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Office of Chemical Safety and
Pollution Prevention

Data Quality Evaluation Information for General Population, Consumer, and Environmental Exposure for Octamethylcyclotetrasiloxane (D4)

Systematic Review Support Document for the Draft Risk Evaluation

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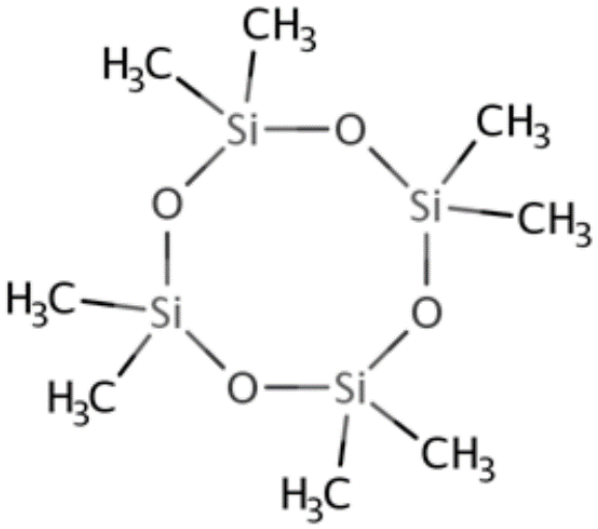

September 2025

This supplemental file contains information regarding the data quality evaluation results for data sources that met the PECO screening criteria for the *Draft Consumer and Indoor Dust Exposure Assessment for Octamethylcyclotetrasiloxane (D4)*, *Draft Environmental Media and General Population Screening for Octamethylcyclotetrasiloxane (D4)*, and *Draft Environmental Exposure Assessment for Octamethylcyclotetrasiloxane (D4)*. EPA conducted data quality evaluation and extraction based on author-reported descriptions and results; additional analyses (e.g., statistical analyses) potentially conducted by EPA are not contained in this supplemental file. EPA performs data quality evaluation as a part of the TSCA systematic review process described in the *Draft Systematic Review Protocol Supporting TSCA Risk Evaluations for Chemical Substances*. The systematic review steps are further described in the *Draft Risk Evaluation for Octamethylcyclotetrasiloxane (D4) – Systematic Review Protocol*.

Additionally, the overall quality determination (OQD) for each reference represents the data as a whole for each evidence stream, not for individual scenarios described within a study. For example, a reference that has both monitoring and experimental data would have OQDs using the data quality evaluation metrics for monitoring and experimental data, respectively. An OQD utilizing the data quality evaluation metrics for monitoring data, or any other single evidence stream, would consider all data pertinent to that evidence stream in the reference. Acronyms and abbreviations used within this supplemental file are defined in the table at the end of this file. This supplemental file may also be referred to as *D4 Data Quality Evaluation Information for General Population, Consumer, and Environmental Exposure.)*.

Table of Contents

6833877	Xu, L., Shi, Y., Cai, Y. (2013). Occurrence and fate of volatile siloxanes in a municipal wastewater treatment plant of Beijing, China. Water Research 47(2):715-724.	**63**
6833907	Radermacher, G., Rüdel, H., Wesch, C., Böhnhardt, A., Koschorreck, J. (2020). Retrospective analysis of cyclic volatile methylsiloxanes in archived German fish samples covering a period of two decades. Science of the Total Environment 706:136011.	**64**
6833923	Biesterbos, J. W. H., Beckmann, G., Anzion Rob, B. M., Ragas Ad, M. J., Russel Frans, G. M., Scheepers Paul, T. J. (2014). Sensitive method for quantification of octamethylcyclotetrasiloxane (D4) and decamethylcyclopentasiloxane (D5) in end-exhaled air by thermal desorption gas chromatography mass spectrometry. Analytical Chemistry 86(12):5794-5799.	**65**
6833929	Zhang, Z., Qi, H., Ren, N., Li, Y., Gao, D., Kannan, K. (2011). Survey of cyclic and linear siloxanes in sediment from the Songhua River and in sewage sludge from wastewater treatment plants, Northeastern China. Archives of Environmental Contamination and Toxicology 60(2):204-211.	**66**
6833947	Li, Q., Hu, J., Lv, X., Ma, J., Wang, X., Wang, X. (2020). Typical indoor concentrations and mass flow of cyclic volatile methylsiloxanes (cVMSs) in Dalian, China. Chemosphere 248:126020.	**67**
6833983	Lee, D., Park, M. K., Lee, I. S., Choi, S. D. (2019). Contamination characteristics of siloxanes in coastal sediment collected from industrialized bays in South Korea. Ecotoxicology and Environmental Safety 182:109457.	**68**
6834013	Cui, S., Fu, Q., An, L., Yu, T., Zhang, F., Gao, S., Liu, D., Jia, H. (2019). Trophic transfer of cyclic methyl siloxanes in the marine food web in the Bohai Sea, China. Ecotoxicology and Environmental Safety 178:86-93.	**69**
6834054	Wang, X. M., Lee, S. C., Sheng, G. Y., Chan, L. Y., Fu, J. M., Li, X. D., Min, Y. S. (2001). Cyclic organosilicon compounds in ambient air in Guangzhou, Macau and Nanhai, Pearl River Delta. Applied Geochemistry 16(11-12):1447-1454.	**70**
6834476	Mcgoldrick, D. J., Durham, J., Leknes, H., Kierkegaard, A., Gerhards, R., Powell, D. E., Mclachlan, M. S. (2011). Assessing interlaboratory comparability and limits of determination for the analysis of cyclic volatile methyl siloxanes in whole Rainbow Trout (Oncorhynchus mykiss). Chemosphere 85(8):1241-1247.	**71**
6834672	Li, Q., Lan, Y., Liu, Z., Wang, X., Wang, X., Hu, J., Geng, H. (2020). Cyclic volatile methylsiloxanes (cVMSs) in the air of the wastewater treatment plants in Dalian, China: Levels, emissions, and trends. Chemosphere 256:127064.	**72**
6834960	Borgå, K., Fjeld, E., Kierkegaard, A., Mclachlan, M. S. (2013). Consistency in trophic magnification factors of cyclic methyl siloxanes in pelagic freshwater food webs leading to Brown Trout. Environmental Science & Technology 47(24):14394.	**73**
6835730	Hong, W. J., Jia, H., Liu, C., Zhang, Z., Sun, Y., Li, Y. F. (2014). Distribution, source, fate and bioaccumulation of methyl siloxanes in marine environment. Environmental Pollution 191:175-181.	**74**
6835742	Lee, I., Rittmann, B. E. (2016). Using Focused Pulsed Technology to Remove Siloxane from Municipal Sewage Sludge. Journal of Environmental Engineering 142(1):04015056.	**75**
6835872	Li, B., Li, W. L., Sun, S. J., Qi, H., Ma, W. L., Liu, L. Y., Zhang, Z. F., Zhu, N. Z., Li, Y. F. (2016). The occurrence and fate of siloxanes in wastewater treatment plant in Harbin, China. Environmental Science and Pollution Research 23(13):13200-13209.	**76**
6836339	Zhi, L., Xu, L., He, X., Zhang, C., Cai, Y. (2019). Distribution of methylsiloxanes in benthic mollusks from the Chinese Bohai Sea. Journal of Environmental Sciences 76:199-207.	**77**
6836342	Xu, L., Xu, S., Zhi, L., He, X., Zhang, C., Cai, Y. (2017). Methylsiloxanes release from one landfill through yearly cycle and their removal mechanisms (especially hydroxylation) in leachates. Environmental Science & Technology 51(21):12337-12346.	**78**
6836343	Shi, Y., Xu, S., Xu, L., Cai, Y. (2015). Distribution, Elimination, and Rearrangement of Cyclic Volatile Methylsiloxanes in Oil-Contaminated Soil of the Shengli Oilfield, China. Environmental Science & Technology 49(19):11527-11535.	**79**
6836347	Guo, J., Zhou, Y., Cui, J., Zhang, B., Zhang, J. (2019). Assessment of volatile methylsiloxanes in environmental matrices and human plasma. Science of the Total Environment 668:1175-1182.	**80**
6836349	Xu, L., Huang, Z., Zhang, Q., Xiang, X., Zhang, S., Cai, Y. (2020). Methylsiloxanes and their brominated products in one e-waste recycling area in china: emission, environmental distribution, and elimination. Environmental Science & Technology 54(7):4267-4274.	**81**
6836350	Horii, Y., Nojiri, K., Minomo, K., Motegi, M., Kannan, K. (2019). Volatile methylsiloxanes in sewage treatment plants in Saitama, Japan: Mass distribution and emissions. Chemosphere 233:677-686.	**82**

Table of Contents

Study Citation:	Cheng, Y., Shoeib, M., Ahrens, L., Harner, T., Ma, J. (2011). Wastewater treatment plants and landfills emit volatile methyl siloxanes (VMSs) to the atmosphere: Investigations using a new passive air sampler.. Environmental Pollution 159(10):2380-2386.
HERO ID:	784251

Domain	Metric		Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	Air samples from various locations within a wastewater plant and a landfill, including background locations upstream. Well described, scientifically sound sampling methods. Sampling site descriptions and map provided. Field blanks and duplicates collected. Sample storage reported. Used passive sampling tubes, calibrated and tested for field conditions. No controlled chamber study was done, which is a better approach for calibration.
	Metric 2:	Analytical Methodology	High	Detailed analytical methods, reported LODs. Instrumentation used was gas chromatograph (GC) coupled with an Agilent G2589A selective mass detector (MSD) and details are provided in the SI. Robust QA/QC with internal standards and blanks, calibration and approaches to avoid contamination from personal care products and other sources of siloxanes.
	Metric 3:	Biomarker Selection	N/A	Air samples; no biomarker needed.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples collected in Canada.
	Metric 5:	Currency	Medium	Samples collected in 2009.
	Metric 6:	Spatial and Temporal Variability	High	14 sampling site collected in various locations of wastewater plant and landfill. Duplicates were collected for some locations and blanks.
	Metric 7:	Exposure Scenario	High	Scenarios included wastewater and landfill air emissions and background levels.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Individual sample concentrations and summary statistics seem to be available in the supplemental information that is not yet available. Otherwise concentrations are available in figures.
	Metric 9:	Quality Assurance	High	Detailed QA/QC description, including analyzed control samples.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Medium	Variability within collected samples was reported and comparison of this study with others. Sources of uncertainty to the measurement are recognized but not easily characterized.

Overall Quality Determination High

Study Citation:	Lu, Y.,an, Yuan, T.,ao, Yun, S., Wang, W., Wu, Q., Kannan, K. (2010). Occurrence of Cyclic and Linear Siloxanes in Indoor Dust from China, and Implications for Human Exposures. Environmental Science & Technology 44(16):6081-6087.
HERO ID:	2095298

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	The sampling methodology included descriptions of the sample locations, sampling equipment, and storage condition. Storage duration was not provided.
	Metric 2:	Analytical Methodology	High	The analytical methods were discussed (e.g., sample extraction/preparation, instrumentation, recoveries, and LOQ).
	Metric 3:	Biomarker Selection	N/A	The authors analyzed the parent chemical in the environment (indoor dust).
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected from China.
	Metric 5:	Currency	Medium	Samples were collected from July-September 2009.
	Metric 6:	Spatial and Temporal Variability	Medium	88 samples were collected from multiple locations (houses n=56, student dormitories n=17, offices n=9, and chemical laboratories n=6). In addition, five samples were collected from the inside of electrical devices and seven from air conditioners. No replicates were reported.
	Metric 7:	Exposure Scenario	High	The data closely represent relevant exposure scenarios related to D4 in indoor dust in dormitories, offices, and chemical laboratories in China.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Only summary statistics were provided (median) and no raw data.
	Metric 9:	Quality Assurance	Medium	QA/QC techniques described the use of blank tests and techniques to reduce background concentrations during sampling and laboratory testing. However, recoveries were only reported for D4-D6 combined.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Medium	Variability was characterized with SD in the supplemental tables. Uncertainties were not discussed.
Overall Quality Determination			**Medium**	

Study Citation:	Borgå, K., Fjeld, E., Kierkegaard, A., McLachlan, M. S. (2012). Food web accumulation of cyclic siloxanes in Lake Mj{\o}sa, Norway. Environmental Science & Technology 46(11):6347-6354.
HERO ID:	2150677

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	Site characteristics, sampling regimen, equipment, matrix characteristics, and storage conditions were all described.
	Metric 2:	Analytical Methodology	Low	The analytical methods were described, but LOQ and recoveries are missing.
	Metric 3:	Biomarker Selection	N/A	The authors analyzed D4 in biota samples.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	The study was conducted in Norway.
	Metric 5:	Currency	Medium	The samples were collected in 2010.
	Metric 6:	Spatial and Temporal Variability	Medium	Fish rather than zooplankton samples are of interest from this study. Of the fish samples, a total of 15, or five from each fish species, were analyzed. For trout, each of the five samples came from a single fish. For smelt and vendace, 2-3 individuals were pooled for each sample.
	Metric 7:	Exposure Scenario	High	The fish data represent a relevant exposure scenario related to D4 in Lake Mjosa in Norway, as nearby residents may consume the fish.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Raw data were reported in Table S5, but no summary statistics were provided.
	Metric 9:	Quality Assurance	Low	QA/QC techniques were described in detail, including the use of procedural blanks, field blanks, internal matrix control, and some duplicate analysis. However, recoveries were not mentioned.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Medium	Variability was not characterized. Uncertainties and limitations were partially discussed, mostly in the context of calculating trophic biomagnification factor.

