United States
Environmental Protection Agency

Office of Chemical Safety and
Pollution Prevention

Final Risk Evaluation for Perchloroethylene

Systematic Review Supplemental File:

Data Quality Evaluation for Data Sources on Consumer and Environmental Exposure

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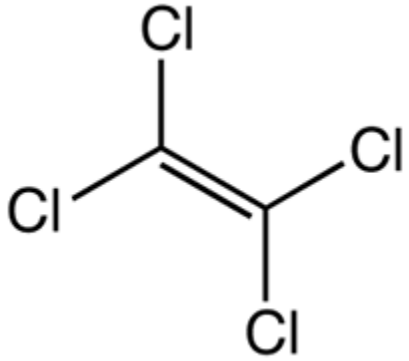

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HERO ID	Data Type	Reference	
Monitoring			**2**
5405	Monitoring	Pellizzari, E. D.,Wallace, L. A.,Gordon, S. M.. 1992. Elimination kinetics of volatile organics in humans using breath measurements. Journal of Exposure Analysis and Environmental Epidemiology 2	**2**
14003	Monitoring	Clayton, C. A.,Pellizzari, E. D.,Whitmore, R. W.,Perritt, R. L.,Quackenboss, J. J.. 1999. National Human Exposure Assessment Survey (NHEXAS): Distributions and associations of lead, arsenic, and volatile organic compounds in EPA Region 5. Journal of Exposure Analysis and Environmental Epidemiology 9	**3**
21469	Monitoring	Wallace, L. A.,Pellizzari, E. D.,Hartwell, T. D.,Sparacino, C. M.,Sheldon, L. S.,Zelon, H.. 1985. Results from the first three seasons of the TEAM study: personal exposures, indoor-outdoor relationships, and breath levels of toxic air pollutants measured for 355 persons in New Jersey.	**4**
21778	Monitoring	Aggazzotti, G.,Fantuzzi, G.,Predieri, G.,Righi, E.,Moscardelli, S.. 1994. Indoor exposure to perchloroethylene (PCE) in individuals living with dry-cleaning workers. Science of the Total Environment 156	**5**
22045	Monitoring	Heavner, D. L.,Morgan, W. T.,Ogden, M. W.. 1995. Determination of volatile organic compounds and ETS apportionment in 49 homes. Environment International 21	**6**
22186	Monitoring	Lebret, E.,van de Wiel, H. J.,Bos, H. P.,Noij, D.,Boleij, J. S. M.. 1986. Volatile organic compounds in Dutch homes. Environment International 12	**7**
23081	Monitoring	Wallace, L. A.. 1986. Personal exposures, indoor and outdoor air concentrations, and exhaled breath concentrations of selected volatile organic compounds measured for 600 residents of New Jersey, North Dakota, North Carolina, and California. Toxicological and Environmental Chemistry 12	**8**
27974	Monitoring	Chan, C. C.,Vainer, L.,Martin, J. W.,Williams, D. T.. 1990. Determination of organic contaminants in residential indoor air using an adsorption-thermal desorption technique. Journal of the Air and Waste Management Association 40	**9**
28104	Monitoring	Hisham, M. W. M.,Grosjean, D.. 1991. Sulfur dioxide, hydrogen sulfide, total reduced sulfur, chlorinated hydrocarbons and photochemical oxidants in southern California museums. Atmospheric Environment 25	**11**

28307	Monitoring	Thomas, K. W.,Pellizzari, E. D.,Perritt, R. L.,Nelson, W. C.. 1991. Effect of dry-cleaned clothes on tetrachloroethylene levels in indoor air, personal air, and breath for residents of several New Jersey homes. Journal of Exposure Analysis and Environmental Epidemiology 1	**14**
28993	Monitoring	Ferrario, J. B.,Lawler, G. C.,Deleon, I. R.,Laseter, J. L.. 1985. Volatile organic pollutants in biota and sediments of Lake Pontchartrain. Bulletin of Environmental Contamination and Toxicology 34	**15**
29192	Monitoring	Singh, H. B.,Salas, L. J.,Stiles, R. E.. 1983. Selected man-made halogenated chemicals in the air and oceanic environment. Journal of Geophysical Research 88	**16**
31210	Monitoring	M. R. Van Winkle, P. A. Scheff. 2001. Volatile organic compounds, polycyclic aromatic hydrocarbons and elements in the air of ten urban homes. Indoor Air 11	**17**
34460	Monitoring	Lehmann, I.,Thoelke, A.,Rehwagen, M.,Rolle-Kampczyk, U.,Schlink, U.,Schulz, R.,Borte, M.,Diez, U.,Herbarth, O.. 2002. The influence of maternal exposure to volatile organic compounds on the cytokine secretion profile of neonatal T cells. Environmental Toxicology 17	**19**
39644	Monitoring	Singh, H. B.,Salas, L. J.,Smith, A. J.,Shigeishi, H.. 1981. Measurements of some potentially hazardous organic chemicals in urban environments. Atmospheric Environment 15	**20**
42715	Monitoring	Ahlers, J.,Regelmann, J.,Riedhammer, C.. 2003. Environmental risk assessment of airborne trichloroacetic acid - a contribution to the discussion on the significance of anthropogenic and natural sources. Chemosphere 52	**21**
47782	Monitoring	Austin, J.. 2003. Day-of-week patterns in toxic air contaminants in southern California. Journal of the Air and Waste Management Association 53	**22**
49414	Monitoring	Ryan, T. J.,Hart, E. M.,Kappler, L. L.. 2002. VOC exposures in a mixed-use university art building. AIHA Journal 63	**23**
56224	Monitoring	Serrano-Trespalacios, P. I.,Ryan, L.,Spengler, J. D.. 2004. Ambient, indoor and personal exposure relationships of volatile organic compounds in Mexico City metropolitan area. Journal of Exposure Analysis and Environmental Epidemiology 1	**24**
58056	Monitoring	Dowty, B. J.,Carlisle, D. R.,Laseter, J. L.. 1975. New Orleans drinking water sources tested by gas chromatography-mass spectrometry: Occurrence and origin of aromatics and halogenated aliphatic hydrocarbons. Environmental Science and Technology 9	**25**
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58091	Monitoring	Ohta, T.,Morita, M.,Mizoguchi, I.. 1976. Local distribution of chlorinated hydrocarbons in the ambient air in Tokyo. Atmospheric Environment 10	**27**
58111	Monitoring	Singh, H. B.,Salas, L. J.,Cavanagh, L. A.. 1977. Distribution, sources and sinks of atmospheric halogenated compounds. Journal of the Air and Waste Management Association 27	**28**
58127	Monitoring	Howie, S. J.. 1981. Ambient perchloroethylene levels inside coin-operated laundries with drycleaning machines on the premises.	**29**
74875	Monitoring	Aggazzotti, G.,Fantuzzi, G.,Righi, E.,Predieri, G.,Gobba, F. M.,Paltrinieri, M.,Cavalleri, A.. 1994. Occupational and environmental exposure to perchloroethylene (PCE) in dry cleaners and their family members. Archives of Environmental and Occupational Health 49	**30**
75108	Monitoring	Murray, A. J.,Riley, J. P.. 1973. Occurrence of some chlorinated aliphatic hydrocarbons in the environment. Nature 242	**31**
76241	Monitoring	Kostiainen, R.. 1995. Volatile organic compounds in the indoor air of normal and sick houses. Atmospheric Environment 29	**32**
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94461	Monitoring	Schwarzenbach, R. P.,Molnar-Kubica, E.,Giger, W.,Wakeham, S. G.. 1979. Distribution, residence time, and fluxes of tetrachloroethylene and 1,4-dichlorobenzene in Lake Zurich, Switzerland. Environmental Science and Technology 13	**34**
104106	Monitoring	Weissflog, L.,Elansky, N.,Putz, E.,Krueger, G.,Lange, C. A.,Lisitzina, L.,Pfennigsdorff, A.. 2004. Trichloroacetic acid in the vegetation of polluted and remote areas of both hemispheres - Part II: Salt lakes as novel sources of natural chlorohydrocarbons. Atmospheric Environment 38	**35**
632064	Monitoring	Sexton, K.,Adgate, J. L.,Church, T. R.,Ashley, D. L.,Needham, L. L.,Ramachandran, G.,Fredrickson, A. L.,Ryan, A. D.. 2005. Children's exposure to volatile organic compounds as determined by longitudinal measurements in blood. Environmental Health Perspectives 113	**36**
632310	Monitoring	Adgate, J. L.,Church, T. R.,Ryan, A. D.,Ramachandran, G.,Fredrickson, A. L.,Stock, T. H.,Morandi, M. T.,Sexton, K.. 2004. Outdoor, indoor, and personal exposure to VOCs in children. Environmental Health Perspectives 112	**37**
632484	Monitoring	Ohura, T.,Amagai, T.,Senga, Y.,Fusaya, M.. 2006. Organic air pollutants inside and outside residences in Shimizu, Japan: Levels, sources and risks. Science of the Total Environment 366	**38**

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644857	Monitoring	Dewulf, J. P.,Van Langenhove, H. R.,Der Auwera, L. F.. 1998. Air/water exchange dynamics of 13 volatile chlorinated C1- and C2-hydrocarbons and monocyclic aromatic hydrocarbons in the southern North Sea and the Scheldt estuary. Environmental Science and Technology 32	**42**
645789	Monitoring	Yamamoto, K.,Fukushima, M.,Kakutani, N.,Kuroda, K.. 1997. Volatile organic compounds in urban rivers and their estuaries in Osaka, Japan. Environmental Pollution 95	**43**
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658643	Monitoring	Amaral, O. C.,Otero, R.,Grimalt, J. O.,Albaiges, J.. 1996. Volatile and semivolatile organochlorine compounds in tap and riverine waters in the area of influence of a chlorinated organic solvent factory. Water Research 30	**45**
659075	Monitoring	Martinez, E.,Llobet, I.,Lacorte, S.,Viana, P.,Barcelo, D.. 2002. Patterns and levels of halogenated volatile compounds in Portuguese surface waters. Journal of Environmental Monitoring 4	**46**
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1062239	Monitoring	X. M. Wu, M. G. Apte, R. Maddalena, D. H. Bennett. 2011. Volatile organic compounds in small- and medium-sized commercial buildings in California. Environmental Science and Technology 45	**57**
1065558	Monitoring	Batterman, S.,Jia, C.,Hatzivasilis, G.. 2007. Migration of volatile organic compounds from attached garages to residences: A major exposure source. Environmental Research 104	**58**
1065844	Monitoring	Dodson, R. E.,Levy, J. I.,Spengler, J. D.,Shine, J. P.,Bennett, D. H.. 2008. Influence of basements, garages, and common hallways on indoor residential volatile organic compound concentrations. Atmospheric Environment 42	**59**
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2128839	Monitoring	Roda, C.,Kousignian, I.,Ramond, A.,Momas, I.. 2013. Indoor tetrachloroethylene levels and determinants in Paris dwellings. Environmental Research 120	**75**
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Experimental			**136**

12793	Experimental	Won, D.,Corsi, R. L.,Rynes, M.. 2000. New indoor carpet as an adsorptive reservoir for volatile organic compounds. Environmental Science and Technology 34	**136**
23126	Experimental	Wallace, L. A.,Pellizzari, E.,Leaderer, B.,Zelon, H.,Sheldon, L.. 1987. Emissions of volatile organic compounds from building materials and consumer products. Atmospheric Environment 21	**137**
27401	Experimental	Tichenor, B. A.,Sparks, L. E.,Jackson, M. D.,Guo, Z.,Mason, M. A.,Plunket, C. M.,Rasor, S. A.. 1990. Emissions of perchloroethylene from dry cleaned fabrics. Atmospheric Environment 24	**138**
27961	Experimental	Guo, Z. S.,Tichenor, B. A.,Mason, M. A.,Plunket, C. M.. 1990. The temperature dependence of the emission of perchloroethylene from dry cleaned fabrics. Environmental Research 52	**139**
28339	Experimental	Sack, T. M.,Steele, D. H.,Hammerstrom, K.,Remmers, J.. 1992. A survey of household products for volatile organic compounds. Atmospheric Environment 26	**140**
58143	Experimental	Fernandez, J.,Guberan, E.,Caperos, J.. 1976. Experimental human exposures to tetrachloroethylene vapor and elimination in breath after inhalation. American Industrial Hygiene Association Journal 36	**141**
58314	Experimental	Opdam, J. J.,Smolders, J. F.. 1987. Alveolar sampling and fast kinetics of tetrachloroethene in man. II. Fast kinetics. Occupational and Environmental Medicine 44	**142**
58324	Experimental	Imbriani, M.,Ghittori, S.,Pezzagno, G.,Capodaglio, E.. 1988. Urinary excretion of tetrachloroethylene (perchloroethylene) in experimental and occupational exposure. Archives of Environmental and Occupational Health 43	**143**
58563	Experimental	Kreiling, J. A.,Stephens, R. E.,Reinisch, C. L.. 2005. A mixture of environmental contaminants increases cAMP-dependent protein kinase in Spisula embryos. Environmental Toxicology and Pharmacology 19	**144**
1040048	Experimental	Sherlach, K. S.,Gorka, A. P.,Dantzler, A.,Roepe, P. D.. 2011. Quantification of perchloroethylene residues in dry-cleaned fabrics. Environmental Toxicology and Chemistry 30	**145**
1512515	Experimental	S. Kim, J. A. Kim, J. Y. An, H. J. Kim, S. D. Kim, J. C. Park. 2007. TVOC and formaldehyde emission behaviors from flooring materials bonded with environmental-friendly MF/PVAc hybrid resins. Indoor Air 17	**146**
1752751	Experimental	Kwon, K. iD,Jo, W.,Lim, H.,Jeong, W.. 2008. Volatile pollutants emitted from selected liquid household products. Environmental Science and Pollution Research 15	**147**

2534318	Experimental	Kowalska, J.,Szewczyńska, M.,Pośniak, M.. 2014. Measurements of chlorinated volatile organic compounds emitted from office printers and photocopiers. Environmental Science and Pollution Research 22	**148**
2535652	Experimental	W. R. Chan, S. Cohn, M. Sidheswaran, D. P. Sullivan, W. J. Fisk. 2014. Contaminant levels, source strengths, and ventilation rates in California retail stores. Indoor Air 25	**149**
2655630	Experimental	Kowalska, J.,Gierczak, T.. 2013. Qualitative and Quantitative Analyses of the Halogenated Volatile Organic Compounds Emitted from the Office Equipment Items. Indoor and Built Environment 22	**150**
2718034	Experimental	M. Nohr, W. Horn, O. Jann, M. Richter, W. Lorenz. 2015. Development of a multi-VOC reference material for quality assurance in materials emission testing. Analytical and Bioanalytical Chemistry 407	**151**
3559311	Experimental	Chao, C. Y. H.,Tung, T. C. W.,Niu, J. L.,Pang, S. W.,Lee, R. Y. M.. 1999. Indoor perchloroethylene accumulation from dry cleaned clothing on residential premises. Building and Environment 34	**152**
3587655	Experimental	Cheng, W. enHsi,Tsai, D. Y.,Lu, J. iaYu,Lee, J. enWei. 2016. Extracting Emissions from Air Fresheners Using Solid Phase Microextraction Devices. Aerosol and Air Quality Research 16	**153**
4440489	Experimental	UL Env. 2017. Floor Coating VOC Emissions Research Report.	**154**
4442460	Experimental	Wetzel, T. A.. 2014. Volatile Organic Compounds (VOCs) In Indoor Air: Emission From Consumer Products and the Use of Plants for Air Sampling.	**157**
4532343	Experimental	C. B. Keil, M. Nicas. 2003. Predicting room vapor concentrations due to spills of organic solvents. AIHA Journal 64	**158**
4663242	Experimental	Won, D. Yang W.. 2012. Material emission information from: 105 building materials and consumer products.	**159**
4683353	Experimental	C Solal, C. Rousselle, C. Mandin, J. Manel, F. Maupetit. 2008. VOCs and formaldehyde emissions from cleaning products and air fresheners. International Conference on Indoor Air Quality and Climate (Indoor Air 2008)	**160**
4683358	Experimental	A. T. Hodgson. 1999. Common indoor sources of volatile organic compounds: Emission rates and techniques for reducing consumer exposures.	**161**
4683360	Experimental	A. T. Hodgson. 2001. Predicted concentrations in new relocatable classrooms of volatile organic compounds emitted from standard and alternate interior finish materials.	**162**
4683366	Experimental	A. C. Ortiz. 2010. Identifying sources of volatile organic compounds and aldehydes in a high performance building.	**163**

Databases Not Unique to a Chemical **164**

484177	Databases Not Unique to a Chemical	Jia, C. R.,D'Souza, J.,Batterman, S.. 2008. Distributions of personal VOC exposures: A population-based analysis. Environment International 34	**164**
729385	Databases Not Unique to a Chemical	Arif, A. A.,Shah, S. M.. 2007. Association between personal exposure to volatile organic compounds and asthma among US adult population. International Archives of Occupational and Environmental Health 80	**165**
1359400	Databases Not Unique to a Chemical	Staples, C. A.,Werner, A. F.,Hoogheem, T. J.. 1985. Assessment of priority pollutant concentrations in the United States using STORET database. Environmental Toxicology and Chemistry 4	**166**
3970117	Databases Not Unique to a Chemical	U.S, E. P. A.. 2017. Chemical data reporting: 1,1,2,2,-tetrachloroethene.	**167**
3970236	Databases Not Unique to a Chemical	Oppt Monitoring Database. 2017. Perchloroethylene.	**168**
3970251	Databases Not Unique to a Chemical	Pubchem,. 2017. PubChem: Tetrachloroethylene.	**169**
3970268	Databases Not Unique to a Chemical	Household Products, Database. 2017. Household products database: Chemical information: Tetrachloroethylene.	**170**
3981163	Databases Not Unique to a Chemical	Consumer Product Information, Database. 2017. What's in it? tetrachloroethylene.	**171**
4663145	Databases Not Unique to a Chemical	Bartzis, J.. 2018. Prioritization of building materials as indoor pollution sources (BUMA).	**172**

Completed Exposure Assessments **173**

18169	Completed Exposure Assessment	Page, G. W.. 1981. Comparison of groundwater and surface water for patterns and levels of contamination by toxic substances. Environmental Science and Technology 15	**173**
22606	Completed Exposure Assessment	Ipcs,. 1984. Tetrachloroethylene. Environmental Health Criteria 31	**174**
23126	Completed Exposure Assessment	Wallace, L. A.,Pellizzari, E.,Leaderer, B.,Zelon, H.,Sheldon, L.. 1987. Emissions of volatile organic compounds from building materials and consumer products. Atmospheric Environment 21	**175**
35002	Completed Exposure Assessment	U.S, E. P. A.. 2001. Sources, emission and exposure for trichloroethylene (TCE) and related chemicals.	**176**
58062	Completed Exposure Assessment	Fuller, B. B.. 1976. Air pollution assessment of tetrachloroethylene.	**177**

58284	Completed Exposure Assessment	Zoeteman, B. C. J.,Harmsen, K.,Linders, J. B. H. J.,Morra, C. F. H.,Slooff, W.. 1980. Persistent organic pollutants in river water and ground water of the Netherlands. Chemosphere 9	**178**
192111	Completed Exposure Assessment	Atsdr,. 1997. Toxicological profile for tetrachloroethylene.	**179**
200024	Completed Exposure Assessment	Fishbein, L.. 1992. Exposure from occupational versus other sources. Scandinavian Journal of Work, Environment and Health 18	**180**
380600	Completed Exposure Assessment	Duboudin, C.. 2010. Pollution inside the home: descriptive analyses Part II: Identification of groups of homogenous homes in terms of pollution. Environnement, Risques & Sante 9	**181**
630433	Completed Exposure Assessment	Chien, Y. C.. 1997. The influences of exposure pattern and duration on elimination kinetics and exposure assessment of tetrachloroethylene in humans [PhD].	**182**
630715	Completed Exposure Assessment	Letkiewicz, F.,Johnston, P.,Macaluso, C.,Elder, R.,Yu, W.. 1982. Occurrence in tetrachloroethylene (perchloroethylene) in drinking water, food and air.	**183**
630847	Completed Exposure Assessment	Nysdoh,. 2005. Improving human risk assessment for tetrachloroethylene by using biomakers and neurobehavioral testing.	**184**
633141	Completed Exposure Assessment	Benignus, V. A.,Boyes, W. K.,Geller, A. M.,Bushnell, P. J.. 2009. Long-term perchloroethylene exposure: A meta-analysis of neurobehavioral deficits in occupationally and residentially exposed groups. Journal of Toxicology and Environmental Health, Part A: Current Issues 72	**185**
694628	Completed Exposure Assessment	Destaillats, H.,Maddalena, R. L.,Singer, B. C.,Hodgson, A. T.,McKone, T. E.. 2008. Indoor pollutants emitted by office equipment: A review of reported data and information needs. Atmospheric Environment 42	**186**
695495	Completed Exposure Assessment	C. J. Weschler. 2009. Changes in indoor pollutants since the 1950s. Atmospheric Environment 43	**187**
732615	Completed Exposure Assessment	Gilbert, D.,Goyer, M.,Lyman, W.,Magil, G.,Walker, P.,Wallace, D.,Wechsler, A.,Yee, J.. 1982. An exposure and risk assessment for tetrachloroethylene.	**188**
735303	Completed Exposure Assessment	Dawson, H. E.,McAlary, T.. 2009. A compilation of statistics for VOCs from post-1990 indoor air concentration studies in North American residences unaffected by subsurface vapor intrusion. Ground Water Monitoring and Remediation 29	**189**
819974	Completed Exposure Assessment	Bogen, K. T.,McKone, T. E.. 1988. Linking indoor air and pharmacokinetic models to assess tetrachloroethylene risk. Risk Analysis 8	**190**
1265174	Completed Exposure Assessment	. 1988. Toxic Air Pollutant Emission Factors Compilation For Selected Air Toxic Compounds and Sources.	**191**

1788276	Completed Exposure Assessment	de Blas, M.,Navazo, M.,Alonso, L.,Durana, N.,Gomez, M. C.,Iza, J.. 2012. Simultaneous indoor and outdoor on-line hourly monitoring of atmospheric volatile organic compounds in an urban building. The role of inside and outside sources. Science of the Total Environment 426	**192**
2536230	Completed Exposure Assessment	Du, Z.,Mo, J.,Zhang, Y.. 2014. Risk assessment of population inhalation exposure to volatile organic compounds and carbonyls in urban China. Environment International 73	**193**
2537636	Completed Exposure Assessment	L. Golsteijn, D. Huizer, M. Hauck, R. van Zelm, M. A. Huijbregts. 2014. Including exposure variability in the life cycle impact assessment of indoor chemical emissions: the case of metal degreasing. Environment International 71	**194**
3491017	Completed Exposure Assessment	. 2015. Health Assessment for Groundwater, Surface Water, Soil and Sediment Data Evaluation, Corozal Well Site, Corozal, Puerto Rico, July 29, 2015. EPA Facility ID: PRN000206452.	**195**
3543741	Completed Exposure Assessment	McDonald, G. J.,Wertz, W. E.. 2007. PCE, TCE, and TCA vapors in subslab soil gas and indoor air: A case study in upstate New York. Ground Water Monitoring and Remediation 27	**196**
3572966	Completed Exposure Assessment	Bauer, U.. 1991. OCCURRENCE OF TETRACHLOROETHYLENE IN THE FEDERAL-REPUBLIC-OF-GERMANY. Chemosphere 23	**197**
3573238	Completed Exposure Assessment	De Rooij, C.,Boutonnet, J. C.,Garny, V.,Lecloux, A.,Papp, R.,Thompson, R. S.,Van Wijk, D.. 1998. Euro Chlor risk assessment for the marine environment OSPARCOM region: North sea - Tetrachloroethylene. Environmental Monitoring and Assessment 53	**198**
3573428	Completed Exposure Assessment	Giger, W.,Molnarkubica, E.. 1978. TETRACHLOROETHYLENE IN CONTAMINATED GROUND AND DRINKING WATERS. Bulletin of Environmental Contamination and Toxicology 19	**199**
3797979	Completed Exposure Assessment	Nicnas,. 2001. Tetrachloroethylene " Priority existing chemical. Assessment Report No. 15.	**200**
3827300	Completed Exposure Assessment	Oecd,. 2013. Emission scenario document on the industrial use of adhesives for substrate bonding.	**201**
3827392	Completed Exposure Assessment	U.S, E. P. A.. 2011. Background indoor air concentrations of volatile organic compounds in North American residences (1990-2005): A compilation of statistics for assessment vapor intrusion.	**202**
3839195	Completed Exposure Assessment	Ecb,. 2005. European Union risk assessment report: Tetrachloroethylene. Part 1 - Environment. 57	**203**
3969286	Completed Exposure Assessment	Australian Government Department of, Health. 2016. Human health tier III assessment for 1-methyl-2-pyrrolidinone.	**204**

3970109	Completed Exposure Assessment	U.S, E. P. A.. 2012. Toxicological review of tetrachloroethylene (perchloroethylene).	**205**
3970186	Completed Exposure Assessment	U.S, E. P. A.. 1998. Cleaner technologies substitutes assessment for professional fabricare processes.	**206**
3970279	Completed Exposure Assessment	ToxNet Hazardous Substances Data, Bank. 2017. HSDB: Tetrachloroethylene.	**207**
3970790	Completed Exposure Assessment	Echa,. 2014. Substance evaluation report - Tetrachloroethylene.	**208**
3970791	Completed Exposure Assessment	Echa,. 2008. Annex XV restriction report: Tetrachloroethylene.	**209**
3970807	Completed Exposure Assessment	Spolana, a s. 2014. Chemical safety report: Trichloroethylene.	**210**
3970809	Completed Exposure Assessment	Domo Caproleuna GmbH. 2014. Chemical safety report: Industrial use as an extractive solvent for the purification of caprolactam from caprolactam oil.	**211**
3970811	Completed Exposure Assessment	D. O. W. Deutschland. 2014. Chemical safety report: Industrial use as process chemical (enclosed systems) in Alcantara material production.	**212**
3970833	Completed Exposure Assessment	Vlisco Netherlands, B. V.. 2014. Chemical safety report Part A: Use of trichloroethylene as a solvent for the removal and recovery of resin from dyed cloth.	**213**
3970838	Completed Exposure Assessment	Parker Hannifin, Manufacturing. 2014. Chemical safety report: Use of trichloroethylene as a process solvent for the manufacturing of hollow fibre gas separation membranes out of polyphenylene oxide (PPO).	**214**
3970842	Completed Exposure Assessment	. 2014. Exposure assessment: Trichloroethylene, Part 3.	**215**
3970844	Completed Exposure Assessment	Iarc,. 2014. IARC Monographs on the evaluation of carcinogenic risks to humans: Trichloroethylene, tetrachloroethylene, and some other chlorinated agents. 106	**216**
3978056	Completed Exposure Assessment	Atsdr,. 2006. Health consultation: Evaluation of tetrachloroethylene vapor intrusion into buildings located above a contaminated aquifer: Schlage Lock Company Security, El Paso County, Colorado: EPA facility ID: COD082657420.	**217**
3978068	Completed Exposure Assessment	Atsdr,. 2005. Health consultation: Walden"s Ridge utility district: Signal Mountain, Hamilton County, Tennessee.	**218**
3978081	Completed Exposure Assessment	Atsdr,. 2008. Health consultation: Public comment release: Indoor and outdoor air data evaluation for Chillum perc site: Chillum perc site (aka Chillum perchloroethylene): Chillum, Prince George County, Maryland: EPA facility ID: MDN000305887.	**219**
3978375	Completed Exposure Assessment	Carex, Canada. 2017. Tetrachloroethylene– Environmental estimate.	**220**

3978377	Completed Exposure Assessment	Carex, Canada. 2017. Tetrachloroethylene– Environmental estimate: Indoor air.	**221**
3978390	Completed Exposure Assessment	Who,. 2006. WHO IRIS: Tetrachloroethylene.	**222**
3980994	Completed Exposure Assessment	Atsdr,. 2011. Case studies in environmental medicine: tetrachloroethylene toxicity.	**223**
3981152	Completed Exposure Assessment	Environment Canada, Health Canada. 1993. Canadian Environmental protection act priority substances list assessment report tetrachloroethylene.	**224**
3982134	Completed Exposure Assessment	European Chlorinated Solvents, Association. 2011. Health profile on perchloroethylene.	**225**
3982310	Completed Exposure Assessment	Oehha,. 2001. Public health goal for tetrachloroethylene in drinking water.	**226**
3982312	Completed Exposure Assessment	Arb,. 1991. Proposed identification of perchloroethylene as a toxic air contaminant.	**227**
3986480	Completed Exposure Assessment	Carb,. 1991. Technical support document part A: Proposed identification of perchloroethylene as a toxic air contaminant.	**228**
3986481	Completed Exposure Assessment	Carb,. 1991. Technical support document part B: Proposed identification of perchloroethylene as a toxic air contaminant.	**229**
4151966	Completed Exposure Assessment	P. E. I. Associates. 1985. Asbestos dust control in brake maintenance. Draft.	**230**
4152094	Completed Exposure Assessment	Ec,. 2004. European Union risk assessment report: Tetrachloroethylene.	**231**
4152270	Completed Exposure Assessment	Wu,,et al.,. 2001. Sources, emissions and exposures for trichloroethylene (TCE) and related chemicals.	**232**
4152304	Completed Exposure Assessment	Herbert, P.,Charbonnier, P.,Rivolta, L.,Servais, M.,Van Mensch, F.,Campbell, I.. 1986. The occurrence of chlorinated solvents in the environment. Prepared by a workshop of the European Chemical Industry Federation (CEFIC). Chemistry and Industry 24	**233**
4663189	Completed Exposure Assessment	Delmaar, J. E.. Emission of chemical substances from solid matrices: a method for consumer exposure assessment.	**234**
Survey			**235**
1005969	Survey	U.S, E. P. A.. 1987. Household solvent products: A national usage survey.	**235**
1065590	Survey	Abt. 1992. Methylene chloride consumer use study survey findings.	**236**
2331429	Survey	Wang, S.,Majeed, M. A.,Chu, P.,Lin, H.. 2009. Characterizing relationships between personal exposures to VOCs and socioeconomic, demographic, behavioral variables. Atmospheric Environment 43	**237**

2443306	Survey	Farrow, A.,Taylor, H.,Northstone, K.,Golding, J.,Avon Longitudinal, Study. 2003. Symptoms of mothers and infants related to total volatile organic compounds in household products. Archives of Environmental Health 58	**238**
Modeling			**242**
56224	Modeling	Serrano-Trespalacios, P. I.,Ryan, L.,Spengler, J. D.. 2004. Ambient, indoor and personal exposure relationships of volatile organic compounds in Mexico City metropolitan area. Journal of Exposure Analysis and Environmental Epidemiology 1	**242**
85812	Modeling	Park, J. H.,Spengler, J. D.,Yoon, D. W.,Dumyahn, T.,Lee, K.,Ozkaynak, H.. 1998. Measurement of air exchange rate of stationary vehicles and estimation of in-vehicle exposure. Journal of Exposure Analysis and Environmental Epidemiology 8	**243**
2494965	Modeling	Akita, Y.,Carter, G.,Serre, M. L.. 2007. Spatiotemporal nonattainment assessment of surface water tetrachloroethylene in New Jersey. Journal of Environmental Quality 36	**244**
3001596	Modeling	Olie, J. D.,Bessems, J. G.,Clewell, H. J.,Meulenbelt, J.,Hunault, C. C.. 2015. Evaluation of semi-generic PBTK modeling for emergency risk assessment after acute inhalation exposure to volatile hazardous chemicals. Chemosphere 132	**245**
4440489	Modeling	UL Env. 2017. Floor Coating VOC Emissions Research Report.	**246**

Refer to Appendix E of '*Application of Systematic Review in TSCA Risk Evaluations*' at https://www.epa.gov for more information of evaluation procedures and parameters.

