than 10 years old (2002)
Metric 5:	Sample Size	Low	× 1	3	no statistics of sample size
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	complete data
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	does not discuss variability or uncertainty

Overall Quality Determination[†] Unacceptable 4 Metric Mean Score: 2.4.

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Source Citation:	Yokouchi, Y.. 2005. Estimates of ratios of anthropogenic halocarbon emissions from Japan based on aircraft monitoring over Sagami Bay, Japan. Journal of Geophysical Research.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	1006187

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation:	Palmer, P. I.. 2003. Eastern Asian emissions of anthropogenic halocarbons deduced from aircraft concentration data. Journal of Geophysical Research.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	1006234

EXTRACTION	
Parameter	Data
Life Cycle Stage:	Use
Release Source:	Eastern Asia
Environmental Media:	Air
Release Estimation Method:	measured from aircraft
Annual Release Quantity (kg/yr):	Gg/yr

EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
	Metric 1: Methodology	Medium	× 1	2	Methodology not well described	
Domain 2: Representative						
	Metric 2: Geographic Scope	Low	× 1	3	China, Japan, Korea	
	Metric 3: Applicability	Unacceptable	× 2	8	global emissions, background concentration	
	Metric 4: Temporal Representativeness	Medium	× 2	4	Data greater than 10 years old (2001)	
	Metric 5: Sample Size	Medium	× 1	2	brief sample description, little statistics on sample size	
Domain 3: Accessibility/Clarity						
	Metric 6: Metadata Completeness	High	× 1	1	complete data	
Domain 4: Variability and Uncertainty						
	Metric 7: Metadata Completeness	Medium	× 1	2	discusses uncertainty only	
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.4.	

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Pratt, G. C.,Palmer, K.,Wu, C. Y.,Oliaei, F.,Hollerbach, C.,Fenske, M. J.. 2000. An assessment of air toxics in Minnesota. Environmental Health Perspectives.
Type of Data Source	Releases to the Environment; Monitoring Data;
Hero ID	1019159

EXTRACTION	
Parameter	Data
Life Cycle Stage:	Use
Release Source:	State of Minnesota
Environmental Media:	Air

EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
	Metric 1: Methodology	High	× 1	1	EPA Assessment System for Population Exposure Nationwide model	
Domain 2: Representative						
	Metric 2: Geographic Scope	High	× 1	1	US	
	Metric 3: Applicability	Unacceptable	× 2	8	emission to air, background concentration	
	Metric 4: Temporal Representativeness	Medium	× 2	4	Data greater than 10 years old (2000)	
	Metric 5: Sample Size	Medium	× 1	2	some biases in sample size, but paper discusses the satittical distribution	
Domain 3: Accessibility/Clarity						
	Metric 6: Metadata Completeness	High	× 1	1	complete data	
Domain 4: Variability and Uncertainty						
	Metric 7: Metadata Completeness	High	× 1	1	discusses both uncertainty and variability	
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.0.	

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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Hurst, D. F.. 2004. Emissions of ozone-depleting substances in Russia during 2001. Journal of Geophysical Research.
 Type of Data Source Releases to the Environment; Environmental Release Data;
 Hero ID 1311751

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Release Source:	Russia
Environmental Media:	Air
Release Estimation Method:	measured from trans-siberian railway
Annual Release Quantity (kg/yr):	Gg/yr
Number of Sites:	49

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	methodology expected to be accurate
Domain 2: Representative					
Metric 2:	Geographic Scope	Low	× 1	3	non-OECD, Russia
Metric 3:	Applicability	Unacceptable	× 2	8	emission to air, background concentration
Metric 4:	Temporal Representativeness	Medium	× 2	4	Data greater than 10 years old (2001)
Metric 5:	Sample Size	High	× 1	1	national scale (thousands)
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	complete data
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	High	× 1	1	discusses both uncertainty and variability
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.1.

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† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Dunse, B. L., Steele, L. P., Wilson, S. R., Fraser, P. J., Krummel, P. B.. 2005. Trace gas emissions from Melbourne, Australia, based on AGAGE observations at Cape Grim, Tasmania, 1995-2000. Atmospheric Environment.

Type of Data Source: Releases to the Environment; Environmental Release Data;

Hero ID: 1947347

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Release Source:	Australia
Environmental Media:	Air
Release Estimation Method:	Measured, Air samples from lab on the Tasmanian coast
Daily Release Quantity (kg/day):	ppt
Annual Release Quantity (kg/yr):	t/yr
Number of Sites:	1

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	analysis of sample and secondary standard
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	Australia
	Metric 3: Applicability	Unacceptable	× 2	8	emission to air, background concentration
	Metric 4: Temporal Representativeness	Medium	× 2	4	Data greater than 10 years old (1995-2000)
	Metric 5: Sample Size	High	× 1	1	36 samples/day over 5 years
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	complete data
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	discusses both uncertainty and variability
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.0.

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Source Citation:	Dunse, B. L.,Steele, L. P.,Wilson, S. R.,Fraser, P. J.,Krummel, P. B.. 2005. Trace gas emissions from Melbourne, Australia, based on AGAGE observations at Cape Grim, Tasmania, 1995-2000. Atmospheric Environment.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	1947347

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
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† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation: Zhang, Y. L.,Guo, H.,Wang, X. M.,Simpson, I. J.,Barletta, B.,Blake, D. R.,Meinardi, S.,Rowland, F. S.,Cheng, H. R.,Saunders, S. M.,Lam, S. H. M.. 2010. Emission patterns and spatiotemporal variations of halocarbons in the Pearl River Delta region, southern China. Journal of Geophysical Research: Atmospheres.

Type of Data Source: Releases to the Environment; Environmental Release Data;
 Hero ID: 2532952

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Release Source:	China
Environmental Media:	Air
Release Estimation Method:	Measured, Air samples from lab in Hong Kong and southern China
Daily Release Quantity (kg/day):	ppt
Number of Sites:	2

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	thorough explanantion, methodology expected to be accurate
Domain 2: Representative					
Metric 2:	Geographic Scope	Low	× 1	3	China
Metric 3:	Applicability	Unacceptable	× 2	8	emission to air, background concentration
Metric 4:	Temporal Representativeness	Medium	× 2	4	Data greater than 10 years old (1998-2008)
Metric 5:	Sample Size	High	× 1	1	198+ samples
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	thorough examination of data
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	High	× 1	1	discusses both uncertainty and variability
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.1.

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Source Citation:	Zhang, Y. L.,Guo, H.,Wang, X. M.,Simpson, I. J.,Barletta, B.,Blake, D. R.,Meinardi, S.,Rowland, F. S.,Cheng, H. R.,Saunders, S. M.,Lam, S. H. M.. 2010. Emission patterns and spatiotemporal variations of halocarbons in the Pearl River Delta region, southern China. Journal of Geophysical Research: Atmospheres.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	2532952

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
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** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation: Ipcs., 1999. Environmental Health Criteria 208: Carbon tetrachloride.
 Type of Data Source: Releases to the Environment; Published Models for Exposures or Releases;
 Hero ID: 3001090

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Release Source:	Global
Environmental Media:	Air, Water, biological
Release Estimation Method:	Measured, Air and water samples from multiple labs around the world
Annual Release Quantity (kg/yr):	g/m3

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	Environmental health criteria by WHO, UN, and ILO
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	Global sampling methods, global environmental concentrations
Metric 3:	Applicability	Unacceptable	× 2	8	emission to air, background concentration
Metric 4:	Temporal Representativeness	Low	× 2	6	Data from greater than 20 years (1974-1999)
Metric 5:	Sample Size	High	× 1	1	Global data
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	thorough examination of data
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	High	× 1	1	discusses both uncertainty and variability
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.1.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Simmonds, P. G.,Cunnold, D. M.,Weiss, R. F.,Prinn, R. G.,Fraser, P. J.,McCulloch, A.,Alyea, F. N.,O'Doherty, S.. 1998. Global trends and emission estimates of CCl4 from in situ background observations from July 1978 to June 1996. Journal of Geophysical Research: Atmospheres.

Type of Data Source: Releases to the Environment; Environmental Release Data;
 Hero ID: 3562677

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Release Source:	Global
Environmental Media:	Air
Release Estimation Method:	Measured, Air samples from 5 remote locations around the world
Annual Release Quantity (kg/yr):	ppt/yr
Number of Sites:	5

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	thorough explanantion, methodology expected to be accurate
Domain 2: Representative					
Metric 2:	Geographic Scope	Low	× 1	3	Global sampling, US + non-OECD (Samoa, Tasmania, Barbados)
Metric 3:	Applicability	Unacceptable	× 2	8	emission to air, background concentration
Metric 4:	Temporal Representativeness	Low	× 2	6	Data from greater than 20 years (1978-1996)
Metric 5:	Sample Size	High	× 1	1	Global data
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	thorough examination of data
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	High	× 1	1	discusses both uncertainty and variability
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.3.

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Source Citation:	Simmonds, P. G.,Cunnold, D. M.,Weiss, R. F.,Prinn, R. G.,Fraser, P. J.,McCulloch, A.,Alyea, F. N.,O'Doherty, S.. 1998. Global trends and emission estimates of CCl4 from in situ background observations from July 1978 to June 1996. Journal of Geophysical Research: Atmospheres.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3562677

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation:	Xiao, X.,Prinn, R. G.,Fraser, P. J.,Weiss, R. F.,Simmonds, P. G.,O'Doherty, S.,Miller, B. R.,Salameh, P. K.,Harth, C. M.,Krummel, P. B.,Golombek, A.,Porter, L. W.,Butler, J. H.,Elkins, J. W.,Dutton, G. S.,Hall, B. D.,Steele, L. P.,Wang, R. H. J.,Cunnold, D. M.. 2010. Atmospheric three-dimensional inverse modeling of regional industrial emissions and global oceanic uptake of carbon tetrachloride. Atmospheric Chemistry and Physics.
Type of Data Source Hero ID	Releases to the Environment; Environmental Release Data; 3568624

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Release Source:	Global
Environmental Media:	Air and water
Release Estimation Method:	uses historical air emissions to create a 3-D chemical transport model and estimate future releases
Annual Release Quantity (kg/yr):	Gg/yr
Number of Sites:	12

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	thorough explanation, methodology expected to be accurate
Domain 2: Representative					
Metric 2:	Geographic Scope	Low	× 1	3	Global sampling, US + non-OECD (Samoa, Ireland, Tasmania, Barbados)
Metric 3:	Applicability	Unacceptable	× 2	8	emission to air and oceanic sink, background concentration
Metric 4:	Temporal Representativeness	High	× 2	2	published 2010, data ranges from '79-'06 then models future CCl4 sensitivity to 2012
Metric 5:	Sample Size	High	× 1	1	Global data
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	thorough examination of data
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	High	× 1	1	discusses both uncertainty and variability
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 1.9.

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Source Citation:	Xiao, X.,Prinn, R. G.,Fraser, P. J.,Weiss, R. F.,Simmonds, P. G.,O'Doherty, S.,Miller, B. R.,Salameh, P. K.,Harth, C. M.,Krummel, P. B.,Golombek, A.,Porter, L. W.,Butler, J. H.,Elkins, J. W.,Dutton, G. S.,Hall, B. D.,Steele, L. P.,Wang, R. H. J.,Cunnold, D. M.. 2010. Atmospheric three-dimensional inverse modeling of regional industrial emissions and global oceanic uptake of carbon tetrachloride. Atmospheric Chemistry and Physics.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3568624

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
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High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation: Altshuller, A. P.. 1976. AVERAGE TROPOSPHERIC CONCENTRATION OF CARBON-TETRACHLORIDE BASED ON INDUSTRIAL PRODUCTION, USAGE, AND EMISSIONS. Environmental Science and Technology.

Type of Data Source: Releases to the Environment; Environmental Release Data;

Hero ID: 3569465

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Release Source:	US Production Sites
Environmental Media:	Air
Annual Release Quantity (kg/yr):	Millions of lbs

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Low	× 1	3	Methodology not well described
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Unacceptable	× 2	8	emission to air, background concentration
Metric 4:	Temporal Representativeness	Unacceptable	× 2	8	Data is Pre-Montreal Protocol
Metric 5:	Sample Size	Low	× 1	3	US data without statistical info
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	only species release data
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	does not discuss variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 3.2.

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High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Oecd., 2009. Emission scenario documents on coating industry (paints, lacquers and varnishes).
 Type of Data Source: Releases to the Environment; Environmental Release Data;
 Hero ID: 3827298

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Release Source:	Solvent for Paints & coatings
Disposal /Treatment Method:	Solvent evaporated to air
Environmental Media:	Air
Release or Emission Factor:	1.0 percent release to air
Release Estimation Method:	estimation, Emission Scenario Document

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	thorough explanation, methodology expected to be accurate
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US + other OECD countries
Metric 3:	Applicability	Unacceptable	× 2	8	paints and coatings are excluded from scope
Metric 4:	Temporal Representativeness	High	× 2	2	Data from less than 10 years ago (2009)
Metric 5:	Sample Size	High	× 1	1	National scale sample size
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	thorough examination of process
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	does not discuss variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 1.9.

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High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: U.S, E. P. A.. 1980. Waste solvent reclamation.
 Type of Data Source Releases to the Environment; Environmental Release Data;
 Hero ID 3840001

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Release Source:	Solvent for Paints & coatings
Disposal /Treatment Method:	Solvent evaporated to air
Environmental Media:	Air
Release or Emission Factor:	Breaks data into process unit emission of kg chemical/Mg total chemical processed for storage tank, condenser vent, incinerator stack, leaks, open sources
Release Estimation Method:	EPA Emission Factor Compilation

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Air Pollutant Emissions Factors (AP-42)
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	Unacceptable	× 2	8	solvent not included in scope of CCl4 data
	Metric 4: Temporal Representativeness	Unacceptable	× 2	8	Data is Pre-Montreal Protocol (1990)
	Metric 5: Sample Size	Medium	× 1	2	little sample size discussion
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	complete range of data
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.7.

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Source Citation:	U.S, E. P. A.. 1980. Waste solvent reclamation.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3840001

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
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High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation: 1994. National emission standards for hazardous air pollutants: Halogenated solvent cleaning – Background information for final standards.
 Type of Data Source Releases to the Environment; Completed Exposure or Risk Assessments;
 Hero ID 3860538

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Release Source:	solvent cleaning/degreasing
Disposal /Treatment Method:	Solvent evaporated to air
Environmental Media:	Air
Release Estimation Method:	National Emission Standard for HAPs

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	National Emission Standard for HAPs
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Unacceptable	× 2	8	solvent not included in scope of CCl4 data
Metric 4:	Temporal Representativeness	Low	× 2	6	Data from greater than 20 years (1994)
Metric 5:	Sample Size	Medium	× 1	2	little sample size discussion
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	complete range of data
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.4.

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High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: U.S, E. P. A.. 2002. Occurrence summary and use support document for the six-year review of national primary drinking water regulations.
 Type of Data Source: Releases to the Environment; Environmental Release Data;
 Hero ID: 3970165

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Release Source:	air emissions, spills
Environmental Media:	Air, land, water
Release Estimation Method:	Occurrence Summary and Use Support Document for the Six-Year Review of National Primary Drinking Water Regulations
Number of Sites:	100

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	EPA Occurrence Summary and Use Support Document for the Six-Year Review of National Primary Drinking Water Regulations
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Unacceptable	× 2	8	Uses listed are included in scope, but data is background concentration from EPA TRI
Metric 4:	Temporal Representativeness	Low	× 2	6	Data from greater than 20 years (1989 to 1999)
Metric 5:	Sample Size	Medium	× 1	2	uncertain statistics
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Medium	× 1	2	gives brief summary of process units and operation
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Medium	× 1	2	lists variability, limited discussion on uncertainty

Overall Quality Determination[†] Unacceptable 4 Metric Mean Score: 2.4.

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Source Citation:	U.S, E. P. A.. 2002. Occurrence summary and use support document for the six-year review of national primary drinking water regulations.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3970165

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
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High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation: ToxNet Hazardous Substances Data, Bank. 2017. HSDB: Carbon tetrachloride.
 Type of Data Source: Releases to the Environment; Environmental Release Data;
 Hero ID: 3970275

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Release Source:	spills
Environmental Media:	water
Release Estimation Method:	USEPA data
Annual Release Quantity (kg/yr):	0.12-0.85 ppt in marine surface water0-9 ppb fresh water0.1-30 ppb city surface water0.2-20 ppb in groundwater

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	NLM NSDB for CCl4
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	wastewater
Metric 4:	Temporal Representativeness	Unacceptable	× 2	8	Data is Pre-Montreal Protocol (1973-1980)
Metric 5:	Sample Size	Low	× 1	3	distribution not characterized by statistics, only 1 exposed
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	complete data
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.1.

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High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: ToxNet Hazardous Substances Data, Bank. 2017. HSDB: Carbon tetrachloride.
 Type of Data Source: Releases to the Environment; Environmental Release Data;
 Hero ID: 3970275

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Release Source:	air emissions
Environmental Media:	air
Release Estimation Method:	USEPA data
Annual Release Quantity (kg/yr):	0-42.4 ppb urban air 110.9-142.3 ppt rural air

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	NLM NSDB for CCl4
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	air emissions
Metric 4:	Temporal Representativeness	Unacceptable	× 2	8	Data is Pre-Montreal Protocol (1979-1987)
Metric 5:	Sample Size	Low	× 1	3	dsitribution not characterized by statistics, only 1 exposed
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	complete data
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.1.

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High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Carex, Canada. 2017. Profiles & estimates: Carbon tetrachloride.
 Type of Data Source: Releases to the Environment; Environmental Release Data;
 Hero ID: 3978372

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	release during chemical use because of high volatility
Release Source:	air emissions
Environmental Media:	air

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Medium	× 1	2	CAREX
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	OECD Country (Canada)
Metric 3:	Applicability	Unacceptable	× 2	8	Physical Data and brief description of releases
Metric 4:	Temporal Representativeness	High	× 2	2	Data from less than 10 years ago (2016)
Metric 5:	Sample Size	Low	× 1	3	distribution not characterized by statistics
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	provides report of results but does not describes methods or assumptions
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	does not specifically address variability or uncertainty but references original study article
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.6.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

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 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Us, E. P. A.. 1990. Industrial wastewater volatile organic compound emissions: Background information for BACT/LAER determinations.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3981116

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	wastewater stream concentration
Release Source:	wastewater
Environmental Media:	water

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	EPA
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Unacceptable	× 2	8	general wastewater concentration
Metric 4:	Temporal Representativeness	Unacceptable	× 2	8	Data is Pre-Montreal Protocol (1990)
Metric 5:	Sample Size	Low	× 1	3	distribution not characterized by statistics
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	provides report of results but does not describes methods or assumptions
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	does not specifically address variability or uncertainty but references original study article
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 3.0.

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* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Pnl., 2012. Abiotic degradation rates for carbon tetrachloride and chloroform: Final report.
 Type of Data Source: Releases to the Environment; Environmental Release Data;
 Hero ID: 3975006

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	liquid waste
Release Source:	wastewater
Disposal /Treatment Method:	pump-and-treat approach
Environmental Media:	water
Annual Release Quantity (kg/yr):	920,000 kg total between 1955-1973
Number of Sites:	1
Waste Treatment Method:	pump from ground and treat with hydrolysis

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	DOE
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	liquid waste
Metric 4:	Temporal Representativeness	High	× 2	2	Data from less than 10 years ago (2012)
Metric 5:	Sample Size	Medium	× 1	2	Range of sampling not discussed, paper references another sources for release estimation data
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Medium	× 1	2	focus of paper is the treatment of released CCl4, so the data includes release media, but lacks detail on the release process and activity
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		High		1.4	

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Source Citation:	Pnl., 2012. Abiotic degradation rates for carbon tetrachloride and chloroform: Final report.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3975006

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation:	Carex, Canada. 2008. Priority environmental carcinogens for surveillance in Canada: Preliminary priority list.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3978370

EXTRACTION	
Parameter	Data
Life Cycle Stage:	Use
Environmental Media:	water and air

EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
	Metric 1: Methodology	High	× 1	1	Trusted Source (CAREX Canada)	
Domain 2: Representative						
	Metric 2: Geographic Scope	Medium	× 1	2	OECD Country (Canada)	
	Metric 3: Applicability	Unacceptable	× 2	8	no specific release data, this document just prioritizes carcinogens to further examination	
	Metric 4: Temporal Representativeness	High	× 2	2	Data from 10 years ago (2008)	
	Metric 5: Sample Size	N/A		N/A	No Comment.	
Domain 3: Accessibility/Clarity						
	Metric 6: Metadata Completeness	N/A		N/A	No Comment.	
Domain 4: Variability and Uncertainty						
	Metric 7: Metadata Completeness	N/A		N/A	No Comment.	
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.2.	

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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation: U.S. E. P. A., I. C. F. Consulting. 2004. The U.S. solvent cleaning industry and the transition to non ozone depleting substances.
 Type of Data Source: Releases to the Environment; Environmental Release Data;
 Hero ID: 3982140

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Emissions to air
Release Source:	air emissions from solvent cleaning industry
Environmental Media:	air
Release Estimation Method:	Use of Chemical Marketing Reporter's Data, EPA's ODS Tracking System
Annual Release Quantity (kg/yr):	0-0.87 million lbs/year nationally

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	EPA
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	Emissions to air
Metric 4:	Temporal Representativeness	Unacceptable	× 2	8	Data is Pre-Montreal Protocol (1986-1995)
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.0.

