

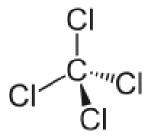
Office of Chemical Safety and Pollution Prevention

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.

Table of Contents

	Page
Releases to the Environment	3
Occupational Exposure	81
Facility	199

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 Hero ID	Releases to the Environment; Environmental Release Data; 606363							
EXTRACTION								
Parameter			Data					
Life Cycle Stage:			Use					
Release Source:			the Netherlands	s Pollutar	nt Releas	se and Transfer Register		
Environmental M	fedia:		Air			-		
Release Estimation	on Method:		measured					
Annual Release (Quantity (kg/	/yr):	2.8x103					
EVALUATION								
Domain		Metric	Rating	MWF*	Score	Comments		
Domain 1: Relia	bility							
	Metric 1:	Methodology	High	$\times 1$	1	national database		
Domain 2: Repre	esentative							
	Metric 2:	Geographic Scope	Medium	$\times 1$	2	OECD Country (Netherlands)		
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	non-occupation focus, release data is background concentration		
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Data from 10 years ago (2008)		
	Metric 5:	Sample Size	High	× 1	1	national scale		
Domain 3: Acces	ssibility/Clar	ity						
	Metric 6:	Metadata Completeness	Low	$\times 1$	3	only includes yearly release data for national release total		
Domain 4: Varia	bility and Ur	ncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	does not discuss variability or uncertainty		
Overall Quality Determination ^{\dagger}		n [†]	Unacceptable		4	Metric Mean Score: 2.2.		

* MWF = Metric Weighting Factor

Source Citation:	global sigr Research:	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 Hero ID	Releases to the Environment; Environmental Release Data; 608526								
EXTRACTION									
Parameter			Data						
Life Cycle Stage:			Use						
Release Source:			"Contemporary	anthrop	ogenic e	emissions"			
Environmental M	ledia:		Air						
Release Estimation	on Method:		thousands of in	n situ mea	sureme	nts from a small aircraft			
Annual Release (Quantity (kg/	/yr):	-0.0003 kg/per	son/yr					
EVALUATION									
Domain		Metric	Rating	MWF*	Score	Comments			
Domain 1: Relial	bility								
	Metric 1:	Methodology	High	$\times 1$	1	thousands of in situ measurements from a small aircraft			
Domain 2: Repre	esentative								
Domain 2. Repre	Metric 2:	Geographic Scope	High	× 1	1	US & Canada			
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	Data for all scenarios across US and Canada, background concentration			
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data greater than 10 years old (2003)			
	Metric 5:	Sample Size	High	× 1	1	national scale (thousands)			
Domain 3: Acces	ssibilitv/Clar	itv							
	Metric 6:	Metadata Completeness	High	$\times 1$	1	very thorough paper			
Domain 4: Varia	bility and Ur	ncertainty							
	Metric 7:	Metadata Completeness	High	× 1	1	addresses both variability and uncertainty			
Overall Quality I	Determinatio	n [†]	Unacceptable		4	Metric Mean Score: 1.9.			
			Continued on	next page	e				

– continued from previous page							
Source Citation:			-	Vofsy, S. C.,Hall, B. D.,Elkins, J. W 2006. Continuing he United States and Canada. Journal of Geophysical			
Type of Data Source Hero ID	Releases to the Environment; Environment 608526	al Release Data;	;				
EVALUATION							
Domain	Metric	Rating	MWF* Score	Comments			

* MWF = Metric Weighting Factor

Source Citation:		g, T.,Kuo-Hsiung, L.,Chih-Yu, C iron and steel facility. Journal of				-Lung, C 2008. Volatile organic compound constituents from an				
Type of Data Source Hero ID	Releases to the Environment; Environmental Release Data; 609426									
EXTRACTION										
Parameter			Data							
Life Cycle Stage:			Manufact	ure						
Life Cycle Descri	ption (Subc	ategory of Use):	Processing	g aid						
Release Source:			Hot formi	ng proces	s in iroi	n and steel facility				
Disposal /Treatme	ent Method:		Stack Gas							
Environmental M	edia:		Air							
Release Estimation	on Method:		Measured	from stac	k then a	analyzed by US EPA Method 18 integrated bag method				
Annual Release Q	Quantity (kg	/yr):	2698 ppb	V						
Number of Sites:			1							
Waste Treatment	Method:		emission	to air						
EVALUATION										
Domain		Metric	Rating	MWF*	Score	Comments				
Domain 1: Reliat	oility									
	Metric 1:	Methodology	Medium	$\times 1$	2	Accurate method, may exclude some releases sources at site				
Domain 2: Repre	sentative									
•	Metric 2:	Geographic Scope	Low	$\times 1$	3	non-OECD (Taiwan)				
	Metric 3:	Applicability	High	$\times 2$	2	emission to air				
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Data from 10 years ago (2008)				
	Metric 5:	Sample Size	Medium	× 1	2	Range of sampling not discussed				
Domain 3: Acces	sibility/Cla	ity								
	Metric 6:	Metadata Completeness	High	× 1	1	complete data				
Domain 4: Varial	oility and U	ncertainty								
	Metric 7:	Metadata Completeness	Medium	× 1	2	lists uncertainty, limited discussion on variability				
Overall Quality D	Determinatio	\mathbf{n}^{\dagger}	High		1.6					
			Continue	ad on nov	t page					

		– continued f	rom previ	ous page	
Source Citation:	Jiun-Horng, T.,Kuo-Hsiung, L.,Chih-Yu integrated iron and steel facility. Journal			0 0	Volatile organic compound constituents from an
Type of Data Source	Releases to the Environment; Environme	ental Release D	ata;		
Hero ID	609426				
EVALUATION					
Domain	Metric	Rating	MWF* S	Score	Comments

Source Citation: Type of Data Source Hero ID	Kroeze, C.,Reijnders, L. 1992. Halocarbons and global warming. Science of the Total Environment. Releases to the Environment; Published Models for Exposures or Releases; 773076							
EXTRACTION Parameter			Data					
Life Cycle Stage: Environmental M Release Estimatic Annual Release (ledia: on Method:	'yr):	Use Air measured, glob kton/yr	al data fr	om tech	unical papers		
EVALUATION Domain		Metric	Rating	MWF*	Score	Comments		
			8					
Domain 1: Reliab	oility							
	Metric 1:	Methodology	High	$\times 1$	1	sources are quality technical papers		
Domain 2: Repre	centative							
Domain 2. Repre	Metric 2:	Geographic Scope	Medium	$\times 1$	2	global data		
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	global emissions, background concentration		
	Metric 4:	Temporal Representativeness	Unacceptable	$\times 2$	8	Data is Pre-Montreal Protocol (1990)		
	Metric 5:	Sample Size	Low	× 1	3	no statistics of sample size		
Domain 3: Acces	sibility/Clar	itv						
	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	Data sources cited but not fully described		
Domain 4: Varial	hility and Ur	acertainty						
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	does not discuss variability or uncertainty		
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 3.0.			

* MWF = Metric Weighting Factor

Source Citation:			anthropogenic h	alocarbo	n emissi	ions from Japan based on aircraft monitoring over Sagami Bay		
Type of Data Source Hero ID	Japan. Journal of Geophysical Research. Releases to the Environment; Environmental Release Data; 1006187							
EXTRACTION								
Parameter			Data					
Life Cycle Stage:			Use					
Release Source:			Sagami Bay, Ja	pan				
Environmental M	edia:		Air	-				
Release Estimation	on Method:		measured from	aircraft				
Annual Release Q	Quantity (kg/	/yr):	Gg/yr					
EVALUATION								
Domain		Metric	Rating	MWF*	Score	Comments		
Domain 1: Reliat	vility							
2011411 11 140144	Metric 1:	Methodology	High	× 1	1	brief samping description, but details published in another paper, analyzed at National Institute forEnvironmental Studies		
Domain 2: Repre	sentative							
Domain 2. Repre	Metric 2:	Geographic Scope	Medium	$\times 1$	2	Japan		
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	global emissions, background concentration		
	Metric 4:	Temporal Representativeness	Medium	$\times 2 \times 2$	4	Data greater than 10 years old (2002)		
	Metric 5:	Sample Size	Low	$\times 1$	3	no statistics of sample size		
Domain 3: Acces	sibility/Clar	ity						
Domain 5. Acces	Metric 6:	Metadata Completeness	High	$\times 1$	1	complete data		
Domain 4: Varial	oility and Ur	ncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	does not discuss variability or uncertainty		
Overall Quality D	Determinatio	n [†]	Unacceptable		4	Metric Mean Score: 2.4.		
			Continued on					

– continued from previous page							
Source Citation:	Yokouchi, Y 2005. Estimates of ratios Japan. Journal of Geophysical Research.	1 0	halocarbon emissions fro	m Japan based on aircraft monitoring over Sagami Bay			
Type of Data Source	Data Source Releases to the Environment; Environmental Release Data;						
Hero ID	1006187						
EVALUATION							
Domain	Metric	Rating	MWF* Score	Comments			
Domain	Metric	Kaung	WIWI Scole	Comments			

* MWF = Metric Weighting Factor

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 Hero ID	Releases to the Environment; Environmental Release Data; 1006234							
EXTRACTION								
Parameter			Data					
Life Cycle Stage:			Use					
Release Source:			Eastern Asia					
Environmental M	ledia:		Air					
Release Estimation	on Method:		measured from	aircraft				
Annual Release (Quantity (kg/	/yr):	Gg/yr					
EVALUATION								
Domain		Metric	Rating	MWF*	Score	Comments		
Domain 1: Reliab	bility							
	Metric 1:	Methodology	Medium	$\times 1$	2	Methodology not well described		
Domain 2: Repre	esentative							
1	Metric 2:	Geographic Scope	Low	$\times 1$	3	China, Japan, Korea		
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	global emissions, background concentration		
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data greater than 10 years old (2001)		
	Metric 5:	Sample Size	Medium	$\times 1$	2	brief sample description, little statistics on sample size		
Domain 3: Acces	ssibility/Clar	ity						
	Metric 6:	Metadata Completeness	High	× 1	1	complete data		
Domain 4: Varial	bility and U	ncertainty						
	Metric 7:	Metadata Completeness	Medium	× 1	2	discusses uncertainty only		
Overall Quality I	Determinatio	n [†]	Unacceptable		4	Metric Mean Score: 2.4.		

* MWF = Metric Weighting Factor

Source Citation:	Pratt, G. C Health Pers		"Hollerbach, C.,	Fenske, N	A. J 20	000. An assessment of air toxics in Minnesota. Environmenta		
Type of Data Source Hero ID	Releases to the Environment; Monitoring Data; 1019159							
EXTRACTION								
Parameter			Data					
Life Cycle Stage:			Use					
Release Source:			State of Minne	sota				
Environmental N	Iedia:		Air					
EVALUATION								
Domain		Metric	Rating	MWF*	Score	Comments		
Domain 1: Relia	bility							
	Metric 1:	Methodology	High	$\times 1$	1	EPA Assessment System for Population ExposureNationwide model		
Domain 2: Repre	esentative							
1	Metric 2:	Geographic Scope	High	$\times 1$	1	US		
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	emission to air, background concentration		
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data greater than 10 years old (2000)		
	Metric 5:	Sample Size	Medium	× 1	2	some biases in sample size, but paper discusses the satitical distribution		
Domain 3: Acces	ssibility/Clar	ity						
	Metric 6:	Metadata Completeness	High	$\times 1$	1	complete data		
Domain 4: Varia	bility and Ur	ncertainty						
	Metric 7:	Metadata Completeness	High	× 1	1	discusses both uncertainty and variability		
Overall Quality I	Determinatio	\mathbf{n}^{\dagger}	Unacceptable		4	Metric Mean Score: 2.0.		

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID		E. 2004. Emissions of ozone-dep o the Environment; Environment		s in Russi	ia during	g 2001. Journal of Geophysical Research.
EXTRACTION Parameter			Data			
Life Cycle Stage			Use			
Life Cycle Stage: Release Source:			Russia			
Environmental N	ledia:		Air			
Release Estimation			measured from	trans-sih	erian ra	ilway
Annual Release (/vr):	Gg/yr	auns 310	ci iun iu	
Number of Sites:		<i>j</i> - <i>)</i> .	49			
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relia	bility					
	Metric 1:	Methodology	High	$\times 1$	1	methodology expected to be accurate
Domain 2: Repre	esentative					
	Metric 2:	Geographic Scope	Low	$\times 1$	3	non-OECD, Russia
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	emission to air, background concentration
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data greater than 10 years old (2001)
	Metric 5:	Sample Size	High	× 1	1	national scale (thousands)
Domain 3: Acces	ssibility/Clar	ity				
	Metric 6:	Metadata Completeness	High	$\times 1$	1	complete data
Domain 4: Varia	bility and Ur	ncertainty				
	Metric 7:	Metadata Completeness	High	× 1	1	discusses both uncertainty and variability
Overall Quality I	Determinatio	n [†]	Unacceptable		4	Metric Mean Score: 2.1.

* MWF = Metric Weighting Factor

Source Citation:		L.,Steele, L. P.,Wilson, S. R.,Fras 1s at Cape Grim, Tasmania, 1995				race gas emissions from Melbourne, Australia, based on AGAGI
Type of Data Source Hero ID		the Environment; Environment			ronnen	u.
EXTRACTION						
Parameter			Data			
Life Cycle Stage:	:		Use			
Release Source:			Australia			
Environmental M	fedia:		Air			
Release Estimation	on Method:		Measured, Air	samples t	from lab	o on the Tasmanian coast
Daily Release Qu			ppt			
Annual Release (Quantity (kg/	/yr):	t/yr			
Number of Sites:			1			
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relial	bility					
	Metric 1:	Methodology	High	× 1	1	analysis of sample and secondary standard
Domain 2: Repre	esentative					
1	Metric 2:	Geographic Scope	Medium	$\times 1$	2	Australia
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	emission to air, background concentration
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data greater than 10 years old (1995-2000)
	Metric 5:	Sample Size	High	× 1	1	36 samples/day over 5 years
Domain 3: Acces	ssibility/Clar	ity				
	Metric 6:	Metadata Completeness	High	$\times 1$	1	complete data
Domain 4: Varia	bility and Ur	ncertainty				
	Metric 7:	Metadata Completeness	High	$\times 1$	1	discusses both uncertainty and variability
Overall Quality I	Determinatio	n†	Unacceptable		4	Metric Mean Score: 2.0.
			Continued on			

		– continued fror	n previous page	
Source Citation:	Dunse, B. L., Steele, L. P., Wilson, S. R., Fr observations at Cape Grim, Tasmania, 19	, ,	, 0	nissions from Melbourne, Australia, based on AGAGE
Type of Data Source	Releases to the Environment; Environment	ntal Release Data	•	
Hero ID	1947347			
EVALUATION				
Domain	Metric	Rating	MWF [*] Score	Comments

* MWF = Metric Weighting Factor

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 Hero ID	Releases to 2532952	the Environment; Environment	al Release Data;				
EXTRACTION Parameter			Data				
Life Cycle Stage:			Use				
Release Source:			China				
Environmental M			Air	_			
Release Estimation		、 、		samples f	from lat	o in Hong Kong and southern China	
Daily Release Qu Number of Sites:		ay):	ppt 2				
Number of Siles:			2				
EVALUATION							
Domain		Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliab	oility						
	Metric 1:	Methodology	High	$\times 1$	1	thorough explanantion, methodology expected to be accurate	
Domain 2: Repre	sentative						
Domain 2. Repre	Metric 2:	Geographic Scope	Low	× 1	3	China	
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	emission to air, background concentration	
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data greater than 10 years old (1998-2008)	
	Metric 5:	Sample Size	High	× 1	1	198+ samples	
Domain 3: Acces	sibility/Clar	itv					
	Metric 6:	Metadata Completeness	High	$\times 1$	1	thorough examination of data	
Domain 4: Varial	bility and Ur	acertainty					
	Metric 7:	Metadata Completeness	High	$\times 1$	1	discusses both uncertainty and variability	
Overall Quality I	Determinatio	\mathbf{n}^{\dagger}	Unacceptable		4	Metric Mean Score: 2.1.	
			Continued on	next pag	e		

		continued from	n previous page	
Source Citation:				, S.,Rowland, F. S.,Cheng, H. R.,Saunders, S. M.,Lam, he Pearl River Delta region, southern China. Journal of
Type of Data Source Hero ID	Releases to the Environment; Environment; 2532952	al Release Data;	;	
EVALUATION				
Domain	Metric	Rating	MWF* Score	Comments

* MWF = Metric Weighting Factor

Type of Data Source H		Environmental Health Criteria the Environment; Published Mo				
EXTRACTION Parameter			Data			
Life Cycle Stage: Release Source: Environmental Med Release Estimation	Method:				r sample	es from multiple labs around the world
Annual Release Qu	iantity (kg/	yr):	g/m3			
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliabil	-					
1	Metric 1:	Methodology	High	× 1	1	Environmental health criteria by WHO, UN, and ILO
Domain 2: Represe	entative					
•	Metric 2:	Geographic Scope	High	$\times 1$	1	Global sampling methods, global environmental concentrations
Ν	Metric 3:	Applicability	Unacceptable	$\times 2$	8	emission to air, background concentration
N	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	Data from greater than 20 years (1974-1999)
Ν	Metric 5:	Sample Size	High	× 1	1	Global data
Domain 3: Accessi	bility/Clar	ity				
	Metric 6:	Metadata Completeness	High	× 1	1	thorough examination of data
Domain 4: Variabi	lity and Ur	certainty				
	Metric 7:	Metadata Completeness	High	× 1	1	discusses both uncertainty and variability
Overall Quality De	terminatio	n†	Unacceptable		4	Metric Mean Score: 2.1.

* MWF = Metric Weighting Factor

Source Citation:		on estimates of CCl4 from in s				Culloch, A., Alyea, F. N., O'Doherty, S. 1998. Global trends m July 1978 to June 1996. Journal of Geophysical Research
Type of Data Source Hero ID	Releases to 3562677	the Environment; Environment	al Release Data;			
EXTRACTION			Data			
Parameter			Data			
Life Cycle Stage:			Use			
Release Source:			Global			
Environmental M	ledia:		Air			
Release Estimation	on Method:		Measured, Air	samples	from 5 r	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: Relial	bility					
	Metric 1:	Methodology	High	× 1	1	thorough explanantion, methodology expected to be accurate
Domain 2: Repre	sentative					
1	Metric 2:	Geographic Scope	Low	$\times 1$	3	Global sampling, US + non-OECD (Samoa, Tasmania, Barbados)
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	emission to air, background concentration
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	Data from greater than 20 years (1978-1996)
	Metric 5:	Sample Size	High	× 1	1	Global data
Domain 3: Acces	sibility/Clar	ity				
	Metric 6:	Metadata Completeness	High	× 1	1	thorough examination of data
Domain 4: Varia	bility and Ur	ncertainty				
	Metric 7:	Metadata Completeness	High	× 1	1	discusses both uncertainty and variability
Overall Quality I	Determinatio	n†	Unacceptable		4	Metric Mean Score: 2.3.
			Continued on	next pag	e	

	_	continued fron	n previous page	
Source Citation:		, ,		h, A.,Alyea, F. N.,O'Doherty, S 1998. Global trends 1978 to June 1996. Journal of Geophysical Research:
Type of Data Source Hero ID	Releases to the Environment; Environment; 3562677	al Release Data;		
EVALUATION				
Domain	Metric	Rating	MWF* Score	Comments

* MWF = Metric Weighting Factor

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 3568624	the Environment; Environment	al Release Data;				
EXTRACTION							
Parameter			Data				
Life Cycle Stage:			Use				
Release Source:			Global				
Environmental M	ledia:		Air and water				
Release Estimation	on Method:			ir emissic	ons to cr	eate a 3-D chemical transport model and estimate	
			future releases				
Annual Release (/yr):	Gg/yr				
Number of Sites:			12				
EVALUATION							
Domain		Metric	Rating	MWF*	Score	Comments	
Domain 1: Relia	bility						
	Metric 1:	Methodology	High	× 1	1	thorough explanantion, methodology expected to be accurate	
Domain 2: Repre	esentative						
1	Metric 2:	Geographic Scope	Low	$\times 1$	3	Global sampling, US + non-OECD (Samoa, Ireland, Tasmania, Barbados)	
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	emission to air and oceanic sink, background concentration	
	Metric 4:	Temporal Representativeness	High	$\times 2$	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: Acces	ssibility/Cla	rity					
	Metric 6:	Metadata Completeness	High	$\times 1$	1	thorough examination of data	
Domain 4: Varia	bility and U	ncertainty					
	Metric 7:	Metadata Completeness	High	× 1	1	discusses both uncertainty and variability	
Overall Quality I	Determinatio	n [†]	Unacceptable		4	Metric Mean Score: 1.9.	

		– continued from	n previous page	
Source Citation:	B.,Golombek, A.,Porter, L. W.,Butler, J. H	H.,Elkins, J. W.,D	utton, G. S., Hall, B. D., St	Ailler, B. R., Salameh, P. K., Harth, C. M., Krummel, P. teele, L. P., Wang, R. H. J., Cunnold, D. M 2010. Atmobal oceanic uptake of carbon tetrachloride. Atmospheric
Type of Data Source Hero ID	Releases to the Environment; Environmer 3568624	ntal Release Data	;	
EVALUATION				
Domain	Metric	Rating	MWF* Score	Comments

* MWF = Metric Weighting Factor

Source Citation:	,	A. P., 1976. AVERAGE TROPO TION, USAGE, AND EMISSION				OF CARBON-TETRACHLORIDE BASED ON INDUSTRIAI echnology.
Type of Data Source Hero ID	Releases to 3569465	the Environment; Environment;	al Release Data;			
EXTRACTION						
Parameter			Data			
Life Cycle Stage:			Use			
Release Source:			US Production	Sites		
Environmental M	ledia:		Air			
Annual Release (Quantity (kg/	/yr):	Millions of lbs			
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relial	oility					
	Metric 1:	Methodology	Low	$\times 1$	3	Methodology not well described
Domain 2: Repre	sentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	emission to air, background concentration
	Metric 4:	Temporal Representativeness	Unacceptable	$\times 2$	8	Data is Pre-Montreal Protocol
	Metric 5:	Sample Size	Low	× 1	3	US data without statistical info
Domain 3: Acces	sibility/Clar	ity				
	Metric 6:	Metadata Completeness	Low	× 1	3	only specfies release data
Domain 4: Varial	bility and Ur	ncertainty				
	Metric 7:	Metadata Completeness	Low	× 1	3	does not discuss variability or uncertainty
Overall Quality I	Determinatio	n [†]	Unacceptable		4	Metric Mean Score: 3.2.

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID		9. Emission scenario documents the Environment; Environmenta		stry (pain	ts, lacqı	uers and varnishes).
EXTRACTION Parameter			Data			
T ut uniteter			Dutu			
Life Cycle Stage:			Use			
Release Source:			Solvent for Pair		-	
Disposal /Treatm			Solvent evapora	ated to air	r	
Environmental M			Air			
Release or Emiss			1.0 percent rele			
Release Estimation	on Method:		estimation, Em	1ssion Sc	enario L	Jocument
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relial	bility					
	Metric 1:	Methodology	High	× 1	1	thorough explanantion, methodology expected to be accurate
Domain 2: Repre	esentative					
1	Metric 2:	Geographic Scope	High	$\times 1$	1	US + other OECD countries
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	paints and coatings are excluded from scope
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Data from less than 10 years ago (2009)
	Metric 5:	Sample Size	High	× 1	1	National scale sample size
Domain 3: Acces	ssibility/Clar	ity				
	Metric 6:	Metadata Completeness	High	× 1	1	thorough examination of process
Domain 4: Varial	bility and Ur	ncertainty				
	Metric 7:	Metadata Completeness	Low	× 1	3	does not discuss variability or uncertainty
Overall Quality I	Determinatio	n [†]	Unacceptable		4	Metric Mean Score: 1.9.

* MWF = Metric Weighting Factor

EXTRACTION					
Parameter		Data			
Life Cycle Stage:		Use			
Release Source:		Solvent for Pair	nts & coa	tings	
Disposal /Treatment Met	hod:	Solvent evapor			
Environmental Media:		Air			
Release or Emission Fac	or:	Breaks data in	to proces	s unit e	emission of kg chemical/Mg total chemical pro-
					ser vent, incinerator stack, leaks, open sources
Release Estimation Meth	od:	EPA Emission	Factor C	ompilati	ion
EVALUATION					
Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric	1: Methodology	High	× 1	1	Air Pollutant Emissions Factors (AP-42)
Domain 2: Representativ	e				
Metric		High	× 1	1	US
Metric	e i i	Unacceptable	$\times 2$	8	solvent not included in scope of CCl4 data
Metric		Unacceptable	$\times 2$	8	Data is Pre-Montreal Protocol (1990)
Metric		Medium	× 1	2	little sample size discussion
	1				•
Domain 3: Accessibility	-				
Metric	6: Metadata Completeness	High	$\times 1$	1	complete range of data
Domain 4: Variability ar	d Uncertainty				
Metric	•	Low	$\times 1$	3	no discussion of variability or uncertainty
		LOW	~ 1	5	no discussion of variability of uncertainty
Overall Quality Determine	nation [†]	Unacceptable		4	Metric Mean Score: 2.7.
		Continued on	novt noo		

	– continued from previous page									
Source Citation: Type of Data Source Hero ID	U.S, E. P. A 1980. Waste solvent reclama Releases to the Environment; Environment 3840001									
EVALUATION Domain	Metric	Rating	MWF* Sco	ore Comments						

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID		994. National emission standards for hazardous air pollutants: Halogenated solvent cleaning – Background information for final standards Releases to the Environment; Completed Exposure or Risk Assessments; 8860538							
EXTRACTION Parameter			Data						
Life Cycle Stage:			Use						
Release Source:			solvent cleanin	g/degreas	sing				
Disposal /Treatment Method:			Solvent evapora	ated to ai	r				
Environmental M	Iedia:		Air						
Release Estimation	on Method:		National Emiss	sion Stand	lard for	HAPs			
EVALUATION									
Domain		Metric	Rating	MWF*	Score	Comments			
Domain 1: Relia	bility								
Domain 1. Kena	Metric 1:	Methodology	High	$\times 1$	1	National Emission Standard for HAPs			
	meure r.	memorally	ingn	~ 1	1				
Domain 2: Repre	esentative								
	Metric 2:	Geographic Scope	High	$\times 1$	1	US			
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	solvent not included in scope of CCl4 data			
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	Data from greater than 20 years (1994)			
	Metric 5:	Sample Size	Medium	× 1	2	little sample size discussion			
Domain 3: Acces	ssibility/Clar	ity							
	Metric 6:	Metadata Completeness	High	$\times 1$	1	complete range of data			
Domain 4: Varia	bility and Ur	ncertainty							
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	no discussion of variability or uncertainty			
Overall Quality I	Determinatio	n [†]	Unacceptable		4	Metric Mean Score: 2.4.			

* MWF = Metric Weighting Factor

Type of Data Source R		A 2002. Occurrence summary a the Environment; Environment	••	ocument	for the s	six-year review of national primary drinking water regulations.
EXTRACTION Parameter			Data			
Life Cycle Stage:			Use			
Release Source:			air emissions, s	nille		
Environmental Med	lia		Air, land, water	-		
Release Estimation					nd Use	Support Document for the Six-Year Review of
Telease Estimation	iniculou.		National Prima	rv Drinki	ng Wate	er Regulations
Number of Sites:			100	.,		
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliabili	itv					
	Aetric 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: Represen	ntative					
-	Aetric 2:	Geographic Scope	High	× 1	1	US
	Aetric 3:	Applicability	Unacceptable	$\times 2$	8	Uses listed are included in scope, but data is background concentration from EPA TRI
Ν	Aetric 4:	Temporal Representativeness	Low	$\times 2$	6	Data from greater than 20 years (1989 to 1999)
Ν	Aetric 5:	Sample Size	Medium	$\times 1$	2	uncertain statistics
Domain 3: Accessit	hility/Clar	ity				
	Aetric 6:	Metadata Completeness	Medium	$\times 1$	2	gives brief summary of process units and operation
Domain 4: Variabili	ity and Ur	ocertainty				
	Aetric 7:	Metadata Completeness	Medium	× 1	2	lists variability, limited discussion on uncertainty
		r			_	······································
Overall Quality Det	erminatio	\mathbf{n}^{\dagger}	Unacceptable		4	Metric Mean Score: 2.4.
			Continued on	next page	e	

– continued from previous page									
Source Citation: Type of Data Source Hero ID	U.S, E. P. A 2002. Occurrence summary Releases to the Environment; Environmen 3970165	11	-	r review of national primary drinking water regulations.					
EVALUATION									
Domain	Metric	Rating	MWF* Score	Comments					

* MWF = Metric Weighting Factor

Type of Data Source I		zardous Substances Data, Bank. the Environment; Environmenta		arbon teti	achlorid	de.
EXTRACTION Parameter			Data			
Life Cycle Stage:			Use			
Release Source:			spills			
Environmental Media:			water			
Release Estimation			USEPA data		c	
Annual Release Qu	iantity (kg/	yr):				water0-9 ppb fresh water0.1-30 ppb city surface
			water0.2-20 pp	b in grou	ndwater	
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliabil	lity					
	Metric 1:	Methodology	High	× 1	1	NLM NSDB for CCl4
Domain 2: Represe	entative					
-	Metric 2:	Geographic Scope	High	$\times 1$	1	US
1	Metric 3:	Applicability	High	$\times 2$	2	wastewater
I	Metric 4:	Temporal Representativeness	Unacceptable	$\times 2$	8	Data is Pre-Montreal Protocol (1973-1980)
1	Metric 5:	Sample Size	Low	× 1	3	distribution not characterized by statistics, only 1 exposed
Domain 3: Accessi	bility/Clar	ity				
	Metric 6:	Metadata Completeness	High	× 1	1	complete data
Domain 4: Variabi	lity and Ur	acertainty				
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	no discussion of variability or uncertainty
		*			4	
Overall Quality De	terminatio	n'	Unacceptable		4	Metric Mean Score: 2.1.

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID		zardous Substances Data, Bank. the Environment; Environmenta		arbon tetr	rachloric	de.
EXTRACTION Parameter			Data			
Life Cycle Stage: Release Source: Environmental M			Use air emissions air			
Release Estimatio			USEPA data			
Annual Release (/yr):	0-42.4 ppb urbs	an air110	.9-142.3	3 ppt rural air
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relia	bility					
	Metric 1:	Methodology	High	$\times 1$	1	NLM NSDB for CCl4
Domain 2: Repre	esentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	High	$\times 2$	2	air emissions
	Metric 4:	Temporal Representativeness	Unacceptable	$\times 2$	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: Acces	ssibility/Clar	ity				
	Metric 6:	Metadata Completeness	High	× 1	1	complete data
Domain 4: Varia	bility and Ur	ncertainty				
	Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality I	Determinatio	n†	Unacceptable		4	Metric Mean Score: 2.1.

* MWF = Metric Weighting Factor

	Canada. 2017. Profiles & estimates s to the Environment; Environment 2		oride.				
EXTRACTION Parameter		Data					
Life Cycle Stage: Life Cycle Description (S Release Source: Environmental Media:	Use release during chemical use because of high volatility air emissions air						
EVALUATION							
Domain	Metric	Rating	MWF*	Score	Comments		
Domain 1: Reliability Metric	1: Methodology	Medium	× 1	2	CAREX		
Domain 2: Representative							
Metric		Medium	× 1	2	OECD Country (Canada)		
Metric	8 1 1 1	Unacceptable	$\times 2$	8	Physical Data and brief description of releases		
Metric		High	$\times 2$	2	Data from less than 10 years ago (2016)		
Metric	5: Sample Size	Low	× 1	3	distribution not characterized by statistics		
Domain 3: Accessibility/	larity						
Metric	-	Low	$\times 1$	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 Determin	ation [†]	Unacceptable		4	Metric Mean Score: 2.6.		

* MWF = Metric Weighting Factor

Type of Data Source	Us, E. P. A. 1990. Industrial wastewater volatile organic compound emissions: Background information for BACT/LAER determinations. Releases to the Environment; Environmental Release Data; 3981116							
EXTRACTION Parameter			Data					
I al ameter			Data					
Life Cycle Stage:			Use					
Life Cycle Descrip	otion (Subca	ategory of Use):	wastewater stre	am conce	entration	1		
Release Source:			wastewater					
Environmental Me	edia:		water					
EVALUATION								
Domain		Metric	Rating	MWF*	Score	Comments		
Domain 1: Reliabi	ility							
	Metric 1:	Methodology	High	$\times 1$	1	EPA		
Domain 2: Repres	entative							
-	Metric 2:	Geographic Scope	High	$\times 1$	1	US		
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	general wastewater concentration		
	Metric 4:	Temporal Representativeness	Unacceptable	$\times 2$	8	Data is Pre-Montreal Protocol (1990)		
- 	Metric 5:	Sample Size	Low	× 1	3	distribution not characterized by statistics		
Domain 3: Access	ibility/Clar	ity						
	Metric 6:	Metadata Completeness	Low	× 1	3	provides report of results but does not describes methods or assumptions		
Domain 4: Variabi	ility and Ur	ncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	does not specifically address variability or uncertainty but references origina study article		
Overall Quality De	eterminatio	n†	Unacceptable		4	Metric Mean Score: 3.0.		