Study Citation:	Pellizzari, E. D.,Wallace, L. A.,Gordon, S. M.. 1992. Elimination kinetics of volatile organics in humans using breath measurements. Journal of Exposure Analysis and Environmental Epidemiology.
Data Type	Monitoring
Hero ID	5405

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	Sampling methodology detailed in separate reference which we don't have. Upgradable upon examination of reference.
	Metric 2:	Analytical Methodology	High	1	
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	>20 years old
	Metric 6:	Spatial and Temporal Variability	Low	3	Only 4 subjects
	Metric 7:	Exposure Scenario	Medium	2	Provided consumer products used, but not names or active ingredients.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	High	1	
	Metric 9:	Quality Assurance	High	1	
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	limited discussion
Overall Quality Determination[*]			Medium	1.8	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Clayton, C. A.,Pellizzari, E. D.,Whitmore, R. W.,Perritt, R. L.,Quackenboss, J. J.. 1999. National Human Exposure Assessment Survey (NHEXAS): Distributions and associations of lead, arsenic, and volatile organic compounds in EPA Region 5. Journal of Exposure Analysis and Environmental Epidemiology.
Data Type	Monitoring
Hero ID	14003

Domain	Metric		Rating†	Score	Comments‡
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	Sampling methodologies explained in detail in other papers
	Metric 2:	Analytical Methodology	High	1	Analytical methodologies explained in detail in other papers.
	Metric 3:	Biomarker Selection	N/A	N/A	air samples
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	>15 years ago
	Metric 6:	Spatial and Temporal Variability	High	1	Large sample size
	Metric 7:	Exposure Scenario	Medium	2	Indoor air, but not directly related to consumer products.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	No raw, no minimum.
	Metric 9:	Quality Assurance	High	1	Supplemental articles on QA/QC activities of project..
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	
Overall Quality Determination*			High	1.4	
Extracted			Yes		

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Wallace, L. A.,Pellizzari, E. D.,Hartwell, T. D.,Sparacino, C. M.,Sheldon, L. S.,Zelon, H.. 1985. Results from the first three seasons of the TEAM study: personal exposures, indoor-outdoor relationships, and breath levels of toxic air pollutants measured for 355 persons in New Jersey.
Data Type	Monitoring
Hero ID	21469

Domain		Metric	Rating†	Score	Comments‡
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	Standard sampling method not mentioned. Air - Tenax, pump flow rates, 12 hr period; Breath - spirometer; No info on sample storage, duration prior to analysis. Field blanks conducted.
	Metric 2:	Analytical Methodology	Medium	2	GC/MS/COMP. Only very limited detailes provided. Recoveries provided, but no other discussion on calibration.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	30 yrs old
	Metric 6:	Spatial and Temporal Variability	High	1	Large sample size, duplicates
	Metric 7:	Exposure Scenario	Medium	2	Indoor air, but not specific to a product
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	Only GM, mean, and max provided. No raw data.
	Metric 9:	Quality Assurance	High	1	Dups, field blanks, lab blanks, controls
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	
Overall Quality Determination*			High	1.6	
Extracted					

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Aggazzotti, G.,Fantuzzi, G.,Predieri, G.,Righi, E.,Moscardelli, S.. 1994. Indoor exposure to perchloroethylene (PCE) in individuals living with dry-cleaning workers. Science of the Total Environment.
Data Type	Monitoring
Hero ID	21778

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	Sampling protocol is described in detail.
	Metric 2:	Analytical Methodology	High	1	Analytical methods are described, and calibration and detection limits are given.
	Metric 3:	Biomarker Selection	N/A	N/A	Biomarker not used for alveolar/breath sampling
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	Presumed to be Modena, Italy
	Metric 5:	Currency	Low	3	Data collected prior to publication in 1994 (15+ years)
	Metric 6:	Spatial and Temporal Variability	High	1	Breath samples from both exposed and control populations, replicate indoor air samples from 30 households
	Metric 7:	Exposure Scenario	High	1	Consumer indoor air exposure measured by indoor air concentrations and breath samples
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	Summary statistics only
	Metric 9:	Quality Assurance	Low	3	Quality assurance is not directly discussed
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	Some discussion of variability between different members of same household
Overall Quality Determination[*]			Medium	1.8	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Heavner, D. L.,Morgan, W. T.,Ogden, M. W.. 1995. Determination of volatile organic compounds and ETS apportionment in 49 homes. Environment International.
Data Type	Monitoring
Hero ID	22045

Domain		Metric	Rating†	Score	Comments‡
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	Flow rate provided. No calibration mentioned. Field blanks used.
	Metric 2:	Analytical Methodology	Low	3	No LOD/LOQ.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	Samples collected in 1991
	Metric 6:	Spatial and Temporal Variability	High	1	
	Metric 7:	Exposure Scenario	Medium	2	Indoor air in residence, but not directly tied to a consumer product, but list of potential products listed.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	No raw data. No percent detected.
	Metric 9:	Quality Assurance	Medium	2	field blanks. no recoveries
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	SD. compared results between smokers and non smokers.
Overall Quality Determination*			Medium	1.9	
Extracted			Yes		

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Lebret, E.,van de Wiel, H. J.,Bos, H. P.,Noij, D.,Boleij, J. S. M.. 1986. Volatile organic compounds in Dutch homes. Environment International.
Data Type	Monitoring
Hero ID	22186

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	sampling method is well explained. but no discussion of storage conditions and calibration.
	Metric 2:	Analytical Methodology	Low	3	calibration, DT, recovery samples are not mentioned.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	>15 yrs old
	Metric 6:	Spatial and Temporal Variability	High	1	
	Metric 7:	Exposure Scenario	Medium	2	Indoor air study. but not consumer products specific.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	range, mean, deta frequency are provided. but no raw data.
	Metric 9:	Quality Assurance	Low	3	no QA/QC is discussed.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Low	3	discussion of variability/uncertainty is quite limited.
Overall Quality Determination[*]			Medium	2.2	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Wallace, L. A.. 1986. Personal exposures, indoor and outdoor air concentrations, and exhaled breath concentrations of selected volatile organic compounds measured for 600 residents of New Jersey, North Dakota, North Carolina, and California. Toxicological and Environmental Chemistry.
Data Type	Monitoring
Hero ID	23081

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	
	Metric 2:	Analytical Methodology	High	1	
	Metric 3:	Biomarker Selection	High	1	breath
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	>15 yrs old
	Metric 6:	Spatial and Temporal Variability	High	1	
	Metric 7:	Exposure Scenario	Medium	2	indoor air study. but not analysis for consumer products.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	no raw data
	Metric 9:	Quality Assurance	High	1	
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	
Overall Quality Determination[*]			High	1.4	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Chan, C. C.,Vainer, L.,Martin, J. W.,Williams, D. T.. 1990. Determination of organic contaminants in residential indoor air using an adsorption-thermal desorption technique. Journal of the Air and Waste Management Association.
Data Type	Monitoring
Hero ID	27974

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	Sampling methodology discussed. At each of 12 homes the following samples were collected in November or December 1986: four indoor air samples, of varying volumes, using single sorbent tube and one indoor air sample using two sorbent tubes connected in series. Repeat samplings were carried out at six of these homes in February or March, 1987. The indoor air samples were collected on the main floor of the home, usually in the living or family room, where no obvious sources of contamination were present. Indoor air samples were collected at the same time, usually in the evening or late afternoon where a uniform 90-minute sampling time was used and pump flow rates were adjusted to sample the required volume of air. Air volumes sampled varied from 5 to 50 L. After sample collection the sorbent tubes were sealed in individual screw cap glass tubes and then stored in a tightly sealed container until analyzed.
	Metric 2:	Analytical Methodology	Medium	2	Analytical methodology discussed. Samples were analyzed using adsorption/Thermal Desorption coupled with Gas Chromatography/Mass Spectrometry (ATD/GS/MS). Method Detection Limit (ng/tube) provided in Table I; 6.0 ng/tube for DCM, TCE and PERC. Analysis was carried out within two days of sampling.
	Metric 3:	Biomarker Selection	N/A	N/A	Biomarker is not used.
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	Canada
	Metric 5:	Currency	Low	3	>15 years (1986,, 1987)
	Metric 6:	Spatial and Temporal Variability	Medium	2	large sample (60 indoor air samples collected 1986: 4 samples using single sorbent tube and 1 sample using two sorbent tubes connected in a series and 12 homes, so 5x12=60 and 30 indoor air samples collected 1987 at 6 homes: 5x6=30).
	Metric 7:	Exposure Scenario	Medium	2	Some discussion of exposure scenario, samples collected on main floor of the home usually in living room or family room where no source of contamination was present.
Domain 3: Accessibility/Clarity					

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Study Citation:	Chan, C. C.,Vainer, L.,Martin, J. W.,Williams, D. T.. 1990. Determination of organic contaminants in residential indoor air using an adsorption-thermal desorption technique. Journal of the Air and Waste Management Association.
Data Type	Monitoring
Hero ID	27974

Domain	Metric		Rating†	Score	Comments‡
	Metric 8:	Reporting of Results	Medium	2	No supplemental or raw data. Tables II and III report indoor air concentrations (range and mean) for 12 homes during 1986 and 6 homes during 1987, respectively.
	Metric 9:	Quality Assurance	Medium	2	A blank sorbent tube was carried to and from each home and handled and analyzed as a sample, except that no air was sampled through the tube. Each week, three tubes fortified at a low level (approx 70-80 ng) and three tubes fortified at a medium level (approx 700- 800 ng) with a standard mixture of target compounds, together with a blank tube, were transported to and from one sampling site and analyzed by ATD/GC/MS. To assess the stability of the organic target compounds during storage of the sampling tube, triplicate sorbent tubes fortified with the target compounds at low and medium levels (approx 70-80 and 700-800 ng, respectively), together with a blank tube, were stored for 0,1,3 and 7 days under normal storage conditions and then analyzed by ATD/GC/MS.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	Since concentrations of contaminants can vary greatly, effective use of the technique requires that several air samples of different volumes be collected at each location.
Overall Quality Determination*			Medium	2.0	
Extracted			Yes		

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Hisham, M. W. M.,Grosjean, D.. 1991. Sulfur dioxide, hydrogen sulfide, total reduced sulfur, chlorinated hydrocarbons and photochemical oxidants in southern California museums. Atmospheric Environment.
Data Type	Monitoring
Hero ID	28104

Domain	Metric		Rating†	Score	Comments‡
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	Sampling methodology discussed. Chlorinated hydrocarbons (e.g., PERC) were measured at one museum in the Los Angeles area: the Gene Autry Western Heritage Museum (located between Griffin Park and Burbank). Measurements were carried out over a period of 2 weeks. Indoor air quality was surveyed at several (typically five) locations within each museum including exhibit galleries, collection storage areas, and other settings such as a research library. Chlorinated hydrocarbons were measured on-line using calibrated continuous analyzers. All analyzers were outfitted with two 1/4 in diameter Teflon sampling lines. Data were acquired around-the-clock every 30 min, yielding alternatively indoor and outdoor air concentrations..
	Metric 2:	Analytical Methodology	Medium	2	Analytical methodology discussed. Chlorinated hydrocarbons were measured by electron capture gas chromatography (EC-GC) as described earlier (Hisham and Grosjean, 1989; Williams and Grosjean, 1989, 1990) using a SRI model 8610 gas chromatograph equipped with a Valco 140 BN EC detector. For the chlorinated hydrocarbons, precisely metered amounts of the pure liquids were injected in a 1.00 m 3 Teflonlined container. Our EC-GC calibration data for chlorinated hydrocarbons were independently verified by analyzing a standard mixture prepared and calibrated in the laboratory of Dr R. Rasmussen (Oregon Graduate Center, Beaverton, OR). This mixture, contained in a passivated stainless steel conister, included 0.5-1.1 ppb each of some 15 halogenated hydrocarbons. Analysis of this mixture in our laboratory gave excellent agreement for C2Cl4 (corresponding to nominal and measured response factors of 0.042 and 0.041 ppb mm-1, respectively. Analysis of the 15-compound mixture also enabled us to verify that none of these compounds interfered with PAN, CH3CCI 3 or C2C14 under our experimental conditions (Hisham and Grosjean, 1990). Detection limit was 0.1 ppb for tetrachloroethylene (PERC)
	Metric 3:	Biomarker Selection	N/A	N/A	Biomarker is not used
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	California, Los Angeles area at the Gene Autry Western Heritage Museum.

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Study Citation:	Hisham, M. W. M.,Grosjean, D.. 1991. Sulfur dioxide, hydrogen sulfide, total reduced sulfur, chlorinated hydrocarbons and photochemical oxidants in southern California museums. Atmospheric Environment.
Data Type	Monitoring
Hero ID	28104

Domain	Metric		Rating†	Score	Comments‡
	Metric 5:	Currency	Low	3	>15 years (1989)
	Metric 6:	Spatial and Temporal Variability	Medium	2	At the Gene Autry Museum, our survey yielded some 600 data points each for PAN, CH3CC13 and C2C1 , all from EC-GC measurements. These pollutants were ubiquitous and could be detected at all indoor locations. Summarized in Table ! are maximum concentrations and the corresponding range of 24-h averages.. Note: both indoor and outdoor samples were collected.
	Metric 7:	Exposure Scenario	Medium	2	At the Gene Autry Museum, measurement of indoor pollutants were made at three locations, one in the museum exhibit area (Trail View Window), one in a hallway connected to the outside by a large roll-up door for truck deliveries, (the 'buffer zone') and one in a working area, the Conservation Room, which was near the buffer zone and connected to it by a small hallway and swing doors. The exhibit area was connected to the museum main HVAC system, and the buffer zone and Conservation Room were both connected to a smaller HVAC system. Both HVAC units were equipped with 50: 50 carbon-Carusorb chemical filtration. Each indoor location exhibited a different pattern with respect to indoor pollutant concentrations.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	No supplemental or raw data provided. Table 1 summarizes maximum concentrations and ranges of 24-h average concentrations at the Gene Autry Museum. Indoor air concentrations reported for PERC (C2Cl4). Also Table 4 reports twenty-four hour averaged PERC (C2Cl4) at the Gene Autry Museum .
	Metric 9:	Quality Assurance	Medium	2	Calibration data for the EC-GC all exhibited linear behavior (R >0.998) in the range of concentrations tested, i.e. 0.7-9 ppb for CzCI4,. The corresponding detection limit was 0.1 ppb for tetrachloroethylene.
Domain 4: Variability and Uncertainty					

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Study Citation:	Hisham, M. W. M.,Grosjean, D.. 1991. Sulfur dioxide, hydrogen sulfide, total reduced sulfur, chlorinated hydrocarbons and photochemical oxidants in southern California museums. Atmospheric Environment.
Data Type	Monitoring
Hero ID	28104

Domain	Metric	Rating†	Score	Comments‡
	Metric 10: Variability and Uncertainty	Medium	2	Indoor levels of ozone, NO 2 and PAN were substantially lower than outdoor levels when the roll-up door was closed, see Fig. 1. The opposite was true of the chlorinated hydrocarbons, (also shown in Fig. 1), thus pointing out to indoor sources of methyl chloroform and tetrachloroethylene. Indoor sources of chlorinated hydrocarbons have also been identified at six of the nine institutions included in our previous study (Hisham and Grosjean, 1989).
Overall Quality Determination*		Medium	2.0	
Extracted		Yes		

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Thomas, K. W.,Pellizzari, E. D.,Perritt, R. L.,Nelson, W. C.. 1991. Effect of dry-cleaned clothes on tetrachloroethylene levels in indoor air, personal air, and breath for residents of several New Jersey homes. Journal of Exposure Analysis and Environmental Epidemiology.
Data Type	Monitoring
Hero ID	28307

Domain		Metric	Rating†	Score	Comments‡
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	Sampling methodology is described with some details; no mention of sample storage.
	Metric 2:	Analytical Methodology	Low	3	Analysis methods only briefly described
	Metric 3:	Biomarker Selection	N/A	N/A	No biomarker
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	Nine homes in New Jersey
	Metric 5:	Currency	Low	3	Study conducted prior to 1991 (15+ years ago)
	Metric 6:	Spatial and Temporal Variability	High	1	Replicate samples, appropriate timing for biomonitoring (breath) samples, repeated sampling over scenario time
	Metric 7:	Exposure Scenario	High	1	Consumer inhalation exposure via dry-cleaned clothes, measured by indoor air/breath concentrations
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	Results reported in summary/chart form, not raw data
	Metric 9:	Quality Assurance	High	1	Quality control and assurance discussed; field blanks, two independent labs for analysis
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	Variability and uncertainty discussed with respect to garment types and other factors affecting emissions
Overall Quality Determination*			Medium	1.7	
Extracted			Yes		

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Ferrario, J. B.,Lawler, G. C.,Deleon, I. R.,Laseter, J. L.. 1985. Volatile organic pollutants in biota and sediments of Lake Pontchartrain. Bulletin of Environmental Contamination and Toxicology.
Data Type	Monitoring
Hero ID	28993

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	sampling method is described well. calibration is not refered.
	Metric 2:	Analytical Methodology	Medium	2	Analysis method is based onNational Bureau of Standards procedure though, modified ver. Older method (1976).
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	>15 yrs old
	Metric 6:	Spatial and Temporal Variability	Low	3	sample size is quite small.
	Metric 7:	Exposure Scenario	Low	3	study of oysters/clams is off PECO.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	No raw data.
	Metric 9:	Quality Assurance	Medium	2	Blanks and calibration standards used, in addition internal standards, however results not reported.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Low	3	No dicsussion for variability/uncertainty.
Overall Quality Determination[*]			Low	2.3	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Singh, H. B.,Salas, L. J.,Stiles, R. E.. 1983. Selected man-made halogenated chemicals in the air and oceanic environment. Journal of Geophysical Research.
Data Type	Monitoring
Hero ID	29192

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	
	Metric 2:	Analytical Methodology	Low	3	sampling method, equipments are discribed. But there is time lag(3 - 6weeks) between sampling and analysis. experimental protocol is provided in another reference(singh 1982).
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	>15 yrs old
	Metric 6:	Spatial and Temporal Variability	Medium	2	Sufficient sample size(About 40). These samples are collected in various dates, sites, and depth. But no replicate samples.
	Metric 7:	Exposure Scenario	High	1	
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	Dataset is well summarized. But no raw data is showed(just average value). The meaning of hyphen is not explained.
	Metric 9:	Quality Assurance	Medium	2	QA is described a bit like calibration, standards though, discussion is quite limited.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Low	3	Comparison of measured values and predicted values is described though, limited discussion.
Overall Quality Determination[*]			Medium	2.0	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	M. R. Van Winkle, P. A. Scheff. 2001. Volatile organic compounds, polycyclic aromatic hydrocarbons and elements in the air of ten urban homes. Indoor Air.
Data Type	Monitoring
Hero ID	31210

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	Sampling methodology discussed under Study Design.
	Metric 2:	Analytical Methodology	High	1	The canisters were analyzed in accordance with the U.S. EPA Compendium Method TO-14 by Gas Chromatography with Selected Ion Monitoring Mass Spectrometry (GC/MS).
	Metric 3:	Biomarker Selection	N/A	N/A	Biomarker is not used.
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	U.S., Southeast Chicago, IL
	Metric 5:	Currency	Low	3	>15 yrs (1994-1995)
	Metric 6:	Spatial and Temporal Variability	Medium	2	large sample size (48 samples see Table 1) no replicates?
	Metric 7:	Exposure Scenario	Medium	2	The questionnaire was designed to measure variables that may influence pollutant penetration, dispersion, and source strength. Potential influencing variables that were measured included household activity levels, household chemical sources, and factors that could affect ventilation. Specific variables included foods cooked, cleaners used during sampling, visitors during sampling, noticeable odors by occupant, chemicals used by occupant, window open status, and air-conditioning use.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	No supplemental or raw data. Summary stats for indoor air provided in Table 1.
	Metric 9:	Quality Assurance	Medium	2	Quality assurance was performed on the indoor data by the Illinois Department of Public Health. VOC, PAH, and elemental concentrations that were qualified as quantified (>10 times the mean blank concentration) and estimated (between 3 and 10 times the mean blank concentration) were included in the data analyses.
Domain 4: Variability and Uncertainty					

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Study Citation:	M. R. Van Winkle, P. A. Scheff. 2001. Volatile organic compounds, polycyclic aromatic hydrocarbons and elements in the air of ten urban homes. Indoor Air.
Data Type	Monitoring
Hero ID	31210

Domain	Metric	Rating†	Score	Comments‡
	Metric 10: Variability and Uncertainty	Medium	2	See Discussion section. Indoor VOC concentrations were highly variable. Similar to the TEAM study, the range of indoor VOC concentrations were within a factor of 10 to 1000. As indicated in Table 1, the indoor VOC concentrations, with the exception of methylene chloride, are generally comparable to the other studies
Overall Quality Determination*		Medium	1.9	
Extracted		Yes		

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Lehmann, I.,Thoelke, A.,Rehwagen, M.,Rolle-Kampczyk, U.,Schlink, U.,Schulz, R.,Borte, M.,Diez, U.,Herbarth, O.. 2002. The influence of maternal exposure to volatile organic compounds on the cytokine secretion profile of neonatal T cells. Environmental Toxicology.
Data Type	Monitoring
Hero ID	34460

Domain	Metric		Rating†	Score	Comments‡
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	Sampling methods and equipment are described.
	Metric 2:	Analytical Methodology	Medium	2	A GC-MS method was described with detection lmits provided.
	Metric 3:	Biomarker Selection	High	1	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	Data collected >15 years old
	Metric 6:	Spatial and Temporal Variability	Medium	2	No replicates.
	Metric 7:	Exposure Scenario	Medium	2	Indoor air measured in children's bedrooms.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Low	3	Summary statistics provided with description of data set, range of concentrations, and number of samples in data set only.
	Metric 9:	Quality Assurance	Low	3	Quality assurance is not directly discussed
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Low	3	No discussion on variability but limitations were discussed.
Overall Quality Determination*			Medium	2.2	
Extracted			Yes		

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Singh, H. B.,Salas, L. J.,Smith, A. J.,Shigeishi, H.. 1981. Measurements of some potentially hazardous organic chemicals in urban environments. Atmospheric Environment.
Data Type	Monitoring
Hero ID	39644

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Low	3	Sampling described in very general terms
	Metric 2:	Analytical Methodology	Low	3	Analysis done in field
	Metric 3:	Biomarker Selection	N/A	N/A	No biomarker
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	Three sites: Los Angeles, Phoenix, Oakland
	Metric 5:	Currency	Low	3	Data collected prior to 1980 (15+ years ago)
	Metric 6:	Spatial and Temporal Variability	Low	3	"Large amount of data", but number of samples not specified
	Metric 7:	Exposure Scenario	Low	3	Outdoor ambient air concentrations for various chemicals including PERC; not currently scenario of interest
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	Summary data only
	Metric 9:	Quality Assurance	Low	3	No specific discussion of quality control/assurance
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Low	3	No specific discussion of uncertainty/variability with regards to PERC
Overall Quality Determination[*]			Low	2.7	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Ahlers, J.,Regelmann, J.,Riedhammer, C.. 2003. Environmental risk assessment of airborne trichloroacetic acid - a contribution to the discussion on the significance of anthropogenic and natural sources. Chemosphere.
Data Type	Monitoring
Hero ID	42715

Domain		Metric	Rating†	Score	Comments‡
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Unacceptable	4	Sampling methods not described
	Metric 2:	Analytical Methodology	N/A	N/A	Unacceptable for other metrics
	Metric 3:	Biomarker Selection	N/A	N/A	Unacceptable for other metrics
Domain 2: Representativeness					
	Metric 4:	Geographic Area	N/A	N/A	Unacceptable for other metrics
	Metric 5:	Currency	N/A	N/A	Unacceptable for other metrics
	Metric 6:	Spatial and Temporal Variability	N/A	N/A	Unacceptable for other metrics
	Metric 7:	Exposure Scenario	Unacceptable	4	Study discussed concentrations in soil, rainwater, and plants - none of these are scenarios of interest
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	N/A	N/A	Unacceptable for other metrics
	Metric 9:	Quality Assurance	N/A	N/A	Unacceptable for other metrics
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	N/A	N/A	Unacceptable for other metrics
Overall Quality Determination*			Unacceptable	4.0	Metric mean score**: 4.0.
Extracted					

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

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.

‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.

* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Austin, J.. 2003. Day-of-week patterns in toxic air contaminants in southern California. Journal of the Air and Waste Management Association.
Data Type	Monitoring
Hero ID	47782

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	N/A	N/A	Data taken from public database (CARB TAC)
	Metric 2:	Analytical Methodology	N/A	N/A	Data taken from public database (CARB TAC)
	Metric 3:	Biomarker Selection	N/A	N/A	No biomarker
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	TAC sites throughout California
	Metric 5:	Currency	Low	3	Data collected between 1989-2001 (15+ years ago)
	Metric 6:	Spatial and Temporal Variability	N/A	N/A	Data taken from public database (CARB TAC)
	Metric 7:	Exposure Scenario	Low	3	Study looks at weekly variations in ambient outdoor air concentration - not currently scenario of interest
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	Summary data included in document
	Metric 9:	Quality Assurance	N/A	N/A	Data taken from public database (CARB TAC)
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	Study examines temporal variability
Overall Quality Determination[*]			Medium	2.2	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Ryan, T. J.,Hart, E. M.,Kappler, L. L.. 2002. VOC exposures in a mixed-use university art building. AIHA Journal.
Data Type	Monitoring
Hero ID	49414

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	Gave sampling details. Samples refrigerated and analyzed within 2 weeks.
	Metric 2:	Analytical Methodology	Medium	2	Methods well described, but info such as calibration, blanks, and recoveries were not provided.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	>15 yrs
	Metric 6:	Spatial and Temporal Variability	High	1	18 to 90 samples
	Metric 7:	Exposure Scenario	High	1	personal monitoring in printing studio at university (relevant to high-end hobbyist)
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	No raw data. Missing the range, but has average, median and AD.
	Metric 9:	Quality Assurance	Low	3	Used the Qedit function for accuracy and precision, but was not described. Blanks not discussed.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	Discussion different locations of building, compared to other studies, provided SD.
Overall Quality Determination[*]			Medium	1.7	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Serrano-Trespalacios, P. I.,Ryan, L.,Spengler, J. D.. 2004. Ambient, indoor and personal exposure relationships of volatile organic compounds in Mexico City metropolitan area. Journal of Exposure Analysis and Environmental Epidemiology.
Data Type	Monitoring
Hero ID	56224

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	Detailed sampling methodology, except no storage duration or calibration procedures reported.
	Metric 2:	Analytical Methodology	High	1	
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	Over 15 years old
	Metric 6:	Spatial and Temporal Variability	High	1	Over 90 individuals
	Metric 7:	Exposure Scenario	Medium	2	Indoor air samples not linked to specific consumer products.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	No raw, missing minimum
	Metric 9:	Quality Assurance	High	1	
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	Comparison to other studies.
Overall Quality Determination[*]			High	1.6	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Dowty, B. J.,Carlisle, D. R.,Laseter, J. L.. 1975. New Orleans drinking water sources tested by gas chromatography-mass spectrometry: Occurrence and origin of aromatics and halogenated aliphatic hydrocarbons. Environmental Science and Technology.
Data Type	Monitoring
Hero ID	58056

Domain		Metric	Rating†	Score	Comments‡
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	
	Metric 2:	Analytical Methodology	High	1	
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	
	Metric 6:	Spatial and Temporal Variability	Unacceptable	4	Appears to be only a single sample
	Metric 7:	Exposure Scenario	Medium	2	source water is media of interest, but not finished water
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Low	3	No raw, data
	Metric 9:	Quality Assurance	Low	3	little discussion
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Low	3	
Overall Quality Determination*			Unacceptable	4.0	Metric mean score**: 2.3.
Extracted					

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

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.

‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.

* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Ewing, B. B.,Chian, E. S. K.,Cook, J. C.,Evans, C. A.,Hopke, P. K.,Perkins, E. G.. 1977. Monitoring to detect previously unrecognized pollutants in surface waters.
Data Type	Monitoring
Hero ID	58060

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	Government paper so assumed use of appropriate methods.
	Metric 2:	Analytical Methodology	Medium	2	Analytical methodology is described and discussed.
	Metric 3:	Biomarker Selection	N/A	N/A	sw samples
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	>15 years
	Metric 6:	Spatial and Temporal Variability	Unacceptable	4	No concentrations; qualitative. Additional data in Progress Reports.
	Metric 7:	Exposure Scenario	Medium	2	SW samples collected.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Unacceptable	4	No concentrations provided.
	Metric 9:	Quality Assurance	Low	3	No discussion on QA.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Low	3	No variability or discussion on uncertainties.
Overall Quality Determination[*]			Unacceptable	4.0	Metric mean score[**]: 2.7.
Extracted					

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

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.

‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.

* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Ohta, T.,Morita, M.,Mizoguchi, I.. 1976. Local distribution of chlorinated hydrocarbons in the ambient air in Tokyo. Atmospheric Environment.
Data Type	Monitoring
Hero ID	58091

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Low	3	Sampling procedures are described very generally
	Metric 2:	Analytical Methodology	Medium	2	Analytical methods and equipment are given
	Metric 3:	Biomarker Selection	N/A	N/A	No biomarker
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	Tokyo, Japan
	Metric 5:	Currency	Low	3	Data collected in 1975 (40+ years ago)
	Metric 6:	Spatial and Temporal Variability	Medium	2	Sampling at 26 locations monthly for 1 year; no replicate samples
	Metric 7:	Exposure Scenario	Low	3	Study is looking at ambient outdoor air concentrations in urban environment; not current scenario of interest
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	Summary data only
	Metric 9:	Quality Assurance	Low	3	No specific mention of quality control or assurance
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	Some discussion of variability due to sampling locations and changing weather conditions
Overall Quality Determination[*]			Low	2.3	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Singh, H. B.,Salas, L. J.,Cavanagh, L. A.. 1977. Distribution, sources and sinks of atmospheric halogenated compounds. Journal of the Air and Waste Management Association.
Data Type	Monitoring
Hero ID	58111

Domain	Metric		Rating†	Score	Comments‡
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	Sampling procedures are given, though more detail for ambient air than surface water samples
	Metric 2:	Analytical Methodology	High	1	Analytical methods and equipment are given in detail
	Metric 3:	Biomarker Selection	N/A	N/A	No biomarker
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	Field studies conducted in California
	Metric 5:	Currency	Low	3	Article published in 1977 (40+ years ago)
	Metric 6:	Spatial and Temporal Variability	Medium	2	Sampling at two sites, one week each. Not clear how many samples were taken
	Metric 7:	Exposure Scenario	Medium	2	A concentration is given for PERC in ocean water
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	Summary data only
	Metric 9:	Quality Assurance	Medium	2	Some indications of quality control procedures in analysis description
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	Study examined variability between more and less urban locations
Overall Quality Determination*			Medium	1.9	
Extracted					

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Howie, S. J.. 1981. Ambient perchloroethylene levels inside coin-operated laundries with drycleaning machines on the premises.
Data Type	Monitoring
Hero ID	58127

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	
	Metric 2:	Analytical Methodology	High	1	Analytical methods discussed in Section 5
	Metric 3:	Biomarker Selection	N/A	N/A	No biomarker
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	Six laundries in Washington DC
	Metric 5:	Currency	Low	3	Data collected in 1980 (15+ years ago)
	Metric 6:	Spatial and Temporal Variability	High	1	Large number of replicate samples
	Metric 7:	Exposure Scenario	Medium	2	Consumer inhalation exposure via dry-cleaned clothes at laundry facilities, measured by indoor concentrations
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	High	1	Raw data provided in Appendix B as well as summary data
	Metric 9:	Quality Assurance	High	1	Quality assurance discussed in section 7
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	Variability and uncertainty are discussed
Overall Quality Determination[*]			High	1.3	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Aggazzotti, G.,Fantuzzi, G.,Righi, E.,Predieri, G.,Gobba, F. M.,Paltrinieri, M.,Cavalleri, A.. 1994. Occupational and environmental exposure to perchloroethylene (PCE) in dry cleaners and their family members. Archives of Environmental and Occupational Health.
Data Type	Monitoring
Hero ID	74875

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	Sampling protocol is described in detail.
	Metric 2:	Analytical Methodology	High	1	Analytical methods are described, and calibration and detection limits are given.
	Metric 3:	Biomarker Selection	N/A	N/A	Biomarker not used for alveolar/breath sampling
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	Modena, Italy
	Metric 5:	Currency	Low	3	Data collected prior to publication in 1994 (15+ years)
	Metric 6:	Spatial and Temporal Variability	High	1	Breath samples from both exposed and control populations, replicate indoor air samples from 30+ households
	Metric 7:	Exposure Scenario	High	1	Consumer indoor air exposure measured by indoor air concentrations and breath samples
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	Summary statistics only
	Metric 9:	Quality Assurance	Low	3	Quality assurance is not directly discussed
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	Some discussion of variability between different times of day, control vs exposed groups
Overall Quality Determination[*]			Medium	1.7	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Murray, A. J.,Riley, J. P.. 1973. Occurrence of some chlorinated aliphatic hydrocarbons in the environment. Nature.
Data Type	Monitoring
Hero ID	75108

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Unacceptable	4	sampling methods, equipments, and any other information are missed.
	Metric 2:	Analytical Methodology	Low	3	GC-ECD is used. calibration, LOD, recovery samples are not described.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	>15 yrs old
	Metric 6:	Spatial and Temporal Variability	Medium	2	sample size is moderate(6 sample). no replicate samples.
	Metric 7:	Exposure Scenario	Medium	2	samples are collected from the North East Atlantic.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Low	3	No raw data.
	Metric 9:	Quality Assurance	Low	3	No description of QA/QC.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Low	3	no discussion of variability/Uncertainty
Overall Quality Determination[*]			Unacceptable	4.0	Metric mean score[**]: 2.7.
Extracted					

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

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.

[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.