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* MWF = Metric Weighting Factor

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 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Nih., 2016. Report on carcinogens: Carbon tetrachloride.
 Type of Data Source: Releases to the Environment; Environmental Release Data;
 Hero ID: 3982329

EXTRACTION

Parameter	Data
Life Cycle Stage:	manufacture/process/use
Life Cycle Description (Subcategory of Use):	Emissions to air, liquid waste
Environmental Media:	air/water
Release Estimation Method:	TRI Database
Annual Release Quantity (kg/yr):	3.9 million lbs total released nationally in 2009. In 1990, 1.7 million pounds was released to air, 36,201 lb to water, and a little over 1,000 lb to soil. In 1999, on-site releases totaled 268,140 lb, and in 2007, 308,633 lb was released by 44 facilities

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	NTP from NIEHS
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	manufacture
	Metric 4: Temporal Representativeness	High	× 2	2	Data from less than 10 years ago (2009)
	Metric 5: Sample Size	High	× 1	1	complete data
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	limited data, only includes production volume
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		High		1.4	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Blaney, B. L.. 1989. Applicability of steam stripping to organics removal from wastewater streams.
 Type of Data Source Releases to the Environment; Environmental Release Data;
 Hero ID 3986884

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Emissions to air, liquid waste
Release Source:	wastewater
Disposal /Treatment Method:	steam stripping
Environmental Media:	water
Annual Release Quantity (kg/yr):	1.7-55 ppmw
Number of Sites:	3
Waste Treatment Method:	steam stripping

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	EPA
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	liquid waste
	Metric 4: Temporal Representativeness	Unacceptable	× 2	8	Data is Pre-Montreal Protocol (1989)
	Metric 5: Sample Size	High	× 1	1	complete data
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	limited data, only includes production volume
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.1.

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Source Citation:	Blaney, B. L.. 1989. Applicability of steam stripping to organics removal from wastewater streams.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3986884

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
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** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation:	Hogue, C.. 2014. OZONE DEPLETION Emissions of carbon tetrachloride continue despite global prohibition. Chemical & Engineering News.
Type of Data Source Hero ID	Releases to the Environment; Environmental Release Data; 3569391

EXTRACTION	
Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Emissions to air
Environmental Media:	air
Annual Release Quantity (kg/yr):	39,000 metric tons/yr from 2000-2012

EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
	Metric 1: Methodology	High	× 1	1	American Chemical Society	
Domain 2: Representative						
	Metric 2: Geographic Scope	High	× 1	1	US	
	Metric 3: Applicability	High	× 2	2	Emissions to air	
	Metric 4: Temporal Representativeness	High	× 2	2	Data from less than 10 years ago (2014)	
	Metric 5: Sample Size	High	× 1	1	complete data	
Domain 3: Accessibility/Clarity						
	Metric 6: Metadata Completeness	Low	× 1	3	limited data, only includes estimated global air emission/year	
Domain 4: Variability and Uncertainty						
	Metric 7: Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty	
Overall Quality Determination [†]		High		1.4		

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Hogue, C.. 2014. OZONE DEPLETION Emissions of carbon tetrachloride continue despite global prohibition. Chemical & Engineering News.
Type of Data Source Hero ID	Releases to the Environment; Environmental Release Data; 3569391

EXTRACTION	
Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Emissions to air
Environmental Media:	air
Annual Release Quantity (kg/yr):	4 gigagrams/yr

EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
	Metric 1: Methodology	High	× 1	1	American Chemical Society	
Domain 2: Representative						
	Metric 2: Geographic Scope	High	× 1	1	US	
	Metric 3: Applicability	High	× 2	2	Emissions to air	
	Metric 4: Temporal Representativeness	High	× 2	2	Data from less than 10 years ago (2016)	
	Metric 5: Sample Size	High	× 1	1	complete data	
Domain 3: Accessibility/Clarity						
	Metric 6: Metadata Completeness	Low	× 1	3	limited data, only includes estimated national air emission/year	
Domain 4: Variability and Uncertainty						
	Metric 7: Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty	
Overall Quality Determination [†]		High		1.4		

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Atsdr., 2005. Toxicological profile for carbon tetrachloride.
 Type of Data Source: Releases to the Environment; Environmental Release Data;
 Hero ID: 3982336

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Emissions to air
Environmental Media:	air
Release Estimation Method:	TRI Data
Annual Release Quantity (kg/yr):	4.44 million lbs
Number of Sites:	55

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	US HHS
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	Emissions to air
Metric 4:	Temporal Representativeness	High	× 2	2	Data from less than 10 years ago (2002)
Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Medium	× 1	2	limited data, includes estimated national air emission/year but does break this number down into the individual sites and lists them
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		High		1.3	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Atsdr., 2005. Toxicological profile for carbon tetrachloride.
 Type of Data Source: Releases to the Environment; Environmental Release Data;
 Hero ID: 3982336

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	liquid waste
Environmental Media:	surface water
Release Estimation Method:	TRI Data
Annual Release Quantity (kg/yr):	320 lb
Number of Sites:	55

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	US HHS
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	Emissions to air
Metric 4:	Temporal Representativeness	High	× 2	2	Data from less than 10 years ago (2002)
Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Medium	× 1	2	limited data, includes estimated national water release/year but does break this number down into the individual sites and lists them
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty

Overall Quality Determination[†] High 1.3

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Atsdr., 2005. Toxicological profile for carbon tetrachloride.
 Type of Data Source: Releases to the Environment; Environmental Release Data;
 Hero ID: 3982336

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	solid waste
Environmental Media:	soil
Release Estimation Method:	TRI Data
Annual Release Quantity (kg/yr):	1033 lb
Number of Sites:	55

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	US HHS
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	Emissions to air
Metric 4:	Temporal Representativeness	High	× 2	2	Data from less than 10 years ago (2002)
Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Medium	× 1	2	limited data, includes estimated national soil release/year but does break this number down into the individual sites and lists them
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty

Overall Quality Determination[†] High 1.3

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Environment Agency, Austria. 2012. Final report: Three years of implementation of the E-PRTR.
 Type of Data Source: Releases to the Environment; Environmental Release Data;
 Hero ID: 3982347

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	wastewater
Environmental Media:	water
Annual Release Quantity (kg/yr):	2007: 942.65 2008:543.09 2009: 478.62 (found on page 208)

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	Trusted Source (EU commissioned study)
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	EU
Metric 3:	Applicability	High	× 2	2	wastewater
Metric 4:	Temporal Representativeness	High	× 2	2	Data from less than 10 years ago (2007, 2008, 2009)
Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	limited data, includes estimated national water release/year but does break this number down into the individual sites
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		High		1.6	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	N. C. State University. 2017. Identification and reduction of pollution sources in textile wet processing.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3986892

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Textile Cleaning
Environmental Media:	air
Daily Release Quantity (kg/day):	0.21 lbs/hr

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	Trusted Source (Department of Textile Chemistry, North Carolina State University)
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Unacceptable	× 2	8	Textile Cleaning
Metric 4:	Temporal Representativeness	Unacceptable	× 2	8	Data is Pre-Montreal Protocol (1986)
Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	limited data, includes estimated national water release/year but does break this number down into the individual sites
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.8.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, two of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Oecd., 2009. Emission scenario documents on coating industry (paints, lacquers and varnishes).
 Type of Data Source: Releases to the Environment; Environmental Release Data;
 Hero ID: 3827298

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	Paints and Coatings
Environmental Media:	Air

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	OECD
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	Europe
Metric 3:	Applicability	Unacceptable	× 2	8	paints and Coatings are excluded from scope
Metric 4:	Temporal Representativeness	High	× 2	2	Data from less than 10 years ago (2009)
Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	No quantitative data, document only discusses emission of VOCs
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.2.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Oecd., 2009. Emission scenario document on adhesive formulation.
 Type of Data Source: Releases to the Environment; Environmental Release Data;
 Hero ID: 3827299

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	Industrial Adhesives
Environmental Media:	Air

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	OECD
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	Europe
Metric 3:	Applicability	Unacceptable	× 2	8	Industrial Adhesives are excluded from scope
Metric 4:	Temporal Representativeness	High	× 2	2	Data from less than 10 years ago (2009)
Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	No quantitative data, document only discusses emission of VOCs
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.2.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Oecd., 2013. Emission scenario document on the industrial use of adhesives for substrate bonding.
 Type of Data Source: Releases to the Environment; Environmental Release Data;
 Hero ID: 3827300

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	Industrial Adhesives
Environmental Media:	Air

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	OECD
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	Europe
Metric 3:	Applicability	Unacceptable	× 2	8	Industrial Adhesives are excluded from scope
Metric 4:	Temporal Representativeness	High	× 2	2	Data from less than 10 years ago (2009)
Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	No quantitative data, document only discusses emission of VOCs
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.2.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Lemieux, P. M., Ryan, J. V., Bass, C., Barat, R.. 1996. Emissions of trace products of incomplete combustion from a pilot-scale incinerator secondary combustion chamber. Journal of the Air and Waste Management Association (1990-1992).
Type of Data Source	Releases to the Environment; Published Models for Exposures or Releases;
Hero ID	3568159

EXTRACTION	
Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Waste handling
Disposal /Treatment Method:	Incineration
Environmental Media:	Air

EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
	Metric 1: Methodology	Medium	× 1	2	high quality data not necessarily a trusted source	
Domain 2: Representative						
	Metric 2: Geographic Scope	High	× 1	1	US	
	Metric 3: Applicability	High	× 2	2	waste handling	
	Metric 4: Temporal Representativeness	High	× 2	2	Data from less than 10 years ago (2017)	
	Metric 5: Sample Size	High	× 1	1	complete data	
Domain 3: Accessibility/Clarity						
	Metric 6: Metadata Completeness	Medium	× 1	2	focus of paper is the modelling of released CCl4, so the data analyzes combustion of CCl4 samples, is not listing of release quantity	
Domain 4: Variability and Uncertainty						
	Metric 7: Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty	
Overall Quality Determination [†]		High		1.4		

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Simmonds, P. G.,Cunnold, D. M.,Alyea, F. N.,Cardelino, C. A.,Crawford, A. J.,Prinn, R. G.,Fraser, P. J.,Rasmussen, R. A.,Rosen, R. D.. 1988. CARBON-TETRACHLORIDE LIFETIMES AND EMISSIONS DETERMINED FROM DAILY GLOBAL MEASUREMENTS DURING 1978-1985. Journal of Atmospheric Chemistry.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3569634

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Emissions to air
Environmental Media:	Air
Release Estimation Method:	estimated from CC14 production documented by the U.S. International Trade Commission
Annual Release Quantity (kg/yr):	26.80 x 10 ⁶ (1985)

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	Journal of Atmospheric chemistry
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	manufacture
Metric 4:	Temporal Representativeness	Unacceptable	× 2	8	Data is Pre-Montreal Protocol (1978-1985)
Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	limited data, only includes estimated global air emission/year
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.1.

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Source Citation:	Simmonds, P. G.,Cunnold, D. M.,Alyea, F. N.,Cardelino, C. A.,Crawford, A. J.,Prinn, R. G.,Fraser, P. J.,Rasmussen, R. A.,Rosen, R. D.. 1988. CARBON-TETRACHLORIDE LIFETIMES AND EMISSIONS DETERMINED FROM DAILY GLOBAL MEASUREMENTS DURING 1978-1985. Journal of Atmospheric Chemistry.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3569634

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
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** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation:	U.S, E. P. A.. 1977. Control of volatile organic emissions from solvent metal cleaning.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3827321

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Emissions to air
Environmental Media:	Air

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	EPA
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	N/A		N/A	No Comment.
Metric 4:	Temporal Representativeness	Unacceptable	× 2	8	Data is Pre-Montreal Protocol (1977)
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.5.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Doe., 2008. Groundwater contamination and treatment at Department of Energy sites.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3974982

EXTRACTION	
Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	ground water
Environmental Media:	water
Release Estimation Method:	plume maps

EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
	Metric 1: Methodology	High	× 1	1	DOE	
Domain 2: Representative						
	Metric 2: Geographic Scope	High	× 1	1	US	
	Metric 3: Applicability	High	× 2	2	waste handling	
	Metric 4: Temporal Representativeness	High	× 2	2	Data from 10 years ago (2008)	
	Metric 5: Sample Size	High	× 1	1	complete data	
Domain 3: Accessibility/Clarity						
	Metric 6: Metadata Completeness	Low	× 1	3	limited data, no discussion of how plumes were calculated and uses qualitative categories for amounts of contamination	
Domain 4: Variability and Uncertainty						
	Metric 7: Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty	
Overall Quality Determination [†]		High		1.4		

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Pnl., 2014. Characterization of biofilm in 200W fluidized bed reactors.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3975004

EXTRACTION	
Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Waste handling
Release Source:	fluidized bed reactor byproducts/impurities
Environmental Media:	watersampling from fluidized bed reactor and composition analysis

EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
	Metric 1: Methodology	High	× 1	1	DOE	
Domain 2: Representative						
	Metric 2: Geographic Scope	High	× 1	1	US	
	Metric 3: Applicability	High	× 2	2	waste handling	
	Metric 4: Temporal Representativeness	High	× 2	2	Data from less than 10 years ago (2014)	
	Metric 5: Sample Size	High	× 1	1	complete data	
Domain 3: Accessibility/Clarity						
	Metric 6: Metadata Completeness	Low	× 1	3	limited data, lumps carbon tet results into volatile solids	
Domain 4: Variability and Uncertainty						
	Metric 7: Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty	
Overall Quality Determination [†]		High		1.4		

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: 2017. Pollution prevention search results, envirofacts database.
 Type of Data Source Releases to the Environment; Environmental Release Data;
 Hero ID 3860453

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	not specified

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	EPA
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Unacceptable	× 2	8	no entries for tetrachloromethane or carbon tetrachloride
Metric 4:	Temporal Representativeness	High	× 2	2	No Comment.
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.0.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: 2013. Optimization review: Velsicol chemical corporation hardeman county landfill superfund site.
 Type of Data Source Releases to the Environment; Environmental Release Data;
 Hero ID 3860542

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	waste handling
Release Source:	pesticides
Disposal /Treatment Method:	unlined trenches
Environmental Media:	groundwater
Release Estimation Method:	plume maps
Daily Release Quantity (kg/day):	5,000 mg/L (does not specify frequency) and max 30,000mg/L
Waste Treatment Method:	Groundwater Extraction and Treatment System

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	EPA
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	waste handling
	Metric 4: Temporal Representativeness	High	× 2	2	Data from 10 years ago (2008)
	Metric 5: Sample Size	High	× 1	1	complete data
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	Little details of how release data was obtained
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		High		1.3	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: 2013. Optimization review: Velsicol chemical corporation hardeman county landfill superfund site.
 Type of Data Source Releases to the Environment; Environmental Release Data;
 Hero ID 3860542

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	waste handling
Release Source:	pesticides
Environmental Media:	air
Daily Release Quantity (kg/day):	5.2 ppbv (outdoor) and 2.6 ppbv (indoor)

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	EPA
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	waste handling
Metric 4:	Temporal Representativeness	High	× 2	2	Data from 10 years ago (2008)
Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Medium	× 1	2	Little details of how release data was obtained
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		High		1.3	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Franklin Associates, Ltd. 2006. Life cycle inventory of polystyrene foam, bleached paperboard, and corrugated paperboard foodservice products.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3978165

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	waste handling
Release Source:	food service products
Environmental Media:	air
Daily Release Quantity (kg/day):	hot cups: polystyrene: 4.7 e-6 lb; poly-coated paperboard: 5.6e -6 lb; corrugated cup sleeves: 1.6 e -6 lb; PE ppbd cup+sleeve: 7.2 e-6 lb;

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	No Comment.
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	waste handling
	Metric 4: Temporal Representativeness	High	× 2	2	Data from 10 years ago (2006)
	Metric 5: Sample Size	High	× 1	1	complete data
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	combined data from industry
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	no discussion of variability, includes discussion of uncertainty
Overall Quality Determination [†]		High		1.3	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Pollution Prevention, Infohouse. 2017. Emissions from open tire fires.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3981114

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	waste handling
Release Source:	tires
Disposal /Treatment Method:	Incineration
Environmental Media:	air

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Medium	× 1	2	Pollution Prevention Infohouse
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	Disposal
Metric 4:	Temporal Representativeness	Low	× 2	6	Data from greater than 20 years ago (1983)
Metric 5:	Sample Size	Low	× 1	3	Distribution of Samples is Qualitative
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Unacceptable	× 1	4	No quantitative data for ccl4
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.2.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Us, E. P. A.. 1997. Evaluation of emissions from the open burning of land-clearing debris.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3981117

EXTRACTION	
Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Other land disposal
Release Source:	Land-Clearing debris
Disposal /Treatment Method:	Incineration
Environmental Media:	air

EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
	Metric 1: Methodology	High	× 1	1	EPA	
Domain 2: Representative						
	Metric 2: Geographic Scope	High	× 1	1	US	
	Metric 3: Applicability	Low	× 2	6	air emissions	
	Metric 4: Temporal Representativeness	Low	× 2	6	Data from greater than 20 years ago (1983)	
	Metric 5: Sample Size	Medium	× 1	2	Very descriptive testing analysis of an unknown sample size	
Domain 3: Accessibility/Clarity						
	Metric 6: Metadata Completeness	Low	× 1	3	Includes various statistics about amount per type of material, but lacks frequency of larger testing sample size	
Domain 4: Variability and Uncertainty						
	Metric 7: Metadata Completeness	Medium	× 1	2	The study does not show a multiple tests with statistics of the same type of debris	
Overall Quality Determination [†]		Low		2.3		

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Assmuth, T.,Kalevi, K.. 1992. Concentrations and toxicological significance of trace organic compounds in municipal solid waste landfill gas. Chemosphere.
 Type of Data Source: Releases to the Environment; Environmental Release Data;
 Hero ID: 660779

EXTRACTION

Parameter	Data
Life Cycle Stage:	Disposal
Life Cycle Description (Subcategory of Use):	Municipal Landfill
Release Source:	Well gas
Disposal /Treatment Method:	landfill
Environmental Media:	gas
Release or Emission Factor:	Range of 0.9 to 88 mg/m3
Release Estimation Method:	gas chromatograph
Release Days per Year:	365.0
Number of Sites:	4

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	Water and Environmental Research Institute
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	Finland
	Metric 3: Applicability	High	× 2	2	Disposal in landfill
	Metric 4: Temporal Representativeness	Low	× 2	6	1992
	Metric 5: Sample Size	High	× 1	1	4 well documented sites
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Well documented
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Medium	× 1	2	Some discussion
Overall Quality Determination [†]		Medium		1.8	
Continued on next page					

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Source Citation:	Assmuth, T.,Kalevi, K.. 1992. Concentrations and toxicological significance of trace organic compounds in municipal solid waste landfill gas. Chemosphere.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	660779

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation:	Gallego, E.,Perales, J. F.,Roca, F. J.,Guardino, X.. 2014. Surface emission determination of volatile organic compounds (VOC) from a closed industrial waste landfill using a self-designed static flux chamber. Science of the Total Environment.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	2546075

EXTRACTION

Parameter	Data
Life Cycle Stage:	Disposal
Life Cycle Description (Subcategory of Use):	industrial landfill
Release Source:	Well gas
Disposal /Treatment Method:	landfill
Environmental Media:	gas
Release or Emission Factor:	Range of 1.6 to 7.0 ug/m2/d
Release Estimation Method:	Global, Kriging and Tributaryarea.
Release Days per Year:	365.0

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	INSHT
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	Spain
	Metric 3: Applicability	High	× 2	2	Disposal in landfill
	Metric 4: Temporal Representativeness	High	× 2	2	2013
	Metric 5: Sample Size	High	× 1	1	15 sampling days
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Well documented
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	High	× 1	1	Well documented
Overall Quality Determination [†]		High		1.2	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Katami, T.,Nisikawa, H.,Yasuhara, A.. 1992. Emission of chlorinated compounds by combustion of waste dry-cleaning materials. Chemosphere.
Type of Data Source Hero ID	Releases to the Environment; Environmental Release Data; 2917538

EXTRACTION	
Parameter	Data
Life Cycle Stage:	Disposal
Life Cycle Description (Subcategory of Use):	hazardous waste incinerator

EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
Metric 1:	Methodology	Medium	× 1	2	National Institute for Environmental Studies Japan	
Domain 2: Representative						
Metric 2:	Geographic Scope	Medium	× 1	2	Japan	
Metric 3:	Applicability	Unacceptable	× 2	8	Release of carbon tetrachloride from incineration of dry cleaning solvents	
Metric 4:	Temporal Representativeness	N/A		N/A	No Comment.	
Metric 5:	Sample Size	N/A		N/A	No Comment.	
Domain 3: Accessibility/Clarity						
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.	
Domain 4: Variability and Uncertainty						
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.	
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 3.0.	

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Oecd., 2015. Emission scenario documents on coating industry (paints, lacquers and varnishes).
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3833129

EXTRACTION	
Parameter	Data
Life Cycle Stage:	Use

EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
Metric 1:	Methodology	Medium	× 1	2	OECD	
Domain 2: Representative						
Metric 2:	Geographic Scope	Medium	× 1	2	Europe	
Metric 3:	Applicability	Unacceptable	× 2	8	Cited uses do not fall under the conditions of use	
Metric 4:	Temporal Representativeness	N/A		N/A	No Comment.	
Metric 5:	Sample Size	N/A		N/A	No Comment.	
Domain 3: Accessibility/Clarity						
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.	
Domain 4: Variability and Uncertainty						
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.	
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 3.0.	