Overall Quality Determination Medium

Study Citation:	Kierkegaard, A., van Egmond, R., McLachlan, M. S. (2011). Cyclic volatile methylsiloxane bioaccumulation in flounder and ragworm in the Humber Estuary. Environmental Science & Technology 45(14):5936-5942.
HERO ID:	2151369

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	Sampling methodology for sediment, ragworm and flounder sampling described in terms of sampling equipment, procedures, study site characteristics and sample storage conditions. Details regarding duration of sample storage prior to analysis lacking.
	Metric 2:	Analytical Methodology	High	Limits of quantification reported within supplemental material (Table S2). Analytical methodology noted in terms of instrumentation, extraction and recoveries.
	Metric 3:	Biomarker Selection	N/A	Sampling for parent chemical of interest in environmental media.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples described as collected from Humber Estuary, England.
	Metric 5:	Currency	Medium	Sampling dates reported as September through October of 2009.
	Metric 6:	Spatial and Temporal Variability	Medium	Sampling conducted only over a period of two months in 2009 from six intertidal sites. The exact sample size for each media type is unclear. The main text indicated that three locations within each site was selected for sampling, which should be 18 locations total. However, Table S1 only showed one location for the Skefling site for sediment and ragworm. Thus, there are 16 locations as opposed to 18 suggested by the main text. For ragworm, 50 samples were collected from within each of those locations. For sediment, samples were collected presumably once from each of the locations within the six sites. For fish, there appears to only be five intertidal sites instead of six, as indicated in Table S4. Despite the unclear sample size, there are at least 10 samples per media. It is also unclear if replicate sampling was collected or just replicate analysis.
	Metric 7:	Exposure Scenario	Medium	In this study, samples of sediment, common ragworm (Hediste diversicolor), and flounder (Pleuronectes flesus) were collected from six different locations and analyzed for cVMS as well as for polychlorinated biphenyls. The bioaccumulation of cVMS was evaluated. Exposure sources described as wastewater pollutants from personal care and cleaning products. Exposure controls lacking.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Raw data reported within supplementary tables for some samples. Data reported in Tables S2-S4 for sediment, ragworm and flounder samples with single raw data point and no summary measures. Number of samples detailed only as raw data results presented within supplementary material and not summarized. Frequency of detection noted within text (page 3).
	Metric 9:	Quality Assurance	Medium	Quality assurance discussed in detail within main text with use of field blanks and no significant contamination of field blanks reported. Recoveries were also reported. Lack of baseline, pre-exposure sampling.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Medium	Variability of results not reported, but could be obtained from supplemental material raw data. Potential study limitations and uncertainties, such as fish mobility, migration patterns and age, were not detailed.

Overall Quality Determination Medium

Study Citation:	Genualdi, S., Harner, T.,om, Cheng, Y.,u, Macleod, M., Hansen, K., van Egmond, R., Shoeib, M., Lee, S. (2011). Global distribution of linear and cyclic volatile methyl siloxanes in air. Environmental Science & Technology 45(8):3349-3354.
HERO ID:	2163280

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	The sampling methodology is missing some details, such as storage conditions/duration and sampler (although that could have been performed prior to sampling event). Authors cited two additional sources for further sampling details: Genualdi et al., 2010 and Shoeib et al., 2008.
	Metric 2:	Analytical Methodology	High	The analytical methods were described extraction, instrumentation, recoveries, and detection limits in the SI.
	Metric 3:	Biomarker Selection	N/A	The study analyzed the parent compound in the environment (outdoor air).
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	The study collected samples from 20 sites worldwide (North America, Arctic, Europe. and Australia).
	Metric 5:	Currency	Medium	Sampling was conducted in 2009.
	Metric 6:	Spatial and Temporal Variability	High	A total of 20 samples were collected globally without replicates.
	Metric 7:	Exposure Scenario	Medium	The exposure scenario is likely relevant to the general population in the outdoor environment.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Only individual sample concentrations were provided in Table SI4 (supplementary information). However, summary statistics can be calculated.
	Metric 9:	Quality Assurance	High	QA/QC techniques were described in detail, including field blanks, blank correction, and acceptable recoveries.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Variability, uncertainties, and limitations were either not characterized at all or discussed at a very very high level.

Overall Quality Determination Medium

Study Citation:	Xu, L., Shi, Y., Liu, N., Cai, Y. (2014). Methyl siloxanes in environmental matrices and human plasma/fat from both general industries and residential areas in China. Science of the Total Environment 505C:454-463.
HERO ID:	2533248

Domain	Metric		Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	The sampling method is clear, appropriate, and detailed for plasma and abdominal fat samples, as well as air, dust, and soil samples from industrial facilities. No significant details are missing. However, for air, dust, and soils collected from residential areas, the authors did not explicitly indicate that they followed the same sampling procedures as for industrial areas.
	Metric 2:	Analytical Methodology	High	The analytical method is clear, appropriate, and detailed. LOQs and recoveries for individual siloxanes are provided in Tables S6-S9.
	Metric 3:	Biomarker Selection	High	Study is testing for the parent chemical in plasma, fat, and the environment.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected from people and locations in China.
	Metric 5:	Currency	Medium	Samples were collected during Jan-Mar 2012.
	Metric 6:	Spatial and Temporal Variability	Medium	For the control group (i.e., residential areas), there were 519 and 249 human plasma and abdominal fat samples, respectively. Again, for the control group, there were 60 paired indoor air/floor dust samples and 10 outdoor air/soil samples. Replicates were not reported.
	Metric 7:	Exposure Scenario	High	The exposure scenario is D4 in human plasma and fat due to occupational exposure, as well as in air and dust in homes and facilities, which is well characterized and relevant. Table S1 also provides more demographic characteristics (e.g., range for range, BMI) of the studied populations.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Low	Median, min, and max for plasma samples are shown in Table 1. Averages for fat samples are shown in Figure 2 and Table S14. Raw data were not provided. Section 3.2 discusses results for environmental matrices but concentrations were aggregated for all cyclic methyl siloxanes. Figure 1 can be digitized to quantify the individual siloxane concentrations.
	Metric 9:	Quality Assurance	High	QA/QC measures are described in Section 2.4, including the use of blanks and acceptable recoveries.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Range was provided to characterize variance. Limitations, data gaps, and uncertainties were not discussed.
Overall Quality Determination			**High**	

Study Citation:	Warner, N. A., Nøst, T. H., Andrade, H., Christensen, G. (2014). Allometric relationships to liver tissue concentrations of cyclic volatile methyl siloxanes in Atlantic cod. Environmental Pollution 190:109-114.
HERO ID:	2539942

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	The sampling method is clear, appropriate, and detailed. No significant details are missing.
	Metric 2:	Analytical Methodology	High	The analytical method is clear, appropriate, and detailed. Information about the MDL is provided in section 2.3, and MDLs are presented in Tables S3 and S4.
	Metric 3:	Biomarker Selection	High	Study is testing for the parent chemical in fish tissue.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected in Norway.
	Metric 5:	Currency	Medium	Samples were collected from 2010-2011.
	Metric 6:	Spatial and Temporal Variability	Medium	Twenty cod samples were collected, as indicated at the top of Results and the supplemental. Replicate samples were not reported.
	Metric 7:	Exposure Scenario	Medium	The exposure scenario is D4 in fish tissue. The scenario is somewhat characterized and is missing some information, but is relevant.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	High	Mean, standard deviation, median, and range are provided in Table 1. Raw data are provided in Table S1.
	Metric 9:	Quality Assurance	High	QA/QC measures are described in Section 2.1, including the use of blanks and acceptable recoveries.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	SDs are provided in Table 1. Limitations, uncertainties, and data gaps were not discussed.

Overall Quality Determination High

Study Citation:	Pieri, F., Katsoyiannis, A., Martellini, T., Hughes, D., Jones, K. C., Cincinelli, A. (2013). Occurrence of linear and cyclic volatile methyl siloxanes in indoor air samples (UK and Italy) and their isotopic characterization. Environment International 59:363-371.
HERO ID:	2549394

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	The sampling methodology cited two authoritative sources: EPA method TO-17 before sampling and German guideline VDI-Richtlinine 4300-6 for sampling. The equipment, locations, storage conditions, and more were described as well.
	Metric 2:	Analytical Methodology	Medium	The analytical methods included a description of instrumentation, calibration curve, and sample preparation. However, only a range of LODs for all chemicals analyzed were provided rather than by individual chemical.
	Metric 3:	Biomarker Selection	N/A	The authors analyzed the parent chemical in indoor air.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected from UK and Italy.
	Metric 5:	Currency	Medium	Sampling was conducted in 2011.
	Metric 6:	Spatial and Temporal Variability	Medium	n=91 across eight types of indoor environments: home bathrooms (n = 18), living rooms (n = 13), adult- (n = 10), boy- (n = 11) and girl- (n = 12) rooms. For settings with expected different diurnal occupancy patterns, samples were collected from schools (n = 5), supermarket (n = 10) and office (n = 12) buildings. Replicates were not reported.
	Metric 7:	Exposure Scenario	High	The data closely represent relevant exposure scenarios related to airborne D4 concentrations in different indoor settings in the UK and Italy
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Olly summary statistics were provided (average concentrations, min, and max).
	Metric 9:	Quality Assurance	Medium	QA/QC techniques described the use of blanks and assessment of reproducibility of results. However, recoveries were only reported as a combined range for all chemicals analyzed.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Variability was characterized (ranges, error bars). Uncertainties and limitations were not discussed.

Overall Quality Determination Medium

Study Citation:	Yucuis, R. A., Stanier, C. O., Hornbuckle, K. C. (2013). Cyclic siloxanes in air, including identification of high levels in Chicago and distinct diurnal variation. Chemosphere 92(8):905-910.
HERO ID:	2553409

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	Some methods not reported such as sampler type, calibration, and materials used in the sampler. Missing approaches to avoid D4 contamination from people handling samples. Sampling date is missing. Sampling location description and occupancy provided, but missing description of products and materials present.
	Metric 2:	Analytical Methodology	Medium	Key analytical methods reported. The samples were analyzed on a Hewlett Packard gas chromatograph mass spectrometer (HP 5973) in select ion monitoring mode. Missing calibration description. Available QA/QC, internal standards recoveries, blanks and duplicates. LODs were calculated but not reported.
	Metric 3:	Biomarker Selection	N/A	Parent chemical studied in an environmental media.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Study performed in the United States.
	Metric 5:	Currency	Medium	Samples collected in 2011, although is unclear.
	Metric 6:	Spatial and Temporal Variability	High	>10 samples collected. Duplicate samples collected for blanks and samples except 5 indoor air samples in lab 1- lab4 and one office.
	Metric 7:	Exposure Scenario	Medium	Indoor air samples collected in working environments like offices and labs, and outdoor air in rural and urban sites. Indoor and outdoor air were collected in different states. Exposure source not well characterized.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Table 1 and Table 2 provide indoor and outdoor concentrations, respectively. Statistics not described.
	Metric 9:	Quality Assurance	Medium	Although main QA/QC processes are mentioned and some are described, the authors did not report analytical calibration and LODs. LODs were calculated, but not reported.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Medium	Diurnal trends for outdoor samples were discussed. Differences in indoor concentrations were reported. Sources or variability and uncertainty were still missing some discussion due to under reporting indoor environment content. Comparison to other studies was also presented and discussed.
Overall Quality Determination			**Medium**	

Study Citation:	Bletsou, A. A., Asimakopoulos, A. G., Stasinakis, A. S., Thomaidis, N. S., Kannan, K. (2013). Mass loading and fate of linear and cyclic siloxanes in a wastewater treatment plant in Greece. Environmental Science & Technology 47(4):1824-1832.
HERO ID:	2555998

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	Sampling methodology for WWTP samples described in terms of sampling equipment, brief procedures, sample storage conditions, study site characteristics. Details regarding sample storage duration prior to analysis lacking.
	Metric 2:	Analytical Methodology	High	Limits of detection reported. Analytical methodology noted in terms of instrumentation, extraction, recoveries, and calibration.
	Metric 3:	Biomarker Selection	High	Sampling for parent chemical of interest in environmental media (raw and treated wastewater plus sludge).
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples described as collected from a WWTP in Athens, Greece.
	Metric 5:	Currency	Medium	Sampling dates reported as April of 2012.
	Metric 6:	Spatial and Temporal Variability	Medium	Twenty four-hour samples of sewage influents and effluents and grab samples of dewatered sludge collected during seven consecutive days in only one month, April of 2012. It can be inferred that the number of samples per media type is 7. Replicate sampling was not conducted.
	Metric 7:	Exposure Scenario	Medium	This study investigated the occurrence and fate of D4 and other chemicals in municipal wastewater treatment plant (WWTP) influent and effluent and dewatered sewage sludge. Exposure sources discussed in text as personal care products.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Raw data not reported. Data reported in Tables 2 (influent and effluent) and 4 (dewatered sludge). Concentration results reported as means, median, minimum and maximum. The number of samples with concentrations above the LOD was 7 for all media, which is presumably 100% detection rate.
	Metric 9:	Quality Assurance	High	Quality assurance discussed, and text noted utilizing procedural and spiked blank samples. Text reports construction of calibration curves.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Variability of results reported within statistical summary measures of minimum and maximum. Potential study limitations were not detailed.