[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Kostiainen, R.. 1995. Volatile organic compounds in the indoor air of normal and sick houses. Atmospheric Environment.
Data Type	Monitoring
Hero ID	76241

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	Sampling methods are described in detail
	Metric 2:	Analytical Methodology	High	1	Analytical methods are given in detail, including calibration and detection limits
	Metric 3:	Biomarker Selection	N/A	N/A	No biomarker
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	Not given, but assume Finland based on laboratory location
	Metric 5:	Currency	Low	3	Data collected prior to publication in 1994 (15+ years)
	Metric 6:	Spatial and Temporal Variability	Low	3	More than 10 locations selected as both normal and "sick" houses, but collection period not given and no mention of replicates
	Metric 7:	Exposure Scenario	High	1	Consumer exposure through indoor air concentration
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	Data mostly presented as summary statistics; some raw data given to illustrate particular cases
	Metric 9:	Quality Assurance	Low	3	Quality assurance is not directly discussed
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	Discussion of how a variety of building and furnishing materials affects indoor air quality
Overall Quality Determination[*]			Medium	1.9	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Lindstrom, A. B.,Proffitt, D.,Fortune, C. R.. 1995. Effects of modified residential construction on indoor air quality. Indoor Air.
Data Type	Monitoring
Hero ID	78782

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	tenax, stated followed epa guidelines. Described sampled homes.
	Metric 2:	Analytical Methodology	Low	3	HPLC and provided MDLs, but did not describe the HPLC.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	>15 yrs
	Metric 6:	Spatial and Temporal Variability	Medium	2	10 homes
	Metric 7:	Exposure Scenario	Medium	2	testing conditions well described (housing characteristics). Only one geographic location.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Low	3	only geometric means provided. No SD, range.
	Metric 9:	Quality Assurance	Low	3	
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	No SD or CV. described differences between conventional and experimental homes. no discussion of uncertainty.
Overall Quality Determination[*]			Low	2.3	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Schwarzenbach, R. P.,Molnar-Kubica, E.,Giger, W.,Wakeham, S. G.. 1979. Distribution, residence time, and fluxes of tetrachloroethylene and 1,4-dichlorobenzene in Lake Zurich, Switzerland. Environmental Science and Technology.
Data Type	Monitoring
Hero ID	94461

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	Sampling information is provided.
	Metric 2:	Analytical Methodology	Medium	2	Analytical methods are described (gas stripping, chromatography) but instrument calibration not discussed
	Metric 3:	Biomarker Selection	N/A	N/A	Study looks at PERC levels in surface water; no biomarker
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	Lake Zurich, Switzerland
	Metric 5:	Currency	Low	3	Sampling done in 1977-78 (15+ years)
	Metric 6:	Spatial and Temporal Variability	Medium	2	Samples collected in different months throughout year to compare different lake conditions. Some replicate samples.
	Metric 7:	Exposure Scenario	High	1	Surface water in lake; sources identified as sewage treatment plants
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	Raw data not provided; summary of PERC concentration data in samples given as charts (Fig 2)
	Metric 9:	Quality Assurance	Low	3	Quality assurance implied through standard protocols
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	Variability is characterized for some but not all samples; uncertainties are identified
Overall Quality Determination[*]			Medium	1.9	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Weissflog, L.,Elansky, N.,Putz, E.,Krueger, G.,Lange, C. A.,Lisitzina, L.,Pfennigsdorff, A.. 2004. Trichloroacetic acid in the vegetation of polluted and remote areas of both hemispheres - Part II: Salt lakes as novel sources of natural chlorohydrocarbons. Atmospheric Environment.
Data Type	Monitoring
Hero ID	104106

Domain		Metric	Rating†	Score	Comments‡
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	Sampling methodology is described and discussed. besides, some infomation of equipments or sampling strage conditions are missed.
	Metric 2:	Analytical Methodology	Medium	2	Analytical methodology is described and discussed. besides, some information of instruments or recovery samples are missed.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	>15yrs
	Metric 6:	Spatial and Temporal Variability	Medium	2	less discuss an use of replicate samples.
	Metric 7:	Exposure Scenario	Medium	2	The information of surface water is discribed.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	raw data. less information of summary of data
	Metric 9:	Quality Assurance	Low	3	no discussion
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	uncertainty is discussed.
Overall Quality Determination*			Medium	2.1	
Extracted			Yes		

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Sexton, K.,Adgate, J. L.,Church, T. R.,Ashley, D. L.,Needham, L. L.,Ramachandran, G.,Fredrickson, A. L.,Ryan, A. D.. 2005. Children's exposure to volatile organic compounds as determined by longitudinal measurements in blood. Environmental Health Perspectives.
Data Type	Monitoring
Hero ID	632064

Domain		Metric	Rating†	Score	Comments‡
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	collected by trained phlebotimist
	Metric 2:	Analytical Methodology	Medium	2	analyzed at CDC using GS MS. Few details provided.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	Samples in 2000
	Metric 6:	Spatial and Temporal Variability	High	1	Large sample size
	Metric 7:	Exposure Scenario	Medium	2	Not directly related to consumer products.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	No raw data. Missing SD
	Metric 9:	Quality Assurance	Medium	2	Quality control was established by using two separate quality control materials, of which at least one was analyzed daily. Blood levels for the control pools were compared with previously established 99 percent confidence limits. Among the additional data validity checks were examination of gas chromatography retentio time, analyte accurate mass, and instrument sensitivity, as well as comparison of mass ratios bwith known standards.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	
Overall Quality Determination*			Medium	1.7	
Extracted			Yes		

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Adgate, J. L.,Church, T. R.,Ryan, A. D.,Ramachandran, G.,Fredrickson, A. L.,Stock, T. H.,Morandi, M. T.,Sexton, K.. 2004. Outdoor, indoor, and personal exposure to VOCs in children. Environmental Health Perspectives.
Data Type	Monitoring
Hero ID	632310

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	storage conditions and durations not provided
	Metric 2:	Analytical Methodology	Low	3	Did not actually provide the detection limit, although the did discuss how they handled LOD values.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	>15 years old
	Metric 6:	Spatial and Temporal Variability	High	1	
	Metric 7:	Exposure Scenario	High	1	
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	High	1	
	Metric 9:	Quality Assurance	Medium	2	no recoveries
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	No CV
Overall Quality Determination[*]			Medium	1.8	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Ohura, T.,Amagai, T.,Senga, Y.,Fusaya, M.. 2006. Organic air pollutants inside and outside residences in Shimizu, Japan: Levels, sources and risks. Science of the Total Environment.
Data Type	Monitoring
Hero ID	632484

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	no storage duration, passive samplers
	Metric 2:	Analytical Methodology	Medium	2	passive sampling were linearly correlated with the concentrations measured by active sampling, calibration not discussed. Good recoveries.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	japan
	Metric 5:	Currency	Low	3	>15 yrs
	Metric 6:	Spatial and Temporal Variability	High	1	24 hr samples, large sample size
	Metric 7:	Exposure Scenario	High	1	Questionairre on Selected sociodemographic characteristics and exposure- related attributes
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	No individual samples.
	Metric 9:	Quality Assurance	High	1	lab and field blanks, recoveries
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	Assessed factors influences exposures
Overall Quality Determination[*]			High	1.6	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Zuraimi, M. S.,Tham, K. W.. 2008. Effects of child care center ventilation strategies on volatile organic compounds of indoor and outdoor origins. Environmental Science and Technology.
Data Type	Monitoring
Hero ID	632758

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	Sampling methodology discussed. For each CCC, an indoor (main classroom) and an outdoor sampling point were randomly selected for simultaneous air sampling. Indoor samplings were performed in the middle of the classroom near the breathing zone of children (approximately 0.5"0.7 m). Designed to evaluate the "typical" levels of VOCs to which the preschool children in each CCC are exposed, samplings were conducted in the middle of the week and during the day from 8 am to 5 pm (sampling interval of 9 h). For noncarbonyls, VOCs were actively sampled using a sampling pump (AP Buck Inc.) onto preconditioned Tenax TA sorbent tubes. Duplicate flow rates were set at 5 and 10 mLmin-1. For carbonyls, duplicate air samples were pumped through DNPH cartridges (Supelco) using another sampling pump at flow rates of 0.5 and 1 L min-1. Flow rates were measured before and after sampling using the mini Buck airflow calibrator (AP Buck Inc.). Details of the sample collection, analysis and QA/QC can be found in the Supporting Information.
	Metric 2:	Analytical Methodology	Medium	2	Analytical methodology discussed. The sampled VOCs on Tenax tubes were desorbed using an automated thermal desorber (Perkin-Elmer), separated using a gas chromatograph (Agilent) and analyzed using a mass selective detector (Agilent). For carbonyls, the analytes were eluted using acetonitrile and analyzed using a high performance liquid chromatography equipped with a diode array detector (Agilent). For every CCC, a field and laboratory blank is employed. VOCs with measured values lower than their method detection limit (MDL) were assigned to a value half of the MDL. Details of the sample collection, analysis and QA/QC can be found in the Supporting Information.
	Metric 3:	Biomarker Selection	N/A	N/A	Biomarker is not used.
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	Singapore
	Metric 5:	Currency	Medium	2	>5 to 15 years (2007 pub date)

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Study Citation:	Zuraimi, M. S.,Tham, K. W.. 2008. Effects of child care center ventilation strategies on volatile organic compounds of indoor and outdoor origins. Environmental Science and Technology.
Data Type	Monitoring
Hero ID	632758

Domain	Metric		Rating†	Score	Comments‡
	Metric 6:	Spatial and Temporal Variability	High	1	High number of samples, duplicates. Sampling numbers provided for each ventilation strategy. In this study, ACMV CCCs (N=5) are defined as those with a dedicated or shared air handling unit, filtration and fresh air provision (typically about 10 percent of total air change), HB CCCs (N=21), those that incorporate air conditioning for a portion of the day (typically 2 h) and relying on natural ventilation at other times, NV CCCs (N=59), those that rely on open windows only for ventilation and AC CCCs (N=19), those that incorporate split unit air-conditioners without any provision of fresh air. During inspections, it was found that there were rooms in some NV CCCs which were air conditioned. For these CCCs (N=19), an indoor air location in the NV room and another in the AC room were measured simultaneously making it a total of 123 samples. Supporting Information (SI) Table S1 provides a descriptive summary of the CCCs characteristics.
	Metric 7:	Exposure Scenario	Medium	2	Singapore is a tropical city, where the ventilation strategies adopted by the child care centers (CCCs) can be classified as naturally ventilated (NV), hybrid (combination of natural ventilation and air conditioning) ventilated (HB), air-conditioned and mechanically ventilated (ACMV), and air-conditioned but without ventilation (AC). In this article, we present the exposures and risk of indoor VOCs, their sources, and the impact of ventilation strategies in a nationwide study involving 104 representative CCCs in Singapore.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	Supplementary Info available but not provided; requested for extraction. Table 1 reports indoor air concentrations of TCE and PERC in CCCs with different ventilation strategies.
	Metric 9:	Quality Assurance	Medium	2	For every CCC, a field and laboratory blank is employed. VOCs with measured values lower than their method detection limit (MDL) were assigned to a value half of the MDL. Details of the sample collection, analysis and QA/QC can be found in the Supporting Information.
Domain 4: Variability and Uncertainty					

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Study Citation:	Zuraimi, M. S.,Tham, K. W.. 2008. Effects of child care center ventilation strategies on volatile organic compounds of indoor and outdoor origins. Environmental Science and Technology.
Data Type	Monitoring
Hero ID	632758

Domain	Metric	Rating†	Score	Comments‡
	Metric 10: Variability and Uncertainty	Medium	2	Because regulatory decisions are based on risk evaluations, it is important to know how CCC ventilation strategies give rise to differing risks estimates of VOC exposures. However, given the large uncertainties in risk calculations, it is difficult to ascertain significant differences between estimated cancer risks. Assumptions used by the U.S. Environmental Protection Agency and the Office of Environmental Health Hazard Assessment such as standard body weight and average breathing rate may not reflect the variability of the population at large and specific differences between adults and children and between Caucasians and Asians. Also, toxicity information obtained from studies using animals have uncertainty related to extrapolations from high doses for animals to low human exposures. Indeed, information providing confidence intervals for cancer potency estimates are still not available. Despite these assumptions which may bias the estimates, the median values provide a good indication of the relative risk levels among attending children in CCCs with different ventilation strategies. Also, analyses of risk assessment used in this study can provide insight not only about the high-risk VOCs, but also about the dominant sources of their exposures, which can allow proper mitigation strategies for more effective means of exposure reduction.
Overall Quality Determination*		Medium	1.7	
Extracted		Yes		

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Dewulf, J. P.,Van Langenhove, H. R.,Der Auwera, L. F.. 1998. Air/water exchange dynamics of 13 volatile chlorinated C1- and C2-hydrocarbons and monocyclic aromatic hydrocarbons in the southern North Sea and the Scheldt estuary. Environmental Science and Technology.
Data Type	Monitoring
Hero ID	644857

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	Sampling equipment, procedures and storage are given
	Metric 2:	Analytical Methodology	Medium	2	Analytical procedure and equipment described, including detection limit but not calibration.
	Metric 3:	Biomarker Selection	N/A	N/A	No biomarker
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	Map is given with North Sea sampling locations
	Metric 5:	Currency	Low	3	Data collected in 1995-1996 (15+ years ago)
	Metric 6:	Spatial and Temporal Variability	High	1	38 total samples in duplicate from six locations
	Metric 7:	Exposure Scenario	Medium	2	Surface water inc. from oceans is a scenario of interest, ambient air is not
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	Data summarized in Table 1
	Metric 9:	Quality Assurance	High	1	Quality control charts and standard addition tests
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	Some discussion of variability with regards to sources of PERC in water samples
Overall Quality Determination[*]			Medium	1.7	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Yamamoto, K.,Fukushima, M.,Kakutani, N.,Kuroda, K.. 1997. Volatile organic compounds in urban rivers and their estuaries in Osaka, Japan. Environmental Pollution.
Data Type	Monitoring
Hero ID	645789

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	Sampling method discussed, but does not indicate if it is a standard method. Samples stored refrigerated until analysis.
	Metric 2:	Analytical Methodology	High	1	GC/MS. EPA Method 524.2 Mean accuracy, the precision & method detection limits
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	>20 years (1993-1995)
	Metric 6:	Spatial and Temporal Variability	High	1	Large sample size; 30 water samples collected from 30 sites; sampled different months & years
	Metric 7:	Exposure Scenario	High	1	Site description and sampling sites provided
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Low	3	No supplemental or raw data reported; levels are reported in Figure 1
	Metric 9:	Quality Assurance	Medium	2	Mean accuracy, precision and method detection limits cited. No control samples?
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	Discussion on reasons for distribution patterns of DCM. TCE and PERC have similar distribution patterns.
Overall Quality Determination[*]			Medium	1.8	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Abrahamsson, K.,Dyrssen, D.,Jogebrant, G.,Krysell, M.. 1989. Halocarbon concentrations in Askerofjorden related to the water exchange and inputs from the petrochemical site at Stenungsund. Vatten.
Data Type	Monitoring
Hero ID	658636

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	sampling method is well described. but no calibration, storage conditions.
	Metric 2:	Analytical Methodology	Medium	2	analytical method is well discussed and recovery is provided. but no calibration is provided.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	> 15 yrs old
	Metric 6:	Spatial and Temporal Variability	Medium	2	13 stations. no discussion of replicates.
	Metric 7:	Exposure Scenario	Medium	2	media interest. but not US.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Low	3	no raw data. only mean and SD. and no data for each depth (5 - 10m).
	Metric 9:	Quality Assurance	Medium	2	recoveries in the 90s for PERC. Not well discussed.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	SD is provided. Not well discussed.
Overall Quality Determination[*]			Medium	2.1	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Amaral, O. C.,Otero, R.,Grimalt, J. O.,Albaiges, J.. 1996. Volatile and semi-volatile organochlorine compounds in tap and riverine waters in the area of influence of a chlorinated organic solvent factory. Water Research.
Data Type	Monitoring
Hero ID	658643

Domain		Metric	Rating†	Score	Comments‡
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	
	Metric 2:	Analytical Methodology	High	1	
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	>15tys
	Metric 6:	Spatial and Temporal Variability	Unacceptable	4	sample size of SW is not discribed.
	Metric 7:	Exposure Scenario	Medium	2	The scenario of surface water is discribed.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	not raw data, and some detailed information of statistics are missed.
	Metric 9:	Quality Assurance	High	1	
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Low	3	uncertainty and variability are not discussed.
Overall Quality Determination*			Unacceptable	4.0	Metric mean score**: 2.0.
Extracted					

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

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.

‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.

* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Martinez, E.,Llobet, I.,Lacorte, S.,Viana, P.,Barcelo, D.. 2002. Patterns and levels of halogenated volatile compounds in Portuguese surface waters. Journal of Environmental Monitoring.
Data Type	Monitoring
Hero ID	659075

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	glass vials, portable freezer, analyzed within 15 days of collection. Used analytical method EPA Method 502 so assumed used a preservative.
	Metric 2:	Analytical Methodology	High	1	EPA Method 502
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	1999-2000
	Metric 6:	Spatial and Temporal Variability	High	1	644 samples
	Metric 7:	Exposure Scenario	Medium	2	surface water in scope - sea, estuarine, river water and industrial effluents - however not in US and older.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Low	3	no standard deviation . Mean in figure only. No raw data.
	Metric 9:	Quality Assurance	High	1	Recovery of 93-95 percent, R2 = 0.99.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Low	3	No SD, did not discus any uncertainities.
Overall Quality Determination[*]			Medium	1.8	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Huybrechts, T.,Dewulf, J.,Van Langenhove, H.. 2005. Priority volatile organic compounds in surface waters of the southern North Sea. Environmental Pollution.
Data Type	Monitoring
Hero ID	660096

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	storage temp and duration provided,
	Metric 2:	Analytical Methodology	Medium	2	Previously described elsewhere., but robust description provided. GC-MS. detection limit provided. Recoveries for surrogates provided.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	1998-2000
	Metric 6:	Spatial and Temporal Variability	High	1	47 samples. Replicate samples used.
	Metric 7:	Exposure Scenario	Medium	2	appropriate medium, but older data and not US
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	no raw data or supplemental data, but they provided robust statistics
	Metric 9:	Quality Assurance	High	1	Followed QUASI-MEME guidelines. detailed measures described elsewhere. This is a European standard, so the assumption is that if appropriate measures were adopted in all steps of the process, then the QA should be at a high level.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	discussed possible reasons for variation. No standard deviation provided.
Overall Quality Determination[*]			Medium	1.7	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Gulyas, H.,Hemmerling, L.. 1990. Tetrachloroethene air pollution originating from coin-operated dry cleaning establishments. Environmental Research.
Data Type	Monitoring
Hero ID	713690

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	Sampling equipment and procedures described, but no mention of sample storage.
	Metric 2:	Analytical Methodology	Medium	2	Analytical methods described
	Metric 3:	Biomarker Selection	N/A	N/A	No biomarker
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	Hamburg, Germany
	Metric 5:	Currency	Low	3	Data collected in 1987 and 1989 (15+ years ago)
	Metric 6:	Spatial and Temporal Variability	Low	3	One sample at multiple intervals in only one car.
	Metric 7:	Exposure Scenario	High	1	Only the dry cleaned clothes in vehicle is applicable.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	High	1	Raw data given in Table 1
	Metric 9:	Quality Assurance	Low	3	Quality control and assurance not specifically discussed
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	Variability and uncertainty regarding different types of dry cleaning equipment discussed
Overall Quality Determination[*]			Medium	2.0	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Sexton, K.,Mongin, S. J.,Adgate, J. L.,Pratt, G. C.,Ramachandran, G.,Stock, T. H.,Morandi, M. T.. 2007. Estimating volatile organic compound concentrations in selected microenvironments using time-activity and personal exposure data. Journal of Toxicology and Environmental Health, Part A: Current Issues.
Data Type	Monitoring
Hero ID	730121

Domain	Metric		Rating†	Score	Comments‡
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	3M model 3500 organic vapor monitors (3500 OVMs), which are charcoal-based passive air samplers.A more detailed description of the study design and results was published previously (Sexton et al., 2004a, 2004b; Pratt et al., 2004, 2005).
	Metric 2:	Analytical Methodology	Medium	2	GC with an HP 5972 MS detector, Analytical and internal standards were prepared, and VOC concentrations were calculated as described previously
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	1999
	Metric 6:	Spatial and Temporal Variability	High	1	333 samples, some dups
	Metric 7:	Exposure Scenario	Medium	2	Inddor air, but not consumer specific
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	Good summary statistics; however, no raw/supplementary data available.
	Metric 9:	Quality Assurance	Medium	2	Duplicate O, I, and P badges were collected periodically during the study (total n = 80), and correlation coefficients were >.94 for all individual VOC.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	Not random sample, one area, are has known low VOC outdoors
Overall Quality Determination*			Medium	1.7	
Extracted			Yes		

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Study Citation:	Sexton, K.,Mongin, S. J.,Adgate, J. L.,Pratt, G. C.,Ramachandran, G.,Stock, T. H.,Morandi, M. T.. 2007. Estimating volatile organic compound concentrations in selected microenvironments using time-activity and personal exposure data. Journal of Toxicology and Environmental Health, Part A: Current Issues.
Data Type	Monitoring
Hero ID	730121

Domain	Metric	Rating†	Score	Comments‡

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Billionnet, C.,Gay, E.,Kirchner, S.,Leynaert, B.,Annesi-Maesano, I.. 2011. Quantitative assessments of indoor air pollution and respiratory health in a population-based sample of French dwellings. Environmental Research.
Data Type	Monitoring
Hero ID	733119

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	Passive samplers. Only limited details provided, but more info in companion doc (Ramalho etal.,2006).
	Metric 2:	Analytical Methodology	Medium	2	GC with FID/MS.. Few details provided. but more info in companion doc (Ramalho etal.,2006). LOD is provided.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Medium	2	2003-2005
	Metric 6:	Spatial and Temporal Variability	High	1	490 samples
	Metric 7:	Exposure Scenario	Medium	2	Indoor air of households, not specific to a consumer product.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	no raw data. no SD/CV.
	Metric 9:	Quality Assurance	Low	3	Implied, no details provided.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	Limitations reported, characteristics of population reported.
Overall Quality Determination[*]			Medium	1.8	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Su, F. C.,Mukherjee, B.,Batterman, S.. 2011. Trends of VOC exposures among a nationally representative sample: Analysis of the NHANES 1988 through 2004 data sets. Atmospheric Environment.
Data Type	Monitoring
Hero ID	784280

Domain	Metric		Rating†	Score	Comments‡
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	Only brief description of blood samples in the article, but documented thoroughly here: https://www.cdc.gov/nchs/data/nhanes/nhanes_09_10/lab.pdf
	Metric 2:	Analytical Methodology	High	1	Analyses used purge and trap extraction or headspace solid phase microextraction (SPME), and capillary gas chromatography/mass spectrometry. Consistent quality control and quality assurance protocols were maintained (NCHS, 2010e). https://www.cdc.gov/nchs/data/nhanes/nhanes_09_10/lab.pdf
	Metric 3:	Biomarker Selection	Medium	2	approximate nature of these biomarkers was indicated by only modest correlation with air samples and the rapid clearance in the blood
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Medium	2	1998-2004
	Metric 6:	Spatial and Temporal Variability	High	1	Participants were selected to be nationally representative using a stratified, multistage, probabilityebased sampling design, e.g., elderly and minorities were overesampled. VOCs were measured for a subsample of adults aged 20e59 years for each cohort studied between 1988 and 2004, with sample sizes from 605 to 1489
	Metric 7:	Exposure Scenario	Medium	2	US population but multiple exposures
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	No access to raw data, but summary stats available.
	Metric 9:	Quality Assurance	Medium	2	Consistent quality control and quality assurance protocols were maintained (NCHS, 2010e). However, results such as chemical recoveries and blanks were not provided in the article to access the quality.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	Limitations mentioned throughout article. SE provided in supp materials. Multiple years compared.

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Study Citation:	Su, F. C.,Mukherjee, B.,Batterman, S.. 2011. Trends of VOC exposures among a nationally representative sample: Analysis of the NHANES 1988 through 2004 data sets. Atmospheric Environment.
Data Type	Monitoring
Hero ID	784280

Domain	Metric	Rating†	Score	Comments‡
Overall Quality Determination*		High	1.6	
Extracted		Yes		

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Chao, C. Y.,Chan, G. Y.. 2001. Quantification of indoor VOCs in twenty mechanically ventilated buildings in Hong Kong. Atmospheric Environment.
Data Type	Monitoring
Hero ID	824555

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	
	Metric 2:	Analytical Methodology	Medium	2	no recoveries, EPA method
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	>15 yrs
	Metric 6:	Spatial and Temporal Variability	Medium	2	10 samples, 4 hr samples
	Metric 7:	Exposure Scenario	Medium	2	foreign country, not directly linked to consumer products
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	No raw data
	Metric 9:	Quality Assurance	Low	3	Didn't discuss QC, but used standard methods
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	SD provided, compared results between locations
Overall Quality Determination[*]			Medium	2.0	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Wang, T.,Wong, C. H.,Cheung, T. F.,Blake, D. R.,Arimoto, R.,Baumann, K.,Tang, J.,Ding, G. A.,Yu, X. M.,Li, Y. S.,Streets, D. G.,Simpson, I. J.. 2004. Relationships of trace gases and aerosols and the emission characteristics at Lin'an, a rural site in eastern China, during spring 2001. Journal of Geophysical Research: Atmospheres.
Data Type	Monitoring
Hero ID	1014392

Domain	Metric		Rating†	Score	Comments‡
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	Sampling equipment and procedures are described. but calibration, DT are not described.
	Metric 2:	Analytical Methodology	Medium	2	calibration, DT, replicates are not described
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	Data collected in 2001 (>15 yrs old)
	Metric 6:	Spatial and Temporal Variability	Medium	2	sample size is 30. but no replicates.
	Metric 7:	Exposure Scenario	Low	3	ambient air
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	no raw data
	Metric 9:	Quality Assurance	Low	3	No discussion of quality assurance
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	Some discussion of uncertainty in correlation between presence of different gases
Overall Quality Determination*			Medium	2.2	
Extracted					

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Kostopoulou, M. N.,Golfinopoulos, S. K.,Nikolaou, A. D.,Xilourgidis, N. K.,Lekkas, T. D.. 2000. Volatile organic compounds in the surface waters of northern Greece. Chemosphere.
Data Type	Monitoring
Hero ID	1024859

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	
	Metric 2:	Analytical Methodology	High	1	
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	Samples collected >15 years ago
	Metric 6:	Spatial and Temporal Variability	High	1	Water samples were collected from four rivers and five lakes in the region of Northern Greece, seasonally, four times per year.
	Metric 7:	Exposure Scenario	Medium	2	Closely represents relevant exposure scenario, except it's not the US population.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	Summary data reported with statistics; raw data not reported
	Metric 9:	Quality Assurance	High	1	
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	Limited discussion of uncertainty
Overall Quality Determination[*]			High	1.6	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	X. M. Wu, M. G. Apte, R. Maddalena, D. H. Bennett. 2011. Volatile organic compounds in small- and medium-sized commercial buildings in California. Environmental Science and Technology.
Data Type	Monitoring
Hero ID	1062239

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	
	Metric 2:	Analytical Methodology	High	1	EPA method TO-17; GC-MSConcentrations below MDL were replaced with 1/2 MDL, while for samples between the MDL and the analytical limit of quantification (LOQ), determined as 10 times the standard deviation of low-level spikes, were reported as the value determined in the laboratory.
	Metric 3:	Biomarker Selection	N/A	N/A	Biomarker is not used.
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Medium	2	>5yrs old (2011 pub)
	Metric 6:	Spatial and Temporal Variability	High	1	
	Metric 7:	Exposure Scenario	Medium	2	indoor air study. but not cosumer products.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	the result of concentration for each chemicals is summarized. But no raw data.
	Metric 9:	Quality Assurance	High	1	
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	discussion of variability is limited.
Overall Quality Determination[*]			High	1.4	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Batterman, S.,Jia, C.,Hatzivasilis, G.. 2007. Migration of volatile organic compounds from attached garages to residences: A major exposure source. Environmental Research.
Data Type	Monitoring
Hero ID	1065558

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	passive samplers. tenax absorbant. samples stored 1-3 days before analysis.
	Metric 2:	Analytical Methodology	High	1	analytical details reported in another paper, but recoveries, blanks, methods, etc. discussed.
	Metric 3:	Biomarker Selection	N/A	N/A	indoor air
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Medium	2	around 2007
	Metric 6:	Spatial and Temporal Variability	Medium	2	15 samples, but sample is not random or necessarily representative, although it may capture much of the variation in the sampled communities.
	Metric 7:	Exposure Scenario	Medium	2	indoor air, but directly related to consumer products.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	No raw data. Mean, SD. Max, DF
	Metric 9:	Quality Assurance	Medium	2	recoveries, blanks discussed, although not specific to chemical.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	SD provided. Investigated various variables.
Overall Quality Determination[*]			High	1.6	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Dodson, R. E.,Levy, J. I.,Spengler, J. D.,Shine, J. P.,Bennett, D. H.. 2008. Influence of basements, garages, and common hallways on indoor residential volatile organic compound concentrations. Atmospheric Environment.
Data Type	Monitoring
Hero ID	1065844

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	Storage conditions and calibration not discussed, but did use a published method. BEAM study.
	Metric 2:	Analytical Methodology	High	1	Standard TO 17 method was used.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Medium	2	2005
	Metric 6:	Spatial and Temporal Variability	High	1	Large sample size.
	Metric 7:	Exposure Scenario	Medium	2	Indoor air, but not ties to a specific consumer product.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	No raw data. Mean and SD in the main report. Other stats may be in supplemental.
	Metric 9:	Quality Assurance	Medium	2	Average recovery of 65 percent. Additional info in supp materials.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	
Overall Quality Determination[*]			High	1.6	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	S. N. Sax, D. H. Bennett, S. N. Chillrud, P. L. Kinney, J. D. Spengler. 2004. Differences in source emission rates of volatile organic compounds in inner-city residences of New York City and Los Angeles. Journal of Exposure Analysis and Environmental Epidemiology.
Data Type	Monitoring
Hero ID	1066049

Domain		Metric	Rating†	Score	Comments‡
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	The sampling and analytical methods are described in US EPA"s Compendium Method TO-17. Sampling methodology discussed. See Study Design.
	Metric 2:	Analytical Methodology	High	1	The sampling and analytical methods are described in US EPA"s Compendium Method TO-17. GC-MSD. LODs reported.
	Metric 3:	Biomarker Selection	N/A	N/A	Biomarker is not used.
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	NYC , NY (Harlem) and Los Angeles, CA (South Central, LA)
	Metric 5:	Currency	Low	3	>15 years (NYC: winterand summer 1999 and Los Angeles: fall and winter 2000)
	Metric 6:	Spatial and Temporal Variability	High	1	large sample size (36 samples); duplicate samples
	Metric 7:	Exposure Scenario	Medium	2	Measurements were conducted in about 40 homes in each of the two cities across two seasons.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	No supplemental or raw data. Summary stats for indoor air provided in Table 3.
	Metric 9:	Quality Assurance	Medium	2	Field and laboratory blanks were collected, with each totaling at least 10 percent of the number of samples. Field blanks were transported and handled like regular samples, but were not attached to pumps . Field blanks were used to determine background contamination and for calculation of method limits of detection (LODs).
Domain 4: Variability and Uncertainty					

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Study Citation:	S. N. Sax, D. H. Bennett, S. N. Chillrud, P. L. Kinney, J. D. Spengler. 2004. Differences in source emission rates of volatile organic compounds in inner-city residences of New York City and Los Angeles. Journal of Exposure Analysis and Environmental Epidemiology.
Data Type	Monitoring
Hero ID	1066049

Domain	Metric	Rating†	Score	Comments‡
	Metric 10: Variability and Uncertainty	High	1	Indoor"outdoor relationships as well as SERs were calculated for each home and sources of variability in the data were examined. Between homes, variability may be due to differences in housing characteristics, building materials, use and storage of household products, and AERs. Between cities, variability can be associated with differences in ambient emission sources and meteorological patterns. Also, seasonal variability within each city can be due to different meteorological patterns in different seasons, which in turn affect AER, environmental chemistry, emission rates, and environmental dispersion rates. By determining the variability in both indoor"outdoor relationships and SERs, we can gain a better understanding of indoor contributions to human exposures. The degree of uncertainty associated with measurement error was also calculated for the estimated emission rates and this uncertainty was compared to the inherent variability. We discuss the implication of this uncertainty on predicting emission rates of VOCs in homes.
Overall Quality Determination*		High	1.6	
Extracted		Yes		

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Roose, P.,Van Thuyne, G.,Belpaire, C.,Raemaekers, M.,Brinkman, U. A.. 2003. Determination of VOCs in yellow eel from various inland water bodies in Flanders (Belgium). Journal of Environmental Monitoring.
Data Type	Monitoring
Hero ID	1066543

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	Sample collection and storage are described. Sampling locations are given and characterized.
	Metric 2:	Analytical Methodology	High	1	Extraction methods and analytical instrumentation and procedures are given. Detection limit calculation method is described.
	Metric 3:	Biomarker Selection	N/A	N/A	Study looks at VOC levels (inc PERC) in eel tissue; no biomarker
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	Sampling locations are listed (Belgium)
	Metric 5:	Currency	Low	3	Sampling done prior to 2003 (15 years ago)
	Metric 6:	Spatial and Temporal Variability	Medium	2	Twenty samples collected from variety of locations (river/ pond/canal) throughout Belgium. No replicates mentioned
	Metric 7:	Exposure Scenario	Medium	2	Surface water through fish tissue samples. Not in US waters
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	High	1	Raw data is given for the 20 eels sampled
	Metric 9:	Quality Assurance	Low	3	No discussion of quality assurance methods
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	Some discussion of variation in PERC levels and connection with water concentration
Overall Quality Determination[*]			Medium	1.8	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Rule, K. L.,Comber, S. D.,Ross, D.,Thornton, A.,Makropoulos, C. K.,Rautiu, R.. 2006. Sources of priority substances entering an urban wastewater catchment–trace organic chemicals. Chemosphere.
Data Type	Monitoring
Hero ID	1250702

Domain		Metric	Rating†	Score	Comments‡
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	sampling method, instument is described. but calibration and storage condition and not mentioned.
	Metric 2:	Analytical Methodology	Medium	2	Analysis methods and LODs are given. but calibration and recovery are not described.
	Metric 3:	Biomarker Selection	N/A	N/A	No biomarker
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Medium	2	Samples were collected in 2005 (>5 yrs old)
	Metric 6:	Spatial and Temporal Variability	Medium	2	no replicates is mentioned
	Metric 7:	Exposure Scenario	High	1	
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Unacceptable	4	no exact result of PERC in any figures or tables. it's just mentioned too simply in 3.1.2.
	Metric 9:	Quality Assurance	High	1	
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	variability is discussed between VOC levels in residential vs. commercial and industrial samples. uncertainty is not discussed.
Overall Quality Determination*			Unacceptable	4.0	Metric mean score**: 1.9.
Extracted					

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

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.

‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.

* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Robinson, K. W.,Flanagan, S. M.,Ayotte, J. D.,Campo, K. W.,Chalmers, A.. 2004. Water Quality in the New England Coastal Basins, Maine, New Hampshire, Massachusetts, and Rhode Island, 1999-2001.
Data Type	Monitoring
Hero ID	1391354

Domain	Metric		Rating†	Score	Comments‡
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	NAWQA protocols for fixed-site sampling are designed to assess the spatial and temporal distribution of water quality in relation to various streamflow conditions and consist of water-quality sample collection at each fixed site monthly or more frequently (Gilliom and others, 1995).
	Metric 2:	Analytical Methodology	Low	3	USGS lab, but no details in this report on the insstruments. "All other water-quality samples were shipped to the USGS National Water-Quality Laboratory (NWQL) in Denver, Colo., for analysis."
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	Samples collected >15 years ago
	Metric 6:	Spatial and Temporal Variability	High	1	
	Metric 7:	Exposure Scenario	High	1	
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Low	3	TCE and PERC measured and median concentrations presented in graphs (Fig 14, 19); so, difficult to extract. Raw data may be available in referenced reports, or appendix 3.
	Metric 9:	Quality Assurance	High	1	
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	Limited discussion of uncertainty
Overall Quality Determination*			Medium	1.8	
Extracted					

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	van de Meent, D.,Den Hollander, H. A.,Pool, W. G.,Vredenbregt, M. J.,van Oers, H. A. M.,de Greef, E.,Luijten, J. a. 1986. Organic micropollutants in Dutch coastal waters. Water Science and Technology.
Data Type	Monitoring
Hero ID	1441544

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	calibration, storage conditions are missed.
	Metric 2:	Analytical Methodology	Unacceptable	4	The analytical method for PERC and TCE is not provided.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	1986, >15 yrs old
	Metric 6:	Spatial and Temporal Variability	High	1	
	Metric 7:	Exposure Scenario	Medium	2	study of Dutch coastal water. not US.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	no raw data, detection frequency not reported.
	Metric 9:	Quality Assurance	Low	3	QA/QC is not discussed.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	uncertainty is few discussed.
Overall Quality Determination[*]			Unacceptable	4.0	Metric mean score[**]: 2.2.
Extracted					

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

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.

[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.

[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	James, K. J.,Stack, M. A.. 1997. The impact of leachate collection on air quality in landfills. Chemosphere.				
Data Type	Monitoring				
Hero ID	1486815				
Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	
	Metric 2:	Analytical Methodology	High	1	
	Metric 3:	Biomarker Selection	N/A	N/A	No biomarker
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	1996 (>15 yrs old)
	Metric 6:	Spatial and Temporal Variability	High	1	
	Metric 7:	Exposure Scenario	Unacceptable	4	study of ambient air concentration from landfill leaching. off-PECO.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	no raw data
	Metric 9:	Quality Assurance	High	1	
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	uncertainty is not discussed.
Overall Quality Determination[*]			Unacceptable	4.0	Metric mean score[**]: 1.8.
Extracted					

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

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.

[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.

[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Jia, C.,Batterman, S.,Godwin, C.. 2008. VOCs in industrial, urban and suburban neighborhoods, Part 1: Indoor and outdoor concentrations, variation, and risk drivers. Atmospheric Environment.
Data Type	Monitoring
Hero ID	1488206

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	sampling sites and methods are well described. but sampler calibration is not described.
	Metric 2:	Analytical Methodology	Medium	2	instrument calibration is not described.
	Metric 3:	Biomarker Selection	N/A	N/A	not biomarker study
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Medium	2	Samples were collected in 2004 and 2005(>5yrs old)
	Metric 6:	Spatial and Temporal Variability	High	1	
	Metric 7:	Exposure Scenario	Medium	2	indoor air study. but no description of consumer products.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	no raw data for TCE or perc.
	Metric 9:	Quality Assurance	Low	3	QA/QC is not discussed.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	
Overall Quality Determination[*]			Medium	1.8	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Duboudin, C.. 2009. Pollution inside the home: descriptive analyses Part I: Analysis of the statistical correlations between pollutants inside homes. Environnement, Risques & Sante.
Data Type	Monitoring
Hero ID	1657000

Domain		Metric	Rating†	Score	Comments‡
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	sampling methodology points to 3 references (one is "Measurement protocols and Quality Control").
	Metric 2:	Analytical Methodology	High	1	Sampling analysis points to 3 references. Assumes it's a nationally recognized standard used in France.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Medium	2	October 2003 - December 2005
	Metric 6:	Spatial and Temporal Variability	Medium	2	567 Total Participants, representing a 74 municipalities in 55 departments and 19 regions of France. Although there's a comment in the text about misrepresenting the seasonality.
	Metric 7:	Exposure Scenario	High	1	
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	Supplemental data are clearly referenced.; however, summary statistics aren't fully reported.
	Metric 9:	Quality Assurance	Low	3	Quality Assurance wasn't directly discussed.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	
Overall Quality Determination*			High	1.6	
Extracted					

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Bouhamra, W. S.,Elkilani, A. S.. 1999. Investigation and modeling of surface sorption-desorption behavior of volatile organic compounds for indoor air quality analysis. Environmental Technology.
Data Type	Monitoring
Hero ID	1744157

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	
	Metric 2:	Analytical Methodology	High	1	
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	Samples assumed to have been collected prior to 1999 (date of publication)
	Metric 6:	Spatial and Temporal Variability	Medium	2	12 samples taken per house (20 houses sampled); it doesn't seem that replicates were used.
	Metric 7:	Exposure Scenario	Medium	2	Indoor concentrations not associated with a specific consumer product
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Low	3	No raw data; only minimum values and percent frequency reported in tables. Mean conc presented in graphical form (not extractable)
	Metric 9:	Quality Assurance	Low	3	Minimal discussion of QC/QA measures; only the use of standards before and after each set of samples is mentioned.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	Limited discussion of variability in indoor concentrations
Overall Quality Determination[*]			Medium	2.0	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	He, Z.,Yang, G. P.,Lu, X. L.. 2013. Distributions and sea-to-air fluxes of volatile halocarbons in the East China Sea in early winter. Chemosphere.
Data Type	Monitoring
Hero ID	1940132

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	Sample collection method, bottle type, storage conditions, and storage duration provided.
	Metric 2:	Analytical Methodology	High	1	GC-ECD. retention times, detection limits provided, calibration standards discussed.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Medium	2	Cruise was in 2010.
	Metric 6:	Spatial and Temporal Variability	High	1	About 40 sampling stations.
	Metric 7:	Exposure Scenario	Medium	2	China, not US. Location on map provided. Other parameters collected such as surface seawater temperature and salinity, were obtained
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	no raw data. range and mean reported, but no SD.
	Metric 9:	Quality Assurance	Medium	2	Storage stability assessed. Use of blanks for LOQ determination. No recovery results provided.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	Described reasons for variability, but no SD provided,
Overall Quality Determination[*]			High	1.4	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	McDonald, T. J.,Kennicutt M C, I. I.,Brooks, J. M.. 1988. VOLATILE ORGANIC COMPOUNDS AT A COASTAL GULF OF MEXICO SITE. Chemosphere.
Data Type	Monitoring
Hero ID	1946098

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Low	3	sampling equipment is described(Glass containers). description of storage duration, sampling method, and calibration is limited.
	Metric 2:	Analytical Methodology	Low	3	analytical conditions are described. No information of recovery or calibration is served.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	>15yrs old
	Metric 6:	Spatial and Temporal Variability	Low	3	single sample
	Metric 7:	Exposure Scenario	High	1	
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	the meaning of dash in table 3 is unclear.
	Metric 9:	Quality Assurance	Low	3	QA/QC is not discussed.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Low	3	Valuability/Uncertainty is not discussed.
Overall Quality Determination[*]			Low	2.4	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Stefaniak, A. B.,Breysse, P. N.,Murray, M. P. M.,Rooney, B. C.,Schaefer, J.. 2000. An evaluation of employee exposure to volatile organic compounds in three photocopy centers. Environmental Research.
Data Type	Monitoring
Hero ID	1953674

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	
	Metric 2:	Analytical Methodology	High	1	Analytical method is stated as TO-14.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	Study was conducted on a university campus (assumed to be Johns Hopkins University)
	Metric 5:	Currency	Low	3	Assumed to have taken place before 2000 (year of publication)
	Metric 6:	Spatial and Temporal Variability	High	1	Replicate sample used at Center 3 on Day 1, near the high-speed photocopier.
	Metric 7:	Exposure Scenario	Medium	2	The purpose of the study was to determine worker exposure in photocopy centers; data may be used as surrogate of consumer exposure to printshop emissions.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	Individual data points reported; summary statistics not reported.
	Metric 9:	Quality Assurance	Medium	2	QA/QC not discussed; background samples collected and analyzed.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	Limited discussion of variability in area samples; only one personal samples was collected per printing shop
Overall Quality Determination[*]			Medium	1.7	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	He, Z.,Yang, G.,Lu, X.,Zhang, H.. 2013. Distributions and sea-to-air fluxes of chloroform, trichloroethylene, tetrachloroethylene, chlorodibromomethane and bromoform in the Yellow Sea and the East China Sea during spring. Environmental Pollution.
Data Type	Monitoring
Hero ID	2128010

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	No standard method, but details provided. Samples analyzed immediately after collection.
	Metric 2:	Analytical Methodology	Medium	2	samples analyzed on board ship- not at a standard laboratory. no standard method, but details provided.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Medium	2	2011
	Metric 6:	Spatial and Temporal Variability	High	1	53 grid sampling stations
	Metric 7:	Exposure Scenario	High	1	location characterized.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	No raw data. Range and mean provided in text. No SD.
	Metric 9:	Quality Assurance	High	1	Accuracy of 5 of 18 percent, blanks, calibration of equipment discussed.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	discussed correlations with ocean parameters. No SD provided.
Overall Quality Determination[*]			High	1.6	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Su, F. C.,Mukherjee, B.,Batterman, S.. 2013. Determinants of personal, indoor and outdoor VOC concentrations: An analysis of the RIOPA data. Environmental Research.
Data Type	Monitoring
Hero ID	2128575

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	Samples collected as part of RIOPA study.Passive samplers, 48 hr collection periods, Details described elsewhere. Medium because only few details provided.
	Metric 2:	Analytical Methodology	Medium	2	Method described elsewhere. GC/MS used. LOD provided. Medium because details not provided to verify.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	>15 yrs (1999 to 2001)
	Metric 6:	Spatial and Temporal Variability	High	1	310 households
	Metric 7:	Exposure Scenario	Medium	2	Indoor air, but not directly related to consumer product use. convenience sample may have over samples outdoor emission sources. 3 US cities
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	no raw data provided
	Metric 9:	Quality Assurance	Medium	2	calibration, blanks etc not mentioned. But they did indicate which chemicals had low recoveries , and TCE and PERC were not mentioned.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	robust strengths, liiations
Overall Quality Determination[*]			Medium	1.8	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Roda, C.,Kousignian, I.,Ramond, A.,Momas, I.. 2013. Indoor tetrachloroethylene levels and determinants in Paris dwellings. Environmental Research.
Data Type	Monitoring
Hero ID	2128839

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	Sampling procedures only summarized, but appear to be standard (section 2.2)
	Metric 2:	Analytical Methodology	Medium	2	Analytical procedures only summarized, but appear to be standard (section 2.2)
	Metric 3:	Biomarker Selection	N/A	N/A	No biomarker
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	Paris, France
	Metric 5:	Currency	Medium	2	Data collected 2003-2007 (5-15 years ago)
	Metric 6:	Spatial and Temporal Variability	High	1	Large sample (177 households), data collected for 1 year, some mention of duplicate samples
	Metric 7:	Exposure Scenario	High	1	Consumer inhalation exposure measured by indoor air concentration
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Low	3	Concentration results as summary only
	Metric 9:	Quality Assurance	Low	3	
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	Section 4.3 discusses determinants of domestic PERC levels
Overall Quality Determination[*]			Medium	1.8	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Zoccolillo, L.,Abete, C.,Amendola, L.,Ruocco, R.,Sbrilli, A.,Termine, M.. 2004. Halocarbons in aqueous matrices from the Rennick Glacier and the Ross Sea (Antarctica). International Journal of Environmental Analytical Chemistry.
Data Type	Monitoring
Hero ID	2189687

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	
	Metric 2:	Analytical Methodology	Medium	2	New method that uses large volume of water. Analyzed under "extreme" conditions in Antarctica.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	1997-1998
	Metric 6:	Spatial and Temporal Variability	Medium	2	multiple stations and samples from multiple depths. replicate samples not collected. Samples were generally collected at multiple time periods.
	Metric 7:	Exposure Scenario	Medium	2	Not US, not linked to a source.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	No summary provided, need to calculate the stats.
	Metric 9:	Quality Assurance	Low	3	TCE had low extraction recoveries (50-60 percent). Study did not discuss if they corrected the concentrations for the low recoveries. PERC recoveries were acceptable.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	variations due to microclimates.
Overall Quality Determination[*]			Medium	2.0	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Jia, C.,Batterman, S.,Godwin, C.,Charles, S.,Chin, J. Y.. 2010. Sources and migration of volatile organic compounds in mixed-use buildings. Indoor Air.
Data Type	Monitoring
Hero ID	2214330

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	sampling method is simply described. but calibration, storage condition are not provided. they might be in reference articles.
	Metric 2:	Analytical Methodology	Medium	2	analytical method is simply described. but calibration,detection limits, recovery are not provided. they might be in reference articles..
	Metric 3:	Biomarker Selection	N/A	N/A	indoor air study
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Medium	2	Samples collected in 2005-2006 and 2008 (>5yrs old)
	Metric 6:	Spatial and Temporal Variability	High	1	
	Metric 7:	Exposure Scenario	Medium	2	indoor air study. but not consumer products.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	data is summarized as a table. but no raw data.
	Metric 9:	Quality Assurance	Medium	2	Some discussion of QA/QC measures and issues.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	
Overall Quality Determination[*]			Medium	1.7	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Bravo-Linares, C. M.,Mudge, S. M.,Loyola-Sepulveda, R. H.. 2007. Occurrence of volatile organic compounds (VOCs) in Liverpool Bay, Irish Sea. Marine Pollution Bulletin.
Data Type	Monitoring
Hero ID	2277377

Domain	Metric		Rating†	Score	Comments‡
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	
	Metric 2:	Analytical Methodology	High	1	
	Metric 3:	Biomarker Selection	N/A	N/A	sw samples
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Medium	2	2006 (>10 years)
	Metric 6:	Spatial and Temporal Variability	High	1	
	Metric 7:	Exposure Scenario	Medium	2	Source of exposure was not discussed.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Low	3	Range of data provided only.(no raw data)
	Metric 9:	Quality Assurance	Low	3	Some QA discussion with regards to sampling.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	There are some discussion on uncertainties and variability.
Overall Quality Determination*			Medium	1.8	
Extracted			Yes		

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Yamamoto, K.,Fukushima, M.,Kakutani, N.,Tsuruho, K.. 2001. Contamination of vinyl chloride in shallow urban rivers in Osaka, Japan. Water Research.
Data Type	Monitoring
Hero ID	2310570

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	Sampling methodology is described and discussed simply.
	Metric 2:	Analytical Methodology	Medium	2	Analytical methodology is described and discussed simply.
	Metric 3:	Biomarker Selection	N/A	N/A	sw samples
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	>15 years
	Metric 6:	Spatial and Temporal Variability	Medium	2	Unknown if replicate sampling was done.
	Metric 7:	Exposure Scenario	Medium	2	SW samples collected.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	Raw data not provided; summary of PERC and TCE concentration data in samples given as charts (Fig 3)
	Metric 9:	Quality Assurance	Low	3	Quality assurance implied through standard protocols
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Low	3	No variability; some dicussion on uncertainty.
Overall Quality Determination[*]			Medium	2.2	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	D'Souza, J. C.,Jia, C.,Mukherjee, B.,Batterman, S.. 2009. Ethnicity, housing and personal factors as determinants of VOC exposures. Atmospheric Environment.
Data Type	Monitoring
Hero ID	2331366

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	NHANES is well documented. passive exposure monitors
	Metric 2:	Analytical Methodology	High	1	NHANES is well documented. Used a standard method.. GC/MS and selected-ion-monitoring mode (CDC,2006b), a second laboratory used GC/MS in scan mode (Weisel et al., 2005b). http://www.nber.org/nhanes/1999_2000/downloads/lab21_doc.pdf
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	1999-2000 data.
	Metric 6:	Spatial and Temporal Variability	High	1	over 600 samples
	Metric 7:	Exposure Scenario	Medium	2	Indoor air in homes, but not directly related to a specific consumer product.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	range, percentiles, det freq. missing SD . no raw data.
	Metric 9:	Quality Assurance	High	1	NHANES.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	No SD provided
Overall Quality Determination[*]			High	1.6	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Loh, M. M.,Houseman, E. A.,Gray, G. M.,Levy, J. I.,Spengler, J. D.,Bennett, D. H.. 2006. Measured concentrations of VOCs in several non-residential microenvironments in the United States. Environmental Science and Technology.
Data Type	Monitoring
Hero ID	2442846

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	Personal samplers, VOC sorbent. Sample volume of 10L or 2.5L Samples stored 1 week in refrigerator..
	Metric 2:	Analytical Methodology	High	1	EPA Method TO17
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Medium	2	2003-2005
	Metric 6:	Spatial and Temporal Variability	High	1	3 to 17 stores per store type, 5 to 28 samples per store type. Table 1
	Metric 7:	Exposure Scenario	Medium	2	Indoor air, but not for a particular product.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	No raw data. Range, mean, CV reported in supp and summaries match the limited stats in main text.
	Metric 9:	Quality Assurance	High	1	Pilot testing, storage stability, 15 percent duplicate samples, field blanks on 11 percent of samples, correction for blanks if significantly above the mean,
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	Considered in sample collection and analysis. Range of store types.
Overall Quality Determination[*]			High	1.3	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Chin, J. Y.,Godwin, C.,Parker, E.,Robins, T.,Lewis, T.,Harbin, P.,Batterman, S.. 2014. Levels and sources of volatile organic compounds in homes of children with asthma. Indoor Air.
Data Type	Monitoring
Hero ID	2443355

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	
	Metric 2:	Analytical Methodology	High	1	
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Medium	2	2010
	Metric 6:	Spatial and Temporal Variability	High	1	7 day samples, large sample size
	Metric 7:	Exposure Scenario	High	1	Source identification using factor analysis
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	No raw data
	Metric 9:	Quality Assurance	High	1	
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	
Overall Quality Determination[*]			High	1.2	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Quack, B.,Suess, E.. 1999. Volatile halogenated hydrocarbons over the western Pacific between 43 degrees and 4 degrees N. Journal of Geophysical Research: Atmospheres.
Data Type	Monitoring
Hero ID	2468900

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	N/A	N/A	
	Metric 2:	Analytical Methodology	N/A	N/A	
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	N/A	N/A	
	Metric 5:	Currency	N/A	N/A	
	Metric 6:	Spatial and Temporal Variability	N/A	N/A	
	Metric 7:	Exposure Scenario	Unacceptable	4	Ambient air from western Pacific Ocean; no relevannce to consumer exposure.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	N/A	N/A	
	Metric 9:	Quality Assurance	N/A	N/A	
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	N/A	N/A	
Overall Quality Determination[*]			Unacceptable	4.0	Metric mean score[**]: 4.0.
Extracted					

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

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.

‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.

* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Plummer, L. N.,Sibrell, P. L.,Casile, G. C.,Busenberg, E.,Hunt, A. G.,Schlosser, P.. 2013. Tracing groundwater with low-level detections of halogenated VOCs in a fractured carbonate-rock aquifer, Leetown Science Center, West Virginia, USA. Applied Geochemistry.
Data Type	Monitoring
Hero ID	2532571

Domain	Metric		Rating†	Score	Comments‡
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	Sampling equipment, procedures and storage are given
	Metric 2:	Analytical Methodology	High	1	Analytical methods and equipment are given, including detection limits and calibration
	Metric 3:	Biomarker Selection	N/A	N/A	No biomarker
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	West Virginia
	Metric 5:	Currency	Medium	2	Samples collected in 2008-2010 (5-15 years ago)
	Metric 6:	Spatial and Temporal Variability	Medium	2	Samples collected at 47 sites, some have replicate samples
	Metric 7:	Exposure Scenario	Medium	2	Surface water and spring water (relevant) and groundwater (not currently of interest)
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	High	1	Raw data given in Table 1
	Metric 9:	Quality Assurance	Low	3	No specific discussion of quality control/assurance
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	Uncertainties are discussed; variability between different water sources
Overall Quality Determination*			High	1.6	
Extracted					

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	W. R. Chan, S. Cohn, M. Sidheswaran, D. P. Sullivan, W. J. Fisk. 2014. Contaminant levels, source strengths, and ventilation rates in California retail stores. Indoor Air.
Data Type	Monitoring
Hero ID	2535652

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	No info on sample storage and duration conditions.
	Metric 2:	Analytical Methodology	High	1	EPA method. LOQ provided in supp materials. No recoveries.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	California
	Metric 5:	Currency	Medium	2	2011-2013
	Metric 6:	Spatial and Temporal Variability	High	1	over 20 samples were store type, at least 5 stores per type.
	Metric 7:	Exposure Scenario	Medium	2	indoor air, but not directly linked to a consumer product.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	raw provided in supp.
	Metric 9:	Quality Assurance	Medium	2	standard methods used, but calibration and recovery results not provied.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	variability discussed, but no CV provided.
Overall Quality Determination[*]			Medium	1.7	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Insogna, S.,Frison, S.,Marconi, E.,Bacaloni, A.. 2014. Trends of volatile chlorinated hydrocarbons and trihalomethanes in Antarctica. International Journal of Environmental Analytical Chemistry.
Data Type	Monitoring
Hero ID	2800175

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	Clean glass bottles, no headspace, stored at 4C until analysis within one year.
	Metric 2:	Analytical Methodology	High	1	Purge and trap with GC-MS. operating conditions provided, standards provided, calibration described.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	High	1	2011-2012
	Metric 6:	Spatial and Temporal Variability	Medium	2	triplicate samples, at only nine sites.
	Metric 7:	Exposure Scenario	Medium	2	surface water on scope, but not US study
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	no raw data
	Metric 9:	Quality Assurance	High	1	analysis performed in triplicate. R2 >0.998. Recoveries from 75 to 95 percent. Samples stored for up to a year and no mention of storage stability.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	compared results to past cruises, No discussion of uncertainty.
Overall Quality Determination[*]			High	1.3	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Ofstad, E. B.,Drangsholt, H.,Carlberg, G. E.. 1981. Analysis of volatile halogenated organic compounds in fish. Science of the Total Environment.
Data Type	Monitoring
Hero ID	2801663

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Low	3	no details for sampling methods.
	Metric 2:	Analytical Methodology	High	1	
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	>15 yrs old
	Metric 6:	Spatial and Temporal Variability	Medium	2	Pooled samples of 3-5 fish.
	Metric 7:	Exposure Scenario	Medium	2	media and organisms interest. but not US.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	No raw data.
	Metric 9:	Quality Assurance	High	1	
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	No range of data is shown.
Overall Quality Determination[*]			Medium	1.9	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Rogers, H. R.,Crathorne, B.,Watts, C. D.. 1992. Sources and fate of organic contaminants in the Mersey estuary: Volatile organohalogen compounds. Marine Pollution Bulletin.
Data Type	Monitoring
Hero ID	2802879

Domain		Metric	Rating†	Score	Comments‡
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	Samples collected without headspace. Stored cool until analysis within 24 hours. Extracted and analyzed within 24 hrs.
	Metric 2:	Analytical Methodology	Medium	2	GC-ECD. HMSO 1995 (british standard method), however lacked many details actually used. internal standards,
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	1987-89
	Metric 6:	Spatial and Temporal Variability	Medium	2	Single samples on 4 sampling dates for each of 4 waterbodies.
	Metric 7:	Exposure Scenario	Medium	2	surface water on topic, but not in US
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Low	3	missing range., SD no raw darta.
	Metric 9:	Quality Assurance	Low	3	used a standard analytical method, but no discussion of methods used or recoveries.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	
Overall Quality Determination*			Medium	2.1	
Extracted			Yes		

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Dawes, V. J.,Waldock, M. J.. 1994. Measurement of Volatile Organic Compounds at UK National Monitoring Plan Stations. Marine Pollution Bulletin.
Data Type	Monitoring
Hero ID	2803418

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	UK National monitoring program
	Metric 2:	Analytical Methodology	Medium	2	purge and trap with gc-MS.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	1992
	Metric 6:	Spatial and Temporal Variability	High	1	about 70 samples overall
	Metric 7:	Exposure Scenario	Medium	2	surface water, but not in US
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Low	3	individual values, but no overall stats
	Metric 9:	Quality Assurance	Medium	2	Precision assessed.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	variation reflects amounts of industrial activity.
Overall Quality Determination[*]			Medium	1.9	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Brown, T.,Dassonville, C.,Derbez, M.,Ramalho, O.,Kirchner, S.,Crump, D.,Mandin, C.. 2015. Relationships between socioeconomic and lifestyle factors and indoor air quality in French dwellings. Environmental Research.
Data Type	Monitoring
Hero ID	2855333

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	Sampling methodology discussed briefly. Volatile organic compounds (VOCs) were measured in the main bedroom over seven days with passive radial samplers(Radiellos, Sigma-AldrichCo.) (Ramalho et al.,2006). VOCs were adsorbed on Carbograph 4 sorbent then thermally desorbed and analyzed by gas phase chromatography equipped with a flame ionization detector and/or mass spectro- meter. VOCs were adsorbed on Carbograph 4 sorbent then thermally desorbed.
	Metric 2:	Analytical Methodology	Medium	2	Analytical methodology discussed briefly. VOCs were analyzed by gas phase chromatography equipped with a flame ionization detector and/or mass spectrometer. Statistical analysis: For any measurement below the limit of detection (LOD) a value equal to the LOD/2 was assigned. For measurements below the limit of quantification (LOQ)a value equal to the LOQ/2 was assigned.
	Metric 3:	Biomarker Selection	N/A	N/A	Biomarker is not used.
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	France
	Metric 5:	Currency	Medium	2	>5 to 15 years (September 2003 and December 2005)
	Metric 6:	Spatial and Temporal Variability	High	1	Indoor air concentration were measured one week in a sample of 567 dwellings representative of the French housing stock between September 2003 and December 2005. Sample size dependent on socioeconomic factors and by selected occupant activities/building characteristics.
	Metric 7:	Exposure Scenario	Medium	2	The pollutants measured were selected on the basis of a classification of indoor air pollutants developed by the Observatory on IAQ that applied criteria for short and long-term toxicity as well as the frequency of their presence in dwellings reported in the scientific literature (Mosqueronetal.,2003). The sources of these pollutants include building materials and furniture, heating and cooking systems, stored solvents, attached garages, and various human activities including cleaning, painting, use of consumer products, and smoking. Microenvironments, indoor climate of the dwellings was also considered
Domain 3: Accessibility/Clarity					

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Study Citation:	Brown, T.,Dassonville, C.,Derbez, M.,Ramalho, O.,Kirchner, S.,Crump, D.,Mandin, C.. 2015. Relationships between socioeconomic and lifestyle factors and indoor air quality in French dwellings. Environmental Research.
Data Type	Monitoring
Hero ID	2855333

Domain	Metric		Rating†	Score	Comments‡
	Metric 8:	Reporting of Results	Medium	2	Supplementary materials provided. Tables 3 and 4 report concentrations for PERC in dwellings by selected socioeconomic status factors and occupant activities/building characteristics, respectively.
	Metric 9:	Quality Assurance	Low	3	Quality assurance/quality control techniques and results were not directly discussed.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	Strengths and limitations of the study discussed under Section 4.4. Week-long samples (averages for the week) take away the ability to see peak exposures, and to relate those peak exposures to certain activities.
Overall Quality Determination*			Medium	1.9	
Extracted			Yes		

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Wallace, L. A.. 1987. The total exposure assessment methodology (TEAM) study: Summary and analysis: Volume I.
Data Type	Monitoring
Hero ID	3004792

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	A lot of detail is given, refer to companion source for full details.
	Metric 2:	Analytical Methodology	High	1	A lot of detail is given, refer to companion source for full details.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	1984
	Metric 6:	Spatial and Temporal Variability	High	1	use of replicate samples, large sample size.
	Metric 7:	Exposure Scenario	High	1	
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	Summary statistics of phases of the study are presented. No/ limited supplemental data available.
	Metric 9:	Quality Assurance	High	1	Recoveries and control samples are discussed
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	Limited characterization of variability.
Overall Quality Determination[*]			High	1.4	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Jain, R. B.. 2015. Levels of selected urinary metabolites of volatile organic compounds among children aged 6-11 years. Environmental Research.
Data Type	Monitoring
Hero ID	3042164

Domain	Metric		Rating†	Score	Comments‡
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	NHANES sampling. Detailed description at https://wwwn.cdc.gov/nchs/nhanes/ContinuousNhanes/Default.aspx?BeginYear=2011
	Metric 2:	Analytical Methodology	High	1	The laboratory methods used to measure VOCs in urine, as previously mentioned are provided in Alwis et al. (2012) and at https://wwwn.cdc.gov/nchs/nhanes/ContinuousNhanes/Default.aspx?BeginYear=2011.
	Metric 3:	Biomarker Selection	Medium	2	According to the ATSDR Toxicological Profile for 1-Bromopropane, dated August 2017, "Biological exposure to the general population and workers can be assessed by measurement of bromide ion, 1-bromopropane, and its metabolite, N-acetyl-S-(n-propyl)-L-cysteine (AcPrCys) in urine or blood (NTP 2013). N-Acetyl-S-(n-propyl)-L-cysteine is expected to be more specific to 1-bromopropane than bromide due to the presence of the bromide ion in foods; however, there have also been concerns regarding the specificity of N-acetyl-S-(n-propyl)-L-cysteine. The ubiquitous nature of N-acetylS-(n-propyl)-L-cysteine in the urine of the general population suggests that it may not be a specific biomarker for 1-bromopropane, as general population exposure is expected to be limited. It is unknown if other chemicals and/or endogenous metabolism contributed to the observed urinary levels of N-acetylS-(n-propyl)-L-cysteine in biomonitoring studies". The document is available at: https://www.atsdr.cdc.gov/ToxProfiles/tp.asp?id=1471&tid=285. NTP. 2013. Report on carcinogens. Monograph on 1-bromopropane. National Toxicology Program, U.S. Department of Health and Human Services.
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Medium	2	2011-2012 samples
	Metric 6:	Spatial and Temporal Variability	Medium	2	Large sample size, but appears to be spot samples collected (vs 24 hr or first morning voids)
	Metric 7:	Exposure Scenario	Medium	2	
Domain 3: Accessibility/Clarity					

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Study Citation:	Jain, R. B.. 2015. Levels of selected urinary metabolites of volatile organic compounds among children aged 6-11 years. Environmental Research.
Data Type	Monitoring
Hero ID	3042164

Domain	Metric		Rating†	Score	Comments‡
	Metric 8:	Reporting of Results	Medium	2	No raw data, but raw data are available from NHANES. Mean and 95 percent Confidence Interval (CI) provided. No Standard Deviation (SD).
	Metric 9:	Quality Assurance	Medium	2	Study provided creatinine levels to assess completeness of urine samples.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	No SD, but discussed age,gender,race/ethnicity,and exposure-toenvironmentaltobaccosmoke.
Overall Quality Determination*			Medium	1.7	
Extracted			Yes		

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Hartwell, T. D.,Pellizzari, E. D.,Perritt, R. L.,Whitmore, R. W.,Zelon, H. S.,Wallace, L.. 1987. Comparison of volatile organic levels between sites and seasons for the total exposure assessment methodology (team) study. Atmospheric Environment.
Data Type	Monitoring
Hero ID	3052900

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	
	Metric 2:	Analytical Methodology	High	1	
	Metric 3:	Biomarker Selection	High	1	breath
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	80s
	Metric 6:	Spatial and Temporal Variability	High	1	
	Metric 7:	Exposure Scenario	Medium	2	not consumer specific
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Low	3	no raw, no range or sd
	Metric 9:	Quality Assurance	Medium	2	
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	
Overall Quality Determination[*]			High	1.6	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Christof, O.,Seifert, R.,Michaelis, W.. 2002. Volatile halogenated organic compounds in European estuaries. Biogeochemistry.
Data Type	Monitoring
Hero ID	3242836

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	niskan sampler, glass bottles, stored cool and dark, until purging, purged with 12 hours.
	Metric 2:	Analytical Methodology	Medium	2	purge and trap with gc-ms. Detailed operating conditions provided.. No authoritative method used.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	1997-1999
	Metric 6:	Spatial and Temporal Variability	High	1	14-15 samples per data set
	Metric 7:	Exposure Scenario	Medium	2	surface water, but not US.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	Only range. No mean, median, sd.
	Metric 9:	Quality Assurance	High	1	Duplicate sample analysis in general. Purge efficiency = 90-93 percent
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	Mentioned that other studies said water traps can cause GC problems, but they said that diverse tests showed that their water traps worked.
Overall Quality Determination[*]			Medium	1.7	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Wiedmann, T. O.,Guthner, B.,Class, T. J.,Ballschmiter, K.. 1994. GLOBAL DISTRIBUTION OF TETRACHLOROETHENE IN THE TROPOSPHERE - MEASUREMENTS AND MODELING. Environmental Science and Technology.
Data Type	Monitoring
Hero ID	3246559

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	N/A	N/A	
	Metric 2:	Analytical Methodology	N/A	N/A	
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	N/A	N/A	
	Metric 5:	Currency	N/A	N/A	
	Metric 6:	Spatial and Temporal Variability	N/A	N/A	
	Metric 7:	Exposure Scenario	Unacceptable	4	Ambient air in troposphere, no relevance for consumer/indoor exposure
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	N/A	N/A	
	Metric 9:	Quality Assurance	N/A	N/A	
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	N/A	N/A	
Overall Quality Determination[*]			Unacceptable	4.0	Metric mean score[**]: 4.0.