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: 2014. Toxic release inventory: Carbon tetrachloride.
 Type of Data Source: Releases to the Environment; Environmental Release Data;
 Hero ID: 3860458

EXTRACTION

Parameter	Data
Life Cycle Stage:	Disposal
Life Cycle Description (Subcategory of Use):	All Industries
Release Source:	Other on-site landfills
Release or Emission Factor:	43 lbs in 2015

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	US EPA
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	Credible release numbers, but unknown uses
	Metric 4: Temporal Representativeness	High	× 2	2	2015
	Metric 5: Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		High		1.0	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: 2014. Toxic release inventory: Carbon tetrachloride.
 Type of Data Source Releases to the Environment; Environmental Release Data;
 Hero ID 3860458

EXTRACTION

Parameter	Data
Life Cycle Stage:	Disposal
Life Cycle Description (Subcategory of Use):	All Industries
Release Source:	Surface water discharges
Release or Emission Factor:	275 lbs in 2015

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	US EPA
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	Credible release numbers, but unknown uses
	Metric 4: Temporal Representativeness	High	× 2	2	2015
	Metric 5: Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		High		1.0	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: 2014. Toxic release inventory: Carbon tetrachloride.
 Type of Data Source: Releases to the Environment; Environmental Release Data;
 Hero ID: 3860458

EXTRACTION

Parameter	Data
Life Cycle Stage:	Disposal
Life Cycle Description (Subcategory of Use):	All Industries
Release Source:	Fugitive air emissions
Release or Emission Factor:	36,629 lbs in 2015

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	US EPA
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	Credible release numbers, but unknown uses
Metric 4:	Temporal Representativeness	High	× 2	2	2015
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		High		1.0	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: 2014. Toxic release inventory: Carbon tetrachloride.
 Type of Data Source Releases to the Environment; Environmental Release Data;
 Hero ID 3860458

EXTRACTION

Parameter	Data
Life Cycle Stage:	Disposal
Life Cycle Description (Subcategory of Use):	All Industries
Release Source:	Point source air emission
Release or Emission Factor:	70,447 lbs in 2015

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	US EPA
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	Credible release numbers, but unknown uses
	Metric 4: Temporal Representativeness	High	× 2	2	2015
	Metric 5: Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		High		1.0	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: 1999. 33/50 Program: The final record.
 Type of Data Source Releases to the Environment; Environmental Release Data;
 Hero ID 3860543

EXTRACTION

Parameter	Data
Life Cycle Stage:	Disposal
Life Cycle Description (Subcategory of Use):	Off-site waste transfer
Release or Emission Factor:	840,947 lbs in 1991 - 479,652 in 1998

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	US EPA
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Low	× 2	6	Credible release numbers, but unknown uses
Metric 4:	Temporal Representativeness	Medium	× 2	4	1999
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.

Overall Quality Determination[†] Medium 2.0

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: 2004. Optimization support evaluation: Greenwood chemical site, Newton, Virginia.
 Type of Data Source: Releases to the Environment; Environmental Release Data;
 Hero ID: 3860544

EXTRACTION

Parameter	Data
Life Cycle Stage:	Disposal
Life Cycle Description (Subcategory of Use):	Industrial wastewater treatment
Release Source:	treatment plant discharge
Release or Emission Factor:	90.8 ug/L
Waste Treatment Method:	UV oxidation system
P2 Control & percent Efficiency:	20 percent

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	US EPA
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Low	× 2	6	Credible release numbers, but unknown uses
Metric 4:	Temporal Representativeness	High	× 2	2	2003
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		Medium		1.7	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: TOXNET. ChemIDplus: Substances name: Perylimid.
 Type of Data Source: Releases to the Environment; Environmental Release Data;
 Hero ID: 3970244

EXTRACTION

Parameter	Data
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EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	US EPA
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	Unacceptable	× 2	8	Nation-wide point source concentrations, but source data is lacking in use detail beyond NAICS code
	Metric 4: Temporal Representativeness	N/A		N/A	No Comment.
	Metric 5: Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	No Comment.

Overall Quality Determination[†] Unacceptable 4 Metric Mean Score: 2.5.

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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Nfesc., 2001. Wet air oxidation for wastewater treatment.
 Type of Data Source: Releases to the Environment; Reports for Data or Information Other than Exposure or Release Data;
 Hero ID: 3981115

EXTRACTION

Parameter	Data
Life Cycle Stage:	Release
Life Cycle Description (Subcategory of Use):	Industrial wastewater treatment
Waste Treatment Method:	Wet air oxidation destroys toxics in industrial wastewater by breaking down complex molecular structures into simpler components such as water and CO2. The process is based on the discovery that organics will oxidize in water, at relatively low temps, as long as oxygen is present and proper pressure is maintained.
P2 Control & percent Efficiency:	99.9

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	US Joint Service Pollution Prevention
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US and US military bases
Metric 3:	Applicability	High	× 2	2	Looks at method of pollution control for CCl4 and other organics in industrial wastewater
Metric 4:	Temporal Representativeness	Medium	× 2	4	2001
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.

Overall Quality Determination[†] High 1.3

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High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Pollution Prevention, Infohouse. 2017. Emissions from open tire fires.
Type of Data Source	Releases to the Environment; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3981114

EXTRACTION

Parameter	Data
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Life Cycle Stage:	Release
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EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	US EPA
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Unacceptable	× 2	8	Discusses tire fire emissions, not appropriate use
Metric 4:	Temporal Representativeness	N/A		N/A	No Comment.
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.5.

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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Us, E. P. A.. 1997. Evaluation of emissions from the open burning of land-clearing debris.					
Type of Data Source	Releases to the Environment; Reports for Data or Information Other than Exposure or Release Data;					
Hero ID	3981117					
EXTRACTION						
Parameter	Data					
Life Cycle Stage:	Release					
EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
	Metric 1: Methodology	High	× 1	1	US EPA	
Domain 2: Representative						
	Metric 2: Geographic Scope	High	× 1	1	US	
	Metric 3: Applicability	Low	× 2	6	air emissions	
	Metric 4: Temporal Representativeness	Low	× 2	6	Data from greater than 20 years ago (1983)	
	Metric 5: Sample Size	Medium	× 1	2	Very descriptive testing analysis of an unknown sample size	
Domain 3: Accessibility/Clarity						
	Metric 6: Metadata Completeness	Low	× 1	3	Includes various statistics about amount per type of material, but lacks frequency of larger testing sample size	
Domain 4: Variability and Uncertainty						
	Metric 7: Metadata Completeness	Medium	× 1	2	The study does not show a multiple tests with statistics of the same type of debris	
Overall Quality Determination [†]		Low		2.3		

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[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Ems,. 2013. Soil vapor extraction: Pilot study report: Kuhlman Electric Corporation: Crystal Springs, Mississippi: EMS project no: KUH0-11-006.
Type of Data Source Hero ID	Releases to the Environment; Reports for Data or Information Other than Exposure or Release Data; 3982210

EXTRACTION	
Parameter	Data
Life Cycle Stage:	Release

EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
Metric 1:	Methodology	Low	× 1	3	Private testing firm	
Domain 2: Representative						
Metric 2:	Geographic Scope	High	× 1	1	US	
Metric 3:	Applicability	Unacceptable	× 2	8	Looks at soil vapor extraction study for remediation of a closed site. No detailed release or exposure data.	
Metric 4:	Temporal Representativeness	N/A		N/A	No Comment.	
Metric 5:	Sample Size	N/A		N/A	No Comment.	
Domain 3: Accessibility/Clarity						
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.	
Domain 4: Variability and Uncertainty						
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.	

Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 3.0.	
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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Doe., 2009. Groundwater contamination and treatment at Department of Energy sites.
Type of Data Source	Releases to the Environment; Environmental Release Data;
Hero ID	3974983

EXTRACTION

Parameter	Data
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Life Cycle Stage:	Release
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EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
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Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	OET
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Unacceptable	× 2	8	Powerpoint describing 94 groundwater contamination sites
Metric 4:	Temporal Representativeness	High	× 2	2	2007
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.0.

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 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Occupational Exposure

Source Citation: Stewart, P. A., Lee, J. S., Marano, D. E., Spirtas, R., Forbes, C. D., Blair, A.. 1991. Retrospective cohort mortality study of workers at an aircraft maintenance facility: II. Exposures and their assessment. British Journal of Industrial Medicine.

Type of Data Source: Occupational Exposure; Monitoring Data;

Hero ID: 65131

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Physical Form:	Liquid
Route of Exposure:	Inhalation, dermal
Number of Samples:	10256
Number of Sites:	1.0
Worker Activity:	Cleaning small parts, parachute cleaning - no exposure data
Number of Workers:	6737
Type of Sampling:	area
Exposure Frequency:	continous
Analytic Method:	job title associated with qualitative (low, medium, high) exposure level

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Medium	× 1	2	Due to lack of data, method associated exposure level with job title at levels low, medium, high
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Low	× 2	6	Data from 1939 to 1982.
Metric 4:	Temporal Representativeness	Unacceptable	× 2	8	Data and use are Pre-Montreal Protocol
Metric 5:	Sample Size	Low	× 1	3	disitribution not characterized by statistics
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Unacceptable	× 1	4	only qualitative results
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	data is not complete enough to characterize variability and uncertainty

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Source Citation:	Stewart, P. A., Lee, J. S., Marano, D. E., Spirtas, R., Forbes, C. D., Blair, A.. 1991. Retrospective cohort mortality study of workers at an aircraft maintenance facility: II. Exposures and their assessment. <i>British Journal of Industrial Medicine</i> .
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	65131

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 3.0.

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 High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation: Kauppinen, T.,Pukkala, E.,Saalo, A.,Sasco, A. J.. 2003. Exposure to chemical carcinogens and risk of cancer among Finnish laboratory workers. American Journal of Industrial Medicine.
 Type of Data Source Occupational Exposure; Monitoring Data;
 Hero ID 194809

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Physical Form:	Liquid
Route of Exposure:	Inhalation, dermal
Exposure Concentration (Unit):	g/year
Number of Samples:	4710
Number of Sites:	450.0
Worker Activity:	laboratory workers
Type of Sampling:	personal
Sampling Location:	lab
Analytic Method:	ASA Reigster entries

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	assessing ASA Register database
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	OECD Country (Finland)
	Metric 3: Applicability	High	× 2	2	laboratory chemical
	Metric 4: Temporal Representativeness	Unacceptable	× 2	8	Data is Pre-Montreal Protocol (1979-1988)
	Metric 5: Sample Size	Medium	× 1	2	doesn't explain distribution across finland
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	lacks sample duration/frequency
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Medium	× 1	2	includes confidence levels

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Source Citation:	Kauppinen, T.,Pukkala, E.,Saalo, A.,Sasco, A. J.. 2003. Exposure to chemical carcinogens and risk of cancer among Finnish laboratory workers. American Journal of Industrial Medicine.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	194809

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.2.

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[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation: Lyng, E., Anttila, A., Hemminki, K.. 1997. Organic solvents and cancer. Cancer Causes and Control.
 Type of Data Source Occupational Exposure; Monitoring Data;
 Hero ID 630734

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Physical Form:	Liquid
Route of Exposure:	Inhalation, dermal
Exposure Concentration (Unit):	490-2600 mg/m3
Worker Activity:	boot & shoe manufacture, rubber industry, aircraft maintenance
Number of Workers:	104,200
Type of Sampling:	personal
Analytic Method:	National Occupational Exposure Survey

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	analyzing and assessing technical papers
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US, Canada, Finland
	Metric 3: Applicability	Medium	× 2	4	boot & shoe manufacture, rubber industry, aircraft maintenance
	Metric 4: Temporal Representativeness	Unacceptable	× 2	8	Data is Pre-Montreal Protocol (1981 to 1983)
	Metric 5: Sample Size	Medium	× 1	2	unclear sample size for CCl4 specifically
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	study does not focus on CCl4
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.3.

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Source Citation:	Lyngé, E., Anttila, A., Hemminki, K.. 1997. Organic solvents and cancer. Cancer Causes and Control.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	630734

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
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High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation: Ipcs., 1999. Environmental Health Criteria 208: Carbon tetrachloride.
 Type of Data Source Occupational Exposure; Monitoring Data;
 Hero ID 3001090

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Physical Form:	liquid and vapor
Route of Exposure:	Inhalation, dermal
Exposure Concentration (Unit):	g/m3 or kg/L
Worker Activity:	general population drinking water and air , some worker scenarios, old data
Type of Sampling:	personal and area
Analytic Method:	National Organics Monitoring Survey of drinking water, utilization of global studies

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	analyzing and assessing technical papers
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US and other OECD nations
	Metric 3: Applicability	Medium	× 2	4	occupational data (factories, grain and water treatment facilities) are outdated (pre-Montreal Protocol)
	Metric 4: Temporal Representativeness	Unacceptable	× 2	8	Data is Pre-Montreal Protocol (1981-1983)
	Metric 5: Sample Size	Low	× 1	3	No in-depth analysis of sample size. Would have to check specific sources
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	limited explanantion of data as the scope of the document is so large
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Medium	× 1	2	limited discussion variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.4.

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Source Citation:	Ipcs,. 1999. Environmental Health Criteria 208: Carbon tetrachloride.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3001090

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
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High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation: Benaise, L. G., Harrison, J. M., Pearce, T. A.. 2006. Health hazard evaluation report no. HETA-2003-0300-2993, West Virginia Department of Health and Human Resources - Webster Springs District Office.

Type of Data Source: Occupational Exposure; Monitoring Data;
 Hero ID: 3859371

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Physical Form:	vapor
Route of Exposure:	inhalation
Exposure Concentration (Unit):	ppb
Number of Samples:	6
Number of Sites:	1.0
Worker Activity:	office building
Number of Workers:	24
Type of Sampling:	area
Sampling Location:	office building
Exposure Duration:	161 - 172 min.
Analytic Method:	air quality monitor

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	NIOSH report
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	Unacceptable	× 2	8	office building with less than 1 ppb result of CCl4
	Metric 4: Temporal Representativeness	Medium	× 2	4	Data from greater than 10 years ago (2004) could be current use
	Metric 5: Sample Size	Low	× 1	3	disitribution not characterized by statistics, only 24 exposed
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	complete data
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Medium	× 1	2	limited discussion variability or uncertainty

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Source Citation:	Benaise, L. G., Harrison, J. M., Pearce, T. A.. 2006. Health hazard evaluation report no. HETA-2003-0300-2993, West Virginia Department of Health and Human Resources - Webster Springs District Office.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3859371

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.2.

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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation: Love, J. R., Kern, M.. 1981. Health hazard evaluation report no. HETA-81-065-938, METRO Bus Maintenance Shop, Washington, DC.
 Type of Data Source Occupational Exposure; Monitoring Data;
 Hero ID 3859376

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Physical Form:	vapor
Route of Exposure:	inhalation during degreasing
Number of Samples:	33
Number of Sites:	1.0
Worker Activity:	Degreasing
Number of Workers:	17
Type of Sampling:	personal and area
Sampling Location:	auto shop
Analytic Method:	air quality monitor

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	NIOSH report
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	Unacceptable	× 2	8	not used for degreasing anymore
	Metric 4: Temporal Representativeness	Unacceptable	× 2	8	Data is Pre-Montreal Protocol (1980)
	Metric 5: Sample Size	Low	× 1	3	disitribution not characterized by statistics, only 17 exposed
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	complete data
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.8.

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Source Citation:	Love, J. R., Kern, M.. 1981. Health hazard evaluation report no. HETA-81-065-938, METRO Bus Maintenance Shop, Washington, DC.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3859376

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation: ToxNet Hazardous Substances Data, Bank. 2017. HSDB: Carbon tetrachloride.
 Type of Data Source Occupational Exposure; Monitoring Data;
 Hero ID 3970275

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Physical Form:	liquid
Route of Exposure:	ingestion
Exposure Concentration (Unit):	1 pint
Number of Samples:	1
Number of Workers:	1
Type of Sampling:	personal
Analytic Method:	monitoring test subject after ingestion p. 3

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	NLM NSDB for CCl4
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	Unacceptable	× 2	8	laboratory test data not worker data
	Metric 4: Temporal Representativeness	Unacceptable	× 2	8	Data is Pre-Montreal Protocol (1963)
	Metric 5: Sample Size	Low	× 1	3	disitribution not characterized by statistics, only 1 exposed
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	complete data
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.8.

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Source Citation:	ToxNet Hazardous Substances Data, Bank. 2017. HSDB: Carbon tetrachloride.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3970275

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation: ToxNet Hazardous Substances Data, Bank. 2017. HSDB: Carbon tetrachloride.
 Type of Data Source: Occupational Exposure; Monitoring Data;
 Hero ID: 3970275

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Physical Form:	vapor
Route of Exposure:	inhalation
Exposure Concentration (Unit):	ug/m3
Worker Activity:	municipal solid waste composting
Number of Workers:	92,143
Type of Sampling:	personal
Analytic Method:	NIOSH survey p. 35

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	NLM NSDB for CCl4
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	solid waste composting (recycle)
	Metric 4: Temporal Representativeness	Unacceptable	× 2	8	Data is Pre-Montreal Protocol (1981-83)
	Metric 5: Sample Size	Low	× 1	3	disitribution not characterized by statistics, only 1 exposed
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	complete data
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.1.

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Source Citation:	ToxNet Hazardous Substances Data, Bank. 2017. HSDB: Carbon tetrachloride.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3970275

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
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* MWF = Metric Weighting Factor

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High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation: Atsdr,. 2007. Health consultation: Evaluation of follow-up indoor air sampling results (January " March 2007) at the Washington Traffic Safety Commission offices TMC cleaners (aka Howard"s Cleaners and Olympia Cleaners) Olympia, Thurston County, Washington: EPA facility ID: WAH000017277.

Type of Data Source Occupational Exposure; Monitoring Data;
 Hero ID 3970403

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Physical Form:	vapor
Route of Exposure:	inhalation
Exposure Concentration (Unit):	0.44-0.53 "g/m3
Number of Samples:	18
Number of Sites:	1.0
Worker Activity:	office building by dry cleaning service
Sampling Location:	office building by dry cleaner
Analytic Method:	portable photoionization detector

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	Washington State Department of Health
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Unacceptable	× 2	8	textile cleaning
Metric 4:	Temporal Representativeness	Medium	× 2	4	Data from greater than 10 years ago (2002, 2004, 2007)
Metric 5:	Sample Size	Low	× 1	3	disitribution not characterized by statistics
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	complete data
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty

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Source Citation: Atsdr, 2007. Health consultation: Evaluation of follow-up indoor air sampling results (January " March 2007) at the Washington Traffic Safety Commission offices TMC cleaners (aka Howard"s Cleaners and Olympia Cleaners) Olympia, Thurston County, Washington: EPA facility ID: WAH000017277.

Type of Data Source Occupational Exposure; Monitoring Data;
 Hero ID 3970403

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.3.

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[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Gilles, D., Lybarger, J.. 1978. Health hazard evaluation report no. HHE 77-111-501, Allied Chemical Corporation, Danville, Illinois.
 Type of Data Source Occupational Exposure; Monitoring Data;
 Hero ID 3970548

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Physical Form:	vapor
Route of Exposure:	inhalation
Number of Sites:	1.0
Worker Activity:	Reactant
Number of Workers:	43
Type of Sampling:	blood test, physical exam, medical history
Sampling Location:	producing CFCs at Allied chemical in danville, IL
Analytic Method:	biological tests on employees

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	NIOSH health hazard evaluation
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	reactant
	Metric 4: Temporal Representativeness	Unacceptable	× 2	8	Data is Pre-Montreal Protocol (1978)
	Metric 5: Sample Size	Medium	× 1	2	some statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	complete data
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.0.