* MWF = Metric Weighting Factor

	ses to	Abiotic degradation rates for ca the Environment; Environment			d chloro	oform: Final report.
EXTRACTION						
Parameter			Data			
Life Cycle Stage:			Use			
Life Cycle Description	Subc	ategory of Use):	liquid was	ste		
Release Source:			wastewate	er		
Disposal /Treatment Me	thod:		pump-and	l-treat app	broach	
Environmental Media:			water			
Annual Release Quantit	y (kg	/yr):	920,000 k	g total be	tween 1	955-1973
Number of Sites:			1			
Waste Treatment Metho	d:		pump froi	m ground	and trea	at with hydrolysis
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability	- 1.	Mathadala an	II: -L	v 1	1	DOD
Metr	c 1:	Methodology	High	× 1	1	DOE
Domain 2: Representati	ve					
Metr		Geographic Scope	High	$\times 1$	1	US
Metr	c 3:	Applicability	High	$\times 2$	2	liquid waste
Metr	c 4:	Temporal Representativeness	High	$\times 2$	2	Data from less than 10 years ago (2012)
Metr	c 5:	Sample Size	Medium	× 1	2	Range of sampling not discussed, paper references another sources for release estimation data
Domain 3: Accessibility	/Claı	itv				
Metr		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 a	nd I I	acertainty				
Metr		Metadata Completeness	Low	$\times 1$	3	no discussion of variability or uncertainty
Overall Quality Determ	inatic	n [†]	High		1.4	
			Continu		t paga	

	– continued from previous page									
Source Citation: Type of Data Source Hero ID	Pnl,. 2012. Abiotic degradation rates fo Releases to the Environment; Environm 3975006		e and chloroform:	Final report.						
EVALUATION Domain	Metric	Rating MW	/F* Score	Comments						

* 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: Type of Data Source Hero ID		nada. 2008. Priority environment o the Environment; Environment		or surveill	ance in	Canada: Preliminary priority list.
EXTRACTION Parameter			Data			
Life Cycle Stage:			Use			
Environmental M	Iedia:		water and air			
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relia	bility					
	Metric 1:	Methodology	High	× 1	1	Trusted Source (CAREX Canada)
Domain 2: Repre	esentative					
-	Metric 2:	Geographic Scope	Medium	$\times 1$	2	OECD Country (Canada)
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	no specific release data, this document just prioritizes carcinogens to further examination
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Data from 10 years ago (2008)
	Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Acces	ssibility/Cla	rity				
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Varia	bility and U	ncertainty				
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality I	Determinatio	${ m n}^\dagger$	Unacceptable		4	Metric Mean Score: 2.2.

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	U.S, E. P. A.,I. C. F. Consulting. 2004. The U.S. solvent cleaning industry and the transition to non ozone depleting substances. Releases to the Environment; Environmental Release Data; 3982140									
EXTRACTION Parameter			Data							
Life Cycle Stage:			Use Emissions to ai							
	Life Cycle Description (Subcategory of Use): Release Source:				nt alaan	in a industry				
Release Source: Environmental Media:			air emissions fr	oni soive	ent clean	ing mausury				
Release Estimation				al Market	ting Rer	porter's Data, EPA's ODS Tracking System				
Annual Release (vr)·	0-0.87 million							
	2 uuuuu (ing)	<i>j-)</i> .		100, jeu 1		~				
EVALUATION										
Domain		Metric	Rating	MWF*	Score	Comments				
Domain 1: Relial	hility									
	Metric 1:	Methodology	High	$\times 1$	1	EPA				
Domain 2: Repre	sentative									
Domain 2. Repre	Metric 2:	Geographic Scope	High	× 1	1	US				
	Metric 3:	Applicability	High	$\times 2$	2	Emissions to air				
	Metric 4:	Temporal Representativeness	Unacceptable	$\times 2$	8	Data is Pre-Montreal Protocol (1986-1995)				
	Metric 5:	Sample Size	N/A		N/A	No Comment.				
Domain 3: Acces	sibility/Clar	ity								
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.				
Domain 4: Varia	bility and Ur									
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.				
	mente /.	inetaata completeness	1.1/1.1		11/11	no comment.				
Overall Quality I	Determinatio	n [†]	Unacceptable		4	Metric Mean Score: 2.0.				

* MWF = Metric Weighting Factor

	Nih, 2016. Report on carcinogens: Carbon tetrachloride. Releases to the Environment; Environmental Release Data; 3982329									
EXTRACTION Parameter		Data								
Life Cycle Stage: Life Cycle Description (Subcategory of Use): Environmental Media: Release Estimation Method: Annual Release Quantity (kg/yr):			manufacture/process/use Emissions to air, liquid waste air/water TRI Database 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 littleover 1,000"lb to soil. In 1999, on-site releases totaled268,140 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 2. Metric 3:	Applicability	High	$\times 1$ $\times 2$	2	manufacture					
Metric 4:	Temporal Representativeness	High	$\times 2 \times 2$	2	Data from less than 10 years ago (2009)					
Metric 5:	Sample Size	High	× 2 × 1	1	complete data					
Domain 3: Accessibility/Clar	itv									
Metric 6:	Metadata Completeness	Low	$\times 1$	3	limited data, only includes production volume					
Domain 4: Variability and Ur	ncertainty									
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty					
Overall Quality Determinatio	\mathbf{n}^{\dagger}	High		1.4						

Type of Data Source R	Blaney, B. L 1989. Applicability of steam stripping to organics removal from wastewater streams. Releases to the Environment; Environmental Release Data; 3986884									
EXTRACTION										
Parameter			Data							
Life Cycle Stage:			Use							
	Life Cycle Description (Subcategory of Use):			r, liquid v	waste					
Release Source:										
Disposal /Treatmen			steam stripping	;						
Environmental Med			water							
Annual Release Qua	antity (kg/	/yr):	1.7-55 ppmw							
Number of Sites:			3							
Waste Treatment M	ethod:		steam stripping	,						
EVALUATION										
Domain		Metric	Rating	MWF*	Score	Comments				
Domain 1: Reliabil	itv									
	Metric 1:	Methodology	High	$\times 1$	1	EPA				
Damain 2. Damaa										
Domain 2: Represe	Metric 2:	Geographic Scope	High	× 1	1	US				
	Metric 2.	Applicability	High	$\times 1$ $\times 2$	2	US liquid waste				
	Metric 4:	Temporal Representativeness	Unacceptable	$\times 2 \times 2$	8	Data is Pre-Montreal Protocol (1989)				
	Aetric 5:	Sample Size	High	$\times 1$	1	complete data				
Domain 2: Accordi	hility/Clar	:+								
Domain 3: Accessil N	Aetric 6:	Metadata Completeness	Low	$\times 1$	3	limited data, only includes production volume				
Demain 4. W. 111	:									
Domain 4: Variabil	Ity and Un Metric 7:	Metadata Completeness	Low	× 1	2					
N	vietric /:	wietadata Completeness	Low	× 1	3	no discussion of variability or uncertainty				
Overall Quality Det	termination	n [†]	Unacceptable		4	Metric Mean Score: 2.1.				
			Continued on	next pag	e					

	– continued from previous page									
Source Citation: Type of Data Source Hero ID	of Data Source Releases to the Environment; Environmental Release Data;									
EVALUATION										
Domain	Metric	Rating	MWF* Score	Comments						

* MWF = Metric Weighting Factor

Source Citation:	Hogue, C News.	2014. OZONE DEPLETION	Emission	s of carb	on tetrac	chloride continue despite global prohibition. Chemical & Engineering
Type of Data Source Hero ID	Releases to 3569391	the Environment; Environment	al Release	e Data;		
EXTRACTION						
Parameter			Data			
Life Cycle Stage:	:		Use			
Life Cycle Descr		ategory of Use):	Emissio	ons to air		
Environmental N			air			
Annual Release Quantity (kg/yr):		39,000	metric to	ns/yr fro	om 2000-2012	
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relia	bility					
Domain 1. Kena	Metric 1:	Methodology	High	$\times 1$	1	American Chemical Society
Domain 2: Repre	esentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	High	$\times 2$	2	Emissions to air
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Data from less than 10 years ago (2014)
	Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Acces	ssibility/Clar	ity				
	Metric 6:	Metadata Completeness	Low	× 1	3	limited data, only includes estimated global air emission/year
Domain 4: Varia	bility and U	ncertainty				
	Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality I	Determinatio	n†	High		1.4	

Source Citation:	Hogue, C News.									
Type of Data Source Hero ID	Releases to 3569391	the Environment; Environment	al Release	e Data;						
EXTRACTION										
Parameter			Data							
Life Cycle Stage:	:		Use							
Life Cycle Description (Subcategory of Use):		Emissio	ons to air							
Environmental N			air							
Annual Release Quantity (kg/yr):		4 gigag	rams/yr							
EVALUATION										
Domain		Metric	Rating	MWF*	Score	Comments				
Domain 1: Relia	bility									
	Metric 1:	Methodology	High	$\times 1$	1	American Chemical Society				
Domain 2: Repre	esentative									
1	Metric 2:	Geographic Scope	High	$\times 1$	1	US				
	Metric 3:	Applicability	High	$\times 2$	2	Emissions to air				
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Data from less than 10 years ago (2016)				
	Metric 5:	Sample Size	High	× 1	1	complete data				
Domain 3: Acces	ssibility/Clar	ity								
	Metric 6:	Metadata Completeness	Low	× 1	3	limited data, only includes estimated national air emission/year				
Domain 4: Varia	bility and U	ncertainty								
	Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty				
Overall Quality I	Determinatio	n†	High		1.4					

Type of Data Source	Atsdr, 2005. Toxicological profile for carbon tetrachloride. Releases to the Environment; Environmental Release Data; 3982336								
EXTRACTION Parameter			Data						
I al allicici			Data						
Life Cycle Stage:			Use						
Life Cycle Descrip	ption (Subc	ategory of Use):	Emissions	s to air					
Environmental Me	edia:		air						
Release Estimation	n Method:		TRI Data						
Annual Release Q	uantity (kg/	/yr):	4.44 milli	on lbs					
Number of Sites:			55						
EVALUATION									
Domain		Metric	Rating	MWF*	Score	Comments			
Domain 1: Reliab	ility								
	Metric 1:	Methodology	High	× 1	1	US HHS			
Domain 2: Repres	entative								
•	Metric 2:	Geographic Scope	High	$\times 1$	1	US			
	Metric 3:	Applicability	High	$\times 2$	2	Emissions to air			
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Data from less than 10 years ago (2002)			
	Metric 5:	Sample Size	High	× 1	1	complete data			
Domain 3: Access	sibility/Clar	ity							
	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: Variab	ility and Ur	certainty							
	Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty			
	, . <u>.</u>	•	TT' 1		1.2	· · ·			
Overall Quality De	eterminatio	n'	High		1.3				

Type of Data Source		95. Toxicological profile for carb the Environment; Environmenta				
EXTRACTION			Data			
Parameter			Data			
Life Cycle Stage:			Use			
Life Cycle Descrip	otion (Subca	ategory of Use):	liquid was	ste		
Environmental Me	edia:		surface wa	ater		
Release Estimation	n Method:		TRI Data			
Annual Release Qu	uantity (kg/	/yr):	320 lb			
Number of Sites:			55			
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliabi	ility					
	Metric 1:	Methodology	High	× 1	1	US HHS
Domain 2: Repres	entative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	High	$\times 2$	2	Emissions to air
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Data from less than 10 years ago (2002)
· · · · · · · · · · · · · · · · · · ·	Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Access	ibility/Clar	ity				
· · · · · · · · · · · · · · · · · · ·	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: Variabi	ility and Ur	ncertainty				
	Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality De	Overall Quality Determination [†]		High		1.3	

Type of Data Source		95. Toxicological profile for carb the Environment; Environmenta				
EXTRACTION						
Parameter			Data			
Life Cycle Stage:			Use			
Life Cycle Descrip	otion (Subca	ategory of Use):	solid wast	e		
Environmental Me			soil			
Release Estimation	n Method:		TRI Data			
Annual Release Qu	uantity (kg/	/yr):	1033 lb			
Number of Sites:		-	55			
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliabi	ility					
	Metric 1:	Methodology	High	× 1	1	US HHS
Domain 2: Repres	entative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	High	$\times 2$	2	Emissions to air
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Data from less than 10 years ago (2002)
	Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Access	ibility/Clar	ity				
	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: Variabi	ility and Ur	ncertainty				
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	no discussion of variability or uncertainty
Overall Quality De	eterminatio	n†	High		1.3	

Source Citation: Type of Data Source Hero ID	Environment Agency, Austria. 2012. Final report: Three years of implementation of the E-PRTR. Releases to the Environment; Environmental Release Data; 3982347								
EXTRACTION Parameter			Data						
Life Cycle Stage:			Use						
Life Cycle Descri		ategory of Use).	wastewate	r					
Environmental M		<i>aceboly of 000).</i>	waster	×1					
	Annual Release Quantity (kg/yr):			2.65 2008:	:543.09	2009: 478.62 (found on page 208)			
EVALUATION									
Domain		Metric	Rating	MWF*	Score	Comments			
Domain 1: Reliab	oility								
	Metric 1:	Methodology	High	× 1	1	Trusted Source (EU commissioned study)			
Domain 2: Repre	sentative								
Domain 2. Repre	Metric 2:	Geographic Scope	Medium	$\times 1$	2	EU			
	Metric 3:	Applicability	High	$\times 2$	2	wastewater			
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Data from less than 10 years ago (2007, 2008, 2009)			
	Metric 5:	Sample Size	High	× 1	1	complete data			
Domain 3: Acces	sibility/Clar	ity							
	Metric 6:	Metadata Completeness	Low	$\times 1$	3	limited data, includes estimated national water release/year but does break this number down into the individual sites			
Domain 4: Varial	hility and Ur	acertainty							
Domain 4: Varial	Metric 7:	Metadata Completeness	Low	~ 1	3	no discussion of variability on uncertainty			
	Metric /:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty			
Overall Quality E	Determinatio	\mathbf{n}^{\dagger}	High		1.6				

Type of Data Source		University. 2017. Identification the Environment; Environment		pollutior	1 source	s in textile wet processing.
EXTRACTION						
Parameter			Data			
Life Cycle Stage:			Use			
Life Cycle Descrip	tion (Subca	ategory of Use):	Textile Cleanin	g		
Environmental Me	dia:		air	0		
Daily Release Qua	ntity (kg/da	ay):	0.21 lbs/hr			
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliabi	lity					
	Metric 1:	Methodology	High	× 1	1	Trusted Source (Department of Textile Chemistry, North Carolina Stat University)
Domain 2: Represe	entative					
•	Metric 2:	Geographic Scope	High	$\times 1$	1	US
]	Metric 3:	Applicability	Unacceptable	$\times 2$	8	Textle Cleaning
]	Metric 4:	Temporal Representativeness	Unacceptable	$\times 2$	8	Data is Pre-Montreal Protocol (1986)
]	Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Access	ibility/Clar	ity				
	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: Variabi	lity and Un	certainty				
	Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality De	etermination	'nţ	Unacceptable		4	Metric Mean Score: 2.8.

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID		9. Emission scenario documents the Environment; Environmenta		stry (pain	ts, lacqı	uers and varnishes).
EXTRACTION Parameter			Data			
Life Cycle Stage: Life Cycle Descr Environmental M	iption (Subca	ategory of Use):	Manufacture Paints and Coa Air	tings		
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relia	bility Metric 1:	Methodology	High	× 1	1	OECD
Domain 2: Repre	antativa					
Domain 2. Repre	Metric 2:	Geographic Scope	Medium	$\times 1$	2	Europe
	Metric 2: Metric 3:	Applicability	Unacceptable	$\times 1$ $\times 2$	8	paints and Coatings are excluded from scope
	Metric 4:	Temporal Representativeness	High	$\times 2 \times 2$	2	Data from less than 10 years ago (2009)
	Metric 5:	Sample Size	High	× 2 × 1	1	complete data
Domain 3: Acces	ssibility/Clar	ity				
Domain 5. Acces	Metric 6:	Metadata Completeness	Low	$\times 1$	3	No quantitative data, document only discusses emisson of VOCs
Domain 4: Varia	•				_	
	Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality I	Determinatio	n [†]	Unacceptable		4	Metric Mean Score: 2.2.

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID		Oecd, 2009. Emission scenario document on adhesive formulation. Releases to the Environment; Environmental Release Data; 3827299									
EXTRACTION Parameter			Data								
Life Cycle Stage: Life Cycle Descr Environmental M	iption (Subc	ategory of Use):	Manufacture Industrial Adhe Air	esives							
EVALUATION											
Domain		Metric	Rating	MWF*	Score	Comments					
Domain 1: Relia	bility										
	Metric 1:	Methodology	High	× 1	1	OECD					
Domain 2: Repre	esentative										
	Metric 2:	Geographic Scope	Medium	$\times 1$	2	Europe					
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	Industrial Adhesives are excluded from scope					
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Data from less than 10 years ago (2009)					
	Metric 5:	Sample Size	High	× 1	1	complete data					
Domain 3: Acces	ssibility/Clar	itv									
	Metric 6:	Metadata Completeness	Low	$\times 1$	3	No quantitative data, document only discusses emisson of VOCs					
Domain 4: Varia	•										
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	no discussion of variability or uncertainty					
Overall Quality I	Determinatio	n†	Unacceptable		4	Metric Mean Score: 2.2.					

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID		3. Emission scenario document the Environment; Environmenta		use of ad	hesives	for substrate bonding.
EXTRACTION Parameter			Data			
Life Cycle Stage: Life Cycle Descr Environmental M	iption (Subca	ategory of Use):	Manufacture Industrial Adhe Air	esives		
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relial	bility					
	Metric 1:	Methodology	High	× 1	1	OECD
Domain 2: Repre	esentative					
- · · · · · · · · · · · · · · · · · · ·	Metric 2:	Geographic Scope	Medium	× 1	2	Europe
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	Industrial Adhesives are excluded from scope
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Data from less than 10 years ago (2009)
	Metric 5:	Sample Size	High	$\times 1$	1	complete data
Domain 3: Acces	sibility/Clar	itv				
	Metric 6:	Metadata Completeness	Low	$\times 1$	3	No quantitative data, document only discusses emisson of VOCs
Domain 4: Varia	hility and Ur	ocertainty				
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	no discussion of variability or uncertainty
Overall Quality I	Determinatio	n [†]	Unacceptable		4	Metric Mean Score: 2.2.

* MWF = Metric Weighting Factor

Source Citation:	secondary	combustion chamber. Journal of	the Air and	Waste M	anagem	
Type of Data Source Hero ID	Releases to 3568159	the Environment; Published Mo	odels for Exp	posures o	r Releas	ses;
EXTRACTION						
Parameter			Data			
Life Cycle Stage:	:		Use			
Life Cycle Descr	iption (Subca	ategory of Use):	Waste har	dling		
Disposal /Treatm	ent Method:		Incinerati	on		
Environmental N	Iedia:		Air			
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relia	bility					
	Metric 1:	Methodology	Medium	$\times 1$	2	high quality data not necessarily a trusted source
Domain 2: Repre	esentative					
•	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	High	$\times 2$	2	waste handling
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Data from less than 10 years ago (2017)
	Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Acces	ssibility/Clar	ity				
	Metric 6:	Metadata Completeness	Medium	× 1	2	focus of paper is the modelling of released CCl4, so the data analyzes com- bustion of CCl4 samples, is not listing of release quantity
Domain 4: Varia	bility and Ur	ncertainty				
	Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality I	Determinatio	n [†]	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:	CARBON-		ES AND EMISSI			I.,Prinn, R. G.,Fraser, P. J.,Rasmussen, R. A.,Rosen, R. D 1988 INED FROM DAILY GLOBAL MEASUREMENTS DURING
Type of Data Source Hero ID	Releases to 3569634	the Environment; Environment	al Release Data;			
EXTRACTION Parameter			Data			
Turumeter			Dutu			
Life Cycle Stage:			Use			
Life Cycle Description (Subcategory of Use):			Emissions to ai	ir		
Environmental M			Air	0014	1	
Release Estimation	on Method:		Commission	n CC14 p	roducti	on documented by the U.S. International Trade
Annual Release Quantity (kg/yr):			26.80 x 106 (19	985)		
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relial	hility					
	Metric 1:	Methodology	High	× 1	1	Journal of Atmospheric chemistry
Domain 2: Repre	esentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	High	$\times 2$	2	manufacture
	Metric 4:	Temporal Representativeness	Unacceptable	$\times 2$	8	Data is Pre-Montreal Protocol (1978-1985)
	Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Acces	sibility/Clar	ity				
	Metric 6:	Metadata Completeness	Low	× 1	3	limited data, only includes estimated global air emission/year
Domain 4: Varia	bility and U	ncertainty				
	Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality I	Determinatio	n [†]	Unacceptable		4	Metric Mean Score: 2.1.
			Continued on	next pag	e	

		continued from	n previous page	
Source Citation:	-	ES AND EMISS		R. G., Fraser, P. J., Rasmussen, R. A., Rosen, R. D., 1988. ROM DAILY GLOBAL MEASUREMENTS DURING
Type of Data Source Hero ID	Releases to the Environment; Environment 3569634	al Release Data;		
EVALUATION				
Domain	Metric	Rating	MWF [*] Score	Comments

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID		U.S, E. P. A 1977. Control of volatile organic emissions from solvent metal cleaning. Releases to the Environment; Environmental Release Data; 3827321									
EXTRACTION Parameter			Data								
Life Cycle Stage: Life Cycle Descr Environmental M	iption (Subca	ategory of Use):	Use Emissions to ai Air	ir							
EVALUATION											
Domain		Metric	Rating	MWF*	Score	Comments					
Domain 1: Relia	bility Metric 1:	Methodology	High	× 1	1	ЕРА					
Domain 2: Repre		Coordination Coordination	TT: _1.	× 1	1						
	Metric 2: Metric 3:	Geographic Scope	High N/A	X I	1 N/A	US No Comment.					
	Metric 3: Metric 4:	Applicability Temporal Representativeness	Unacceptable	$\times 2$	N/A 8	No Comment. Data is Pre-Montreal Protocol (1977)					
	Metric 4: Metric 5:	Sample Size	N/A	× 2	o N/A	No Comment.					
Domain 3: Acces	ssibility/Clar	ity									
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.					
Domain 4: Varia	bility and Ur	ncertainty									
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.					
Overall Quality I	Determinatio	n†	Unacceptable		4	Metric Mean Score: 2.5.					

* 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 .

Type of Data Source		 Groundwater contamination and the Environment; Environment; 		-	partmen	t of Energy sites.
EXTRACTION						
Parameter			Data			
Life Cycle Stage:			Use			
Life Cycle Descrip	otion (Subca	ategory of Use):	ground	water		
Environmental Me		`	water			
Release Estimation	n Method:		plume 1	maps		
EVALUATION						
Domain		Metric	Rating	MWF★	Score	Comments
Domain 1: Reliab	ility					
	Metric 1:	Methodology	High	$\times 1$	1	DOE
D D						
Domain 2: Repres			TT' 1	1	1	
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3: Metric 4:	Applicability Temporal Representativeness	High	$\times 2 \times 2$	2 2	waste handling
	Metric 4: Metric 5:	Sample Size	High Uigh	× 2 × 1	1	Data from 10 years ago (2008)
	Metric 5:	Sample Size	High	X I	1	complete data
Domain 3: Access	ibility/Clar	ity				
	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: Variab	ility and Ur	acertainty				
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	no discussion of variability or uncertainty
		1				
Overall Quality D	eterminatio	n [†]	High		1.4	

Source Citation: Type of Data Source Hero ID	,	Pnl, 2014. Characterization of biofilm in 200W fluidized bed reactors. Releases to the Environment; Environmental Release Data; 3975004									
EXTRACTION Parameter			Data								
Life Cycle Stage			Use								
Life Cycle Descr Release Source:	ription (Subc	ategory of Use):		andling	. 1						
Environmental N	Aedia:					products/impurities dized bed reactor and composition analysis					
EVALUATION						· · ·					
Domain		Metric	Rating	MWF*	Score	Comments					
Domain 1: Relia	bility										
	Metric 1:	Methodology	High	× 1	1	DOE					
Domain 2: Repro	esentative										
	Metric 2:	Geographic Scope	High	$\times 1$	1	US					
	Metric 3:	Applicability	High	$\times 2$	2	waste handling					
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Data from less than 10 years ago (2014)					
	Metric 5:	Sample Size	High	$\times 1$	1	complete data					
Domain 3: Acce	ssibilitv/Clar	itv									
	Metric 6:	Metadata Completeness	Low	× 1	3	limited data, lumps carbon tet results into volatile solids					
Domain 4: Varia	bility and Ur	ncertainty									
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	no discussion of variability or uncertainty					
Overall Quality I	Determinatio	n†	High		1.4						

Source Citation: Type of Data Source Hero ID		2017. Pollution prevention search results, envirofacts database. Releases to the Environment; Environmental Release Data; 3860453									
EXTRACTION											
Parameter			Data								
Life Cycle Stage:			Use								
Life Cycle Descr		ategory of Use):	not specified								
EVALUATION											
Domain		Metric	Rating	MWF*	Score	Comments					
Domain 1: Relia	bility										
	Metric 1:	Methodology	High	× 1	1	EPA					
Domain 2: Repre	esentative										
1	Metric 2:	Geographic Scope	High	$\times 1$	1	US					
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	no entries for tetrachloromethane or carbon tetrachloride					
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	No Comment.					
	Metric 5:	Sample Size	N/A		N/A	No Comment.					
Domain 3: Acces	ssibility/Clar	itv									
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.					
Domain 4: Varia	bility and Ur	ncertainty									
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.					
Overall Quality I	Determinatio	n [†]	Unacceptable		4	Metric Mean Score: 2.0.					

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	•	013. Optimization review: Velsicol chemical corporation hardeman county landfill superfund site. Releases to the Environment; Environmental Release Data; 860542								
EXTRACTION			Dete							
Parameter			Data							
Life Cycle Stage:			Use							
Life Cycle Descr	iption (Subc	ategory of Use):	waste han	dling						
Release Source:			pesticides							
Disposal /Treatm	ent Method:		unlined tr	enches						
Environmental N	Iedia:		groundwa	ter						
Release Estimation	on Method:		plume ma	ps						
Daily Release Qu		ay):				ify frequency) and max 30,000mg/L				
Waste Treatment	Method:		Groundwa	ater Extra	ction an	nd Treatment System				
EVALUATION										
Domain		Metric	Rating	MWF*	Score	Comments				
Domain 1: Relia	hility									
Domain 1. Hena	Metric 1:	Methodology	High	$\times 1$	1	EPA				
Domain 2: Repre	esentative									
1	Metric 2:	Geographic Scope	High	$\times 1$	1	US				
	Metric 3:	Applicability	High	$\times 2$	2	waste handling				
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Data from 10 years ago (2008)				
	Metric 5:	Sample Size	High	× 1	1	complete data				
Domain 3: Acces	ssibility/Clar	ity								
	Metric 6:	Metadata Completeness	Medium	× 1	2	Little details of how release data was obtained				
Domain 4: Varia	bility and Ur	ncertainty								
	Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty				
Overall Quality I	Determinatio	n†	High		1.3					

Source Citation: Type of Data Source Hero ID		2013. Optimization review: Velsicol chemical corporation hardeman county landfill superfund site. Releases to the Environment; Environmental Release Data; 3860542								
EXTRACTION										
Parameter			Data							
Life Cycle Stage:	:		Use							
Life Cycle Description (Subcategory of Use):			waste han	dling						
Release Source:	1		pesticides	•						
Environmental M	Iedia:		air							
Daily Release Quantity (kg/day):		5.2 ppbv (outdoor)	and 2.6	ppbv (indoor)					
EVALUATION										
Domain		Metric	Rating	MWF*	Score	Comments				
Domain 1: Relia	bility									
Domain 1. Kena	Metric 1:	Methodology	High	$\times 1$	1	EPA				
Domain 2: Repre	esentative									
2 onium 21 respi	Metric 2:	Geographic Scope	High	× 1	1	US				
	Metric 3:	Applicability	High	$\times 2$	2	waste handling				
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Data from 10 years ago (2008)				
	Metric 5:	Sample Size	High	× 1	1	complete data				
Domain 3: Acces	ssibility/Cla	rity								
	Metric 6:	Metadata Completeness	Medium	× 1	2	Little details of how release data was obtained				
Domain 4: Varia	bility and U	ncertainty								
	Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty				
Overall Quality I	Determinatio	\mathbf{n}^{\dagger}	High		1.3					

Source Citation:	products.		•		styrene f	foam, bleached paperboard, and corrugated paperboard foodservic
Type of Data Source Hero ID	Releases to 3978165	the Environment; Environment	al Release D	Data;		
EXTRACTION						
Parameter			Data			
Life Cycle Stage:			Use			
	Life Cycle Description (Subcategory of Use):			dling		
Release Source:			food servi	•	cts	
Environmental M	ledia:		air	-		
Daily Release Quantity (kg/day):					e-6 lb; poly-coated paperboard: 5.6e -6 lb; corrugated E ppbd cup+sleeve: 7.2 e-6 lb;	
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relial	oility					
	Metric 1:	Methodology	High	× 1	1	No Comment.
Domain 2: Repre	sentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	High	$\times 2$	2	waste handling
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Data from 10 years ago (2006)
	Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Acces	sibility/Clar	ity				
	Metric 6:	Metadata Completeness	Medium	× 1	2	combined data from industry
Domain 4: Varial	bility and U	ncertainty				
	Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability, includes discussion of uncertainty
Overall Quality I	Determinatio	\mathbf{n}^{\dagger}	High		1.3	

Source Citation: Type of Data Source Hero ID		revention, Infohouse. 2017. Em the Environment; Environment		n tire fires	5.	
EXTRACTION Parameter			Data			
Life Cycle Stage:			Use			
Life Cycle Description (Subcategory of Use):			waste handling			
Release Source:			tires			
Disposal /Treatme	Incineration					
Environmental M	edia:		air			
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliab	ility					
	Metric 1:	Methodology	Medium	$\times 1$	2	Pollution Prevention Infohouse
Domain 2: Repres	sentative					
1	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	$\times 2$	2	Disposal
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	Data from greater than 20 years ago (1983)
	Metric 5:	Sample Size	Low	× 1	3	Distribution of Samples is Qualitative
Domain 3: Access	sibility/Clar	ity				
	Metric 6:	Metadata Completeness	Unacceptable	× 1	4	No quantitative data for ccl4
Domain 4: Variab	oility and Ur	ncertainty				
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality D	eterminatio	n†	Unacceptable		4	Metric Mean Score: 2.2.

* MWF = Metric Weighting Factor

Type of Data Source	Us, E. P. A 1997. Evaluation of emissions from the open burning of land-clearing debris. Releases to the Environment; Environmental Release Data; 3981117							
EXTRACTION Parameter			Data					
Life Cycle Stage:			Use					
Life Cycle Descrip	otion (Subca	ategory of Use):	Other land	l disposal				
Release Source:			Land-Clea					
Disposal /Treatme	nt Method:		Incineratio	•				
Environmental Media:		air						
EVALUATION								
Domain		Metric	Rating	MWF*	Score	Comments		
Domain 1: Reliab	ility							
	Metric 1:	Methodology	High	× 1	1	EPA		
Domain 2: Repres	entative							
-	Metric 2:	Geographic Scope	High	$\times 1$	1	US		
	Metric 3:	Applicability	Low	$\times 2$	6	air emissions		
	Metric 4:	Temporal Representativeness	Low	$\times 2$	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: Access	ibility/Clar							
	Metric 6:	Metadata Completeness	Low	× 1	3	Includes various statistics about amount per type of material, but lacks fre- quency of larger testing sample size		
Domain 4: Variab	ility and Ur	ncertainty						
	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 D	etermination	n [†]	Low		2.3			

Source Citation:			ions and to	kicologica	al signif	icance of trace organic compounds in municipal solid waste landfil
Type of Data Source Hero ID	gas. Chem Releases to 660779	osphere. the Environment; Environment	al Release D	ata;		
EXTRACTION						
Parameter			Data			
Life Cycle Stage:			Disposal			
Life Cycle Descri	ption (Subc	ategory of Use):	Municipal	Landfill		
Release Source:			Well gas			
Disposal /Treatme	ent Method:		landfill			
Environmental M	edia:		gas			
Release or Emissi	on Factor:		Range of	0.9 to 88	mg/m3	
Release Estimatio	n Method:		gas chrom	atograph		
Release Days per	Year:		365.0			
Number of Sites:			4			
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliab	ility					
	Metric 1:	Methodology	Medium	× 1	2	Water and Environmental Research Institute
Domain 2: Repres	sentative					
	Metric 2:	Geographic Scope	Medium	$\times 1$	2	Finland
	Metric 3:	Applicability	High	$\times 2$	2	Disposal in landfill
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	1992
	Metric 5:	Sample Size	High	× 1	1	4 well documented sites
Domain 3: Access	sibility/Clar	ity				
	Metric 6:	Metadata Completeness	High	× 1	1	Well documented
Domain 4: Variab	ility and U	ncertainty				
	Metric 7:	Metadata Completeness	Medium	× 1	2	Some discussion
Overall Quality D	eterminatio	\mathbf{n}^{\dagger}	Medium		1.8	
			Continue	1		

		– continued fi	rom previous	s page			
Source Citation:	Assmuth, T.,Kalevi, K. 1992. Concent gas. Chemosphere.	rations and tox	icological sig	gnificance of trace organic compounds in municipal solid waste landfill			
Type of Data Source							
Hero ID	660779						
EVALUATION							
Domain	Metric	Rating	MWF* Sco	ore Comments			

Source Citation:		.,Perales, J. F.,Roca, F. J.,Guardin vaste landfill using a self-design					atile organic compounds (VOC) from a close nent.
Type of Data Source Hero ID		the Environment; Environment					
EXTRACTION							
Parameter			Data				
Life Cycle Stage	:		Disposal				
Life Cycle Descr		ategory of Use):	industrial	landfill			
Release Source:			Well gas				
Disposal /Treatm	ent Method:		landfill				
Environmental M			gas				
Release or Emiss			Range of				
Release Estimation			Global, K	riging an	d Tribut	aryarea.	
Release Days per	Year:		365.0				
EVALUATION							
Domain		Metric	Rating	MWF*	Score		Comments
Domain 1: Relia	bility						
	Metric 1:	Methodology	Medium	$\times 1$	2	INSHT	
Domain 2: Repre	esentative						
	Metric 2:	Geographic Scope	Medium	$\times 1$	2	Spain	
	Metric 3:	Applicability	High	$\times 2$	2	Disposal in landfill	
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2013	
	Metric 5:	Sample Size	High	× 1	1	15 sampling days	
Domain 3: Acce	ssibility/Clar	ity					
	Metric 6:	Metadata Completeness	High	× 1	1	Well documented	
Domain 4: Varia	bility and U	ncertainty					
	Metric 7:	Metadata Completeness	High	× 1	1	Well documented	
Overall Quality I	Determinatio	\mathbf{n}^{\dagger}	High		1.2		

Source Citation:	Katami, T., sphere.	Nisikawa, H.,Yasuhara, A 199	2. Emission of c	hlorinate	d comp	ounds by combustion of waste dry-cleaning materials. Chemo			
Type of Data Source Hero ID	Releases to 2917538	the Environment; Environment	al Release Data;						
EXTRACTION Parameter			Data						
Life Cycle Stage: Life Cycle Description (Subcategory of Use):		Disposal hazardous waste incinerator							
EVALUATION									
Domain		Metric	Rating	MWF*	Score	Comments			
Domain 1: Relial	hility								
	Metric 1:	Methodology	Medium	× 1	2	National Institute for Environmental Studies Japan			
Domain 2: Repre	esentative								
	Metric 2:	Geographic Scope	Medium	$\times 1$	2	Japan			
	Metric 3:	Applicability	Unacceptable	$\times 2$	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: Acces	ssibility/Clar	ity							
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.			
Domain 4: Varia	bility and Ur	ncertainty							
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.			
Overall Quality I	Determinatio	n [†]	Unacceptable		4	Metric Mean Score: 3.0.			