Extracted

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

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.

[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.

[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Kiurski, J. S.,Oros, I. B.,Kecic, V. S.,Kovacevic, I. M.,Aksentijevic, S. M.. 2016. The temporal variation of indoor pollutants in photocopying shop. Stochastic Environmental Research and Risk Assessment.
Data Type	Monitoring
Hero ID	3371701

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Low	3	Indoor concentrations were measured using gas sensitive semiconductor (GSS) sensor technology (with exchangeable sensor heads for each target gas). There was no discussion on instrument calibration or performance
	Metric 2:	Analytical Methodology	Low	3	Indoor concentrations were measured using gas sensitive semiconductor (GSS) sensor technology (with exchangeable sensor heads for each target gas). There was no discussion on validation, or instrument sensitivity or performance
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	Sampling assumed to have been conducted prior to 2016 (date of publication)
	Metric 6:	Spatial and Temporal Variability	High	1	
	Metric 7:	Exposure Scenario	Medium	2	Study measured concentrations of PCE in a photocopying shop; data may be surrogate for consumer exposure to printshop emissioons.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	Individual data points reported; no summary statistics provided.
	Metric 9:	Quality Assurance	Low	3	No discussion of QA/QC measures
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Low	3	Limited discussion on temporal trends;; no discussion on data gaps, uncertainties, or limitations.
Overall Quality Determination[*]			Low	2.3	
Extracted			Yes		

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Study Citation:	Kiurski, J. S.,Oros, I. B.,Kecic, V. S.,Kovacevic, I. M.,Aksentijevic, S. M.. 2016. The temporal variation of indoor pollutants in photocopying shop. Stochastic Environmental Research and Risk Assessment.
Data Type	Monitoring
Hero ID	3371701

Domain	Metric	Rating†	Score	Comments‡

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	K. W. Tham, M. S. Zuraimi, S. C. Sekhar. 2004. Emission modelling and validation of VOCs' source strengths in air-conditioned office premises. Environment International.
Data Type	Monitoring
Hero ID	3393192

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	Provided info on tubes, liters collected, range of flow rates, sample stored in cooler, analyzed on same day.
	Metric 2:	Analytical Methodology	Low	3	Did not mention a standard method. Used GC and described column, use of calibration. Did not provide operating conditions. Did not reference another article for more details.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	<2004. Exact date not mentioned.
	Metric 6:	Spatial and Temporal Variability	Low	3	Only one building. Duplicate samples collected.
	Metric 7:	Exposure Scenario	Low	3	No linkage to a source. Singapore.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	No raw data.
	Metric 9:	Quality Assurance	Low	3	Mentioned that quality control was conducted. 5 point calibration curve for each analyte. But no actual QC results provided.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	
Overall Quality Determination[*]			Low	2.4	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	T. Hoang, R. Castorina, F. Gaspar, R. Maddalena, P. L. Jenkins, Q. Zhang, T. E. Mckone, E. Benfenati, A. Y. Shi, A. Bradman. 2016. VOC exposures in California early childhood education environments. Indoor Air.
Data Type	Monitoring
Hero ID	3453092

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	Sampling methodology discussed though, calibration of sampler for indoor air is not described.
	Metric 2:	Analytical Methodology	High	1	
	Metric 3:	Biomarker Selection	N/A	N/A	Biomarker is not used.
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Medium	2	>5 to 15 yrs old
	Metric 6:	Spatial and Temporal Variability	High	1	
	Metric 7:	Exposure Scenario	Medium	2	lack of the information of emission source
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	the summary of results are well described. But no raw data.
	Metric 9:	Quality Assurance	High	1	
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	uncertainty for sampling is discussed simply.
Overall Quality Determination[*]			High	1.6	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Dai, H.,Jing, S.,Wang, H.,Ma, Y.,Li, L.,Song, W.,Kan, H.. 2017. VOC characteristics and inhalation health risks in newly renovated residences in Shanghai, China. Science of the Total Environment.
Data Type	Monitoring
Hero ID	3453725

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	
	Metric 2:	Analytical Methodology	Medium	2	Analytical methodology is described and discussed; MDL for DCM not listed.
	Metric 3:	Biomarker Selection	N/A	N/A	indoor air samples
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	High	1	
	Metric 6:	Spatial and Temporal Variability	Medium	2	8 residences; three sampling sites at each residence: living room, bedoom, and study. No mention of replicate sampling.
	Metric 7:	Exposure Scenario	Medium	2	Indoor air samples; not specifically associated with a consumer product
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	Results reported in summary/chart form, not raw data. However, raw data may be provided in Supplementary Info.
	Metric 9:	Quality Assurance	Low	3	QA is implied.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	
Overall Quality Determination[*]			Medium	1.7	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Ma, H.,Zhang, H.,Wang, L.,Wang, J.,Chen, J.. 2014. Comprehensive screening and priority ranking of volatile organic compounds in Daliao River, China. Environmental Monitoring and Assessment.
Data Type	Monitoring
Hero ID	3488897

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	Sampling methods and storage are described.
	Metric 2:	Analytical Methodology	Medium	2	Analytical methods and instrumentation are given. Detection limits mentioned, but calibration not described.
	Metric 3:	Biomarker Selection	N/A	N/A	No biomarker
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	Map with sampling locations along Daliao River (China)
	Metric 5:	Currency	Medium	2	Samples collected in 2011 (5-15 years ago)
	Metric 6:	Spatial and Temporal Variability	High	1	Duplicate and triplicate samples taken from 20 locations.
	Metric 7:	Exposure Scenario	High	1	Surface water concentration for VOCs including PERC
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	Summary results only.
	Metric 9:	Quality Assurance	High	1	Quality assurance described in sampling/analytical procedures
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	Variability assessed with replicate samples
Overall Quality Determination[*]			High	1.4	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Bianchi, E.,Lessing, G.,Brina, K. R.,Angeli, L.,Andriguetti, N. B.,Peruzzo, J. R.,Do Nascimento, C. A.,Spilki, F. R.,Ziulkoski, A. L.,da Silva, L. B.. 2017. Monitoring the Genotoxic and Cytotoxic Potential and the Presence of Pesticides and Hydrocarbons in Water of the Sinos River Basin, Southern Brazil. Archives of Environmental Contamination and Toxicology.
Data Type	Monitoring
Hero ID	3489827

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	
	Metric 2:	Analytical Methodology	High	1	
	Metric 3:	Biomarker Selection	N/A	N/A	sw samples
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Medium	2	>5 yrs.
	Metric 6:	Spatial and Temporal Variability	Medium	2	"60 samples during 9 collections"; no mention of replicate sampling.
	Metric 7:	Exposure Scenario	Medium	2	sw samples, not in the US.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	Raw data not provided; summary of PERC and DCM concentration data on page 325 (Table 1).
	Metric 9:	Quality Assurance	Low	3	QA is implied.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	Study provided some discussion on uncertainties; no variability.
Overall Quality Determination[*]			Medium	1.8	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Wittlingerová, Z.,Macháčková, J.,Petruželková, A.,Zimová, M.. 2016. Occurrence of perchloroethylene in surface water and fish in a river ecosystem affected by groundwater contamination. Environmental Science and Pollution Research.
Data Type	Monitoring
Hero ID	3489953

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	Clear methodology for collecting fish samples
	Metric 2:	Analytical Methodology	High	1	Analytical methods based on EPA 601 & 624 standard methods
	Metric 3:	Biomarker Selection	N/A	N/A	PCE is concentrated in the fish tissues being sampled
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	Geographic location is clearly listed - SAP factory in Mimon, Czech Republic
	Metric 5:	Currency	Medium	2	Samples taken in two batches: 1998 and 2011/2012 (newest between 5-15 years)
	Metric 6:	Spatial and Temporal Variability	High	1	"1998: 7 samples, 1 fish species, 2 locations 2011/2012: 17 samples, 4 fish species, 2 locations"
	Metric 7:	Exposure Scenario	High	1	BCF - aquatic species are ecological population of interest
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	High	1	Raw data and summary are given, with discussion of outlier
	Metric 9:	Quality Assurance	Medium	2	Quality control for laboratory testing surface water samples
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	Interspecies variability discussed
Overall Quality Determination[*]			High	1.2	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Burton, W. C.,Harte, P. T.. 2013. Bedrock Geology and Outcrop Fracture Trends in the Vicinity of the Savage Municipal Well Superfund Site, Milford, New Hampshire.
Data Type	Monitoring
Hero ID	3490995

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	N/A	N/A	
	Metric 2:	Analytical Methodology	N/A	N/A	
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	N/A	N/A	
	Metric 5:	Currency	N/A	N/A	
	Metric 6:	Spatial and Temporal Variability	N/A	N/A	
	Metric 7:	Exposure Scenario	Unacceptable	4	Study is focused on geological properties of an area with groundwater contamination by PCE. No PCE concentration data as part of this study, and groundwater intake is not currently of interest.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	N/A	N/A	
	Metric 9:	Quality Assurance	N/A	N/A	
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	N/A	N/A	
Overall Quality Determination[*]			Unacceptable	4.0	Metric mean score[**]: 4.0.
Extracted					

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

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.

[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.

[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Blanco, S.,Bécares, E.. 2010. Are biotic indices sensitive to river toxicants? A comparison of metrics based on diatoms and macro-invertebrates. Chemosphere.
Data Type	Monitoring
Hero ID	3501965

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Low	3	Little discussion of method
	Metric 2:	Analytical Methodology	Medium	2	Used standard method SM 6220 C., however few details provided to verify method properly executed.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Medium	2	2007
	Metric 6:	Spatial and Temporal Variability	Medium	2	only 11 samples
	Metric 7:	Exposure Scenario	Medium	2	surface water, but river in spain.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Low	3	No raw data, no min or SD.
	Metric 9:	Quality Assurance	Low	3	QC assumed because used standard method.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	
Overall Quality Determination[*]			Medium	2.2	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Sidonia, V.,Haydee, K. M.,Ristoiu, D.,Luminita, S. D.. 2009. Chlorinated solvents detection in soil and river water in the area along the paper factory from Dej Town, Romania. Studia Universitatis Babes-Bolyai. Chemia.
Data Type	Monitoring
Hero ID	3543217

Domain		Metric	Rating†	Score	Comments‡
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	
	Metric 2:	Analytical Methodology	High	1	
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Medium	2	Samples collected <15 years ago
	Metric 6:	Spatial and Temporal Variability	High	1	
	Metric 7:	Exposure Scenario	Medium	2	Only one sample point; location relative to paper plant not specified; sampled when the plant was on- and off-line
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	High	1	
	Metric 9:	Quality Assurance	Medium	2	Lab quality assumed from detail in process description; no control for water samples
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	
Overall Quality Determination*			High	1.3	

Extracted

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.

‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.

* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Zoccolillo, L.,Rellori, M.. 1994. Halocarbons in Antarctic surface waters. International Journal of Environmental Analytical Chemistry.
Data Type	Monitoring
Hero ID	3544414

Domain	Metric		Rating†	Score	Comments‡
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	Sampling methodology briefly discussed.
	Metric 2:	Analytical Methodology	Medium	2	Analytical methodology briefly discussed
	Metric 3:	Biomarker Selection	N/A	N/A	Biomarker not used.
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	Antarctica, Italy
	Metric 5:	Currency	Low	3	>15 years
	Metric 6:	Spatial and Temporal Variability	Medium	2	moderate sample size. no replicate samples.
	Metric 7:	Exposure Scenario	Medium	2	Exposure scenario of interest: surface water.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	Concentration reported in Table 2.
	Metric 9:	Quality Assurance	Medium	2	Procedural recoveries provided, 50 percent for TCE and 75 percent for PERC. Controls not discussed.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Low	3	Not discussed. Authors suggest that the differences in the concentrations in various waters can be attributed to sampling site microclimate and to morphology.
Overall Quality Determination*			Medium	2.1	
Extracted			Yes		

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Amagai, T.,Olansandan,,Matsushita, H.,Ono, M.,Nakai, S.,Tamura, K.,Maeda, K.. 1999. A survey of indoor pollution by volatile organohalogen compounds in Katsushika, Tokyo, Japan. Indoor and Built Environment.
Data Type	Monitoring
Hero ID	3545469

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	calibration, flow rates
	Metric 2:	Analytical Methodology	Low	3	LOQ not reported.
	Metric 3:	Biomarker Selection	N/A	N/A	No biomonitoring.
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	>15 yrs ago
	Metric 6:	Spatial and Temporal Variability	High	1	>50 samples
	Metric 7:	Exposure Scenario	Medium	2	Indoor air, but no direct link to consumer product.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	No raw data.
	Metric 9:	Quality Assurance	Medium	2	Used field blanks. Recoveries not mentioned.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	
Overall Quality Determination[*]			Medium	1.8	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Focazio, M. J.,Kolpin, D. W.,Barnes, K. K.,Furlong, E. T.,Meyer, M. T.,Zaugg, S. D.,Barber, L. B.,Thurman, M. E.. 2008. A national reconnaissance for pharmaceuticals and other organic wastewater contaminants in the United States–II) untreated drinking water sources. Science of the Total Environment.
Data Type	Monitoring
Hero ID	3559503

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	
	Metric 2:	Analytical Methodology	High	1	
	Metric 3:	Biomarker Selection	N/A	N/A	not baiomarker study
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	Samples were collected in 2001 (>15 yrs old)
	Metric 6:	Spatial and Temporal Variability	High	1	
	Metric 7:	Exposure Scenario	Unacceptable	4	Reported concentrations do not distinguish between surface water and groundwater measurements.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Low	3	there is not raw data, mean value, and range of value.
	Metric 9:	Quality Assurance	High	1	
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	variability is fewly discussed.
Overall Quality Determination[*]			Unacceptable	4.0	Metric mean score[**]: 1.9.
Extracted					

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

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.

[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.

[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Begerow, J.,Jermann, E.,Keles, T.,Freier, I.,Ranft, U.,Dunemann, L.. 1996. Internal and external tetrachloroethene exposure of persons living in differently polluted areas of Northrhine-Westphalia (Germany). Zentralblatt fuer Hygiene und Umweltmedizin.
Data Type	Monitoring
Hero ID	3561656

Domain		Metric	Rating†	Score	Comments‡
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	Sampling equipment and procedures given in detail for both blood and air samples
	Metric 2:	Analytical Methodology	Medium	2	Analytical equipment and procedures given in detail for both blood and air samples
	Metric 3:	Biomarker Selection	N/A	N/A	Blood samples tested for PCE and not any biomarkers
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	Essen and Borken, Nordrhein-Westfalens
	Metric 5:	Currency	Medium	2	Data collected prior to 1996 (15+ years ago)
	Metric 6:	Spatial and Temporal Variability	Medium	2	Large number of samples taken, but unclear if replicates were used.
	Metric 7:	Exposure Scenario	High	1	Consumer exposure through blood sample concentration and indoor air concentration
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	Both blood and air concentrations are given as summary statistics
	Metric 9:	Quality Assurance	Medium	2	Quality assurance/cleaning procedures were discussed in sample collection
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	Variability examined in detail
Overall Quality Determination*			Medium	1.7	
Extracted			Yes		

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Kawauchi, T.,Nishiyama, K.. 1989. Residual tetrachloroethylene in dry-cleaned clothes. Environmental Research.
Data Type	Monitoring
Hero ID	3563210

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Low	3	Sampling discussion is mostly focused on fabrics, with less discussion of room air samples. Did not indicate which room articles were placed, ventilation conditions, etc.
	Metric 2:	Analytical Methodology	Low	3	Analysis methods described. Recovery samples specifically mentioned. LOD not provided
	Metric 3:	Biomarker Selection	N/A	N/A	No biomarker
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	Assumed to be Japan
	Metric 5:	Currency	Low	3	Study conducted prior to 1988 (15+ years ago)
	Metric 6:	Spatial and Temporal Variability	Low	3	Air and breath samples collected only between 2-4pm on weekdays.
	Metric 7:	Exposure Scenario	High	1	Consumer inhalation exposure, measured by room air and expired air (breath) concentrations
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	Summary results only.
	Metric 9:	Quality Assurance	Low	3	No specific discussion of quality control/assurance
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	Variability discussed with regards to differences between drycleaning establishments
Overall Quality Determination[*]			Medium	2.2	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Fielding, M.,Gibson, T. M.,James, H. A.. 1981. Levels of trichloroethylene, tetrachloroethylene and para-dichlorobenzene in groundwaters. Environmental Technology Letters.
Data Type	Monitoring
Hero ID	3570809

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	sampling methods and equipments are described. but calibration is not described.
	Metric 2:	Analytical Methodology	High	1	
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	1980s (>15yrs old)
	Metric 6:	Spatial and Temporal Variability	Low	3	sample size is too small (duplicate sample at one site)
	Metric 7:	Exposure Scenario	High	1	
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	No raw data for each sample.
	Metric 9:	Quality Assurance	Low	3	QA/QC is not discussed.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	uncertainty is not discussed.
Overall Quality Determination[*]			Medium	2.0	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Minsley, B.. 1983. Tetrachloroethylene contamination of groundwater in Kalamazoo. Journal of the American Water Works Association.
Data Type	Monitoring
Hero ID	3573107

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Low	3	Sampling procedures and equipment described in detail, but only for groundwater well sampling
	Metric 2:	Analytical Methodology	Low	3	Analysis for samples mentioned only briefly
	Metric 3:	Biomarker Selection	N/A	N/A	No biomarker
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	Kalamazoo, Michigan
	Metric 5:	Currency	Low	3	Data collected prior to 1983 (15+ years ago)
	Metric 6:	Spatial and Temporal Variability	Medium	2	Surface water sampled at eight locations, no mention of replicates
	Metric 7:	Exposure Scenario	Unacceptable	4	Study focused on groundwater contamination, only briefly touches on surface water concentration. This involved legacy contamination (1980) from groundwater and should not be used.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	Summary data only
	Metric 9:	Quality Assurance	Low	3	No specific discussion of quality control/assurance
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Low	3	Variability not discussed with regard to surface water results
Overall Quality Determination[*]			Unacceptable	4.0	Metric mean score[**]: 2.7.
Extracted					

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

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.

[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.

[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Coffin, R. R.,Witherell, L. E.,Novick, L. F.,Stone, K. M.. 1987. ESTABLISHMENT OF AN EXPOSURE LEVEL TO TETRACHLOROETHYLENE IN AMBIENT AIR IN VERMONT. Public Health Reports.
Data Type	Monitoring
Hero ID	3573147

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Unacceptable	4	Sampling methodology is not discussed.
	Metric 2:	Analytical Methodology	N/A	N/A	
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	N/A	N/A	
	Metric 5:	Currency	N/A	N/A	
	Metric 6:	Spatial and Temporal Variability	N/A	N/A	
	Metric 7:	Exposure Scenario	N/A	N/A	
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	N/A	N/A	
	Metric 9:	Quality Assurance	N/A	N/A	
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	N/A	N/A	
Overall Quality Determination[*]			Unacceptable	4.0	Metric mean score[**]: 4.0.
Extracted					

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

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.

[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.

[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Lee, W.,Park, S. H.,Kim, J.,Jung, J. Y.. 2015. Occurrence and removal of hazardous chemicals and toxic metals in 27 industrial wastewater treatment plants in Korea. Desalination and Water Treatment.
Data Type	Monitoring
Hero ID	3580141

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Low	3	No discussion , but assumed to be in the standard analytical method used.
	Metric 2:	Analytical Methodology	High	1	Purge and trap with GC. Standard Korean method.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	High	1	
	Metric 6:	Spatial and Temporal Variability	High	1	27 facilities
	Metric 7:	Exposure Scenario	Medium	2	waste water effluent, but not in the US
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Low	3	No raw data, no SD. No detection frequency.
	Metric 9:	Quality Assurance	Low	3	No discussion, but assumed because used standard Korean method.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Low	3	No SD
Overall Quality Determination[*]			Medium	2.0	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Duclos, Y.,Blanchard, M.,Chesterikoff, A.,Chevreuil, M.. 2000. Impact of paris waste upon the chlorinated solvent concentrations of the river Seine (France). Water, Air, and Soil Pollution.
Data Type	Monitoring
Hero ID	3587944

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	Sampling methodology is described and discussed.
	Metric 2:	Analytical Methodology	Medium	2	Analytical methodology is described and discussed.
	Metric 3:	Biomarker Selection	N/A	N/A	sw samples
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	>15 yrs
	Metric 6:	Spatial and Temporal Variability	Medium	2	3 sampling sessions; 14 stations
	Metric 7:	Exposure Scenario	Medium	2	sw samples collected, but not in the US.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	Data seems to be raw data.
	Metric 9:	Quality Assurance	Low	3	QA is implied.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	Limited discussion on uncertainty; no variability.
Overall Quality Determination[*]			Medium	2.1	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Schwarzenbach, R. P.,Giger, W.,Hoehn, E.,Schneider, J. K.. 1983. Behavior of organic compounds during infiltration of river water to groundwater. Field studies. Environmental Science and Technology.
Data Type	Monitoring
Hero ID	3797825

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Low	3	many details of sampling method is missing like storage duration, vial, calibration.
	Metric 2:	Analytical Methodology	Low	3	equipment and analytcal conditions are described. but many details are missing like calibration, DT, replicates.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	>15yrs old
	Metric 6:	Spatial and Temporal Variability	High	1	
	Metric 7:	Exposure Scenario	Medium	2	surface water study. but river is in Switzerland, not US.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	average and SD are shown. No raw data.
	Metric 9:	Quality Assurance	Low	3	discussion of QA/QC is quite limited.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Low	3	discussion of variability/uncertainty is quite limited..
Overall Quality Determination[*]			Low	2.3	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Cdc,. 2017. National report on human exposure to environmental chemicals.				
Data Type	Monitoring				
Hero ID	3827236				
Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	Biomonitoring data for US population from NHANES; information on sampling methodology readily available.
	Metric 2:	Analytical Methodology	High	1	Biomonitoring data for US population from NHANES; information on analytical methodology readily available.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Medium	2	Blood concentrations for the period 2001-2008
	Metric 6:	Spatial and Temporal Variability	High	1	
	Metric 7:	Exposure Scenario	Medium	2	Blood concentrations for general population
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	Raw data, measures of variation not reported.
	Metric 9:	Quality Assurance	High	1	Biomonitoring data for US population from NHANES; information on QA/QC methodology readily available.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	Biomonitoring data for US population from NHANES; information on variability/uncertainty readily available.
Overall Quality Determination[*]			High	1.3	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Atsdr,. 2007. Public health assessment: Peninsula Boulevard groundwater plume town of Hempstead, Nassau County, New York: EPA facility ID: NYN000204407.
Data Type	Monitoring
Hero ID	3970464

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	Government paper so assumed use of appropriate methods.
	Metric 2:	Analytical Methodology	Unacceptable	4	No method described.
	Metric 3:	Biomarker Selection	N/A	N/A	sw samples
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	2007 (>10 years), data collocted >15 years ago
	Metric 6:	Spatial and Temporal Variability	Unacceptable	4	Sample size is not reported and assumptions cannot be made.
	Metric 7:	Exposure Scenario	Medium	2	SW samples collected.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Low	3	Maximum value provided only.
	Metric 9:	Quality Assurance	Low	3	No discussion on QA.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Low	3	No variability or discussion on uncertainties.
Overall Quality Determination[*]			Unacceptable	4.0	Metric mean score[**]: 2.8.
Extracted					

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

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.

[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.

[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Usgs,. 2006. Recent (2003-05) water quality of Barton Springs, Austin, Texas, with emphasis on factors effecting variability.
Data Type	Monitoring
Hero ID	3975032

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	Water sampling procedures only briefly described (pg 14). Sample storage is mentioned.
	Metric 2:	Analytical Methodology	Medium	2	"Done by NWQL using published USGS analytical methods"
	Metric 3:	Biomarker Selection	N/A	N/A	No biomarker
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	Barton Spring, TX
	Metric 5:	Currency	Medium	2	Data collected 2003-2005 (5-15 years ago)
	Metric 6:	Spatial and Temporal Variability	Medium	2	22 samples from each spring orifice over two phases of sample collection; uncertain if replicates were used
	Metric 7:	Exposure Scenario	Medium	2	Study of contaminants (inc. PERC) in surface springs from groundwater source
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	High	1	Raw data in Table 9; various summary statistics and figures throughout
	Metric 9:	Quality Assurance	Medium	2	Quality control and assurance data is supposed to be in Appendix 3, which was not included with this copy
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	Variability of water quality factors was focus of this study
Overall Quality Determination[*]			Medium	1.7	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Usgs,. 1994. Organic compounds downstream from a treated-wastewater discharge near Dalls, Texas, March 1987.
Data Type	Monitoring
Hero ID	3975036

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	Water samples for nutrient, organic, and inorganic determinations were collected and preserved according to standard USGS procedures (Wells and others, 1990).
	Metric 2:	Analytical Methodology	Medium	2	Methods described and cited, but no indication of recoveries. Tentative compound identification from GC/MS analyses was based on computer matching of samplemass spectra with the National Bureau of Standards library. Identification of all compounds extracted by PT and other selected methods, and indicated with a (b) in the data tables, was confirmed by matching the mass spectrum and retention time of the sample with those of authentic standards.(1987).
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	March 9 and 10, 1987
	Metric 6:	Spatial and Temporal Variability	Low	3	4 sites, but appears to be one sample per site.
	Metric 7:	Exposure Scenario	High	1	Media of interest. Location well described.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Low	3	No summary stats or raw data.
	Metric 9:	Quality Assurance	Low	3	one upstream control site. QA assumed, but not discussed.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	Discussed uncertainty of analysis methods
Overall Quality Determination[*]			Medium	2.0	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Usgs,. 2006. Water-quality conditions of Chester Creek, Anchorage, Alaska, 1998-2001.
Data Type	Monitoring
Hero ID	3975042

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	Data collection and analysis described in pages 5-7
	Metric 2:	Analytical Methodology	High	1	Data collection and analysis described in pages 5-7
	Metric 3:	Biomarker Selection	N/A	N/A	No biomarker
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	Chester Creek, Alaska
	Metric 5:	Currency	Low	3	Data collected 1998-2001 (15+ years ago)
	Metric 6:	Spatial and Temporal Variability	Medium	2	11 samples analyzed for VOCs, including PERC
	Metric 7:	Exposure Scenario	High	1	For PCE, only concentration in surface water. Fish tissue analysis did not include VOCs.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	Summary data only; Table 3
	Metric 9:	Quality Assurance	Low	3	No specific discussion of quality control/assurance
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Low	3	No specific discussion of uncertainty/variability
Overall Quality Determination[*]			Medium	1.9	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Usgs,. 2003. A national survey of methyl tert-butyl ether and other volatile organic compounds in drinking-water sources: Results of the random survey.
Data Type	Monitoring
Hero ID	3975046

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	Sampling equipment and procedures described; sampling performed by different community water systems personnel across country
	Metric 2:	Analytical Methodology	High	1	Analytical methods and equipment discussed including detection limits
	Metric 3:	Biomarker Selection	N/A	N/A	No biomarker used
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	United States
	Metric 5:	Currency	Low	3	Data collected between 1999-2000 (15+ years ago)
	Metric 6:	Spatial and Temporal Variability	Medium	2	954 samples submitted from across the US, with field blanks included
	Metric 7:	Exposure Scenario	Medium	2	Data collected on many different chemicals in drinking water sources; only PERC in surface water is of interest
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	Summary only; PERC is in Appendix 2 on pg 76
	Metric 9:	Quality Assurance	High	1	Quality control samples
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	Uncertainty discussed extensively
Overall Quality Determination[*]			Medium	1.7	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Ak, D. E. C.. 2012. Wendell Avenue (MC cleaners).
Data Type	Monitoring
Hero ID	3982325

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Unacceptable	4	sampling method is not described.
	Metric 2:	Analytical Methodology	Unacceptable	4	analytical method is not described.
	Metric 3:	Biomarker Selection	N/A	N/A	not biomarker study
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Medium	2	measured in 2010(>5 yrs old)
	Metric 6:	Spatial and Temporal Variability	Unacceptable	4	sample size is not clear
	Metric 7:	Exposure Scenario	Unacceptable	4	Vapor intrusion, soil, and groundwater - not currently scenarios of interest.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Low	3	no raw data, and any other statistical values.
	Metric 9:	Quality Assurance	N/A	N/A	no discussion
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Unacceptable	4	no discussion
Overall Quality Determination[*]			Unacceptable	4.0	Metric mean score[**]: 3.2.
Extracted					

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

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.

[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.

[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Usgs,. 2009. Organic wastewater compounds, pharmaceuticals, and coliphage in ground water receiving discharge from onsite wastewater treatment systems near La Pine, Oregon: Occurrence and implications for transport.
Data Type	Monitoring
Hero ID	3982442

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	Sample collection and storage are described. Sampling locations are given and characterized.
	Metric 2:	Analytical Methodology	High	1	Detection limit and calibration standards discussed.
	Metric 3:	Biomarker Selection	N/A	N/A	No biomarker
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	La Pine, Oregon
	Metric 5:	Currency	Medium	2	Samples collected in 2003 (5-15 years ago)
	Metric 6:	Spatial and Temporal Variability	High	1	Replicate samples taken
	Metric 7:	Exposure Scenario	Medium	2	PERC concentration in wastewater effluent is scenario of interest, though this effluent is being sent to groundwater
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	High	1	Raw data in Table B1, B2
	Metric 9:	Quality Assurance	High	1	Quality control data were collected
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	Variability discussed in Appendix B
Overall Quality Determination[*]			High	1.2	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Helz, G. R.,Hsu, R. Y.. 1978. Volatile chloro- and bromocarbons in coastal waters. Limnology and Oceanography.
Data Type	Monitoring
Hero ID	4140523

Domain	Metric		Rating†	Score	Comments‡
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	Sampling methodology discussed. To obtain data on the character of volatile halocarbons in waste discharges, we collected a series of samples from Back River, Maryland (Fig. 1B). This is a shallow, 12 km long tributary estuary to the Chesapeake Bay, with a salinity range of about 04 g* kg-l. Its mean depth is about 1 m and it is well mixed vertically. Near its upper end, Back River receives 1.5- 1.9 x lo8 liter. d-r of wastewater from Baltimore"s main sewage treatment plant; the waste discharges often exceed the freshwater flow from the watershed by a factor of two (Helz et al. 1975). The plant provides 100 percent secondary treatment, mostly by the trickling filter process, to wastes of both domestic and commercial origin. The effluent is chlorinated before discharge. The first series of samples from Back River (No. 8-12) was collected in early February 1977, after northern Chesapeake Bay had been covered with ice for more than a month. The only uncovered area was a 0.2-km-diameter patch of water immediately above the underwater diffusers at the discharge point in midriver. The second set of samples (No. 13-23) was collected in early May 1977, well after the spring thaw.
	Metric 2:	Analytical Methodology	Medium	2	Analytical methodology discussed. GC equipped with a Hall electrolytic conductivity detector (TRACOR). In early stages of the work, some identifications were checked by mass spectrometry, but the high selectivity of the method for only volatile chloro- and bromocarbons minimizes the danger of misidentification when only GC retention time is used. Limit of detection not specified.
	Metric 3:	Biomarker Selection	N/A	N/A	Biomarker not used.
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	Maryland (Back River estuary)
	Metric 5:	Currency	Low	3	>15 years (February and May 1977)
	Metric 6:	Spatial and Temporal Variability	Low	3	The first series of samples from Back River (No. 8-12; 5 samples) was collected in early February 1977, after northern Chesapeake Bay had been covered with ice for more than a month. The second set of samples (No. 13-23; 11 samples) was collected in early May 1977, well after the spring thaw (open water).