Overall Quality Determination Medium

Study Citation:	Krogseth, I. S., Kierkegaard, A., McLachlan, M. S., Breivik, K., Hansen, K. M., Schlabach, M. (2013). Occurrence and seasonality of cyclic volatile methyl siloxanes in Arctic air. Environmental Science & Technology 47(1):502-509.
HERO ID:	2557591

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	Outdoor air sampling performed. Key sampling methods reported. Used solid phase extraction active air sampling method (SPE-AAS). Description of sampling tube resin, preparation and conditions. Described storage before and after sampling.
	Metric 2:	Analytical Methodology	Low	Key analytical methods reported. GC System connected to an Agilent 7863 Series Injector and an HP 5973 Mass Selective Detector (MSD) in positive electron ionization mode. single-point calibration curve (concentration approximately 20 ng/mL). The linearity of the instrument was investigated, and all samples were found to be within the dynamic linear range of the instrument. Internal standards used and recoveries reported in text, field blanks and method blanks. LOD is 3.5 ng/sample for D4.D4 may have been formed from D5 (reacted on the cartridge) and there may have been D4 loses during sampling.
	Metric 3:	Biomarker Selection	N/A	Measured parent chemical in environmental media.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Study performed in Ny Alesund in the Svalbard archipelago, Arctic (Norway).
	Metric 5:	Currency	Medium	Samples collected in 2011.
	Metric 6:	Spatial and Temporal Variability	High	>10 samples collected and replicates.
	Metric 7:	Exposure Scenario	Low	Exposure scenarios include background air in Arctic environments.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	High	Raw data reported, see Table 1.
	Metric 9:	Quality Assurance	High	QA reported in detail.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Sources of uncertainty and variability from the sampling and analytical methods were discussed and reliable.According to the paper the D4 estimate are uncertain because a) D4 may have been formed from D5 (reacted on the cartridge) and b) there may have been D4 loses during sampling.

Overall Quality Determination Low

Study Citation:	van Egmond, R., Sparham, C., Hastie, C., Gore, D., Chowdhury, N. (2013). Monitoring and modelling of siloxanes in a sewage treatment plant in the UK. Chemosphere 93(5):757-765.
HERO ID:	2557762

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	Most sampling methods, such as equipment and collection regimen/frequency, were reported. However, there was no mention of storage conditions.
	Metric 2:	Analytical Methodology	High	Sample preparation, extraction, instrumentation, LOD, and recoveries were reported.
	Metric 3:	Biomarker Selection	N/A	The study tested for D4 in sewage samples.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	This study was conducted in the UK.
	Metric 5:	Currency	Medium	The samples were collected in 2010.
	Metric 6:	Spatial and Temporal Variability	Low	There were no replicates. The total number of samples is unclear. Table S2 notes that there are n=3 unless stated. For one of the sample times, n was stated as 2. However, the mean of the effluent concentrations is based on n=8. The numbers don't add up (i.e., one sample per time except when stated would yield a total of 9 samples OR 3 samples per time except when stated would add up to 23). For table 5, it appears that the total of influent and sludge samples were three each.
	Metric 7:	Exposure Scenario	Low	This study was a pilot and mostly focused on modeling; therefore the exposure scenario was not well characterized.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Only the total concentration is reported for influent and sludge. Raw data were not reported for sludge and influent. Summary statistics were not reported. For effluent, the mean, SD, and raw data are provided.
	Metric 9:	Quality Assurance	Medium	Only some QA/QC was reported, such as acceptable recoveries, field blanks, and spiked sampling.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	The study did not report gaps, limitations, or uncertainties. No variance was reported except for effluent concentrations.

Overall Quality Determination Medium

Study Citation: Warner, N. A., Kozerski, G., Durham, J., Koerner, M., Gerhards, R., Campbell, R., Mcnett, D. A. (2013). Positive vs. false detection: a comparison of analytical methods and performance for analysis of cyclic volatile methylsiloxanes (cVMS) in environmental samples from remote regions. Chemosphere 93(5):749-756.

HERO ID: 2557764

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	The sampling methodology for both sediment and biota is clear and appropriate. Details such as equipment, locations, and sample storage are provided. Storage duration was not provided though.
	Metric 2:	Analytical Methodology	High	The analytical methodology is clear, appropriate, and detailed.
	Metric 3:	Biomarker Selection	High	Study is testing for the parent chemical in fish and sediment.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected in Svalbard, Norway.
	Metric 5:	Currency	Medium	Samples were collected in 2009.
	Metric 6:	Spatial and Temporal Variability	Low	There were 10 samples for sediment. However, it is uncertain how many fish samples there were but presumably each row corresponds to one sample so there were 19 samples. Replicates were not reported.
	Metric 7:	Exposure Scenario	Medium	The exposure scenario is D4 in fish livers and sediment. The scenario is not well characterized but is of interest.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Summary statistics are mostly missing but can be calculated from the raw data provided in Tables 3 and 4.
	Metric 9:	Quality Assurance	High	The challenges with background correction, LOD vs MDL, and field blank are described in detail in the results section.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	The characterization of variability is absent. No measures of variance are provided.

Overall Quality Determination Medium

Study Citation:	Xu, L., Shi, Y., Wang, T., Dong, Z., Su, W., Cai, Y. (2012). Methyl siloxanes in environmental matrices around a siloxane production facility, and their distribution and elimination in plasma of exposed population. Environmental Science & Technology 46(21):11718-11726.
HERO ID:	2558926

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	The sampling methodology for air and soil were mostly adequate except for missing storage duration. For plasma samples, the authors described the support of Laiyang Central Hospital and provided no further information on how plasma was collected by the hospital.
	Metric 2:	Analytical Methodology	High	Key analytical methods were described: pretreatment, instrumentation, LODs, and recoveries LODs and recoveries for each matrix are provided in Tables S3-S5.
	Metric 3:	Biomarker Selection	High	The parent chemical was measured in human plasma, air, and dust.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected in China.
	Metric 5:	Currency	Medium	Samples were collected in 2011.
	Metric 6:	Spatial and Temporal Variability	High	Samples from Zone B (residential area in close proximity the facility) and from Zone C (residential area serving as the reference) are of primary interest. Zone B recruited 14 individuals and C recruited 58.
	Metric 7:	Exposure Scenario	High	Data closely represent relevant exposure scenarios related to D4 in air, soil/dust and human plasma near a siloxane production facility and a reference population in China.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Low	No raw data or summary statistics were presented.
	Metric 9:	Quality Assurance	High	QA/QC techniques were described in detail (e.g., blank correction, acceptable recoveries, methods to minimize contamination).
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Variability was not characterized. Uncertainties and limitations were not discussed.

Overall Quality Determination High

Study Citation:	Warner, N. A., Evenset, A., Christensen, G., Gabrielsen, G. W., Borgå, K., Leknes, H. (2010). Volatile siloxanes in the European arctic: Assessment of sources and spatial distribution. Environmental Science & Technology 44(19):7705-7710.
HERO ID:	2581892

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	The authors described the sampling methodology for sediment and biota in full detail, which included how samples were collected from each media, stored, and transported.
	Metric 2:	Analytical Methodology	High	Extraction, instrumentation, LODs (Table S5), and recoveries were all reported.
	Metric 3:	Biomarker Selection	N/A	The authors analyzed the parent chemical in sediment, fish, and seal blubber.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected in Norway.
	Metric 5:	Currency	Medium	Samples were collected in 2009.
	Metric 6:	Spatial and Temporal Variability	Medium	Across the sampling sites, 10 were collected for sediment, 10 for Atlantic cod, 10 for sculpin, 6 for zooplankton, and 5 for seal blubber. No replicates were reported.
	Metric 7:	Exposure Scenario	Medium	The likely exposure scenario to biota will be their direct consumption by surrounding communities. However, sediment exposure scenarios is less clear.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	High	Sediment samples were all <MDL for D4. Only individual sample concentrations were provided for biota. Even though summary statistics are absence, D4 was <MDL for all.
	Metric 9:	Quality Assurance	High	QA/QC techniques were described in detail, including the use of blank samples.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Medium	Variability was not characterized, but also unnecessary for D4 because concentrations were all <MDL. Uncertainties were briefly discussed.

Overall Quality Determination High

Study Citation:	Krogseth, I. S., Zhang, X., Lei, Y. D., Wania, F., Breivik, K. (2013). Calibration and application of a passive air sampler (XAD-PAS) for volatile methyl siloxanes. Environmental Science & Technology 47(9):4463-4470.
HERO ID:	2674442

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	Sampling location, time, equipment, calibration, and other methodologies were described in detail in both the main text and supplemental.
	Metric 2:	Analytical Methodology	High	The analytical methods were described in detail, including instrumentation, extraction, analysis on storage effects, recoveries and LODs in Table S5.
	Metric 3:	Biomarker Selection	N/A	The authors analyzed the parent compound in outdoor air.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected in Canada.
	Metric 5:	Currency	Medium	Samples were collected in 2012.
	Metric 6:	Spatial and Temporal Variability	Medium	The sampler was deployed to 26 sites sampling sites (21 urban, 3 rural, 2 at sewage treatment plants). A total of 43 samples were collected based on counting the number of individual samples from Table S7. Air samples were taken over an extended period of time (7-98 days). Duplicate samples were collected at various intervals but not for every collection point.
	Metric 7:	Exposure Scenario	Medium	The data likely represent relevant exposure scenarios for general population. Table S3 provides the population density for each sample.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Only individual sample concentrations were reported in Table S7. Summary statistics can be calculated.
	Metric 9:	Quality Assurance	High	QA/QC techniques were described in detail (e.g., field blanks, acceptable recoveries, analysis of storage effects).
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Variability was not characterized but can be calculated. Uncertainties and limitations were discussed.

Overall Quality Determination Medium

Study Citation:	Ahrens, L., Harner, T.,om, Shoeib, M. (2014). Temporal variations of cyclic and linear volatile methylsiloxanes in the atmosphere using passive samplers and high-volume air samplers. Environmental Science & Technology 48(16):9374-9381.
HERO ID:	2691789

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	Ambient outdoor air sampled at semiurban meteorological station in Toronto. Key sampling methods reported. Active and passive sampling devices were used and compared. Device calibration, and conditioning of tubes was described and reported. Sampling times, and flow rates provided.
	Metric 2:	Analytical Methodology	High	Key analytical methods reported. Gas chromatography−mass spectrometry. The blank concentrations, limits of detection (LODs), and limits of quantification (LOQs) are given in Tables S5 and S6 in the SI. Blanks, internal standards, surrogates and appropriate QC approaches were used and reported.
	Metric 3:	Biomarker Selection	N/A	Study measured parent chemical in environmental media.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples collected in Toronto, Canada.
	Metric 5:	Currency	Medium	Samples collected in 2010 and 2011.
	Metric 6:	Spatial and Temporal Variability	High	>10 samples collected and replicates.
	Metric 7:	Exposure Scenario	Medium	Background air concentrations reported. Need information on potential sources and releases. Exposure source not well characterized.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Raw data not reported.
	Metric 9:	Quality Assurance	High	Key QA reported.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Medium	Few gaps and limitations reported. Comparison between two sampling approaches, variability and uncertainty for those goals were met, however, characterization of D4 sources (not a goal of the study) was missing.

Overall Quality Determination High

Study Citation:	Kierkegaard, A., McLachlan, M. S. (2013). Determination of linear and cyclic volatile methylsiloxanes in air at a regional background site in Sweden. Atmospheric Environment 80:322-329.
HERO ID:	2700474

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	The study reported key sampling methods: materials/instruments, sample location, storage condition and duration, and more.
	Metric 2:	Analytical Methodology	High	The study described their extraction procedures, analytical instruments, LOQ, and recoveries.
	Metric 3:	Biomarker Selection	N/A	The study tested for the parent chemical in background air.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	The study was conducted in Sweden.
	Metric 5:	Currency	Medium	The samples were collected in 2011.
	Metric 6:	Spatial and Temporal Variability	Low	The number of samples collected was not not explicitly reported but can be inferred. Table 2 indicates that there were between 56-82 samples. However, the individual concentrations provided in Table S3 total 39 samples (15 of which had a contamination of cVMS during the sampling period). Parallel samples were collected on each day of the sampling campaign.
	Metric 7:	Exposure Scenario	Medium	Some information was provided about the exposure scenario, primarily the microenvironment (i.e., at a private home at the outskirts of a village with 800 inhabitants).
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	A mean was provided in Table 2. Raw data are available in Table S3.
	Metric 9:	Quality Assurance	Low	The study described a number of QA/QC methods that included parallel sampling, sample efficiency, storage formation, potential transformation of D5, and acceptable recoveries. However, the raw data indicated some samples that experienced contamination without further detail.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Medium	The study reported a range and some discussions of limitations and uncertainties (e.g., how sample storage can affect concentrations).

Overall Quality Determination — Medium

Study Citation:	Huber, S., Warner, N. A., Nygård, T., Remberger, M., Harju, M., Uggerud, H. T., Kaj, L., Hanssen, L. (2015). A broad cocktail of environmental pollutants found in eggs of three seabird species from remote colonies in Norway. Environmental Toxicology and Chemistry 34(6):1296-1308.
HERO ID:	2823276

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	Sampling methodology was described, such as sampling procedures, storage conditions, and matrix characteristics.
	Metric 2:	Analytical Methodology	High	LOD reported in tables in supplement. The analytical method sufficiently described.
	Metric 3:	Biomarker Selection	N/A	Analyte is the parent chemical in eggs.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples collected in 2 remote islands, Sklinna and Rost, on the Norwegian coast.
	Metric 5:	Currency	Medium	Eggs collected during breeding season between May and June 2012.
	Metric 6:	Spatial and Temporal Variability	Medium	Eggs collected from three seabird species: 6 eggs from one island and 12 eggs from a second island per species. 3 eggs pooled per location/species (homogenized together) before analysis.
	Metric 7:	Exposure Scenario	High	This is a biomonitoring study where seabird transfer of ingested chemicals to their eggs is analyzed.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	High	Raw data for individual pooled samples (3 eggs per) presented in Supplement. All 18 samples analyzed below LOD.
	Metric 9:	Quality Assurance	Medium	QA/QC described briefly in Supplement Section 1.13, including 3 types of blanks. No recoveries discussed.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Variability and uncertainty not reported.