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	Oecd,. 2015. Emission scenario documents on coating industry (paints, lacquers and varnishes). Releases to the Environment; Environmental Release Data; 3833129											
EXTRACTION												
Parameter			Data									
Life Cycle Stage:			Use									
EVALUATION												
Domain		Metric	Rating	MWF*	Score	Comments						
Domain 1: Reliab	oility											
	Metric 1:	Methodology	Medium	$\times 1$	2	OECD						
Domain 2: Repre	sentative											
· · · · · · · · · · · · · · · · · · ·	Metric 2:	Geographic Scope	Medium	$\times 1$	2	Europe						
	Metric 3:	Applicability	Unacceptable	$\times 2$	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: Acces	sibility/Clar	ity										
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.						
Domain 4: Varial	bility and U	ncertainty										
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.						
Overall Quality E	Determinatio	n†	Unacceptable		4	Metric Mean Score: 3.0.						

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID		2014. Toxic release inventory: Carbon tetrachloride. Releases to the Environment; Environmental Release Data; 3860458									
EXTRACTION Parameter			Data								
Life Cycle Stage: Life Cycle Descr Release Source: Release or Emiss	iption (Subc	ategory of Use):	Disposa All Indu Other o 43 lbs i	ustries n-site lan	dfills						
EVALUATION											
Domain		Metric	Rating	MWF*	Score	Comments					
Domain 1: Relia	bility Metric 1:	Methodology	High	× 1	1	US EPA					
Domain 2: Repre	esentative Metric 2: Metric 3: Metric 4: Metric 5:	Geographic Scope Applicability Temporal Representativeness Sample Size	High High High N/A		1 2 2 N/A	US Credible release numbers, but unknown uses 2015 No Comment.					
Domain 3: Acces	ssibility/Clar Metric 6:	ity Metadata Completeness	N/A		N/A	No Comment.					
Domain 4: Varia	bility and Ur Metric 7:	ncertainty Metadata Completeness	N/A		N/A	No Comment.					
Overall Quality Determination [†]		High		1.0							

Source Citation: Type of Data Source Hero ID		2014. Toxic release inventory: Carbon tetrachloride. Releases to the Environment; Environmental Release Data; 3860458									
EXTRACTION Parameter			Data								
Life Cycle Stage: Life Cycle Descr Release Source: Release or Emiss	iption (Subc	ategory of Use):	Disposa All Indu Surface 275 lbs	ustries water dis	scharges						
EVALUATION											
Domain		Metric	Rating	MWF*	Score	Comments					
Domain 1: Relia	bility Metric 1:	Methodology	High	× 1	1	US EPA					
Domain 2: Repre	esentative Metric 2: Metric 3: Metric 4:	Geographic Scope Applicability	High High	$\times 1$ $\times 2$	1 2	US Credible release numbers, but unknown uses					
	Metric 4: Metric 5:	Temporal Representativeness Sample Size	High N/A	$\times 2$	2 N/A	2015 No Comment.					
Domain 3: Acces	ssibility/Clar Metric 6:	ity Metadata Completeness	N/A		N/A	No Comment.					
Domain 4: Varia	bility and Ur Metric 7:	ncertainty Metadata Completeness	N/A		N/A	No Comment.					
Overall Quality Determination [†]		High		1.0							

Source Citation: Type of Data Source Hero ID	2014. Toxic release inventory: Carbon tetrachloride. Releases to the Environment; Environmental Release Data; 3860458									
EXTRACTION Parameter			Data							
Life Cycle Stage: Life Cycle Descr Release Source: Release or Emiss	iption (Subc	ategory of Use):								
EVALUATION										
Domain		Metric	Rating	MWF*	Score	Comments				
Domain 1: Relia	bility Metric 1:	Methodology	High	× 1	1	US EPA				
Domain 2: Repre	Metric 2: Metric 3:	Geographic Scope Applicability	High High	$\times 1$ $\times 2$	1 2	US Credible release numbers, but unknown uses				
	Metric 4: Metric 5:	Temporal Representativeness Sample Size	High N/A	$\times 2$	2 N/A	2015 No Comment.				
Domain 3: Acces	ssibility/Clar Metric 6:	ity Metadata Completeness	N/A		N/A	No Comment.				
Domain 4: Varia	bility and Ur Metric 7:	ncertainty Metadata Completeness	N/A		N/A	No Comment.				
Overall Quality Determination [†]		High		1.0						

Source Citation: Type of Data Source Hero ID	2014. Toxic release inventory: Carbon tetrachloride. Releases to the Environment; Environmental Release Data; 3860458									
EXTRACTION Parameter			Data							
Life Cycle Stage: Life Cycle Descr Release Source: Release or Emiss	iption (Subc	ategory of Use):				1				
EVALUATION										
Domain		Metric	Rating	MWF*	Score	Comments				
Domain 1: Relia	bility Metric 1:	Methodology	High	× 1	1	US EPA				
Domain 2: Repre	esentative Metric 2: Metric 3:	Geographic Scope Applicability	High High	$\times 1$ $\times 2$	1 2	US Credible release numbers, but unknown uses				
	Metric 4: Metric 5:	Temporal Representativeness Sample Size	High N/A	$\times 2 \times 2$	2 N/A	2015 No Comment.				
Domain 3: Acces	-	ity								
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.				
Domain 4: Varia	•	•	NT/A		NT/ A					
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.				
Overall Quality Determination ^{\dagger}		High		1.0						

Source Citation: Type of Data Source Hero ID		0 Program: The final record. the Environment; Environmenta	al Release D	ata;				
EXTRACTION Parameter			Data					
Life Cycle Stage: Life Cycle Description (Subcategory of Use): Release or Emission Factor:				Disposal Off-site waste transfer 840,947 lbs in 1991 - 479,652 in 1998				
EVALUATION								
Domain		Metric	Rating	MWF*	Score	Comments		
Domain 1: Reliab	oility Metric 1:	Methodology	High	× 1	1	US EPA		
D : 2 D								
Domain 2: Repre	Metric 2:	Geographic Scope	Uich	× 1	1	US		
	Metric 2. Metric 3:	Applicability	High Low	$\times 1$ $\times 2$	6	US Credible release numbers, but unknown uses		
	Metric 4:	Temporal Representativeness	Medium	$\times 2 \times 2$	4	1999		
	Metric 5:	Sample Size	N/A	~ 2	N/A	No Comment.		
Domain 3: Acces	sibility/Clar	itv						
20114110111000	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.		
Domain 4: Varial	nility and Ur	acertainty						
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.		
Overall Quality D	Determinatio	n [†]	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: Type of Data Source Hero ID		mization support evaluation: Gr the Environment; Environment			te, Newt	ton, Virginia.
EXTRACTION Parameter			Data			
Life Cycle Stage:			Disposal			
Life Cycle Descri Release Source:	iption (Subc	ategory of Use):	Industrial			nent
Release Source: Release or Emiss	ion Easton		treatment		charge	
Waste Treatment			90.8 ug/L UV oxida		m	
P2 Control & per			20 percen	-		
r 2 Control & per		icy.	20 percen	ι		
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relial	bility					
	Metric 1:	Methodology	High	$\times 1$	1	US EPA
Domain 2: Repre	sentative					
Domain 2. Repre	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Low	$\times 2$	6	Credible release numbers, but unknown uses
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2003
	Metric 5:	Sample Size	N/Å		N/A	No Comment.
Domain 3: Acces	sibility/Clar	ity				
Domain 5. Acces	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
		r				
Domain 4: Varial	bility and Ur	•				
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality I	Determinatio	n [†]	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:	TOYNET	ChemIDplus: Substances name:	Pervlimid			
Type of Data Source		the Environment; Environment				
Hero ID	3970244) the Environment, Environmenta	ai Kelease Data,			
	3770244					
EXTRACTION						
Parameter			Data			
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relial	bility					
	Metric 1:	Methodology	High	× 1	1	US EPA
Domain 2: Repre	esentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	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: Acces	ssibility/Clar	ity				
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Varia	bility and U	certainty				
Domain 4. Varia	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
	meure /.	Metadata Completeness	11/1		IVA	No Comment.
Overall Quality I	Determinatio	\mathbf{n}^{\dagger}	Unacceptable		4	Metric Mean Score: 2.5.

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID		1. Wet air oxidation for wastew the Environment; Reports for D			ther tha	n Exposure or Release Data;
EXTRACTION Parameter			Data			
Life Cycle Stage: Life Cycle Descr Waste Treatment P2 Control & per	iption (Subc Method:		plex mole process is	idation de cular stru based on	estroys t ctures i the disc	ment toxics in industrial wastewater by breaking down com- nto simpler components such as water and CO2. The covery that organics will oxidize in water, at relatively en is present and proper pressure is maintained.
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relia	bility Metric 1:	Methodology	High	× 1	1	US Joint Service Pollution Prevention
Domain 2: Repre	esentative					
-	Metric 2:	Geographic Scope	High	$\times 1$	1	US and US military bases
	Metric 3:	Applicability	High	$\times 2$	2	Looks at method of pollution control for CCl4 and other organics in industrial wastewater
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	2001
	Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Acces	sibility/Clar	ity				
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Varia	bility and Ur	ncertainty				
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality I	Determinatio	\mathbf{n}^{\dagger}	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: Type of Data Source Hero ID		revention, Infohouse. 2017. Em the Environment; Reports for D				oosure or Release Data;
EXTRACTION						
Parameter			Data			
Life Cycle Stage:			Release			
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relial	bility					
	Metric 1:	Methodology	High	$\times 1$	1	US EPA
Domain 2: Repre	esentative					
· · · · · · · · · · · · · · · · · · ·	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	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: Acces	ssibility/Clar	ity				
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Varia	bilitv and Ur	ncertainty				
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality I	Determinatio	n [†]	Unacceptable		4	Metric Mean Score: 2.5.

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID		1997. Evaluation of emissions the Environment; Reports for D				
EXTRACTION Parameter			Data			
Life Cycle Stage:			Release			
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relia	bility					
	Metric 1:	Methodology	High	× 1	1	US EPA
Domain 2: Repre	esentative					
1	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Low	$\times 2$	6	air emissions
	Metric 4:	Temporal Representativeness	Low	$\times 2$	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: Acces	ssibility/Clar	ity				
	Metric 6:	Metadata Completeness	Low	× 1	3	Includes various statistics about amount per type of material, but lacks fre- quency of larger testing sample size
Domain 4: Varia	bility and Ur	ncertainty				
	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 I	Determinatio	n [†]	Low		2.3	

Source Citation:	Ems,. 201 KUH0-11-	-	study report: I	Kuhlman	Electric	Corporation: Crystal Springs, Mississippi: EMS project no
Type of Data Source Hero ID	Releases to 3982210	the Environment; Reports for D	ata or Informatio	on Other t	han Exp	posure or Release Data;
EXTRACTION Parameter			Data			
Life Cycle Stage:			Release			
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relial	bility					
	Metric 1:	Methodology	Low	× 1	3	Private testing firm
Domain 2: Repre	esentative					
1	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	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: Acces	ssibility/Cla	rity				
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Varial	bility and U	ncertainty				
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality I	Determinatio	\mathbf{n}^{\dagger}	Unacceptable		4	Metric Mean Score: 3.0.

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID		 Groundwater contamination ar b the Environment; Environmenta 		epartmen	t of Ene	rgy sites.
EXTRACTION						
Parameter			Data			
Life Cycle Stage:	:		Release			
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relial	bility					
	Metric 1:	Methodology	High	× 1	1	OET
Domain 2: Repre	esentative					
Domain 21 Hope	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	Powerpoint describing 94 groundwater contamination sites
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2007
	Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Acces	ssibility/Clar	rity				
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Varia	bility and Ur	ncertainty				
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality I	Determinatio	n [†]	Unacceptable		4	Metric Mean Score: 2.0.

* MWF = Metric Weighting Factor

Occupational Exposure

		A.,Lee, J. S.,Marano, D. E.,Spirt e facility: II. Exposures and the				11. Retrospective cohort mortality study of workers at an aircraf			
		al Exposure; Monitoring Data;	ii assessment. Di	iusii jou		ndustriai Medicine.			
	5131	ai Exposure, Monitoring Data,							
EXTRACTION									
Parameter			Data						
Life Cycle Stage:			Use						
Physical Form:			Liquid						
Route of Exposure:			Inhalation, der	mal					
Number of Samples:			10256						
Number of Sites:			1.0						
Worker Activity:			Cleaning small	parts, pa	rachute	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: Reliabilit	v								
	etric 1:	Methodology	Medium	× 1	2	Due to lack of data, method associated exposure level with job title at levels low, medium, high			
Domain 2: Represen	tative								
-	etric 2:	Geographic Scope	High	$\times 1$	1	US			
Μ	etric 3:	Applicability	Low	$\times 2$	6	Data from 1939 to 1982.			
Μ	etric 4:	Temporal Representativeness	Unacceptable	$\times 2$	8	Data and use are Pre-Montreal Protocol			
М	etric 5:	Sample Size	Low	× 1	3	disitribution not characterized by statistics			
Domain 3: Accessibi	ility/Clar	ity							
	etric 6:	Metadata Completeness	Unacceptable	× 1	4	only qualitative results			
Domain 4: Variabilit	ty and Un	certainty							
M	etric 7:	Metadata Completeness	Low	× 1	3	data is not complete enough to characterize variability and uncertainty			
			Continued on	next pag	e				

		– continued from	previous	page				
Source Citation:	urce 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 Dat	ta;						
Hero ID	65131							
EVALUATION								
Domain	Metric	Rating	MWF*	Score		Comments		
Overall Quality 1	Determination [†]	Unacceptable		4	Metric Mean Score: 3.0.			

* MWF = Metric Weighting Factor

			Exposure	to chen	nical carcinogens and risk of cancer among Finnish laborator
	s. American Journal of Industrial National Exposure; Monitoring Data;				
Hero ID 194809					
EXTRACTION					
Parameter		Data			
Life Cycle Stage:		Use			
Physical Form:		Liquid			
Route of Exposure:		Inhalation, der	mal		
Exposure Concentration	Unit):	g/year			
Number of Samples:		4710			
Number of Sites:		450.0			
Worker Activity:		laboratory wor	kers		
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	$\times 1$	2	assessing ASA Register database
Domain 2: Representativ					
Metric		Medium	$\times 1$	2	OECD Country (Finland)
Metric	<u> </u>	High	$\times 2$	2	laboratory chemical
Metric		Unacceptable	$\times 2$	8	Data is Pre-Montreal Protocol (1979-1988)
Metric		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 an	d Uncertainty				
Metric	7: Metadata Completeness	Medium	$\times 1$	2	includes confidence levels
		Continued on	n next pag	je	

		– continued from	previous	page	
Source Citation:	Kauppinen, T.,Pukkala, E.,Saalo, A.,S workers. American Journal of Industri		xposure	to chem	nical carcinogens and risk of cancer among Finnish laboratory
Type of Data Source	Occupational Exposure; Monitoring D	ata:			
Hero ID	194809	,			
EVALUATION					
Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality	Determination [†]	Unacceptable		4	Metric Mean Score: 2.2.

* MWF = Metric Weighting Factor

	ype of Data Source Occupational Exposure; Monitoring Data;						
EXTRACTION							
Parameter		Data					
Life Cycle Stage:		Use					
Physical Form:		Liquid					
Route of Exposure:		Inhalation, der	mal				
Exposure Concentration (Un	nit):	490-2600 mg/r	n3				
Worker Activity:		boot & shoe m	anufactur	e, rubbe	er industry, aircraft maintenance		
Number of Workers:		104,200					
Type of Sampling:		personal					
Analytic Method:		National Occup	pational E	Exposure	e 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	$\times 1$	1	US, Canada, Finland		
Metric 3:	Applicability	Medium	$\times 2$	4	boot & shoe manufacture, rubber industry, aircraft maintenance		
Metric 4:	Temporal Representativeness	Unacceptable	$\times 2$	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/Cla	arity						
Metric 6:	-	Medium	× 1	2	study does not focus on CCl4		
Domain 4: Variability and U	Jncertainty						
Metric 7:		Low	$\times 1$	3	no discussion of variability or uncertainty		
Overall Quality Determinati	on [†]	Unacceptable		4	Metric Mean Score: 2.3.		
		Continued on	next pag	e			

	– continued from previous page							
Source Citation: Type of Data Source Hero ID	Lynge, E., Anttila, A., Hemminki, K 1997. Occupational Exposure; Monitoring Data; 630734	Organic solvent	s and cancer. Cancer Cat	ises and Control.				
EVALUATION								
Domain	Metric	Rating	MWF* Score	Comments				

* MWF = Metric Weighting Factor

	 Environmental Health Criteria nal Exposure; Monitoring Data; 	208: Carbon tetr	rachloride	е.	
EXTRACTION		D (
Parameter		Data			
Life Cycle Stage:		Use			
Physical Form:		liquid and vapo	or		
Route of Exposure:		Inhalation, der			
Exposure Concentration (Uni	t):	g/m3 or kg/L			
Worker Activity:		general populat	tion drink	ting wat	er and air, some worker scenarios, old data
Type of Sampling:		personal and ar	ea		
Analytic Method:		National Organ	nics Mon	itoring	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	$\times 1$	1	US and other OECD nations
Metric 3:	Applicability	Medium	$\times 2$	4	occupational data (factories, grain and water treatment facilities) are outdatec (pre-Montreal Protocol)
Metric 4:	Temporal Representativeness	Unacceptable	$\times 2$	8	Data is Pre-Montreal Protocol (1981-1983)
Metric 5:	Sample Size	Low	$\times 1$	3	No in-depth analysis of sample size. Would have to check specific sources
Domain 3: Accessibility/Clar	ity				
Metric 6:	Metadata Completeness	Low	$\times 1$	3	limited explanantion of data as the scope of the document is so large
Domain 4: Variability and U					
Metric 7:	Metadata Completeness	Medium	$\times 1$	2	limited discussion variability or uncertainty
Meule 7:	metauata Completeness	withill	~ 1	2	limited discussion variability or uncertainty
Overall Quality Determination	\mathbf{n}^{\dagger}	Unacceptable		4	Metric Mean Score: 2.4.
			next pag		

	- continued from previous page							
Source Citation: Type of Data Source Hero ID	Ipcs, 1999. Environmental Health Criteria Occupational Exposure; Monitoring Data; 3001090		rachloride.					
EVALUATION								
Domain	Metric	Rating	MWF* Score	Comments				

* MWF = Metric Weighting Factor

	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.						
	Occupational Exposure; Monitoring Data;						
	59371	ai Exposure, Monitoring Data,					
EXTRACTION							
Parameter			Data				
Life Cycle Stage:			Use				
Physical Form:							
Route of Exposure:			vapor inhalation				
Exposure Concentrati	ion (Unit						
		.):	ppb				
Number of Samples: Number of Sites:			6 1.0				
Worker Activity:			office building				
Number of Workers:			24				
Type of Sampling:							
Sampling Location:			area office building				
Exposure Duration:			161 - 172 min.				
Analytic Method:			air quality monitor				
Analytic Method.			an quanty mon	1101			
EVALUATION							
Domain		Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliability	v						
•	etric 1:	Methodology	High	$\times 1$	1	NIOSH report	
Domain 2: Represent	ative						
•	etric 2:	Geographic Scope	High	× 1	1	US	
	etric 3:	Applicability	Unacceptable	$\times 2$	8	office building with less than 1 ppb result of CCl4	
	etric 4:	Temporal Representativeness	Medium	$\times 2 \times 2$	4	Data from greater than 10 years ago (2004) could be current use	
	etric 5:	Sample Size	Low	× 1	3	disitribution not characterized by statistics, only 24 exposed	
Domain 3: Accessibil	-	-	TT: 1	1	1		
Me	etric 6:	Metadata Completeness	High	× 1	1	complete data	
Domain 4: Variability	y and Un	certainty					
-	etric 7:	Metadata Completeness	Medium	$\times 1$	2	limited discussion variability or uncertainty	
			Continued on				

– continued from previous page									
Source Citation:	rce 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.				

* MWF = Metric Weighting Factor

ro ID Occupation 3859376	al Exposure; Monitoring Data;				
XTRACTION					
Parameter		Data			
Life Cycle Stage:		Use			
Physical Form:		vapor			
Route of Exposure:		inhalation duri	ng degrea	asing	
Number of Samples:		33	0 0	C C	
Number of Sites:		1.0			
Worker Activity:		Degreasing			
Number of Workers:		17			
Type of Sampling:		personal and ar	ea		
Sampling Location:		auto shop			
Analytic Method:		air quality mon	itor		
VALUATION					
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	$\times 1$	1	US
Metric 3:	Applicability	Unacceptable	$\times 2$	8	not used for degreasing anymore
Metric 4:	Temporal Representativeness	Unacceptable	$\times 2$	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/Clar	ity				
Metric 6:	Metadata Completeness	High	× 1	1	complete data
Domain 4: Variability and Un	certainty				
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination	n [†]	Unacceptable		4	Metric Mean Score: 2.8.

– continued from previous page							
Source Citation: Type of Data Source Hero ID	Love, J. R.,Kern, M.: 1981. Health hazard Occupational Exposure; Monitoring Data: 3859376	-	rt no. HETA-81-065-938, N	METRO Bus Maintenance Shop, Washington, DC.			
EVALUATION Domain	Metric	Rating	MWF* Score	Comments			

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID		zardous Substances Data, Bank. aal Exposure; Monitoring Data;	2017. HSDB: C	arbon teti	rachloric	de.
EXTRACTION			_			
Parameter			Data			
Life Cycle Stage:			Use			
Physical Form:			liquid			
Route of Exposur			ingestion			
Exposure Concern		t):	1 pint			
Number of Samp	les:		1			
Number of Worke			1			
Type of Sampling			personal			
Analytic Method:	:		monitoring test	t subject a	after ing	estion p. 3
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliat	vility					
	Metric 1:	Methodology	High	$\times 1$	1	NLM NSDB for CCl4
Domain 2: Repre	sentative					
Domain 21 Hopfe	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	laboratory test data not worker data
	Metric 4:	Temporal Representativeness	Unacceptable	$\times 2$	8	Data is Pre-Montreal Protocol (1963)
	Metric 5:	Sample Size	Low	$\times 1$	3	disitribution not characterized by statistics, only 1 exposed
Domain 3: Acces	sibility/Clar	ity				
	Metric 6:	Metadata Completeness	High	$\times 1$	1	complete data
Domain 4: Varial	bility and Ur	ncertainty				
	Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.8.	
			Continued on	next nag	e	

	- continued from previous page							
Source Citation: Type of Data Source Hero ID	ToxNet Hazardous Substances Data, Bank Occupational Exposure; Monitoring Data; 3970275		Carbon tetrachloride.					
EVALUATION								
Domain	Metric	Rating	MWF* Score	Comments				

* MWF = Metric Weighting Factor

Type of Data Source O		zardous Substances Data, Bank. al Exposure; Monitoring Data;	2017. HSDB: Ca	arbon tetr	achloric	de.
EXTRACTION						
Parameter			Data			
Life Cycle Stage:			Use			
Physical Form:			vapor			
Route of Exposure:			inhalation			
Exposure Concentra	tion (Unit):	ug/m3			
Worker Activity:			municipal solid	l waste co	mpostii	ng
Number of Workers:	:		92,143			
Type of Sampling:			personal			
Analytic Method:			NIOSH survey	p. 35		
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliabili	tv					
	letric 1:	Methodology	High	$\times 1$	1	NLM NSDB for CCl4
Domain 2: Represer	ntative					
-	Ietric 2:	Geographic Scope	High	× 1	1	US
	Ietric 3:	Applicability	High	$\times 2$	2	solid waste composting (recycle)
	letric 4:	Temporal Representativeness	Unacceptable	$\times 2$	8	Data is Pre-Montreal Protocol (1981-83)
	letric 5:	Sample Size	Low	× 1	3	disitribution not characterized by statistics, only 1 exposed
Domain 3: Accessib	oility/Clari	ty				
	-	Metadata Completeness	High	× 1	1	complete data
Domain 4: Variabili	ty and Un	certainty				
		Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Dete	erminatior	1 [†]	Unacceptable		4	Metric Mean Score: 2.1.
			Continued on	next page	<u> </u>	

	 – continued from previous page 							
Source Citation: Type of Data Source Hero ID	ToxNet Hazardous Substances Data, Bank. Occupational Exposure; Monitoring Data; 3970275	2017. HSDB: C	Carbon tetrachloride.					
EVALUATION								
Domain	Metric	Rating	MWF* Score	Comments				

* MWF = Metric Weighting Factor

Source Citation:	Safety Cor					bling results (January " March 2007) at the Washington Traffic mpia Cleaners) Olympia, Thurston County, Washington: EPA		
Type of Data Source Hero ID	Occupation 3970403	nal Exposure; Monitoring Data;						
EXTRACTION								
Parameter			Data					
Life Cycle Stage:			Use					
Physical Form:			vapor					
Route of Exposur	e:		inhalation					
Exposure Concen		t):	0.44-0.53 "g/m	13				
Number of Sampl			18					
Number of Sites:			1.0					
Worker Activity:			office building	by dry cl	eaning s	ervice		
Sampling Location:		office building by dry cleaner						
Analytic Method:			portable photoi	ionizatior	n detecto)T		
EVALUATION								
Domain		Metric	Rating	MWF*	Score	Comments		
Domain 1: Reliab	vility							
	Metric 1:	Methodology	High	$\times 1$	1	Washington State Department of Health		
Domain 2: Repres	sentative							
	Metric 2:	Geographic Scope	High	$\times 1$	1	US		
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	textile cleaning		
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	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: Acces	sibility/Clar	ity						
	Metric 6:	Metadata Completeness	High	× 1	1	complete data		
Domain 4: Variab	oility and Ur	ncertainty						
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	no discussion of variability or uncertainty		
			Continued on	next pag	e			

		- continued from	previous	page	
Source Citation:	-	1		1	oling results (January " March 2007) at the Washington Traffic mpia Cleaners) Olympia, Thurston County, Washington: EPA
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	3970403				
EVALUATION					
Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality I	Determination [†]	Unacceptable		4	Metric Mean Score: 2.3.

Type of Data Source C		ybarger, J 1978. Health hazard al Exposure; Monitoring Data;	l evaluation repo	rt no. HF	IE 77-1	11-501, Allied Chemical Corporation, Danville, Illinois.
EXTRACTION Parameter			Data			
			TT			
Life Cycle Stage: Physical Form:			Use			
Route of Exposure:			vapor inhalation			
Number of Sites:			1.0			
Worker Activity:			Reactant			
Number of Workers			43			
Type of Sampling:	•		45 blood test, phys	ical ever	n madi	cal history
Sampling Location:						ical in danville, IL
Analytic Method:			biological tests			
Analytic Method.			biological tests	on empi	oyees	
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliabili	· · · ·					
	Aetric 1:	Methodology	High	$\times 1$	1	NIOSH health hazard evaluation
N	feurie 1.	Wethodology	Ingn	~ 1	1	NOSH health hazard evaluation
Domain 2: Represe	ntative					
-	Aetric 2:	Geographic Scope	High	$\times 1$	1	US
	Aetric 3:	Applicability	High	$\times 1$ $\times 2$	2	reactant
	Aetric 4:	Temporal Representativeness	Unacceptable	$\times 2 \times 2$	8	Data is Pre-Montreal Protocol (1978)
	Aetric 5:	Sample Size	Medium	$\times 1$	2	some statistics
1	ficule 3.	Sample Size	Weddulli	~ 1	2	some statistics
Domain 3: Accessil	bility/Clar					
N	Aetric 6:	Metadata Completeness	High	$\times 1$	1	complete data
Domain 4: Variabil	ity and Un	certainty				
	Aetric 7:	Metadata Completeness	Low	$\times 1$	3	no discussion of variability or uncertainty
				<i>,</i> , , ,		
Overall Quality Det	ermination	n†	Unacceptable		4	Metric Mean Score: 2.0.
z Quanty Dot					•	
			Continued on	next pag	e	

	 – continued from previous page 									
Source Citation: Type of Data Source Hero ID	Gilles, D.,Lybarger, J.: 1978. Health hazar Occupational Exposure; Monitoring Data; 3970548	1	ort no. HHE 77-111-501, .	Allied Chemical Corporation, Danville, Illinois.						
EVALUATION										
Domain	Metric	Rating	MWF* Score	Comments						

* MWF = Metric Weighting Factor

ero ID 3970550									
XTRACTION Parameter		Data							
Life Cycle Stage:		Manufact	ure						
Life Cycle Description (Subca	tegory of Use):			chlorina	ted compounds used in solvents for cleaning and de-				
F		greasing			······································				
Physical Form:		vapor							
Route of Exposure:		inhalation	l						
Exposure Concentration (Unit):	Not detect	ted - 0.18	mg/m3					
Number of Samples:		13							
Number of Sites:		1.0							
Type of Measurement or Meth	od:	TWA							
Worker Activity:			erated in p	producti	ion process				
Number of Workers:			30						
Type of Sampling:			personal						
Sampling Location:		U.S. magnesiusm Rowley, UT air quality monitor							
Analytic Method:		air quality	monitor						
VALUATION									
Domain	Metric	Rating	MWF*	Score	Comments				
Domain 1: Reliability									
Metric 1:	Methodology	High	$\times 1$	1	NIOSH health hazard evaluation				
Domain 2: Representative									
Metric 2:	Geographic Scope	High	$\times 1$	1	US				
Metric 3:	Applicability	High	$\times 2$	2	manufacture				
Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data from greater than 10 years ago (2005)				
Metric 5:	Sample Size	High	× 1	1	discussion of statistics				
Domain 3: Accessibility/Clari	tv								
-	Metadata Completeness	High	$\times 1$	1	complete data				
				1					

			- continued	from pre	vious pa	ige
Source Citation: Type of Data Source Hero ID	,	,Bernard, B. P.,Esswein, E. J nal Exposure; Monitoring Data		hazard ev	valuation	n report no.HETA 2004-0169-2982, U.S. Mangesium, Rowley, Utah.
EVALUATION Domain		Metric	Rating	MWF*	Score	Comments
	Metric 7:	Metadata Completeness	High	× 1	1	clearly documented data with thorough assessment
Overall Quality	Determinatio	\mathbf{n}^{\dagger}	High		1.2	

continued from previous page

* 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.