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Source Citation:	Gilles, D., Lybarger, J.. 1978. Health hazard evaluation report no. HHE 77-111-501, Allied Chemical Corporation, Danville, Illinois.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3970548

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
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High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation: Kim, E. A., Bernard, B. P., Esswein, E. J.. 2005. Health hazard evaluation report no. HETA 2004-0169-2982, U.S. Mangesium, Rowley, Utah.
 Type of Data Source Occupational Exposure; Monitoring Data;
 Hero ID 3970550

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	Manufacturing of chlorinated compounds used in solvents for cleaning and de-greasing
Physical Form:	vapor
Route of Exposure:	inhalation
Exposure Concentration (Unit):	Not detected - 0.18 mg/m3
Number of Samples:	13
Number of Sites:	1.0
Type of Measurement or Method:	TWA
Worker Activity:	CCl4 generated in production process
Number of Workers:	30
Type of Sampling:	personal
Sampling Location:	U.S. magnesiusm Rowley, UT
Analytic Method:	air quality monitor

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	NIOSH health hazard evaluation
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	manufacture
Metric 4:	Temporal Representativeness	Medium	× 2	4	Data from greater than 10 years ago (2005)
Metric 5:	Sample Size	High	× 1	1	discussion of statistics
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	complete data

Domain 4: Variability and Uncertainty

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Source Citation:	Kim, E. A., Bernard, B. P., Esswein, E. J.. 2005. Health hazard evaluation report no.HETA 2004-0169-2982, U.S. Mangesium, Rowley, Utah.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3970550

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 7: Metadata Completeness	High	× 1	1	clearly documented data with thorough assessment
Overall Quality Determination [†]		High		1.2	

* MWF = Metric Weighting Factor

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High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation: Lenhart, S. W., Driscoll, R.. 1992. Health hazard evaluation report no. HETA 90-223-2211, Thomson consumer electronics, Marion, Indiana.
 Type of Data Source Occupational Exposure; Monitoring Data;
 Hero ID 3970551

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	Manufacturing of chlorinated compounds used in solvents for cleaning and degreasing
Physical Form:	vapor
Route of Exposure:	inhalation
Exposure Concentration (Unit):	"small amounts"
Number of Sites:	1.0
Worker Activity:	CCl4 generated in production process, specifically degreasers using trichloroethylene - only lists "small amounts"
Number of Workers:	721
Type of Sampling:	personal and area
Sampling Location:	Thomson Consumer Electronics Marion, IN
Analytic Method:	NIOSH 1003, 1300, 1400, 1450, 1500, and 1501 charcoal tubes, personal sampling pumps, short-term detector tubes, miran gas analyzer, photionization air analyzer

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	NIOSH health hazard evaluation
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Low	× 2	6	degreasing, testing results only list TCE as CCl4 was found in "small amounts"
Metric 4:	Temporal Representativeness	Low	× 2	6	Data from greater than 20 years ago (1992)
Metric 5:	Sample Size	Low	× 1	3	disitribution not characterized by statistics
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	complete data

Domain 4: Variability and Uncertainty

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Source Citation:	Lenhart, S. W., Driscoll, R.. 1992. Health hazard evaluation report no. HETA 90-223-2211, Thomson consumer electronics, Marion, Indiana.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3970551

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Low		2.3	

* MWF = Metric Weighting Factor

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High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Gorman, R.,Rinsky, R.,Stein, G.,Anderson, K.. 1984. Health hazard evaluation report no. HETA 82-075-1545, Pratt & Whitney Aircraft, West Palm Beach, Florida.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3970552

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Physical Form:	vapor
Route of Exposure:	inhalation
Number of Samples:	100+
Number of Sites:	1.0
Worker Activity:	degreasing - non detectable amounts of CCl4
Type of Sampling:	personal and area
Sampling Location:	Pratt & Whitney Aircraft Palm Beach, FL
Analytic Method:	charcoal tubes, photoionization detector, water sampling

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	NIOSH health hazard evaluation
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	Low	× 2	6	degreasing
	Metric 4: Temporal Representativeness	Unacceptable	× 2	8	Data is Pre-Montreal Protocol (1981 and 1982)
	Metric 5: Sample Size	High	× 1	1	discussion of statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	complete data
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Medium	× 1	2	limited discussion variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.2.
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Source Citation:	Gorman, R.,Rinsky, R.,Stein, G.,Anderson, K.. 1984. Health hazard evaluation report no. HETA 82-075-1545, Pratt & Whitney Aircraft, West Palm Beach, Florida.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3970552

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
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Source Citation: Barsan, M. E.. 1991. Health hazard evaluation report no. HETA 90-344-2159, A.W. Cash Valve Manufacturing Corporation, Decatur, Illinois.
 Type of Data Source Occupational Exposure; Monitoring Data;
 Hero ID 3970554

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Physical Form:	vapor
Route of Exposure:	inhalation
Number of Samples:	7
Number of Sites:	1.0
Worker Activity:	degreasing - did not test for CCl4
Type of Sampling:	personal and area
Sampling Location:	A.W. Cash Valve Manufacturing Corp. Decatur, IL
Analytic Method:	charcoal tubes

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	NIOSH health hazard evaluation
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	Unacceptable	× 2	8	not about CCl4, but about TCE
	Metric 4: Temporal Representativeness	Low	× 2	6	Data from greater than 20 years ago (1990)
	Metric 5: Sample Size	Low	× 1	3	dsitribution not characterized by statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	complete data
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Medium	× 1	2	limited discussion variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.4.

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Source Citation:	Barsan, M. E.. 1991. Health hazard evaluation report no. HETA 90-344-2159, A.W. Cash Valve Manufacturing Corporation, Decatur, Illinois.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3970554

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
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Source Citation: Kiefer, M., Driscoll, R. J.. 1998. Health hazard evaluation report no. HETA 97-0185-2675, McGregor Loudspeaker Manufacturing Company, Prairie du Chien, Wisconsin.

Type of Data Source: Occupational Exposure; Monitoring Data;
 Hero ID: 3970559

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Physical Form:	vapor
Route of Exposure:	inhalation
Number of Samples:	5
Number of Sites:	1.0
Worker Activity:	production line for loudspeakers
Type of Sampling:	area
Sampling Location:	McGregor Loudspeaker Manufacturing Company Prairie du Chien, WI
Analytic Method:	1300, 1500, 1005, 1609, 1501, and 2500 thermal desorption tubes

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	NIOSH health hazard evaluation
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	Unacceptable	× 2	8	did not test for CCl4
	Metric 4: Temporal Representativeness	Low	× 2	6	Data from greater than 20 years ago (1997)
	Metric 5: Sample Size	Low	× 1	3	disitribution not characterized by statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	complete data
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Medium	× 1	2	limited discussion variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.4.

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Source Citation:	Kiefer, M., Driscoll, R. J.. 1998. Health hazard evaluation report no. HETA 97-0185-2675, McGregor Loudspeaker Manufacturing Company, Prarie du Chien, Wisconsin.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3970559

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
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High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation: Mouradian, R.,Burt, S.,Tepper, A.,Hanley, K.. 1995. Health hazard evaluation report no. HETA 88-0140-2517, Boise Cascade, United Paperworkers, International Union, Rumford, Maine.

Type of Data Source Occupational Exposure; Monitoring Data;
 Hero ID 3970560

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Physical Form:	vapor
Route of Exposure:	inhalation
Number of Samples:	5
Number of Sites:	1.0
Worker Activity:	bleaching paper
Type of Sampling:	area
Sampling Location:	United Paperworkers Internat'l Union Rumford, ME
Analytic Method:	silica gel adsorbent spiked with 2,3,7,8-TCDD and 2,3,7,8-TCDF withradioactive carbon (13C) or chlorine(37Cl) markers

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	NIOSH health hazard evaluation
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	Unacceptable	× 2	8	air samples did not detect CCl4
	Metric 4: Temporal Representativeness	Low	× 2	6	Data from greater than 20 years ago (1991)
	Metric 5: Sample Size	High	× 1	1	representative sample
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	complete data
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Medium	× 1	2	limited discussion variability or uncertainty

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Source Citation:	Mouradian, R.,Burt, S.,Tepper, A.,Hanley, K.. 1995. Health hazard evaluation report no. HETA 88-0140-2517, Boise Cascade, United Paperworkers, International Union, Rumford, Maine.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3970560

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.2.

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High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation: Crandall, M. S.,Albrecht, W. N.,Blade, L. M.. 1989. Health hazard evaluation report no. HETA 86-380-1957, York Internationl Corporation, Madisonville, Kentucky.

Type of Data Source Occupational Exposure; Monitoring Data;
 Hero ID 3970561

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Physical Form:	vapor
Route of Exposure:	inhalation
Number of Sites:	1.0
Worker Activity:	degreasing assmebled copper tubing and aluminium fins into heat exchanger units - did not test for CCl4
Number of Workers:	120
Type of Sampling:	personal
Sampling Location:	York International Corp Madisonville, KY

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	NIOSH health hazard evaluation
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	Unacceptable	× 2	8	did not test for CCl4
	Metric 4: Temporal Representativeness	Unacceptable	× 2	8	Data is Pre-Montreal Protocol (1986)
	Metric 5: Sample Size	Low	× 1	3	disitribution not characterized by statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	complete data
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.8.

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Source Citation:	Crandall, M. S.,Albrecht, W. N.,Blade, L. M.. 1989. Health hazard evaluation report no. HETA 86-380-1957, York Internationl Corporation, Madisionville, Kentucky.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3970561

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
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High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation: Seitz, T., Driscoll, R.. 1989. Health hazard evaluation report no. HETA 88-082-1971, Jostens Incorporated, Princeton, Illinois.
 Type of Data Source Occupational Exposure; Monitoring Data;
 Hero ID 3970562

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Physical Form:	vapor
Route of Exposure:	inhalation
Number of Samples:	15
Number of Sites:	1.0
Worker Activity:	jewelry polishing and plating
Number of Workers:	60
Type of Sampling:	personal and area
Sampling Location:	Jostens Inc. Princeton, IL
Analytic Method:	1003, 1300, and 1501 charcoal tubes

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	NIOSH health hazard evaluation
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	Unacceptable	× 2	8	did not test for CCl4
	Metric 4: Temporal Representativeness	Unacceptable	× 2	8	Data is Pre-Montreal Protocol (1988)
	Metric 5: Sample Size	Low	× 1	3	disitribution not characterized by statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	complete data
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.8.

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Source Citation:	Seitz, T., Driscoll, R.. 1989. Health hazard evaluation report no. HETA 88-082-1971, Jostens Incorporated, Princeton, Illinois.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3970562

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
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** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, two of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation: Burroughs, G. E., Horan, J.. 1982. Health hazard evaluation report no. HETA 80-147-1076, Calhio Chemical Copmany, Perry, Ohio.
 Type of Data Source Occupational Exposure; Monitoring Data;
 Hero ID 3970563

EXTRACTION

Parameter	Data
Life Cycle Stage:	manufacture
Physical Form:	vapor
Route of Exposure:	inhalation
Number of Samples:	24
Worker Activity:	fungicides byproduct
Type of Sampling:	personal and area
Sampling Location:	Calhio Chemical Perry, Ohio
Analytic Method:	Length-of-stain detector tubes

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	NIOSH health hazard evaluation
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	Agricultural products manufacturing
	Metric 4: Temporal Representativeness	Unacceptable	× 2	8	Data is Pre-Montreal Protocol (1982)
	Metric 5: Sample Size	Low	× 1	3	disitribution not characterized by statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	data sources generally described, some details missing
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.2.

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Source Citation:	Burroughs, G. E., Horan, J.. 1982. Health hazard evaluation report no. HETA 80-147-1076, Calhio Chemical Copmany, Perry, Ohio.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3970563

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation: Rosensteel, R. E., Rostand, R. A.. 1976. Health hazard evaluation report no.HHE 74-93-296, Calhio Chemicals, Perry, Ohio.
 Type of Data Source Occupational Exposure; Monitoring Data;
 Hero ID 3970564

EXTRACTION

Parameter	Data
Life Cycle Stage:	manufacture
Physical Form:	vapor
Route of Exposure:	inhalation
Number of Samples:	19
Number of Sites:	1.0
Worker Activity:	fungicides
Type of Sampling:	personal and area
Sampling Location:	Calhio Chemical Perry, Ohio
Analytic Method:	charcoal tubes

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	NIOSH health hazard evaluation
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	Agricultural products manufacturing - but amount of CCl4 well below detection limit
Metric 4:	Temporal Representativeness	Unacceptable	× 2	8	Data is Pre-Montreal Protocol (1982)
Metric 5:	Sample Size	Low	× 1	3	disitribution not characterized by statistics
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Medium	× 1	2	data sources generally described, some details missing
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.2.

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Source Citation:	Rosensteel, R. E., Rostand, R. A.. 1976. Health hazard evaluation report no.HHE 74-93-296, Calhio Chemicals, Perry, Ohio.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	3970564

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
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** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation: Broadwater, K.,Brueck, S. E.,Nourian, F.,Roberts, J.,Oza, A. Y.. 2016. Health hazard evaluation report no. HHE 2013-0117-3247, Evaluation of odors and surface residue in a medical center research facility.

Type of Data Source Occupational Exposure; Monitoring Data;
 Hero ID 3970565

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Manufacturing of chlorinated compounds used in adhesives and sealants
Physical Form:	vapor
Route of Exposure:	inhalation
Exposure Concentration (Unit):	"trace amounts"
Number of Sites:	1.0
Worker Activity:	office building/laboratory
Type of Sampling:	area
Sampling Location:	medical research facility
Analytic Method:	thermal desorption tubes containing three beds of sorbent material: (1) 90 milligrams of Carboxen Y, (2) 115 milligrams of Carboxen B, and (3) 150 milligrams Carboxen"

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	NIOSH health hazard evaluation
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	Low	× 2	6	trace amounts found in office building, evaluation claimed prigin to be building materials or household cleaners
	Metric 4: Temporal Representativeness	High	× 2	2	Data from less than 10 years ago (2013)
	Metric 5: Sample Size	Low	× 1	3	disitribution not characterized by statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	data sources generally described, some details missing
Domain 4: Variability and Uncertainty					

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Source Citation:	Broadwater, K.,Brueck, S. E.,Nourian, F.,Roberts, J.,Oza, A. Y.. 2016. Health hazard evaluation report no. HHE 2013-0117-3247, Evaluation of odors and surface residueus in a medical center research facility.
Type of Data Source Hero ID	Occupational Exposure; Monitoring Data; 3970565

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 7: Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Medium		2.0	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Echa., 2017. Uses at industrial sites: Carbon tetrachloride.
 Type of Data Source: Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
 Hero ID: 3970709

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture and Process (intermediate)
Physical Form:	vapor. Liquid
Route of Exposure:	inhalation, dermal
Worker Activity:	transfer of chemical, filling small containers

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	European Chemical Agency
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	OECD Countries (Europe)
Metric 3:	Applicability	Unacceptable	× 2	8	list of industrial uses, no quantitative data
Metric 4:	Temporal Representativeness	High	× 2	2	recent, but no date is listed
Metric 5:	Sample Size	High	× 1	1	National Data
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Unacceptable	× 1	4	does not document data sources, methods or assumptions
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.3.

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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Iarc,. 1999. IARC Monographs on the evaluation of carcinogenic risks to humans: Carbon tetrachloride.
 Type of Data Source Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
 Hero ID 3970843

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Textile Cleaning
Physical Form:	vapor. Liquid
Route of Exposure:	inhalation, dermal
Type of Measurement or Method:	TWA
Number of Workers:	5365

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	IARC studies
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Unacceptable	× 2	8	Textiles, Dry Cleaning
Metric 4:	Temporal Representativeness	Unacceptable	× 2	8	Data is Pre-Montreal Protocol (1948 to 1978)
Metric 5:	Sample Size	Low	× 1	3	disitribution not characterized by statistics
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	provides report of results but does not describes methods or assumptions
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	does not specifically address variability or uncertainty but references original study article

Overall Quality Determination[†] Unacceptable 4 Metric Mean Score: 3.0.

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Source Citation:	Iarc., 1999. IARC Monographs on the evaluation of carcinogenic risks to humans: Carbon tetrachloride.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3970843

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
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** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, two of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation:	Iarc,. 1999. IARC Monographs on the evaluation of carcinogenic risks to humans: Carbon tetrachloride.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3970843

EXTRACTION	
Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	aircraft maintenance
Physical Form:	vapor. Liquid
Route of Exposure:	inhalation, dermal
Number of Workers:	6737

EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
Metric 1:	Methodology	High	× 1	1	IARC studies	
Domain 2: Representative						
Metric 2:	Geographic Scope	High	× 1	1	US	
Metric 3:	Applicability	High	× 2	2	aircraft maintenance	
Metric 4:	Temporal Representativeness	Unacceptable	× 2	8	Data from greater than 20 years ago (1952-1956)	
Metric 5:	Sample Size	Low	× 1	3	disitribution not characterized by statistics	
Domain 3: Accessibility/Clarity						
Metric 6:	Metadata Completeness	Low	× 1	3	provides report of results but does not describes methods or assumptions	
Domain 4: Variability and Uncertainty						
Metric 7:	Metadata Completeness	Low	× 1	3	does not specifically address variability or uncertainty but references original study article	
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.3.	

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Iarc., 1999. IARC Monographs on the evaluation of carcinogenic risks to humans: Carbon tetrachloride.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3970843

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Other basic organic and inorganic chemical manufacturing
Physical Form:	vapor. Liquid
Route of Exposure:	inhalation, dermal

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	IARC studies
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	additive in rubber manufacturing
	Metric 4: Temporal Representativeness	Unacceptable	× 2	8	Data is Pre-Montreal Protocol (1964 to 1973)
	Metric 5: Sample Size	Low	× 1	3	disitribution not characterized by statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	provides report of results but does not describes methods or assumptions
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	does not specifically address variability or uncertainty but references original study article
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.3.

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* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Niosh,. 1975. Criteria for a recommended standard occupational exposure to carbon tetrachloride.					
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;					
Hero ID	3974896					
EXTRACTION						
Parameter	Data					
Life Cycle Stage:	Use					
Life Cycle Description (Subcategory of Use):	Textile Cleaning, Machinery cleaning					
Physical Form:	vapor. Liquid					
Route of Exposure:	inhalation, dermal					
EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
	Metric 1: Methodology	High	× 1	1	NIOSH	
Domain 2: Representative						
	Metric 2: Geographic Scope	High	× 1	1	US	
	Metric 3: Applicability	Unacceptable	× 2	8	outdated applications	
	Metric 4: Temporal Representativeness	Unacceptable	× 2	8	Data is Pre-Montreal Protocol (1975)	
	Metric 5: Sample Size	Low	× 1	3	distribution not characterized by statistics	
Domain 3: Accessibility/Clarity						
	Metric 6: Metadata Completeness	Low	× 1	3	provides report of results but does not describes methods or assumptions	
Domain 4: Variability and Uncertainty						
	Metric 7: Metadata Completeness	Low	× 1	3	does not specifically address variability or uncertainty but references original study article	
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 3.0.	

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, two of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Osha., 2012. Appendix A: Chemicals noted for skin absorption (OSHA and ACGIH designated only).					
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;					
Hero ID	3978344					
EXTRACTION						
Parameter	Data					
Life Cycle Stage:	Use					
Physical Form:	vapor. Liquid					
Route of Exposure:	inhalation, dermal					
EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
	Metric 1: Methodology	High	× 1	1	OSHA	
Domain 2: Representative						
	Metric 2: Geographic Scope	High	× 1	1	US	
	Metric 3: Applicability	Unacceptable	× 2	8	List of TWAs and STELs	
	Metric 4: Temporal Representativeness	High	× 2	2	Data from less than 10 years ago (2012)	
	Metric 5: Sample Size	Low	× 1	3	distribution not characterized by statistics	
Domain 3: Accessibility/Clarity						
	Metric 6: Metadata Completeness	Low	× 1	3	provides report of results but does not describes methods or assumptions	
Domain 4: Variability and Uncertainty						
	Metric 7: Metadata Completeness	Low	× 1	3	does not specifically address variability or uncertainty but references original study article	
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.3.	

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Carex, Canada. 2017. Profiles & estimates: Carbon tetrachloride.
 Type of Data Source: Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
 Hero ID: 3978372

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Agricultural products manufacturing, textile cleaning agent, Machinery cleaning
Physical Form:	vapor. Liquid
Route of Exposure:	inhalation, dermal
Exposure Concentration (Unit):	5-7100 ppm
Worker Activity:	dry cleaning

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Medium	× 1	2	CAREX
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	OECD Country (Canada)
Metric 3:	Applicability	Unacceptable	× 2	8	Physical Data and brief description of exposure
Metric 4:	Temporal Representativeness	High	× 2	2	Data from less than 10 years ago (2016)
Metric 5:	Sample Size	Low	× 1	3	distribution not characterized by statistics
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	provides report of results but does not describes methods or assumptions
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	does not specifically address variability or uncertainty but references original study article

Overall Quality Determination[†] Unacceptable 4 Metric Mean Score: 2.6.

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Source Citation:	Carex, Canada. 2017. Profiles & estimates: Carbon tetrachloride.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3978372

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
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** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation: Cameo, Chemicals. 2016. Chemical datasheet: carbon tetrachloride.
 Type of Data Source: Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
 Hero ID: 3981009

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	MSDS
Physical Form:	vapor. Liquid
Route of Exposure:	inhalation, dermal

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	NOAA Cameo chemicals
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	Unacceptable	× 2	8	physical data, hazards, and safety guidelines
	Metric 4: Temporal Representativeness	Medium	× 2	4	Data from greater than 10 years ago (1999 to 2016)
	Metric 5: Sample Size	Low	× 1	3	disitribution not characterized by statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	provides report of results but does not describes methods or assumptions
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	does not specifically address variability or uncertainty but references original study article
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.6.

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* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Queens College, University of New York United Steelworks. 2012. Waste isolation pilot plan medical screening program: Phase I: Needs assessment.

Type of Data Source: Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;

Hero ID: 3974980

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Machinery cleaning
Physical Form:	vapor. Liquid
Route of Exposure:	inhalation, dermal
Exposure Concentration (Unit):	0.055-0.54 ppm
Type of Measurement or Method:	TWA
Worker Activity:	solidified organic sludge from Idaho and Rocky Flats, where it was used as a cleaning agent
Type of Sampling:	area

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	US DOE
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	Unacceptable	× 2	8	cleaning agent out of scope
	Metric 4: Temporal Representativeness	Medium	× 2	4	Data from greater than 10 years ago (1999-2009)
	Metric 5: Sample Size	Medium	× 1	2	number of samples, mean, range and standard deviation provided, discrete sampling results not given
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	data includes sample methodology, but does not clearly explain sample location, worker activities or sample duration
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Medium	× 1	2	data includes standard deviation

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Source Citation:	Queens College, University of New York United Steelworks. 2012. Waste isolation pilot plan medical screening program: Phase I: Needs assessment.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3974980

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.3.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation:	Spin,. 2017. SPIN substances in preparations in nordic countries tetrachloromethane.				
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;				
Hero ID	3981129				
EXTRACTION					
Parameter	Data				
Life Cycle Stage:	Use				
EVALUATION					
Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Trusted Source (Danish EPA)
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	OECD countries ("Nordic Countries")
	Metric 3: Applicability	Unacceptable	× 2	8	Database search listing National air & water exposure and use with no units or sources listed
	Metric 4: Temporal Representativeness	High	× 2	2	Data from less than 10 years ago (2000-2014)
	Metric 5: Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.2.

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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation:	Oehha,. 2007. Occupational health hazard risk assessment project for California: Identification of chemicals of concern, possible risk assessment methods, and examples of health protective occupational air concentrations.
Type of Data Source Hero ID	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 3982225

EXTRACTION	
Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	multiple
Physical Form:	vapor. Liquid
Route of Exposure:	inhalation, dermal

EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
	Metric 1: Methodology	High	× 1	1	OEHHA	
Domain 2: Representative						
	Metric 2: Geographic Scope	High	× 1	1	US	
	Metric 3: Applicability	Unacceptable	× 2	8	Uses OSHA PEL to calculate a cancer risk. No exposure data listed	
	Metric 4: Temporal Representativeness	Medium	× 2	4	Data from greater than 10 years ago (2007)	
	Metric 5: Sample Size	N/A		N/A	No Comment.	
Domain 3: Accessibility/Clarity						
	Metric 6: Metadata Completeness	N/A		N/A	No Comment.	
Domain 4: Variability and Uncertainty						
	Metric 7: Metadata Completeness	N/A		N/A	No Comment.	
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.3.	