Overall Quality Determination High

Study Citation:	Sanchis, J., Cabrerizo, A., Galban-Malagon, C., Barcelo, D., Farre, M., Dachs, J. (2015). Unexpected occurrence of volatile dimethylsiloxanes in antarctic soils, vegetation, phytoplankton, and krill. Environmental Science & Technology 49(7):4415-4424.
HERO ID:	2944392

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	Sampling methodology was only described for krill. A reference to a previously published study was provided for sampling of surface soil and vegetation (Ref #47: Cabrerizo, A.; Dachs, J.; Barceló, D.; Jones, K. C. Influence of Organic Matter Content and Human Activities on the Occurrence of Organic Pollutants in Antarctic Soils, Lichens, Grass, and Mosses. Environ. Sci. Technol. 2012, 46 (3), 1396−1405)).
	Metric 2:	Analytical Methodology	High	The analytical methods included a description of sample extraction for each media type and instrumentation (GC-MS/MS). LODs and recoveries are reported in Table S4.
	Metric 3:	Biomarker Selection	N/A	The authors analyzed different environmental samples (soil, vegetation, krill, phytoplankton)
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected in Antarctica.
	Metric 5:	Currency	Medium	Samples were collected in 2009.
	Metric 6:	Spatial and Temporal Variability	High	There were 11 samples for soil, 17 for vegetation, 11 for phytoplankton, and 11 for krill.
	Metric 7:	Exposure Scenario	Low	The relevance of D4 contamination of soil, vegetation, phytoplankton and krill in Antarctica is low. However, it provides evidence of long range atmospheric transport.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	High	Summary statistics are reported (mean, median, min, max) in Table 1. Raw data are reported in Tables S5a-d.
	Metric 9:	Quality Assurance	High	QA/QC techniques were described in detail, including the of instrumental, procedural, and field blanks throughout the analytical process. Field blanks were also used to assess the potential contamination during sampling, storage, and shipment. Recoveries were acceptable.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Medium	Variability was characterized with min/max. There was only a limited discussion of uncertainties, limitations, and data gaps.

Overall Quality Determination High

Study Citation:	Mcgoldrick, D. J., Chan, C., Drouillard, K., Keir, M. J., Clark, M. G., Backus, S. M. (2014). Concentrations and trophic magnification of cyclic siloxanes in aquatic biota from the Western Basin of Lake Erie, Canada. Environmental Pollution 186:141-148.
HERO ID:	2948930

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	Some sampling information was described, but because sampling was conducted as part of routine monitoring under Environment Canada's National Fish Contaminants Monitoring and Surveillance Program, it can be reasonably inferred that appropriate methodologies were followed.
	Metric 2:	Analytical Methodology	High	Sample preparation/extraction, instrumentation, LODs/LOQs, and recoveries were all reported in either the main paper or supplemental.
	Metric 3:	Biomarker Selection	N/A	The authors tested for the parent chemical in aquatic biota.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected from Lake Erie, Canada.
	Metric 5:	Currency	Medium	Samples were collected in 2009.
	Metric 6:	Spatial and Temporal Variability	Medium	A total of 43 samples were collected, 41 of which were from various fish species. No replicate sampling was reported.
	Metric 7:	Exposure Scenario	High	The data closely represent a relevant exposure scenario related to aquatic biota in Lake Erie, Canada
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Only summary statistics were reported (mean, SD)
	Metric 9:	Quality Assurance	Low	QA/QC techniques were briefly described. Recoveries were as low as 40% for walleye according to Table S2, and correction was not described.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Medium	Variability was characterized (SD). Uncertainties were discussed in the context of developing trophic magnification factor, not related to monitoring data.

Overall Quality Determination Medium

Study Citation:	Ratola, N., Ramos, S., Homem, V., Silva, J. A., Jiménez-Guerrero, P., Amigo, J. M., Santos, L., Alves, A. (2016). Using air, soil and vegetation to assess the environmental behaviour of siloxanes. Environmental Science and Pollution Research 23(4):3273-3284.
HERO ID:	3007017

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	The air,soil and pine needles' sampling methodology was described in detail and is scientifically sound.
	Metric 2:	Analytical Methodology	Medium	The analytical methods were well described and included recoveries. LODs was mentioned but not reported. Extraction efficiencies from SIP disks were not reported.
	Metric 3:	Biomarker Selection	N/A	The authors analyzed the parent compound in environmental samples.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected in Portugal.
	Metric 5:	Currency	Medium	The samples were collected in 2014.
	Metric 6:	Spatial and Temporal Variability	Critically Deficient	From the eight sampling sites, a total of 32 SIPs were collected for air, including 16 field blanks. The number of soil and pine needles samples was not reported.
	Metric 7:	Exposure Scenario	Medium	The data likely represent a relevant exposure scenario related to D4 in air, pine and soil samples from different areas of Portugal. Details about the population of interest are missing.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Low	Only relative abundances (%) were reported in the SI material, making it difficult to estimate D4 concentrations. The text on p.7 suggests that the data in the SI figures are summary statistics (means). The text also only reports on the sum of siloxane concentrations or detection frequencies for individual siloxanes.
	Metric 9:	Quality Assurance	Low	QA/QC techniques were briefly described in terms of field blanks.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Uncertainties were briefly discussed. Variability was not characterized.

Overall Quality Determination — Uninformative

Study Citation:	Fromme, H., Cequier, E., Kim, J. T., Hanssen, L., Hilger, B., Thomsen, C., Chang, Y. S., Völkel, W. (2015). Persistent and emerging pollutants in the blood of German adults: Occurrence of dechloranes, polychlorinated naphthalenes, and siloxanes. Environment International 85:292-298.
HERO ID:	3007350

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	The sampling methodology primarily involved collection of fresh blood by the Bavarian Red Cross and centrifuging to obtain the plasma. Some pieces of detail were missing: how were the blood donors randomly selected, how centrifuging was conducted, and storage durations.
	Metric 2:	Analytical Methodology	High	The analytical methods to evaluate human plasma were described in detail, including sample preparation, instrumentation, analytical methods, recoveries, and LODs.
	Metric 3:	Biomarker Selection	High	The study measured the parent compound in plasma.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected from healthy blood donors in Germany.
	Metric 5:	Currency	Medium	Sampling was conducted in 2013 and 2014.
	Metric 6:	Spatial and Temporal Variability	Medium	A total of 42 samples were collected. Replicates were not reported.
	Metric 7:	Exposure Scenario	High	The data closely represent relevant exposure scenarios related to D4 found in human plasma in Germany. Since this is a biomonitoring study, source attribution is difficult if not impossible.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Low	Only the 95th percentile and maximum were provided; no summary statistics were calculated. No raw data were provided.
	Metric 9:	Quality Assurance	High	QA/QC was described in terms of blank correction, acceptable recoveries, and strict requirements to avoid contamination.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Variability was partially characterized with a maximum but not minimum. Uncertainties were not discussed.

Overall Quality Determination Medium

Study Citation: Tran, T. M., Abualnaja, K. O., Asimakopoulos, A. G., Covaci, A., Gevao, B., Johnson-Restrepo, B., Kumosani, T. A., Malarvannan, G., Minh, T. B., Moon, H. B., Nakata, H., Sinha, R. K., Kannan, K. (2015). A survey of cyclic and linear siloxanes in indoor dust and their implications for human exposures in twelve countries. Environment International 78:39-44.

HERO ID: 3013038

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	Some details were missing, such as the specifics of sampling equipment, time of collection, and storage duration.
	Metric 2:	Analytical Methodology	Medium	Most pertinent analytical methods were reported, including sample preparation/extraction, instrumentation, analytical methods, LOQ (3.0 ng/g for D4). Recoveries in matrix spikes were only reported as a range for all target compounds combined.
	Metric 3:	Biomarker Selection	N/A	The study measured the parent chemical in indoor dust.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected from 12 different countries, including China (n = 18), Colombia (n = 28), Greece (n = 28), India (n = 28), Japan (n = 13), Kuwait (n = 28), Pakistan (n = 28), Romania(n = 23), Saudi Arabia (n = 28), South Korea (n = 28), the USA(n = 22), and Vietnam (n = 38).
	Metric 5:	Currency	Medium	Samples were collected from 2010 to 2014.
	Metric 6:	Spatial and Temporal Variability	Medium	Samples were collected from 12 different countries, including China (n = 18), Colombia (n = 28), Greece (n = 28), India (n = 28),Japan (n = 13), Kuwait (n = 28), Pakistan (n = 28), Romania(n = 23), Saudi Arabia (n = 28), South Korea (n = 28), the USA(n = 22), and Vietnam (n = 38). There were no replicate samples collected. The number of samples collected per country are reported in Table 1.
	Metric 7:	Exposure Scenario	High	This study measured indoor dust in homes, cars, offices, and laboratories.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Raw data were not reported in this study.
	Metric 9:	Quality Assurance	Medium	QA/QC was reported and included the use of blanks, matrix spikes, calibration curve, and methods to check for background contamination. However, recoveries were only reported as a range (67.2-121%) for all siloxanes combined.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Medium	Variance was characterized by range but not SD. Limitations were partially reported in the last paragraph of the study.

Overall Quality Determination Medium

Study Citation:	Tran, T. M., Kannan, K. (2015). Occurrence of cyclic and linear siloxanes in indoor air from Albany, New York, USA, and its implications for inhalation exposure. Science of the Total Environment 511:138-144.
HERO ID:	3014985

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	The sampling methods description are complete, with explanation of pre-sampling cleaning, duration of sample, equipment, storage conditions and duration, and more.
	Metric 2:	Analytical Methodology	High	Analytical methods were described in detail. Recoveries and MDLs/MQLs are reported in Table 1.
	Metric 3:	Biomarker Selection	N/A	The authors analyzed the parent compound in indoor air.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected in Albany, NY.
	Metric 5:	Currency	Medium	Samples were collected in 2014.
	Metric 6:	Spatial and Temporal Variability	Medium	There were a total of 60 indoor air samples spread across homes (n=20), offices (n=7), laboratories (n=13), schools (n=6), salons (n=6), and public places (n=8). Duplicate samples were only collected at three locations.
	Metric 7:	Exposure Scenario	High	Data closely represent relevant exposure scenarios related to D4 indoor airborne concentrations where people spend a lot of time in.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Only summary statistics were reported (mean, range, detection frequency). These statistics were also stratified by the type of indoor environment.
	Metric 9:	Quality Assurance	High	QA/QC techniques were described in detail, including the use of procedural blanks, spiked blanks, analytical duplicates, and acceptable recoveries.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Variability was characterized with a range. Uncertainties were not discussed.

Overall Quality Determination High

Study Citation:	Shields, H. C., Fleischer, D. M., Weschler, C. J. (1996). Comparisons among VOCs measured in three types of US commercial buildings with different occupant densities. Indoor Air 6(1):2-17.
HERO ID:	3449521

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Low	The study reported sampling equipment and site characteristics. Missing information included sample storage conditions/duration and sampler calibration.
	Metric 2:	Analytical Methodology	Low	The LOD and LOQ appear to be 0.05 ug/m3 and 0.5 ug/m3, respectively. The limits appear to be the same for all VOCs of interest. Recovery samples were not reported.
	Metric 3:	Biomarker Selection	N/A	The study measured the parent compound in the indoor and outdoor air.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	This study was conducted at different types of buildings across the continental United States.
	Metric 5:	Currency	Low	The data were collected in 1991.
	Metric 6:	Spatial and Temporal Variability	Medium	A total of 140 samples were collected: 50 samples from telecommunication offices, 9 from data centers, 11 from administrative offices, and 70 from outdoors. Replicates were mentioned but it is unclear if they were collected for every sample point.
	Metric 7:	Exposure Scenario	Low	The possible sources of D4 are the personal care products. Sampling of indoor and outdoor air is relevant. However, some potential confounders were reported (e.g., smoking) in some of the microenvironments.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	No raw data were reported in this study.
	Metric 9:	Quality Assurance	Low	Other than field and lab blanks, QA/QC was not reported.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Geometric standard deviation was reported. No limitations or uncertainties were described.

Overall Quality Determination Low

Study Citation:	Shoeib, M., Schuster, J., Rauert, C., Su, K., Smyth, S. A., Harner, T. (2016). Emission of poly and perfluoroalkyl substances, UV-filters and siloxanes to air from wastewater treatment plants. Environmental Pollution 218:595-604.
HERO ID:	3463879

Domain	Metric		Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	The sampling methodology is clear and appropriate. Details such as site characteristics, equipment, and sample storage are provided. A citation to a previously published method is also included.
	Metric 2:	Analytical Methodology	High	The analytical method was clear and appropriate and included all pertinent information (e.g., analytical instrumentation, recoveries, methods, LODs in Table S6).
	Metric 3:	Biomarker Selection	N/A	Study is testing for the parent chemical in an environmental media.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected in Canada.
	Metric 5:	Currency	Medium	Samples were collected from 2013-2014.
	Metric 6:	Spatial and Temporal Variability	Medium	16 air samples were collected for both on-site and off-site scenarios. Replicate sampling was not reported.
	Metric 7:	Exposure Scenario	High	The exposure scenario is D4 in air due to WWTP emissions. The scenario is well characterized and is of interest for the chemical.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Figures and main text only provide summary statistics for the total cVMSs. However, Tables S6 and S7 provide raw data for summer and winter sampling periods, respectively.
	Metric 9:	Quality Assurance	Medium	Some QA/QC methods were described. Recovery for D4 was 67% +/- 10. Results were recovery corrected by methods to do so were not described.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Standard deviations are provided in the text section of the results for only the total of cVMSs. For D4, no variance was characterized. Some uncertainties and limitations were described.