	. W.,Driscoll, R., 1992. Health h nal Exposure; Monitoring Data;	azard eva	luation re	port no.	HETA 90-223-2211, Thomson consumer electronics, Marion, Indian					
XTRACTION Parameter		Data								
Parameter		Data								
Life Cycle Stage:		Manufa	cture							
Life Cycle Description (Subo	category of Use):	Manufa	cturing o	of chlori	nated compounds used in solvents for cleaning and de-					
		greasin	g							
Physical Form:		vapor								
Route of Exposure:		inhalati								
Exposure Concentration (Un	it):		amounts"							
Number of Sites:		1.0								
Worker Activity:			enerated i nly lists '		ction process, specifically degreasers using trichloroethy- mounts"					
Number of Workers:		721	5							
Type of Sampling:		persona	al and are	a						
Sampling Location:				Thomson Consumer Electronics Marion, IN						
Analytic Method:		NIOSH 1003, 1300, 1400, 1450, 1500, and 1501 charcoal tubes, personal sampling								
		pumps,	short-ter	m detec	tor tubes, miran gas analyzer, phtotionization air analyzer					
VALUATION										
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	$\times 1$	1	US					
Metric 3:	Applicability	Low	$\times 2$	6	degreasing, testing results only list TCE as CCl4 was found in "small amounts"					
Metric 4:	Temporal Representativeness	Low	$\times 2$	6	Data from greater than 20 years ago (1992)					
Metric 5:	Sample Size	$Low \times 1$ 3 disitribution not characterized by statistics								
	•,									
Domain 3: Accessibility/Cla	-	TT' 1		1						
Metric 6:	Metadata Completeness	High	× 1	1	complete data					
Domain 4: Variability and U	ncertainty									
		Conti	nued on r	next page	٩					

	-	Continue	u nom p	Tevious	page
			luation re	port no.	HETA 90-223-2211, Thomson consumer electronics, Marion, Indiana.
	Metric	Rating	MWF*	Score	Comments
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Determinatio	n [†]	Low		2.3	
	Occupation 3970551 Metric 7:	Lenhart, S. W.,Driscoll, R 1992. Health H Occupational Exposure; Monitoring Data; 3970551 Metric	Lenhart, S. W.,Driscoll, R 1992. Health hazard eval Occupational Exposure; Monitoring Data; 3970551 Metric Rating Metric 7: Metadata Completeness Low	Lenhart, S. W.,Driscoll, R 1992. Health hazard evaluation re Occupational Exposure; Monitoring Data; 3970551 Metric Rating MWF* Metric 7: Metadata Completeness Low × 1	Occupational Exposure; Monitoring Data; 3970551 Metric Rating Metric 7: Metadata Completeness Low ×1

continued from previous page

* 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.

		.,Rinsky, R.,Stein, G.,Anderson, Beach, Florida.	K 1984. Hea	lth hazaro	d evalua	tion report no. HETA 82-075-1545, Pratt & Whitney Aircraft
Type of Data Source		nal Exposure; Monitoring Data;				
EXTRACTION Parameter			Data			
Life Cycle Stage:			Use			
Physical Form:			vapor			
Route of Exposure	e:		inhalation			
Number of Sample	es:		100+			
Number of Sites:			1.0			
Worker Activity:			degreasing - no	on detecta	able amo	ounts of CCl4
Type of Sampling:			personal and an			
Sampling Location	n:		Pratt & Whitne			
Analytic Method:			charcoal tubes,	photoior	nization	detector, water sampling
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliab	ility					
	Metric 1:	Methodology	High	× 1	1	NIOSH health hazard evaluation
Domain 2: Repres	entative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Low	$\times 2$	6	degreasing
	Metric 4:	Temporal Representativeness	Unacceptable	$\times 2$	8	Data is Pre-Montreal Protocol (1981 and 1982)
	Metric 5:	Sample Size	High	× 1	1	discussion of statistics
Domain 3: Access	sibility/Clar	-				
	Metric 6:	Metadata Completeness	High	$\times 1$	1	complete data
Domain 4: Variab	ility and Ur	ncertainty				
	Metric 7:	Metadata Completeness	Medium	× 1	2	limited discussion variability or uncertainty
Overall Quality D	eterminatio	n [†]	Unacceptable		4	Metric Mean Score: 2.2.

– continued from previous page									
Source Citation:	Gorman, R.,Rinsky, R.,Stein, G.,Anderson, West Palm Beach, Florida.	К 1984. Н	lealth hazard evaluation rep	port no. HETA 82-075-1545, Pratt & Whitney Aircraft,					
Type of Data Source	Occupational Exposure; Monitoring Data;								
Hero ID	3970552								
EVALUATION									
Domain	Metric	Rating	MWF* Score	Comments					

* MWF = Metric Weighting Factor

	Barsan, M. Illinois.	. E 1991. Health hazard eval	uation report no.	. HETA	90-344-	-2159, A.W. Cash Valve Manufacturing Corporation, Decatur
Type of Data Source		nal Exposure; Monitoring Data;				
EXTRACTION						
Parameter			Data			
Life Cycle Stage:			Use			
Physical Form:			vapor			
Route of Exposure			inhalation			
Number of Sample	es:		7			
Number of Sites:			1.0			
Worker Activity:			degreasing - di	d not test	for CCl	4
Type of Sampling:			personal and ar	ea		
Sampling Location	n:		A.W. Cash Val	ve Manut	facturing	g Corp. Decatur, IL
Analytic Method:			charcoal tubes			
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliab	ility					
	Metric 1:	Methodology	High	$\times 1$	1	NIOSH health hazard evaluation
Domain 2: Repres	entative					
-	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	not about CCl4, but about TCE
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	Data from greater than 20 years ago (1990)
	Metric 5:	Sample Size	Low	$\times 1$	3	dsitribution not characterized by statistics
Domain 3: Access	sibility/Clar	ity				
	Metric 6:	Metadata Completeness	High	× 1	1	complete data
Domain 4: Variab	ility and Ur	ncertainty				
	Metric 7:	Metadata Completeness	Medium	× 1	2	limited discussion variability or uncertainty
Overall Quality D	eterminatio	n [†]	Unacceptable		4	Metric Mean Score: 2.4.
			Continued on			

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

* MWF = Metric Weighting Factor

			ard evaluation rep	port no. 1	HETA 97	7-0185-2675, McGregor Loudspeaker Manufacturing Company
		Chien, Wisconsin. nal Exposure; Monitoring Data;				
	3970559	lai Exposure, Monitoring Data;				
EXTRACTION						
Parameter			Data			
Life Cycle Stage:			Use			
Physical Form:			vapor			
Route of Exposure	e:		inhalation			
Number of Sample	es:		5			
Number of Sites:			1.0			
Worker Activity:			production line	for loud	speakers	3
Type of Sampling:			area			
Sampling Location	n:		McGregor Lou	dspeaker	. Manufa	acturing Company Prairie du Chien, WI
Analytic Method:			1300, 1500, 10	05, 1609	, 1501, a	and 2500thermal desorption tubes
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliab	ility					
	Metric 1:	Methodology	High	× 1	1	NIOSH health hazard evaluation
Domain 2: Repres	entative					
•	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	did not test for CCl4
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	Data from greater than 20 years ago (1997)
	Metric 5:	Sample Size	Low	× 1	3	disitribution not characterized by statistics
Domain 3: Access	sibility/Clar	ity				
	Metric 6:	Metadata Completeness	High	$\times 1$	1	complete data
Domain 4: Variab	ility and Ur	ncertainty				
	Metric 7:	Metadata Completeness	Medium	× 1	2	limited discussion variability or uncertainty
Overall Quality D	eterminatio	\mathbf{n}^{\dagger}	Unacceptable		4	Metric Mean Score: 2.4.
			-			

	– continued from previous page									
Source Citation:	Kiefer, M., Driscoll, R. J 1998. Health ha Prarie du Chien, Wisconsin.	zard evaluation r	eport no. HETA 97-0185-2	2675, McGregor Loudspeaker Manufacturing Company,						
Type of Data Source Hero ID	Occupational Exposure; Monitoring Data; 3970559									
EVALUATION										
Domain	Metric	Rating	MWF* Score	Comments						

* MWF = Metric Weighting Factor

		, R.,Burt, S.,Tepper, A.,Hanley, ers, International Union, Rumfor		lth hazar	d evalua	ation report no. HETA 88-0140-2517, Boise Cascade, Unite
		al Exposure; Monitoring Data;	u, Maine.			
	70560	1 ·····, · · · · · · · · · · · · · · · ·				
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 pape	r		
Type of Sampling:			area			
Sampling Location:			United Paperwe	orkers Int	ternat'l I	Union Rumford, ME
Analytic Method:			silica gel adsor	bent spike	ed with 2	2,3,7,8-TCDD and 2,3,7,8-TCDF withradioactive
			carbon (13C) o	r chlorine	e(37Cl)	markers
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Paliabilit	¥7					
Domain 1: Reliabilit	y etric 1:	Methodology	High	× 1	1	NIOSH health hazard evaluation
IVI		Methodology	nigii	XI	1	NIOSH health hazard evaluation
Domain 2: Represent		~				
	etric 2:	Geographic Scope	High	× 1	1	US
	etric 3:	Applicability	Unacceptable	$\times 2$	8	air samples did not detect CCl4
	etric 4:	Temporal Representativeness	Low	$\times 2$	6	Data from greater than 20 years ago (1991)
M	etric 5:	Sample Size	High	× 1	1	representative sample
Domain 3: Accessibi	•	•				
M	etric 6:	Metadata Completeness	High	$\times 1$	1	complete data
Domain 4: Variabilit	y and Ur	certainty				
	etric 7:	Metadata Completeness	Medium	$\times 1$	2	limited discussion variability or uncertainty
		*				

	-	continued fro	om previous	page			
Source Citation:	Mouradian, R.,Burt, S.,Tepper, A.,Hanley Paperworkers, International Union, Rumfo		lealth hazard	1 evalua	ation report no.	HETA 88-0140-2517, Boise	Cascade, United
Type of Data Source Hero ID	Occupational Exposure; Monitoring Data; 3970560						
EVALUATION							
Domain	Metric	Rating	MWF*	Score		Comments	
Overall Quality 1	Determination [†]	Unacceptabl	e	4	Metric Mean Score	:: 2.2.	

* MWF = Metric Weighting Factor

		И. S.,Albrecht, W. N.,Blade, L. M ille, Kentucky.	I 1989. Health	hazard ev	valuation	report no. HETA 86-380-1957, York Internationl Corporation	
Type of Data Source		nal Exposure; Monitoring Data;					
EXTRACTION							
Parameter			Data				
Life Cycle Stage:			Use				
Physical Form:			vapor				
Route of Exposure	:		inhalation				
Number of Sites:			1.0				
Worker Activity:			degreasing assr	nebled co	opper tuł	bing and aluminium fins into heat exchanger units	
			- did not test fo				
Number of Worker	rs:		120				
Type of Sampling:			personal				
Sampling Location	1:		York International Corp Madisionville, KY				
EVALUATION							
Domain		Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliabi	lity						
	Metric 1:	Methodology	High	$\times 1$	1	NIOSH health hazard evaluation	
Demain 2. Dema							
Domain 2: Repres	Metric 2:	Casaranhia Saana	High	× 1	1		
	Metric 2: Metric 3:	Geographic Scope Applicability	High Unacceptable	$\times 1$ $\times 2$	1 8	US	
	Metric 3. Metric 4:	Temporal Representativeness	-	$\times 2 \times 2$		did not test for CCl4	
	Metric 4: Metric 5:	Sample Size	Unacceptable Low	$\times 2$ $\times 1$	8 3	Data is Pre-Montreal Protocol (1986) disitribution not characterized by statistics	
		*	2011	~ 1	5	distribution not characterized by statistics	
Domain 3: Access	-	-					
	Metric 6:	Metadata Completeness	High	× 1	1	complete data	
Domain 4: Variabi	ility and Ur	ncertainty					
	Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty	
Overall Quality De	eterminatio	n [†]	Unacceptable		4	Metric Mean Score: 2.8.	
- •			-				

	– continued from previous page									
Source Citation:	Crandall, M. S., Albrecht, W. N., Blade, L. Madisionville, Kentucky.	M 1989. Healt	h hazard evaluation report n	no. HETA 86-380-1957, York Internationl Corporation,						
Type of Data Source Hero ID	Occupational Exposure; Monitoring Data; 3970561									
EVALUATION										
Domain	Metric	Rating	MWF [*] Score	Comments						

* MWF = Metric Weighting Factor

Type of Data Source O		iscoll, R 1989. Health hazard and Exposure; Monitoring Data;	evaluation report	no. HET	A 88-08	82-1971, Jostens Incorporated, Princeton, Illinois.
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 polishi	ng and pla	ating	
Number of Workers:			60	ng una ph	ating	
Type of Sampling:			personal and ar	rea		
Sampling Location:			Jostens Inc. Pr		L	
Analytic Method:			1003, 1300, an	,		tubes
j						
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliabilit	W					
	etric 1:	Methodology	High	$\times 1$	1	NIOSH health hazard evaluation
IVI	euric 1.	Wethodology	Ingn	× 1	1	NOSH health hazard evaluation
Domain 2: Represen	tative					
	etric 2:	Geographic Scope	High	$\times 1$	1	US
	etric 3:	Applicability	Unacceptable	$\times 2$	8	did not test for CCl4
	etric 4:	Temporal Representativeness	Unacceptable	$\times 2$	8	Data is Pre-Montreal Protocol (1988)
	etric 5:	Sample Size	Low	$\times 1$	3	disitribution not characterized by statistics
Damain 2. Accordin	:1:4-/01	·				
Domain 3: Accessib	•	•	II: -l-	· 1	1	
M	etric 6:	Metadata Completeness	High	× 1	1	complete data
Domain 4: Variabilit	ty and Un	certainty				
	etric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
		†	Unagazetel		Λ	M.: M. S. 30
Overall Quality Dete	rininatio	11	Unacceptable		4	Metric Mean Score: 2.8.
			Continued on	next page	e	

	– continued from previous page									
Source Citation: Type of Data Source Hero ID	Seitz, T.,Driscoll, R., 1989. Health hazard Occupational Exposure; Monitoring Data: 3970562	1	t no. HETA 88-082-1971	, Jostens Incorporated, Princeton, Illinois.						
EVALUATION Domain	Metric	Rating	MWF* Score	Comments						

* MWF = Metric Weighting Factor

	s, G. E.,Horan, J 1982. Health h nal Exposure; Monitoring Data;	azard evaluation	report no	. HETA	80-147-1076, Calhio Chemical Copmany, Perry, Ohio.
EXTRACTION Parameter		Data			
Life Cycle Stage:		manufacture			
Physical Form:		vapor			
Route of Exposure:		inhalation			
Number of Samples:		24			
Worker Activity:		fungicides byp	roduct		
Type of Sampling:		personal and ar	ea		
Sampling Location:		Calhio Chemic	al Perry,	Ohio	
Analytic Method:		Length-of-stair	n 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	$\times 1$	1	US
Metric 3:	Applicability	High	$\times 2$	2	Agricultural products manufacturing
Metric 4:	Temporal Representativeness	Unacceptable	$\times 2$	8	Data is Pre-Montreal Protocol (1982)
Metric 5:	Sample Size	Low	× 1	3	disitribution not characterized by statistics
Domain 3: Accessibility/Cla	rity				
Metric 6:	Metadata Completeness	Medium	$\times 1$	2	data sources generally described, some details missing
Domain 4: Variability and U	ncertainty				
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination	on [†]	Unacceptable		4	Metric Mean Score: 2.2.
		Continued on	next pag	e	

– continued from previous page									
Source Citation: Type of Data Source Hero ID	Burroughs, G. E.,Horan, J., 1982. Health h Occupational Exposure; Monitoring Data; 3970563	azard evaluatior	n report no.	HETA 80-1	47-1076, Calhio Chemical Copmany, Perry, Ohio.				
EVALUATION									
Domain	Metric	Rating	MWF*	Score	Comments				

* MWF = Metric Weighting Factor

	l, R. E.,Rostand, R. A 1976. He nal Exposure; Monitoring Data;	alth hazard evalu	ation rep	ort no.H	IHE 74-93-296, Calhio Chemicals, Perry, Ohio.
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 ar			
Sampling Location:		Calhio Chemic	al Perry,	Ohio	
Analytic Method:		charcoal tubes			
EVALUATION					
Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1:	Methodology	High	$\times 1$	1	NIOSH health hazard evaluation
Domain 2: Representative					
Metric 2:	Geographic Scope	High	$\times 1$	1	US
Metric 3:	Applicability	High	$\times 2$	2	Agricultural products manufacturing - but amount of CCl4 well below detec- tion limit
Metric 4:	Temporal Representativeness	Unacceptable	$\times 2$	8	Data is Pre-Montreal Protocol (1982)
Metric 5:	Sample Size	Low	× 1	3	disitribution not characterized by statistics
Domain 3: Accessibility/Cla	rity				
Metric 6:	Metadata Completeness	Medium	× 1	2	data sources generally described, some details missing
Domain 4: Variability and U	ncertainty				
Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination	on [†]	Unacceptable		4	Metric Mean Score: 2.2.
		Continued on	next pag	e	

– continued from previous page						
Source Citation: Type of Data Source Hero ID	Rosensteel, R. E.,Rostand, R. A., 1976. Occupational Exposure; Monitoring Dat 3970564		luation report no.HHE 74-93-2	96, Calhio Chemicals, Perry, Ohio.		
EVALUATION						
Domain	Metric	Rating	MWF* Score	Comments		

* MWF = Metric Weighting Factor

	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 resideus in a medical center research facility.								
	Occupational Exposure; Monitoring Data; 3970565								
XTRACTION Parameter			Data						
Life Cycle Stage:			Use						
Life Cycle Description (Subcategory of Use):				uring of c	hlorinat	ed compounds used in adhesives and sealants			
Physical Form:	(Subca	negory of esc).	vapor	uning of c	morma	ed compounds used in adhesives and searants			
Route of Exposure:			inhalation						
Exposure Concentration	ı (Uni [,]	t):	"trace am						
Number of Sites:	. (0		1.0	o un to					
Worker Activity:			office buil	ding/labc	oratory				
Type of Sampling:			area	U	5				
Sampling Location:			medical research facility						
Analytic Method:			thermal d	esorption	tubes c	ontaining three beds of sorbent material: (1) 90 mil-			
			ligrams of Carbopack" Y, (2) 115 milligrams of Carbopack"B, and (3) 150 mil-						
			ligrams C	arboxen"					
VALUATION									
Domain		Metric	Rating	MWF*	Score	Comments			
D . 1 D . 1 . 1 . 1 . 1 . 1 . 1 . 1									
Domain 1: Reliability	:a 1.	Mathadalagu	High	× 1	1				
Domain 1: Reliability Metr	ic 1:	Methodology	High	× 1	1	NIOSH health hazard evaluation			
Metr		Methodology	High	× 1	1	NIOSH health hazard evaluation			
•	ive			× 1	1	NIOSH health hazard evaluation			
Metr Domain 2: Representat	ive ic 2:	Methodology Geographic Scope Applicability	High High Low		-				
Metr Domain 2: Representat Metr	ive ic 2: ic 3:	Geographic Scope	High	× 1	1	US trace amounts found in office building, evaluation claimed prigin to be building			
Metr Domain 2: Representat Metr Metr	ive ic 2: ic 3: ic 4:	Geographic Scope Applicability	High Low	$\times 1$ $\times 2$	1 6	US trace amounts found in office building, evaluation claimed prigin to be building materials or household cleaners			
Metr Domain 2: Representat Metr Metr Metr Metr	ive ic 2: ic 3: ic 4: ic 5:	Geographic Scope Applicability Temporal Representativeness Sample Size	High Low High		1 6 2	US trace amounts found in office building, evaluation claimed prigin to be building materials or household cleaners Data from less than 10 years ago (2013)			
Metr Domain 2: Representat Metr Metr Metr Domain 3: Accessibilit	ive ic 2: ic 3: ic 4: ic 5: y/Clar	Geographic Scope Applicability Temporal Representativeness Sample Size	High Low High Low	$ \begin{array}{c} \times 1 \\ \times 2 \\ \times 2 \\ \times 1 \end{array} $	1 6 2 3	US trace amounts found in office building, evaluation claimed prigin to be building materials or household cleaners Data from less than 10 years ago (2013) disitribution not characterized by statistics			
Metr Domain 2: Representat Metr Metr Metr Metr	ive ic 2: ic 3: ic 4: ic 5: y/Clar	Geographic Scope Applicability Temporal Representativeness Sample Size	High Low High		1 6 2	US trace amounts found in office building, evaluation claimed prigin to be building materials or household cleaners Data from less than 10 years ago (2013)			
Metr Domain 2: Representat Metr Metr Metr Domain 3: Accessibilit	ive ic 2: ic 3: ic 4: ic 5: y/Clar ic 6:	Geographic Scope Applicability Temporal Representativeness Sample Size ity Metadata Completeness	High Low High Low	$ \begin{array}{c} \times 1 \\ \times 2 \\ \times 2 \\ \times 1 \end{array} $	1 6 2 3	US trace amounts found in office building, evaluation claimed prigin to be building materials or household cleaners Data from less than 10 years ago (2013) disitribution not characterized by statistics			

	– continued from previous page						
Source Citation:		r, K.,Brueck, S. E.,Nourian, F., Id surface resideus in a medica				lealth hazard evaluation report no. HHE 2013-0117-3247, Evaluation	
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	Determinatio	n [†]	Medium		2.0		

Source Citation: Type of Data Source Hero ID	,	Echa,. 2017. Uses at industrial sites: Carbon tetrachloride. Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 1970709						
EXTRACTION Parameter		Data						
Life Cycle Stage:Manufacture and Process (intermediate)Physical Form:vapor. LiquidRoute of Exposure:inhalation, dermalWorker Activity:transfer of chemical, filling small containers						,		
EVALUATION Domain		Metric	Rating	MWF*	Score	Comments		
Domuni		induite	ituing		Beole	Commons		
Domain 1: Reliab	oility							
	Metric 1:	Methodology	High	$\times 1$	1	European Chemical Agency		
Domain 2: Repre	sentative							
Domain 2. Repre	Metric 2:	Geographic Scope	Medium	× 1	2	OECD Countries (Europe)		
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	list of industrial uses, no quantitative data		
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	recent, but no date is listed		
	Metric 5:	Sample Size	High	$\times 1$	1	National Data		
Domain 3: Acces	sibility/Clar	itv						
2 011111 01 1 1000	Metric 6:	Metadata Completeness	Unacceptable	$\times 1$	4	does not document data sources, methods or assumptions		
Domain 4: Variat	oility and Ur Metric 7:	ncertainty Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty		
Overall Quality Determination [†]			Unacceptable		4	Metric Mean Score: 2.3.		

* MWF = Metric Weighting Factor

	999. IARC Monographs on the eval tional Exposure; Reports for Data o 3				
EXTRACTION					
Parameter		Data			
Life Cycle Stage:		Use			
Life Cycle Description (Su	bcategory of Use):	Textile Cleanin	ıg		
Physical Form:		vapor. Liquid	0		
Route of Exposure:		inhalation, deri	mal		
Type of Measurement or M	fethod:	TWA			
Number of Workers:		5365			
EVALUATION					
Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric	I: Methodology	High	$\times 1$	1	IARC studies
	1. Wewlodology	mgn	~ 1	1	
Domain 2: Representative					
Metric	2: Geographic Scope	High	$\times 1$	1	US
Metric	3: Applicability	Unacceptable	$\times 2$	8	Textiles, Dry Cleaning
Metric 4	4: Temporal Representativeness	Unacceptable	$\times 2$	8	Data is Pre-Montreal Protocol (1948 to 1978)
Metric	5: Sample Size	Low	× 1	3	disitribution not characterized by statistics
Domain 3: Accessibility/C	larity				
Metric	-	Low	× 1	3	provides report of results but does not describes methods or assumptions
Domain 4: Variability and	Uncertainty				
Metric		Low	× 1	3	does not specifically address variability or uncertainty but references original study article
Overall Quality Determina	tion [†]	Unacceptable		4	Metric Mean Score: 3.0.
		Continued on	next pag	e	

	– continued from previous page							
Source Citation:Iarc, 1999. IARC Monographs on the evaluation of carcinogenic risks to humans: Carbon tetrachloride.Type of Data SourceOccupational Exposure; Reports for Data or Information Other than Exposure or Release Data;Hero ID3970843								
EVALUATION								
Domain	Metric	Rating	MWF* Score	Comments				

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	Iarc, 1999. IARC Monographs on the evaluation of carcinogenic risks to humans: Carbon tetrachloride. Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 3970843					
EXTRACTION						
Parameter			Data			
Life Cycle Stage			Use			
Life Cycle Descr		ategory of Use):	aircraft mainter	nance		
Physical Form:	iption (Bube		vapor. Liquid	nunee		
Route of Exposu	re:		inhalation, deri	mal		
Number of Work			6737			
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relia	bility.					
Domain 1. Kena	Metric 1:	Methodology	High	$\times 1$	1	IARC studies
D D						
Domain 2: Repre			TT' 1	1	1	
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	$\times 2$	2	aircraft maintenance
	Metric 4:	Temporal Representativeness	Unacceptable	$\times 2$	8	Data from greater than 20 years ago (1952-1956)
	Metric 5:	Sample Size	Low	× 1	3	disitribution not characterized by statistics
Domain 3: Acce	ssibility/Clar	rity				
	Metric 6:	Metadata Completeness	Low	$\times 1$	3	provides report of results but does not describes methods or assumptions
Domain 4: Varia	bility and U.	certainty				
Domani 4. Varia	Metric 7:	Metadata Completeness	Low	$\times 1$	3	does not specifically address variability or uncertainty but references origina
	wieute 7:	wetauata Completeness	LUW	× 1	3	does not specifically address variability or uncertainty but references origina study article
Overall Quality I	Determinatio	n [†]	Unacceptable		4	Metric Mean Score: 2.3.

* MWF = Metric Weighting Factor

Type of Data Source C	Iarc, 1999. IARC Monographs on the evaluation of carcinogenic risks to humans: Carbon tetrachloride. Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 3970843						
EXTRACTION Parameter			Data				
Life Cycle Stage: Life Cycle Descript Physical Form: Route of Exposure:	Use Other basic organic and inorganic chemical manufacturing vapor. Liquid inhalation, dermal						
EVALUATION							
Domain		Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliabil	ity Metric 1:	Methodology	High	× 1	1	IARC studies	
Domain 2: Represe							
	Metric 2:	Geographic Scope	High	× 1	1	US	
	Metric 3:	Applicability	High	$\times 2$ $\times 2$	2	additive in rubber manufacturing	
	Metric 4: Metric 5:	Temporal Representativeness Sample Size	Unacceptable Low	× 2 × 1	8 3	Data is Pre-Montreal Protocol (1964 to 1973) disitribution not characterized by statistics	
Domain 3: Accessi	bility/Clar Metric 6:	ity Metadata Completeness	Low	× 1	3	provides report of results but does not describes methods or assumptions	
Domain 4: Variabil M	lity and Un Metric 7:	ncertainty Metadata Completeness	Low	× 1	3	does not specifically address variability or uncertainty but references original study article	
Overall Quality Det	termination	n [†]	Unacceptable		4	Metric Mean Score: 2.3.	

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	Niosh, 1975. Criteria for a recommended standard occupational exposure to carbon tetrachloride. Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 3974896						
EXTRACTION Parameter			Data				
Life Cycle Stage: Life Cycle Descri Physical Form: Route of Exposur	iption (Subc	ategory of Use):	Use Textile Cleanin vapor. Liquid inhalation, derr		nery cle	aning	
EVALUATION							
Domain		Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliab	oility Metric 1:	Methodology	High	× 1	1	NIOSH	
Domain 2: Repre	sentative Metric 2:	Geographic Scope	High	× 1	1	US	
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	outdated applications	
	Metric 4:	Temporal Representativeness	Unacceptable	$\times 2$	8	Data is Pre-Montreal Protocol (1975)	
	Metric 5:	Sample Size	Low	× 1	3	disitribution not characterized by statistics	
Domain 3: Acces	sibility/Clar Metric 6:	ity Metadata Completeness	Low	× 1	3	provides report of results but does not describes methods or assumptions	
Domain 4: Variat	bility and Ur Metric 7:	ncertainty Metadata Completeness	Low	× 1	3	does not specifically address variability or uncertainty but references original study article	
Overall Quality D	Determinatio	n [†]	Unacceptable		4	Metric Mean Score: 3.0.	

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source		2. Appendix A: Chemicals noted al Exposure; Reports for Data o				
Hero ID	3978344	ai Exposure, reports for Data o			Aposur	e of Release Data,
EXTRACTION						
Parameter			Data			
Life Cycle Stage:			Use			
Physical Form:			vapor. Liquid			
Route of Exposure	e:		inhalation, derr	nal		
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliab	oility					
	Metric 1:	Methodology	High	$\times 1$	1	OSHA
Domain 2: Repres	sentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	List of TWAs and STELs
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Data from less than 10 years ago (2012)
	Metric 5:	Sample Size	Low	× 1	3	disitribution not characterized by statistics
Domain 3: Access	sibility/Clar	ity				
	Metric 6:	Metadata Completeness	Low	$\times 1$	3	provides report of results but does not describes methods or assumptions
Domain 4: Variab	vility and Ur	certainty				
Domain 4. Vallat	Metric 7:	Metadata Completeness	Low	$\times 1$	3	does not specifically address variability or uncertainty but references origina
	wiente /.	Metadata Completeness	LUW	^ 1	5	study article

* MWF = Metric Weighting Factor

Type of Data Source	Carex, Canada. 2017. Profiles & estimates: Carbon tetrachloride. Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 3978372						
EXTRACTION Parameter			Data				
Life Cycle Stage: Life Cycle Descript Physical Form: Route of Exposure: Exposure Concentr Worker Activity:	:		Use Agricultural provapor. Liquid inhalation, derr 5-7100 ppm dry cleaning		anufactı	uring, textile cleaning agent, Machinery cleaning	
EVALUATION Domain		Metric	Rating	MWF*	Score	Comments	
			- ming		50010	Commond	
Domain 1: Reliabil	lity Metric 1:	Methodology	Medium	× 1	2	CAREX	
Domain 2: Represe	entative						
	Metric 2:	Geographic Scope	Medium	$\times 1$	2	OECD Country (Canada)	
N	Metric 3:	Applicability	Unacceptable	$\times 2$	8	Physical Data and brief description of exposure	
Ν	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Data from less than 10 years ago (2016)	
Ν	Metric 5:	Sample Size	Low	× 1	3	disitribution not characterized by statistics	
Domain 3: Accessi	bility/Clar	ity					
	Metric 6:	Metadata Completeness	Low	$\times 1$	3	provides report of results but does not describes methods or assumptions	
Demain 4. Venishil	1:4						
Domain 4: Variabil	Metric 7:	Metadata Completeness	Low	× 1	3	does not specifically address variability or uncertainty but references origina study article	
Overall Quality De	termination	'n†	Unacceptable		4	Metric Mean Score: 2.6.	
			Continued on	next pag	e		

	– continued from previous page							
Source Citation: Type of Data Source Hero ID	Carex, Canada. 2017. Profiles & estimate Occupational Exposure; Reports for Data 3978372			ease Data;				
EVALUATION								
Domain	Metric	Rating	MWF* Score	Comments				

* MWF = Metric Weighting Factor

Type of Data Source Occu	Cameo, Chemicals. 2016. Chemical datasheet: carbon tetrachloride. Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 3981009							
EXTRACTION Parameter			Data					
Farameter			Data					
Life Cycle Stage:			Use					
Life Cycle Description	(Subca	tegory of Use):	MSDS					
Physical Form:			vapor. Liquid					
Route of Exposure:			inhalation, deri	nal				
EVALUATION								
Domain		Metric	Rating	MWF*	Score	Comments		
Domain 1: Reliability								
Metr	ic 1:	Methodology	High	$\times 1$	1	NOAA Cameo chemicals		
Domain 2: Representat	ive							
Metr		Geographic Scope	High	$\times 1$	1	US		
Metr	ic 3:	Applicability	Unacceptable	$\times 2$	8	physical data, hazards, and safety guidelines		
Metr	ic 4:	Temporal Representativeness	Medium	$\times 2$	4	Data from greater than 10 years ago (1999 to 2016)		
Metr	ic 5:	Sample Size	Low	× 1	3	disitribution not characterized by statistics		
Domain 3: Accessibilit	y/Clari	ty						
Metr		Metadata Completeness	Low	$\times 1$	3	provides report of results but does not describes methods or assumptions		
Domain 4: Variability a	nd Un	certainty						
Metr		Metadata Completeness	Low	× 1	3	does not specifically address variability or uncertainty but references original study article		
Overall Quality Determ	inatio	ı†	Unacceptable		4	Metric Mean Score: 2.6.		

* MWF = Metric Weighting Factor

	 Queens College, University of New York United Steelworks. 2012. Waste isolation pilot plan medical screening program: Phase I: Ne assessment. Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 3974980 								
EXTRACTION									
Parameter			Data						
Life Cycle Stage:			Use						
Life Cycle Descript	tion (Subca	ategory of Use):	Machinery clea	aning					
Physical Form:			vapor. Liquid						
Route of Exposure:			inhalation, der	mal					
Exposure Concentry	ation (Uni	t):	0.055-0.54 ppr	n					
Type of Measureme	ent or Meth	hod:	TWA						
Worker Activity:			solidified organ	nic sludg	e from	Idaho and Rocky Flats, where it was used as a			
			cleaning agent						
Type of Sampling:			area	area					
EVALUATION									
Domain		Metric	Rating	MWF*	Score	Comments			
Domain 1: Reliabil	ity								
	Metric 1:	Methodology	High	$\times 1$	1	US DOE			
Domain 2: Represe	entative								
-	Metric 2:	Geographic Scope	High	$\times 1$	1	US			
Ν	Metric 3:	Applicability	Unacceptable	$\times 2$	8	cleaning agent out of scope			
Ν	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data from greater than 10 years ago (1999-2009)			
Ν	Metric 5:	Sample Size	Medium	$\times 1$	2	number of samples, mean, range and standard deviation provided, discrete sampling results not given			
Domain 3: Accessi	bility/Clar	itv							
	Metric 6:	Metadata Completeness	Low	× 1	3	data includes sample methodology, but does not clearly explain sample loca- tion, worker activities or sample duration			
Domain 4: Variabil	litv and Ur	ncertainty							
	Metric 7:	Metadata Completeness	Medium	$\times 1$	2	data includes standard deviation			
			Continued on	next nag	e				

		– continued from	previous	page				
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 Hero ID	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 974980							
EVALUATION								
Domain	Metric	Rating	MWF*	Score		Comments		
Overall Quality I	Determination [†]	Unacceptable		4	Metric Mean Score: 2.3.			