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Study Citation:	Helz, G. R.,Hsu, R. Y.. 1978. Volatile chloro- and bromocarbons in coastal waters. Limnology and Oceanography.
Data Type	Monitoring
Hero ID	4140523

Domain	Metric		Rating†	Score	Comments‡
	Metric 7:	Exposure Scenario	Medium	2	Back River: This is a shallow, 12 km long tributary estuary to the Chesapeake Bay, with a salinity range of about 04 g* kg-l. Its mean depth is about1 m and it is well mixed vertically. Near its upper end, Back River receives 1.5-1.9 x lo8 liter. d-r of wastewater from Baltimore"s main sewage treatment plant; the waste discharges often exceed the freshwater flow from the watershed by a factor of two (Helz et al. 1975). The plant provides 100 percent secondary treatment, mostly by the trickling filter process, to wastes of both domestic and commercial origin. The effluent is chlorinated before discharge.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	No supplemental or raw data. Table 3 lists DCM, TCE, and PERC concentrations in NM for Back River samples collected in February 1977 (ice cover) and May 1977 (open water). Some values are ND, but LOD is not reported.
	Metric 9:	Quality Assurance	Low	3	QA/QC procedures not directly discussed.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	Some discussion of variability due to sampling times, February (ice cover) and May (open water), and concentration decrease seaward due to tidal mixing of the effluent. Some uncertainty regarding the factors causing volatization and its influence on May samples.
Overall Quality Determination*			Medium	2.2	
Extracted					

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Aggazzotti, G.,Predieri, G.. 1986. SURVEY OF VOLATILE HALOGENATED ORGANICS (VHO) IN ITALY - LEVELS OF VHO IN DRINKING WATERS, SURFACE WATERS AND SWIMMING POOLS. Water Research.
Data Type	Monitoring
Hero ID	4149721

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Low	3	Minimal details for the surface water. collected from 31 stations
	Metric 2:	Analytical Methodology	Medium	2	No standard method, but GC-EC conditions described.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	
	Metric 6:	Spatial and Temporal Variability	Low	3	31 stations, collected multiples time per year. But exact number of samples not reported.
	Metric 7:	Exposure Scenario	Medium	2	a canal which collects the wastes of the city of Modena
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Low	3	no number of samples,, no SD, no raw data
	Metric 9:	Quality Assurance	Low	3	Mentions calibration for VHO, but no mention of field blanks, lab blanks, recoveries
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	
Overall Quality Determination[*]			Low	2.4	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Fytianos, K.,Vasilikiotis, G.,Weil, L.. 1985. Identification and determination of some trace organic compounds in coastal seawater of Northern Greece. Bulletin of Environmental Contamination and Toxicology.
Data Type	Monitoring
Hero ID	4149731

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Low	3	Described sample containers and filtration method. no info on sample storage or duration.
	Metric 2:	Analytical Methodology	Low	3	gc-ms-ecd. Standard method not used. Operating conditions not reported., although may be in Garrison et al. 1978;Shinohara et ai.1981).
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	1980s
	Metric 6:	Spatial and Temporal Variability	Low	3	Not explicit. 2 rivers, samples collected twice a month for two years = 24 samples per station
	Metric 7:	Exposure Scenario	Medium	2	Not US, but sites described. The former is situated close to a large city, Thessaloniki, and a large industrial area, including a refinery unit. The latter is close to a smaller city, Kavala, which is rapidly developing due to off-shore oil wells.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Low	3	only mean values reported
	Metric 9:	Quality Assurance	Low	3	No recoveries, blanks discussed.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Low	3	No SD reported.
Overall Quality Determination[*]			Low	2.7	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Hurford, N.,Law, R. J.,Payne, A. P.,Fileman, T. W.. 1989. Concentrations of chemicals in the North Sea arising from discharges from chemical tankers.
Data Type	Monitoring
Hero ID	4149734

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	sampling method is well described. but calibration is not mentioned.
	Metric 2:	Analytical Methodology	High	1	
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	>15yrs old
	Metric 6:	Spatial and Temporal Variability	High	1	
	Metric 7:	Exposure Scenario	Medium	2	surface water study. but Samples are collected from the sea around UK.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	No raw data.
	Metric 9:	Quality Assurance	Medium	2	QC is described. no quantitative results for QA/QC.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Medium	2	no discussion of uncertainty.
Overall Quality Determination[*]			Medium	1.8	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Sauer, T. C.. 1981. Volatile organic compounds in open ocean and coastal surface waters. Organic Geochemistry.
Data Type	Monitoring
Hero ID	4152375

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	sampling equipments, storage conditions are described. but no information of calibration, storage duration.
	Metric 2:	Analytical Methodology	High	1	
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Low	3	>15yrs old
	Metric 6:	Spatial and Temporal Variability	Low	3	<10 samples for open ocean. <5 samples for coast.
	Metric 7:	Exposure Scenario	High	1	
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Low	3	no raw data. no mean or SD. no discussion of blanks.
	Metric 9:	Quality Assurance	Medium	2	discussed extraction efficiency.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Low	3	discussion of variability/uncertainty is limited.
Overall Quality Determination[*]			Medium	2.1	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Ec,. 2014. SINPHONIE: Schools Indoor Pollution and Health Observatory Network in Europe.
Data Type	Monitoring
Hero ID	4440449

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	calibration of sampler is not provided.
	Metric 2:	Analytical Methodology	Low	3	calibration of instrument ,detection limit are not provided
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	Medium	2	<15yrs old (2010-2011)
	Metric 6:	Spatial and Temporal Variability	High	1	
	Metric 7:	Exposure Scenario	Medium	2	not directly related to consumer product.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Medium	2	raw data is not provided
	Metric 9:	Quality Assurance	High	1	
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	High	1	
Overall Quality Determination[*]			Medium	1.7	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Wetzel, T. A.. 2014. Volatile Organic Compounds (VOCs) In Indoor Air: Emission From Consumer Products and the Use of Plants for Air Sampling.
Data Type	Monitoring
Hero ID	4442460

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Low	3	Very few details provided on sampling such as where samples placed. Very unclear as to when the product was introduced to the house and when samples were collected. No internal conditions such as temp and RH provided.
	Metric 2:	Analytical Methodology	Low	3	Standard EPA method, but no LOQ.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representativeness					
	Metric 4:	Geographic Area	High	1	
	Metric 5:	Currency	High	1	current
	Metric 6:	Spatial and Temporal Variability	Low	3	only one sample per room per house. 4 houses.
	Metric 7:	Exposure Scenario	Low	3	Product chemical content use pattern within house not provided.
Domain 3: Accessibility/Clarity					
	Metric 8:	Reporting of Results	Low	3	Only one sample per location, but not averages across houses.
	Metric 9:	Quality Assurance	Low	3	Quality assurance only briefly discussed, but a standard method was used.
Domain 4: Variability and Uncertainty					
	Metric 10:	Variability and Uncertainty	Low	3	Variation across houses not discussed.
Overall Quality Determination[*]			Low	2.6	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Won, D.,Corsi, R. L.,Rynes, M.. 2000. New indoor carpet as an adsorptive reservoir for volatile organic compounds. Environmental Science and Technology.
Data Type	Experimental
Hero ID	12793

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology and Conditions	High	1	No standard method mentioned, but methodology well described.
	Metric 2:	Analytical Methodology	Medium	2	method described, but information such as calibration and recoveries not provided.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representative					
	Metric 4:	Testing Scenario	Medium	2	US sample. Differenct rh tested and different carpets tests.
	Metric 5:	Sample Size and Variability	Medium	2	3 carpet, with and without pads. Only 1 to 9 samples per type.
	Metric 6:	Temporality	Low	3	paper published in 2000 (>15 yrs)
Domain 3: Accessibility/Clarity					
	Metric 7:	Reporting of Results	Medium	2	avg and CV only. No raw.
	Metric 8:	Quality Assurance	N/A	N/A	
Domain 4: Variability and Uncertainty					
	Metric 9:	Variability and Uncertainty	Medium	2	limited discussion of uncertainities
Overall Quality Determination[*]			Medium	2.0	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Wallace, L. A.,Pellizzari, E.,Leaderer, B.,Zelon, H.,Sheldon, L.. 1987. Emissions of volatile organic compounds from building materials and consumer products. Atmospheric Environment.
Data Type	Experimental
Hero ID	23126

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology and Conditions	High	1	
	Metric 2:	Analytical Methodology	Low	3	instrument calibration, detection limit, recovery samples are not discribed.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representative					
	Metric 4:	Testing Scenario	High	1	
	Metric 5:	Sample Size and Variability	Low	3	just 3 samples for each 4 products
	Metric 6:	Temporality	Low	3	> 15yrs old study
Domain 3: Accessibility/Clarity					
	Metric 7:	Reporting of Results	Medium	2	no raw data
	Metric 8:	Quality Assurance	N/A	N/A	
Domain 4: Variability and Uncertainty					
	Metric 9:	Variability and Uncertainty	Low	3	The uncertainties are discussed. That's because equiribrium is assumed, the values might be underestimated.
Overall Quality Determination[*]			Low	2.3	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Tichenor, B. A.,Sparks, L. E.,Jackson, M. D.,Guo, Z.,Mason, M. A.,Plunket, C. M.,Rasor, S. A.. 1990. Emissions of perchloroethylene from dry cleaned fabrics. Atmospheric Environment.
Data Type	Experimental
Hero ID	27401

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology and Conditions	High	1	
	Metric 2:	Analytical Methodology	High	1	Contractor concerned that LOD/LOQ not given, but the authors do clearly state the lower end of their calibration curves, so we know the minimum concentration without regression. Authors provide details on methodology, instrumentation settings, and QA/QC processes.
	Metric 3:	Biomarker Selection	N/A	N/A	testing on fabric
Domain 2: Representative					
	Metric 4:	Testing Scenario	High	1	
	Metric 5:	Sample Size and Variability	Medium	2	Some samples less than 10 (emissions from fabrics one per article of clothing)
	Metric 6:	Temporality	Low	3	Older study >15 yrs.
Domain 3: Accessibility/Clarity					
	Metric 7:	Reporting of Results	High	1	
	Metric 8:	Quality Assurance	N/A	N/A	
Domain 4: Variability and Uncertainty					
	Metric 9:	Variability and Uncertainty	High	1	
Overall Quality Determination[*]			High	1.4	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Guo, Z. S.,Tichenor, B. A.,Mason, M. A.,Plunket, C. M.. 1990. The temperature dependence of the emission of perchloroethylene from dry cleaned fabrics. Environmental Research.
Data Type	Experimental
Hero ID	27961

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology and Conditions	High	1	Upgraded to high. The sampling methodology and conditions are reported in detail. This study is old, but this question does not cover temporality. Further, these methodologies are still common practice (small environmental chambers, tenax sorptive tubes, GC analysis).
	Metric 2:	Analytical Methodology	High	1	Upgraded to high. The analytical methodology and conditions are reported in detail. This study is old, but this question does cover temporality. Further, these methodologies are still common practice (small environmental chambers, tenax sorptive tubes, GC analysis).
	Metric 3:	Biomarker Selection	N/A	N/A	No biomarker
Domain 2: Representative					
	Metric 4:	Testing Scenario	Medium	2	Scenarios tested for a range of conditions, including some corresponding to typical consumer exposure.
	Metric 5:	Sample Size and Variability	Medium	2	Multiple samples taken over period of up to five days.
	Metric 6:	Temporality	Low	3	Experiments took place > 15 years ago (published 1989)
Domain 3: Accessibility/Clarity					
	Metric 7:	Reporting of Results	Medium	2	Summary statistics are included but raw data is not.
	Metric 8:	Quality Assurance	N/A	N/A	Quality control was mentioned in experimental design, but not described in detail.
Domain 4: Variability and Uncertainty					
	Metric 9:	Variability and Uncertainty	Medium	2	Variability and uncertainty are touched on
Overall Quality Determination[*]			Medium	1.9	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Sack, T. M.,Steele, D. H.,Hammerstrom, K.,Remmers, J.. 1992. A survey of household products for volatile organic compounds. Atmospheric Environment.
Data Type	Experimental
Hero ID	28339

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology and Conditions	High	1	
	Metric 2:	Analytical Methodology	Low	3	detection limits, recovery samples are not discribed.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representative					
	Metric 4:	Testing Scenario	Medium	2	exposure control is not discussed.
	Metric 5:	Sample Size and Variability	Medium	2	number of products per category varied. Replicates tests for some products, but not all.
	Metric 6:	Temporality	Low	3	>15 yrs old
Domain 3: Accessibility/Clarity					
	Metric 7:	Reporting of Results	Medium	2	no raw data. Only average is reported.
	Metric 8:	Quality Assurance	N/A	N/A	
Domain 4: Variability and Uncertainty					
	Metric 9:	Variability and Uncertainty	Low	3	uncertainties, limitations are not discussed.
Overall Quality Determination[*]			Low	2.3	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Fernandez, J.,Guberan, E.,Caperos, J.. 1976. Experimental human exposures to tetrachloroethylene vapor and elimination in breath after inhalation. American Industrial Hygiene Association Journal.
Data Type	Experimental
Hero ID	58143

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology and Conditions	High	1	Sampling methods, protocol, and equipment are described
	Metric 2:	Analytical Methodology	Medium	2	Analytical methods are briefly discussed. Technique (gas chromatography) and instrumentation are given.
	Metric 3:	Biomarker Selection	Medium	2	tce in breath
Domain 2: Representative					
	Metric 4:	Testing Scenario	Medium	2	Experimental conditions in controlled environment rather than consumer exposure; biomonitoring
	Metric 5:	Sample Size and Variability	Low	3	Appropriate sample size, but no mention of replicates
	Metric 6:	Temporality	Low	3	Article published in March 1976 issue of journal, so results are 15+ years old.
Domain 3: Accessibility/Clarity					
	Metric 7:	Reporting of Results	Medium	2	Raw data points provided in figures only
	Metric 8:	Quality Assurance	N/A	N/A	No specific discussion of quality assurance/control
Domain 4: Variability and Uncertainty					
	Metric 9:	Variability and Uncertainty	Medium	2	Some discussion of variability/uncertainty particularly with regard to urine sampling
Overall Quality Determination[*]			Medium	2.1	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Opdam, J. J.,Smolders, J. F.. 1987. Alveolar sampling and fast kinetics of tetrachloroethene in man. II. Fast kinetics. Occupational and Environmental Medicine.
Data Type	Experimental
Hero ID	58314

Domain		Metric	Rating†	Score	Comments‡
Domain 1: Reliability					
	Metric 1:	Sampling Methodology and Conditions	Medium	2	sampling described in detail elsewhere, but info such as sampling times, breath holding provided.
	Metric 2:	Analytical Methodology	Low	3	analysis described elsewhere. no details provided in report. could be upgraded upon examination of other report.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representative					
	Metric 4:	Testing Scenario	Low	3	testing conditions described elsewhere.
	Metric 5:	Sample Size and Variability	Medium	2	6 volunteers
	Metric 6:	Temporality	Low	3	1987 study, although the PERC was not a product, so timing not as important.
Domain 3: Accessibility/Clarity					
	Metric 7:	Reporting of Results	Medium	2	no raw data
	Metric 8:	Quality Assurance	N/A	N/A	limited QC discussed
Domain 4: Variability and Uncertainty					
	Metric 9:	Variability and Uncertainty	Medium	2	limited discussion of variability
Overall Quality Determination*			Low	2.4	
Extracted					

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Imbriani, M.,Ghittori, S.,Pezzagno, G.,Capodaglio, E.. 1988. Urinary excretion of tetrachloroethylene (perchloroethylene) in experimental and occupational exposure. Archives of Environmental and Occupational Health.
Data Type	Experimental
Hero ID	58324

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology and Conditions	High	1	Sampling method described in detail.
	Metric 2:	Analytical Methodology	Medium	2	Method discussed, but not in detail. Recoveries provided.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representative					
	Metric 4:	Testing Scenario	Medium	2	different exposure activities used (rest, biking). Not exposed to a product, but to PERC.
	Metric 5:	Sample Size and Variability	High	1	three groups of 5
	Metric 6:	Temporality	Low	3	>15 yrs
Domain 3: Accessibility/Clarity					
	Metric 7:	Reporting of Results	Medium	2	no raw data
	Metric 8:	Quality Assurance	N/A	N/A	recoveries provided, calibration of equipment not discussed, or blanks.
Domain 4: Variability and Uncertainty					
	Metric 9:	Variability and Uncertainty	Medium	2	
Overall Quality Determination[*]			Medium	1.9	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Kreiling, J. A.,Stephens, R. E.,Reinisch, C. L.. 2005. A mixture of environmental contaminants increases cAMP-dependent protein kinase in Spisula embryos. Environmental Toxicology and Pharmacology.
Data Type	Experimental
Hero ID	58563

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology and Conditions	High	1	Sampling procedures are given in detail
	Metric 2:	Analytical Methodology	High	1	Analytical methodology given in detail
	Metric 3:	Biomarker Selection	Medium	2	Biomarker (RII antigen) compared after exposure to PERC both individually and in combination with other studied chemicals
Domain 2: Representative					
	Metric 4:	Testing Scenario	Low	3	Study looks at Atlantic surf clams; these are sediment-dwelling and thus excluded from scenario of interest; study is not looking at concentration in body tissues
	Metric 5:	Sample Size and Variability	High	1	Large number of samples
	Metric 6:	Temporality	Medium	2	Experiments took place prior to publication in 2004 (5-15 years ago)
Domain 3: Accessibility/Clarity					
	Metric 7:	Reporting of Results	Medium	2	Summary only; data provided in figures
	Metric 8:	Quality Assurance	N/A	N/A	Quality Assurance not specifically discussed
Domain 4: Variability and Uncertainty					
	Metric 9:	Variability and Uncertainty	High	1	Variety of chemical concentrations tested
Overall Quality Determination[*]			High	1.6	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Sherlach, K. S.,Gorka, A. P.,Dantzler, A.,Roepe, P. D.. 2011. Quantification of perchloroethylene residues in dry-cleaned fabrics. Environmental Toxicology and Chemistry.
Data Type	Experimental
Hero ID	1040048

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology and Conditions	High	1	
	Metric 2:	Analytical Methodology	Medium	2	Not a standard method, but well described. However, the LOD was not provided. EPA: Need supplemental information, reference indicates information is in supplementary material.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representative					
	Metric 4:	Testing Scenario	High	1	Multiple fabric types.
	Metric 5:	Sample Size and Variability	High	1	samples analyzed in triplicate. Only 7 dry cleaning facilities.
	Metric 6:	Temporality	N/A	N/A	Out-gassing of Perc. Extraction is sealed and frozen within one day.
Domain 3: Accessibility/Clarity					
	Metric 7:	Reporting of Results	High	1	Supplementary and main paper have raw data and summary statistics
	Metric 8:	Quality Assurance	N/A	N/A	Recoveries not reported; Report what can be recovered, but do not know what is already in the fabric. Control fabric used. Calibration curve used.
Domain 4: Variability and Uncertainty					
	Metric 9:	Variability and Uncertainty	High	1	
Overall Quality Determination[*]			High	1.2	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	S. Kim, J. A. Kim, J. Y. An, H. J. Kim, S. D. Kim, J. C. Park. 2007. TVOC and formaldehyde emission behaviors from flooring materials bonded with environmental-friendly MF/PVAc hybrid resins. Indoor Air.
Data Type	Experimental
Hero ID	1512515

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology and Conditions	High	1	flooring prep discussed, chamber set up discussed
	Metric 2:	Analytical Methodology	Medium	2	GC/MS. conditions in table 5. no info on calibration or recoveries.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representative					
	Metric 4:	Testing Scenario	Medium	2	one set of sampling conditions, table 2. Not sure if resin is considered an adhesive. Korean study. exact product not known.
	Metric 5:	Sample Size and Variability	Low	3	number of tests is uncertain.
	Metric 6:	Temporality	Medium	2	10 yrs old
Domain 3: Accessibility/Clarity					
	Metric 7:	Reporting of Results	Medium	2	no raw data. Uncertain if the EF is a mean or s
	Metric 8:	Quality Assurance	N/A	N/A	QC not explicitly discussed.
Domain 4: Variability and Uncertainty					
	Metric 9:	Variability and Uncertainty	Low	3	No SD
Overall Quality Determination[*]			Medium	2.1	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Kwon, K. iD,Jo, W.,Lim, H.,Jeong, W.. 2008. Volatile pollutants emitted from selected liquid household products. Environmental Science and Pollution Research.
Data Type	Experimental
Hero ID	1752751

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology and Conditions	Medium	2	Experimental protocol and equipment are described thoroughly.
	Metric 2:	Analytical Methodology	High	1	Analytical procedures given in detail, including mention of detection limits and recovery
	Metric 3:	Biomarker Selection	N/A	N/A	No biomarker
Domain 2: Representative					
	Metric 4:	Testing Scenario	Low	3	Household products tested, but under laboratory conditions. Goal was to determine composition of products
	Metric 5:	Sample Size and Variability	Medium	2	42 household products tested
	Metric 6:	Temporality	Medium	2	Tests conducted prior to article publication in 2008 (5-15 years ago)
Domain 3: Accessibility/Clarity					
	Metric 7:	Reporting of Results	Low	3	Summary data only, data is product compositions and not air concentration or consumer dose
	Metric 8:	Quality Assurance	N/A	N/A	No specific discussion of quality assurance/control
Domain 4: Variability and Uncertainty					
	Metric 9:	Variability and Uncertainty	Medium	2	Some discussion of limitations in section 6
Overall Quality Determination[*]			Medium	2.1	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Kowalska, J.,Szewczyńska, M.,Pośniak, M.. 2014. Measurements of chlorinated volatile organic compounds emitted from office printers and photocopiers. Environmental Science and Pollution Research.
Data Type	Experimental
Hero ID	2534318

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology and Conditions	Medium	2	No standard method method mentioned, but chamber size, temp, RH, air volume, duration reported.
	Metric 2:	Analytical Methodology	Medium	2	Discussed method, calibration curve. For substance identification, the mass spectrum library NIST 05 was available.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representative					
	Metric 4:	Testing Scenario	Medium	2	Office printers is on PECO for PERC.
	Metric 5:	Sample Size and Variability	Medium	2	7 different office equipment devices. Appears that replicates were conducted since mean and SD provided for each device.
	Metric 6:	Temporality	Low	3	Test date not specified, although assumed to be recent based on pub date.
Domain 3: Accessibility/Clarity					
	Metric 7:	Reporting of Results	Medium	2	No raw data, mean and SD provided for each device.
	Metric 8:	Quality Assurance	N/A	N/A	calibration provided. no discussion of controls.
Domain 4: Variability and Uncertainty					
	Metric 9:	Variability and Uncertainty	Medium	2	Discussed different equipment types.
Overall Quality Determination[*]			Medium	2.1	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	W. R. Chan, S. Cohn, M. Sidheswaran, D. P. Sullivan, W. J. Fisk. 2014. Contaminant levels, source strengths, and ventilation rates in California retail stores. Indoor Air.
Data Type	Experimental
Hero ID	2535652

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology and Conditions	High	1	
	Metric 2:	Analytical Methodology	High	1	
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representative					
	Metric 4:	Testing Scenario	High	1	
	Metric 5:	Sample Size and Variability	High	1	
	Metric 6:	Temporality	High	1	
Domain 3: Accessibility/Clarity					
	Metric 7:	Reporting of Results	High	1	
	Metric 8:	Quality Assurance	N/A	N/A	
Domain 4: Variability and Uncertainty					
	Metric 9:	Variability and Uncertainty	High	1	
Overall Quality Determination[*]			High	1.0	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Kowalska, J.,Gierczak, T.. 2013. Qualitative and Quantitative Analyses of the Halogenated Volatile Organic Compounds Emitted from the Office Equipment Items. Indoor and Built Environment.
Data Type	Experimental
Hero ID	2655630

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology and Conditions	Medium	2	Sampling equipment and methods are described.
	Metric 2:	Analytical Methodology	High	1	Analytical methods are given, including calibration and determination limits
	Metric 3:	Biomarker Selection	N/A	N/A	No biomarker
Domain 2: Representative					
	Metric 4:	Testing Scenario	Low	3	Agree that the testing scenario relevance is low- The office items were "disintegrated"(not clear how or to what degree), and heated to desporb VOCs. Cannot directly compare to emissions of intact articles at room temperature.
	Metric 5:	Sample Size and Variability	Low	3	16 different items tested; no mention of replicates
	Metric 6:	Temporality	Medium	2	Tests conducted prior to article publication in 2008 (5-15 years ago)
Domain 3: Accessibility/Clarity					
	Metric 7:	Reporting of Results	High	1	Raw data is given (chromatograms); numbers in summary data
	Metric 8:	Quality Assurance	N/A	N/A	No specific discussion of quality assurance/control
Domain 4: Variability and Uncertainty					
	Metric 9:	Variability and Uncertainty	Low	3	No specific discussions of variability/uncertainty
Overall Quality Determination[*]			Medium	2.1	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	M. Nohr, W. Horn, O. Jann, M. Richter, W. Lorenz. 2015. Development of a multi-VOC reference material for quality assurance in materials emission testing. Analytical and Bioanalytical Chemistry.
Data Type	Experimental
Hero ID	2718034

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology and Conditions	Medium	2	Development of new method. micro chamber.
	Metric 2:	Analytical Methodology	Low	3	No LOQ provided in article. Method described elsewhere.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representative					
	Metric 4:	Testing Scenario	Medium	2	The emissions is from volatility in a petri dish. The product was not "applied".
	Metric 5:	Sample Size and Variability	Low	3	Three batches of same product.
	Metric 6:	Temporality	High	1	
Domain 3: Accessibility/Clarity					
	Metric 7:	Reporting of Results	Medium	2	No raw data.
	Metric 8:	Quality Assurance	N/A	N/A	not discussed.
Domain 4: Variability and Uncertainty					
	Metric 9:	Variability and Uncertainty	High	1	RSD provided. discussed influence on humidity, chamber flow.
Overall Quality Determination[*]			Medium	2.0	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Chao, C. Y. H.,Tung, T. C. W.,Niu, J. L.,Pang, S. W.,Lee, R. Y. M.. 1999. Indoor perchloroethylene accumulation from dry cleaned clothing on residential premises. Building and Environment.
Data Type	Experimental
Hero ID	3559311

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology and Conditions	High	1	Experimental protocol and sampling methodology are described thoroughly.
	Metric 2:	Analytical Methodology	Low	3	Analysis methods described broadly - gas chromatography/ mass spectroscopy
	Metric 3:	Biomarker Selection	N/A	N/A	No biomarker
Domain 2: Representative					
	Metric 4:	Testing Scenario	High	1	Test locations are actual homes, chosen from consumer survey; tests simulate typical drycleaning exposure
	Metric 5:	Sample Size and Variability	Medium	2	7 samples per test, duplicate samples at some test locations.
	Metric 6:	Temporality	Low	3	Study done in 1996 (15+ years ago)
Domain 3: Accessibility/Clarity					
	Metric 7:	Reporting of Results	High	1	Raw data reported in Tables 2-4
	Metric 8:	Quality Assurance	N/A	N/A	Quality control measures mentioned.
Domain 4: Variability and Uncertainty					
	Metric 9:	Variability and Uncertainty	High	1	Environmental conditions and results of duplicate tests are provided.
Overall Quality Determination[*]			Medium	1.7	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Cheng, W. enHsi,Tsai, D. Y.,Lu, J. iaYu,Lee, J. enWei. 2016. Extracting Emissions from Air Fresheners Using Solid Phase Microextraction Devices. Aerosol and Air Quality Research.
Data Type	Experimental
Hero ID	3587655

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology and Conditions	Medium	2	new sampling method; qualification tests conducted on the samplers used.
	Metric 2:	Analytical Methodology	Medium	2	Missing some details, method SOP not reported.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representative					
	Metric 4:	Testing Scenario	Low	3	One test condition. No detailed description of product.
	Metric 5:	Sample Size and Variability	Low	3	No replicate. Single samples of three products.
	Metric 6:	Temporality	High	1	current (2016; publication date)
Domain 3: Accessibility/Clarity					
	Metric 7:	Reporting of Results	Medium	2	No raw data. No summary across fresheners, although not as applicable.
	Metric 8:	Quality Assurance	N/A	N/A	Minimal QC. RSD (flow rates) in supp files.
Domain 4: Variability and Uncertainty					
	Metric 9:	Variability and Uncertainty	Medium	2	some discussion of variability between emissions.
Overall Quality Determination[*]			Medium	2.1	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	UL Env. 2017. Floor Coating VOC Emissions Research Report.
Data Type	Experimental
Hero ID	4440489

Domain	Metric		Rating†	Score	Comments‡
Domain 1: Reliability					
	Metric 1:	Sampling Methodology and Conditions	Medium	2	Environmental chamber and chemical emissions were analytically measured. Sampling conditions reported (temperature, RH, and air change per hour throughout each test).
	Metric 2:	Analytical Methodology	Medium	2	VOC measurements were made using gas chromatography with mass spectrometric detection (GC-MS). Measurements are reported to a quantifiable level of 0.04 "g based on a standard air volume collection of 18 L. Calibrated.
	Metric 3:	Biomarker Selection	N/A	N/A	Biomarker is not used.
Domain 2: Representative					

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Study Citation:	UL Env. 2017. Floor Coating VOC Emissions Research Report.
Data Type	Experimental
Hero ID	4440489

Domain	Metric		Rating†	Score	Comments‡
	Metric 4:	Testing Scenario	Medium	2	Small chamber screening phase: Screening tests were conducted to determine the type and amount of VOCs emitted from each floor coating. The coatings were applied to solid wood substrates according to the manufacturers recommended instructions. Then the samples were immediately placed in a 90 L test chamber that is supplied with purified air at standard conditions of 23"C, 50 percent relative humidity, and 1 air change per hour. Air samples were collected after a 24-hr equilibrium period to determine the emission rate of VOCs. Full scale large chamber application phase: Based on the small chamber screening data, 3 formulations, a low-emitting coating (Water Based 7), a high-emitting water-based coating (Water Based 3), and a solvent based coating (Solvent Based 2) were identified for more comprehensive testing. The comprehensive testing was conducted in a room sized environmental chamber (32 m3) and each test included an application phase (where an installer entered the chamber and applied the coating) and an early occupancy phase (where the floor was allowed to equilibrate normally and air samples were collected over a 7-day period in the chamber). The chamber was supplied with purified air at standard conditions of 23"C, 50 percent relative humidity, and 1 air change per hour throughout the test. Prior to testing, an 8" x 12" wood floor was assembled in the chamber to serve as the finish substrate. Background samples were collected to identify potential contaminants from the wood floor substrate. At the start of the application phase, the technician (a professional flooring contractor) entered the chamber with a small container of finish and a standard synthetic lambs wool applicator. The finish was poured onto small sections of the flooring and spread evenly over the entire surface, then the technician opened the door and quickly exited the chamber. Each coating was applied with the recommended number of coats (2 or 3) and using the recommended dry time between coats (2-hrs to 24-hrs). Air samples were collected during the application of each coat (to capture the maximum breathing concentration) and over the coating plus drying time (to determine the average breathing concentration during application). After the door was closed following application of the final coat, the early occupancy phase of the test was started. Data from the application phase is compared to occupational exposure guidelines.
	Metric 5:	Sample Size and Variability	Medium	2	small sample size; air samples were collected during application of each coat (to capture the maximum breathing concentration) and over the coating plus drying time (to determine average breathing concentration during application.