Overall Quality Determination Medium

Study Citation:	Rosendahl, P., Hippler, J., Schmitz, O. J., Hoffmann, O., Rusch, P. (2016). Cyclic volatile methylsiloxanes in human blood as markers for ruptured silicone gel-filled breast implants. Analytical and Bioanalytical Chemistry 408(12):3309-3317.
HERO ID:	3491431

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	The sampling methodology is clear and appropriate. Details such as sample storage are provided.
	Metric 2:	Analytical Methodology	High	The analytical methodology is clear, appropriate, and detailed. The LOD is provided.
	Metric 3:	Biomarker Selection	High	The study is testing for the parent chemical in human blood.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	Critically Deficient	The paper never clearly states that these samples were collected in Germany, but maybe it can be implied.
	Metric 5:	Currency	Low	Publication date is 2016. No sample collection date was provided.
	Metric 6:	Spatial and Temporal Variability	Medium	24 samples were collected from 24 women with intact and ruptured implants. No replicates reported.
	Metric 7:	Exposure Scenario	High	The study is testing for D4 in human blood due to breast implants. This scenario is of interest for the chemical and microclimate details are provided.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Raw data are presented in Fig 2 but digitization is required. Some data are reported in text of results section as well.
	Metric 9:	Quality Assurance	High	The use of a control sample is discussed and results are provided. Field, procedural, and instrumental blanks were used, and sample preparation were in accordance to steps based on a previously published literature.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	The characterization of variability is absent. No measures of variance are provided.

Overall Quality Determination — Uninformative

Study Citation:	Krogseth, I. S., Whelan, M. J., Christensen, G. N., Breivik, K., Evenset, A., Warner, N. A. (2017). Understanding of cyclic volatile methyl siloxane fate in a high latitude lake is constrained by uncertainty in organic carbon-water partitioning. Environmental Science & Technology 51(1):401-409.
HERO ID:	3604641

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	The sampling methodology is scientifically sound and described in detail. It details the equipment, storage conditions, site characteristics, matrix characteristics, and sampling schedule.
	Metric 2:	Analytical Methodology	High	Description of analytical methodology included techniques, instruments, calibration, LOQ/LOD, and recoveries. Supplemental describes the above in detail.
	Metric 3:	Biomarker Selection	N/A	The authors analyzed environmental media (sediment, wastewater, river water, and lake water).
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected in Norway.
	Metric 5:	Currency	Medium	Samples were taken in 2014.
	Metric 6:	Spatial and Temporal Variability	Medium	Samples were collected in March and June from the same four sites to account for ice and ice-free days, respectively.
	Metric 7:	Exposure Scenario	High	Media (i.e., sediment, surface water, sewage) samples were collected to investigate potential local exposure to down-the-drain chemicals in sparsely populated areas.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Mean and SD are provided in the supplemental by media, except surface water where most samples were below detection.
	Metric 9:	Quality Assurance	High	QA/QC procedures and results (e.g., recoveries, field blanks) were detailed in the SI.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	High	Variability was characterized (SD), and uncertainties were discussed.

Overall Quality Determination High

Study Citation:	Gallego, E., Perales, J. F., Roca, F. J., Guardino, X., Gadea, E. (2017). Volatile methyl siloxanes (VMS) concentrations in outdoor air of several Catalan urban areas. Atmospheric Environment 155:108-118.
HERO ID:	3859990

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	Information was provided about the sample locations, matrix characteristics, sampling frequency, and equipment. However, the authors did not describe the sample storage conditions/duration or sampler calibration.
	Metric 2:	Analytical Methodology	Medium	The study authors reported the analytical equipment, use of EPA Compendium Method TO-17 for the sorbent tube preparation, calibration curves, and MDLs (Table S1). However, recovery samples were not reported.
	Metric 3:	Biomarker Selection	N/A	The study tested for the parent chemical in the outdoor air.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	This study was conducted in Catalan, Spain.
	Metric 5:	Currency	High	Samples were collected between 2013 and 2015.
	Metric 6:	Spatial and Temporal Variability	Medium	As reported in Table 1, there were 261 samples collected across the 10 sampling sites. were no replicates collected.
	Metric 7:	Exposure Scenario	High	Sampling of outdoor air in urban areas is relevant. The authors also described possible exposure sources that include wastewater treatment plants and other industrial releases, as well as estimated the population surrounding each of the studied locations.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Raw data were not reported. The study authors reported the mean and range.
	Metric 9:	Quality Assurance	Low	Most necessary QA was reported (e.g., thermal conditioning of sorbent tubes, blanks). Recovery samples were not reported.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Medium	Variance was characterized by SD for each of the sampling location but not in total. Some limitations were discussed.

Overall Quality Determination Medium

Study Citation:	Tran, T. M., Le, H. T., Vu, N. D., Minh Dang, G. H., Minh, T. B., Kannan, K. (2017). Cyclic and linear siloxanes in indoor air from several northern cities in Vietnam: Levels, spatial distribution and human exposure. Chemosphere 184:1117-1124.
HERO ID:	3861464

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	The authors described pre-collection procedures to measure background levels in their sampling equipment, the duration, volume, and rate of air sampling, sample location, and storage conditions and duration.
	Metric 2:	Analytical Methodology	High	The authors described sample preparation, instrumentation, MDL/MQL, and recoveries (Table S3).
	Metric 3:	Biomarker Selection	N/A	The study measured the parent compounds in indoor air.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	This study collected samples from four cities in Vietnam: Hanoi, Bacninh, Thaibinh, and Tuyenquang.
	Metric 5:	Currency	High	Samples were collected in 2016 and 2017.
	Metric 6:	Spatial and Temporal Variability	Medium	97 indoor samples were collected but there were no replicate samples.
	Metric 7:	Exposure Scenario	High	Exposure to D4 through inhalation of indoor air is relevant. The characterization of the indoor air environment (e.g., homes, offices, cars) are also informative of the microenvironment.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Raw data were not reported. The study reported the mean, median, and range in Table 1 for siloxanes in particulate phase, Table 2 for the sum of particulate and vapor phases, and Table S5 for vapor phase.
	Metric 9:	Quality Assurance	High	All key QA/QC was reported by the study authors, including blank and spiked samples, acceptable recoveries, and calibration curves.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	The study did not report gaps, limitations, or uncertainties. Variance characterized with a range.

Overall Quality Determination High

Study Citation:	Powell, D. E., Suganuma, N., Kobayashi, K., Nakamura, T., Ninomiya, K., Matsumura, K., Omura, N., Ushioka, S. (2017). Trophic dilution of cyclic volatile methylsiloxanes (cVMS) in the pelagic marine food web of Tokyo Bay, Japan. Science of the Total Environment 578:366-382.
HERO ID:	3985328

Domain	Metric		Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	Medium. Sampling methodology for sediment and fish sampling described in terms of sampling equipment, procedures, study site characteristics, and sample storage conditions (supplemental material). Details regarding duration of sample storage prior to analysis lacking.
	Metric 2:	Analytical Methodology	High	High. Limits of detection and quantification reported within supplemental material (Table S3). Analytical methodology noted in terms of instrumentation, extraction, and recoveries (see supplemental material, Table S3).
	Metric 3:	Biomarker Selection	N/A	N/A. Sampling for parent chemical of interest in environmental media.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	High. Samples described as collected from Tokyo Bay, Japan.
	Metric 5:	Currency	Medium	Medium. Sampling dates reported as November, 2011.
	Metric 6:	Spatial and Temporal Variability	Medium	Medium. Sampling conducted only over a period of one month in 2011 for n=21 fish and n=20 sediment samples. Replicate sampling conducted for field samples (Table S2). Fish sampling described as taken from water depths of 8 to 30 meters. Sediment samples were collected from 20 different locations at depths of 10 to 35 meters by systematic sampling near the center of each grid square defined utilizing a two-dimensional, a priori probability design based on 25 km2 central aligned square grids.
	Metric 7:	Exposure Scenario	High	Medium. This study evaluated bioaccumulation and trophic transfer of three cyclic volatile methylsiloxanes (cVMS) in the pelagic marine food web of Tokyo Bay, Japan, but also reported cVMS concentrations within fish and sediment samples. Exposure sources described as pollutants from municipal, industrial, and agricultural sources which enter the bay head as direct emissions or as freshwater inflow from six major rivers (Arakawa, Edo, Obitsu, Yōrō, Tama, and Sumida) that flow through densely populated and industrial areas. No exposure controls (i.e., background samples) were reported.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Medium. Raw data for sediment samples, but not fish, reported within Table S6. Data reported in Table 3 for fish samples and Table S6 and S7 for sediment with means and standard deviations. Number of samples reported in Table 2 for fish as n=21, and within supplemental text for sediment (n=20). Frequency of detection not noted.
	Metric 9:	Quality Assurance	High	High. Quality assurance discussed in detail within supplemental material with use of field and laboratory blanks reported. Recoveries were also reported and acceptable.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	High	Medium. Variability of results reported within statistical summary measure of standard deviation. Potential study limitations and uncertainties, such as fish mobility, migration patterns and age, were detailed within main text.

Overall Quality Determination High

Study Citation:	Liu, N., Xu, L., Cai, Y. (2017). Methyl siloxanes in barbershops and residence indoor dust and the implication for human exposures. Science of the Total Environment 618:1324-1330.
HERO ID:	4168341

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	Sample methodology was reported to some extent, including brief descriptions of equipment, questionnaires, and storage condition. Storage duration not reported.
	Metric 2:	Analytical Methodology	High	The authors described extraction methods, instrumentation, LOQs, and recoveries. LODs are reported as range for D4-D6 in the main text, but LODs for individual siloxanes are reported in Table S1 (1.4 ng/g for D4).
	Metric 3:	Biomarker Selection	N/A	The study analyzed the parent chemical in indoor dust.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected from Tianjin, China.
	Metric 5:	Currency	Low	Study was published in 2018. No sampling date was provided.
	Metric 6:	Spatial and Temporal Variability	Medium	"A total of 11 indoor dust samples were collected from barbershops (n = 36), university dormitories (n = 24 and 18 for female and male, respectively), urban households (n = 30, from parlors, bedrooms and bathrooms) and bathhouses (n = 6)." No replicates were reported.
	Metric 7:	Exposure Scenario	High	Exposure scenario was characterized as dust ingestion from use of personal care products as the likely source.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Mean, min, max, and detection frequencies were reported. Raw data were not provided.
	Metric 9:	Quality Assurance	Medium	Only some QA/QC was explained, namely efforts to avoid contamination, field blanks, and acceptable recoveries.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Variance characterized with range. Gaps and limitations were not reported.
Overall Quality Determination			**Medium**	

Study Citation:	Jia, H., Zhang, Z., Wang, C., Hong, W. J., Sun, Y., Li, Y. F. (2015). Trophic transfer of methyl siloxanes in the marine food web from coastal area of Northern China. Environmental Science & Technology 49(5):2833-2840.
HERO ID:	4182280

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Low	Extensive information was provided about the sampled species and their location. A citation to a previously published method was provided for the rest of the sample collection methods, and the brief explanation in the paper was too sparse to evaluate its completeness/rigor. A citation to an authorized source (HY003.4–91 from China was provided but is only for zooplankton.
	Metric 2:	Analytical Methodology	High	The analytical methods are scientifically sound and included recoveries and LOD. Details are available in the supplemental.
	Metric 3:	Biomarker Selection	N/A	The study analyzed parent chemical on different marine species' tissue.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected in China.
	Metric 5:	Currency	Medium	Samples were collected in 2013.
	Metric 6:	Spatial and Temporal Variability	Medium	A total of 305 samples were collected across 13 different species, with 6-71 samples per species. No replicates were reported.
	Metric 7:	Exposure Scenario	High	Data closely represent relevant exposure scenarios related to D4 found in marine species from Dalian Bay, China.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Only summary statistics were provided (average, SD) in Table 1.
	Metric 9:	Quality Assurance	High	QA/QC techniques were described in detail, including the use of field and procedural blanks, spikes, and acceptable recoveries.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Medium	Variability was characterized (SD). Uncertainties were discussed in the context of trophic magnification factor calculation and not the monitoring data itself.
Overall Quality Determination			**Medium**	

Study Citation:	Olofsson, U., Brorström-Lundén, E., Kylin, H., Haglund, P. (2013). Comprehensive mass flow analysis of Swedish sludge contaminants. Chemosphere 90(1):28-35.
HERO ID:	4182871

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	The sampling methodology is discussed in the supplement. The discussion contains most information (site characters, sampling procedure, storage).
	Metric 2:	Analytical Methodology	Medium	Analytical procedure was performed by other labs. LOD was mentioned to be calculated but not reported in the document.
	Metric 3:	Biomarker Selection	N/A	The study tested in environmental media.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	The study was conducted in Sweden.
	Metric 5:	Currency	Low	The study took place in Autumn of 2004.
	Metric 6:	Spatial and Temporal Variability	Medium	Sludge samples were collected at seven STPs.
	Metric 7:	Exposure Scenario	Medium	Sludge was reported as the exposure medium.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	The supplement contained the individual data points but still lacked a few important information including standard deviation.
	Metric 9:	Quality Assurance	High	Quality assurance and quality checks was discussed in the supplement. No issues were identified.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Medium	The study has limited discussion of key uncertainties, limitations, and data gaps.

Overall Quality Determination Medium

Study Citation:	Horii, Y., Minomo, K., Ohtsuka, N., Motegi, M., Nojiri, K., Kannan, K. (2017). Distribution characteristics of volatile methylsiloxanes in Tokyo Bay watershed in Japan: Analysis of surface waters by purge and trap method. Science of the Total Environment 586:56-65.
HERO ID:	4904828

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	The water sampling methodology is described in detail. Descriptions of the equipment, sampling regimen, site characteristics, and storage conditions were included.
	Metric 2:	Analytical Methodology	High	Extraction method, instrumentation, and MDL (Table A4) were described both in main text and supplemental. Citation to a previous study where authors modified the methods for this current study was also provided.
	Metric 3:	Biomarker Selection	N/A	The authors analyzed environmental samples (water and effluent).
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Study was conducted in Japan.
	Metric 5:	Currency	Medium	The samples were collected in 2012 and 2013.
	Metric 6:	Spatial and Temporal Variability	Medium	The number of samples collected from the river and treated effluent were 48 and 25, respectively. No replicates were reported.
	Metric 7:	Exposure Scenario	High	Data represent a relevant exposure scenario related to D4 contamination of rivers in the Tokyo Bay watershed from Japan. The scenario is relevant to general population exposure as this large watershed is home to over 29 million people with multiple sewage treatment plants of varying sizes that discharge into it.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	High	Table 1 provides summary statistics while Tables A5 and A6 provide raw data.
	Metric 9:	Quality Assurance	High	QA/QC techniques were described in detail and included field blanks, recoveries, and matrix spikes.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	The authors reported a limited characterization of variability (range). Uncertainties and limitations were not discussed.