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Nih., 2016. Report on carcinogens: Carbon tetrachloride.
 Type of Data Source: Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
 Hero ID: 3982329

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Processing aid
Physical Form:	vapor. Liquid
Route of Exposure:	inhalation, dermal
Worker Activity:	blast furnaces and steel mills, in the air transportation industry, and in motor vehicle and telephone and telegraph equipment manufacturing
Number of Workers:	4,500 workers potentially were exposed during production of carbon tetrachloride and 52,000 during its industrial use. The National Occupational Exposure Survey (conducted from 1981 to 1983) estimated that 77,315 workers, including 12,605 women, potentially were exposed to carbon tetrachloride

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	NTP from NIEHS
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	manufacture
	Metric 4: Temporal Representativeness	High	× 2	2	Data from less than 10 years ago (2009)
	Metric 5: Sample Size	High	× 1	1	complete data
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	limited data, only includes production volume
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		High		1.4	

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Source Citation:	Nih., 2016. Report on carcinogens: Carbon tetrachloride.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3982329

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation: Nih., 2016. Report on carcinogens: Carbon tetrachloride.
 Type of Data Source: Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
 Hero ID: 3982329

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	textile processing
Physical Form:	vapor, Liquid
Route of Exposure:	inhalation
Exposure Concentration (Unit):	ambient air: 20-70ppm, average exposure of 206-338 ppm for operators
Number of Workers:	The National Occupational Exposure Survey (conducted from 1981 to 1983) estimated that 77,315 workers, including 12,605 women, potentially were exposed to carbon tetrachloride

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	NTP from NIEHS
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	Unacceptable	× 2	8	Textile processing
	Metric 4: Temporal Representativeness	High	× 2	2	Data from less than 10 years ago (2009)
	Metric 5: Sample Size	High	× 1	1	complete data
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	limited data, only includes production volume
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.1.

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Source Citation:	Nih., 2016. Report on carcinogens: Carbon tetrachloride.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3982329

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
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** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation:	CalEpa., 2005. Appendix D.3 Chronic RELS and toxicity summaries using the previous version of Hot Spots Risk Assessment guidelines (OEHHA 1999).
Type of Data Source Hero ID	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 3982628

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Physical Form:	vapor. Liquid
Route of Exposure:	inhalation, dermal

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Trusted Source (OEHHA)
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	Unacceptable	× 2	8	list general air concentration and animal exposure testing
	Metric 4: Temporal Representativeness	N/A		N/A	No Comment.
	Metric 5: Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.5.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Atsdr., 2005. Toxicological profile for carbon tetrachloride.
 Type of Data Source Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
 Hero ID 3982336

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Agricultural products manufacturing
Physical Form:	vapor. Liquid
Route of Exposure:	inhalation, dermal
Exposure Concentration (Unit):	0.002-0.1ppm
Worker Activity:	worker at grain facility

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	US HHS
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	Agricultural Manufacturing
Metric 4:	Temporal Representativeness	Unacceptable	× 2	8	Data is Pre-Montreal Protocol (1987)
Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	limited data, only includes estimated exposure for average worker working with fumigant
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty

Overall Quality Determination[†] Unacceptable 4 Metric Mean Score: 2.1.

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Source Citation:	Atsdr, 2005. Toxicological profile for carbon tetrachloride.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3982336

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
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** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation: 2004. Nested Case-Control Study of Leukemia and Ionizing Radiation at the Portsmouth Naval Shipyard.
 Type of Data Source: Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
 Hero ID: 2972030

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	cleaning
Physical Form:	vapor. Liquid
Route of Exposure:	inhalation, dermal
Number of Sites:	1.0
Worker Activity:	transportation, woodworking, welding, electrical, painting

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	NIOSH
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Unacceptable	× 2	8	naval base, solvent use
Metric 4:	Temporal Representativeness	Medium	× 2	4	Data from greater than 10 years ago (2007)
Metric 5:	Sample Size	High	× 1	1	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Unacceptable	× 1	4	no monitoring data
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.4.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, two of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	U.S, E. P. A.. 2016. TSCA work plan chemical risk assessment: Peer review draft 1-bromopropane: (n-Propyl bromide) spray adhesives, dry cleaning, and degreasing uses CASRN: 106-94-5.
Type of Data Source Hero ID	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 3355305

EXTRACTION	
Parameter	Data
Life Cycle Stage:	Use

EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
Metric 1:	Methodology	High	× 1	1	EPA	
Domain 2: Representative						
Metric 2:	Geographic Scope	High	× 1	1	US	
Metric 3:	Applicability	Unacceptable	× 2	8	no mention of carbon tet, work plan for 1-BP	
Metric 4:	Temporal Representativeness	N/A		N/A	No Comment.	
Metric 5:	Sample Size	N/A		N/A	No Comment.	
Domain 3: Accessibility/Clarity						
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.	
Domain 4: Variability and Uncertainty						
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.	

Overall Quality Determination [†]	Unacceptable	4	Metric Mean Score: 2.5.			
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** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Stewart, A., Witts, L. J.. 1993. Chronic carbon tetrachloride intoxication. 1944. British Journal of Industrial Medicine.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3569868

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	manufacturing aid
Physical Form:	vapor. Liquid
Route of Exposure:	inhalation, dermal
Number of Sites:	1.0

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Medium	× 1	2	Nuffield Dept. of Clinical Medicine
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	Manufacturing Aid
Metric 4:	Temporal Representativeness	Unacceptable	× 2	8	Data is Pre-Montreal Protocol (1944)
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.2.

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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Oecd., 2011. SIDS initial assessment profile: Carbon tetrachloride.
 Type of Data Source: Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
 Hero ID: 3827246

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	lab chemical
Physical Form:	vapor. Liquid
Route of Exposure:	inhalation, dermal

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	SIDS Assessment
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	Unacceptable	× 2	8	general health effects
	Metric 4: Temporal Representativeness	N/A		N/A	No Comment.
	Metric 5: Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Unacceptable	× 1	4	no monitoring data, only discusses general health effects
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 3.0.

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* MWF = Metric Weighting Factor

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High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Lioy, P. J.,Fan, Z.,Zhang, J.,Georgopoulos, P.,Wang, S. W.,Ohman-Strickland, P.,Wu, X.,Zhu, X.,Harrington, J.,Tang, X.,Meng, Q.,Jung, K. H.,Kwon, J.,Hernandez, M.,Bonnano, L.,Held, J.,Neal, J.,Committee, H. H. R.. 2011. Personal and ambient exposures to air toxics in Camden, New Jersey. Research report (Health Effects Institute).

Type of Data Source: Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;

Hero ID: 1062454

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Emissions
Physical Form:	vapor
Route of Exposure:	inhalation
Exposure Concentration (Unit):	0.53(mg/m3)
Number of Samples:	62
Type of Measurement or Method:	continuous
Type of Sampling:	area
Sampling Location:	Waterfront South

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	HEI
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	Unacceptable	× 2	8	ambient air exposure
	Metric 4: Temporal Representativeness	N/A		N/A	No Comment.
	Metric 5: Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	No Comment.

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Source Citation:	Lioy, P. J., Fan, Z., Zhang, J., Georgopoulos, P., Wang, S. W., Ohman-Strickland, P., Wu, X., Zhu, X., Harrington, J., Tang, X., Meng, Q., Jung, K. H., Kwon, J., Hernandez, M., Bonnano, L., Held, J., Neal, J., Committee, H. H. R.. 2011. Personal and ambient exposures to air toxics in Camden, New Jersey. Research report (Health Effects Institute).
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	1062454

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.5.

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* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation: Lioy, P. J., Fan, Z., Zhang, J., Georgopoulos, P., Wang, S. W., Ohman-Strickland, P., Wu, X., Zhu, X., Harrington, J., Tang, X., Meng, Q., Jung, K. H., Kwon, J., Hernandez, M., Bonnano, L., Held, J., Neal, J., Committee, H. H. R.. 2011. Personal and ambient exposures to air toxics in Camden, New Jersey. Research report (Health Effects Institute).

Type of Data Source: Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;

Hero ID: 1062454

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Emissions
Physical Form:	vapor
Route of Exposure:	inhalation
Exposure Concentration (Unit):	0.54(mg/m3)
Number of Samples:	62
Type of Measurement or Method:	continuous
Type of Sampling:	area
Sampling Location:	Copewood-Davis

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	HEI
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	Unacceptable	× 2	8	ambient air exposure
	Metric 4: Temporal Representativeness	N/A		N/A	No Comment.
	Metric 5: Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	No Comment.

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Source Citation:	Lioy, P. J., Fan, Z., Zhang, J., Georgopoulos, P., Wang, S. W., Ohman-Strickland, P., Wu, X., Zhu, X., Harrington, J., Tang, X., Meng, Q., Jung, K. H., Kwon, J., Hernandez, M., Bonnano, L., Held, J., Neal, J., Committee, H. H. R.. 2011. Personal and ambient exposures to air toxics in Camden, New Jersey. Research report (Health Effects Institute).
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	1062454

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.5.

** Consistent with our *Application of Systematic Review in TSCA Risk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation:	Fda., 1998. Appendix 4. Toxicological data for class 1 solvents".
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3974789

EXTRACTION	
Parameter	Data
Life Cycle Stage:	Use

EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
	Metric 1: Methodology	Low	× 1	3	appendix 4 to unknown document	
Domain 2: Representative						
	Metric 2: Geographic Scope	High	× 1	1	US	
	Metric 3: Applicability	Unacceptable	× 2	8	animal exposure	
	Metric 4: Temporal Representativeness	N/A		N/A	No Comment.	
	Metric 5: Sample Size	N/A		N/A	No Comment.	
Domain 3: Accessibility/Clarity						
	Metric 6: Metadata Completeness	Unacceptable	× 1	4	no quantitative data	
Domain 4: Variability and Uncertainty						
	Metric 7: Metadata Completeness	N/A		N/A	No Comment.	
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 3.2.	

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, two of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Niosh,. 2016. NIOSH pocket guide to chemical hazards: Carbon tetrachloride.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3974866

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	exposure prevention
Route of Exposure:	inhalation

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	NIOSH
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Unacceptable	× 2	8	animal exposure
Metric 4:	Temporal Representativeness	N/A		N/A	No Comment.
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.5.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Niosh,. 2000. NIOSH recommendation for chemical protective clothing database: 1,4-Dioxane.
 Type of Data Source: Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
 Hero ID: 3974867

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	exposure prevention
Route of Exposure:	dermal

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	NIOSH
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Unacceptable	× 2	8	skin protection
Metric 4:	Temporal Representativeness	N/A		N/A	No Comment.
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.5.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Niosh,. 1995. Occupational safety and health guideline for carbon tetrachloride.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3974894

EXTRACTION	
Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	exposure prevention
Route of Exposure:	inhalation, dermal

EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
Metric 1:	Methodology	High	× 1	1	US HHS	
Domain 2: Representative						
Metric 2:	Geographic Scope	High	× 1	1	US	
Metric 3:	Applicability	Unacceptable	× 2	8	skin protection	
Metric 4:	Temporal Representativeness	Unacceptable	× 2	8	Data is Pre-Montreal Protocol (1995)	
Metric 5:	Sample Size	N/A		N/A	No Comment.	
Domain 3: Accessibility/Clarity						
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.	
Domain 4: Variability and Uncertainty						
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.	
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 3.0.	

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, two of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Niosh,. 1976. NIOSH revised recommended carbon tetrachloride standard.					
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;					
Hero ID	3974898					
EXTRACTION						
Parameter	Data					
Life Cycle Stage:	Use					
Life Cycle Description (Subcategory of Use):	exposure prevention					
Route of Exposure:	inhalation, dermal					
EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
Metric 1:	Methodology	High	× 1	1	NIOSH	
Domain 2: Representative						
Metric 2:	Geographic Scope	High	× 1	1	US	
Metric 3:	Applicability	Unacceptable	× 2	8	skin protection	
Metric 4:	Temporal Representativeness	Unacceptable	× 2	8	Data is Pre-Montreal Protocol (1976)	
Metric 5:	Sample Size	N/A		N/A	No Comment.	
Domain 3: Accessibility/Clarity						
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.	
Domain 4: Variability and Uncertainty						
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.	
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 3.0.	

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, two of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Wages, R. obert,Markowitz, S. teven,Kieding, S. ylvia,Griffon, M. ark,Ellenbecker, M. ichael. 1998. Former worker medical surveillance program at Idaho National Engineering and Environmental Laboratory (INEEL) Phase I: Needs assessment.

Type of Data Source: Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;

Hero ID: 3974967

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	degreasing
Route of Exposure:	inhalation
Exposure Concentration (Unit):	"dose factor"
Number of Samples:	450
Worker Activity:	CPP-602 (Instrument Shop), CF-654 (Paint Shop), TAN-607 (Decon Shop, Pipe Laundry Area, Hot Shop 101), TRA-603 (MTR), and TRA-642 (ETR); instrument technicians (CPP), painters (CFA), mechanics, pipe fitters, welders, laborers, electricians and decon technicians (TAN) and laborers, mechanics, process operators, and reactor operators(TRA)
Number of Workers:	51
Type of Sampling:	questionnaire
Analytic Method:	we assigned numerical weights to the qualitative values (Fligh = 10, Medium=5 and Low=1) and multiplied that value by the frequency (in hours/day)to obtain a "Dose Factor".

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	DOE
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Medium	× 2	4	degreasing (not aerospace)
Metric 4:	Temporal Representativeness	Low	× 2	6	Data from greater than 20 years ago (1998)
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Unacceptable	× 1	4	used only qualitative values

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Source Citation:	Wages, R. obert,Markowitz, S. teven,Kieding, S. ylvia,Griffon, M. ark,Ellenbecker, M. ichael. 1998. Former worker medical surveillance program at Idaho National Engineering and Environmental Laboratory (INEEL) Phase I: Needs assessment.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3974967

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.3.

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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation:	Markowitz, S. teven,Scarborough, C. arl,Kieding, S. ylvia,Griffon, M. ark. 2004. Y-12 and Oak Ridge National Laboratory medical surveillance program, Phase I: Needs assessment.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3974971

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	uranium chlorination
Number of Samples:	247
Number of Workers:	54; 78
Type of Sampling:	questionnaire

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	DOE
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Unacceptable	× 2	8	uranium chlorination
Metric 4:	Temporal Representativeness	Medium	× 2	4	Data from greater than 10 years ago (2004)
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Unacceptable	× 1	4	used only qualitative values
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.6.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, two of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Wages, R. obert,Markowitz, S. teven,Kieding, S. ylvia,Griffon, M. ark,Samaras, E. lizabeth Averill. 1997. Former worker medicla surveillance program at Department of Energy gaseous diffusion plants: Phase I: Needs assessment.
Type of Data Source Hero ID	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 3974974

EXTRACTION	
Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	degreasing
Route of Exposure:	inhalation, dermal
Type of Sampling:	questionnaire

EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
	Metric 1: Methodology	High	× 1	1	DOE	
Domain 2: Representative						
	Metric 2: Geographic Scope	High	× 1	1	US	
	Metric 3: Applicability	High	× 2	2	degreasing (not aerospace)	
	Metric 4: Temporal Representativeness	Low	× 2	6	Data from greater than 20 years ago (1997)	
	Metric 5: Sample Size	N/A		N/A	No Comment.	
Domain 3: Accessibility/Clarity						
	Metric 6: Metadata Completeness	Unacceptable	× 1	4	used only qualitative values	
Domain 4: Variability and Uncertainty						
	Metric 7: Metadata Completeness	N/A		N/A	No Comment.	
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.0.	

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* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Doe., 2003. A needs assessment for medical screening of construction workers at the Portsmouth and Paducah gaseous diffusion plants.
 Type of Data Source: Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
 Hero ID: 3974976

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	degreasing
Route of Exposure:	inhalation, dermal
Type of Sampling:	hazard rating

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	DOE
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	degreasing (not aerospace)
	Metric 4: Temporal Representativeness	Medium	× 2	4	Data from greater than 10 years ago (2003)
	Metric 5: Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Unacceptable	× 1	4	used only qualitative values
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 1.7.

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* MWF = Metric Weighting Factor

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High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Niosh,. 1994. Immediately dangerous to life or health concentrations (IDLH): Carbon tetrachloride.
 Type of Data Source Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
 Hero ID 3978143

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	exposure prevention
Route of Exposure:	inhalation, dermal
Exposure Concentration (Unit):	75-600ppm (average 210ppm)
Number of Samples:	1
Number of Workers:	1
Exposure Duration:	3 hour

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	NIOSH
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	Unacceptable	× 2	8	IDLH data
	Metric 4: Temporal Representativeness	High	× 2	2	Data from less than 10 years ago (2014)
	Metric 5: Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	No Comment.

Overall Quality Determination[†] Unacceptable 4 Metric Mean Score: 2.0.

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Source Citation:	Niosh,. 1994. Immediately dangerous to life or health concentrations (IDLH): Carbon tetrachloride.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3978143

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
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* MWF = Metric Weighting Factor

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High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation: Niosh,. 2014. International chemical safety cards (ICDC): Carbon tetrachloride.
 Type of Data Source: Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
 Hero ID: 3978151

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	exposure prevention
Route of Exposure:	inhalation, dermal

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	NIOSH
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Unacceptable	× 2	8	General exposure limits
Metric 4:	Temporal Representativeness	N/A		N/A	No Comment.
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.5.

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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Osha., 2017. Respiratory protection eTool: Using a math model table to determine a cartridge's service life: Comparing predicted calculation with experimental data.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3978257

EXTRACTION	
Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	exposure prevention
Route of Exposure:	inhalation

EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
	Metric 1: Methodology	High	× 1	1	OSHA	
Domain 2: Representative						
	Metric 2: Geographic Scope	High	× 1	1	US	
	Metric 3: Applicability	Unacceptable	× 2	8	Respirator cartridge testing	
	Metric 4: Temporal Representativeness	N/A		N/A	No Comment.	
	Metric 5: Sample Size	N/A		N/A	No Comment.	
Domain 3: Accessibility/Clarity						
	Metric 6: Metadata Completeness	N/A		N/A	No Comment.	
Domain 4: Variability and Uncertainty						
	Metric 7: Metadata Completeness	N/A		N/A	No Comment.	
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.5.	

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

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High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Construction Safety, Council. 2012. Job Hazard Analysis (JHA) for health hazards in construction.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3978262

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Construction Site
Route of Exposure:	inhalation

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	OSHA
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Unacceptable	× 2	8	Construction Site Hazard Checklist
Metric 4:	Temporal Representativeness	N/A		N/A	No Comment.
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.5.

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High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Osha., 2001. Shipyard industry standards.
 Type of Data Source Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
 Hero ID 3978263

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	exposure prevention
Route of Exposure:	inhalation

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	NIOSH
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Unacceptable	× 2	8	General exposure limits
Metric 4:	Temporal Representativeness	N/A		N/A	No Comment.
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.5.

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High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Nicnas,. 2017. IMAP: Environment tier II assessment for methane, tetrachloro.
 Type of Data Source Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
 Hero ID 3978351

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Route of Exposure:	inhalation
Exposure Concentration (Unit):	0.5-1mg/m3 (air)

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	NICNAS
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	Australia (OECD)
Metric 3:	Applicability	Unacceptable	× 2	8	Environmental Exposure
Metric 4:	Temporal Representativeness	N/A		N/A	No Comment.
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.8.

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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	European Chlorinated Solvents, Association. 2017. ECSA product & application toolbox: Guidance on safe & sustainable use of chlorinated solvents.
Type of Data Source Hero ID	Occupational Exposure; Published Models for Exposures or Releases; 3982127

EXTRACTION	
Parameter	Data
Life Cycle Stage:	Use
Route of Exposure:	inhalation, dermal

EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
	Metric 1: Methodology	High	× 1	1	ECSA	
Domain 2: Representative						
	Metric 2: Geographic Scope	Medium	× 1	2	European Union (OECD)	
	Metric 3: Applicability	Unacceptable	× 2	8	General exposure limits	
	Metric 4: Temporal Representativeness	N/A		N/A	No Comment.	
	Metric 5: Sample Size	N/A		N/A	No Comment.	
Domain 3: Accessibility/Clarity						
	Metric 6: Metadata Completeness	N/A		N/A	No Comment.	
Domain 4: Variability and Uncertainty						
	Metric 7: Metadata Completeness	N/A		N/A	No Comment.	
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.8.	

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: European Chlorinated Solvents, Association. 2017. Chlorinated solvents: Other solvents.
 Type of Data Source: Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
 Hero ID: 3982128

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Route of Exposure:	inhalation, dermal

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	ECSA
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	European Union (OECD)
Metric 3:	Applicability	Unacceptable	× 2	8	General exposure limits
Metric 4:	Temporal Representativeness	N/A		N/A	No Comment.
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.

Overall Quality Determination[†] Unacceptable 4 Metric Mean Score: 2.8.

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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Osha., 2017. OSHA occupational chemical database: Carbon tetrachloride.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3978249

EXTRACTION	
Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	exposure prevention
Route of Exposure:	inhalation, dermal

EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
Metric 1:	Methodology	High	× 1	1	OSHA	
Domain 2: Representative						
Metric 2:	Geographic Scope	High	× 1	1	US	
Metric 3:	Applicability	Unacceptable	× 2	8	General exposure limits	
Metric 4:	Temporal Representativeness	N/A		N/A	No Comment.	
Metric 5:	Sample Size	N/A		N/A	No Comment.	
Domain 3: Accessibility/Clarity						
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.	
Domain 4: Variability and Uncertainty						
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.	
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.5.	