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	Spin, 2017. SPIN substances in preparations in nordic countries tetrachloromethane. Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 3981129						
EXTRACTION Parameter			Data				
Life Cycle Stage:	:		Use				
EVALUATION							
Domain		Metric	Rating	MWF*	Score	Comments	
Domain 1: Relial	bility						
	Metric 1:	Methodology	High	× 1	1	Trusted Source (Danish EPA)	
Domain 2: Repre	esentative						
-	Metric 2:	Geographic Scope	Medium	$\times 1$	2	OECD countries ("Nordic Countries")	
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	Database search listing National air & water exposure and use with no units or sources listed	
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Data from less than 10 years ago (2000-2014)	
	Metric 5:	Sample Size	N/A		N/A	No Comment.	
Domain 3: Acces	ssibility/Clar	ity					
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.	
Domain 4: Varia	bility and Uı	ncertainty					
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.	
Overall Quality I	Determinatio	\mathbf{n}^{\dagger}	Unacceptable		4	Metric Mean Score: 2.2.	

* MWF = Metric Weighting Factor

Source Citation:	assessment	t methods, and examples of healt	h protective occu	pational	air conc				
Type of Data Source Hero ID	Occupation 3982225	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 3982225							
EXTRACTION									
Parameter			Data						
Life Cycle Stage:			Use						
Life Cycle Descr	iption (Subc	ategory of Use):	multiple						
Physical Form:			vapor. Liquid						
Route of Exposur	re:		inhalation, deri	nal					
EVALUATION									
Domain		Metric	Rating	MWF*	Score	Comments			
Domain 1: Relia	bilitv								
	Metric 1:	Methodology	High	× 1	1	ОЕННА			
Domain 2: Repre	esentative								
	Metric 2:	Geographic Scope	High	$\times 1$	1	US			
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	Uses OSHA PEL to calculate a cancer risk. No exposure data listed			
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data from greater than 10 years ago (2007)			
	Metric 5:	Sample Size	N/A		N/A	No Comment.			
Domain 3: Acces	ssibility/Clar	ity							
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.			
Domain 4: Varia	bility and U	ncertainty							
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.			
Overall Quality I	Determinatio	n [†]	Unacceptable		4	Metric Mean Score: 2.3.			

* MWF = Metric Weighting Factor

Type of Data Source (Nih, 2016. Report on carcinogens: Carbon tetrachloride. Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 3982329							
EXTRACTION Parameter			Data					
Life Cycle Stage:			Use					
Life Cycle Descript	tion (Subc	ategory of Use):	Process	ing aid				
Physical Form:			vapor. 1	Liquid				
Route of Exposure:				on, derm				
Worker Activity:						mills, in the air transportation industry, and in motor		
Number of Workers	s:		4,500 w and 52, (conduc	orkers po 000 durin cted from	otentially g its ind 1981to	nd telegraph equipment manufacturing y were exposed during production of carbon tetrachloride lustrial use. The National Occupational Exposure Survey o 1983) estimated that 77,315 workers, including 12,605 exposed to carbon tetrachloride		
EVALUATION								
Domain		Metric	Rating	MWF*	Score	Comments		
Domain 1: Reliabil	lity Metric 1:	Methodology	High	× 1	1	NTP from NIEHS		
Domain 2. Domago	ntotivo							
Domain 2: Represe	Metric 2:	Geographic Scope	High	$\times 1$	1	US		
	Metric 2:	Applicability	High	$\times 1$ $\times 2$	2	manufacture		
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Data from less than 10 years ago (2009)		
	Metric 5:	Sample Size	High	× 1	1	complete data		
Domain 3: Accessi	bility/Clar	ity						
	Metric 6:	Metadata Completeness	Low	$\times 1$	3	limited data, only includes production volume		
Domain 4: Vort 11	litre og 1 TT							
Domain 4: Variabil	Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty		
Г	vicule 7.	inetadata Completeness	LUW	^ 1	5	no discussion or variability of uncertainty		
Overall Quality De	terminatio	\mathbf{n}^{\dagger}	High		1.4			
			Conti	nued on n	ext page	e		

	<u> </u>	d from previous page		
			or Release Data;	
Metric	Rating	MWF* Score	Comments	
	Occupational Exposure; Reports fo 3982329	Nih, 2016. Report on carcinogens: Carbon tetrachle Occupational Exposure; Reports for Data or Informat 3982329	3982329	Nih,. 2016. Report on carcinogens: Carbon tetrachloride. Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 3982329

ype of Data SourceOccupationero ID3982329	ional Exposure; Reports for Data c				·
XTRACTION		Dete			
Parameter		Data			
Life Cycle Stage:		Use			
Life Cycle Description (Su	Life Cycle Description (Subcategory of Use):		ing		
Physical Form:		vapor, Liquid			
Route of Exposure:		inhalation			
Exposure Concentration (Unit):					e eposure of 206-338 ppm for operators
Number of Workers:					posure Survey (conducted from 1981 to 1983)
		to carbon tetrad		orkers, ir	ncluding 12,605 women, potentially were exposed
			cinoriae		
VALUATION					
Domain	Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability					
Metric 1	: Methodology	High	× 1	1	NTP from NIEHS
Weute	. Wethodology	Ingn	~ 1	1	NTI HOIII MILLIS
Domain 2: Representative					
Metric	: Geographic Scope	High	$\times 1$	1	US
Metric 3	U I	Unacceptable	$\times 2$	8	Textile processing
Metric 4	1 1	High	$\times 2$	2	Data from less than 10 years ago (2009)
Metric 5	: Sample Size	High	× 1	1	complete data
Domain 3: Accessibility/C	larity				
Metric 6	-	Low	× 1	3	limited data, only includes production volume
		• • •		-	·····
Domain 4: Variability and	Uncertainty				
Metric		Low	$\times 1$	3	no discussion of variability or uncertainty
Overall Quality Determina	tion [†]	Unacceptable		4	Metric Mean Score: 2.1.
		Continued on	nevt neg		
			i next pag	C	

		– continued from	n previous page		
Source Citation: Type of Data Source Hero ID	Nih, 2016. Report on carcinogens: Carbo Occupational Exposure; Reports for Data 3982329		ther than Exposure or Rele	ase Data;	
EVALUATION					
Domain	Metric	Rating	MWF* Score	Comments	

* MWF = Metric Weighting Factor

Source Citation:	CalEpa,. 2 (OEHHA 1		ELS and toxicity	summario	es using	the previous version of Hot Spots Risk Assessment guidelines
Type of Data Source Hero ID	Occupation 3982628	nal Exposure; Reports for Data o	r Information Otl	her than I	Exposur	e or Release Data;
EXTRACTION						
Parameter			Data			
Life Cycle Stage:			Use			
Physical Form:			vapor. Liquid			
Route of Exposur	re:		inhalation, deri	nal		
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relia	hility					
Domain 1. Kena	Metric 1:	Methodology	High	× 1	1	Trusted Source (OEHHA)
Domain 2: Repre	esentative					
Domain 21 Hope	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	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: Acces	ssibility/Clar	ity				
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Varia	bility and Ur	ncertainty				
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality I	Determinatio	n†	Unacceptable		4	Metric Mean Score: 2.5.

* MWF = Metric Weighting Factor

Type of Data Source	Atsdr, 2005. Toxicological profile for carbon tetrachloride. Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 3982336						
EXTRACTION			_				
Parameter			Data				
Life Cycle Stage:			Use				
Life Cycle Descrip	tion (Subca	ategory of Use):	Agricultural pr	oducts ma	anufactu	uring	
Physical Form:			vapor. Liquid				
Route of Exposure			inhalation, derr	nal			
Exposure Concentre	ration (Unit	t):	0.002-0.1ppm				
Worker Activity:			worker at grain	facility			
EVALUATION							
Domain		Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliabi	lity						
	Metric 1:	Methodology	High	× 1	1	US HHS	
		memorally	mgn	×1		001110	
Domain 2: Represe	entative						
-	Metric 2:	Geographic Scope	High	$\times 1$	1	US	
]	Metric 3:	Applicability	High	$\times 2$	2	Agricultural Manufacturing	
]	Metric 4:	Temporal Representativeness	Unacceptable	$\times 2$	8	Data is Pre-Montreal Protocol (1987)	
]	Metric 5:	Sample Size	High	$\times 1$	1	complete data	
Domain 2. Accord	ikility/Class	:+					
Domain 3: Access	Metric 6:	Metadata Completeness	Low	× 1	3	limited data, only includes estimated exposure for average worker working with fumigant	
Domain 4. Variahi	lity and Un	aartainty					
Domain 4: Variabi	Metric 7:	Metadata Completeness	Low	$\times 1$	3	no discussion of variability on uncertainty	
-		wiciauata Completeness	LUW	× 1	3	no discussion of variability or uncertainty	
Overall Quality De	etermination	n^{\dagger}	Unacceptable		4	Metric Mean Score: 2.1.	
			Continued on	next page	e		

		– continued from	n previous page		
Source Citation: Type of Data Source Hero ID	Atsdr,. 2005. Toxicological profile for car Occupational Exposure; Reports for Data 3982336			se Data;	
EVALUATION	N	D			
Domain	Metric	Rating	MWF* Score	Comments	

* MWF = Metric Weighting Factor

or Information Ot Data Use cleaning vapor. Liquid inhalation, der 1.0	her than i	Exposur	Portsmouth Naval Shipyard. e or Release Data; elding, electrical, painting Comments
Use cleaning vapor. Liquid inhalation, der 1.0 transportation,	woodwo		
Use cleaning vapor. Liquid inhalation, der 1.0 transportation,	woodwo		
cleaning vapor. Liquid inhalation, der 1.0 transportation,	woodwo		
cleaning vapor. Liquid inhalation, der 1.0 transportation,	woodwo		
vapor. Liquid inhalation, der 1.0 transportation,	woodwo		
inhalation, der 1.0 transportation,	woodwo		
1.0 transportation,	woodwo		
transportation,			
Rating	MWF*	Score	Comments
Rating	MWF*	Score	Comments
High	$\times 1$	1	NIOSH
High	$\times 1$	1	US
-	$\times 2$	8	naval base, solvent use
Medium	$\times 2$	4	Data from greater than 10 years ago (2007)
High	× 1	1	No Comment.
Unacceptable	× 1	4	no monitoring data
Low	~ 1	3	no discussion of variability on uncertainty
LOW	× 1	3	no discussion of variability or uncertainty
Unacceptable		4	Metric Mean Score: 2.4.
	High Unacceptable Medium High Unacceptable Low	High× 1Unacceptable× 2Medium× 2High× 1Unacceptable× 1Low× 1	High $\times 1$ 1Unacceptable $\times 2$ 8Medium $\times 2$ 4High $\times 1$ 1Unacceptable $\times 1$ 4Low $\times 1$ 3

* MWF = Metric Weighting Factor

Source Citation:		A 2016. TSCA work plan chem nd degreasing uses CASRN: 106		ent: Peer	review	draft 1-bromopropane: (n-Propyl bromide) spray adhesives, dry
Type of Data Source Hero ID		nal Exposure; Reports for Data o		her than H	Exposure	e or Release Data;
EXTRACTION Parameter			Data			
Life Cycle Stage:	:		Use			
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relia	bility					
	Metric 1:	Methodology	High	$\times 1$	1	EPA
Domain 2: Repre	esentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	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: Acces	ssibility/Clar	ity				
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Varia	bility and U	ncertainty				
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality I	Determinatio	n [†]	Unacceptable		4	Metric Mean Score: 2.5.

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID		Stewart, A.,Witts, L. J 1993. Chronic carbon tetrachloride intoxication. 1944. British Journal of Industrial Medicine. Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 3569868							
EXTRACTION Parameter			Data						
			Data						
Life Cycle Stage:			Use						
Life Cycle Description (Subcategory of Use):			manufacturing	aid					
Physical Form:			vapor. Liquid						
Route of Exposur			inhalation, deri	mal					
Number of Sites:			1.0						
EVALUATION									
Domain		Metric	Rating	MWF*	Score	Comments			
Domain 1: Relial	bility								
Domain 1. Ivenu	Metric 1:	Methodology	Medium	$\times 1$	2	Nuffield Dept. of Clinical Medicine			
Domain 2: Repre	esentative								
	Metric 2:	Geographic Scope	High	$\times 1$	1	US			
	Metric 3:	Applicability	High	$\times 2$	2	Manufacturing Aid			
	Metric 4:	Temporal Representativeness	Unacceptable	$\times 2$	8	Data is Pre-Montreal Protocol (1944)			
	Metric 5:	Sample Size	N/A		N/A	No Comment.			
Domain 3: Acces	ssibility/Clar	ity							
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.			
Domain 4: Varia	bility and Ur	ncertainty							
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.			
Overall Quality I	Determinatio	\mathbf{n}^{\dagger}	Unacceptable		4	Metric Mean Score: 2.2.			

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID		Oecd,. 2011. SIDS initial assessment profile: Carbon tetrachloride. Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 3827246								
EXTRACTION			_							
Parameter			Data							
Life Cycle Stage:			Use							
Life Cycle Description (Subcategory of Use):			lab chemical							
Physical Form:	-		vapor. Liquid							
Route of Exposure:			inhalation, deri	mal						
EVALUATION										
Domain		Metric	Rating	MWF*	Score	Comments				
Domain 1: Reliab	oility									
	Metric 1:	Methodology	Medium	× 1	2	SIDS Assessment				
Domain 2: Repre	sentative									
1	Metric 2:	Geographic Scope	High	$\times 1$	1	US				
	Metric 3:	Applicability	Unacceptable	$\times 2$	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: Acces	sibility/Clar	ity								
	Metric 6:	Metadata Completeness	Unacceptable	× 1	4	no monitoring data, only discusses general health effects				
Domain 4: Varial	oility and Ur	ncertainty								
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.				
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 3.0.					

* MWF = Metric Weighting Factor

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). Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;									
Type of Data Source Hero ID	Occupation 1062454	nal Exposure; Reports for Data o	r Information Ot	her than I	Exposur	e or Release Data;				
EXTRACTION										
Parameter			Data							
Life Cycle Stage:	:		Use							
Life Cycle Descr		ategory 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 Sou	ıth						
EVALUATION										
Domain		Metric	Rating	MWF*	Score	Comments				
Domain 1: Relia	bility									
Domain 1. Kena	Metric 1:	Methodology	High	× 1	1	HEI				
Domain 2: Repre	esentative									
Domuni 2. Repre	Metric 2:	Geographic Scope	High	$\times 1$	1	US				
	Metric 3:	Applicability	Unacceptable	$\times 2$	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: Acces	ssibility/Clar	ity								
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.				
Domain 4: Varia	bility and U	ncertainty								
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.				
			Continued on	ı next pag	je					

		– continued from	previous	page				
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 Hero ID	Occupational Exposure; Reports for Data 1062454	a or Information Oth	her than E	Exposure	or Release Data;			
EVALUATION								
Domain	Metric	Rating	MWF*	Score	Comments			
Overall Quality	Determination [†]	Unacceptable		4	Metric Mean Score: 2.5.			

Hero ID EXTRACTION Parameter Life Cycle Stage: Life Cycle Descrip Physical Form: Route of Exposure: Exposure Concentr	tion (Subca : ration (Unit ss: ent or Meth	i):	Data Use Emissions vapor inhalation 0.54(mg/m3)	her than F	Exposure	e or Release Data;						
Parameter Life Cycle Stage: Life Cycle Descrip Physical Form: Route of Exposure: Exposure Concentr	: ration (Unit es: ent or Meth	i):	Use Emissions vapor inhalation 0.54(mg/m3)									
Life Cycle Stage: Life Cycle Descrip Physical Form: Route of Exposure: Exposure Concentr	: ration (Unit es: ent or Meth	i):	Use Emissions vapor inhalation 0.54(mg/m3)									
Life Cycle Descrip Physical Form: Route of Exposure: Exposure Concentr	: ration (Unit es: ent or Meth	i):	Emissions vapor inhalation 0.54(mg/m3)									
Life Cycle Descrip Physical Form: Route of Exposure: Exposure Concentr	: ration (Unit es: ent or Meth	i):	vapor inhalation 0.54(mg/m3)									
Route of Exposure: Exposure Concentr	ration (Unit es: ent or Meth		inhalation 0.54(mg/m3)									
Exposure Concentr	ration (Unit es: ent or Meth		0.54(mg/m3)									
	es: ent or Meth			inhalation								
N 1 CO 1	ent or Meth	and	()	0.54(mg/m3)								
Number of Samples:			62									
Type of Measurement or Method:			continuous									
Type of Sampling:			area									
Sampling Location:			Copewood-Day	/is								
EVALUATION												
Domain		Metric	Rating	MWF*	Score	Comments						
Domain 1: Reliabil	lity											
	Metric 1:	Methodology	High	$\times 1$	1	HEI						
Domain 2: Represe	entative											
	Metric 2:	Geographic Scope	High	$\times 1$	1	US						
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	ambient air exposure						
J	Metric 4:	Temporal Representativeness	N/A		N/A	No Comment.						
1	Metric 5:	Sample Size	N/A		N/A	No Comment.						
Domain 3: Accessi	ibility/Clar	ity										
1	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.						
Domain 4: Variabi	ility and Un	certainty										
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.						
			Continued on									

	-	- continued from	previous	page				
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 Hero ID	Occupational Exposure; Reports for Data 1062454	or Information Oth	her than E	Exposure	e or Release Data;			
EVALUATION								
Domain	Metric	Rating	MWF*	Score		Comments		
Overall Quality 1	Determination [†]	Unacceptable		4	Metric Mean Score: 2.5.			

Source Citation: Type of Data Source Hero ID		Fda, 1998. Appendix 4. Toxicological data for class 1 solvents". Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 1974789						
EXTRACTION								
Parameter			Data					
Life Cycle Stage:			Use					
EVALUATION								
Domain		Metric	Rating	MWF*	Score	Comments		
Domain 1: Relia	bility							
	Metric 1:	Methodology	Low	$\times 1$	3	appendix 4 to unknown document		
Domain 2: Repre	esentative							
1	Metric 2:	Geographic Scope	High	$\times 1$	1	US		
	Metric 3:	Applicability	Unacceptable	$\times 2$	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: Acces	ssibility/Clar	rity						
	Metric 6:	Metadata Completeness	Unacceptable	× 1	4	no quantitative data		
Domain 4: Varia	bility and U	ncertainty						
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.		
Overall Quality I	Determinatio	n [†]	Unacceptable		4	Metric Mean Score: 3.2.		

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID		Niosh, 2016. NIOSH pocket guide to chemical hazards: Carbon tetrachloride. Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 3974866							
EXTRACTION Parameter			Data						
Life Cycle Stage: Life Cycle Description (Subcategory of Use): Route of Exposure:		Use exposure prevention inhalation							
EVALUATION									
Domain		Metric	Rating	MWF*	Score	Comments			
Domain 1: Reliab	bility Metric 1:	Methodology	High	× 1	1	NIOSH			
Domain 2: Repre	esentative								
Domain 21 Hopro	Metric 2:	Geographic Scope	High	$\times 1$	1	US			
	Metric 3:	Applicability	Unacceptable	$\times 2$	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: Acces	sibility/Clar	ity							
Domain 5. Teees	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.			
Domain 4: Varial	bility and Ur Metric 7:	ncertainty Metadata Completeness	N/A		N/A	No Comment.			
	Weute /:	metadata Completeness	IN/A		IN/A	No Comment.			
Overall Quality I	Determination	n†	Unacceptable		4	Metric Mean Score: 2.5.			

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	Niosh, 2000. NIOSH recommendation for chemical protective clothing database: 1,4-Dioxane. Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 3974867						
EXTRACTION Parameter			Data				
Life Cycle Stage: Life Cycle Description (Subcategory of Use): Route of Exposure:		Use exposure prevention dermal					
EVALUATION							
Domain		Metric	Rating	MWF*	Score	Comments	
Domain 1: Relial	bility						
	Metric 1:	Methodology	High	× 1	1	NIOSH	
Domain 2: Repre	esentative						
	Metric 2:	Geographic Scope	High	$\times 1$	1	US	
	Metric 3:	Applicability	Unacceptable	$\times 2$	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: Acces	ssibility/Clar	ity					
Domain 5. Acces	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.	
Domain 4: Varia	bility and Ur	ncertainty					
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.	
Overall Quality I	Determinatio	n†	Unacceptable		4	Metric Mean Score: 2.5.	

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID		Niosh, 1995. Occupational safety and health guideline for carbon tetrachloride. Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 3974894							
EXTRACTION Parameter			Data						
Life Cycle Stage: Life Cycle Description (Subcategory of Use): Route of Exposure:		Use exposure prevention inhalation, dermal							
EVALUATION									
Domain		Metric	Rating	MWF*	Score	Comments			
Domain 1: Reliat	bility								
	Metric 1:	Methodology	High	× 1	1	US HHS			
Domain 2: Repre	sentative								
· · · · · · · · · · · · · · · · · · ·	Metric 2:	Geographic Scope	High	× 1	1	US			
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	skin protection			
	Metric 4:	Temporal Representativeness	Unacceptable	$\times 2$	8	Data is Pre-Montreal Protocol (1995)			
	Metric 5:	Sample Size	N/A		N/A	No Comment.			
Domain 3: Acces	sibility/Clar	ity							
Domain 5. 7 Kees	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.			
Domain 4: Varial	bility and Ur	ncertainty							
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.			
Overall Quality I	Determinatio	n†	Unacceptable		4	Metric Mean Score: 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:

Source Citation: Type of Data Source Hero ID	, , , , , , , , , , , , , , , , , , , ,	Niosh, 1976. NIOSH revised recommended carbon tetrachloride standard. Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 1974898							
EXTRACTION Parameter			Data						
Life Cycle Stage: Life Cycle Description (Subcategory of Use): Route of Exposure:			Use exposure prevention inhalation, dermal						
EVALUATION									
Domain		Metric	Rating	MWF*	Score	Comments			
Domain 1: Relial	bility Metric 1:	Methodology	High	× 1	1	NIOSH			
Domain 2: Repre	esentative								
Domain 2. Repre	Metric 2:	Geographic Scope	High	$\times 1$	1	US			
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	skin protection			
	Metric 4:	Temporal Representativeness	Unacceptable	$\times 2$	8	Data is Pre-Montreal Protocol (1976)			
	Metric 5:	Sample Size	N/A		N/A	No Comment.			
Domain 3: Acces	sibility/Clar	ity							
Domain 5. Acces	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.			
Domain 4: Varia	bility and Ur Metric 7:	ncertainty Metadata Completeness	N/A		N/A	No Comment.			
Overall Quality I		<u> </u>	Unacceptable		4	Metric Mean Score: 3.0.			

* MWF = Metric Weighting Factor

ource 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.							
ype of Data Source ero ID	Occupation 3974967	nal Exposure; Reports for Data o	r Information Oth	her than I	Exposur	e or Release Data;		
XTRACTION								
Parameter			Data					
Life Cycle Stage:			Use					
Life Cycle Descr	iption (Subc	ategory of Use):	degreasing					
Route of Exposure: Exposure Concentration (Unit):			inhalation					
			"dose factor"					
Number of Samples:		450						
Worker Activity: Number of Workers: Type of Sampling: Analytic Method:			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); instru- ment technicians (CPP), painters (CFA), mechanics, pipe fitters, welders, labor- ers, electricians and decon technicians (TAN) and laborers, mechanics, process operators, and reactor operators(TRA) 51 questionaire 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".					
	:		and Low=l) and					
VALUATION	:	Metric	and Low=l) and "Dose Factor".	d multipl	ied that	value by the frequency (in hours/day)to obtain a		
		Metric	and Low=l) and		ied that			
VALUATION	bility		and Low=l) and "Dose Factor". Rating	d multipl MWF*	ied that	value by the frequency (in hours/day)to obtain a		
VALUATION Domain		Metric	and Low=l) and "Dose Factor".	d multipl	ied that	value by the frequency (in hours/day)to obtain a		
VALUATION Domain	bility Metric 1:		and Low=l) and "Dose Factor". Rating	d multipl MWF*	ied that	value by the frequency (in hours/day)to obtain a Comments		
VALUATION Domain Domain 1: Relial	bility Metric 1:	Methodology Geographic Scope	and Low=l) and "Dose Factor". Rating	d multipl MWF*	ied that	value by the frequency (in hours/day)to obtain a Comments		
VALUATION Domain Domain 1: Relial	bility Metric 1: esentative	Methodology Geographic Scope Applicability	and Low=l) and "Dose Factor". Rating High	d multipl MWF* × 1	Score	value by the frequency (in hours/day)to obtain a Comments DOE		
VALUATION Domain Domain 1: Relial	bility Metric 1: esentative Metric 2:	Methodology Geographic Scope Applicability Temporal Representativeness	and Low=l) and "Dose Factor". Rating High	d multipl MWF* × 1 × 1	Score	value by the frequency (in hours/day)to obtain a Comments DOE US		
VALUATION Domain Domain 1: Relial	bility Metric 1: esentative Metric 2: Metric 3:	Methodology Geographic Scope Applicability	and Low=l) and "Dose Factor". Rating High High Medium	d multipl MWF* $\times 1$ $\times 1$ $\times 2$	ied that Score 1 4	value by the frequency (in hours/day)to obtain a Comments DOE US degreasing (not aerospace)		
VALUATION Domain Domain 1: Relial Domain 2: Repre	bility Metric 1: esentative Metric 2: Metric 3: Metric 4: Metric 5:	Methodology Geographic Scope Applicability Temporal Representativeness Sample Size	and Low=l) and "Dose Factor". Rating High High Medium Low	d multipl MWF* $\times 1$ $\times 1$ $\times 2$	Score	value by the frequency (in hours/day)to obtain a Comments DOE US degreasing (not aerospace) Data from greater than 20 years ago (1998)		
VALUATION Domain Domain 1: Relial	bility Metric 1: esentative Metric 2: Metric 3: Metric 4: Metric 5:	Methodology Geographic Scope Applicability Temporal Representativeness Sample Size	and Low=l) and "Dose Factor". Rating High High Medium Low	d multipl MWF* $\times 1$ $\times 1$ $\times 2$	Score	value by the frequency (in hours/day)to obtain a Comments DOE US degreasing (not aerospace) Data from greater than 20 years ago (1998)		

			– continued from	previous	page			
Source Citation:	program at Idaho National Engineering and Environmental Laboratory (INEEL) Phase I: Needs assessment.							
Type of Data Source Hero ID	Occupation 3974967	Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 3974967						
EVALUATION								
Domain		Metric	Rating	MWF*	Score	Comments		
Domain 4: Varia	bility and Ur	ncertainty						
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.		
Overall Quality Determination [†] Unacceptable 4 Metric Mean Score: 2.3.						Metric Mean Score: 2.3.		

* MWF = Metric Weighting Factor

Source Citation:		, S. teven,Scarbrough, C. arl,Kiec Phase I: Needs assessment.	ling, S. ylvia,Grif	fon, M. a	rk. 2004	4. Y-12 and Oak Ridge National Laboratory medical surveillance
Type of Data Source Hero ID		nal Exposure; Reports for Data o	r Information Otl	her than H	Exposur	e or Release Data;
EXTRACTION						
Parameter			Data			
Life Cycle Stage:		Use				
Life Cycle Descri		ategory of Use):	uranium chlori	nation		
Number of Samp	les:		247			
Number of Work	ers:		54; 78			
Type of Sampling	g:		questionaire			
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relial	bility					
	Metric 1:	Methodology	High	× 1	1	DOE
Domain 2: Repre	esentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	uranium chlorination
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data from greater than 10 years ago (2004)
	Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Acces	ssibility/Cla	ity				
	Metric 6:	Metadata Completeness	Unacceptable	× 1	4	used only qualitative values
Domain 4: Varial	bility and U	ncertainty				
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality I	Determinatio	\mathbf{n}^{\dagger}	Unacceptable		4	Metric Mean Score: 2.6.

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source	program at	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. Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data;							
Hero ID	3974974	iu Exposure, reports for Dute o			Inposure	e of Refelse Bull,			
EXTRACTION									
Parameter			Data						
Life Cycle Stage:			Use						
Life Cycle Descr	iption (Subc	ategory of Use):	degreasing						
Route of Exposur			inhalation, deri	nal					
Type of Sampling	5:		questionaire						
EVALUATION									
Domain		Metric	Rating	MWF*	Score	Comments			
Domain 1: Relial	bility								
	Metric 1:	Methodology	High	$\times 1$	1	DOE			
Domain 2: Repre	esentative								
1	Metric 2:	Geographic Scope	High	$\times 1$	1	US			
	Metric 3:	Applicability	High	$\times 2$	2	degreasing (not aerospace)			
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	Data from greater than 20 years ago (1997)			
	Metric 5:	Sample Size	N/A		N/A	No Comment.			
Domain 3: Acces	sibility/Clar	ity							
	Metric 6:	Metadata Completeness	Unacceptable	× 1	4	used only qualitative values			
Domain 4: Varial	bility and U	ncertainty							
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.			
Overall Quality I	Determinatio	n [†]	Unacceptable		4	Metric Mean Score: 2.0.			

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	Doe, 2003. A needs assessment for medical screening of construction workers at the Portsmouth and Paducah gaseous diffusion plants. Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 3974976							
EXTRACTION Parameter			Data					
Life Cycle Stage:			Use					
Life Cycle Descri	ption (Subca	ategory of Use):	degreasing					
Route of Exposure			inhalation, deri	nal				
Type of Sampling			hazard rating					
EVALUATION								
Domain		Metric	Rating	MWF*	Score	Comments		
Domain 1: Reliab	oility							
	Metric 1:	Methodology	High	$\times 1$	1	DOE		
Domain 2: Repres	sentative							
	Metric 2:	Geographic Scope	High	$\times 1$	1	US		
	Metric 3:	Applicability	High	$\times 2$	2	degreasing (not aerospace)		
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data from greater than 10 years ago (2003)		
	Metric 5:	Sample Size	N/A		N/A	No Comment.		
Domain 3: Access	sibility/Clar	itv						
	Metric 6:	Metadata Completeness	Unacceptable	$\times 1$	4	used only qualitative values		
Domain 4: Variab	vility and Ur	certainty						
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.		
Overall Quality D	etermination	n [†]	Unacceptable		4	Metric Mean Score: 1.7.		

* MWF = Metric Weighting Factor

Type of Data Source Occu	Niosh, 1994. Immediately dangerous to life or health concentrations (IDLH): Carbon tetrachloride. Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 3978143							
EXTRACTION Parameter		Data						
		Data						
Life Cycle Stage:		Use						
Life Cycle Description (Subcategory of Use):	exposure preve						
Route of Exposure:		inhalation, der						
Exposure Concentration Number of Samples:	(Unit):	75-600ppm (av	erage 210)ppm)				
Number of Workers:		1						
Exposure Duration:	3 hour							
EVALUATION								
Domain	Metric	Rating	MWF*	Score	Comments			
יייייי								
Domain 1: Reliability Metri	c 1: Methodology	High	× 1	1	NIOSH			
Domain 2: Representati								
Metri		High	× 1	1	US			
Metri		Unacceptable	$\times 2$	8	IDLH data			
Metri Metri	1 1	High N/A	$\times 2$	2 N/A	Data from less than 10 years ago (2014)			
Ivicui	5. Sample Size	IN/A		IN/A	No Comment.			
Domain 3: Accessibility	/Clarity							
Metri	e 6: Metadata Completeness	N/A		N/A	No Comment.			
Domain 4: Variability a	nd Uncertainty							
Metri	-	N/A		N/A	No Comment.			
Overall Quality Determ	Unacceptable		4	Metric Mean Score: 2.0.				
		Continued on	nevt pag	<u>a</u>				

	· · · · · · · · · · · · · · · · · · ·	– continued from	n previous page		
Source Citation: Type of Data Source Hero ID	Niosh, 1994. Immediately dangerous to l Occupational Exposure; Reports for Data 3978143		· · · ·		
EVALUATION					
Domain	Metric	Rating	MWF★ Score	Comments	

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID		Niosh, 2014. International chemical safety cards (ICDC): Carbon tetrachloride. Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 3978151							
EXTRACTION Parameter			Data						
Life Cycle Stage: Life Cycle Description (Subcategory of Use): Route of Exposure:		Use exposure preve inhalation, derr							
EVALUATION									
Domain		Metric	Rating	MWF*	Score	Comments			
Domain 1: Relial	bility								
	Metric 1:	Methodology	High	$\times 1$	1	NIOSH			
Domain 2: Repre	esentative								
1	Metric 2:	Geographic Scope	High	$\times 1$	1	US			
	Metric 3:	Applicability	Unacceptable	$\times 2$	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: Acces	ssibility/Clar	itv							
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.			
Domain 4: Varia	bility and Ur	ncertainty							
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.			
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.5.				

* MWF = Metric Weighting Factor

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 Hero ID	Occupation 3978257	nal Exposure; Reports for Data o	r Information Otl	her than H	Exposur	e or Release Data;			
EXTRACTION									
Parameter			Data						
Life Cycle Stage	:		Use						
Life Cycle Descr	iption (Subca	ategory of Use):	exposure preve	ntion					
Route of Exposu	re:		inhalation						
EVALUATION									
Domain		Metric	Rating	MWF*	Score	Comments			
Domain 1: Relia	hility								
	Metric 1:	Methodology	High	$\times 1$	1	OSHA			
Domain 2: Repre	esentative								
1	Metric 2:	Geographic Scope	High	$\times 1$	1	US			
	Metric 3:	Applicability	Unacceptable	$\times 2$	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: Acce	ssibility/Clar	ity							
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.			
Domain 4: Varia	bility and Ur	ncertainty							
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.			
Overall Quality I	Determinatio	n [†]	Unacceptable		4	Metric Mean Score: 2.5.			