Overall Quality Determination High

Study Citation: Hanssen, L., Warner, N. A., Braathen, T., Odland, J. Ø., Lund, E., Nieboer, E., Sandanger, T. M. (2013). Plasma concentrations of cyclic volatile methylsiloxanes (cVMS) in pregnant and postmenopausal Norwegian women and self-reported use of personal care products (PCPs). Environment International 51:82-87.

HERO ID: 4955598

Domain	Metric		Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	Sampling methodology described in terms of sampling equipment, brief procedures, sample storage conditions, study site characteristics. Details regarding sample storage duration prior to analysis lacking.
	Metric 2:	Analytical Methodology	High	Limits of detection reported. Analytical methodology noted in terms of instrumentation, extraction, recoveries and calibration.
	Metric 3:	Biomarker Selection	High	Biomarker reflects exposure to parent chemical of interest.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples described as collected from women in Norway.
	Metric 5:	Currency	Medium	ampling dates reported as 2005 (NOWAC cohort) and February and May of 2009 (MISA cohort).
	Metric 6:	Spatial and Temporal Variability	Medium	Single plasma samples taken from each participant. Total samples from NOWAC cohort reported as n=94 plasma samples, with n=17 from MISA cohort. Replicate sampling not conducted.
	Metric 7:	Exposure Scenario	High	This study quantified concentrations of cyclic volatile methylsiloxanes (cVMS) in blood plasma of pregnant and postmenopausal women from two cohorts, the Norwegian Women and Cancer Study (NOWAC) and the North Norwegian Mother-and-Child Study (MISA) and investigated the association to self-reported use of personal care products. Exposure sources discussed in text as personal care products.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Raw data not reported. Data reported in Tables 2 and 3. Concentration results reported as median, minimum and maximum. Number of samples noted as n=94 (NOWAC cohort) and n=17 (MISA cohort). Frequency of detection noted.
	Metric 9:	Quality Assurance	Medium	Quality assurance discussed, recoveries (97% +/-6%) reported, and text noted utilizing procedural blank samples. Contamination of procedural blanks noted, but results corrected for blank concentrations.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	High	Variability of results reported within statistical summary measures of minimum, maximum. Potential study limitations detailed.

Overall Quality Determination High

Study Citation:	Sha, B., Dahlberg, A. K., Wiberg, K., Ahrens, L. (2018). Fluorotelomer alcohols (FTOHs), brominated flame retardants (BFRs), organophosphorus flame retardants (OPFRs) and cyclic volatile methylsiloxanes (cVMSs) in indoor air from occupational and home environments. Environmental Pollution 241:319-330.
HERO ID:	5083520

Domain	Metric		Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	Sampling site was described in detail. Sampler handling and storage after sampling and before analysis were not explained.
	Metric 2:	Analytical Methodology	Low	Extraction methods were briefly explained but point to another paper. In the QA/QC section of the paper, the author stated the extraction method has not been used previously for the compounds of interest and is evident that methods need to be revised based on low recovery.
	Metric 3:	Biomarker Selection	N/A	Chemicals were measured in indoor air.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected in Sweden.
	Metric 5:	Currency	High	Samples were collected in September and November 2016.
	Metric 6:	Spatial and Temporal Variability	Medium	Replicate samples appeard to be only collected from one of the buildings. "Three pairs of duplicate samples were collected in the computer room (CR) in B2, the lecture room (LR3) in B3 and the dining area (DA1) in B1."
	Metric 7:	Exposure Scenario	High	Samples were collected from "three buildings located at the Ultuna campus of the Swedish University of Agricultural Sciences (SLU), Uppsala, Sweden".
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Individual data points were not reported. Summary statistics including arithmetic mean and range for concentrations were reported in Table 1.
	Metric 9:	Quality Assurance	Low	Section 2.7 QA/QC. Replicate sampling was limited to three sample and result of one duplicate sample showed a relative standard deviation of 100% between the two TCEP measurements. Low recoveries were also reported but not used to correct quantitative data.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Limited discussion of limitations were presented in section 3.5 and potential factors affecting the concentrations were discussed.

Overall Quality Determination Low

Study Citation:	Rauert, C., Shoieb, M., Schuster, J. K., Eng, A., Harner, T. (2018). Atmospheric concentrations and trends of poly- and perfluoroalkyl substances (PFAS) and volatile methyl siloxanes (VMS) over 7 years of sampling in the Global Atmospheric Passive Sampling (GAPS) network. Environmental Pollution 238:94-102.
HERO ID:	5186328

Domain	Metric		Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	Some sampling methods were reported (e.g., site characteristics, some equipment), and citation for more details were provided as Shoeib at al., 2016.
	Metric 2:	Analytical Methodology	Low	D4 samples were analyzed via GC-MS. Extraction and recoveries were reported. The method to calculate MDL was described not actual MDLs were not reported.
	Metric 3:	Biomarker Selection	N/A	The study measured D4 in the ambient air.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected in US, Canada, Bermuda, Norway, Iceland, France, Australia, Czech Republic, and Ireland.
	Metric 5:	Currency	Medium	Samples were collected in 2013 and 2015.
	Metric 6:	Spatial and Temporal Variability	High	Replicates were not reported. The sampling sites from different countries covered three types of locations: polar (n=3), background (n=15), and urban (n=3). In 2013 and for all but one location, quarterly samples were collected (though at locations and for some quarters, sampling was not deployed). That one location that did not have quarterly sampling had year-round sampling. In 2015, samples were deployed in Q2 at one location where it was deployed for the entire year.
	Metric 7:	Exposure Scenario	Medium	This is a passive air sampling study aimed at characterizing trends from when the monitoring project started in 2009 to 2015. This paper reports on 2013 and 2015 data. Sampling sites were categorized as polar, background, or urban. These air concentrations are relevant to gen pop exposure, and the chemical sources were broadly described as originating from industrial or consumer use (personal care products). However, because it's a passive air sampling study across several global locations, the paper does not report some information that is relevant to characterizing the exposure scenario.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Raw data were reported in Table S19 and S20 for 2013 and 2015 samples, respectively. Summary statistics were not provided, but can be calculated from the raw data.
	Metric 9:	Quality Assurance	Low	Recoveries were reported as the sum for all volatile methyl siloxanes as 48 +/- 18. Correction for low recovery was not described.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Variance was not characterized. Gaps and limitations were not reported.

Overall Quality Determination Medium

Study Citation: Bruemmer, J., Falcon, R., Greenwood, R., Mills, G. A., Hastie, C., Sparham, C., van Egmond, R. (2015). Measurement of cyclic volatile methylsiloxanes in the aquatic environment using low-density polyethylene passive sampling devices using an in-field calibration study–challenges and guidance. Chemosphere 122:38-44.

HERO ID: 5376274

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	Sampling methodology described in terms of sampling equipment, procedures, study site characteristics. Details regarding sample storage conditions and duration prior to analysis lacking.
	Metric 2:	Analytical Methodology	High	Limits of quantification reported. Analytical methodology noted in terms of instrumentation, extraction, recoveries and in-field calibration.
	Metric 3:	Biomarker Selection	N/A	Sampling for parent chemical of interest in environmental media.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples described as collected from wastewater in the UK.
	Metric 5:	Currency	Medium	Sampling dates reported as 6-13 March of 2012.
	Metric 6:	Spatial and Temporal Variability	Medium	Sampling conducted over a period of one week, with sampling time reported as 0-167 hours. Replicate sampling not conducted.
	Metric 7:	Exposure Scenario	Medium	In this study, passive samplers were utilized to sample cyclic volatile methylsiloxanes (cVMS) in wastewater influent and effluent from a treatment plant in the United Kingdom (UK). Exposure sources discussed in text as personal care products. It can be inferred that the exposure can occur when the effluent discharges to surface water.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Raw data not reported. Data reported in Table 1. Concentration results reported as mean, median, minimum and maximum, standard error of mean, standard deviation and coefficient of variation. Number of samples noted as n=16. Frequency of detection not noted.
	Metric 9:	Quality Assurance	Low	Quality assurance not discussed and recoveries not reported, but text noted utilizing field blank samples and efforts made to ensure sampling equipment was free from contamination.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Variability of results reported within statistical summary measures of standard error of mean, standard deviation, coefficient of variation, minimum, maximum. Potential study limitations not detailed.

Overall Quality Determination Medium

Study Citation:	Rauert, C., Harner, T., Schuster, J. K., Eng, A., Fillmann, G., Castillo, L. E., Fentanes, O., Villa Ibarra, M. V., Miglioranza, K. S. B., Rivadeneira, I. M., Pozo, K., Zuluaga, B. H. A. (2018). Atmospheric Concentrations of New Persistent Organic Pollutants and Emerging Chemicals of Concern in the Group of Latin America and Caribbean (GRULAC) Region. Environmental Science & Technology 52(13):7240-7249.
HERO ID:	5386424

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	Sampling equipment and study sites were discussed. However, sample storage and calibration were not mentioned.
	Metric 2:	Analytical Methodology	Medium	Analytical method (GC-MS/MS) was used. And detection limits were mentioned in the SI.
	Metric 3:	Biomarker Selection	N/A	Air samples were collected. No biomarker was needed.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	The study included 9 sites covering 7 countries: Mexico (n = 2), Costa Rica (n = 1), Colombia (n = 1), Brazil (n = 2), Bolivia (n = 1), Argentina (n = 1), and Chile (n = 1).
	Metric 5:	Currency	High	The deployment of sampling equipment was reported to be 2014-2015.
	Metric 6:	Spatial and Temporal Variability	Medium	Replicate samples were not mentioned to be provided. Each site had 1 or 2 samplers collecting samples for at least a quarter of a year.
	Metric 7:	Exposure Scenario	High	This study measured air, background mostly. The majority of sites were classified as background sites (n = 5), with 3 urban and 1 agricultural site.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	High	Individual data points were reported in the SI.
	Metric 9:	Quality Assurance	High	Quality assurance measures and all pertinent information was provided in the data source or companion source.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Medium	The study has limited discussion of key uncertainties, limitations, and data gaps.

Overall Quality Determination High

Study Citation:	Mcgoldrick, D. J., Letcher, R. J., Barresi, E., Keir, M. J., Small, J., Clark, M. G., Sverko, E., Backus, S. M. (2014). Organophosphate flame retardants and organosiloxanes in predatory freshwater fish from locations across Canada. Environmental Pollution 193(Elsevier):254-261.
HERO ID:	5469297

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	Sampling methods described in detail.
	Metric 2:	Analytical Methodology	Medium	MLOQs reported in table. Referred to another publication for methods.
	Metric 3:	Biomarker Selection	N/A	Parent chemical in environmental media.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected in Canada.
	Metric 5:	Currency	Medium	Samples were collected in 2010.
	Metric 6:	Spatial and Temporal Variability	Medium	3-10 fish were collected per station.
	Metric 7:	Exposure Scenario	High	Paper detailed how regions and exposure population were relevant and chosen.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Summary stats (median, mean, SD) were reported. Individual points not reported.
	Metric 9:	Quality Assurance	High	QA was described in detail. Blanks and recoveries were described.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Medium	Variability and uncertainty not discussed. SD is included.

Overall Quality Determination High

Study Citation:	Wang, X., Schuster, J., Jones, K. C., Gong, P. (2018). Occurrence and spatial distribution of neutral perfluoroalkyl substances and cyclic volatile methylsiloxanes in the atmosphere of the Tibetan Plateau. Atmospheric Chemistry and Physics 18(12):8745-8755.
HERO ID:	5882740

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	The sampler preparation methods, equipment, and locations were reported in detail. However, the sample storage conditions and duration were not reported.
	Metric 2:	Analytical Methodology	High	The analytical methodology included a description of extraction, instrumentation (GC-MC), LOD in Table SI3, and recoveries in the main text.
	Metric 3:	Biomarker Selection	N/A	The authors measured the parent chemical in air.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	This study was conducted in the Tibetan Plateau, China.
	Metric 5:	Currency	Medium	As reported in the abstract and Table 1, samples were collected in 2011 for PFASs and 2013 for cVMSs.
	Metric 6:	Spatial and Temporal Variability	High	One sample was collected from each of 16 sites, in addition to duplicate SIP-PASs being deployed at each sampling site.
	Metric 7:	Exposure Scenario	Medium	This was a monitoring study to determine occurrence and spatial distribution of chemicals. The study did not explore the sources of exposure, but background levels can still be relevant for the general population. One source of contaminants for cities is presumed to be personal care products.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	High	Raw data and summary statistics were reported in Table S9.
	Metric 9:	Quality Assurance	High	QA/QC methods included the analysis of field blanks, lab blanks, and acceptable recoveries.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	The study did not report gaps, limitations, or uncertainties nor characterized variance.
Overall Quality Determination			**High**	

Study Citation:	Krogseth, I. S., Undeman, E., Evenset, A., Christensen, G. N., Whelan, M. J., Breivik, K., Warner, N. A. (2017). Elucidating the behavior of cyclic volatile methylsiloxanes in a subarctic freshwater food web: A modeled and measured approach. Environmental Science & Technology 51(21):12489-12497.
HERO ID:	5882872

Domain	Metric		Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	The fish sampling methodology is scientifically sound and was described in detail. It included a description of collection methods, equipment, site characteristics, and preparation of tissue samples.
	Metric 2:	Analytical Methodology	High	The analytical methods were described and LODs and recoveries were reported in the SI.
	Metric 3:	Biomarker Selection	N/A	The authors tested fish tissue for the chemical of interest.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected from a lake in Norway.
	Metric 5:	Currency	Medium	Samples were collected in 2014.
	Metric 6:	Spatial and Temporal Variability	Medium	A total of 33 biota samples were collected, with 2-13 samples per species.
	Metric 7:	Exposure Scenario	High	The data closely represent a relevant exposure scenario for fish contaminated with D4 in Norway.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	High	Summary statistics were reported (mean, SD, range, box plots) in the main text. Table S6 provides the raw data.
	Metric 9:	Quality Assurance	High	QA/QC techniques were described, including the use of control samples (field, dissection and reference). Supplemental document also provides a lot more details, including recoveries which are within the acceptable range.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	High	Variability was characterized (SD, IQR, range). Uncertainties were discussed in detail.