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Osha., 2005. OSHA permissible exposure limit and general information: carbon tetrachloride.
 Type of Data Source: Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
 Hero ID: 3980999

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	exposure prevention
Route of Exposure:	inhalation, dermal

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	OSHA
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Unacceptable	× 2	8	General exposure limits
Metric 4:	Temporal Representativeness	N/A		N/A	No Comment.
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.5.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Oehha., 2016. Carbon tetrachloride.
 Type of Data Source: Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
 Hero ID: 3982267

EXTRACTION	
Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	exposure prevention
Route of Exposure:	inhalation, dermal

EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
Metric 1:	Methodology	High	× 1	1	CAIEPA	
Domain 2: Representative						
Metric 2:	Geographic Scope	High	× 1	1	US	
Metric 3:	Applicability	Unacceptable	× 2	8	General exposure limits	
Metric 4:	Temporal Representativeness	N/A		N/A	No Comment.	
Metric 5:	Sample Size	N/A		N/A	No Comment.	
Domain 3: Accessibility/Clarity						
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.	
Domain 4: Variability and Uncertainty						
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.	
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.5.	

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Cdc/Niosh,. Carbon tetrachloride.
 Type of Data Source Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
 Hero ID 3986503

EXTRACTION	
Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	exposure prevention
Route of Exposure:	inhalation, dermal

EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
Metric 1:	Methodology	High	× 1	1	NIOSH	
Domain 2: Representative						
Metric 2:	Geographic Scope	High	× 1	1	US	
Metric 3:	Applicability	Unacceptable	× 2	8	General exposure limits	
Metric 4:	Temporal Representativeness	N/A		N/A	No Comment.	
Metric 5:	Sample Size	N/A		N/A	No Comment.	
Domain 3: Accessibility/Clarity						
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.	
Domain 4: Variability and Uncertainty						
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.	
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.5.	

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Niosh., 2011. 1988 OSHA PEL Project documentation: Carbon tetrachloride.
 Type of Data Source: Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
 Hero ID: 3986445

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	OSHA
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Unacceptable	× 2	8	General exposure limits
Metric 4:	Temporal Representativeness	N/A		N/A	No Comment.
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.5.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Ec., 2009. Recommendation from the scientific committee on occupational exposure limits for carbon tetrachloride.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3982344

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Medium	× 1	2	European Commission
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	Belgium
Metric 3:	Applicability	Unacceptable	× 2	8	General exposure limits
Metric 4:	Temporal Representativeness	N/A		N/A	No Comment.
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 3.0.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Osha., 1991. Proposed rules: Occupational exposure to methylene chloride.
 Type of Data Source: Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
 Hero ID: 3982430

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	OSHA
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Unacceptable	× 2	8	Occupational exposure to Methylene Chloride, not ccl4
Metric 4:	Temporal Representativeness	N/A		N/A	No Comment.
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.5.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	da Silva Augusto, L. G.,Lieber, S. R.,Ruiz, M. A.,de Souza, C. A.. 1997. Micronucleus monitoring to assess human occupational exposure to organochlorides. Environmental and Molecular Mutagenesis.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	629708

EXTRACTION	
Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Unspecified
Number of Workers:	41

EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
	Metric 1: Methodology	Medium	× 1	2	Environmental and Molecular Mutagenesis	
Domain 2: Representative						
	Metric 2: Geographic Scope	Medium	× 1	2	Brazil	
	Metric 3: Applicability	Unacceptable	× 2	8	Conditions of use unspecified	
	Metric 4: Temporal Representativeness	N/A		N/A	No Comment.	
	Metric 5: Sample Size	N/A		N/A	No Comment.	
Domain 3: Accessibility/Clarity						
	Metric 6: Metadata Completeness	N/A		N/A	No Comment.	
Domain 4: Variability and Uncertainty						
	Metric 7: Metadata Completeness	N/A		N/A	No Comment.	
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 3.0.	

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Ojajärvi, A., Partanen, T., Ahlbom, A., Boffetta, P., Hakulinen, T., Jourenkova, N., Kauppinen, T., Kogevinas, M., Vainio, H., Weiderpass, E., Wesseling, C.. 2001. Risk of pancreatic cancer in workers exposed to chlorinated hydrocarbon solvents and related compounds: A meta-analysis. American Journal of Epidemiology.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	707289

EXTRACTION	
Parameter	Data
Life Cycle Stage:	Use

EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
Metric 1:	Methodology	High	× 1	1	Journal of Epidemiology	
Domain 2: Representative						
Metric 2:	Geographic Scope	High	× 1	1	US	
Metric 3:	Applicability	Unacceptable	× 2	8	Conditions of use vague or unspecified	
Metric 4:	Temporal Representativeness	N/A		N/A	No Comment.	
Metric 5:	Sample Size	N/A		N/A	No Comment.	
Domain 3: Accessibility/Clarity						
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.	
Domain 4: Variability and Uncertainty						
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.	
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.5.	

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Niosh,. 1987. Current Intelligence Bulletin 48 Organic Solvent Neurotoxicity (with reference package).
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	724690

EXTRACTION

Parameter	Data
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Life Cycle Stage:	Use
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EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	NIOSH health hazard evaluation
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Unacceptable	× 2	8	Looks at solvent use, condition of use out of scope
Metric 4:	Temporal Representativeness	N/A		N/A	No Comment.
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.5.

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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Niosh,. 2005. Health hazard evaluation report no. HETA-2004-0169-2982, U.S. Magnesium, Rowley, UT.
 Type of Data Source Occupational Exposure; Completed Exposure or Risk Assessments;
 Hero ID 3974895

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Processing aid (i.e., metal recovery).
Physical Form:	vapor
Route of Exposure:	inhalation
Exposure Concentration (Unit):	1 sample with concentration of 0.18 mg/m3 (0.03 ppm), rest ND or trace.
Number of Samples:	13
Number of Sites:	3.0
Type of Measurement or Method:	NIOSH Method 1003
Worker Activity:	Reactor building, electrolytics area, generan and reactor maintenance.
Number of Workers:	13
Type of Sampling:	PBZ
Exposure Duration:	full shift (8- 12hrs)
PPE:	none

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	NIOSH health hazard evaluation
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	Medium	× 2	4	Facility likely has appropriate condition of use, but sampling points may not be pertinent
	Metric 4: Temporal Representativeness	Medium	× 2	4	2005
	Metric 5: Sample Size	High	× 1	1	Data fully characterized
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Data fully characterized
Domain 4: Variability and Uncertainty					

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Source Citation:	Niosh,. 2005. Health hazard evaluation report no. HETA-2004-0169-2982, U.S. Magnesium, Rowley, UT.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3974895

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
	Metric 7: Metadata Completeness	High	× 1	1	Variability included
Overall Quality Determination [†]		High		1.4	

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High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation: Osha., 2003. Personal protective equipment. Publication # OSHA 3151-12R.
 Type of Data Source Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
 Hero ID 1239624

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Unspecified
Physical Form:	liquid?
Route of Exposure:	dermal
PPE:	lists nitrile gloves as the best choice for protection against CCl4, with neoprene as a second choice.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Medium	× 1	2	OSHA results
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Unacceptable	× 2	8	No condition of use mentioned, guidance for protective glove selection
Metric 4:	Temporal Representativeness	Medium	× 2	4	2003
Metric 5:	Sample Size	Low	× 1	3	Not applicable
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	Not applicable
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	Not discussed
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.7.

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 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Echa., 2017. Guidance on safe use: Carbon tetrachloride.
 Type of Data Source: Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
 Hero ID: 3970707

EXTRACTION

Parameter	Data
Life Cycle Stage:	Disposal
Life Cycle Description (Subcategory of Use):	Hazardous landfill
Physical Form:	liquid
Route of Exposure:	dermal/inhalation
Exposure Concentration (Unit):	2.9-110 ppb
Number of Sites:	27.0
Worker Activity:	Cleaning out a dam in a creek contaminated by landfill runoff

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	ECHA
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	Europe
	Metric 3: Applicability	Unacceptable	× 2	8	Includes only basic safety handling advice
	Metric 4: Temporal Representativeness	N/A		N/A	No Comment.
	Metric 5: Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	No Comment.

Overall Quality Determination[†] Unacceptable 4 Metric Mean Score: 2.8.

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Source Citation:	Echa,. 2017. Guidance on safe use: Carbon tetrachloride.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3970707

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation: Niosh., 2011. 1988 OSHA PEL Project documentation: Carbon tetrachloride.
 Type of Data Source: Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
 Hero ID: 3986445

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	CDC
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Unacceptable	× 2	8	Contains only exposure limits
Metric 4:	Temporal Representativeness	N/A		N/A	No Comment.
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.5.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Ec., 2009. Recommendation from the scientific committee on occupational exposure limits for carbon tetrachloride.
Type of Data Source	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;
Hero ID	3982344

EXTRACTION

Parameter	Data
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Life Cycle Stage:	Use
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EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Medium	× 1	2	European Commission
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	Europe
Metric 3:	Applicability	Unacceptable	× 2	8	Contains only exposure limits
Metric 4:	Temporal Representativeness	N/A		N/A	No Comment.
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.8.

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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Atsdr, 2009. Health consultation: Indoor air quality: Raytheon area: St. Petersburg, Pinellas County, Florida: EPA facility ID: FLD004100152, Part 2.
 Type of Data Source: Occupational Exposure; Completed Exposure or Risk Assessments;
 Hero ID: 3982212

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Hydrochlorofluorocarbons (HCFCs), Hydrofluorocarbon (HFCs) and Hydrofluoroolefin (HFOs)
Physical Form:	liquid/vapor
Route of Exposure:	inhalation
Exposure Concentration (Unit):	1.8 ug/m3
Number of Samples:	2
Number of Sites:	18.0
Type of Measurement or Method:	12-hour samples in stainless steel Summa" canisters
Exposure Duration:	12-hr
Analytic Method:	EPA Method Total Organic 15

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	NIOSH
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	Medium	× 2	4	Looks at indoor air quality of closed facility, so no specific worker measurements or descriptions
	Metric 4: Temporal Representativeness	High	× 2	2	2009
	Metric 5: Sample Size	High	× 1	1	Large number of samples taken
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Detailed discussion
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	Not covered in detail

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Source Citation:	Atsdr, 2009. Health consultation: Indoor air quality: Raytheon area: St. Petersburg, Pinellas County, Florida: EPA facility ID: FLD004100152, Part 2.
Type of Data Source	Occupational Exposure; Completed Exposure or Risk Assessments;
Hero ID	3982212

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination [†]		High		1.4	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation:	Niosh,. 1977. Health hazard evaluation report no. HHE-75-11-403, Port of Duluth-Superior Grain Elevators, Duluth, Minnesota and Superior, Wisconsin.
Type of Data Source Hero ID	Occupational Exposure; Completed Exposure or Risk Assessments; 3974897

EXTRACTION	
Parameter	Data
Life Cycle Stage:	Use

EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
	Metric 1: Methodology	High	× 1	1	NIOSH	
Domain 2: Representative						
	Metric 2: Geographic Scope	High	× 1	1	US	
	Metric 3: Applicability	Unacceptable	× 2	8	Assesses grain elevator worker exposures, including to CCl4 fumigants, not a current category of use	
	Metric 4: Temporal Representativeness	Low	× 2	6	1975-6	
	Metric 5: Sample Size	N/A		N/A	No Comment.	
Domain 3: Accessibility/Clarity						
	Metric 6: Metadata Completeness	N/A		N/A	No Comment.	
Domain 4: Variability and Uncertainty						
	Metric 7: Metadata Completeness	N/A		N/A	No Comment.	

Overall Quality Determination [†]	Unacceptable		4	Metric Mean Score: 2.7.		
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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Defense Occupational and Environmental Health Readiness System - Industrial Hygiene (DOEHRS-IH), 2018. Email between DOD and EPA: RE: [Non-DoD Source] Update: DoD exposure data for EPA risk evaluation - EPA request for additional information. U.S. Department of Defense.

Type of Data Source: Occupational Exposure; Monitoring Data;
 Hero ID: 5178607

EXTRACTION

Parameter	Data
Life Cycle Stage:	Process and Use
Life Cycle Description (Subcategory of Use):	destruction by detonation
Route of Exposure:	inhalation
Exposure Concentration (Unit):	mg/m3
Number of Samples:	102
Number of Sites:	3.0
Worker Activity:	clean up residual metal and ash; transferr of liquid waste solution into a waste drum; plastics/modeling
Type of Sampling:	personal

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	DOD
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	Specialty Use
	Metric 4: Temporal Representativeness	High	× 2	2	2015
	Metric 5: Sample Size	Low	× 1	3	distribution of samples is qualitative or characterized by no statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	Limited discussion of sampling details
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	No discussion of variability and uncertainty

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Source Citation:	Defense Occupational and Environmental Health Readiness System - Industrial Hygiene (DOEHRS-IH). 2018. Email between DOD and EPA: RE: [Non-DoD Source] Update: DoD exposure data for EPA risk evaluation - EPA request for additional information. U.S. Department of Defense.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	5178607

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality Determination [†]		Medium		1.7	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation: F. Graul. 2013. Comment submitted by Faye Graul, Executive Director, Halogenated Solvents Industry Alliance, Inc..
 Type of Data Source Occupational Exposure; Monitoring Data;
 Hero ID 3986602

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	manufacture
Route of Exposure:	inhalation
Exposure Concentration (Unit):	ppm
Number of Samples:	61
Type of Measurement or Method:	8-12 hr exposure
Worker Activity:	catch samples, filter change, large line equipment opening, line opening, loading/unloading, process sampling, transferring hazardous waste
Type of Sampling:	personal

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Low	× 1	3	methodology not specified
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	PBZ exposure to workers while manufacturing
	Metric 4: Temporal Representativeness	High	× 2	2	2005-2016
	Metric 5: Sample Size	Medium	× 1	2	distribution is characterized by range with no statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	Includes sample type and exposure type but missing other metadata
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	No discussion of variability and uncertainty
Overall Quality Determination [†]		Medium		1.7	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: HSIA. 2018. HSIA comments to U.S. EPA.
 Type of Data Source Occupational Exposure; Monitoring Data;
 Hero ID 5176376

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	manufacture
Route of Exposure:	inhalation
Exposure Concentration (Unit):	ppm
Number of Samples:	354
Type of Measurement or Method:	8-12 hr exposure
Worker Activity:	technician, maintenance, operator, process supervisor, electrician, millwright, tank area loader
Type of Sampling:	personal
Exposure Duration:	8 and 12-hr exposures

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Low	× 1	3	methodology not specified
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	PBZ exposure to workers while manufacturing
Metric 4:	Temporal Representativeness	Medium	× 2	4	2005-2018; some data older than 10 years
Metric 5:	Sample Size	High	× 1	1	discrete samples provided
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Medium	× 1	2	most metadata given, missing information on exposure duration and frequency
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	No discussion of variability and uncertainty
Overall Quality Determination [†]		Medium		1.8	

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Source Citation:	HSIA. 2018. HSIA comments to U.S. EPA.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	5176376

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation: Ghittori, S., Saretto, G., & Imbriani, M.. 1994. Biological monitoring of workers exposed to carbon tetrachloride vapor. Applied Occupational and Environmental Hygiene.

Type of Data Source: Occupational Exposure; Monitoring Data;
 Hero ID: 6656518

EXTRACTION

Parameter	Data
Life Cycle Stage:	Reactant/intermediate
Life Cycle Description (Subcategory of Use):	Reactant/intermediate
Route of Exposure:	inhalation
Exposure Concentration (Unit):	mg/m3
Number of Samples:	55
Type of Measurement or Method:	half work shift (4-hr)
Number of Workers:	55
Type of Sampling:	personal
Exposure Duration:	8-hr

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	Sampling and Analytical methods were well described and are acceptable but are not equivalent to OSHA or NIOSH methods
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	Italy
	Metric 3: Applicability	High	× 2	2	PBZ exposure to workers during use as an intermediate
	Metric 4: Temporal Representativeness	Medium	× 2	4	1994
	Metric 5: Sample Size	Medium	× 1	2	distribution is characterized by range and average but no other statistics
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	Includes sample type and exposure type but missing other metadata
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	The monitoring study addresses uncertainty in the exposure estimates
Overall Quality Determination [†]		Medium		1.9	

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Source Citation:	Ghittori, S., Saretto, G., & Imbriani, M.. 1994. Biological monitoring of workers exposed to carbon tetrachloride vapor. Applied Occupational and Environmental Hygiene.
Type of Data Source	Occupational Exposure; Monitoring Data;
Hero ID	6656518

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Facility

Source Citation: Holbrook, M. T.. 2000. Kirk-Othmer Encyclopedia of Chemical Technology Carbon tetrachloride.
 Type of Data Source Facility;
 Hero ID 3828875

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	US production volumes from 1960-1988
Process Description:	describes 3 methods for CCl ₄ manufacture: Chlorination of Hydrocarbons, Oxy-chlorination of Hydrocarbons, Carbon Disulfide Chlorination
Total Annual U.S. Volume (and percent of PV):	346,080 tons/yr in 1988
Number of Sites:	6

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	Kirk-othmer entry
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	describes most current use as intermediate
Metric 4:	Temporal Representativeness	Low	× 2	6	Data from greater than 20 years ago (1990).
Metric 5:	Sample Size	Medium	× 1	2	little sample size discussion
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	complete range of data
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Medium		1.8	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	U.S, E. P. A.. 1980. Waste solvent reclamation.
Type of Data Source	Facility;
Hero ID	3840001

EXTRACTION	
Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Solvent recovery and emissions
Process Description:	vapor recovery, condensation, carbon adsorption, scrubbing, distillation

EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
Metric 1:	Methodology	High	× 1	1	Air Pollutant Emissions Factors (AP-42)	
Domain 2: Representative						
Metric 2:	Geographic Scope	High	× 1	1	US	
Metric 3:	Applicability	Unacceptable	× 2	8	solvent not included in scope of CC14 data	
Metric 4:	Temporal Representativeness	Low	× 2	6	Data from greater than 20 years ago (1990).	
Metric 5:	Sample Size	Medium	× 1	2	little sample size discussion	
Domain 3: Accessibility/Clarity						
Metric 6:	Metadata Completeness	High	× 1	1	complete range of data	
Domain 4: Variability and Uncertainty						
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty	
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.4.	

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: U.S, E. P. A.. 2002. Occurrence summary and use support document for the six-year review of national primary drinking water regulations.
 Type of Data Source Facility;
 Hero ID 3970165

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture, process, & Use
Life Cycle Description (Subcategory of Use):	lists amounts of CCl4 on-site
Process Description:	includes both manufacture, process, and use:
Total Annual U.S. Volume (and percent of PV):	ranges from 1,000 to 49,999,000
Number of Sites:	100

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	EPA Occurrence Summary and Use Support Document for the Six-Year Review of National Primary Drinking Water Regulations
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	Uses listed are included in scope
Metric 4:	Temporal Representativeness	Low	× 2	6	Data from greater than 20 years ago (1989 to 1999)
Metric 5:	Sample Size	Medium	× 1	2	uncertain statistics
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Medium	× 1	2	gives brief summary of process units and operation
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Medium	× 1	2	lists variability, limited discussion on uncertainty

Overall Quality Determination[†] Medium 1.8

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Pubchem,. 2017. PubChem: Carbon tetrachloride.
 Type of Data Source Facility;
 Hero ID 3970247

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Total Annual U.S. Volume (and percent of PV):	ranges from 2.6x10 ¹¹ g/yr to 3.3x10 ¹¹ g/yr

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	pubchem
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Unacceptable	× 2	8	pubchem report is a glorified MSDS, includes some production data
Metric 4:	Temporal Representativeness	Unacceptable	× 2	8	published 2017, data from pre Montreal protocol (1980 to 1988)
Metric 5:	Sample Size	Unacceptable	× 1	4	uncertain statistics
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Medium	× 1	2	data sources briefly described
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty

Overall Quality Determination[†] Unacceptable 4 Metric Mean Score: 3.0.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, three of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Pubchem,. 2017. PubChem: Carbon tetrachloride.
Type of Data Source	Facility;
Hero ID	3970247

EXTRACTION	
Parameter	Data
Life Cycle Stage:	import
Total Annual U.S. Volume (and percent of PV):	ranges from 3.0x10 ⁹ g/yr to 2.6x10 ¹⁰ g/yr and also lists 9.2x10 ⁷ lb/yr

EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
Metric 1:	Methodology	High	× 1	1	pubchem	
Domain 2: Representative						
Metric 2:	Geographic Scope	High	× 1	1	US	
Metric 3:	Applicability	Unacceptable	× 2	8	pubchem report is a glorified MSDS, includes some production data	
Metric 4:	Temporal Representativeness	Unacceptable	× 2	8	published 2017, data from pre Montreal protocol (1980 to 1988)	
Metric 5:	Sample Size	Unacceptable	× 1	4	uncertain statistics	
Domain 3: Accessibility/Clarity						
Metric 6:	Metadata Completeness	Medium	× 1	2	data sources briefly described	
Domain 4: Variability and Uncertainty						
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty	

Overall Quality Determination [†]	Unacceptable	4	Metric Mean Score: 3.0.			
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** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, three of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: ToxNet Hazardous Substances Data, Bank. 2017. HSDB: Carbon tetrachloride.
 Type of Data Source Facility;
 Hero ID 3970275

EXTRACTION

Parameter	Data
Life Cycle Stage:	manufacture
Total Annual U.S. Volume (and percent of PV):	ranges from 2.9x1011g/yr to 3.3x1011g/yr and 2.95 x 108 lbs/yr to 5.87x108 lbs/yr

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	US international trade commission
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	manufacture
Metric 4:	Temporal Representativeness	Unacceptable	× 2	8	pre Montreal protocol, most recent data from 1978-1995
Metric 5:	Sample Size	Low	× 1	3	distribution not characterized by statistics, only 1 exposed
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	complete data
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.1.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: ToxNet Hazardous Substances Data, Bank. 2017. HSDB: Carbon tetrachloride.
 Type of Data Source Facility;
 Hero ID 3970275

EXTRACTION

Parameter	Data
Life Cycle Stage:	import
Total Annual U.S. Volume (and percent of PV):	3.0x10 ⁹ g/yr to 2.6x10 ¹⁰ g/yr

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	US international trade commission
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	import
Metric 4:	Temporal Representativeness	Unacceptable	× 2	8	pre Montreal protocol, most recent data from 1976-1993
Metric 5:	Sample Size	Low	× 1	3	distribution not characterized by statistics, only 1 exposed
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	complete data
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty

Overall Quality Determination[†] Unacceptable 4 Metric Mean Score: 2.1.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Kim, E. A., Bernard, B. P., Esswein, E. J.. 2005. Health hazard evaluation report no. HETA 2004-0169-2982, U.S. Mangesium, Rowley, Utah.
 Type of Data Source Facility;
 Hero ID 3970550

EXTRACTION

Parameter	Data
Life Cycle Stage:	manufacture
Life Cycle Description (Subcategory of Use):	off-gas byproduct
Process Description:	manufacture of magnesium ingots and chemical byproducts: Natural MgCl ₂ is concentrated in brine by evaporation and spray dryers, dried MgCl ₂ , oxygen, iron, coal coke, and chlorine are added to melt reactor, product flows out of reactor and off-gas collects byproducts
Total Annual U.S. Volume (and percent of PV):	43,000 metric tons of magnesium per year
Number of Sites:	1
Possible Physical Form:	gas

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	NIOSH health hazard evaluation
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	manufacture
	Metric 4: Temporal Representativeness	Medium	× 2	4	Data from greater than 10 years ago (2005)
	Metric 5: Sample Size	Low	× 1	3	distribution not characterized by statistics, only 1 exposed
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	report focus is exposure
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Medium		1.9	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Burroughs, G. E., Horan, J.. 1982. Health hazard evaluation report no. HETA 80-147-1076, Calhio Chemical Copmany, Perry, Ohio.
 Type of Data Source Facility;
 Hero ID 3970563

EXTRACTION

Parameter	Data
Life Cycle Stage:	manufacture
Life Cycle Description (Subcategory of Use):	off-gas byproduct
Process Description:	The perchloromethylmercaptan for manufacture of fungicide is prepared in batch reactors by chlorinating carbon disulfide in the presence of an iodine catalyst. sulfur monochloride and carbon tetrachloride are produced as by-products in the reactors.
Number of Sites:	1
Possible Physical Form:	gas

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	NIOSH health hazard evaluation
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	Agricultural products manufacturing
Metric 4:	Temporal Representativeness	Unacceptable	× 2	8	data from pre Montreal protocol (1982)
Metric 5:	Sample Size	Low	× 1	3	dsitribution not characterized by statistics
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	report focus is exposure
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.3.