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID		Construction Safety, Council. 2012. Job Hazard Analysis (JHA) for health hazards in construction. Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 3978262							
EXTRACTION Parameter			Data						
Life Cycle Stage: Life Cycle Description (Subcategory of Use): Route of Exposure:		Use Construction Site inhalation							
EVALUATION									
Domain		Metric	Rating	MWF*	Score	Comments			
Domain 1: Relial	bility Metric 1:	Methodology	High	× 1	1	OSHA			
Domain 2: Repre	esentative								
Domain 2. Repre	Metric 2:	Geographic Scope	High	$\times 1$	1	US			
	Metric 3:	Applicability	Unacceptable	$\times 1$ $\times 2$	8	Construction Site Hazard Checklist			
	Metric 4:	Temporal Representativeness	N/A	<u>~ 2</u>	N/A	No Comment.			
	Metric 5:	Sample Size	N/A		N/A	No Comment.			
Domain 3: Acces	sibility/Clar	itv							
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.			
Domain 4: Varia	bility and Ur	ncertainty							
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.			
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.5.				

* 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: Type of Data Source Hero ID		Osha,. 2001. Shipyard industry standards. Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 3978263							
EXTRACTION Parameter			Data						
Life Cycle Stage: Life Cycle Description (Subcategory of Use): Route of Exposure:			Use exposure prevention inhalation						
EVALUATION									
Domain		Metric	Rating	MWF*	Score	Comments			
Domain 1: Relial	bility								
	Metric 1:	Methodology	High	$\times 1$	1	NIOSH			
Domain 2: Repre	esentative								
1	Metric 2:	Geographic Scope	High	$\times 1$	1	US			
	Metric 3:	Applicability	Unacceptable	$\times 2$	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: Acces	ssibility/Clar	itv							
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.			
Domain 4: Varia	bility and Ur	ncertainty							
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.			
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.5.				

* 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: Type of Data Source Hero ID		Vicnas, 2017. IMAP: Environment tier II assessment for methane, tetrachloro. Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 978351							
EXTRACTION Parameter			Data						
Life Cycle Stage: Route of Exposur Exposure Concen	re:	t):	Use inhalation 0.5-1mg/m3 (at	ir)					
EVALUATION									
Domain		Metric	Rating	MWF*	Score	Comments			
Domain 1: Reliat	oility Metric 1:	Methodology	High	× 1	1	NICNAS			
Domain 2: Repre	sentative								
1	Metric 2:	Geographic Scope	Medium	$\times 1$	2	Australia (OECD)			
	Metric 3:	Applicability	Unacceptable	$\times 2$	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: Acces	sibility/Clar	itv							
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.			
Domain 4: Varial	bility and Un Metric 7:	certainty Metadata Completeness	N/A		N/A	No Comment.			
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.8.				

* MWF = Metric Weighting Factor

Source Citation:	European C solvents.	Chlorinated Solvents, Association	n. 2017. ECSA p	roduct &	applica	tion toolbox: Guidance c	on safe & sustainable use of chlorinated
Type of Data Source Hero ID	Occupatior 3982127	al Exposure; Published Models	for Exposures or	Releases	;		
EXTRACTION			Data				
Parameter			Data				
Life Cycle Stage Route of Exposu			Use inhalation, derr	nal			
EVALUATION							
Domain		Metric	Rating	MWF*	Score		Comments
Domain 1: Relia	bility						
	Metric 1:	Methodology	High	$\times 1$	1	ECSA	
Domain 2: Repre	esentative						
-	Metric 2:	Geographic Scope	Medium	$\times 1$	2	European Union (OECD)	
	Metric 3:	Applicability	Unacceptable	$\times 2$	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: Acce	ssibility/Clar	ity					
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.	
Domain 4: Varia	bility and Ur	ncertainty					
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.	
Overall Quality I	Determinatio	n [†]	Unacceptable		4	Metric Mean Score: 2.8.	

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID		European Chlorinated Solvents, Association. 2017. Chlorinated solvents: Other solvents. Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 3982128							
EXTRACTION									
Parameter			Data						
Life Cycle Stage:	:		Use						
Route of Exposur	re:		inhalation, deri	nal					
EVALUATION									
Domain		Metric	Rating	MWF*	Score		Comments		
Domain 1: Relial	bility								
	Metric 1:	Methodology	High	$\times 1$	1	ECSA			
Domain 2: Repre	esentative								
	Metric 2:	Geographic Scope	Medium	$\times 1$	2	European Union (OECD)			
	Metric 3:	Applicability	Unacceptable	$\times 2$	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: Acces	ssibilitv/Clar	ritv							
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.			
Domain 4: Varia	•	-							
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.			
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.8.				

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID		Osha, 2017. OSHA occupational chemical database: Carbon tetrachloride. Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 3978249							
EXTRACTION Parameter			Data						
Life Cycle Stage: Life Cycle Description (Subcategory of Use): Route of Exposure:		Use exposure prevent inhalation, derr							
EVALUATION									
Domain		Metric	Rating	MWF*	Score	Comments			
Domain 1: Relial	bility								
	Metric 1:	Methodology	High	× 1	1	OSHA			
Domain 2: Repre	sentative								
	Metric 2:	Geographic Scope	High	$\times 1$	1	US			
	Metric 3:	Applicability	Unacceptable	$\times 2$	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: Acces	sibility/Clar	itv							
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.			
Domain 4: Varial	bility and Ur								
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.			
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.5.				

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID		Osha, 2005. OSHA permissible exposure limit and general information: carbon tetrachloride. Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 980999							
EXTRACTION Parameter			Data						
Life Cycle Stage: Life Cycle Description (Subcategory of Use): Route of Exposure:		Use exposure prevention inhalation, dermal							
EVALUATION									
Domain		Metric	Rating	MWF*	Score	Comments			
Domain 1: Reliab	oility Metric 1:	Methodology	High	× 1	1	OSHA			
Domain 2: Repre	sentative								
	Metric 2:	Geographic Scope	High	$\times 1$	1	US			
	Metric 3:	Applicability	Unacceptable	$\times 2$	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: Acces	sibility/Clar	itv							
Domain 5. Theory	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.			
Domain 4: Varial	•				27/4				
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.			
Overall Quality I	Determination	n [†]	Unacceptable		4	Metric Mean Score: 2.5.			

* 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: Type of Data Source Hero ID	,	Dehha, 2016. Carbon tetrachloride. Decupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 3982267							
EXTRACTION Parameter			Data						
Life Cycle Stage: Life Cycle Descr Route of Exposur	iption (Subca	ategory of Use):	Use exposure prevent inhalation, derr						
EVALUATION									
Domain		Metric	Rating	MWF*	Score	Comments			
Domain 1: Relial	bility Metric 1:	Methodology	High	× 1	1	CAIEPA			
Domain 2: Repre	sentative								
Domain 2. Repre	Metric 2:	Geographic Scope	High	$\times 1$	1	US			
	Metric 3:	Applicability	Unacceptable	$\times 1$ $\times 2$	8	General exposure limits			
	Metric 4:	Temporal Representativeness	N/A	× 2	N/A	No Comment.			
	Metric 5:	Sample Size	N/A		N/A	No Comment.			
Domain 3: Acces	ssibility/Clar	ity							
Domain 5. Acces	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.			
Domain 4: Varia	-								
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.			
Overall Quality I	Determinatio	n†	Unacceptable		4	Metric Mean Score: 2.5.			

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	· · · · · · · · · · · · · · · · · · ·	Edc/Niosh,. Carbon tetrachloride. Decupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 986503							
EXTRACTION Parameter			Data						
Life Cycle Stage: Life Cycle Descri Route of Exposur	iption (Subca	ategory of Use):	Use exposure prevent inhalation, derr						
EVALUATION									
Domain		Metric	Rating	MWF*	Score	Comments			
Domain 1: Reliab	oility Metric 1:	Methodology	High	× 1	1	NIOSH			
Domain 2: Repre	sentative								
Domain 2. Repre	Metric 2:	Geographic Scope	High	× 1	1	US			
	Metric 3:	Applicability	Unacceptable	$\times 2$	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: Acces	sibility/Clar	ity							
Domain 5. Theory	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.			
Domain 4: Varial	-								
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.			
Overall Quality I	Determination	n [†]	Unacceptable		4	Metric Mean Score: 2.5.			

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID		Niosh, 2011. 1988 OSHA PEL Project documentation: Carbon tetrachloride. Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 986445							
EXTRACTION									
Parameter			Data						
Life Cycle Stage:			Use						
EVALUATION									
Domain		Metric	Rating	MWF*	Score	Comments			
Domain 1: Relial	bility								
	Metric 1:	Methodology	High	$\times 1$	1	OSHA			
Domain 2: Repre	esentative								
- ·····	Metric 2:	Geographic Scope	High	$\times 1$	1	US			
	Metric 3:	Applicability	Unacceptable	$\times 2$	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: Acces	ssibility/Clar	rity							
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.			
Domain 4: Varia	bility and U	ncertainty							
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.			
Overall Quality I	Determinatio	n [†]	Unacceptable		4	Metric Mean Score: 2.5.			

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID		Ec, 2009. Recommendation from the scientific committee on occupational exposure limits for carbon tetrachloride. Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 3982344							
EXTRACTION									
Parameter			Data						
Life Cycle Stage:	:		Use						
EVALUATION									
Domain		Metric	Rating	MWF*	Score	Comments			
Domain 1: Relial	bility								
	Metric 1:	Methodology	Medium	$\times 1$	2	European Commission			
Domain 2: Repre	esentative								
	Metric 2:	Geographic Scope	Medium	$\times 1$	2	Belgium			
	Metric 3:	Applicability	Unacceptable	$\times 2$	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: Acces	ssibility/Clar	rity							
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.			
Domain 4: Varia	bility and U	ocertainty							
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.			
Overall Quality I	Determinatio	n [†]	Unacceptable		4	Metric Mean Score: 3.0.			

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID		Osha, 1991. Proposed rules: Occupational exposure to methylene chloride. Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 3982430							
EXTRACTION									
Parameter			Data						
Life Cycle Stage:			Use						
EVALUATION									
Domain		Metric	Rating	MWF*	Score	Comments			
Domain 1: Relial	bility								
	Metric 1:	Methodology	High	$\times 1$	1	OSHA			
Domain 2: Repre	esentative								
	Metric 2:	Geographic Scope	High	$\times 1$	1	US			
	Metric 3:	Applicability	Unacceptable	$\times 2$	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: Acces	ssibility/Clar	ity							
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.			
Domain 4: Varia	bility and U	ncertainty							
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.			
Overall Quality I	Determinatio	n†	Unacceptable		4	Metric Mean Score: 2.5.			

* MWF = Metric Weighting Factor

Source Citation:		igusto, L. G.,Lieber, S. R.,Ruiz, I rides. Environmental and Molec			97. Mic	ronucleus monitoring to assess human occupational exposure to
Type of Data Source Hero ID	Occupation 629708	nal Exposure; Reports for Data o	r Information Otl	ner than H	Exposure	e or Release Data;
EXTRACTION						
Parameter			Data			
Life Cycle Stage	:		Use			
Life Cycle Descr	ription (Subc	ategory of Use):	Unspecified			
Number of Work	ers:		41			
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relia	bility					
Domain 1. Kena	Metric 1:	Methodology	Medium	$\times 1$	2	Environmental and Moleular Mutagenesis
Domain 2: Repre	esentative					
1	Metric 2:	Geographic Scope	Medium	$\times 1$	2	Brazil
	Metric 3:	Applicability	Unacceptable	$\times 2$	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: Acce	ssibility/Clar	ity				
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Varia	bility and Ur	ncertainty				
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination ^{\dagger}		Unacceptable		4	Metric Mean Score: 3.0.	

* MWF = Metric Weighting Factor

Source Citation:	E.,Wesselin		tic cancer in wo			ova, N.,Kauppinen, T.,Kogevinas, M.,Vainio, H.,Weiderpass, o chlorinated hydrocarbon solvents and related compounds: A
Type of Data Source Hero ID	Occupation 707289	nal Exposure; Reports for Data or	r Information Oth	ner than I	Exposure	e or Release Data;
EXTRACTION Parameter			Data			
Life Cycle Stage:	:		Use			
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relia	bility					
	Metric 1:	Methodology	High	$\times 1$	1	Journal of Epidemiology
Domain 2: Repre	esentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	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: Acces	ssibilitv/Clar	itv				
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Varia	bility and Ur	ncertainty				
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality I	Determinatio	n†	Unacceptable		4	Metric Mean Score: 2.5.

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID		87. Current Intelligence Bulletin nal Exposure; Reports for Data o				
EXTRACTION Parameter			Data			
1 al anictei			Data			
Life Cycle Stage:			Use			
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relial	bility					
	Metric 1:	Methodology	High	× 1	1	NIOSH health hazard evaluation
Domain 2: Repre	esentative					
- ·····	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	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: Acces	ssibility/Clar	ity				
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Varia	bility and Ur	ncertainty				
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality I	Determinatio	n [†]	Unacceptable		4	Metric Mean Score: 2.5.

* MWF = Metric Weighting Factor

e of Data Source Occupatio o ID 3974895	nal Exposure; Completed Exposu		1550551110	шз,					
FRACTION									
Parameter		Data							
Life Cycle Stage:		Use							
Life Cycle Description (Subcategory of Use):			g aid (i.e.	, metal	recovery).				
Physical Form:					• /				
Route of Exposure:		inhalation	l						
Exposure Concentration (Un	it):	1 sample	with conc	entratio	on 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 Met	hod:	NIOSH M							
Worker Activity:		Reactor b	uilding, e	lectroly	tics area, generan and reactor maintenance.				
Number of Workers:		13							
Type of Sampling:			PBZ						
Exposure Duration:			full shift (8- 12hrs)						
PPE:		none							
ALUATION									
Domain	Metric	Rating	MWF*	Score	Comments				
Domain	neure	Tutting		Beole	Commonds				
Domain 1: Reliability									
Metric 1:	Methodology	High	× 1	1	NIOSH health hazard evaluation				
Domain 2: Representative									
Metric 2:	Geographic Scope	High	$\times 1$	1	US				
Metric 3:	Applicability	Medium	$\times 2$	4	Facility likely has appropriate condition of use, but sampling points may not be pertinent				
Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	2005				
Metric 5:	Sample Size	High	× 1	1	Data fully characterized				
Domain 3: Accessibility/Cla	rity								
Metric 6:	Metadata Completeness	High	$\times 1$	1	Data fully characterized				
	-	-							

– continued from previous page								
	Metric	Rating	MWF*	Score	Comments			
Metric 7:	Metadata Completeness	High	× 1	1	Variability included			
Determination	n [†]	High		1.4				
:	Occupation 3974895 Metric 7:	Occupational Exposure; Completed Expo 3974895 Metric	Niosh,. 2005. Health hazard evaluation report no. HE Occupational Exposure; Completed Exposure or Risk 3974895 Metric Rating Metric 7: Metadata Completeness	Niosh,. 2005. Health hazard evaluation report no. HETA-2004-Occupational Exposure; Completed Exposure or Risk Assessme 3974895 Metric Rating MWF* Metric 7: Metadata Completeness High × 1	Niosh,. 2005. Health hazard evaluation report no. HETA-2004-0169-29 Occupational Exposure; Completed Exposure or Risk Assessments; 3974895 Metric Rating MWF* Score Metric 7: Metadata Completeness High × 1 1			

Source Citation: Type of Data Source Hero ID		3. Personal protective equipmen nal Exposure; Reports for Data o				
EXTRACTION Parameter			Data			
Life Cycle Stage: Life Cycle Descr Physical Form: Route of Exposur PPE:	iption (Subc	ategory of Use):	Use Unspecified liquid? dermal lists nitrile glov as a second cho		e best ch	noice for protection against CCl4, with neoprene
EVALUATION Domain		Metric	Rating	MWF*	Score	Comments
		hieute	Rung		Score	Connexts
Domain 1: Relial	-					
	Metric 1:	Methodology	Medium	× 1	2	OSHA results
Domain 2: Repre	sentative					
Domuni 2. Repre	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	No condition of use mentioned, guidance for protective glove selection
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	2003
	Metric 5:	Sample Size	Low	× 1	3	Not applicible
Domain 3: Acces	wibility/Clor	ity				
Domain 5. Acces	Metric 6:	Metadata Completeness	Low	$\times 1$	3	Not applicible
		interactual Completeness	2011		5	
Domain 4: Varia	bility and Ur	ncertainty				
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	Not discussed
Overall Quality I	Determinatio	n [†]	Unacceptable		4	Metric Mean Score: 2.7.

* MWF = Metric Weighting Factor

Type of Data Source	,	7. Guidance on safe use: Carbor al Exposure; Reports for Data o		ner than E	Exposure	e or Release Data;
EXTRACTION						
Parameter			Data			
Life Cycle Stage:			Disposal			
Life Cycle Descrip	tion (Subca	tegory of Use):	Hazardous land	lfill		
Physical Form:			liquid			
Route of Exposure	:		dermal/inhalati	on		
Exposure Concentr):	2.9-110 ppb			
Number of Sites:			27.0			
Worker Activity:			Cleaning out a	dam in a	creek co	ontaminated by landfill runoff
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliabi	-		TT' 1			
	Metric 1:	Methodology	High	× 1	1	ECHA
Domain 2: Represe	entative					
-	Metric 2:	Geographic Scope	Medium	× 1	2	Europe
	Metric 3:	Applicability	Unacceptable	$\times 2$	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: Accessi	ibility/Clari	tv				
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variabi	lity and Un	certainty				
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
			1.111		1 1/ 1 1	
Overall Quality De	etermination	1 [†]	Unacceptable		4	Metric Mean Score: 2.8.
			Continued on	next page		

	 – continued from previous page 								
Source Citation: Type of Data Source Hero ID	Echa, 2017. Guidance on safe use: Carb Occupational Exposure; Reports for Data 3970707		ther than Exposure or Relea	ase Data;					
EVALUATION									
Domain	Metric	Rating	MWF* Score	Comments					

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID		Viosh, 2011. 1988 OSHA PEL Project documentation: Carbon tetrachloride. Occupational Exposure; Reports for Data or Information Other than Exposure or Release Data; 986445								
EXTRACTION										
Parameter			Data							
Life Cycle Stage:			Use							
EVALUATION										
Domain		Metric	Rating	MWF*	Score	Comments				
Domain 1: Relial	bility									
	Metric 1:	Methodology	High	$\times 1$	1	CDC				
Domain 2: Repre	esentative									
· · · · · · · · · · · · · · · · · · ·	Metric 2:	Geographic Scope	High	$\times 1$	1	US				
	Metric 3:	Applicability	Unacceptable	$\times 2$	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: Acces	ssibility/Clar	rity								
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.				
Domain 4: Varia	bility and U	ncertainty								
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.				
Overall Quality I	Determinatio	\mathbf{n}^{\dagger}	Unacceptable		4	Metric Mean Score: 2.5.				

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID		Recommendation from the scier nal Exposure; Reports for Data o				xposure limits for carbon tetrachloride. e or Release Data;
EXTRACTION						
Parameter			Data			
Life Cycle Stage:			Use			
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relial	bility					
	Metric 1:	Methodology	Medium	× 1	2	European Commission
Domain 2: Repre	esentative					
1	Metric 2:	Geographic Scope	High	$\times 1$	1	Europe
	Metric 3:	Applicability	Unacceptable	$\times 2$	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: Acces	ssibility/Clar	rity				
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Varia	bility and U	ncertainty				
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality I	Determinatio	n [†]	Unacceptable		4	Metric Mean Score: 2.8.

* MWF = Metric Weighting Factor

	2009. Health consultation: Ind 4100152, Part 2.	loor air qua	lity: Ray	ytheon a	area: St. Petersburg, Pinellas County, Florida: EPA facility II	
Type of Data SourceOccupaHero ID398221	tional Exposure; Completed Exposu 2	ure or Risk A	Assessme	ents;		
EXTRACTION Parameter		Data				
Life Cycle Stage:		Use				
Life Cycle Description (Se	bcategory of Use):			carbons	(HCFCs), Hydrofluorocarbon (HFCs) and Hydroflu-	
Physical Form:		liquid/vap	· /			
Route of Exposure:		inhalation				
Exposure Concentration (Jnit):	1.8 ug/m3				
Number of Samples:	,	2				
Number of Sites:		18.0				
Type of Measurement or M	1ethod:	12-hour sa	amples in	stainles	ss steel Summa" canisters	
Exposure Duration:	12-hr					
Analytic Method:		EPA Meth	nod 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	$\times 1$	1	US	
Metric	3: Applicability	Medium	× 2	4	Looks at indoor air quality of closed facility, so no specific worker measure- ments or descriptions	
Metric	1 1	High	$\times 2$	2	2009	
Metric	5: Sample Size	High	× 1	1	Large number of samples taken	
Domain 2. According the Million	1 ouity					
Domain 3: Accessibility/C Metric	•	High	× 1	1	Detailed discussion	
Wieuric		High	× 1	1	Detailed discussion	
	Uncertainty					
Domain 4. Variability and						
Domain 4: Variability and Metric	-	Low	$\times 1$	3	Not covered in detail	

		– continued from p	revious page		
Source Citation:	Atsdr,. 2009. Health consultation FLD004100152, Part 2.	: Indoor air quality: R	aytheon area: S	St. Petersburg, Pinellas County, Florida:	EPA facility ID:
Type of Data Source Hero ID	Occupational Exposure; Completed 3982212	Exposure or Risk Assessm	nents;		
EVALUATION					
Domain	Metric	Rating MWF	* Score	Comments	
Overall Quality I	Determination [†]	High	1.4		

Source Citation:	Niosh,. 19 Wisconsin	-	ort no. HHE-75-1	11-403, P	ort of Du	uluth-Superior Grain Elevators, Duluth, Minnesota and Superior
Type of Data Source Hero ID	Occupation 3974897	nal Exposure; Completed Exposu	ire or Risk Asses	sments;		
EXTRACTION Parameter			Data			
Life Cycle Stage:	:		Use			
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relia	bility					
	Metric 1:	Methodology	High	× 1	1	NIOSH
Domain 2: Repre	esentative					
1	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	Assesses grain elevator worker exposures, including to CCl4 fumigants, not a current category of use
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	1975-6
	Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Acces	ssibility/Cla	rity				
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Varia	bility and U	ncertainty				
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality I	Determinatio	\mathbf{n}^{\dagger}	Unacceptable		4	Metric Mean Score: 2.7.

* MWF = Metric Weighting Factor

	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.								
	Occupational Exposure; Monitoring Data; 5178607								
EXTRACTION									
Parameter			Data						
Life Cycle Stage:			Process a	nd Use					
Life Cycle Descrip	tion (Subc	ategory of Use):	destructio	on by deto	nation				
Route of Exposure			inhalatio	-					
Exposure Concent	ration (Uni	t):	mg/m3						
Number of Samples:			102						
Number of Sites:			3.0						
Worker Activity:			-			d 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: Reliabi	lity								
	Metric 1:	Methodology	High	$\times 1$	1	DOD			
Domain 2: Repres	entative								
-	Metric 2:	Geographic Scope	High	$\times 1$	1	US			
	Metric 3:	Applicability	High	$\times 2$	2	Specialty Use			
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2015			
	Metric 5:	Sample Size	Low	× 1	3	distribution of samples is qualitative or characterized by no statistics			
Domain 3: Access	ibility/Clar	ity							
	Metric 6:	Metadata Completeness	Low	× 1	3	Limited discussion of sampling details			
Domain 4: Variabi	ility and Ur	ncertainty							
	Metric 7:	Metadata Completeness	Low	× 1	3	No discussion of variability and uncertainty			
				-		a to the second s			
			Continu	ed on nex	t nogo				

		continued f	from pre	vious pa	ge
Source Citation:	1				ndustrial Hygiene (DOEHRS-IH). 2018. Email between DOD and valuation - EPA request for additional information. U.S. Department
Type of Data Source	Occupational Exposure; Monitoring Data;				
Hero ID	5178607				
EVALUATION					
Domain	Metric	Rating	MWF*	Score	Comments
Overall Quality	Determination [†]	Medium		1.7	

ype of Data Source Oc		013. Comment submitted by Fay nal Exposure; Monitoring Data;	ye Graul, Ex	ecutive D	virector,	Halogenated Solvents Industry Alliance, Inc
EXTRACTION Parameter			Data			
			Data			
Life Cycle Stage:			Manufactu			
Life Cycle Descriptio	on (Subca	ategory of Use):	manufactu			
Route of Exposure:			inhalation			
Exposure Concentration	ion (Uni	t):	ppm			
Number of Samples:			61			
Type of Measurement	t or Met	hod:	8-12 hr ex			
Worker Activity: Type of Sampling:						e, large line equipment opening, line opening, loading/ ng, transferring hazardous waste
CVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliability Me	y etric 1:	Methodology	Low	× 1	3	methodology not specified
Domain 2: Represent		Caramakia Saraa	II:-h	· · 1	1	
	etric 2: etric 3:	Geographic Scope Applicability	High High	$\times 1$ $\times 2$	1	US
	etric 5:	Temporal Representativeness	High	$\times 2 \times 2$	2 2	PBZ exposure to workers while manufacturing 2005-2016
	etric 4:	Sample Size	Medium	× 2 × 1	2	2005-2016 distribution is characterized by range with no statistics
IVIE	un J.	Sample Size	wiediuiii	~ 1	2	uisuiouuon is characterizeu by range with no statistics
Domain 3: Accessibil	lity/Clar	ity				
	etric 6:	Metadata Completeness	Medium	× 1	2	Includes sample type and exposure type but missing other metadata
		r				1 - 51
Domain 4: Variability	y and Ur	acertainty				
-	etric 7:	Metadata Completeness	Low	$\times 1$	3	No discussion of variability and uncertainty
Overall Quality Deter	minatio	n†	Medium		1.7	

		8. HSIA comments to U.S. EPA.				
	-	nal Exposure; Monitoring Data;				
Hero ID	5176376					
EXTRACTION						
Parameter			Data			
Life Cycle Stage:			Manufactu	ure		
Life Cycle Descrip	otion (Subc	ategory of Use):	manufactu	ire		
Route of Exposure	:		inhalation			
Exposure Concent	ration (Uni	t):	ppm			
Number of Sample	es:		354			
Type of Measurem	ent or Met	hod:	8-12 hr ex	posure		
Worker Activity:			technician	, maintei	nance, c	operator, process supervisor, electrician, millwright,
			tank area l	loader		
Type of Sampling:			personal			
Exposure Duration	1:		8 and 12-h	nr exposu	res	
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliabi	ility					
	Metric 1:	Methodology	Low	× 1	3	methodology not specified
					-	
Domain 2: Repres	entative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	High	$\times 2$	2	PBZ exposure to workers while manufacturing
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	2005-2018; some data older than 10 years
	Metric 5:	Sample Size	High	× 1	1	discrete samples provided
Domain 3: Access	ibility/Clar	rity				
	Metric 6:	Metadata Completeness	Medium	× 1	2	most metadata given, missing information on exposure duration and frequency
Domain 4: Variabi	ility and Ur	ocertainty				
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	No discussion of variability and uncertainty
				^ 1	5	To discussion of variability and uncertainty
	atorminatio	n†	Medium		1.8	
Overall Quality De		11	meanum		1.0	

	– continued from previous page								
Source Citation: Type of Data Source Hero ID	HSIA. 2018. HSIA comments to U.S. EPA. Occupational Exposure; Monitoring Data; 5176376								
EVALUATION									
Domain	Metric	Rating	MWF*	Score	Comments				

Source Citation:			94. Biologic	al monito	oring of	workers exposed to carbon tetrachloride vapor. Applied Occupationa
Type of Data Source		nmental Hygiene. nal Exposure; Monitoring Data;				
Hero ID	6656518	lai Exposure, montoring Data,				
EXTRACTION						
Parameter			Data			
Life Cycle Stage:			Reactant/i	ntermedi	ate	
Life Cycle Descrip	ption (Subc	ategory of Use):	Reactant/i	ntermedi	ate	
Route of Exposure	e:		inhalation			
Exposure Concent	tration (Uni	t):	mg/m3			
Number of Sample	es:		55			
Type of Measuren		hod:	half work	shift (4-h	r)	
Number of Worke			55			
Type of Sampling			personal			
Exposure Duration	n:		8-hr			
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliab	ility					
	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: Repres	sentative					
-	Metric 2:	Geographic Scope	Medium	$\times 1$	2	Italy
	Metric 3:	Applicability	High	$\times 2$	2	PBZ exposure to workers during use as an intermediate
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	1994
	Metric 5:	Sample Size	Medium	× 1	2	distribution is characterized by range and average but no other statistics
Domain 3: Access	sibility/Clar	ity				
	Metric 6:	Metadata Completeness	Medium	× 1	2	Includes sample type and exposure type but missing other metadata
Domain 4: Variab	ility and U	ncertainty				
	Metric 7:	Metadata Completeness	Low	× 1	3	The monitoring study addresses uncertainty in the exposure estimates
Overall Quality D	eterminatio	\mathbf{n}^{\dagger}	Medium		1.9	
			Continue	ed on nex	tnage	

nittori, S., Saretto, G., & Imbriani, M.,	1004 D: 1 .		
d Environmental Hygiene.	1994. Biologia	cal monitoring of wo	orkers exposed to carbon tetrachloride vapor. Applied Occupational
ccupational Exposure; Monitoring Dat	a;		
56518			
Metric	Rating	MWF [★] Score	Comments
2	cupational Exposure; Monitoring Dat 56518	cupational Exposure; Monitoring Data; 56518	cupational Exposure; Monitoring Data; 56518

Facility

Source Citation: Type of Data Source Hero ID	Holbrook, Facility; 3828875	M. T 2000. Kirk-Othmer Ency	clopedia of	Chemical	Techno	ologyCarbon tetrachloride.
EXTRACTION Parameter			Data			
Life Cycle Stage: Life Cycle Descr		atagory of Usa);	Manufact		maa fra	om 1960-1988
Process Descript	• ·	alegoly of Use).				Cl4 manufacture: Chlorination of Hydrocarbons, Oxy-
riceess Descript						ons, Carbon Disulfide Chlorination
Total Annual U.S	S. Volume (a	nd percent of PV):	346,080 to			·
Number of Sites:			6			
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relia	bility					
	Metric 1:	Methodology	High	$\times 1$	1	Kirk-othmer entry
	•					
Domain 2: Repre	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 2: Metric 3:	Applicability	High	$\times 1$ $\times 2$	2	US describes most current use as intermediate
	Metric 4:	Temporal Representativeness	Low	$\times 2 \times 2$	6	Data from greater than 20 years ago (1990).
	Metric 5:	Sample Size	Medium	$\times 1$	2	little sample size discussion
D	1.11. (01					
Domain 3: Acces	•	•	II:-L	V 1	1	
	Metric 6:	Metadata Completeness	High	× 1	1	complete range of data
Domain 4: Varia	bility and U	ncertainty				
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	no discussion of variability or uncertainty
Overall Quality I	Determinatio	n [†]	Medium		1.8	

Source Citation: Type of Data Source Hero ID	U.S, E. P. A Facility; 3840001	A 1980. Waste solvent reclamat	tion.			
EXTRACTION Parameter			Data			
Life Cycle Stage:			Use			
Life Cycle Descr Process Descript		ategory of Use):	Solvent recovery	•		arbon adsorption, scrubbing, distillation
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relia	bility					
	Metric 1:	Methodology	High	$\times 1$	1	Air Pollutant Emissions Factors (AP-42)
Domain 2: Repre	esentative					
2 onian 21 nopre	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	solvent not included in scope of CCl4 data
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	Data from greater than 20 years ago (1990).
	Metric 5:	Sample Size	Medium	$\times 1$	2	little sample size discussion
Domain 3: Acces	ssibility/Clar	ity				
Domain 5. 7 Keek	Metric 6:	Metadata Completeness	High	$\times 1$	1	complete range of data
Domain 4: Varia	bility and U	containty				
Domain 4. Varia	Metric 7:	Metadata Completeness	Low	$\times 1$	3	no discussion of variability or uncertainty
Overall Quality I	Determinatio	n [†]	Unacceptable		4	Metric Mean Score: 2.4.

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	U.S, E. P. A Facility; 3970165	A 2002. Occurrence summary a	and use supp	port docu	ment for	r the six-year review of national primary drinking water regulations.	
EXTRACTION Parameter			Data				
Life Cycle Stage: Life Cycle Description (Subcategory of Use): Process Description: Total Annual U.S. Volume (and percent of PV): Number of Sites:			Manufacture, process, & Use lists amounts of CCl4 on-site includes both manufacture, process, and use: ranges from 1,000 to 49,999,000 100				
EVALUATION							
Domain		Metric	Rating	MWF*	Score	Comments	
Domain 1: Relia	bility						
	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: Repre	esentative						
Domain 2. Repre	Metric 2:	Geographic Scope	High	$\times 1$	1	US	
	Metric 3:	Applicability	High	$\times 2$	2	Uses listed are included in scope	
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	Data from greater than 20 years ago (1989 to 1999)	
	Metric 5:	Sample Size	Medium	$\times 1$	2	uncertain statistics	
Domain 3: Acce	ssibility/Clar	ity					
	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	gives brief summary of process units and operation	
Domain 4: Varia	bility and U	cortainty					
Domain 4. Valla	Metric 7:	Metadata Completeness	Medium	$\times 1$	2	lists variability, limited discussion on uncertainty	
Overall Quality I	Determinatio	n [†]	Medium		1.8		

Source Citation: Type of Data Source Hero ID	Pubchem,. Facility; 3970247	2017. PubChem: Carbon tetracl	hloride.			
EXTRACTION			_			
Parameter			Data			
Life Cycle Stage:	:		Manufacture			
Total Annual U.S	S. Volume (a	nd percent of PV):	ranges from 2.6	6x1011g/	yr to 3.3	3x1011g/yr
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relia	bility					
	Metric 1:	Methodology	High	× 1	1	pubchem
Domain 2: Repre	esentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	pubchem report is a glorified MSDS, includes some production data
	Metric 4:	Temporal Representativeness	Unacceptable	$\times 2$	8	published 2017, data from pre Montreal protocol (1980 to 1988)
	Metric 5:	Sample Size	Unacceptable	× 1	4	uncertain statistics
Domain 3: Acces	ssibility/Clar	ity				
	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	data sources briefly described
Domain 4: Varia	bility and Ur	ncertainty				
Domain varia	Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality I	Determinatio	n [†]	Unacceptable		4	Metric Mean Score: 3.0.