Overall Quality Determination High

Study Citation:	Hydroqual, (1993). Sampling and analysis for D4 (octamethylcyclotetrasiloxane) at selected wastewater treatment plants with cover letter dated 06/11/93.
HERO ID:	5889473

Domain	Metric		Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	Three grab samples of influent and effluent wastewater from five wastewater treatment plants were collected at one- to two-hour intervals during the hours of 8 am to 3 pm on a single day. Field blanks and samples for matrix spike/matrix spike duplicate analyses were also collected at each plant. Sampling equipment, protocols, and storage conditions are described in good detail and are scientifically sound.
	Metric 2:	Analytical Methodology	High	Sample preparation, extraction, and analysis by GC/MS was described in good detail and is scientifically sound. Analytical MDL and practical quantitation limit (PQL) were reported.
	Metric 3:	Biomarker Selection	N/A	This study was testing for the chemical of interest in environmental media (influent and effluent water from wastewater treatment plants).
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected from four wastewater treatment plants in New Jersey and one in NY, USA.
	Metric 5:	Currency	Low	Samples were collected in March and April of 1993.
	Metric 6:	Spatial and Temporal Variability	Medium	Three influent and three effluent samples were analyzed at each of the five wastewater treatment plants surveyed. However, use of replicates was not reported.
	Metric 7:	Exposure Scenario	Medium	This report describes contamination of influent and effluent water at wastewater treatment facilities; the effluent water represents water being reintroduced to public waterways for possible exposure, although the extent to which the public is likely to come into contact with these water sources is unclear.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Raw data are reported in Table 2-1. The average measured concentration for each plant is also reported. Inclusion of more statistical analyses would merit a higher score.
	Metric 9:	Quality Assurance	Medium	Accuracy and precision were demonstrated by matrix recovery and replicate analyses. Recoveries for different spike concentrations in secondary effluent samples during validation studies were between 80-108%.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	There is no quantitative characterization of variability. However, there is discussion of sources of uncertainty, including the influence of springtime snowmelt and rains on possible decreases of concentrations measured relative to other times of year.
Overall Quality Determination			**Medium**	

Study Citation:	Xue, X., Jia, H., Xue, J. (2019). Bioaccumulation of methyl siloxanes in common carp (cyprinus carpio) and in an estuarine food web in northeastern China. Archives of Environmental Contamination and Toxicology 76(3):496-507.
HERO ID:	6833792

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	Medium. Sampling methodology described in terms of sampling equipment, procedures, study site characteristics, and sample storage conditions. Details regarding duration prior to analysis lacking; however, sampling methods were referenced (Ma et al., 2013). Note that the study reported collecting water samples, but these are samples from the aquaria from common carp exposure test rather than from surface water bodies.
	Metric 2:	Analytical Methodology	High	Medium. Limits of quantification reported in Table S3. Analytical methodology noted in terms of instrumentation, extraction, recoveries.
	Metric 3:	Biomarker Selection	N/A	N/A. Sampling for parent chemical of interest in environmental media.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	High. Samples described as collected from Shuangtaizi estuary in north-eastern region of Bohai Sea, China.
	Metric 5:	Currency	Medium	Medium. Sampling dates reported as October 2014.
	Metric 6:	Spatial and Temporal Variability	Medium	Medium. Sampling conducted over a period of one month. Replicate sampling not conducted. Number of samples for food web sampling reported within Table 2 as n=91, with 1-30 samples per species.
	Metric 7:	Exposure Scenario	Medium	Medium. This study reported concentrations and estimated trophic magnification potential of food web methyl siloxanes estuary species from the north-eastern region of Bohai Sea, China. Exposure sources discussed in text as personal care products. The exposure pathway is presumably human consumption of the biota.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Medium. Raw data not reported. Data reported in Table 2. Concentration results reported as mean and standard deviation. Number of samples noted as n=91. Frequency of detection noted as 99%.
	Metric 9:	Quality Assurance	Low	Low. Quality assurance discussed, recoveries not reported for D4, but text noted utilizing blank samples. Text noted detectable D4 within blanks (Table S4), but did not mention correction for blank concentrations within results.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Low. Variability of results reported within statistical summary measure of standard deviation. Potential study limitations not detailed.

Overall Quality Determination Medium

Study Citation:	Sanchís, J., Llorca, M., Picó, Y., Farré, M., Barceló, D. (2016). Volatile dimethylsiloxanes in market seafood and freshwater fish from the X{\'u}quer River, Spain. Science of the Total Environment 545-546:236-243.
HERO ID:	6833796

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	The description of sampling methods included equipment, site characteristics, matrix characteristics, and storage conditions.
	Metric 2:	Analytical Methodology	High	Analytical methods included a description of instrumentation, detection limits, calibration, and recoveries.
	Metric 3:	Biomarker Selection	N/A	Parent chemical was analyzed in biota.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected from fish markets and the Xúquer River in Spain.
	Metric 5:	Currency	Low	Paper was published in 2016 but authors did not report when samples were collected.
	Metric 6:	Spatial and Temporal Variability	Medium	Forty samples were collected from commercial markets, and 16 from the river. Replicate sampling was not reported, but samples were prepared in triplicate for analysis.
	Metric 7:	Exposure Scenario	High	The exposure scenario - consumption of biota - by local populations is relevant.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Summary statistics are reported in Tables 4 and 5 but raw data were not provided.
	Metric 9:	Quality Assurance	Medium	Some QA techniques were reported in terms of procedural blanks, recoveries, and steps to avoid contamination.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Variance was only characterized with a range. Few gaps and limitations were reported.

Overall Quality Determination Medium

Study Citation: Powell, D. E., Schøyen, M., Øxnevad, S., Gerhards, R., Böhmer, T., Koerner, M., Durham, J., Huff, D. W. (2018). Bioaccumulation and trophic transfer of cyclic volatile methylsiloxanes (cVMS) in the aquatic marine food webs of the Oslofjord, Norway. Science of the Total Environment 622-623:127-139.

HERO ID: 6833812

Domain	Metric		Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	The sampling methodology is scientifically sound and cited previously published work with more details.
	Metric 2:	Analytical Methodology	Medium	The analytical methods were reported and cited previously published work for more details, but did not include recoveries.
	Metric 3:	Biomarker Selection	N/A	The authors analyzed parent chemical in biota.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected in Norway.
	Metric 5:	Currency	Medium	The samples were collected in 2008.
	Metric 6:	Spatial and Temporal Variability	Medium	1-12 samples were collected for each species type between the two sampling sites. Replicate samples were not reported except for sediment.
	Metric 7:	Exposure Scenario	High	The data closely represent a relevant exposure scenario related to D4 contaminated biota in Oslofjord, Norway.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Only summary statistics were reported (mean, SD). Raw data were not provided.
	Metric 9:	Quality Assurance	Low	While a citation to a previous publication was provided for details on their rigorous QA/QC procedures, recoveries were not mentioned. Retrieving that paper will not change this metric's score because recovery results will vary by study.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Medium	Variability was characterized (SD). Uncertainties were discussed in relation to trophic magnification factor and not monitoring/biota data itself.

Overall Quality Determination Medium

Study Citation:	Zhang, Y., Zeng, G., Shen, M., Tian, Y. (2018). Cyclic volatile methylsiloxanes in sediment, soil, and surface water from Dongting Lake, China. Journal of Soils and Sediments 18(5):2063-2071.
HERO ID:	6833820

Domain	Metric		Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	The surface water, sediment and soil sampling methods (e.g., equipment, regimen, storage conditions, site characteristics) were well described.
	Metric 2:	Analytical Methodology	High	The analytical methods (e.g., instrumentation, recoveries, LODs) were described in detail.
	Metric 3:	Biomarker Selection	N/A	The authors analyzed the parent chemical in soil, sediment, and surface water.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected in China.
	Metric 5:	Currency	High	Sampling was conducted in 2016.
	Metric 6:	Spatial and Temporal Variability	Medium	15 samples were collected for each environmental media. No replicates were reported.
	Metric 7:	Exposure Scenario	High	The data represents relevant exposure scenarios, where the possible D4 sources and diversity of populations surrounding Dongting Lake was described.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Summary statistics were provided, and raw data may be in supplemental.
	Metric 9:	Quality Assurance	High	QA/QC techniques were described in detail, including the use of procedure blanks, spiked samples, measures to reduce contamination, and calibration curves.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Medium	Variability was characterized (range, SD). Uncertainties were briefly discussed.

Overall Quality Determination High

Study Citation:	Wang, D. G., Steer, H., Tait, T., Williams, Z., Pacepavicius, G., Young, T., Ng, T., Smyth, S. A., Kinsman, L., Alaee, M. (2013). Concentrations of cyclic volatile methylsiloxanes in biosolid amended soil, influent, effluent, receiving water, and sediment of wastewater treatment plants in Canada. Chemosphere 93(5):766-773.
HERO ID:	6833827

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	Sampling methods described the equipment, storage conditions/durations, study site characteristics, and matrix characteristics. Authors sampled influent and effluent of WWTPs, the receiving waters, nearby sediment, and soils that received biosolids from WWTPs.
	Metric 2:	Analytical Methodology	High	Extraction methods, analytical methods, instrumentation, MDLs, and acceptable recoveries were reported.
	Metric 3:	Biomarker Selection	N/A	This study measure parent compound in environmental media.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	The study was conducted in Canada.
	Metric 5:	Currency	Medium	The samples were collected in 2010.
	Metric 6:	Spatial and Temporal Variability	Medium	For influent, effluent, and receiving waters, a grab sample was collected from each plant (n=11). Sediment samples were collected in triplicate from each of the 11 receiving waters. For the soil samples, five samples were collected from each farm, in addition to six replicate samples. Study is scored a medium on this metric because it is unclear if every sample was collected in replicate.
	Metric 7:	Exposure Scenario	High	The multiple media analyzed in this study are of interest. For WWTPs, the source is likely its widespread commercial and consumer use. For the receiving water and sediment, the source is the WTTP. For the soil from farms, the source is the biosolid/sludge from WWTPs.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Table 2 reported the mean and standard deviation for influent, effluent, receiving water, and sediment by WWTP. Table 3 reported the mean and SD for soil by WWTP. Study may have partially reported raw data. However, it is unclear which ones had replicate sampling.
	Metric 9:	Quality Assurance	High	All key QA (e.g., trip and field blanks, recoveries) was reported by the study authors.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	The study did not report gaps, limitations, or uncertainties.

Overall Quality Determination High

Study Citation:	Knoerr, S. M., Durham, J. A., Mcnett, D. A. (2017). Development of collection, storage and analysis procedures for the quantification of cyclic volatile methylsiloxanes in wastewater treatment plant effluent and influent. Chemosphere 182:114-121.
HERO ID:	6833846

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	Sampling methods were reported in detail.
	Metric 2:	Analytical Methodology	High	The study authors reported all key analytical methods, including the LOD and recovery samples.
	Metric 3:	Biomarker Selection	N/A	The parent chemical was measured in wastewater treatment plant effluent and influent.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	Critically Deficient	The location of the sample collection was not reported by study authors.
	Metric 5:	Currency	Low	The date of sample collection was not reported by study authors. The study was published in 2017.
	Metric 6:	Spatial and Temporal Variability	Medium	There were 10 samples collected from two treatment plants. No replicates were reported.
	Metric 7:	Exposure Scenario	Low	The study focused on measurement methods so the exposure sources and populations of interest are not described.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Raw data were not reported but the study authors reported the average concentrations.
	Metric 9:	Quality Assurance	High	The study authors reported all key QA/QC.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	The study authors did not report gaps and limitations but did report uncertainties. Variance was not reported other than in Figure 2 as an error bar.

Overall Quality Determination Uninformative

Study Citation:	Wang, D. G., Aggarwal, M., Tait, T., Brimble, S., Pacepavicius, G., Kinsman, L., Theocharides, M., Smyth, S. A., Alaee, M. (2015). Fate of anthropogenic cyclic volatile methylsiloxanes in a wastewater treatment plant. Water Research 72:209-217.
HERO ID:	6833855

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	Necessary sampling methods were reported, including site and matrix characteristics, equipment, procedure, storage conditions/duration).
	Metric 2:	Analytical Methodology	High	In the supplemental, the authors reported the LOD, recoveries, analytical methods, extraction method, and instrumentation.
	Metric 3:	Biomarker Selection	N/A	The parent chemical was analyzed in wastewater influent, effluent, and sludge.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	This study was conducted in Lake Ontario, Canada.
	Metric 5:	Currency	Medium	The study was conducted in 2011.
	Metric 6:	Spatial and Temporal Variability	High	Samples were collected at different intervals during different flow volumes. In general, there were 15 influent, 15 effluent, 8 primary sludge, and 6 waste activated sludge samples were collected in triplicate.
	Metric 7:	Exposure Scenario	Low	This study was focused on fate of methylsiloxanes so it did not explore exposure sources. Wastewater discharges is a relevant scenario for primarily the aquatic environment.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Raw data were not reported. The study reported the concentrations and standard deviation in Table 1.
	Metric 9:	Quality Assurance	High	The study reported adequate QA in the supplementary information.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	The study did not report gaps, limitations, or uncertainties related to the monitoring data.