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Source Citation:	Burroughs, G. E., Horan, J.. 1982. Health hazard evaluation report no. HETA 80-147-1076, Calhio Chemical Copmany, Perry, Ohio.
Type of Data Source	Facility;
Hero ID	3970563

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
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** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation: Holbrook, M. T.. 2000. Kirk-Othmer Encyclopedia of Chemical Technology Carbon tetrachloride.
 Type of Data Source Facility;
 Hero ID 3981045

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	US production volumes from 1960-1988
Process Description:	describes 3 methods for CCl ₄ manufacture: Chlorination of Hydrocarbons, Oxy-chlorination of Hydrocarbons, Carbon Disulfide Chlorination
Total Annual U.S. Volume (and percent of PV):	346,080 tons/yr in 1988
Number of Sites:	6

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	Kirk-othmer entry
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Unacceptable	× 2	8	REPEAT ENTRY
Metric 4:	Temporal Representativeness	Unacceptable	× 2	8	pre Montreal protocol, most recent data from 1990.
Metric 5:	Sample Size	Medium	× 1	2	little sample size discussion
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	complete range of data
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.7.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, two of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Holbrook, M. T.. 2003. Kirk-Othmer Encyclopedia of Chemical TechnologyChloroform.
 Type of Data Source Facility;
 Hero ID 3981046

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	US production volumes of chloroform of 2003
Process Description:	describes 3 methods for chloroform manufacture: oxychlorination of methane, hydrogenation of carbon tetrachloride, reduction of alcohols and ketones
Total Annual U.S. Volume (and percent of PV):	91,000,000 kg/yr capacity
Number of Sites:	4

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	Kirk-othmer entry
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Unacceptable	× 2	8	NOT for CCl4 but for Chloroform
Metric 4:	Temporal Representativeness	Medium	× 2	4	Data from greater than 10 years ago (2003)
Metric 5:	Sample Size	Low	× 1	3	distribution not characterized by statistics
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	methods, data sources not thoroughly explained
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.6.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Weil, E. D., Sandler, S. R., Gernon, M., 2006. Kirk-Othmer Encyclopedia of Chemical Technology Sulfur compounds.
 Type of Data Source: Facility;
 Hero ID: 3981048

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	production method for CCl4 and byproduct of sulfur compound production
Process Description:	The commercial manufacture of carbon tetrachloride by chlorination of carbon disulfide yields sulfur monochloride

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	Kirk-othmer entry
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Unacceptable	× 2	8	focus NOT for CCl4 but for sulfur compounds
Metric 4:	Temporal Representativeness	Medium	× 2	4	Data from greater than 10 years ago (2005)
Metric 5:	Sample Size	Low	× 1	3	distribution not characterized by statistics
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	methods, data sources not thoroughly explained
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.6.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Kirk, Othmer. 2004. Kirk-Othmer Encyclopedia of Chemical Technology Chlorocarbons and chlorohydrocarbons.
Type of Data Source	Facility;
Hero ID	3994180

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	byproduct of thermal chlorination to produce trichloroethylene
Total Annual U.S. Volume (and percent of PV):	20,000 tons

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	Kirk-othmer entry
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Unacceptable	× 2	8	doesn't describe process to produce CCl4 but describes it as a byproduct in trichloroethylene
Metric 4:	Temporal Representativeness	Medium	× 2	4	Data from greater than 10 years ago (2004)
Metric 5:	Sample Size	Low	× 1	3	distribution not characterized by statistics
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	methods, data sources not thoroughly explained
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.6.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Spin,. 2017. SPIN substances in preparations in nordic countries tetrachloromethane.				
Type of Data Source	Facility;				
Hero ID	3981129				
EXTRACTION					
Parameter	Data				
Life Cycle Stage:	Use				
EVALUATION					
Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Trusted Source (Danish EPA)
Domain 2: Representative					
	Metric 2: Geographic Scope	Medium	× 1	2	OECD countries ("Nordic Countries")
	Metric 3: Applicability	Unacceptable	× 2	8	Database search listing country CCl4 use with very limited details listed (tonnes)
	Metric 4: Temporal Representativeness	High	× 2	2	Data from less than 10 years ago (2000-2014)
	Metric 5: Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.2.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation: Nih., 2016. Report on carcinogens: Carbon tetrachloride.
 Type of Data Source Facility;
 Hero ID 3982329

EXTRACTION

Parameter	Data
Life Cycle Stage:	Import
Life Cycle Description (Subcategory of Use):	import
Total Annual U.S. Volume (and percent of PV):	90 lb imported since 1996

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	NTP from NIEHS
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	import
Metric 4:	Temporal Representativeness	High	× 2	2	Data from less than 10 years ago (2009)
Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	limited data, only includes production volume
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		High		1.4	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Nih., 2016. Report on carcinogens: Carbon tetrachloride.
 Type of Data Source Facility;
 Hero ID 3982329

EXTRACTION

Parameter	Data
Life Cycle Stage:	manufacture
Life Cycle Description (Subcategory of Use):	domestic manufacture
Total Annual U.S. Volume (and percent of PV):	3.8 million lbs (US exported)
Number of Sites:	3

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	NTP from NIEHS
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	manufacture
	Metric 4: Temporal Representativeness	High	× 2	2	Data from less than 10 years ago (2009)
	Metric 5: Sample Size	High	× 1	1	complete data
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	limited data, only includes production volume
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		High		1.4	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Atsdr., 2005. Toxicological profile for carbon tetrachloride.
 Type of Data Source Facility;
 Hero ID 3982336

EXTRACTION

Parameter	Data
Life Cycle Stage:	manufacture
Life Cycle Description (Subcategory of Use):	domestic manufacture
Total Annual U.S. Volume (and percent of PV):	130 million lbs (2 plants combined)
Number of Sites:	2

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	US HHS
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	manufacture
	Metric 4: Temporal Representativeness	High	× 2	2	Data from less than 10 years ago (2004)
	Metric 5: Sample Size	High	× 1	1	complete data
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	limited data, only includes production volume
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		High		1.4	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Atsdr., 2005. Toxicological profile for carbon tetrachloride.
 Type of Data Source Facility;
 Hero ID 3982336

EXTRACTION

Parameter	Data
Life Cycle Stage:	manufacture
Life Cycle Description (Subcategory of Use):	import
Total Annual U.S. Volume (and percent of PV):	<50 kg (total US for both 2002 and 2003)

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	US HHS
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	manufacture
Metric 4:	Temporal Representativeness	High	× 2	2	Data from less than 10 years ago (2004)
Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	limited data, only includes production volume
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		High		1.4	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Oecd., 2009. Emission scenario documents on coating industry (paints, lacquers and varnishes).
 Type of Data Source Facility;
 Hero ID 3827298

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Paints and Coatings

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	OECD
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Unacceptable	× 2	8	paints and Coatings are excluded from scope
Metric 4:	Temporal Representativeness	High	× 2	2	Data from less than 10 years ago (2009)
Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	No quantitative data, document only discusses production of VOCs
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.1.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Oecd., 2009. Emission scenario document on adhesive formulation.
 Type of Data Source Facility;
 Hero ID 3827299

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Industrial Adhesives

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	OECD
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Unacceptable	× 2	8	industrial adhesives are excluded from scope
Metric 4:	Temporal Representativeness	High	× 2	2	Data from less than 10 years ago (2009)
Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	No quantitative data, document only discusses production of VOCs
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.1.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Oecd., 2013. Emission scenario document on the industrial use of adhesives for substrate bonding.
 Type of Data Source Facility;
 Hero ID 3827300

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Industrial Adhesives

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	OECD
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Unacceptable	× 2	8	industrial adhesives are excluded from scope
Metric 4:	Temporal Representativeness	High	× 2	2	Data from less than 10 years ago (2013)
Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	No quantitative data, document only discusses production of VOCs
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.1.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	U.S, E. P. A.. 2015. List of lists: Consolidated list of chemicals subject to the Emergency Planning and Community Right- To-Know Act (EPCRA), Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and Section 112(r) of the Clean Air Act.
Type of Data Source	Facility;
Hero ID	3378218

EXTRACTION	
Parameter	Data
Life Cycle Stage:	Use

EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
Metric 1:	Methodology	High	× 1	1	EPA	
Domain 2: Representative						
Metric 2:	Geographic Scope	High	× 1	1	US	
Metric 3:	Applicability	Unacceptable	× 2	8	lists required quantity for EPCRA and CERCLA, not helpful	
Metric 4:	Temporal Representativeness	High	× 2	2	Data from less than 10 years ago (2015)	
Metric 5:	Sample Size	N/A		N/A	No Comment.	
Domain 3: Accessibility/Clarity						
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.	
Domain 4: Variability and Uncertainty						
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.	

Overall Quality Determination [†]	Unacceptable	4	Metric Mean Score: 2.0.			
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** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Murphy, B. L.. 2016. Vapor degreasing with chlorinated solvents. Environmental Forensics.
 Type of Data Source Facility;
 Hero ID 3544388

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Vapor Degreasing

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Medium	× 1	2	high quality data not necessarily a trusted source
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	vapor degreasing
Metric 4:	Temporal Representativeness	High	× 2	2	Data from less than 10 years ago (2016)
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Unacceptable	× 1	4	no discussion of carbon tet production of quantity of use, although describes using vapor degreasing
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 1.6.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Simmonds, P. G.,Cunnold, D. M.,Alyea, F. N.,Cardelino, C. A.,Crawford, A. J.,Prinn, R. G.,Fraser, P. J.,Rasmussen, R. A.,Rosen, R. D.. 1988. CARBON-TETRACHLORIDE LIFETIMES AND EMISSIONS DETERMINED FROM DAILY GLOBAL MEASUREMENTS DURING 1978-1985. Journal of Atmospheric Chemistry.
Type of Data Source	Facility;
Hero ID	3569634

EXTRACTION	
Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	US production volumes from 1972-1985
Total Annual U.S. Volume (and percent of PV):	1083.3 x 10 ⁶ kg/yr (1985)

EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
Metric 1:	Methodology	High	× 1	1	Journal of Atmospheric chemistry	
Domain 2: Representative						
Metric 2:	Geographic Scope	High	× 1	1	US	
Metric 3:	Applicability	High	× 2	2	manufacture	
Metric 4:	Temporal Representativeness	Unacceptable	× 2	8	data from pre Montreal protocol (1985)	
Metric 5:	Sample Size	High	× 1	1	complete data	
Domain 3: Accessibility/Clarity						
Metric 6:	Metadata Completeness	Low	× 1	3	no discussion of carbon tet manufacturing process, daily throughput, or worker interaction	
Domain 4: Variability and Uncertainty						
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty	
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.1.	

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: U.S, E. P. A.. 2017. Preliminary information on manufacturing, processing, distribution, use, and disposal: Carbon tetrachloride.
 Type of Data Source Facility;
 Hero ID 3827302

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	manufacture and import
Total Annual U.S. Volume (and percent of PV):	149,927,241 lbs/yr (2011)
Number of Sites:	9

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	EPA
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	manufacture
Metric 4:	Temporal Representativeness	High	× 2	2	Data from less than 10 years ago (2017)
Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Medium	× 1	2	annual manufacture and import volumes, minimal details
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		High		1.3	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Weil, E. D., Sandler, S. R., Gernon, M., 2006. Kirk-Othmer Encyclopedia of Chemical Technology Sulfur compounds.
 Type of Data Source Facility;
 Hero ID 2346119

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Reactant
Process Description:	Thiophosgene forms from carbon tet and hydrogen sulfide
Total Annual U.S. Volume (and percent of PV):	0 US production

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	Kirk-othmer entry
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	Reactant
Metric 4:	Temporal Representativeness	Medium	× 2	4	Data from greater than 10 years ago (2006)
Metric 5:	Sample Size	Low	× 1	3	very little process detail
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	No quantitative data, document only briefly discusses use as a reactant
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Medium		1.9	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Weil, E. D., Sandler, S. R., Gernon, M., 2006. Kirk-Othmer Encyclopedia of Chemical Technology Sulfur compounds.
 Type of Data Source Facility;
 Hero ID 2346119

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Reactant
Process Description:	trichloromethanesulfonyl chloride decomposes slowly at BP especially when in contact with iron
Total Annual U.S. Volume (and percent of PV):	minimal

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	Kirk-othmer entry
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	Reactant
Metric 4:	Temporal Representativeness	Medium	× 2	4	Data from greater than 10 years ago (2006)
Metric 5:	Sample Size	Low	× 1	3	very little process detail
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	No quantitative data, document only briefly discusses use as a reactant
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Medium		1.9	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Echa., 2017. Substance information: Carbon tetrachloride.
 Type of Data Source Facility;
 Hero ID 3839957

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	manufacture and import
Total Annual U.S. Volume (and percent of PV):	1000-10000 tonnes/year

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	ECHA
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	European Union
Metric 3:	Applicability	High	× 2	2	manufacture
Metric 4:	Temporal Representativeness	High	× 2	2	Data from less than 10 years ago (2016)
Metric 5:	Sample Size	Low	× 1	3	no process detail
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	No quantitative data, document only briefly discusses use as a reactant
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Medium		1.8	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Echa., 2017. Carbon tetrachloride, Part 2.
 Type of Data Source Facility;
 Hero ID 3970708

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	chemical and physical properties

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	N/A		N/A	No Comment.
Domain 2: Representative					
Metric 2:	Geographic Scope	N/A		N/A	No Comment.
Metric 3:	Applicability	Unacceptable	× 2	8	chemical and physical properties
Metric 4:	Temporal Representativeness	N/A		N/A	No Comment.
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 4.0.

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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Orau Team. 2004. NIOSH dose reconstruction project: Technical basis document for the Rocky Flats Plant- Site description.
 Type of Data Source Facility;
 Hero ID 3974899

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	degreasing
Process Description:	Metal turnings from Module C machining process and Module B scrap cutters were put in metal baskets and dipped in five carbon tetrachloride baths; Parts were cleaned with carbon tetrachloride.
Number of Sites:	1

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	NIOSH
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	metal degreasing(bath)
Metric 4:	Temporal Representativeness	Medium	× 2	4	Data from greater than 10 years ago (2004)
Metric 5:	Sample Size	Low	× 1	3	no process detail
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	No quantitative data, document only briefly discusses use as a degreaser
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Medium		1.9	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: European Chlorinated Solvents, Association. 2017. Chlorinated solvents: Glossay.
 Type of Data Source Facility;
 Hero ID 3982129

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	manufacture and import
Process Description:	high temperature chlorination of propylene or methane

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	ECSA
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	European Union (OECD)
Metric 3:	Applicability	High	× 2	2	manufacture
Metric 4:	Temporal Representativeness	High	× 2	2	Data from less than 10 years ago (2016)
Metric 5:	Sample Size	Low	× 1	3	no process detail
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	No quantitative data, document only briefly discusses use as a reactant
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Medium		1.8	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: European Chlorinated Solvents, Association. 2017. Chlorinated solvents: Glossay.
 Type of Data Source Facility;
 Hero ID 3982129

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	reactant
Process Description:	a feedstock in the production of CFCs, HCFCs and HFCs

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	ECSA
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	European Union (OECD)
Metric 3:	Applicability	High	× 2	2	manufacture
Metric 4:	Temporal Representativeness	High	× 2	2	Data from less than 10 years ago (2016)
Metric 5:	Sample Size	Low	× 1	3	no process detail
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	No quantitative data, document only briefly discusses use as a reactant
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Medium		1.8	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: European Chlorinated Solvents, Association. 2017. Chlorinated solvents: Glossay.
 Type of Data Source Facility;
 Hero ID 3982129

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Process aid
Process Description:	process agent in the production of chlorine, to extract nitrogen trichloride, and as a solvent to recover chlorine from tail gas

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	ECSA
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	European Union (OECD)
Metric 3:	Applicability	High	× 2	2	manufacture
Metric 4:	Temporal Representativeness	High	× 2	2	Data from less than 10 years ago (2016)
Metric 5:	Sample Size	Low	× 1	3	no process detail
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	No quantitative data, document only briefly discusses use as a reactant
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Medium		1.8	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Nfesc., 2001. Wet air oxidation for wastewater treatment.
Type of Data Source	Facility;
Hero ID	3981115

EXTRACTION	
Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Disposal
Process Description:	Wet air oxidation (WAO) destroys toxics in industrial wastewater by breaking down complex molecular structures into simpler components such as water and carbon dioxide.

EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
	Metric 1: Methodology	Low	× 1	3	Joint Service Pollution Prevention Opportunity Handbook	
Domain 2: Representative						
	Metric 2: Geographic Scope	High	× 1	1	US	
	Metric 3: Applicability	Unacceptable	× 2	8	No Comment.	
	Metric 4: Temporal Representativeness	N/A		N/A	No Comment.	
	Metric 5: Sample Size	N/A		N/A	No Comment.	
Domain 3: Accessibility/Clarity						
	Metric 6: Metadata Completeness	Low	× 1	3	Metadata is incomplete. This describes a methodology and calculation for a process, not any active site using this process	
Domain 4: Variability and Uncertainty						
	Metric 7: Metadata Completeness	N/A		N/A	No Comment.	
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 3.0.	

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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Deng, J. F., Wang, J. D., Shih, T. S., Lan, F. L.. 1987. Outbreak of carbon tetrachloride poisoning in a color printing factory related to the use of isopropyl alcohol and an air conditioning system in Taiwan. American Journal of Industrial Medicine.
Type of Data Source	Facility;
Hero ID	62382

EXTRACTION	
Parameter	Data
Life Cycle Stage:	Use

EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
Metric 1:	Methodology	Medium	× 1	2	American Journal of Industrial Med.	
Domain 2: Representative						
Metric 2:	Geographic Scope	High	× 1	1	US	
Metric 3:	Applicability	Unacceptable	× 2	8	Condition of use is out of scope	
Metric 4:	Temporal Representativeness	N/A		N/A	No Comment.	
Metric 5:	Sample Size	N/A		N/A	No Comment.	
Domain 3: Accessibility/Clarity						
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.	
Domain 4: Variability and Uncertainty						
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.	

Overall Quality Determination [†]	Unacceptable	4	Metric Mean Score: 2.8.			
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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Bommaraju, T. V., Luke, B., O'Brien, T. F., Blackburn, M. C.. 2004. Chlorine.					
Type of Data Source	Facility;					
Hero ID	3859414					
EXTRACTION						
Parameter	Data					
Life Cycle Stage:	Use					
EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
Metric 1:	Methodology	Medium	× 1	2	Textbook	
Domain 2: Representative						
Metric 2:	Geographic Scope	High	× 1	1	US	
Metric 3:	Applicability	Unacceptable	× 2	8	Includes only a vague list of potential uses	
Metric 4:	Temporal Representativeness	N/A		N/A	No Comment.	
Metric 5:	Sample Size	N/A		N/A	No Comment.	
Domain 3: Accessibility/Clarity						
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.	
Domain 4: Variability and Uncertainty						
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.	
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.8.	