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	Pubchem,. Facility; 3970247	2017. PubChem: Carbon tetracl	hloride.			
EXTRACTION Parameter			Data			
Turumeter			Dutu			
Life Cycle Stage:			import			
Total Annual U.S. Volume (and percent of PV):		nd percent of PV):	ranges from 3.0)x109g/y	r to 2.6x	1010g/yr and also lists 9.2x107 lb/yr
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relial	bility					
	Metric 1:	Methodology	High	× 1	1	pubchem
Domain 2: Repre	esentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	pubchem report is a glorified MSDS, includes some production data
	Metric 4:	Temporal Representativeness	Unacceptable	$\times 2$	8	published 2017, data from pre Montreal protocol (1980 to 1988)
	Metric 5:	Sample Size	Unacceptable	$\times 1$	4	uncertain statistics
Domain 3: Acces	sibility/Clar	ity				
	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	data sources briefly described
Domain 4: Varia	hility and Ur	acertainty				
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	no discussion of variability or uncertainty
Overall Quality I		<u> </u>	Unacceptable		4	Metric Mean Score: 3.0.
Overall Quality L	Jeterninatio	11	Unacceptable		4	Metric Mean Score: 3.0.

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	ToxNet Hat Facility; 3970275	zardous Substances Data, Bank.	2017. HSDB: Ca	arbon teti	achloric	de.
EXTRACTION Parameter			Data			
Life Cycle Stage: Total Annual U.S		nd percent of PV):	manufacture ranges from 2. lbs/yr	9x1011g	/yr to 3.	.3x1011g/yr and 2.95 x 108 lbs/yr to 5.87x108
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relia	bility					
	Metric 1:	Methodology	High	$\times 1$	1	US international trade commission
Domain 2: Repre	esentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	High	$\times 2$	2	manufacture
	Metric 4:	Temporal Representativeness	Unacceptable	$\times 2$	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: Acces	ssibilitv/Clar	itv				
	Metric 6:	Metadata Completeness	High	$\times 1$	1	complete data
Domain 4: Varia	bility and Ur	ncertainty				
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	no discussion of variability or uncertainty
Overall Quality I	Determinatio	n†	Unacceptable		4	Metric Mean Score: 2.1.

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	ToxNet Ha Facility; 3970275	zardous Substances Data, Bank.	2017. HSDB: C	arbon teti	rachloric	le.
EXTRACTION Parameter			Data			
			. <u>,</u>			
Life Cycle Stage: Total Annual U.S		nd percent of PV):	import 3.0x109 g/yr to	o 2.6x101	0 g/yr	
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relia	bility					
	Metric 1:	Methodology	High	× 1	1	US international trade commission
Domain 2: Repre	esentative					
1	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	High	$\times 2$	2	import
	Metric 4:	Temporal Representativeness	Unacceptable	$\times 2$	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: Acces	ssibility/Clar	rity				
	Metric 6:	Metadata Completeness	High	× 1	1	complete data
Domain 4: Varia	bility and U	ncertainty				
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	no discussion of variability or uncertainty
Overall Quality I	Determinatio	\mathbf{n}^{\dagger}	Unacceptable		4	Metric Mean Score: 2.1.

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	Kim, E. A., Facility; 3970550	Bernard, B. P.,Esswein, E. J., 20	005. Health	hazard ev	valuatio	n report no.HETA 2004-0169-2982, U.S. Mangesium, Rowley, Utah
EXTRACTION Parameter			Data			
Life Cycle Stage: Life Cycle Descri Process Descriptio		ategory of Use):	concentra	product are of ma ted in brin , and chlo	ne by eva rine are	n ingots and chemical byproducts: Natural MgCl2 is aporation and spray dryers, dried MgCl2, oxygen, iron, added to melt reactor, product flows out of reactor and
Total Annual U.S. Number of Sites: Possible Physical		nd percent of PV):				nesium per year
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliab	ility Metric 1:	Methodology	High	× 1	1	NIOSH health hazard evaluation
Domain 2: Repres	sentative					
Domain 2. Repres	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	High	$\times 2$	2	manufacture
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	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: Access	sibilitv/Clar	itv				
	Metric 6:	Metadata Completeness	Low	$\times 1$	3	report focus is exposure
Domain 4: Variab	oility and Un Metric 7:	certainty Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality D	etermination	n†	Medium		1.9	

Type of Data Source Fa	urroughs, acility; 970563	G. E.,Horan, J.: 1982. Health h	azard evaluation	report no). HETA	80-147-1076, Calhio Chemical Copmany, Perry, Ohio.
EXTRACTION Parameter			Data			
Life Cycle Stage: Life Cycle Description Process Description:		ategory of Use):	reactors by chl	nethylmer orinating	carbon	for manufacture of fungicide is prepared in batch disulfide in the presence of an iodine catalyst. tetrachloride are produced as by-products in the
Number of Sites:			1			
Possible Physical Fo	orm:		gas			
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliabilit	ty					
М	letric 1:	Methodology	High	$\times 1$	1	NIOSH health hazard evaluation
Domain 2: Represen	tativa					
-	letric 2:	Geographic Scope	High	$\times 1$	1	US
	letric 3:	Applicability	High	$\times 2$	2	Agricultural products manufacturing
	letric 4:	Temporal Representativeness	Unacceptable	$\times 2$	8	data from pre Montreal protocol (1982)
	letric 5:	Sample Size	Low	× 1	3	distribution not characterized by statistics
Domain 3: Accessib	ulity/Clari	ity				
	letric 6:	Metadata Completeness	Low	$\times 1$	3	report focus is exposure
Domain 4: Variabili	tv and Un	certainty				
	letric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.3.	
			Continued on	next pag	e	

		– continued from	previous page	
Source Citation: Type of Data Source Hero ID	Burroughs, G. E.,Horan, J., 1982. Health Facility; 3970563	hazard evaluation	report no. HETA 80-14	7-1076, Calhio Chemical Copmany, Perry, Ohio.
EVALUATION Domain	Metric	Rating	MWF* Score	Comments

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	Holbrook, Facility; 3981045	M. T., 2000. Kirk-Othmer Ency	clopedia of Chem	nical Tech	nology	Carbon tetrachloride.
EXTRACTION Parameter			Data			
Life Cycle Stage: Life Cycle Descr		ategory of Use):	Manufacture US production	volumes	from 19	960-1988
Process Descript	ion:		chlorination of	Hydroca	rbons, C	nanufacture: Chlorination of Hydrocarbons, Oxy- Carbon Disulfide Chlorination
Total Annual U.S Number of Sites:		nd percent of PV):	346,080 tons/yı 6	r in 1988		
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relia	bility					
	Metric 1:	Methodology	High	× 1	1	Kirk-othmer entry
Domain 2: Repre	esentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	REPEAT ENTRY
	Metric 4:	Temporal Representativeness	Unacceptable	$\times 2$	8	pre Montreal protocol, most recent data from 1990.
	Metric 5:	Sample Size	Medium	× 1	2	little sample size discussion
Domain 3: Acces	ssibility/Clar	ity				
	Metric 6:	Metadata Completeness	High	× 1	1	complete range of data
Domain 4: Varia	bility and Ur	ncertainty				
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	no discussion of variability or uncertainty
Overall Quality I	Determinatio	n [†]	Unacceptable		4	Metric Mean Score: 2.7.

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	Holbrook, Facility; 3981046	M. T., 2003. Kirk-Othmer Ency	clopedia of Chem	nical Tech	nology	Chloroform.
EXTRACTION Parameter			Data			
Life Cycle Stage:	:		Manufacture			
Life Cycle Description (Subcategory of Use):		US production	volumes	of chlor	roform of 2003	
Process Descript	ion:					oform manufacture: oxychlrination of methane,
						loride, reduction of alcohols and ketones
	5. Volume (a	nd percent of PV):	91,000,000 kg/	yr capaci	ty	
Number of Sites:			4			
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relia	bility					
	Metric 1:	Methodology	High	× 1	1	Kirk-othmer entry
Domain 2: Repre	esentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	NOT for CCl4 but for Chloroform
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data from greater than 10 years ago (2003)
	Metric 5:	Sample Size	Low	× 1	3	distribution not characterized by statistics
Domain 3: Acces	ssibility/Clar	ity				
	Metric 6:	Metadata Completeness	Low	$\times 1$	3	methods, data sources not thoroughly explained
Domain 4: Varia	bility and Ur	ncertainty				
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	no discussion of variability or uncertainty
Overall Quality I	Determinatio	n [†]	Unacceptable		4	Metric Mean Score: 2.6.

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	Weil, E. D. Facility; 3981048	"Sandler, S. R.,Gernon, M 200	6. Kirk-Othmer H	Encyclope	edia of C	Chemical TechnologySulfur compounds.
EXTRACTION Parameter			Data			
Life Cycle Stage: Life Cycle Descr Process Descripti	iption (Subc	ategory of Use):	Manufacture production met	al manufa	acture o	d byproduct of sulfur compound production f carbon tetrachloride by chlorination of carbon pride
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relial	bility					
	Metric 1:	Methodology	High	$\times 1$	1	Kirk-othmer entry
Domain 2: Repre	esentative					
Domain 21 Hope	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	focus NOT for CCl4 but for sulfur compounds
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data from greater than 10 years ago (2005)
	Metric 5:	Sample Size	Low	$\times 1$	3	distribution not characterized by statistics
Domain 3: Acces	ssibility/Clar	itv				
Domain 5. Theory	Metric 6:	Metadata Completeness	Low	$\times 1$	3	methods, data sources not thoroughly explained
Domain 4: Varia	bility and Ur Metric 7:	ncertainty Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality I	Determinatio	n†	Unacceptable		4	Metric Mean Score: 2.6.

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	Kirk, Othn Facility; 3994180	ner. 2004. Kirk-Othmer Encyclop	pedia of Chemica	al Techno	logyChl	orocarbons and chlorohydrocarbons.
EXTRACTION Parameter			Data			
Life Cycle Stage: Life Cycle Descr Total Annual U.S	iption (Subc	ategory of Use): nd percent of PV):	Manufacture byproduct of th 20,000 tons	nermal ch	lorinatio	on to produce trichloroethylene
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relia	bility					
	Metric 1:	Methodology	High	× 1	1	Kirk-othmer entry
Domain 2: Repre	esentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	doesn't describe process to produce CCl4 but descibes it as a byproduct ir trichloroethylene
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data from greater than 10 years ago (2004)
	Metric 5:	Sample Size	Low	× 1	3	distribution not characterized by statistics
Domain 3: Acces	ssibility/Clar	ity				
	Metric 6:	Metadata Completeness	Low	$\times 1$	3	methods, data sources not thoroughly explained
Domain 4: Varia	bility and U	ncertainty				
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	no discussion of variability or uncertainty
Overall Quality I	Determinatio	n†	Unacceptable		4	Metric Mean Score: 2.6.

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	Spin,. 201 Facility; 3981129	7. SPIN substances in preparatio	ns in nordic cour	ntries tetra	achloror	nethane.
EXTRACTION						
Parameter			Data			
Life Cycle Stage:	:		Use			
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relial	bility					
	Metric 1:	Methodology	High	× 1	1	Trusted Source (Danish EPA)
Domain 2: Repre	esentative					
-	Metric 2:	Geographic Scope	Medium	$\times 1$	2	OECD countries ("Nordic Countries")
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	Database search listing country CCl4 use with very limited details listed (tonnes)
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Data from less than 10 years ago (2000-2014)
	Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Acces	ssibility/Cla	rity				
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Varia	bility and U	ncertainty				
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality I	Determinatio	\mathbf{n}^{\dagger}	Unacceptable		4	Metric Mean Score: 2.2.

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	Nih,. 2016 Facility; 3982329	. Report on carcinogens: Carbor	ı tetrachlo	oride.		
EXTRACTION Parameter			Data			
Life Cycle Stage: Life Cycle Descri Total Annual U.S	iption (Subc	ategory of Use): nd percent of PV):	Import import 90 lb in	nported s	ince 199	96
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relial	bility Metric 1:	Methodology	High	× 1	1	NTP from NIEHS
Domain 2: Repre	centative					
Domain 2. Repre	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	High	$\times 2$	2	import
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Data from less than 10 years ago (2009)
	Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Acces	sibility/Clar	itv				
	Metric 6:	Metadata Completeness	Low	$\times 1$	3	limited data, only includes production volume
Domain 4: Varia	bility and Ur	certainty				
		Metadata Completeness	Low	$\times 1$	3	no discussion of variability or uncertainty
Overall Quality I	Determinatio	n [†]	High		1.4	

Source Citation: Type of Data Source Hero ID	Nih,. 2016 Facility; 3982329	. Report on carcinogens: Carbor	n tetrachlo	oride.		
EXTRACTION Parameter			Data			
Life Cycle Stage: Life Cycle Descr Total Annual U.S Number of Sites:	iption (Subc . Volume (a	ategory of Use): nd percent of PV):		cture ic manufa lion lbs (I		rted)
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relia	bility Metric 1:	Methodology	High	× 1	1	NTP from NIEHS
Domain 2: Repre						
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	High	$\times 2$	2	manufacture
	Metric 4: Metric 5:	Temporal Representativeness Sample Size	High High	$\times 2$ $\times 1$	2 1	Data from less than 10 years ago (2009) complete data
Domain 3: Acces	aibility/Clar	*				•
Domain 5. Acces	Metric 6:	Metadata Completeness	Low	× 1	3	limited data, only includes production volume
Domain 4: Varia	bility and Ur	ncertainty				
	Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality I	Determinatio	n†	High		1.4	

Source Citation: Type of Data Source Hero ID	Atsdr,. 200 Facility; 3982336	5. Toxicological profile for carb	on tetrach	lloride.		
EXTRACTION Parameter			Data			
Life Cycle Stage: Life Cycle Descr Total Annual U.S Number of Sites:	iption (Subca . Volume (ar	ategory of Use): nd percent of PV):		ic manufa		s combined)
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relia	bility Metric 1:	Methodology	High	× 1	1	US HHS
Domain 2: Repre	esentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	High	$\times 2$	2	manufacture
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Data from less than 10 years ago (2004)
	Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Acces	sibility/Clar	ity				
	Metric 6:	Metadata Completeness	Low	$\times 1$	3	limited data, only includes production volume
Domain 4: Varia	bility and Ur	ncertainty				
	Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality I	Determinatio	n†	High		1.4	

Source Citation: Type of Data Source Hero ID	Atsdr,. 200 Facility; 3982336	05. Toxicological profile for carb	on tetrach	nloride.		
EXTRACTION Parameter			Data			
Life Cycle Stage: Life Cycle Descri Total Annual U.S	iption (Subc	ategory of Use): nd percent of PV):	manufa import <50 kg		for bot	h 2002 and 2003)
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliab	oility Metric 1:	Methodology	High	× 1	1	US HHS
Domain 2: Repre	sentative					
Domain 2. Repre	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	High	$\times 2$	2	manufacture
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Data from less than 10 years ago (2004)
	Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Acces	sibility/Clar	ity				
	Metric 6:	Metadata Completeness	Low	× 1	3	limited data, only includes production volume
Domain 4: Varial	bility and Ur	ncertainty				
	Metric 7:	-	Low	$\times 1$	3	no discussion of variability or uncertainty
Overall Quality D	Determinatio	n [†]	High		1.4	

Source Citation: Type of Data Source Hero ID	Oecd,. 200 Facility; 3827298	9. Emission scenario documents	s on coating indu	stry (pain	ıts, lacqı	uers and varnishes).
EXTRACTION Parameter			Data			
Farameter			Data			
Life Cycle Stage:			Use			
Life Cycle Descr	iption (Subc	ategory of Use):	Paints and Coa	tings		
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relial	bility					
	Metric 1:	Methodology	High	$\times 1$	1	OECD
Domain 2: Repre	esentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	paints and Coatings are excluded from scope
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Data from less than 10 years ago (2009)
	Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Acces	ssibility/Clar	ity				
	Metric 6:	Metadata Completeness	Low	$\times 1$	3	No quantitative data, document only discusses production of VOCs
Domain 4: Varia	bility and Ur	ncertainty				
	Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality I	Determinatio	n [†]	Unacceptable		4	Metric Mean Score: 2.1.

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	Oecd,. 200 Facility; 3827299	9. Emission scenario document	on adhesive form	ulation.		
EXTRACTION Parameter			Data			
Life Cycle Stage:			Use			
Life Cycle Descr	iption (Subc	ategory of Use):	Industrial Adhe	esives		
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relia	bility					
	Metric 1:	Methodology	High	× 1	1	OECD
Domain 2: Repre	esentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	industrial adhesives are excluded from scope
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Data from less than 10 years ago (2009)
	Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Acces	ssibility/Clar	ity				
	Metric 6:	Metadata Completeness	Low	$\times 1$	3	No quantitative data, document only discusses production of VOCs
Domain 4: Varia	bility and Ur	certainty				
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	no discussion of variability or uncertainty
Overall Quality I	Determinatio	*	Unacceptable		4	Metric Mean Score: 2.1.

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	Oecd, 201 Facility; 3827300	3. Emission scenario document	on the industrial	use of ad	hesives	for substrate bonding.
EXTRACTION Parameter			Data			
Life Cycle Stage:			Use			
Life Cycle Descr		ategory of Use):	Industrial Adhe	esives		
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relial	bility					
	Metric 1:	Methodology	High	× 1	1	OECD
Domain 2: Repre	esentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	industrial adhesives are excluded from scope
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Data from less than 10 years ago (2013)
	Metric 5:	Sample Size	High	$\times 1$	1	complete data
Domain 3: Acces	ssibility/Clar	rity				
	Metric 6:	Metadata Completeness	Low	× 1	3	No quantitative data, document only discusses production of VOCs
Domain 4: Varia	bility and U	ncertainty				
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	no discussion of variability or uncertainty
Overall Quality I	Determinatio	\mathbf{n}^{\dagger}	Unacceptable		4	Metric Mean Score: 2.1.

* MWF = Metric Weighting Factor

Source Citation:						the Emergency Planning and Community Right- To-Know Act bility Act (CERCLA) and Section 112(r) of the Clean Air Act.
Type of Data Source Hero ID	Facility; 3378218	1	1 1			
EXTRACTION Parameter			Data			
Life Cycle Stage	:		Use			
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relia	bility					
	Metric 1:	Methodology	High	× 1	1	EPA
Domain 2: Repre	esentative					
•	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	8	lists required quantity for EPCRA and CERCLA, not helpful
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Data from less than 10 years ago (2015)
	Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Acce	ssibility/Clar	rity				
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Varia	bility and U	ncertainty				
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality I	Determinatio	n [†]	Unacceptable		4	Metric Mean Score: 2.0.

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	Murphy, B Facility; 3544388	. L 2016. Vapor degreasing wit	h chlorinated sol	vents. En	ivironme	ental Forensics.
EXTRACTION Parameter			Data			
Life Cycle Stage:			Use			
Life Cycle Descr		ategory of Use):	Vapor Degreas	ing		
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relial	bility					
	Metric 1:	Methodology	Medium	× 1	2	high quality data not necessarily a trusted source
Domain 2: Repre	esentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	High	$\times 2$	2	vapor degreasing
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Data from less than 10 years ago (2016)
	Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Acces	ssibility/Clar	itv				
	Metric 6:	Metadata Completeness	Unacceptable	$\times 1$	4	no discussion of carbon tet production of quantity of use, although describes using vapor degreasing
Domain 4: Varia	bility and Ur	certainty				
Domain 4. Valla	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality I	Determinatio	n†	Unacceptable		4	Metric Mean Score: 1.6.

* MWF = Metric Weighting Factor

Source Citation:	CARBON-		ES AND EMISSI			I.,Prinn, R. G.,Fraser, P. J.,Rasmussen, R. A.,Rosen, R. D., 1988 INED FROM DAILY GLOBAL MEASUREMENTS DURING
Type of Data Source Hero ID	Facility; 3569634					
EXTRACTION						
Parameter			Data			
Life Cycle Stage:	:		Manufacture			
Life Cycle Descr	ription (Subc	ategory of Use):	US production	volumes	from 19	972-1985
Total Annual U.S	S. Volume (a	nd percent of PV):	1083.3 x 106 k	g/yr (198	5)	
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relia	hility					
	Metric 1:	Methodology	High	× 1	1	Journal of Atmospheric chemistry
Domain 2: Repre	esentative					
1	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	High	$\times 2$	2	manufacture
	Metric 4:	Temporal Representativeness	Unacceptable	$\times 2$	8	data from pre Montreal protocol (1985)
	Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Acces	ssibility/Clar	ity				
	Metric 6:	Metadata Completeness	Low	× 1	3	no discussion of carbon tet manufacturing process, daily throughput, or worker interaction
Domain 4: Varia	bility and U	ncertainty				
	Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality I	Determinatio	'n [†]	Unacceptable		4	Metric Mean Score: 2.1.

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	U.S, E. P. A Facility; 3827302								
EXTRACTION			Data						
Parameter			Data						
Life Cycle Stage	:		Manufact	ure					
Life Cycle Descr			manufactu						
		nd percent of PV):	149,927,2	41 lbs/yr	(2011)				
Number of Sites:			9						
EVALUATION									
Domain		Metric	Rating	MWF*	Score	Comments			
Domain 1: Relia	bility								
	Metric 1:	Methodology	High	× 1	1	EPA			
Domain 2: Repre	esentative								
1	Metric 2:	Geographic Scope	High	$\times 1$	1	US			
	Metric 3:	Applicability	High	$\times 2$	2	manufacture			
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Data from less than 10 years ago (2017)			
	Metric 5:	Sample Size	High	× 1	1	complete data			
Domain 3: Acce	ssibility/Clar	ity							
	Metric 6:	Metadata Completeness	Medium	× 1	2	annual manufacture and import volumes, minimal details			
Domain 4: Varia	bility and Ur	ncertainty							
	Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty			
Overall Quality I	Determinatio	n†	High		1.3				

Source Citation: Type of Data Source Hero ID	Weil, E. D. Facility; 2346119	"Sandler, S. R.,Gernon, M 200	6. Kirk-Oth	mer Ency	clopedi	a of Chemical TechnologySulfur compounds.
EXTRACTION			_			
Parameter			Data			
Life Cycle Stage:			Use			
Life Cycle Descr	iption (Subca	ategory of Use):	Reactant			
Process Descript	ion:		Thiophos	gene form	s from	carbon tet and hydrogen sulfide
Total Annual U.S	. Volume (ar	nd percent of PV):	0 US proc	luction		
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relia	bility					
	Metric 1:	Methodology	High	× 1	1	Kirk-othmer entry
Domain 2: Repre	sentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	High	$\times 2$	2	Reactant
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data from greater than 10 years ago (2006)
	Metric 5:	Sample Size	Low	× 1	3	very little process detail
Domain 3: Acces	sibility/Clar	ity				
	Metric 6:	Metadata Completeness	Low	$\times 1$	3	No quantitative data, document only briefly discusses use as a reactant
Domain 4: Varia	bilitv and Ur	ncertainty				
	Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality I	Determinatio	n [†]	Medium		1.9	

Source Citation: Type of Data Source Hero ID	Weil, E. D. Facility; 2346119	"Sandler, S. R.,Gernon, M 200	6. Kirk-Oth	mer Ency	clopedia	a of Chemical TechnologySulfur compounds.
EXTRACTION			Data			
Parameter			Data			
Life Cycle Stage:			Use			
Life Cycle Descri		ategory of Use):	Reactant			
Process Descripti	on:		trichloron contact w		lfenyl c	hloride decomposes slowly at BP especially when in
Total Annual U.S	. Volume (a	nd percent of PV):	minimal	iui non		
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relial	oility					
Domain 1. Kella	Metric 1:	Methodology	High	$\times 1$	1	Kirk-othmer entry
Domain 2: Repre	sentative					
Domain 2. Repre	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	High	$\times 2$	2	Reactant
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data from greater than 10 years ago (2006)
	Metric 5:	Sample Size	Low	× 1	3	very little process detail
Domain 3: Acces	sibility/Clar	ity				
	Metric 6:	Metadata Completeness	Low	× 1	3	No quantitative data, document only briefly discusses use as a reactant
Domain 4: Varia	bility and Ur	ncertainty				
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	no discussion of variability or uncertainty
Overall Quality I	Determinatio	n [†]	Medium		1.9	

Source Citation: Type of Data Source Hero ID	Echa,. 201 Facility; 3839957	7. Substance information: Carbo	on tetrachloi	ride.		
EXTRACTION Parameter			Data			
Life Cycle Stage: Life Cycle Descri Total Annual U.S		ategory of Use): nd percent of PV):	Manufacti manufacti 1000-100	are and in		
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliab	vility					
	Metric 1:	Methodology	High	$\times 1$	1	ECHA
Domain 2: Repre	sentative					
· · · · · · · · · · · · · · · · · · ·	Metric 2:	Geographic Scope	Medium	$\times 1$	2	European Union
	Metric 3:	Applicability	High	$\times 2$	2	manufacture
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Data from less than 10 years ago (2016)
	Metric 5:	Sample Size	Low	× 1	3	no process detail
Domain 3: Acces	sibilitv/Clar	itv				
	Metric 6:	Metadata Completeness	Low	× 1	3	No quantitative data, document only briefly discusses use as a reactant
Domain 4: Varial	vility and Ur	acertainty				
Domain 1. Variat	Metric 7:		Low	$\times 1$	3	no discussion of variability or uncertainty
Overall Quality D	eterminatio	Overall Quality Determination [†]			1.8	

Source Citation: Type of Data Source Hero ID	Echa,. 201 Facility; 3970708	7. Carbon tetrachloride, Part 2.				
EXTRACTION						
Parameter			Data			
Life Cycle Stage:	:		Use			
Life Cycle Descr	iption (Subca	ategory of Use):	chemical and p	hysical p	roperties	S
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relia	bility					
	Metric 1:	Methodology	N/A		N/A	No Comment.
Domain 2: Repre	esentative					
-	Metric 2:	Geographic Scope	N/A		N/A	No Comment.
	Metric 3:	Applicability	Unacceptable	$\times 2$	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: Acces	ssibilitv/Clar	itv				
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Varia	bility and Ur	certainty				
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality I	Determination	n [†]	Unacceptable		4	Metric Mean Score: 4.0.

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	Orau Team Facility; 3974899							
EXTRACTION Parameter			Data					
Life Cycle Stage:			Use					
Life Cycle Descr	iption (Subc	ategory of Use):	degreasing	g				
Process Description:		were put	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		curcon c			
EVALUATION								
Domain		Metric	Rating	MWF*	Score	Comments		
Domain 1: Relial	bility							
	Metric 1:	Methodology	High	× 1	1	NIOSH		
Domain 2: Repre	sentative							
	Metric 2:	Geographic Scope	High	$\times 1$	1	US		
	Metric 3:	Applicability	High	$\times 2$	2	metal degreasing(bath)		
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	Data from greater than 10 years ago (2004)		
	Metric 5:	Sample Size	Low	$\times 1$	3	no process detail		
Domain 3: Acces	sibility/Clar	ity						
	Metric 6:	Metadata Completeness	Low	× 1	3	No quantitative data, document only briefly discusses use as a degreaser		
Domain 4: Varia	bility and Ur	ncertainty						
	Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty		
Overall Quality I	Determinatio	n [†]	Medium		1.9			

Type of Data Source	European C Facility; 3982129								
EXTRACTION Parameter			Data						
Life Cycle Stage: Life Cycle Descrip Process Descriptio		ategory of Use):	Manufacti manufacti high temp	are and in		ion of propylene or methane			
EVALUATION									
Domain		Metric	Rating	MWF★	Score	Comments			
Domain 1: Reliab	ility								
	Metric 1:	Methodology	High	× 1	1	ECSA			
Domain 2: Repres	entative								
•	Metric 2:	Geographic Scope	Medium	$\times 1$	2	European Union (OECD)			
	Metric 3:	Applicability	High	$\times 2$	2	manufacture			
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Data from less than 10 years ago (2016)			
	Metric 5:	Sample Size	Low	× 1	3	no process detail			
Domain 3: Access	sibility/Clar	ity							
	Metric 6:	Metadata Completeness	Low	$\times 1$	3	No quantitative data, document only briefly discusses use as a reactant			
Domain 4: Variab	ility and Ur	acertainty							
	Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty			
Overall Quality Determination [†]		Medium		1.8					

Source Citation: Type of Data Source Hero ID	European C Facility; 3982129	Chlorinated Solvents, Association	n. 2017. Ch	lorinated	solvent	s: Glossay.
EXTRACTION Parameter			Data			
Life Cycle Stage: Life Cycle Descrip Process Description		ategory of Use):	Use reactant a feedstoc	k in the p	roductio	on of CFCs, HCFCs and HFCs
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliab	ility					
	Metric 1:	Methodology	High	$\times 1$	1	ECSA
Domain 2: Repres	sentative					
- ·····	Metric 2:	Geographic Scope	Medium	$\times 1$	2	European Union (OECD)
	Metric 3:	Applicability	High	$\times 2$	2	manufacture
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Data from less than 10 years ago (2016)
	Metric 5:	Sample Size	Low	× 1	3	no process detail
Domain 3: Access	sibilitv/Clar	itv				
	Metric 6:	Metadata Completeness	Low	× 1	3	No quantitative data, document only briefly discusses use as a reactant
Domain 4: Variab	ulity and Ur	ocertainty				
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	no discussion of variability or uncertainty
Overall Quality Determination [†]			Medium		1.8	

Source Citation: Type of Data Source Hero ID	European C Facility; 3982129	Chlorinated Solvents, Association	n. 2017. Ch	lorinated	solvent	s: Glossay.
EXTRACTION Parameter			Data			
Life Cycle Stage: Life Cycle Descri Process Descripti		ategory of Use):		gent in the		ction of chlorine, to extract nitrogen trichloride, and as e from tail gas
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliat	oility Metric 1:	Methodology	High	× 1	1	ECSA
Domain 2: Repre	sentative					
	Metric 2:	Geographic Scope	Medium	$\times 1$	2	European Union (OECD)
	Metric 3:	Applicability	High	$\times 2$	2	manufacture
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Data from less than 10 years ago (2016)
	Metric 5:	Sample Size	Low	$\times 1$	3	no process detail
Domain 3: Acces	sibility/Clar	ity				
	Metric 6:	Metadata Completeness	Low	$\times 1$	3	No quantitative data, document only briefly discusses use as a reactant
Domain 4: Varial	oility and Ur	acertainty				
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	no discussion of variability or uncertainty
Overall Quality D	Determinatio	n†	Medium		1.8	

Source Citation: Type of Data Source Hero ID	Nfesc,. 200 Facility; 3981115	01. Wet air oxidation for wastewa	ater treatment.					
EXTRACTION Parameter			Data					
Life Cycle Stage: Life Cycle Description (Subcategory of Use): Process Description:		Use Disposal 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: Relia	bility Metric 1:	Methodology	Low	× 1	3	Joint Service Pollution Prevention Opportunity Handbook		
Domain 2. Doma	antotiva							
Domain 2: Repre	Metric 2:	Geographic Scope	High	$\times 1$	1	US		
	Metric 3:	Applicability	Unacceptable	$\times 2$	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: Acces	ssibility/Clar	itv						
	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: Varia	bility and Ur	ncertainty						
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.		
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 3.0.			

* MWF = Metric Weighting Factor

Source Citation:		,Wang, J. D.,Shih, T. S.,Lan, F. I yl alcohol and an air conditioning				achloride poisoning in a color printing factory related to the use
Type of Data Source Hero ID	Facility; 62382		, system in Tarwe		icun you	
EXTRACTION Parameter			Data			
Life Cycle Stage	:		Use			
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relia	bility					
	Metric 1:	Methodology	Medium	× 1	2	American Journal of Industrial Med.
Domain 2: Repre	esentative					
-	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	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: Acce	ssibility/Clar	rity				
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Varia	bility and U	ncertainty				
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality I	Determinatio	\mathbf{n}^{\dagger}	Unacceptable		4	Metric Mean Score: 2.8.

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	Bommarajı Facility; 3859414	u, T. V.,Luke, B.,O'Brien, T. F.,E	Blackburn, M. C	. 2004. C	hlorine.	
EXTRACTION						
Parameter			Data			
Life Cycle Stage:			Use			
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relia	bility					
	Metric 1:	Methodology	Medium	× 1	2	Textbook
Domain 2: Repre	esentative					
- ·····	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	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: Acces	ssibility/Clar	ity				
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Varia	bility and U	certainty				
Domain 4. Varia	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality I	Determinatio	n [†]	Unacceptable		4	Metric Mean Score: 2.8.