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Study Citation:	UL Env. 2017. Floor Coating VOC Emissions Research Report.
Data Type	Experimental
Hero ID	4440489

Domain	Metric	Rating[†]	Score	Comments[‡]
	Metric 6: Temporality	High	1	<5 years (2017 pub date)
Domain 3: Accessibility/Clarity				
	Metric 7: Reporting of Results	Medium	2	No supplemental or raw data. Table 4 reports measured chamber concentrations during full-scale large chamber application phase results.
	Metric 8: Quality Assurance	N/A	N/A	Measured concentrations from the application phase were compared to occupational exposure guidelines
Domain 4: Variability and Uncertainty				
	Metric 9: Variability and Uncertainty	Low	3	
Overall Quality Determination[*]		Medium	2.0	
Extracted		Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Wetzel, T. A.. 2014. Volatile Organic Compounds (VOCs) In Indoor Air: Emission From Consumer Products and the Use of Plants for Air Sampling.
Data Type	Experimental
Hero ID	4442460

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology and Conditions	Low	3	Some info is described in another report. But missing key pieces of information such as the exact times samples were collected from the chamber.
	Metric 2:	Analytical Methodology	Medium	2	Analytical method described, but no limits reported.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representative					
	Metric 4:	Testing Scenario	Low	3	Chemical content or weight fraction of product not reported.
	Metric 5:	Sample Size and Variability	Low	3	<5 samples
	Metric 6:	Temporality	High	1	current
Domain 3: Accessibility/Clarity					
	Metric 7:	Reporting of Results	Low	3	The report lacked a lot of information and organization. no raw data, no results per sampling interval.
	Metric 8:	Quality Assurance	N/A	N/A	
Domain 4: Variability and Uncertainty					
	Metric 9:	Variability and Uncertainty	Medium	2	Discussed calibration. Assessed reproducibility and accuracy of the emission rates generated from the chamber. No recoveries mentioned.
Overall Quality Determination[*]			Low	2.4	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	C. B. Keil, M. Nicas. 2003. Predicting room vapor concentrations due to spills of organic solvents. AIHA Journal.
Data Type	Experimental
Hero ID	4532343

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology and Conditions	High	1	Sampling method well described.
	Metric 2:	Analytical Methodology	Medium	2	chemical not analyzed. evaporation determined by mass, as logged by a computer. No calibration was discussed.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representative					
	Metric 4:	Testing Scenario	Low	3	Spill of chemical, not of formulated product. One set of conditions however the article states that other studies show that evap rates don't vary much with different conditions.
	Metric 5:	Sample Size and Variability	Low	3	range and avg provided, but could not find the number of samples.
	Metric 6:	Temporality	Low	3	2003, > 15 yrs old, but tested using a chemical so not as relevant.
Domain 3: Accessibility/Clarity					
	Metric 7:	Reporting of Results	Low	3	no raw data and no number of samples.
	Metric 8:	Quality Assurance	N/A	N/A	Did not discuss QC measures.
Domain 4: Variability and Uncertainty					
	Metric 9:	Variability and Uncertainty	Low	3	Conducted a study in a test house with one chemical (not DCM) to compare lab results.
Overall Quality Determination[*]			Low	2.6	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Won, D. Yang W.. 2012. Material emission information from: 105 building materials and consumer products.
Data Type	Experimental
Hero ID	4663242

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology and Conditions	High	1	
	Metric 2:	Analytical Methodology	Medium	2	analytical method is well described. but no recovery samples.
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representative					
	Metric 4:	Testing Scenario	Low	3	Consumer uses(subcategory in table 2) don't match for use of interest of EPA very much.
	Metric 5:	Sample Size and Variability	Low	3	only one sample collected per test
	Metric 6:	Temporality	Medium	2	2010 and 2011(>5 yrs old)
Domain 3: Accessibility/Clarity					
	Metric 7:	Reporting of Results	High	1	
	Metric 8:	Quality Assurance	N/A	N/A	calibration, comparison to past data are described. but recoveries is not discussed.
Domain 4: Variability and Uncertainty					
	Metric 9:	Variability and Uncertainty	High	1	
Overall Quality Determination[*]			Medium	1.9	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	C Solal, C. Rousselle, C. Mandin, J. Manel, F. Maupetit. 2008. VOCs and formaldehyde emissions from cleaning products and air fresheners. International Conference on Indoor Air Quality and Climate (Indoor Air 2008).
Data Type	Experimental
Hero ID	4683353

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology and Conditions	Medium	2	Although it appears that standard methods were used, not many details were provided. The emission test chamber method is described in EN ISO 16000-9 (Determination of the emission of volatile organic compounds from building products and furnishing " Emission test chamber method). VOCs were sampled on Tenax-TA and analysed using TD/GC/MSD/FID according to ISO 16000-6.
	Metric 2:	Analytical Methodology	Medium	2	Although it appears that standard methods were used, not many details were provided. Samples were analysed using TD/GC/MSD/FID according to ISO 16000-6.
	Metric 3:	Biomarker Selection	N/A	N/A	no biomarkers
Domain 2: Representative					
	Metric 4:	Testing Scenario	Low	3	Not US products. Don't know weight fractions of products.
	Metric 5:	Sample Size and Variability	Low	3	Only two samples per product type.
	Metric 6:	Temporality	Medium	2	10 years
Domain 3: Accessibility/Clarity					
	Metric 7:	Reporting of Results	Low	3	Only the maximum concentration provided.
	Metric 8:	Quality Assurance	N/A	N/A	Implied through the use of standard methods.
Domain 4: Variability and Uncertainty					
	Metric 9:	Variability and Uncertainty	Medium	2	only limited discussion of variability.
Overall Quality Determination[*]			Low	2.4	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	A. T. Hodgson. 1999. Common indoor sources of volatile organic compounds: Emission rates and techniques for reducing consumer exposures.
Data Type	Experimental
Hero ID	4683358

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology and Conditions	High	1	robust sampling method description
	Metric 2:	Analytical Methodology	High	1	GC-MS; previously been described (Hodgson and Girman, 1989). This method is a modification of U.S. EPA Method TO-1 (Winberry et al., 1988a).
	Metric 3:	Biomarker Selection	N/A	N/A	
Domain 2: Representative					
	Metric 4:	Testing Scenario	Low	3	Tested products not an exact match to scenarios of interest.
	Metric 5:	Sample Size and Variability	Low	3	3 experiments: latex paint, vinyl flooring, carpet
	Metric 6:	Temporality	Low	3	>15 yrs old
Domain 3: Accessibility/Clarity					
	Metric 7:	Reporting of Results	Medium	2	No raw data
	Metric 8:	Quality Assurance	N/A	N/A	
Domain 4: Variability and Uncertainty					
	Metric 9:	Variability and Uncertainty	Medium	2	Some discussion of uncertainty and variability
Overall Quality Determination[*]			Medium	2.1	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	A. T. Hodgson. 2001. Predicted concentrations in new relocatable classrooms of volatile organic compounds emitted from standard and alternate interior finish materials.
Data Type	Experimental
Hero ID	4683360

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology and Conditions	High	1	
	Metric 2:	Analytical Methodology	High	1	
	Metric 3:	Biomarker Selection	N/A	N/A	no biomarkers
Domain 2: Representative					
	Metric 4:	Testing Scenario	Medium	2	kind of products, test substance, testing methods are described. But exposure control is not discussed, and temperature/pressure are assumed value for estimation of concentration.
	Metric 5:	Sample Size and Variability	Low	3	2 - 4 products samples per product type.
	Metric 6:	Temporality	Low	3	>15 yrs old
Domain 3: Accessibility/Clarity					
	Metric 7:	Reporting of Results	Medium	2	Each results are summarized in each tables. The value in each tables are not raw data though, raw values of concentration are possibly calculated by equation(1). Statistical discussion is missed.
	Metric 8:	Quality Assurance	N/A	N/A	QC discussion is quite limited.
Domain 4: Variability and Uncertainty					
	Metric 9:	Variability and Uncertainty	Low	3	Variability/Uncertainty discussion is quite limited.
Overall Quality Determination[*]			Medium	2.1	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	A. C. Ortiz. 2010. Identifying sources of volatile organic compounds and aldehydes in a high performance building.
Data Type	Experimental
Hero ID	4683366

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology and Conditions	High	1	testing generally followed California Specification 01350 [15] and ASTM Standard Guide D-6007-02 [16] using small emission chambers.
	Metric 2:	Analytical Methodology	Medium	2	USEPA Method TO-17. standard method and LOQ provided, but not details on recovery or calibration.
	Metric 3:	Biomarker Selection	N/A	N/A	no biomarker
Domain 2: Representative					
	Metric 4:	Testing Scenario	Medium	2	only one testing condition. did not vary temp, airflow, etc.
	Metric 5:	Sample Size and Variability	Low	3	one test per product.
	Metric 6:	Temporality	Medium	2	8 years old
Domain 3: Accessibility/Clarity					
	Metric 7:	Reporting of Results	Medium	2	
	Metric 8:	Quality Assurance	N/A	N/A	quality assurance implied but not discussed.
Domain 4: Variability and Uncertainty					
	Metric 9:	Variability and Uncertainty	Low	3	no discussion of limitations
Overall Quality Determination[*]			Medium	2.1	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Jia, C. R.,D'Souza, J.,Batterman, S.. 2008. Distributions of personal VOC exposures: A population-based analysis. Environment International.
Data Type	Databases Not Unique to a Chemical
Hero ID	484177

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	NHANES
	Metric 2:	Analytical Methodology	High	1	NHANES
Domain 2: Representative					
	Metric 3:	Geographic Area	High	1	
	Metric 4:	Temporal	Low	3	Over 15 years old
	Metric 5:	Exposure Scenario	Medium	2	Indoor air, but not specifically linked to a consumer use.
Domain 3: Accessibility/Clarity					
	Metric 6:	Availability of DB and Supporting Documents	High	1	
	Metric 7:	Reporting Results	Medium	2	No raw data, but complete summary stats
Domain 4: Variability and Uncertainty					
	Metric 8:	Variability and Uncertainty	N/A	N/A	Discussed exposure factors.
Overall Quality Determination[*]			High	1.6	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Arif, A. A.,Shah, S. M.. 2007. Association between personal exposure to volatile organic compounds and asthma among US adult population. International Archives of Occupational and Environmental Health.
Data Type	Databases Not Unique to a Chemical
Hero ID	729385

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	NHANES
	Metric 2:	Analytical Methodology	High	1	NHANES. Detailed description of laboratory protocols is available from the NCHS web site.
Domain 2: Representative					
	Metric 3:	Geographic Area	High	1	US
	Metric 4:	Temporal	Low	3	>15 yrs
	Metric 5:	Exposure Scenario	Low	3	Sample collected for 24-48 hrs. Not specific to indoors or to a consumer product. Personal activities were investigated.
Domain 3: Accessibility/Clarity					
	Metric 6:	Availability of DB and Supporting Documents	High	1	NHANES
	Metric 7:	Reporting Results	Medium	2	no min or max (but 95th CI provided)
Domain 4: Variability and Uncertainty					
	Metric 8:	Variability and Uncertainty	N/A	N/A	
Overall Quality Determination[*]			Medium	1.7	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Staples, C. A.,Werner, A. F.,Hoogheem, T. J.. 1985. Assessment of priority pollutant concentrations in the United States using STORET database. Environmental Toxicology and Chemistry.
Data Type	Databases Not Unique to a Chemical
Hero ID	1359400

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	STORET refers overall to "STORage and RETrieval", an electronic data system for water quality monitoring data; developed and approved source by EPA
	Metric 2:	Analytical Methodology	High	1	STORET refers overall to "STORage and RETrieval", an electronic data system for water quality monitoring data; developed and approved source by EPA
Domain 2: Representative					
	Metric 3:	Geographic Area	High	1	
	Metric 4:	Temporal	Low	3	>15 yrs
	Metric 5:	Exposure Scenario	High	1	STORET refers overall to "STORage and RETrieval", an electronic data system for water quality monitoring data; developed and approved source by EPA
Domain 3: Accessibility/Clarity					
	Metric 6:	Availability of DB and Supporting Documents	High	1	
	Metric 7:	Reporting Results	Medium	2	only median and number of samples
Domain 4: Variability and Uncertainty					
	Metric 8:	Variability and Uncertainty	N/A	N/A	
Overall Quality Determination[*]			High	1.4	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	U.S, E. P. A.. 2017. Chemical data reporting: 1,1,2,2,-tetrachloroethene.
Data Type	Databases Not Unique to a Chemical
Hero ID	3970117

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	High	1	Data submitted to EPA by manufacturers.
	Metric 2:	Analytical Methodology	N/A	N/A	
Domain 2: Representative					
	Metric 3:	Geographic Area	High	1	US database.
	Metric 4:	Temporal	High	1	Data appears to be for 2010-2011 production volumes. 2016 data now available.
	Metric 5:	Exposure Scenario	High	1	Indicates if a consumer use product.
Domain 3: Accessibility/Clarity					
	Metric 6:	Availability of DB and Supporting Documents	High	1	Widely accepted. Users Guide.
	Metric 7:	Reporting Results	Medium	2	Data is organized. Typically only provides range or max concentration for product category.
Domain 4: Variability and Uncertainty					
	Metric 8:	Variability and Uncertainty	N/A	N/A	
Overall Quality Determination[*]			High	1.2	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Oppt Monitoring Database. 2017. Perchloroethylene.
Data Type	Databases Not Unique to a Chemical
Hero ID	3970236

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	
	Metric 2:	Analytical Methodology	Medium	2	
Domain 2: Representative					
	Metric 3:	Geographic Area	High	1	
	Metric 4:	Temporal	Medium	2	
	Metric 5:	Exposure Scenario	Low	3	
Domain 3: Accessibility/Clarity					
	Metric 6:	Availability of DB and Supporting Documents	Medium	2	
	Metric 7:	Reporting Results	Low	3	
Domain 4: Variability and Uncertainty					
	Metric 8:	Variability and Uncertainty	N/A	N/A	
Overall Quality Determination[*]			Medium	2.1	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Pubchem,. 2017. PubChem: Tetrachloroethylene.
Data Type	Databases Not Unique to a Chemical
Hero ID	3970251

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Low	3	Sampling methodologies were not reported.
	Metric 2:	Analytical Methodology	N/A	N/A	no samples were analyzed
Domain 2: Representative					
	Metric 3:	Geographic Area	N/A	N/A	no sample analysis
	Metric 4:	Temporal	Low	3	Many sources are older >15 yrs.
	Metric 5:	Exposure Scenario	High	1	
Domain 3: Accessibility/Clarity					
	Metric 6:	Availability of DB and Supporting Documents	Low	3	No info on how data was compiled or level of QC provided.
	Metric 7:	Reporting Results	High	1	
Domain 4: Variability and Uncertainty					
	Metric 8:	Variability and Uncertainty	N/A	N/A	none discussed
Overall Quality Determination[*]			Medium	2.2	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Household Products, Database. 2017. Household products database: Chemical information: Tetrachloroethylene.
Data Type	Databases Not Unique to a Chemical
Hero ID	3970268

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Medium	2	About Database webpage describes some info on how data was collected, but not detailed.
	Metric 2:	Analytical Methodology	N/A	N/A	
Domain 2: Representative					
	Metric 3:	Geographic Area	High	1	US database.
	Metric 4:	Temporal	High	1	Products have range of dates including <5 yrs.
	Metric 5:	Exposure Scenario	High	1	Weight fractions in 18,000 various consumer products.
Domain 3: Accessibility/Clarity					
	Metric 6:	Availability of DB and Supporting Documents	High	1	Widely accepted US govt database.
	Metric 7:	Reporting Results	High	1	Data is organized. No summary provided, so summary stats not applicable
Domain 4: Variability and Uncertainty					
	Metric 8:	Variability and Uncertainty	N/A	N/A	
Overall Quality Determination[*]			High	1.2	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Consumer Product Information, Database. 2017. What's in it? tetrachloroethylene.
Data Type	Databases Not Unique to a Chemical
Hero ID	3981163

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	Low	3	Webpage provides only very limited info. Brands selected based on market share.
	Metric 2:	Analytical Methodology	N/A	N/A	Shelf survey.
Domain 2: Representative					
	Metric 3:	Geographic Area	High	1	USA and canada database
	Metric 4:	Temporal	High	1	"Date verified" provided, come <5 yrs old.
	Metric 5:	Exposure Scenario	High	1	Weight fractions of consumer products.
Domain 3: Accessibility/Clarity					
	Metric 6:	Availability of DB and Supporting Documents	Low	3	No info how data collected or QC provided.
	Metric 7:	Reporting Results	High	1	Data is organized. No summary provided, so summary stats not applicable
Domain 4: Variability and Uncertainty					
	Metric 8:	Variability and Uncertainty	N/A	N/A	
Overall Quality Determination[*]			Medium	1.7	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Bartzis, J.. 2018. Prioritization of building materials as indoor pollution sources (BUMA).
Data Type	Databases Not Unique to a Chemical
Hero ID	4663145

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Sampling Methodology	N/A	N/A	
	Metric 2:	Analytical Methodology	N/A	N/A	
Domain 2: Representative					
	Metric 3:	Geographic Area	High	1	
	Metric 4:	Temporal	Medium	2	
	Metric 5:	Exposure Scenario	Medium	2	
Domain 3: Accessibility/Clarity					
	Metric 6:	Availability of DB and Supporting Documents	High	1	
	Metric 7:	Reporting Results	High	1	
Domain 4: Variability and Uncertainty					
	Metric 8:	Variability and Uncertainty	N/A	N/A	
Overall Quality Determination[*]			High	1.4	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Page, G. W.. 1981. Comparison of groundwater and surface water for patterns and levels of contamination by toxic substances. Environmental Science and Technology.
Data Type	Completed Exposure Assessment
Hero ID	18169

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	Medium	2	measurements, approaches are described briefly. But not in detail.
Domain 2: Representative				
	Metric 2: Exposure Scenario	Medium	2	surface water study. geography of area is described. but it's quite old study.(data collected in 1979)
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	High	1	
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	Low	3	variability/uncertainty is not discussed.
Overall Quality Determination[*]		Medium	2.0	
Extracted				

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Ipcs,. 1984. Tetrachloroethylene. Environmental Health Criteria.
Data Type	Completed Exposure Assessment
Hero ID	22606

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	Medium	2	Govt report of secondary exposure data. Medium score since the paper does not describe lit search.
Domain 2: Representative				
	Metric 2: Exposure Scenario	Medium	2	SW and aquatic species of interest. Geographical info most likely found within the secondary sources.
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	High	1	
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	Low	3	Various secondary sources cited for data. However, limited discussion on data gaps.
Overall Quality Determination[*]		Medium	2.0	
Extracted				

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Wallace, L. A.,Pellizzari, E.,Leaderer, B.,Zelon, H.,Sheldon, L.. 1987. Emissions of volatile organic compounds from building materials and consumer products. Atmospheric Environment.
Data Type	Completed Exposure Assessment
Hero ID	23126

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	Medium	2	Did not describe why selected the one study to compare vs others.
Domain 2: Representative				
	Metric 2: Exposure Scenario	Medium	2	Indoor air concentrations, but not specific to a product.
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	Medium	2	secondary data - only the average concentration was reported for comparison.
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	Medium	2	No SD provided for indoor concentrations. They did explain why chamber vs indoor air concentrations may differ.
Overall Quality Determination[*]		Medium	2.0	
Extracted				

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	U.S, E. P. A.. 2001. Sources, emission and exposure for trichloroethylene (TCE) and related chemicals.
Data Type	Completed Exposure Assessment
Hero ID	35002

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	Medium	2	Government report, but did not describe lit search methods
Domain 2: Representative				
	Metric 2: Exposure Scenario	Medium	2	For surface water secondary data, does not provide location within US.
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	High	1	
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	High	1	
Overall Quality Determination[*]		High	1.5	
Extracted				

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Fuller, B. B.. 1976. Air pollution assessment of tetrachloroethylene.
Data Type	Completed Exposure Assessment
Hero ID	58062

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	Low	3	No description of literature search method.
Domain 2: Representative				
	Metric 2: Exposure Scenario	Medium	2	US study and media of interest (water, biota on pg 64), but the secondary data is from 1975.
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	High	1	
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	Low	3	no discussion related to the concentrations in the environment
Overall Quality Determination[*]		Medium	2.2	
Extracted				

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Zoeteman, B. C. J.,Harmsen, K.,Linders, J. B. H. J.,Morra, C. F. H.,Slooff, W.. 1980. Persistent organic pollutants in river water and ground water of the Netherlands. Chemosphere.
Data Type	Completed Exposure Assessment
Hero ID	58284

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	Low	3	persistence is mainly discussed. basically secondary references are quited.
Domain 2: Representative				
	Metric 2: Exposure Scenario	Low	3	US study. but auite old study (1980) and not much data.
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	High	1	
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	Medium	2	Some discussion of uncertainties.
Overall Quality Determination[*]		Medium	2.2	
Extracted				

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Atsdr,. 1997. Toxicological profile for tetrachloroethylene.
Data Type	Completed Exposure Assessment
Hero ID	192111

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Methodology	Medium	2	
Domain 2: Representative					
	Metric 2:	Exposure Scenario	High	1	
Domain 3: Accessibility/Clarity					
	Metric 3:	Documentation of References	High	1	
Domain 4: Variability and Uncertainty					
	Metric 4:	Variability and Uncertainty	High	1	
Overall Quality Determination[*]			High	1.2	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Fishbein, L.. 1992. Exposure from occupational versus other sources. Scandinavian Journal of Work, Environment and Health.
Data Type	Completed Exposure Assessment
Hero ID	200024

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	Low	3	Few assumption provided. Literature search methods not discussed.
Domain 2: Representative				
	Metric 2: Exposure Scenario	Low	3	Over 15 years old. Intakes not specific to indoors.
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	Low	3	A reference section is provided. But the range provided for indoor air concentrations was not specifically stated in the text.
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	Low	3	No discussion.
Overall Quality Determination[*]		Low	3.0	
Extracted				

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Duboudin, C.. 2010. Pollution inside the home: descriptive analyses Part II: Identification of groups of homogenous homes in terms of pollution. Environnement, Risques & Sante.
Data Type	Completed Exposure Assessment
Hero ID	380600

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	Medium	2	Limited discussion of methods, but references provided for sampling and analytical methodology.
Domain 2: Representative				
	Metric 2: Exposure Scenario	Medium	2	survey from 2003-2005
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	Medium	2	Some references that would be useful to review are in French.
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	Medium	2	Conducted statistical analysis to group comparable homes. No CV of concentrations provided.
Overall Quality Determination[*]		Medium	2.0	
Extracted				

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Chien, Y. C.. 1997. The influences of exposure pattern and duration on elimination kinetics and exposure assessment of tetrachloroethylene in humans [PhD].
Data Type	Completed Exposure Assessment
Hero ID	630433

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	Medium	2	
Domain 2: Representative				
	Metric 2: Exposure Scenario	Medium	2	
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	High	1	
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	Medium	2	
Overall Quality Determination[*]		Medium	1.8	
Extracted				

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Letkiewicz, F.,Johnston, P.,Macaluso, C.,Elder, R.,Yu, W.. 1982. Occurrence in tetrachloroethylene (perchloroethylene) in drinking water, food and air.
Data Type	Completed Exposure Assessment
Hero ID	630715

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	High	1	Draws on data from previous federal surveys, as well as some state data
Domain 2: Representative				
	Metric 2: Exposure Scenario	High	1	PERC concentrations in drinking water
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	High	1	References are documented and appear to be reliable
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	High	1	Study looks at variability in exposure throughout United States
Overall Quality Determination[*]		High	1.0	
Extracted				

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Nysdoh,. 2005. Improving human risk assessment for tetrachloroethylene by using biomakers and neurobehavioral testing.
Data Type	Completed Exposure Assessment
Hero ID	630847

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	High	1	Technical approach appears reliable, much discussion of methods and techniques
Domain 2: Representative				
	Metric 2: Exposure Scenario	High	1	Assessment of data collected in NYC between 2001-2003; Consumer inhalation exposure through both air concentrations and blood/breath levels
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	High	1	References and reported data are provided in appendix
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	High	1	Variability characterized for blood/breath perc levels
Overall Quality Determination[*]		High	1.0	
Extracted				

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Benignus, V. A.,Boyes, W. K.,Geller, A. M.,Bushnell, P. J.. 2009. Long-term perchloroethylene exposure: A meta-analysis of neurobehavioral deficits in occupationally and residentially exposed groups. Journal of Toxicology and Environmental Health, Part A: Current Issues.
Data Type	Completed Exposure Assessment
Hero ID	633141

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Methodology	High	1	Assessment techniques appear to be accepted and reliable.
Domain 2: Representative					
	Metric 2:	Exposure Scenario	High	1	All studies included are of consumer inhalation exposure measured by indoor air quality
Domain 3: Accessibility/Clarity					
	Metric 3:	Documentation of References	High	1	Studies referenced all appear in peer-reviewed publications
Domain 4: Variability and Uncertainty					
	Metric 4:	Variability and Uncertainty	Medium	2	Variability in population/media is explored
Overall Quality Determination[*]			High	1.2	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Destaillats, H.,Maddalena, R. L.,Singer, B. C.,Hodgson, A. T.,McKone, T. E.. 2008. Indoor pollutants emitted by office equipment: A review of reported data and information needs. Atmospheric Environment.
Data Type	Completed Exposure Assessment
Hero ID	694628

Domain	Metric		Rating†	Score	Comments‡
Domain 1: Reliability					
	Metric 1:	Methodology	Unacceptable	4	just Literature review.
Domain 2: Representative					
	Metric 2:	Exposure Scenario	Medium	2	The release of PERC from office equipments is described. US study. HBCD is not mentioned in document. published In 2008.
Domain 3: Accessibility/Clarity					
	Metric 3:	Documentation of References	High	1	
Domain 4: Variability and Uncertainty					
	Metric 4:	Variability and Uncertainty	N/A	N/A	no discussion - all secondary data.
Overall Quality Determination*			Unacceptable	4.0	Metric mean score**: 2.3.
Extracted					

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

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.

‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.

* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	C. J. Weschler. 2009. Changes in indoor pollutants since the 1950s. Atmospheric Environment.
Data Type	Completed Exposure Assessment
Hero ID	695495

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	Low	3	Little discussion on methodology.Table 1 provides a sense of how and why an indoor environment in 2008 is so different from its counterpart in the early 1950s.
Domain 2: Representative				
	Metric 2: Exposure Scenario	Medium	2	Article discusses trends in indoor pollutants. Table 2 reports selected pollutants (includes DCM, Carbon Tet, TCE, and PERC) and trends in their indoor concentrations since the 1950s. There are no concentration measurement; trends are broadly summarized by up and down arrows. Figure 4(a) reports median indoor concentrations of Carbon Tet, PERC, and TCE, but these data are derived from 1981-1984 TEAM Study and the 1999-2001 RIOPA study (secondary studies will not be extracted)
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	Medium	2	References are listed
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	Medium	2	The study has limited discussion of key uncertainties and limitations.
Overall Quality Determination[*]		Medium	2.2	
Extracted				

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Gilbert, D.,Goyer, M.,Lyman, W.,Magil, G.,Walker, P.,Wallace, D.,Wechsler, A.,Yee, J.. 1982. An exposure and risk assessment for tetrachloroethylene.
Data Type	Completed Exposure Assessment
Hero ID	732615

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	High	1	
Domain 2: Representative				
	Metric 2: Exposure Scenario	High	1	
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	High	1	
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	High	1	
Overall Quality Determination[*]		High	1.0	
Extracted		Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Dawson, H. E.,McAlary, T.. 2009. A compilation of statistics for VOCs from post-1990 indoor air concentration studies in North American residences unaffected by subsurface vapor intrusion. Ground Water Monitoring and Remediation.
Data Type	Completed Exposure Assessment
Hero ID	735303

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	High	1	Detailed description of literature evaluated and statistical analysis.
Domain 2: Representative				
	Metric 2: Exposure Scenario	Low	3	Most studies are >15 yrs old, and not directly tied to consumer products.
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	High	1	
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	High	1	robust discussion, discussed variability
Overall Quality Determination[*]		High	1.5	
Extracted				

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Bogen, K. T.,McKone, T. E.. 1988. Linking indoor air and pharmacokinetic models to assess tetrachloroethylene risk. Risk Analysis.
Data Type	Completed Exposure Assessment
Hero ID	819974

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Methodology	High	1	
Domain 2: Representative					
	Metric 2:	Exposure Scenario	Low	3	model for inhalation from groundwater, but groundwater is off-PECO
Domain 3: Accessibility/Clarity					
	Metric 3:	Documentation of References	High	1	
Domain 4: Variability and Uncertainty					
	Metric 4:	Variability and Uncertainty	High	1	compared to other studies
Overall Quality Determination[*]			High	1.5	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	. 1988. Toxic Air Pollutant Emission Factors Compilation For Selected Air Toxic Compounds and Sources.
Data Type	Completed Exposure Assessment
Hero ID	1265174

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	Low	3	mathematical approach is described very simply. But the discussion of the approach like validity is missed.
Domain 2: Representative				
	Metric 2: Exposure Scenario	Medium	2	there are tables of emission factors of TCE and perc for industrial process. But data is quite old (>15yrs).
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	Low	3	input data is missed. some of un-peer reviewed sources are cited.
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	Low	3	variability/uncertainty is a bit discussed.
Overall Quality Determination[*]		Low	2.8	
Extracted		Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	de Blas, M.,Navazo, M.,Alonso, L.,Durana, N.,Gomez, M. C.,Iza, J.. 2012. Simultaneous indoor and outdoor on-line hourly monitoring of atmospheric volatile organic compounds in an urban building. The role of inside and outside sources. Science of the Total Environment.
Data Type	Completed Exposure Assessment
Hero ID	1788276

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Methodology	High	1	
Domain 2: Representative					
	Metric 2:	Exposure Scenario	High	1	The contractor comment downgraded the paper because it does not link directly to a consumer product, but that is not the purpose of the study. The indoor/outdoor mixing ration measurements can help inform background indoor air concentrations when considering risk due to use scenarios.
Domain 3: Accessibility/Clarity					
	Metric 3:	Documentation of References	High	1	
Domain 4: Variability and Uncertainty					
	Metric 4:	Variability and Uncertainty	High	1	
Overall Quality Determination[*]			High	1.0	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Du, Z.,Mo, J.,Zhang, Y.. 2014. Risk assessment of population inhalation exposure to volatile organic compounds and carbonyls in urban China. Environment International.
Data Type	Completed Exposure Assessment
Hero ID	2536230

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	High	1	
Domain 2: Representative				
	Metric 2: Exposure Scenario	Medium	2	
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	High	1	
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	High	1	
Overall Quality Determination[*]		High	1.2	
Extracted				

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	L. Golsteijn, D. Huizer, M. Hauck, R. van Zelm, M. A. Huijbregts. 2014. Including exposure variability in the life cycle impact assessment of indoor chemical emissions: the case of metal degreasing. Environment International.
Data Type	Completed Exposure Assessment
Hero ID	2537636

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	High	1	
Domain 2: Representative				
	Metric 2: Exposure Scenario	High	1	
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	High	1	
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	High	1	
Overall Quality Determination[*]		High	1.0	
Extracted		Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	. 2015. Health Assessment for Groundwater, Surface Water, Soil and Sediment Data Evaluation, Corozal Well Site, Corozal, Puerto Rico, July 29, 2015. EPA Facility ID: PRN000206452.
Data Type	Completed Exposure Assessment
Hero ID	3491017

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Methodology	High	1	Assumptions for calculations are well-documented
Domain 2: Representative					
	Metric 2:	Exposure Scenario	Low	3	Surface water is discussed briefly, only to rule it out. Bulk of assessment is on groundwater, which is not currently of interest.
Domain 3: Accessibility/Clarity					
	Metric 3:	Documentation of References	High	1	Reference are well documented; data from EPA and PRDOH
Domain 4: Variability and Uncertainty					
	Metric 4:	Variability and Uncertainty	Medium	2	Some discussions of uncertainty related to dose calculations
Overall Quality Determination[*]			Medium	1.8	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	McDonald, G. J.,Wertz, W. E.. 2007. PCE, TCE, and TCA vapors in subslab soil gas and indoor air: A case study in upstate New York. Ground Water Monitoring and Remediation.
Data Type	Completed Exposure Assessment
Hero ID	3543741

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	High	1	
Domain 2: Representative				
	Metric 2: Exposure Scenario	Medium	2	Indoor air study. but not specialized as consumer products.
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	High	1	
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	High	1	
Overall Quality Determination[*]		High	1.2	
Extracted				

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Bauer, U.. 1991. OCCURRENCE OF TETRACHLOROETHYLENE IN THE FEDERAL-REPUBLIC-OF-GERMANY. Chemosphere.
Data Type	Completed Exposure Assessment
Hero ID	3572966

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	Low	3	No discussion on methodology.
Domain 2: Representative				
	Metric 2: Exposure Scenario	Low	3	Older (1991) German study citing data from 1976-1986.
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	High	1	Caution that many cited references could be in German.
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	Low	3	No variability and some uncertainties were addressed.
Overall Quality Determination[*]		Low	2.5	
Extracted				

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	De Rooij, C.,Boutonnet, J. C.,Garny, V.,Lecloux, A.,Papp, R.,Thompson, R. S.,Van Wijk, D.. 1998. Euro Chlor risk assessment for the marine environment OSPARCOM region: North sea - Tetrachloroethylene. Environmental Monitoring and Assessment.
Data Type	Completed Exposure Assessment
Hero ID	3573238

Domain	Metric	Rating†	Score	Comments‡
Domain 1: Reliability				
	Metric 1: Methodology	Low	3	No discussion on methodology.
Domain 2: Representative				
	Metric 2: Exposure Scenario	Low	3	Older (1998) risk assessment study utilizing data from 1975-1995 in European surface waters.
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	High	1	
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	Low	3	No variability and some uncertainties were addressed.
Overall Quality Determination*		Low	2.5	
Extracted				

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Giger, W.,Molnarkubica, E.. 1978. TETRACHLOROETHYLENE IN CONTAMINATED GROUND AND DRINKING WATERS. Bulletin of Environmental Contamination and Toxicology.
Data Type	Completed Exposure Assessment
Hero ID	3573428

Domain	Metric	Rating†	Score	Comments‡
Domain 1: Reliability				
	Metric 1: Methodology	Low	3	No discussion on methodology.
Domain 2: Representative				
	Metric 2: Exposure Scenario	Low	3	Study is regarding dw gw. Study cites conc of PERC up to 80 ug/L in sw.
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	High	1	
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	Low	3	No primary SW conc reported; up to 80 ug/L.
Overall Quality Determination*		Low	2.5	
Extracted				

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Nicnas,. 2001. Tetrachloroethylene " Priority existing chemical. Assessment Report No. 15.
Data Type	Completed Exposure Assessment
Hero ID	3797979

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	High	1	
Domain 2: Representative				
	Metric 2: Exposure Scenario	Medium	2	Australia
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	High	1	
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	Medium	2	Some variability and uncertainties were discussed.
Overall Quality Determination[*]		High	1.5	
Extracted		Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Oecd,. 2013. Emission scenario document on the industrial use of adhesives for substrate bonding.
Data Type	Completed Exposure Assessment
Hero ID	3827300

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	High	1	
Domain 2: Representative				
	Metric 2: Exposure Scenario	Low	3	mostly occupational, not consumer
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	High	1	
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	Medium	2	Some discussion of data gaps for release and exposure estimates (occupational)
Overall Quality Determination[*]		Medium	1.8	
Extracted				

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	U.S, E. P. A.. 2011. Background indoor air concentrations of volatile organic compounds in North American residences (1990-2005): A compilation of statistics for assessment vapor intrusion.
Data Type	Completed Exposure Assessment
Hero ID	3827392

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	Medium	2	The assessment methods , assumptions are discribed simply for each studies which are collected by EPA.
Domain 2: Representative				
	Metric 2: Exposure Scenario	Medium	2	>10 yrs old
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	Medium	2	References are peer reviewed sources and compiled data are summarized. But no raw data.
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	High	1	
Overall Quality Determination[*]		Medium	1.8	
Extracted				

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Ecb,. 2005. European Union risk assessment report: Tetrachloroethylene. Part 1 - Environment.
Data Type	Completed Exposure Assessment
Hero ID	3839195

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	High	1	
Domain 2: Representative				
	Metric 2: Exposure Scenario	Medium	2	media interest. but relatively old report (2005: >5yrs old). Not US study.
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	Medium	2	Most references cited and seem to be available publicly. Others are personal communications.
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	High	1	
Overall Quality Determination[*]		High	1.5	
Extracted		Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Australian Government Department of, Health. 2016. Human health tier III assessment for 1-methyl-2-pyrrolidinone.
Data Type	Completed Exposure Assessment
Hero ID	3969286

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	High	1	Used Consexpo to model inhalation and dermal doses. Used all default parameters with 4 different weight fractions.
Domain 2: Representative				
	Metric 2: Exposure Scenario	High	1	
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	High	1	
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	Medium	2	model;ed multiple weight fractions.
Overall Quality Determination[*]		High	1.2	
Extracted		Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	U.S, E. P. A.. 2012. Toxicological review of tetrachloroethylene (perchloroethylene).
Data Type	Completed Exposure Assessment
Hero ID	3970109

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	High	1	Methodology (literature search strategy) discussed in detail and seems complete.
Domain 2: Representative				
	Metric 2: Exposure Scenario	Low	3	Many studies seem to correlate to occupational and animal studies, and less on indoor air within households or sw concentrations.
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	High	1	References cited and seem to be available publicly.
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	High	1	
Overall Quality Determination[*]		High	1.5	
Extracted				

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	U.S, E. P. A.. 1998. Cleaner technologies substitutes assessment for professional fabricare processes.
Data Type	Completed Exposure Assessment
Hero ID	3970186

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	Medium	2	Govt report of secondary exposure data. Limited discussion on lit search methods, assumptions, extrapolations.
Domain 2: Representative				
	Metric 2: Exposure Scenario	Medium	2	Older report (1998). Consumer exposures and aquatic/surface water concentrations are provided.
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	High	1	
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	Medium	2	Uncertainties discussed; limited characterization of variability
Overall Quality Determination[*]		Medium	1.8	
Extracted				

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	ToxNet Hazardous Substances Data, Bank. 2017. HSDB: Tetrachloroethylene.
Data Type	Completed Exposure Assessment
Hero ID	3970279

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	Low	3	No discussion on methodology.
Domain 2: Representative				
	Metric 2: Exposure Scenario	Medium	2	Relevant media, but almost all secondary articles are >15 years old.
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	High	1	
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	Low	3	Variability is n/a; Uncertainties not identified.
Overall Quality Determination[*]		Medium	2.2	
Extracted				

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Echa,. 2014. Substance evaluation report - Tetrachloroethylene.
Data Type	Completed Exposure Assessment
Hero ID	3970790

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	Medium	2	lit search method is missed.
Domain 2: Representative				
	Metric 2: Exposure Scenario	Unacceptable	4	just occupational exposure is disscussed. consumer, aquatic exposure is not described.
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	High	1	
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	High	1	
Overall Quality Determination[*]		Unacceptable	4.0	Metric mean score[**]: 2.0.
Extracted				

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

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.

‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.

* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Echa,. 2008. Annex XV restriction report: Tetrachloroethylene.
Data Type	Completed Exposure Assessment
Hero ID	3970791

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	High	1	
Domain 2: Representative				
	Metric 2: Exposure Scenario	Medium	2	Govt 2008 report. Consumer exposures (back-in-use materials).
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	Low	3	Many references cited seem to be personal communications.
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	Medium	2	Some variability, uncertainties were discussed.
Overall Quality Determination[*]		Medium	2.0	
Extracted		Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Spolana, a s. 2014. Chemical safety report: Trichloroethylene.
Data Type	Completed Exposure Assessment
Hero ID	3970807

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	High	1	EUSES. Annex 1 has assumptions
Domain 2: Representative				
	Metric 2: Exposure Scenario	Medium	2	EU, <5 yrs
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	High	1	
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	Low	3	Multiple scenarios, but no discussion of uncertainty.
Overall Quality Determination[*]		Medium	1.8	
Extracted		Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Domo Caproleuna GmbH. 2014. Chemical safety report: Industrial use as an extractive solvent for the purification of caprolactam from caprolactam oil.
Data Type	Completed Exposure Assessment
Hero ID	3970809

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	High	1	Used EUSES to model PECs. Assumptions provided.
Domain 2: Representative				
	Metric 2: Exposure Scenario	Medium	2	Industrial release, but not US.
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	Low	3	Only one reference ,assumed to be the source of the fate properties.
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	Low	3	not discussed
Overall Quality Determination[*]		Medium	2.2	
Extracted		Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	D. O. W. Deutschland. 2014. Chemical safety report: Industrial use as process chemical (enclosed systems) in Alcantara material production.
Data Type	Completed Exposure Assessment
Hero ID	3970811

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	Medium	2	EUSES is an accepted model, not sure all inputs provided.
Domain 2: Representative				
	Metric 2: Exposure Scenario	Medium	2	Applicable scenario, but not US
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	High	1	
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	Medium	2	
Overall Quality Determination[*]		Medium	1.8	
Extracted		Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Vlisco Netherlands, B. V.. 2014. Chemical safety report Part A: Use of trichloroethylene as a solvent for the removal and recovery of resin from dyed cloth.
Data Type	Completed Exposure Assessment
Hero ID	3970833

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	High	1	EUSES
Domain 2: Representative				
	Metric 2: Exposure Scenario	High	1	
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	High	1	
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	Low	3	No discussion of uncertainty
Overall Quality Determination[*]		High	1.5	
Extracted		Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Parker Hannifin, Manufacturing. 2014. Chemical safety report: Use of trichloroethylene as a process solvent for the manufacturing of hollow fibre gas separation membranes out of polyphenylene oxide (PPO).
Data Type	Completed Exposure Assessment
Hero ID	3970838

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	High	1	EUSES
Domain 2: Representative				
	Metric 2: Exposure Scenario	Medium	2	EU. <5 ytrs old
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	Medium	2	
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	Medium	2	No direct discussion, but evaluated multiple scenarios.
Overall Quality Determination[*]		Medium	1.8	
Extracted		Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	. 2014. Exposure assessment: Trichloroethylene, Part 3.
Data Type	Completed Exposure Assessment
Hero ID	3970842

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	Low	3	Used EUSES but didn't describe inputs
Domain 2: Representative				
	Metric 2: Exposure Scenario	Medium	2	based on industrial releases, but in EU
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	Low	3	this is just a chapter and no references included.
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	Low	3	No discussion of variability and uncertainty
Overall Quality Determination[*]		Low	2.8	
Extracted		Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Iarc,. 2014. IARC Monographs on the evaluation of carcinogenic risks to humans: Trichloroethylene, tetrachloroethylene, and some other chlorinated agents.
Data Type	Completed Exposure Assessment
Hero ID	3970844

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Methodology	High	1	
Domain 2: Representative					
	Metric 2:	Exposure Scenario	Medium	2	Some exposure data are quite old.
Domain 3: Accessibility/Clarity					
	Metric 3:	Documentation of References	High	1	
Domain 4: Variability and Uncertainty					
	Metric 4:	Variability and Uncertainty	Medium	2	uncertainty of exposure data is not discussed
Overall Quality Determination[*]			High	1.5	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Atsdr,. 2006. Health consultation: Evaluation of tetrachloroethylene vapor intrusion into buildings located above a contaminated aquifer: Schlage Lock Company Security, El Paso County, Colorado: EPA facility ID: COD082657420.
Data Type	Completed Exposure Assessment
Hero ID	3978056

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Methodology	Medium	2	the concept of exposure assessment is described. but no details.
Domain 2: Representative					
	Metric 2:	Exposure Scenario	Unacceptable	4	Indoor air study. However, source is not from consumer products, but vapor intrusion from soil contaminated by groundwater.
Domain 3: Accessibility/Clarity					
	Metric 3:	Documentation of References	High	1	
Domain 4: Variability and Uncertainty					
	Metric 4:	Variability and Uncertainty	Low	3	Limited discussion
Overall Quality Determination[*]			Unacceptable	4.0	Metric mean score[**]: 2.5.
Extracted					

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

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.

[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.

[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Atsdr,. 2005. Health consultation: Walden"s Ridge utility district: Signal Mountain, Hamilton County, Tennessee.
Data Type	Completed Exposure Assessment
Hero ID	3978068

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	Medium	2	exposure pathway is simply described though, no details are shown.
Domain 2: Representative				
	Metric 2: Exposure Scenario	Unacceptable	4	Human exposure for drinking water is discussed.
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	High	1	
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	Low	3	discussion is quite limited.
Overall Quality Determination[*]		Unacceptable	4.0	Metric mean score[**]: 2.5.
Extracted				

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

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.

‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.

* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Atsdr,. 2008. Health consultation: Public comment release: Indoor and outdoor air data evaluation for Chillum perc site: Chillum perc site (aka Chillum perchloroethylene): Chillum, Prince George County, Maryland: EPA facility ID: MDN000305887.
Data Type	Completed Exposure Assessment
Hero ID	3978081

Domain	Metric		Rating†	Score	Comments‡
Domain 1: Reliability					
	Metric 1:	Methodology	Medium	2	concept of exposure assessment is described. but no details.
Domain 2: Representative					
	Metric 2:	Exposure Scenario	Unacceptable	4	Vapor intrusion study.
Domain 3: Accessibility/Clarity					
	Metric 3:	Documentation of References	High	1	
Domain 4: Variability and Uncertainty					
	Metric 4:	Variability and Uncertainty	Low	3	no discussion.
Overall Quality Determination*			Unacceptable	4.0	Metric mean score**: 2.5.
Extracted					

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

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.

‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.

* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Carex, Canada. 2017. Tetrachloroethylene– Environmental estimate.
Data Type	Completed Exposure Assessment
Hero ID	3978375

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	Low	3	No discussion on methodology.
Domain 2: Representative				
	Metric 2: Exposure Scenario	Medium	2	Canadian and US sources >5 years.
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	High	1	
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	Low	3	No variability; Uncertainties not identified.
Overall Quality Determination[*]		Medium	2.2	
Extracted				

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Carex, Canada. 2017. Tetrachloroethylene– Environmental estimate: Indoor air.
Data Type	Completed Exposure Assessment
Hero ID	3978377

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
Metric 1:	Methodology	High	1	
Domain 2: Representative				
Metric 2:	Exposure Scenario	Medium	2	Studies >10 years old in US, Canada, Japan.
Domain 3: Accessibility/Clarity				
Metric 3:	Documentation of References	High	1	
Domain 4: Variability and Uncertainty				
Metric 4:	Variability and Uncertainty	Low	3	No variability; Uncertainties not identified.
Overall Quality Determination[*]		Medium	1.8	
Extracted				

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Who,. 2006. WHO IRIS: Tetrachloroethylene.
Data Type	Completed Exposure Assessment
Hero ID	3978390

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	High	1	
Domain 2: Representative				
	Metric 2: Exposure Scenario	Low	3	references are old (>15 yrs old). not US study.
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	High	1	
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	High	1	
Overall Quality Determination[*]		High	1.5	
Extracted				

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Atsdr,. 2011. Case studies in environmental medicine: tetrachloroethylene toxicity.
Data Type	Completed Exposure Assessment
Hero ID	3980994

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Methodology	Unacceptable	4	no assessment is conducted. no concentration data.
Domain 2: Representative					
	Metric 2:	Exposure Scenario	Low	3	consumer exposure is fewly refered. it's quite old (>15 yrs old).
Domain 3: Accessibility/Clarity					
	Metric 3:	Documentation of References	High	1	
Domain 4: Variability and Uncertainty					
	Metric 4:	Variability and Uncertainty	Low	3	no discussion
Overall Quality Determination[*]			Unacceptable	4.0	Metric mean score[**]: 2.8.
Extracted					

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

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.

‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.

* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Environment Canada, Health Canada. 1993. Canadian Environmental protection act priority substances list assessment report tetrachloroethylene.
Data Type	Completed Exposure Assessment
Hero ID	3981152

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	High	1	
Domain 2: Representative				
	Metric 2: Exposure Scenario	Low	3	Govt study from 1993. Wastewater effluent, indoor air, aquatic species, sw.
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	High	1	
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	Medium	2	Variability seems to have been met. Uncertainty has been discussed regarding some articles.
Overall Quality Determination[*]		Medium	1.8	
Extracted				

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	European Chlorinated Solvents, Association. 2011. Health profile on perchloroethylene.
Data Type	Completed Exposure Assessment
Hero ID	3982134

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	Low	3	Not much discussion on the "available data."
Domain 2: Representative				
	Metric 2: Exposure Scenario	Low	3	Some data for indoor air and aquatic species but missing details.
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	Unacceptable	4	Secondary sources were not cited and the study did not provide a list of references.
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	Low	3	Limited variability and no discussion on uncertainty.
Overall Quality Determination[*]		Unacceptable	4.0	Metric mean score[**]: 3.2.
Extracted				

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

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.

[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.

[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Oehha,. 2001. Public health goal for tetrachloroethylene in drinking water.
Data Type	Completed Exposure Assessment
Hero ID	3982310

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	Medium	2	Govt report of secondary exposure data. Medium score since does not describe lit search method.
Domain 2: Representative				
	Metric 2: Exposure Scenario	Low	3	Govt report from 2001. Indoor air concentrations and consumer (dry cleaned clothes).
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	High	1	
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	Low	3	Some variability. Uncertainty was described for developed models.
Overall Quality Determination[*]		Medium	2.2	
Extracted				

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Arb,. 1991. Proposed identification of perchloroethylene as a toxic air contaminant.
Data Type	Completed Exposure Assessment
Hero ID	3982312

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	Medium	2	Techniques and facts are described. but description of details like method to calculate the concentration are limited.
Domain 2: Representative				
	Metric 2: Exposure Scenario	Medium	2	indoor air concentration is shown. but consumer product is not mentioned. quite old study (>15 yrs old)
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	Low	3	It's not clear that references are peer reviewed.
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	Low	3	uncertainties and data gaps are discussed quite limitedly.
Overall Quality Determination[*]		Low	2.5	
Extracted				

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Carb,. 1991. Technical support document part A: Proposed identification of perchloroethylene as a toxic air contaminant.
Data Type	Completed Exposure Assessment
Hero ID	3986480

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	Medium	2	Govt report of secondary exposure data. Medium score since does not describe lit search method.
Domain 2: Representative				
	Metric 2: Exposure Scenario	Low	3	Older study (1991). Building materials and consumer products. Indoor air conc.
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	High	1	
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	High	1	
Overall Quality Determination[*]		Medium	1.8	
Extracted				

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Carb,. 1991. Technical support document part B: Proposed identification of perchloroethylene as a toxic air contaminant.
Data Type	Completed Exposure Assessment
Hero ID	3986481

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	Low	3	description of lit search method and exposure is missed.
Domain 2: Representative				
	Metric 2: Exposure Scenario	Unacceptable	4	no media interests.
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	High	1	
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	Low	3	no discussion.
Overall Quality Determination[*]		Unacceptable	4.0	Metric mean score[**]: 2.8.
Extracted				

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

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.

‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.

* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	P. E. I. Associates. 1985. Asbestos dust control in brake maintenance. Draft.
Data Type	Completed Exposure Assessment
Hero ID	4151966

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	Low	3	Because this monitoring was done under a variety of sampling times and conditions. with variable amounts of brake drum dust, and variable asbestos concentrations in the dust. and by different test methods, the results should be viewed only as rough estimates of worker exposure.
Domain 2: Representative				
	Metric 2: Exposure Scenario	High	1	very relevant: dust control for brake maintenance workers
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	Low	3	A mix of old agency reports and publications, industry papers, and also some personal communications and workshops; but well documented
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	Medium	2	Variability described and uncertainty addressed; ultimately a comparison of dust control methods relative to each other.
Overall Quality Determination[*]		Medium	2.2	
Extracted		Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Ec,. 2004. European Union risk assessment report: Tetrachloroethylene.
Data Type	Completed Exposure Assessment
Hero ID	4152094

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Methodology	High	1	
Domain 2: Representative					
	Metric 2:	Exposure Scenario	Medium	2	media interest. but in EU and a bit old (in 2004).
Domain 3: Accessibility/Clarity					
	Metric 3:	Documentation of References	High	1	
Domain 4: Variability and Uncertainty					
	Metric 4:	Variability and Uncertainty	High	1	
Overall Quality Determination[*]			High	1.2	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Wu,,et al.,. 2001. Sources, emissions and exposures for trichloroethylene (TCE) and related chemicals.
Data Type	Completed Exposure Assessment
Hero ID	4152270

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	High	1	
Domain 2: Representative				
	Metric 2: Exposure Scenario	Low	3	US study. but surface water or consumer exposure is described too simly. and quite old study (>15 yrs old)
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	High	1	
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	High	1	
Overall Quality Determination[*]		High	1.5	
Extracted				

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Herbert, P.,Charbonnier, P.,Rivolta, L.,Servais, M.,Van Mensch, F.,Campbell, I.. 1986. The occurrence of chlorinated solvents in the environment. Prepared by a workshop of the European Chemical Industry Federation (CEFIC). Chemistry and Industry.
Data Type	Completed Exposure Assessment
Hero ID	4152304

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Methodology	Low	3	There is no actual description of assessment.
Domain 2: Representative					
	Metric 2:	Exposure Scenario	Low	3	The data of surface water is shown. but not US (Europe), and quite old (> 15 yrs)
Domain 3: Accessibility/Clarity					
	Metric 3:	Documentation of References	High	1	
Domain 4: Variability and Uncertainty					
	Metric 4:	Variability and Uncertainty	Medium	2	several scenarios are shown. no discussion for uncertainty.
Overall Quality Determination[*]			Medium	2.2	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Delmaar, J. E.. Emission of chemical substances from solid matrices: a method for consumer exposure assessment.
Data Type	Completed Exposure Assessment
Hero ID	4663189

Domain	Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability				
	Metric 1: Methodology	Low	3	The report discusses the literature review, assumptions, and limitations of the model. The discussion on data and extrapolations from the model are limited due to data availability and lack of tested data.
Domain 2: Representative				
	Metric 2: Exposure Scenario	Low	3	The study models volatile substances using summarized data and does not specifically model 1-BP. Sample and surrogate data used may be similar, but the emphasis on building materials is not in alignment with 1BP uses.
Domain 3: Accessibility/Clarity				
	Metric 3: Documentation of References	Low	3	Numerous studies are referenced, but their use is not always clear or directly related to the text and/or data.
Domain 4: Variability and Uncertainty				
	Metric 4: Variability and Uncertainty	Low	3	Variabilities and uncertainties are addressed, but not as they apply to 1-BP or its specific exposure environments. Models are built on surrogate paramater values which introduces large degrees of uncertainty.
Overall Quality Determination[*]		Low	3.0	
Extracted				

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	U.S, E. P. A.. 1987. Household solvent products: A national usage survey.
Data Type	Survey
Hero ID	1005969

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Data Collection Methodology	High	1	
	Metric 2:	Data Analysis Methodology	High	1	
Domain 2: Representative					
	Metric 3:	Geographic Area	High	1	Nationwide (U.S.A.) survey with outreach via random dialing and willingness to provide address and respond to survey.
	Metric 4:	Sampling / Sampling Size	High	1	
	Metric 5:	Response Rate	Medium	2	
Domain 3: Accessibility/Clarity					
	Metric 6:	Reporting of Results	High	1	
	Metric 7:	Quality Assurance	Medium	2	
Domain 4: Variability and Uncertainty					
	Metric 8:	Variability and Uncertainty	N/A	N/A	
Overall Quality Determination[*]			High	1.3	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Abt. 1992. Methylene chloride consumer use study survey findings.
Data Type	Survey
Hero ID	1065590

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Data Collection Methodology	Medium	2	Data collection instrument was described. The protocols for field personnel was not.
	Metric 2:	Data Analysis Methodology	Medium	2	Weighted summary stats provided, and unweighted counts provided in appendix. Could not find a discussion on sampling and non sampling errors.
Domain 2: Representative					
	Metric 3:	Geographic Area	High	1	
	Metric 4:	Sampling / Sampling Size	High	1	
	Metric 5:	Response Rate	Medium	2	for the questionaire, response rate was about 40 percent.
Domain 3: Accessibility/Clarity					
	Metric 6:	Reporting of Results	High	1	
	Metric 7:	Quality Assurance	Low	3	No discussion of QC
Domain 4: Variability and Uncertainty					
	Metric 8:	Variability and Uncertainty	N/A	N/A	limited discussion
Overall Quality Determination[*]			Medium	1.7	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Wang, S.,Majeed, M. A.,Chu, P.,Lin, H.. 2009. Characterizing relationships between personal exposures to VOCs and socioeconomic, demographic, behavioral variables. Atmospheric Environment.
Data Type	Survey
Hero ID	2331429

Domain		Metric	Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Data Collection Methodology	High	1	Survey was not conducted by the authors, but was taken from a VOC study done as part of the 1999-2000 NHANES
	Metric 2:	Data Analysis Methodology	High	1	Statistical methods for analyzing the NHANES data are discussed
Domain 2: Representative					
	Metric 3:	Geographic Area	High	1	Survey conducted in the United States
	Metric 4:	Sampling / Sampling Size	High	1	Samples seem large enough to represent the various populations of interest in this study
	Metric 5:	Response Rate	Low	3	Response rate may be documented in original survey data
Domain 3: Accessibility/Clarity					
	Metric 6:	Reporting of Results	Medium	2	Summary statistics only
	Metric 7:	Quality Assurance	Low	3	Not discussed, but implied by use of NHANES survey data
Domain 4: Variability and Uncertainty					
	Metric 8:	Variability and Uncertainty	N/A	N/A	Not discussed as part of this analysis of NHANES survey data
Overall Quality Determination[*]			Medium	1.7	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Farrow, A.,Taylor, H.,Northstone, K.,Golding, J.,Avon Longitudinal, Study. 2003. Symptoms of mothers and infants related to total volatile organic compounds in household products. Archives of Environmental Health.
Data Type	Survey
Hero ID	2443306

Domain	Metric	Rating†	Score	Comments‡
Domain 1: Reliability				
Metric 1:	Data Collection Methodology	Medium	2	Data collection methodology discussed. The Avon Longitudinal Study of Parents and Children (ALSPAC) is a population-based study of children born to women who resided in Avon (United Kingdom) during their pregnancy and who had an expected delivery date between April 1, 1991, and December 31, 1992. There were 14,541 pregnant women enrolled in this study, and a cohort of 13,971 of their children was still being followed at age 12 mo. The goal of the ALSPAC is to evaluate environmental, genetic, and social factors that can influence the health of infants and their mothers. Information was collected from mothers through self-report questionnaires at different times during their pregnancy, as well as after the infant"s birth, to ascertain family and household characteristics, parental occupations, and other socioeconomic factors. The purpose of this study within the ALSPAC was (a) to determine indoor levels of VOCs relative to the use of specific household products and (b) to identify households in which total VOC (TVOC) levels were high. Investigation of the entire cohort of children and their parents further identified common health effects at different points of data collection. We asked subjects to complete a questionnaire that had questions about the frequency of use of 9 common household products that contain high proportions of VOCs. A total of 13,164 women completed the 1st questionnaire when they were 8 wk pregnant. Of these women, 10,976 completed a 2nd questionnaire 8 mo after birth, and 10,119 completed a 3rd questionnaire when their child was 21 mo of age. We assumed that information about household product use during early pregnancy reflected routine use of these products" rather than later uses which might include cleaning that occurred because the infant was now a member of the household (e.g., use of products to ensure special cleanliness in the infant"s environment). The types of household products examined were window cleaners, carpet cleaners, dry-cleaning fluids, turpentine or white spirit, paint stripper, house paints or varnishes, pesticides, other aerosols or sprays, and air fresheners. The categories of use were (a) never or less than once per week, (b) once per week, and (c) daily on most days.

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Study Citation:	Farrow, A.,Taylor, H.,Northstone, K.,Golding, J.,Avon Longitudinal, Study. 2003. Symptoms of mothers and infants related to total volatile organic compounds in household products. Archives of Environmental Health.
Data Type	Survey
Hero ID	2443306

Domain		Metric	Rating†	Score	Comments‡
	Metric 2:	Data Analysis Methodology	Medium	2	Statistical analyses. Mean TVOC levels were calculated on the basis of the monthly values from the living rooms and main bedrooms of the homes monitored in the BRE indoor air study (N = 170). Households with less than 5 TVOC readings for the year were excluded from the analysis. TVOC levels were dichotomized into 2 percentiles: < 75th percentile and " 75th percentile. Use of each of the 9 household products during early pregnancy was dichotomized to < 1/wk and " 1/wk. We used Pearson"s chi-square and Fisher"s Exact test (crosstabs) to evaluate the relationships between VOC levels in the homes and product use during early pregnancy. We then used products that were statistically significantly associated with higher TVOC levels in the analysis of the entire cohort to determine if use of these products was associated with reporting of symptoms for infants or mothers. For the total cohort, we applied logistic-regression analysis to obtain adjusted odds ratios (ORs) for each symptom with use of a specific product for different frequencies of use, to determine if the odds of experiencing a symptom increased as use of the product increased. Adjustments were made for education, mother"s age, housing tenure, number of children in the home, number of smokers in the home, paid job subsequent to birth of the child, dampness or condensation in the home, mold in the home, type of winter heating fuel, and month the questionnaire was completed. The first 6 variables controlled for socioeconomic status; the latter 4 controlled for seasonal ventilation differences that might have influenced the build-up of VOCs (from indoor sources).
Domain 2: Representative					
	Metric 3:	Geographic Area	High	1	United Kingdom

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Study Citation:	Farrow, A.,Taylor, H.,Northstone, K.,Golding, J.,Avon Longitudinal, Study. 2003. Symptoms of mothers and infants related to total volatile organic compounds in household products. Archives of Environmental Health.
Data Type	Survey
Hero ID	2443306

Domain	Metric	Rating†	Score	Comments‡
	Metric 4: Sampling / Sampling Size	Medium	2	The Avon Longitudinal Study of Parents and Children (ALSPAC) is a population-based study of children born to women who resided in Avon (United Kingdom) during their pregnancy and who had an expected delivery date between April 1, 1991, and December 31, 1992. There were 14,541 pregnant women enrolled in this study, and a cohort of 13,971 of their children was still being followed at age 12 mo. The goal of the ALSPAC is to evaluate environmental, genetic, and social factors that can influence the health of infants and their mothers. Information was collected from mothers through self-report questionnaires at different times during their pregnancy, as well as after the infant"s birth, to ascertain family and household characteristics, parental occupations, and other socioeconomic factors. We asked subjects to complete a questionnaire that had questions about the frequency of use of 9 common household products that contain high proportions of VOCs.
	Metric 5: Response Rate	Medium	2	We asked subjects to complete a questionnaire that had questions about the frequency of use of 9 common household products that contain high proportions of VOCs. A total of 13,164 women completed the 1st questionnaire when they were 8 wk pregnant. Of these women, 10,976 completed a 2nd questionnaire 8 mo after birth, and 10,119 completed a 3rd questionnaire when their child was 21 mo of age. Of the 170 total homes included in this focused study, at least 10 samples were returned from each of 109 households, and at least 5 samples were returned from each of 148 households. The 3,339 total samples represented 73 percent of the number of potential samples. The highest and lowest TVOC concentrations from individual samples were 11.4 mg/m3 (in a living room) and 0.02 mg/m3 (in a main bedroom), respectively. The highest and lowest geometric mean concentrations of TVOCs in the living room and bedroom, from a total of 12 samples from any house, were 1.559 mg/m3 and 0.063 mg/m3, respectively. The percentiles of mean TVOC concentrations in the living rooms and bedrooms are contained in the Notes in Table 1.
Domain 3: Accessibility/Clarity				
	Metric 6: Reporting of Results	Medium	2	No supporting information or raw data available. Table 1 reports products used during pregnancy that were associated significantly with greater than/equal to 75th percentile geometric mean of measured Total Volatile Organic Compounds (TVOCs). No data reported specifically for TCE.

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Study Citation:	Farrow, A.,Taylor, H.,Northstone, K.,Golding, J.,Avon Longitudinal, Study. 2003. Symptoms of mothers and infants related to total volatile organic compounds in household products. Archives of Environmental Health.
Data Type	Survey
Hero ID	2443306

Domain	Metric	Rating†	Score	Comments‡
	Metric 7: Quality Assurance	Medium	2	No quality control issues were identified
Domain 4: Variability and Uncertainty				
	Metric 8: Variability and Uncertainty	N/A	N/A	For example, in 33 homes all readings in both the living room and the main bedroom were less than 0.4 mg/m3. In 5 homes, the TVOC concentrations for both rooms always exceeded the stated value. Caution is required when our data are compared with results reported by others and with recommended guidelines, which may be based on a different definition of TVOC.
Overall Quality Determination*		Medium	1.9	
Extracted		Yes		

† High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
‡ The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
* 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Serrano-Trespalacios, P. I.,Ryan, L.,Spengler, J. D.. 2004. Ambient, indoor and personal exposure relationships of volatile organic compounds in Mexico City metropolitan area. Journal of Exposure Analysis and Environmental Epidemiology.
Data Type	Modeling
Hero ID	56224

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Mathematicl Equations	Low	3	Not provided in source. Provided in Hamlett, 2003.
	Metric 2:	Model Evaluation	Low	3	Model described in supplemental source Hamlett, 2003. Monitoring results also provided to compare.
Domain 2: Representative					
	Metric 3:	Exposure Scenario	Medium	2	Indoor air
Domain 3: Accessibility/Clarity					
	Metric 4:	Model and Model Documentation Availability	Low	3	Model described in supplemental source Hamlett, 2003.
	Metric 5:	Model Inputs and Defaults	Medium	2	
Domain 4: Variability and Uncertainty					
	Metric 6:	Variability and Uncertainty	Medium	2	Monitoring results also provided.
Overall Quality Determination[*]			Low	2.5	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Park, J. H.,Spengler, J. D.,Yoon, D. W.,Dumyahn, T.,Lee, K.,Ozkaynak, H.. 1998. Measurement of air exchange rate of stationary vehicles and estimation of in-vehicle exposure. Journal of Exposure Analysis and Environmental Epidemiology.
Data Type	Modeling
Hero ID	85812

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Mathematicl Equations	Medium	2	IAQ model by EPA, but Beta version
	Metric 2:	Model Evaluation	Medium	2	Model has been validated, but unsure if specifically for indoor car scenarios.
Domain 2: Representative					
	Metric 3:	Exposure Scenario	High	1	Contractor comments were based on age of data (date of publication), however the exposure scenario is highly representative of a scenario of interest
Domain 3: Accessibility/Clarity					
	Metric 4:	Model and Model Documentation Availability	High	1	Model documention available
	Metric 5:	Model Inputs and Defaults	High	1	Inputs provided
Domain 4: Variability and Uncertainty					
	Metric 6:	Variability and Uncertainty	Low	3	Compared to another study, but limited discussion of uncertainties.
Overall Quality Determination[*]			Medium	1.7	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Akita, Y.,Carter, G.,Serre, M. L.. 2007. Spatiotemporal nonattainment assessment of surface water tetrachloroethylene in New Jersey. Journal of Environmental Quality.
Data Type	Modeling
Hero ID	2494965

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Mathematicl Equations	High	1	Model seems scientifically sound
	Metric 2:	Model Evaluation	High	1	Model is corroborated with relevant monitoring data (PCE concentration in surface water streams)
Domain 2: Representative					
	Metric 3:	Exposure Scenario	Low	3	Model is based on data collected from monitoring stations between 1999 and 2003 (15+ years)
Domain 3: Accessibility/Clarity					
	Metric 4:	Model and Model Documentation Availability	High	1	Model is based on equations that are given in the article.
	Metric 5:	Model Inputs and Defaults	High	1	Model inputs are PCE concentrations recorded at the locations of established monitoring stations
Domain 4: Variability and Uncertainty					
	Metric 6:	Variability and Uncertainty	Medium	2	Variability and impact of potential sampling error are discussed briefly
Overall Quality Determination[*]			High	1.5	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	Olie, J. D.,Bessems, J. G.,Clewell, H. J.,Meulenbelt, J.,Hunault, C. C.. 2015. Evaluation of semi-generic PBTK modeling for emergency risk assessment after acute inhalation exposure to volatile hazardous chemicals. Chemosphere.
Data Type	Modeling
Hero ID	3001596

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Mathematicl Equations	High	1	
	Metric 2:	Model Evaluation	High	1	compared against monitoring data
Domain 2: Representative					
	Metric 3:	Exposure Scenario	Medium	2	
Domain 3: Accessibility/Clarity					
	Metric 4:	Model and Model Documentation Availability	High	1	models freely available
	Metric 5:	Model Inputs and Defaults	High	1	available in supplement
Domain 4: Variability and Uncertainty					
	Metric 6:	Variability and Uncertainty	High	1	
Overall Quality Determination[*]			High	1.2	
Extracted					

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.

Study Citation:	UL Env. 2017. Floor Coating VOC Emissions Research Report.
Data Type	Modeling
Hero ID	4440489

Domain	Metric		Rating[†]	Score	Comments[‡]
Domain 1: Reliability					
	Metric 1:	Mathematicl Equations	Medium	2	Emission rates of TVOC were used in a computer model todetermine potential air concentrations of the pollutants. The computer model used the measured emission rate changes over the one-week time period to determine the change in air concentrations that would accordingly occur. The emission factor can be modeled according to a first-order decay.
	Metric 2:	Model Evaluation	Medium	2	The emission rates calculated from these samples were used in a mathematical model to predict the concentration that would occur in an office environment. The model parameters were 11.1 m2 of flooring in a 30.6 m3 room with an outdoor air change rate of 0.68/hr.
Domain 2: Representative					
	Metric 3:	Exposure Scenario	High	1	<5 years (2017 pub date) Table 5 reports predicted concentrations of NMP from time of application to one week for floor coatings W7 and W3 (floor loading in office)
Domain 3: Accessibility/Clarity					
	Metric 4:	Model and Model Documentation Availability	High	1	There is sufficient documentation in the data source
	Metric 5:	Model Inputs and Defaults	Medium	2	Data quality acceptance criteria are not discussed but inputs appear appropriate. The emission factor can be modeled according to a first-order decay: EFm = EF0 e-kt where, EFm = modeled emission factor ("g/m"hr) or ("g/unit"hr) EF0 = initial emission factor ("g/m"hr) or ("g/unit"hr) k = rate constant (hr-1) t = time (hr)
Domain 4: Variability and Uncertainty					
	Metric 6:	Variability and Uncertainty	Low	3	
Overall Quality Determination[*]			Medium	1.8	
Extracted			Yes		

[†] High = 1; Medium = 2; Low = 3; Unacceptable = 4; N/A has no value.
[‡] The overall rating is calculated as necessary. EPA may not always provide a comment for a metric that has been categorized as High.
[*] 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: $=\geq 1.7$ to < 2.3; Low: $=\geq 2.3$ to ≤ 3.