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Marshall, K. A.,Pottenger, L. H.. 2004. Chlorocarbons and chlorohydrocarbons.
 Type of Data Source Facility;
 Hero ID 3859415

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	Domestic Manufacture
Process Description:	Methyl chloride is produced by the thermal chlorination of methane in the gas phase at a temperature in the range of 490-530 degreesC. Methylene chloride, chloroform, and carbon tetrachloride and HCL are formed in this process. When methyl chloride is produced using the methanol process, methyl chloride is used as a feedstock to a thermal chlorination process to produce methylene chloride, chloroform, and carbon tetrachloride in a process similar to methane chlorination process.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	Textbook
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	Medium	× 2	4	Manufacture information for methyl chloride, which creates Carbon tetrachloride as a byproduct.
	Metric 4: Temporal Representativeness	High	× 2	2	2004
	Metric 5: Sample Size	N/A		N/A	Not applicable
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	N/A		N/A	Not applicable
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	Not applicable
Overall Quality Determination [†]		High		1.5	

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Source Citation:	Marshall, K. A.,Pottenger, L. H.. 2004. Chlorocarbons and chlorohydrocarbons.
Type of Data Source	Facility;
Hero ID	3859415

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation: Holbrook, M. T.. 2004. Methylene chloride.
 Type of Data Source Facility;
 Hero ID 3859416

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	Domestic Manufacture
Process Description:	Methylene chloride produced industrially in the US by 2 methods. The older, less used method involves direct reaction of excess methane and chlorine at high temps (400-500 C) or at lower temperatures catalytically or photolytically. Also produces methyl chloride, chloroform and carbon tetrachloride. Most common method employs the reaction of hydrogen chloride and methanol to give methyl chloride, chloroform and carbon tetrachloride.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	Textbook
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	Medium	× 2	4	Manufacture information for methyl chloride, which creates Carbon tetrachloride as a byproduct.
	Metric 4: Temporal Representativeness	High	× 2	2	2006
	Metric 5: Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		High		1.5	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Larranaga, M. D., Lewis, R. J., Lewis, R. A.. 2016. Hawley's Condensed Chemical Dictionary Carbonyl fluoride.
 Type of Data Source Facility;
 Hero ID 3982122

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Other Uses
Process Description:	Typical Use: Refrigerants. Metal degreasing, agricultural fumigant, chlorinating organic compounds, production of semiconductors, solvent (fats, oils, rubber, etc.). Note: Not permitted in products intended for home use. Derivation: (1) Interaction of carbon disulfide and chlorine in the presence of iron; (2) chlorination of methane or higher hydrocarbons at 250-400°C.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Low	× 1	3	Unknown
Domain 2: Representative					
	Metric 2: Geographic Scope	Low	× 1	3	Unknown
	Metric 3: Applicability	Low	× 2	6	Includes general use and manufacture information
	Metric 4: Temporal Representativeness	Low	× 2	6	Unknown
	Metric 5: Sample Size	Low	× 1	3	No Comment.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	No Comment.
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	Low	× 1	3	No Comment.
Overall Quality Determination [†]		Low		3.0	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Osha., 2017. OSHA occupational chemical database: Carbon tetrachloride.
 Type of Data Source Facility;
 Hero ID 3978249

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture, process, & Use

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	USDOL
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Unacceptable	× 2	8	Physical characteristics with no detailed use data
Metric 4:	Temporal Representativeness	N/A		N/A	No Comment.
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.5.

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* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Osha., 2005. OSHA permissible exposure limit and general information: carbon tetrachloride.
 Type of Data Source Facility;
 Hero ID 3980999

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture, process, & Use

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	USDOL
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Unacceptable	× 2	8	Physical characteristics with no use data
Metric 4:	Temporal Representativeness	N/A		N/A	No Comment.
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.5.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Oehha., 2016. Carbon tetrachloride.
 Type of Data Source Facility;
 Hero ID 3982267

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Other uses
Process Description:	Dry cleaning agent, fire extinguisher, solvent, degreaser, refrigerant, chlorofluorocarbon feedstock.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	Office of Environmental Health Hazard Assessment
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Low	× 2	6	Physical characteristics with vague use data.
Metric 4:	Temporal Representativeness	High	× 2	2	2018 site
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		Medium		1.7	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Cdc/Niosh,. Carbon tetrachloride.					
Type of Data Source	Facility;					
Hero ID	3986503					
EXTRACTION						
Parameter	Data					
Life Cycle Stage:	Manufacture, process, & Use					
EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
Metric 1:	Methodology	High	× 1	1	CDC	
Domain 2: Representative						
Metric 2:	Geographic Scope	High	× 1	1	US	
Metric 3:	Applicability	Unacceptable	× 2	8	Physical characteristics and exposure limits	
Metric 4:	Temporal Representativeness	N/A		N/A	No Comment.	
Metric 5:	Sample Size	N/A		N/A	No Comment.	
Domain 3: Accessibility/Clarity						
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.	
Domain 4: Variability and Uncertainty						
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.	
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.5.	

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Niosh,. 1977. Occupational diseases: A guide to their recognition.
 Type of Data Source Facility;
 Hero ID 3986432

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Other uses
Process Description:	Solvent for oils, fats, lacquers, varnishes, rubber, waxes, resins. Used in manufacture of fluorocarbons, and as azeotropic drying agent, dry cleaning agent, fire extinguishing agent, fumigant and anthelmintic agent.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Low	× 1	3	Unknown
Domain 2: Representative					
Metric 2:	Geographic Scope	Low	× 1	3	Unknown
Metric 3:	Applicability	Low	× 2	6	Physical characteristics with vague use data.
Metric 4:	Temporal Representativeness	Low	× 2	6	Unknown pub date, but bibliographical references are from the 1960s
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		Low		3.0	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Osha., 1991. Proposed rules: Occupational exposure to methylene chloride.
 Type of Data Source Facility;
 Hero ID 3982430

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	Domestic manufacture
Process Description:	methyl chloride, methylene chloride, chloroform and carbon tetrachloride) are produced by a chain reaction, with hydrogen chloride as a byproduct. The products of the reaction (including unreacted methane, HCl and Cl ₂) are separated by fractionation, scrubbing and drying operations.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	OSHA
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Medium	× 2	4	Describes method of manufacture, but not number of locations or amount produced
Metric 4:	Temporal Representativeness	Low	× 2	6	1991
Metric 5:	Sample Size	N/A		N/A	N/a
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.

Overall Quality Determination[†] Medium 2.0

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Weil, E. D., Sandler, S. R., Gernon, M.. 2006. Kirk-Othmer Encyclopedia of Chemical Technology Sulfur compounds.
Type of Data Source	Facility;
Hero ID	3981048

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Medium	× 1	2	John Wiley & Sons Textbook
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Unacceptable	× 2	8	Describes manufacture of compounds which sometimes involve CCl4 as a by-product
Metric 4:	Temporal Representativeness	N/A		N/A	No Comment.
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.8.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7 ; Medium: ≥ 1.7 to < 2.3 ; Low: ≥ 2.3 to ≤ 3 .

Source Citation: Holbrook, M. T.. 2000. Kirk-Othmer Encyclopedia of Chemical Technology Carbon tetrachloride.
 Type of Data Source Facility;
 Hero ID 3981045

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	Domestic manufacture
Total Annual U.S. Volume (and percent of PV):	346.08 x 10 ³ Tons in 1988
Number of Sites:	6

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Medium	× 1	2	John Wiley & Sons Textbook
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	Low	× 2	6	Production data
Metric 4:	Temporal Representativeness	Unacceptable	× 2	8	pre Montreal protocol, most recent data from 1990.
Metric 5:	Sample Size	N/A		N/A	N/a
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.8.

** Consistent with our *Application of Systematic Review in TSCARisk Evaluations* document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Oecd Existing Chemical Database. 2011. SIDS initial assessment profile: Tetrachloromethane (carbon tetrachloride).
 Type of Data Source Facility;
 Hero ID 3970847

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	Domestic manufacture
Total Annual U.S. Volume (and percent of PV):	<500 metric tonnes/yr since 2010 - nearly all exported

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Low	× 1	3	Unknown
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	Unknown
Metric 3:	Applicability	High	× 2	2	Production data
Metric 4:	Temporal Representativeness	High	× 2	2	2010
Metric 5:	Sample Size	N/A		N/A	N/a
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		High		1.5	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Echa., 2017. Substance information: Carbon tetrachloride.
 Type of Data Source Facility;
 Hero ID 3839957

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	Domestic manufacture
Total Annual U.S. Volume (and percent of PV):	1000-10000 tonnes/yr imported or produced in Europe

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	ECHA
Domain 2: Representative					
Metric 2:	Geographic Scope	Medium	× 1	2	Europe
Metric 3:	Applicability	High	× 2	2	manufacture
Metric 4:	Temporal Representativeness	High	× 2	2	Data from less than 10 years ago (2016)
Metric 5:	Sample Size	Low	× 1	3	no process detail
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	No quantitative data, document only briefly discusses use as a reactant
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Medium		1.8	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: U.S. EPA. 2018. Problem formulation of the risk evaluation for carbon tetrachloride (methane, tetrachloro-). EPA-740-R1-7020.
 Type of Data Source Facility;
 Hero ID 5085558

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture, use, processing
Life Cycle Description (Subcategory of Use):	discussion of uses of CCl4 in scope

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	EPA
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	Discusses scope of conditions of use of CCl4
Metric 4:	Temporal Representativeness	High	× 2	2	within last 10 years
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		High		1.0	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: K. A. Marshall, L. H. Pottenger. 2016. Chlorocarbons and chlorohydrocarbons.
 Type of Data Source Facility;
 Hero ID 3828879

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	manufacture
Process Description:	Oxychlorination of hydrocarbons

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	Kirk-othmer entry
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	Describes chemical reaction in detail used for manufacture
Metric 4:	Temporal Representativeness	High	× 2	2	2016
Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	Clearly documented its data sources, assessment methods, results and assumptions
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		High		1.2	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: 3828875".
 Type of Data Source Facility;
 Hero ID 3828875

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	manufacture
Process Description:	describes 3 methods for CCl4 manufacture: Chlorination of Hydrocarbons, Oxy-chlorination of Hydrocarbons, Carbon Disulfide Chlorination

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	Kirk-othmer entry
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	Describes chemical reaction in detail used for manufacture
Metric 4:	Temporal Representativeness	Medium	× 2	4	2000
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		High		1.3	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	P. MacRoy. 2017. Comment submitted by Patrick MacRoy, Safer Chemicals, Healthy Families (SCHF), Environmental Health Strategy Center and Healthy Building Network, Part 2.
Type of Data Source	Facility;
Hero ID	3986750

EXTRACTION	
Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	reactant
Process Description:	CTC is used as a feedstock to produce HFC-245fa and HFC-365mfc, which reportedly accounted for 71 percent and 23 percent of global consumption in 2016

EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
	Metric 1: Methodology	Medium	× 1	2	Safer Chemicals, Healthy Families (SCHF)	
Domain 2: Representative						
	Metric 2: Geographic Scope	High	× 1	1	US	
	Metric 3: Applicability	High	× 2	2	Describes prevalent use of CCl4	
	Metric 4: Temporal Representativeness	High	× 2	2	2018	
	Metric 5: Sample Size	High	× 1	1	complete data	
Domain 3: Accessibility/Clarity						
	Metric 6: Metadata Completeness	High	× 1	1	Clearly documented its data sources, assessment methods, results and assumptions	
Domain 4: Variability and Uncertainty						
	Metric 7: Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty	
Overall Quality Determination [†]		High		1.3		

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: U.S, E. P. A.. 2017. Preliminary information on manufacturing, processing, distribution, use, and disposal: Carbon tetrachloride.
 Type of Data Source Facility;
 Hero ID 3827302

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Reactant, reactive ion etching, processing agent, additive, laboratory chemical
Process Description:	manufacturing, processing, distribution, use and disposal information

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	EPA
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	Describes prevelant use of CCl4
Metric 4:	Temporal Representativeness	High	× 2	2	2017
Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Medium	× 1	2	annual manufacture and import volumes, minimal details
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		High		1.3	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	3986751".
Type of Data Source	Facility;
Hero ID	3986751

EXTRACTION	
Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	aerospace use
Process Description:	aerospace adhesives and cleaning

EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
	Metric 1: Methodology	High	× 1	1	Aerospace Industries Association (AIA)	
Domain 2: Representative						
	Metric 2: Geographic Scope	High	× 1	1	US	
	Metric 3: Applicability	High	× 2	2	Describes prevalent use of CCl4	
	Metric 4: Temporal Representativeness	High	× 2	2	2017	
	Metric 5: Sample Size	High	× 1	1	complete data	
Domain 3: Accessibility/Clarity						
	Metric 6: Metadata Completeness	Low	× 1	3	No quantitative data on the identified processes, only brief description	
Domain 4: Variability and Uncertainty						
	Metric 7: Metadata Completeness	N/A		N/A	No Comment.	
Overall Quality Determination [†]		High		1.3		

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: R. Krock. 2017. Comment submitted by Richard Krock, Vice President, Regulatory and Technical Affairs, The Vinyl Institute (VI), Part 2.
 Type of Data Source Facility;
 Hero ID 3986749

EXTRACTION

Parameter	Data
Life Cycle Stage:	manufacture
Life Cycle Description (Subcategory of Use):	manufacture
Process Description:	chlorination of methane

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	The Vinyl Institute (VI)
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	Describes prevalent use of CCl4
Metric 4:	Temporal Representativeness	High	× 2	2	2017
Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	No quantitative data on the identified processes, only brief description
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		High		1.3	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: R. Krock. 2017. Comment submitted by Richard Krock, Vice President, Regulatory and Technical Affairs, The Vinyl Institute (VI), Part 2.
 Type of Data Source Facility;
 Hero ID 3986749

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	reactant
Process Description:	light liquids containing CCl4 are used in the catalytic oxidation (Catoxid") process to manufacture anhydrous HCl,

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	The Vinyl Institute (VI)
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	Describes prevelant use of CCl4
	Metric 4: Temporal Representativeness	High	× 2	2	2017
	Metric 5: Sample Size	High	× 1	1	complete data
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Low	× 1	3	No quantitative data on the identified processes, only brief description
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		High		1.3	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: F. Graul. 2013. Comment submitted by Faye Graul, Executive Director, Halogenated Solvents Industry Alliance, Inc..
 Type of Data Source Facility;
 Hero ID 3986602

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture/process/use
Life Cycle Description (Subcategory of Use):	manufacture, import/repackaging
Process Description:	worker activities and chemical transport

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	Halogenated Solvents Industry Alliance (HSIA)
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	Describes prevalent use of CCl4
Metric 4:	Temporal Representativeness	Medium	× 2	4	2005-2016
Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	data sources not discussed
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		High		1.5	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Oecd., 2010. Emission Scenario Document on Photoresist Use in Semiconductor Manufacturing.
 Type of Data Source Facility;
 Hero ID 3840005

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Reactive Ion Etching
Process Description:	Process Description and worker activities

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	OECD
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	RIE
Metric 4:	Temporal Representativeness	High	× 2	2	2010
Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Medium	× 1	2	data sources briefly described
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		High		1.1	

* MWF = Metric Weighting Factor

† If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Holbrook, M. T.. 2003. Kirk-Othmer Encyclopedia of Chemical TechnologyChloroform.
 Type of Data Source Facility;
 Hero ID 3981046

EXTRACTION

Parameter	Data
Life Cycle Stage:	Manufacture
Life Cycle Description (Subcategory of Use):	manufacture
Process Description:	byproduct from methylene chloride and chlorine

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	Kirk Othmer
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	Describes reaction to create (manufacture) carbon tet
Metric 4:	Temporal Representativeness	Medium	× 2	4	2003
Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	Clearly documented its data sources, assessment methods, results and assumptions
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		High		1.3	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Weil, E. D., Sandler, S. R., Gernon, M.. 2006. Kirk-Othmer Encyclopedia of Chemical Technology Sulfur compounds.
 Type of Data Source Facility;
 Hero ID 2346119

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	reactant/intermediate
Process Description:	Thiophosgene forms from the reaction of carbon tetrachloride with hydrogen sulfide, sulfur, or various sulfides at elevated temperatures.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	High	× 1	1	Kirk Othmer
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	Describes reaction to create (manufacture) carbon tet
	Metric 4: Temporal Representativeness	Medium	× 2	4	2006
	Metric 5: Sample Size	High	× 1	1	complete data
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	High	× 1	1	Clearly documented its data sources, assessment methods, results and assumptions
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		High		1.3	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Organisation for Economic Co-operation and Development (OECD). 2015. Emission scenario document (ESD) on chemical vapour deposition in the semiconductor industry.
Type of Data Source	Facility;
Hero ID	5184986

EXTRACTION	
Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Reactive Ion Etching
Process Description:	Process Description and worker activities

EVALUATION						
Domain	Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability						
	Metric 1: Methodology	High	× 1	1	OECD	
Domain 2: Representative						
	Metric 2: Geographic Scope	High	× 1	1	US	
	Metric 3: Applicability	High	× 2	2	RIE	
	Metric 4: Temporal Representativeness	High	× 2	2	2010	
	Metric 5: Sample Size	High	× 1	1	complete data	
Domain 3: Accessibility/Clarity						
	Metric 6: Metadata Completeness	Medium	× 1	2	data sources briefly described	
Domain 4: Variability and Uncertainty						
	Metric 7: Metadata Completeness	N/A		N/A	No Comment.	
Overall Quality Determination [†]		High		1.1		

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:

High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: H. Hoag. 2016. The Greening of Chemistry.
 Type of Data Source Facility;
 Hero ID 5097937

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Processing aid
Process Description:	elimination of use in pharmaceutical process

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	Medium	× 1	2	Science History Institute
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	Processing Aid
Metric 4:	Temporal Representativeness	High	× 2	2	2008
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	Low	× 1	3	results and theories provided, but underlying methods, data sources, and assumptions are not fully transparent
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		High		1.4	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: U.S. EPA. 1983. Preliminary Study of Sources of Carbon Tetrachloride: Final Report.
 Type of Data Source Facility;
 Hero ID 5097936

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Processing aid
Process Description:	Use as processing aid in pharmaceutical process

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	EPA
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	Processing Aid
Metric 4:	Temporal Representativeness	Low	× 2	6	1983
Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	Clearly documented its data sources, assessment methods, results and assumptions
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		High		1.6	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation:	Holmes, L. 2017. Comment submitted by Laurie Holmes, Senior Director, Environmental Policy, Motor & Equipment Manufacturers Association (MEMA). Motor & Equipment Manufacturers Association.
Type of Data Source	Facility;
Hero ID	3986676

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	Additive
Process Description:	carbon tetrachloride may be used during some automotive component manufacturing processes as an adhesive and a plastic additive. There is no indication that this chemical is present in automotive aftermarket products or new automotive components.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	Motor & Equipment Manufacturers Association (MEMA)
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	Additive
	Metric 4: Temporal Representativeness	High	× 2	2	2017
	Metric 5: Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	data sources briefly described
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		High		1.3	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: Aerospace Industries Association (AIA). 2019. AIA email with statement on CCl4 use.
 Type of Data Source Facility;
 Hero ID 5175470

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	aerospace use
Process Description:	After additional investigation, usage identified by AIA companies were based upon products that have been discontinued. There appear to be products that contain trace amounts of CCl4 (<1 percent) that might be a reaction by-product, contaminant or imperfect distillation of perchloroethylene. Therefore, CCl4 is no longer an AIA concern.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
	Metric 1: Methodology	Medium	× 1	2	Aerospace Industries Association (AIA)
Domain 2: Representative					
	Metric 2: Geographic Scope	High	× 1	1	US
	Metric 3: Applicability	High	× 2	2	Aerospace
	Metric 4: Temporal Representativeness	High	× 2	2	2018
	Metric 5: Sample Size	N/A		N/A	No Comment.
Domain 3: Accessibility/Clarity					
	Metric 6: Metadata Completeness	Medium	× 1	2	data sources briefly described
Domain 4: Variability and Uncertainty					
	Metric 7: Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		High		1.3	

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[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: M. T. Holbrook. 2003. Methylene chloride.
 Type of Data Source Facility;
 Hero ID 730490

EXTRACTION

Parameter	Data
Life Cycle Stage:	Use
Life Cycle Description (Subcategory of Use):	reactant/intermediate
Process Description:	carbon tetrachloride can be reduced, ie, hydrodechlorinated, to chloroform.

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	Kirk Othmer
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	Describes reaction to create Chloroform using carbon tet
Metric 4:	Temporal Representativeness	Medium	× 2	4	2003
Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	Clearly documented its data sources, assessment methods, results and assumptions
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		High		1.3	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.

Source Citation: ATSDR. 2005. Toxicological profile for carbon tetrachloride (CAS# 56"23"5).
 Type of Data Source Facility;
 Hero ID 195104

EXTRACTION

Parameter	Data
Life Cycle Stage:	Disposal
Life Cycle Description (Subcategory of Use):	Disposal
Process Description:	Disposal details

EVALUATION

Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	× 1	1	CDC
Domain 2: Representative					
Metric 2:	Geographic Scope	High	× 1	1	US
Metric 3:	Applicability	High	× 2	2	Describes specific disposal requirements
Metric 4:	Temporal Representativeness	Medium	× 2	4	2005
Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Accessibility/Clarity					
Metric 6:	Metadata Completeness	High	× 1	1	Clearly documented its data sources, assessment methods, results and assumptions
Domain 4: Variability and Uncertainty					
Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		High		1.3	

* MWF = Metric Weighting Factor

[†] If any individual metrics are deemed Unacceptable, then the overall rating is also unacceptable. Otherwise, the overall rating is based on the following scale:
 High: ≥ 1 to < 1.7; Medium: ≥ 1.7 to < 2.3; Low: ≥ 2.3 to ≤ 3.