* MWF = Metric Weighting Factor

Type of Data Source Facility	Marshall, K. A.,Pottenger, L. H 2004. Chlorocarbons and chlorohydrocarbons. Facility; 3859415							
EXTRACTION Parameter		Data						
Life Cycle Stage: Life Cycle Description (St Process Description:	Manufacture Domestic Manufacture 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		High	$\times 1$	1	US			
Metric 3	11 5	Medium	$\times 2$	4	Manufacture information for methyl chloride, which creates Carbon tetrachlo- ride as a byproduct.			
Metric 4	1 1	High	$\times 2$	2	2004			
Metric	5: Sample Size	N/A		N/A	Not applicable			
Domain 3: Accessibility/C	larity							
Metric	-	N/A		N/A	Not applicable			
Domain 4: Variability and	Uncertainty							
Metric 2	-	N/A		N/A	Not applicable			
Overall Quality Determina	tion [†]	High		1.5				
		Continue	ed on nex	t nage				

		- continued from previous	page	
Source Citation: Type of Data Source Hero ID	Marshall, K. A.,Pottenger, L. H., 2004. Facility; 3859415	Chlorocarbons and chlorohydr	rocarbons.	
EVALUATION				
Domain	Metric	Rating MWF* Score	e C	omments
				_

- continued from previous page

Source Citation: Type of Data Source Hero ID	Holbrook, Facility; 3859416	M. T 2004. Methylene chloride	2.				
EXTRACTION Parameter			Data				
Life Cycle Stage: Life Cycle Description (Subcategory of Use): Process Description:		Manufacture Domestic Manufacture 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 emplys the reaction of hydrogen chloride and methanol to give methyl chloride, chloroform and carbon tetrachloride.					
EVALUATION							
Domain		Metric	Rating	MWF*	Score	Comments	
Domain 1: Relia	bility						
	Metric 1:	Methodology	Medium	× 1	2	Textbook	
Domain 2: Repre	esentative						
	Metric 2:	Geographic Scope	High	$\times 1$	1	US	
	Metric 3:	Applicability	Medium	$\times 2$	4	Manufacture information for methyl chloride, which creates Carbon tetrachlo- ride as a byproduct.	
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2006	
	Metric 5:	Sample Size	N/A		N/A	No Comment.	
Domain 3: Acces	ssibility/Clar	itv					
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.	
Domain 4: Varia	bility and Ur	certainty					
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.	
	Determinatio		High		1.5		

Source Citation: Type of Data Source Hero ID	Larranaga, Facility; 3982122	•							
EXTRACTION Parameter			Data						
Life Cycle Stage: Life Cycle Description (Subcategory of Use): Process Description:			Use Other Uses Typical Use: Refrigerants. Metal degreasing, agriculturalfumigant, chlorinat- ing organic compounds, productionof semiconductors, solvent (fats, oils, rub- ber,etc.).Note: Not permitted in products intended for homeuse.Derivation: (1) Interaction of carbon disulfide andchlorine in the presence of iron; (2) chlorination ofmethane or higher hydrocarbons at 250400C.						
EVALUATION									
Domain		Metric	Rating	MWF*	Score	Comments			
Domain 1: Relia	bility								
	Metric 1:	Methodology	Low	$\times 1$	3	Unknown			
Domain 2: Repr	esentative								
	Metric 2:	Geographic Scope	Low	$\times 1$	3	Unknown			
	Metric 3:	Applicability	Low	$\times 2$	6	Includes general use and manufacture information			
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	Unknown			
	Metric 5:	Sample Size	Low	$\times 1$	3	No Comment.			
Domain 3: Acce	ssibility/Cla	ity							
	Metric 6:	Metadata Completeness	Low	$\times 1$	3	No Comment.			
Domain 4: Varia	bility and U	ncertainty							
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	No Comment.			
Overall Quality Determination [†]		Low		3.0					

Source Citation: Type of Data Source Hero ID	Osha,. 201 Facility; 3978249	7. OSHA occupational chemical	l database: Carbo	on tetrach	loride.	
EXTRACTION						
Parameter			Data			
Life Cycle Stage:			Manufacture, p	process, &	t Use	
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relial	bility					
	Metric 1:	Methodology	High	$\times 1$	1	USDOL
Domain 2: Repre	esentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	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: Acces	ssibility/Clar	ity				
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Varia	bility and Ur	ncertainty				
Domain 4. Varia	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality I	Determinatio	n [†]	Unacceptable		4	Metric Mean Score: 2.5.

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	Osha,. 200 Facility; 3980999	5. OSHA permissible exposure	limit and general	informat	ion: car	bon tetrachloride.
EXTRACTION						
Parameter			Data			
Life Cycle Stage:			Manufacture, p	process, &	z Use	
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relial	bility					
	Metric 1:	Methodology	High	× 1	1	USDOL
Domain 2: Repre	esentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	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: Acces	ssibility/Clar	ity				
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Varia	bility and Ur	acertainty				
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality I	Determinatio	n [†]	Unacceptable		4	Metric Mean Score: 2.5.

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	Oehha,. 20 Facility; 3982267	16. Carbon tetrachloride.						
EXTRACTION Parameter			Data					
Life Cycle Stage: Life Cycle Description (Subcategory of Use): Process Description:		Dry clean	Use Other uses Dry cleaning agent, fire extinguisher, solvent, degreaser, refrigerant, chlorofluo- rocarbon feedstock.					
EVALUATION								
Domain		Metric	Rating	MWF*	Score	Comments		
Domain 1: Reliat	oility Metric 1:	Methodology	High	× 1	1	Office of Environmental Health Hazard Assessment		
Domain 2: Repre	sentative							
Domain 2. Repre	Metric 2:	Geographic Scope	High	$\times 1$	1	US		
	Metric 3:	Applicability	Low	$\times 2$	6	Physical characteristics with vague use data.		
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2018 site		
	Metric 5:	Sample Size	N/A		N/A	No Comment.		
Domain 3: Acces	sibility/Clar	ity						
2011411 01 1 1000	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.		
Domain 4: Varial	hility and Ur	certainty						
Domani 4. Valla	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.		
Overall Quality I	Determination	n [†]	Medium		1.7			

Source Citation:	Cdc/Niosh,.	. Carbon tetrachloride.				
Type of Data Source	Facility;					
Hero ID	3986503					
EXTRACTION						
Parameter			Data			
Life Cycle Stage:			Manufacture, p	process, &	: Use	
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliat	nility					
	Metric 1:	Methodology	High	× 1	1	CDC
Domain 2: Repre	sentative					
	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	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: Acces	sibilitv/Clari	tv				
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Varial	aility and Un	certainty				
Domain 4. Variat	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
	mente /.	Metadata Completeness	1 1/ / 1		IVA	No comment.
Overall Quality D	Determination	1 [†]	Unacceptable		4	Metric Mean Score: 2.5.

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	Niosh,. 19 Facility; 3986432	77. Occupational diseases: A gu	ide to the	ir recogn	ition.			
EXTRACTION Parameter			Data					
Parameter			Data					
Life Cycle Stage:			Use					
Life Cycle Descr		ategory of Use):	Other u					
Process Description:					quers, varnishes, rubber, waxes, resins. Used in manu-			
						and as azeotropic drying agent, dry cleaning agent, fire		
			extinguishing agent, fumigant and anthelmintic agent.					
EVALUATION								
Domain		Metric	Rating	MWF*	Score	Comments		
Domain 1: Relia	hility							
Domain 1. Kena	Metric 1:	Methodology	Low	$\times 1$	3	Unknown		
	Methe 1.	Wedlodology	LOW	~ 1	5	Chkhown		
Domain 2: Repre	esentative							
-	Metric 2:	Geographic Scope	Low	$\times 1$	3	Unknown		
	Metric 3:	Applicability	Low	$\times 2$	6	Physical characteristics with vague use data.		
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	Unknown pub date, but bibliographical references are from the 1960s		
	Metric 5:	Sample Size	N/A		N/A	No Comment.		
Domain 3: Acces	ssibility/Clar	ity						
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.		
Domain 4: Varia	bility and U	ncertainty						
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.		
Overall Quality I	Determinatio	n†	Low		3.0			

Source Citation: Type of Data Source Hero ID	Osha,. 199 Facility; 3982430	1. Proposed rules: Occupational	l exposure to	o methyle	ne chloi	ride.	
EXTRACTION Parameter			Data				
Life Cycle Stage: Life Cycle Description (Subcategory of Use): Process Description:		Manufacture Domestic manufacture methyl chloride, methylene chloride, chloroform and carbon tetrachloride) are produced by a chain reaction, with hydrogen chlorideas a byproduct. The products of the reaction (including unreacted methane, HCl and Cl2) are separated by fractionation, scrubbing and drying operations.					
EVALUATION							
Domain		Metric	Rating	MWF*	Score	Comments	
Domain 1: Relia	bility Metric 1:	Methodology	High	× 1	1	OSHA	
		inediodology					
Domain 2: Repre		Coordination Coordination	TT: -1-	× 1	1		
	Metric 2: Metric 3:	Geographic Scope Applicability	High Medium	$\times 1$ $\times 2$	4	US Describes method of manufacture, but not number of locations or amount produced	
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	1991	
	Metric 5:	Sample Size	N/A		N/A	N/a	
Domain 3: Acce	ssibility/Clar	ity					
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.	
Domain 4: Varia	bility and U	ncertainty					
Domain 1. Varia	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.	
Overall Quality I	Determinatio	n†	Medium		2.0		

Source Citation: Type of Data Source Hero ID	Weil, E. D. Facility; 3981048	.,Sandler, S. R.,Gernon, M 200	6. Kirk-Othmer I	Encyclope	edia of C	Chemical TechnologySulfur compounds.
EXTRACTION			D (
Parameter			Data			
Life Cycle Stage:			Manufacture			
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relial	bility					
	Metric 1:	Methodology	Medium	× 1	2	John Wiley & Sons Textbook
Domain 2: Repre	esentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Unacceptable	$\times 2$	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: Acces	ssibility/Clar	rity				
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Varia	bility and U	ncertainty				
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality I	Determinatio	\mathbf{n}^{\dagger}	Unacceptable		4	Metric Mean Score: 2.8.

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	Holbrook, Facility; 3981045	M. T 2000. Kirk-Othmer Encyd	clopedia of Chem	nical Tech	nology	Carbon tetrachloride.
EXTRACTION Parameter			Data			
Life Cycle Stage:	:		Manufacture			
Life Cycle Description (Subcategory of Use):			Domestic manu	ıfacture		
Total Annual U.S. Volume (and percent of PV):			346.08 x 103 T	ons in 19	88	
Number of Sites:			6			
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relial	bility					
	Metric 1:	Methodology	Medium	× 1	2	John Wiley & Sons Textbook
Domain 2: Repre	esentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	Low	$\times 2$	6	Production data
	Metric 4:	Temporal Representativeness	Unacceptable	$\times 2$	8	pre Montreal protocol, most recent data from 1990.
	Metric 5:	Sample Size	N/A		N/A	N/a
Domain 3: Acces	ssibility/Clar	ity				
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Varia	bility and Ur	ncertainty				
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination [†]		Unacceptable		4	Metric Mean Score: 2.8.	

* MWF = Metric Weighting Factor

Source Citation: Type of Data Source Hero ID	Oecd Exisi Facility; 3970847	ting Chemical Database. 2011.	SIDS initial	assessme	ent profi	le: Tetrachloromethane (carbon tetrachloride).
EXTRACTION Parameter			Data			
Life Cycle Stage: Life Cycle Descri Total Annual U.S		ategory of Use): nd percent of PV):	Manufacto Domestic <500 met	manufact		e 2010 - nearly all exported
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliab	vility					
Domun 11 Honuc	Metric 1:	Methodology	Low	× 1	3	Unknown
Domain 2: Repre	sentative					
r i r i r	Metric 2:	Geographic Scope	Medium	$\times 1$	2	Unknown
	Metric 3:	Applicability	High	$\times 2$	2	Production data
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2010
	Metric 5:	Sample Size	N/A		N/A	N/a
Domain 3: Acces	sibilitv/Clar	itv				
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Varial	vility and Ur	certainty				
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality D	Determinatio	n [†]	High		1.5	

Source Citation: Type of Data Source Hero ID	Echa,. 201 Facility; 3839957	7. Substance information: Carbo	on tetrachloi	ide.		
EXTRACTION Parameter			Data			
Life Cycle Stage: Life Cycle Descri Total Annual U.S	iption (Subc	ategory of Use): nd percent of PV):	Manufacto Domestic 1000-100	manufact		orted or produced in Europe
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliat	bility					
	Metric 1:	Methodology	High	$\times 1$	1	ECHA
Domain 2: Repre	esentative					
1	Metric 2:	Geographic Scope	Medium	$\times 1$	2	Europe
	Metric 3:	Applicability	High	$\times 2$	2	manufacture
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	Data from less than 10 years ago (2016)
	Metric 5:	Sample Size	Low	× 1	3	no process detail
Domain 3: Acces	ssibility/Clar	ity				
	Metric 6:	Metadata Completeness	Low	× 1	3	No quantitative data, document only briefly discusses use as a reactant
Domain 4: Varial	bility and Ur	ncertainty				
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	no discussion of variability or uncertainty
Overall Quality I	Determinatio	n [†]	Medium		1.8	

Source Citation: Type of Data Source Hero ID	U.S. EPA. Facility; 5085558	2018. Problem formulation of th	e risk eva	duation fo	or carbo	n tetrachloride (methane, tetrachloro-). EPA-740-R1-7020.			
EXTRACTION Parameter			Data						
Life Cycle Stage:			Manufacture, use, processing						
Life Cycle Descr	iption (Subc	ategory of Use):	discuss	ion of use	es of CC	14 in scope			
EVALUATION									
Domain		Metric	Rating	MWF*	Score	Comments			
Domain 1: Relial	oility								
	Metric 1:	Methodology	High	× 1	1	EPA			
Domain 2: Repre	sentative								
-	Metric 2:	Geographic Scope	High	$\times 1$	1	US			
	Metric 3:	Applicability	High	$\times 2$	2	Discusses scope of conditions of use of CCl4			
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	within last 10 years			
	Metric 5:	Sample Size	N/A		N/A	No Comment.			
Domain 3: Acces	sibility/Clar	ity							
	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.			
Domain 4: Varia	bility and U	ncertainty							
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.			
Overall Quality Determination [†]		High		1.0					

Source Citation: Type of Data Source Hero ID	K. A. Mars Facility; 3828879	shall, L. H. Pottenger. 2016. Chl	orocarbo	ns and ch	lorohydı	rocarbons.	
EXTRACTION Parameter			Data				
Life Cycle Stage: Life Cycle Description (Subcategory of Use): Process Description:		manufa	Manufacture manufacture Oxychlorination of hydrocarbons				
EVALUATION							
Domain		Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliat	bility Metric 1:	Methodology	High	× 1	1	Kirk-othmer entry	
Domain 2. Doma	aantatiwa						
Domain 2: Repre	Metric 2:	Geographic Scope	High	× 1	1	US	
	Metric 3:	Applicability	High	$\times 2$	2	Describes chemical reaction in detail used for manufacture	
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2016	
	Metric 5:	Sample Size	High	× 1	1	complete data	
Domain 3: Acces	sibility/Clar	ity					
	Metric 6:	Metadata Completeness	High	$\times 1$	1	Clearly documented its data sources, assessment methods, results and assumptions	
Domain 4: Varial	bility and Ur	certainty					
Domain 4. Varia	Metric 7:	Metadata Completeness	Low	$\times 1$	3	no discussion of variability or uncertainty	
Overall Quality Determination [†]			High		1.2		

Source Citation: Type of Data Source Hero ID	3828875". Facility; 3828875					
EXTRACTION Parameter			Data			
Life Cycle Stage: Life Cycle Descri Process Descriptio		ategory of Use):		ire 3 method		Cl4 manufacture: Chlorination of Hydrocarbons, Oxy- ons, Carbon Disulfide Chlorination
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliab	ility Metric 1:	Methodology	High	× 1	1	Kirk-othmer entry
Demein 2. Deme						
Domain 2: Repres	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 2: Metric 3:	Applicability	High	$\times 1$ $\times 2$	2	Describes chemical reaction in detail used for manufacture
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	2000
	Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Acces	sibility/Clari	itv				
2011411 01 11000	Metric 6:	Metadata Completeness	N/A		N/A	No Comment.
Domain 4: Variab	vility and Un	certainty				
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality D	etermination	n [†]	High		1.3	

Source Citation:		2017. Comment submitted b Healthy Building Network, Part		IacRoy, S	afer Ch	emicals, Healthy Families (SCHF), Environmental Health Strateg
Type of Data Source Hero ID	Facility; 3986750					
EXTRACTION						
Parameter			Data			
Life Cycle Stage	:		Use			
Life Cycle Descr		ategory of Use):	reactant			
Process Description:					k to produce HFC-245fa and HFC-365mfc, whichre- percent and 23 percent of global consumption in 2016	
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relia	hility					
	Metric 1:	Methodology	Medium	× 1	2	Safer Chemicals, Healthy Families (SCHF)
Domain 2: Repr	esentative					
I II I	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	High	$\times 2$	2	Describes prevelant use of CCl4
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2018
	Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Acce	ssibility/Clar	ity				
	Metric 6:	Metadata Completeness	High	× 1	1	Clearly documented its data sources, assessment methods, results and assumptions
Domain 4: Varia	bility and U	ncertainty				
	Metric 7:	Metadata Completeness	Low	× 1	3	no discussion of variability or uncertainty
Overall Quality I	Determinatio	n [†]	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: Type of Data Source Hero ID	U.S, E. P. A Facility; 3827302	A 2017. Preliminary informatic	on on manuf	àcturing,	process	ing, distribution, use, and disposal: Carbon tetrachloride.		
EXTRACTION Parameter			Data					
Life Cycle Stage: Life Cycle Description (Subcategory of Use): Process Description:		Use Reactant, reactive ion etching, processing agent, additive, laboratory chemical manufacturing, processing, distribution, use and disposal information						
EVALUATION								
Domain		Metric	Rating	MWF*	Score	Comments		
Domain 1: Relial	bility							
	Metric 1:	Methodology	High	× 1	1	EPA		
Domain 2: Repre	esentative							
1	Metric 2:	Geographic Scope	High	$\times 1$	1	US		
	Metric 3:	Applicability	High	$\times 2$	2	Describes prevelant use of CCl4		
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2017		
	Metric 5:	Sample Size	High	× 1	1	complete data		
Domain 3: Acces	ssibility/Clar	itv						
	Metric 6:	Metadata Completeness	Medium	× 1	2	annual manufacture and import volumes, minimal details		
Domain 4: Varia	bility and Ur	ocertainty						
	Metric 7:	Metadata Completeness	Low	$\times 1$	3	no discussion of variability or uncertainty		
Overall Quality I		•	High		1.3			

Source Citation: Type of Data Source Hero ID	3986751". Facility; 3986751					
EXTRACTION						
Parameter			Data			
Life Cycle Stage	:		Use			
Life Cycle Description (Subcategory of Use):		aerospa	ce use			
Process Description:		aerospa	ce adhesi	ves and	cleaning	
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relia	bility					
	Metric 1:	Methodology	High	× 1	1	Aerospace Industries Association (AIA)
Domain 2: Repre	esentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	High	$\times 2$	2	Describes prevelant use of CCl4
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2017
	Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Acce	ssibility/Clar	ity				
	Metric 6:	Metadata Completeness	Low	$\times 1$	3	No quantitative data on the identified processes, only brief description
Domain 4: Varia	bility and Ur	acartainty				
Domain 4. Varia	•	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality I	Determinatio	n†	High		1.3	

Source Citation: Type of Data Source Hero ID	 R. Krock. 2017. Comment submitted by Richard Krock, Vice President, Regulatory and Technical Affairs, The Vinyl Institute (VI), Part 2. Facility; 3986749 								
EXTRACTION Parameter			Data						
Life Cycle Stage: Life Cycle Description (Subcategory of Use): Process Description:		manufa	manufacture manufacture chlorination of methane						
EVALUATION									
Domain		Metric	Rating	MWF*	Score	Comments			
Domain 1: Relia	bility Metric 1:	Methodology	High	× 1	1	The Vinyl Institute (VI)			
Domain 2: Repre	contativo								
Domain 2. Repre	Metric 2:	Geographic Scope	High	$\times 1$	1	US			
	Metric 3:	Applicability	High	$\times 2$	2	Describes prevelant use of CCl4			
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2017			
	Metric 5:	Sample Size	High	$\times 1$	1	complete data			
Domain 3: Acces	ssibility/Clar	itv							
20114110111000	Metric 6:	Metadata Completeness	Low	$\times 1$	3	No quantitative data on the identified processes, only brief description			
Domain 4: Varia	bility and U	certainty							
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.			
Overall Quality I	Determinatio	n [†]	High		1.3				

Source Citation: Type of Data Source Hero ID	R. Krock. 2 Facility; 3986749	2017. Comment submitted by Ri	ichard Kro	ock, Vice	Preside	nt, Regulatory and Technical Affairs, The Vinyl Institute (VI), Part 2
EXTRACTION Parameter			Data			
Life Cycle Stage: Life Cycle Descr Process Descript	iption (Subc	ategory of Use):				Cl4 are used in the catalytic oxidation (Catoxid") process s HCl,
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relia	bility Metric 1:	Methodology	Uiah	× 1	1	The Minut Institute (MI)
	Methic 1.	Wethodology	High	× 1	1	The Vinyl Institute (VI)
Domain 2: Repre	esentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	High	$\times 2$	2	Describes prevelant use of CCl4
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2017
	Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Acces	sibility/Clar	ity				
Domain 5. Acces	Metric 6:	Metadata Completeness	Low	$\times 1$	3	No quantitative data on the identified processes, only brief description
Domain 4: Varia	hility and Ur	certainty				
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality I	Determinatio	n†	High		1.3	

Source Citation: Type of Data Source Hero ID	F. Graul. 2 Facility; 3986602	013. Comment submitted by Fay	ye Graul, Ex	ecutive D	virector,	Halogenated Solvents Industry Alliance, Inc
EXTRACTION Parameter			Data			
Life Cycle Stage: Life Cycle Descr Process Descripti	iption (Subc	ategory of Use):	Manufacti manufacti worker ac	ure, impoi	t/repacl	kaging ical transport
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relia	bility Metric 1:	Methodology	High	× 1	1	Halogenated Solvents Industry Alliance (HSIA)
						· · · ·
Domain 2: Repre	Metric 2:	Geographic Scope	High	× 1	1	US
	Metric 3:	Applicability	High	$\times 1$ $\times 2$	2	Describes prevelant use of CCl4
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	2005-2016
	Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Acces	sibility/Clar	itv				
	Metric 6:	Metadata Completeness	Low	× 1	3	data sources not discussed
Domain 4: Varia	bility and Ur	acertainty				
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality I	Determinatio	n†	High		1.5	

Source Citation: Type of Data Source Hero ID	Oecd,. 201 Facility; 3840005	0. Emission Scenario Documen	t on Photore	esist Use i	in Semio	conductor Manufacturing.
EXTRACTION Parameter			Data			
Life Cycle Stage: Life Cycle Descri Process Descripti	ption (Subc	ategory of Use):	Use Reactive I Process D			orker activities
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliab	oility Metric 1:	Methodology	High	× 1	1	OECD
		methodology	Ingh	~ 1	1	
Domain 2: Repre						
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	High	$\times 2$	2	RIE
	Metric 4: Metric 5:	Temporal Representativeness Sample Size	High High	$\times 2 \times 1$	2 1	2010 complete data
		*				*
Domain 3: Acces	sibility/Clar Metric 6:	ity Metadata Completeness	Medium	× 1	2	data sources briefly described
		r				
Domain 4: Varial	oility and Ur	ncertainty				
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality D	Determinatio	n [†]	High		1.1	

Source Citation: Type of Data Source Hero ID	Holbrook, Facility; 3981046	M. T., 2003. Kirk-Othmer Ency	clopedia of	Chemical	Techno	logyChloroform.		
EXTRACTION Parameter			Data					
Life Cycle Stage: Life Cycle Description (Subcategory of Use): Process Description:		Manufacture manufacture byproduct from methylene chloride and chlorine						
EVALUATION								
Domain		Metric	Rating	MWF*	Score	Comments		
Domain 1: Reliab	oility Metric 1:	Methodology	High	× 1	1	Kirk Othmer		
Domain 2. Bonno	contativo							
Domain 2: Repre	Metric 2:	Geographic Scope	High	$\times 1$	1	US		
	Metric 2: Metric 3:	Applicability	High	$\times 1$ $\times 2$	2	Describes reaction to create (manufacture) carbon tet		
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	2003		
	Metric 5:	Sample Size	High	× 1	1	complete data		
Domain 3: Acces	sibility/Clar	ity						
	Metric 6:	Metadata Completeness	High	$\times 1$	1	Clearly documented its data sources, assessment methods, results and assumptions		
Domain 4: Varial	oility and Ur	ncertainty						
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.		
Overall Quality D	Determinatio	n [†]	High		1.3			

Source Citation: Type of Data Source Hero ID	Weil, E. D. Facility; 2346119	"Sandler, S. R.,Gernon, M 200	6. Kirk-Oth	mer Ency	clopedia	a of Chemical TechnologySulfur compounds.
EXTRACTION Parameter			Data			
Life Cycle Stage:			Use			
Life Cycle Descr	iption (Subc	ategory of Use):	reactant/in	nermediat	e	
Process Descript	ion:					the reaction of carbon tetrachloride with hydrogen alfides at elevated temperatures.
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relia	hility					
	Metric 1:	Methodology	High	$\times 1$	1	Kirk Othmer
Domain 2: Repre	esentative					
Domain 2. Repre	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	High	$\times 2$	2	Describes reaction to create (manufacture) carbon tet
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	2006
	Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Acces	ssibility/Clar	ity				
	Metric 6:	Metadata Completeness	High	$\times 1$	1	Clearly documented its data sources, assessment methods, results and assumptions
Domain 4: Varia	bility and U	containty				
Domain 4: Varia	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
	mente /.	metadata Compreteness	11/17		11/17	No Comment.
Overall Quality I	Determinatio	\mathbf{n}^{\dagger}	High		1.3	

Source Citation:		on for Economic Co-operation an conductor industry.	d Developm	ent (OEC	D). 201	5. Emission scenario document (ESD) on chemical vapour deposition
Type of Data Source	Facility;	conductor madery.				
Hero ID	5184986					
EXTRACTION						
Parameter			Data			
Life Cycle Stage	:		Use			
Life Cycle Descr		ategory of Use):	Reactive I	on Etchir	ng	
Process Descript			Process D	escription	n and wo	orker activities
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Relia	bility					
	Metric 1:	Methodology	High	$\times 1$	1	OECD
Domain 2: Repre	esentative					
	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	High	$\times 2$	2	RIE
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2010
	Metric 5:	Sample Size	High	× 1	1	complete data
Domain 3: Acce	ssibility/Clar	ity				
	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	data sources briefly described
Domain 4: Varia	bility and Ur	ncertainty				
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality I	Determinatio	n [†]	High		1.1	

	H. Hoag. 2 Facility; 5097937	016. The Greening of Chemistry	у.			
EXTRACTION Parameter			Data			
Life Cycle Stage: Life Cycle Descrij Process Descriptio		ategory of Use):	Use Processing eliminatio		n pharn	naceutical process
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliab	ility Metric 1:	Methodology	Medium	× 1	2	Science History Institute
Domain 2: Repres	entative					
•	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	High	$\times 2$	2	Processing Aid
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2008
	Metric 5:	Sample Size	N/A		N/A	No Comment.
Domain 3: Access	sibility/Clar	ity				
	Metric 6:	Metadata Completeness	Low	× 1	3	results and theories provided, but underlying methods, data sources, and as- sumptions are not fully transparent
Domain 4: Variab	ility and Ur	ncertainty				
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality D	eterminatio	n [†]	High		1.4	

Source Citation: Type of Data Source Hero ID	U.S. EPA. Facility; 5097936	1983. Preliminary Study of Sour	cces of Ca	urbon Teti	rachloric	de: Final Report.		
EXTRACTION Parameter			Data					
Life Cycle Stage: Life Cycle Description (Subcategory of Use): Process Description:			Use Processing aid Use as processing aid in pharmaceutical process					
EVALUATION								
Domain		Metric	Rating	MWF*	Score	Comments		
Domain 1: Reliab	ility Metric 1:	Methodology	High	× 1	1	EPA		
Domain 2: Repres	sentative							
Domain 2. Repres	Metric 2:	Geographic Scope	High	$\times 1$	1	US		
	Metric 3:	Applicability	High	$\times 2$	2	Processing Aid		
	Metric 4:	Temporal Representativeness	Low	$\times 2$	6	1983		
	Metric 5:	Sample Size	N/A		N/A	No Comment.		
Domain 3: Access	sibility/Clar	ity						
	Metric 6:	Metadata Completeness	High	× 1	1	Clearly documented its data sources, assessment methods, results and assumptions		
Domain 4: Variab	oility and Ur	ncertainty						
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.		
Overall Quality Determination ^{\dagger}			High		1.6			

Source Citation: Type of Data Source Hero ID	Holmes, L. 2017. Comment submitted by Laurie Holmes, Senior Director, Environmental Policy, Motor & Equipment Manufact Association (MEMA). Motor & Equipment Manufacturers Association. Facility; 3986676								
EXTRACTION	2700010								
Parameter			Data						
Life Cycle Stage: Life Cycle Description (Subcategory of Use): Process Description:			Use Additive carbon tetrachloride may be used during someautomotive component manufac- turing processes as an adhesive and a plastic additive. There is no indication that this chemical is present in automotive aftermarket productsor new automotive components.						
EVALUATION									
Domain		Metric	Rating	MWF*	Score	Comments			
Domain 1: Relia	bility								
Domain 1. Kena	Metric 1:	Methodology	Medium	$\times 1$	2	Motor & Equipment Manufacurers Association (MEMA)			
Domain 2: Repre	esentative								
	Metric 2:	Geographic Scope	High	$\times 1$	1	US			
	Metric 3:	Applicability	High	$\times 2$	2	Additive			
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2017			
	Metric 5:	Sample Size	N/A		N/A	No Comment.			
Domain 3: Acces	ssibility/Cla	ity							
	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	data sources briefly described			
Domain 4: Varia	bility and U	ncertainty							
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.			
Overall Quality Determination [†]		High		1.3					

Source Citation: Type of Data Source Hero ID	Aerospace Industries Association (AIA). 2019. AIA email with statement on CCl4 use. Facility; 5175470							
EXTRACTION Parameter			Data					
Life Cycle Stage: Life Cycle Description (Subcategory of Use): Process Description:			Use aerospace use 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: Relia	bility Metric 1:	Methodology	Medium	× 1	2	Aerospace Industries Association (AIA)		
Domain 2: Repre	esentative							
Domain 2. Repre	Metric 2:	Geographic Scope	High	$\times 1$	1	US		
	Metric 3:	Applicability	High	$\times 2$	2	Aerospace		
	Metric 4:	Temporal Representativeness	High	$\times 2$	2	2018		
	Metric 5:	Sample Size	N/A		N/A	No Comment.		
Domain 3: Acce	ssibility/Cla	ity						
	Metric 6:	Metadata Completeness	Medium	$\times 1$	2	data sources briefly described		
Domain 4: Varia	bility and U	ncertainty						
Metric 7: Metadata Completeness		N/A		N/A	No Comment.			
Overall Quality Determination [†]			High		1.3			

Type of Data Source	M. T. Holb Facility; 730490	rook. 2003. Methylene chloride.					
EXTRACTION Parameter			Data				
Life Cycle Stage: Life Cycle Description (Subcategory of Use): Process Description:		Use reactant/inermediate carbon tetrachloride can be reduced, ie, hydrodechlorinated, to chloroform.					
EVALUATION							
Domain		Metric	Rating	MWF*	Score	Comments	
Domain 1: Reliab	ility Metric 1:	Methodology	High	× 1	1	Kirk Othmer	
Domain 2: Repres	entative						
-	Metric 2:	Geographic Scope	High	$\times 1$	1	US	
	Metric 3:	Applicability	High	$\times 2$	2	Describes reaction to create Chloroform using carbon tet	
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	2003	
	Metric 5:	Sample Size	High	$\times 1$	1	complete data	
Domain 3: Access	sibility/Clar	ity					
	Metric 6:	Metadata Completeness	High	$\times 1$	1	Clearly documented its data sources, assessment methods, results and assumptions	
Domain 4: Variab	ility and Ur	ncertainty					
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.	
Overall Quality Determination [†]			High		1.3		

Source Citation: Type of Data Source Hero ID	ATSDR. 20 Facility; 195104	005. Toxicological profile for ca	rbon tetrach	loride (C.	AS# 56"	'23"5).
EXTRACTION Parameter			Data			
Life Cycle Stage: Life Cycle Description (Subcategory of Use): Process Description:		Disposal Disposal Disposal details				
EVALUATION						
Domain		Metric	Rating	MWF*	Score	Comments
Domain 1: Reliab	oility Metric 1:	Methodology	High	× 1	1	CDC
Domain 2: Repre	contativo					
Domain 2. Repre	Metric 2:	Geographic Scope	High	$\times 1$	1	US
	Metric 3:	Applicability	High	$\times 1$ $\times 2$	2	Describes specific disposal requirements
	Metric 4:	Temporal Representativeness	Medium	$\times 2$	4	2005
	Metric 5:	Sample Size	High	$\times 1$	1	complete data
Domain 3: Acces	sibility/Clar	itv				
	Metric 6:	Metadata Completeness	High	× 1	1	Clearly documented its data sources, assessment methods, results and assumptions
Domain 4: Variat	oility and Ur	ncertainty				
	Metric 7:	Metadata Completeness	N/A		N/A	No Comment.
Overall Quality Determination ^{\dagger}			High		1.3	