Overall Quality Determination Medium

Study Citation:	Guo, J., Zhou, Y., Zhang, B., Zhang, J. (2019). Distribution and evaluation of the fate of cyclic volatile methyl siloxanes in the largest lake of southwest China. Science of the Total Environment 657:87-95.
HERO ID:	6833862

Domain	Metric		Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	The sampling methodology was described in detail for air, water, and sediment in the supplemental. Information was provided regarding site characteristics, equipment, storage conditions and duration, and citations to previously published methods.
	Metric 2:	Analytical Methodology	High	Analytical methods were thoroughly discussed for each media type that included descriptions of extraction, instrumentation, LOD/LOQ, and recoveries for each media. All this information is described in the supplemental.
	Metric 3:	Biomarker Selection	N/A	The authors analyzed the parent compound in air, water, and sediment samples.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Sampling was conducted in Southwest China.
	Metric 5:	Currency	High	Samples were collected in 2017.
	Metric 6:	Spatial and Temporal Variability	Medium	Twenty samples were collected for sediment, 34 samples for surface water (20 from Dian Lake and 14 from four of the main inflow rivers), and 40 for air. No replicates were reported.
	Metric 7:	Exposure Scenario	High	The data likely represent a relevant exposure scenario related to D4 contamination of Dian Lake, which is a major source of domestic, agricultural, and industrial water for surrounding communities.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	No raw data were reported. Figure 2 provides concentrations by sites. Main text on pg 4 provides summary statistics (mean and SD) for all sites combined.
	Metric 9:	Quality Assurance	High	QA/QC techniques were described in detail and included the use of control samples and acceptable recoveries.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Variability for all sites combined was characterized with SD in the main text. No uncertainties, limitations, or gaps were discussed.

Overall Quality Determination High

Study Citation:	Zhi, L., Zhang, C., Xu, L., He, X., Cai, Y. (2018). Occurrence and profiles of methylsiloxanes and their hydrolysis product in aqueous matrices from the Daqing oilfield in China. Science of the Total Environment 631-632:879-886.
HERO ID:	6833872

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	Pertinent sampling methodology was reported, including site characteristics, matrix characteristics, equipment, regimen, and sample conditions (i.e., 4C for up to 48 hr).
	Metric 2:	Analytical Methodology	High	Key analytical methods that were reported included the pretreatment/extraction, instrumentation (Agilent 7890A GC coupled with Agilent 5975C MS), LOQs (in supplemental), and recoveries.
	Metric 3:	Biomarker Selection	N/A	The study analyzed the parent chemical in surface water, wastewater, and sediment.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	This study was conducted in Daqing, China.
	Metric 5:	Currency	High	The samples were collected in 2015.
	Metric 6:	Spatial and Temporal Variability	Medium	There were 8 samples for each surface water and sediment from the reference area. Replicates were not reported.
	Metric 7:	Exposure Scenario	Medium	The study examined D4 concentrations near crude oil production areas. The samples collected from within the oilfield are not relevant, but samples in the reference area can be applicable to the general population.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Raw data for only surface water were reported in Table S7. Table 1 reported the mean, standard deviation, min, median, and max.
	Metric 9:	Quality Assurance	High	The study reported QA/QC techniques (e.g., procedural blanks, spiked samples, acceptable recoveries, duplicate analysis).
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Variance was characterized with SD, min, and max. However, tThe study did not report gaps, limitations, or uncertainties.

Overall Quality Determination High

Study Citation:	Xu, L., Shi, Y., Cai, Y. (2013). Occurrence and fate of volatile siloxanes in a municipal wastewater treatment plant of Beijing, China. Water Research 47(2):715-724.
HERO ID:	6833877

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	Key sampling methods were reported, including site and matrix characteristics, sampling procedure, compositing, and storage conditions.
	Metric 2:	Analytical Methodology	High	Key analytical methods reported (e.g., extraction methods, instrumentation, GC/MS, recoveries which are in the supplemental).
	Metric 3:	Biomarker Selection	N/A	The parent compound was analyzed in environmental media.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected from Beijing, China.
	Metric 5:	Currency	Medium	Samples were collected in 2011.
	Metric 6:	Spatial and Temporal Variability	Medium	A total of 26 aqueous and 24 sludge samples were collected at different times of the year. Replicates were not reported.
	Metric 7:	Exposure Scenario	Medium	The application of the sludge to land can inform soil concentrations.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Raw data were reported but not summary statistics.
	Metric 9:	Quality Assurance	Medium	Some QA/QC techniques were described in the supplemental, such as use of laboratory blanks and calibration.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Variance was not reported, although it was be calculated with the raw data. Few gaps and limitations were reported.
Overall Quality Determination			**Medium**	

Study Citation:	Radermacher, G., Rüdel, H., Wesch, C., Böhnhardt, A., Koschorreck, J. (2020). Retrospective analysis of cyclic volatile methylsiloxanes in archived German fish samples covering a period of two decades. Science of the Total Environment 706:136011.
HERO ID:	6833907

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	Some information was provided, such as location characteristics and species characteristics. Additional references are needed to fully evaluate this metric. A number of studies were cited as presented additional information on sampling, sample treatment, preparation, and storage. It is possible that one of thpse studies will provide all of the needed information: German Federal Environmental Agency, 2008; Gies et al., 2007; Klein et al., 2008; Fliedner et al., 2008; Wenzel et al., 2004; Subedi et al., 2012; Rudel et al., 2013; Kotthoff et al., 2019
	Metric 2:	Analytical Methodology	High	The analytical methodology included a description of extraction, instrumentation, LODs and LOQs by wet weight, and recoveries at three concentration levels.
	Metric 3:	Biomarker Selection	N/A	The authors analyzed the parent chemical in fish samples.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected in Germany.
	Metric 5:	Currency	High	Samples were collected from 1995 to 2017. Metric is rated based on the most recent sampling year.
	Metric 6:	Spatial and Temporal Variability	Medium	A total of 56 samples of bream fillets from the German Environmental Specimen Bank were analyzed for D4. Only selected replicates for analysis were reported.
	Metric 7:	Exposure Scenario	Medium	The data likely represent a relevant exposure scenario related to fish contaminated with D4 in Germany.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Summary statistics were not reported, but raw data are presented in Tables S4 and S5.
	Metric 9:	Quality Assurance	High	Method blanks and acceptable recoveries were reported at three different concentrations. The use of laboratory internal reference materials was also described in lieu of reference materials.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Variability was not characterized. Uncertainties and study limitations were not discussed.

Overall Quality Determination Medium

Study Citation: Biesterbos, J. W. H., Beckmann, G., Anzion Rob, B. M., Ragas Ad, M. J., Russel Frans, G. M., Scheepers Paul, T. J. (2014). Sensitive method for quantification of octamethylcyclotetrasiloxane (D4) and decamethylcyclopentasiloxane (D5) in end-exhaled air by thermal desorption gas chromatography mass spectrometry. Analytical Chemistry 86(12):5794-5799.

HERO ID: 6833923

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	The authors described the the sample collection procedure, sampler preparation, calibration, storage conditions and duration, among other pertinent methodologies.
	Metric 2:	Analytical Methodology	Medium	The instrumentation (TD-GC-MS), generation of calibration curves, and LOQ were reported. Recoveries were not reported.
	Metric 3:	Biomarker Selection	N/A	The study measured the parent chemical in exhaled air.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	Critically Deficient	The location of the participants/location of sample collection used in this study was not reported.
	Metric 5:	Currency	Low	The date of sample collection was not reported but the study was published in 2014.
	Metric 6:	Spatial and Temporal Variability	High	Samples were collected "in duplication from 15 consumers exposed to PCPs (regular use) and from the same consumers after they refrained from the use of PCPs for 24 hours."
	Metric 7:	Exposure Scenario	Low	This was mostly a methodological study and did not represent a real-world scenario.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	High	Raw data were reported in Table 3. Mean concentrations are reported in Results of Biological Monitoring.
	Metric 9:	Quality Assurance	Low	The study did not report QA/QC, including recoveries.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	The study did not report gaps, limitations, or uncertainties. A range can be determined based on the raw data.

Overall Quality Determination Uninformative

Study Citation:	Zhang, Z., Qi, H., Ren, N., Li, Y., Gao, D., Kannan, K. (2011). Survey of cyclic and linear siloxanes in sediment from the Songhua River and in sewage sludge from wastewater treatment plants, Northeastern China. Archives of Environmental Contamination and Toxicology 60(2):204-211.
HERO ID:	6833929

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	Study sites were described in detail. Other sampling methodology (e.g., equipment, storage) were only briefly discussed.
	Metric 2:	Analytical Methodology	High	Analytical methods that were described in detail included instrumentation, recoveries, LODs/LOQs, and citations to previously cited references.
	Metric 3:	Biomarker Selection	N/A	Parent compounds were measured in the environmental media.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Sediment samples were collected downstream of major cities along the Songhua River. Sludge samples were collected from WWTPs serving large cities located along the river.
	Metric 5:	Currency	Medium	Samples were collected in 2009.
	Metric 6:	Spatial and Temporal Variability	High	Eight sludge samples were collected from WWTPs and 25 sediment samples along the river.
	Metric 7:	Exposure Scenario	Medium	Sampling of river sediment downstream of large cities and from WWTPs serving them is potentially relevant.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Summary statistics are reported but raw data are missing.
	Metric 9:	Quality Assurance	High	QA/QC results included procedural blank, a spike blank, a matrix spike, and recoveries.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Variance was characterized with SD and ranges. Uncertainties, data gaps, and limitations were not discussed.

Overall Quality Determination Medium

Study Citation:	Li, Q., Hu, J., Lv, X., Ma, J., Wang, X., Wang, X. (2020). Typical indoor concentrations and mass flow of cyclic volatile methylsiloxanes (cVMSs) in Dalian, China. Chemosphere 248:126020.
HERO ID:	6833947

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	The sampling methodology describes all pertinent components (e.g., equipment, site characteristics, collection regimen, details of environmental parameters at the time of sampling). Samples were analyzed immediately after sampling.
	Metric 2:	Analytical Methodology	High	Detailed analytical methods were provided (e.g., instrumentation, sample preparation, calibration curves, LODs/LOQs, recoveries). The LODs/LOQs reported in the main text may contain a mistake as they report for both ENV+ cartridge (gas phase). Table S6 specifies that the LOD and LOQ for D4 in the particulate phase is 4.5 and 12 ng/m3, respectively. The LOD and LOQ in the gas phase is 5.3 and 12 ng/m3, respectively.
	Metric 3:	Biomarker Selection	N/A	The authors analyzed the parent compound in indoor and outdoor air samples.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected in Dalian, China.
	Metric 5:	Currency	High	Sampling happened in 2015.
	Metric 6:	Spatial and Temporal Variability	Medium	A total of 62 samples were collected, of which 24 where from indoor air of dormitories and 38 from the outdoor air. Indoor air samples were collected from 8 different dorms, and outdoor air from three different locations. In summary, there were 3-13 samples collected from each microenvironment. No replicates were collected.
	Metric 7:	Exposure Scenario	High	Data closely represent relevant exposure scenarios related to indoor and outdoor airborne D4 concentrations in Dalian, China. The population of interest are university students in dormitories, and the exposure source is presumed to be personal care products.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Only summary statistics were provided (averages, SD, ranges). Raw data were not reported.
	Metric 9:	Quality Assurance	High	QA/QC techniques were described in detail (e.g., procedural and field blanks, acceptable recoveries).
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Variability was characterized (range, SD, error bars). Uncertainties were discussed for the model, but not the monitored data.

Overall Quality Determination High

Study Citation:	Lee, D., Park, M. K., Lee, I. S., Choi, S. D. (2019). Contamination characteristics of siloxanes in coastal sediment collected from industrialized bays in South Korea. Ecotoxicology and Environmental Safety 182:109457.
HERO ID:	6833983

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	The sediment sampling methodology only briefly described the equipment and storage conditions. Site characteristics were described in detail. Other information was not provided.
	Metric 2:	Analytical Methodology	High	The analytical methods were described in detail and included recoveries, extraction, instrumentation, and the LOD.
	Metric 3:	Biomarker Selection	N/A	The authors analyzed parent chemical in sediment samples.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected from four industrialized bays in South Korea.
	Metric 5:	Currency	High	Sediment samples were collected in 2016.
	Metric 6:	Spatial and Temporal Variability	Medium	69 sediment samples were collected without replicates.
	Metric 7:	Exposure Scenario	Medium	Possible exposure to D4 through sediment contamination in the industrialized bay is potentially a relevant exposure scenario. Metric is not scored a high because most of the bay appears to be for industrial use, except for a stream that flows through a residential area.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Only summary statistics were reported (mean, SD, median, range). No raw data are available.
	Metric 9:	Quality Assurance	Low	QA/QC techniques were described in detail, but correction for low recoveries (54% for D4) was not explained.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Medium	Variability was characterized (SD, range). Limitations and uncertainties were briefly described.

Overall Quality Determination Medium

Study Citation:	Cui, S., Fu, Q., An, L., Yu, T., Zhang, F., Gao, S., Liu, D., Jia, H. (2019). Trophic transfer of cyclic methyl siloxanes in the marine food web in the Bohai Sea, China. Ecotoxicology and Environmental Safety 178:86-93.
HERO ID:	6834013

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Low	Few sampling methods were described as the authors cited a previously published paper by Ma et al., 2013 (Bioaccumulation and trophic transfer of PBDEs in a marine food web rom Liaodong Bay, North China).
	Metric 2:	Analytical Methodology	High	Key analytical methods were reported in the supplemental. MDLs and recoveries were in Section 3.1 of the main paper.
	Metric 3:	Biomarker Selection	N/A	The study tested for the parent chemical in biota.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	This study was conducted in the Bohai Sea, China.
	Metric 5:	Currency	Medium	The samples were collected in 2014.
	Metric 6:	Spatial and Temporal Variability	Medium	The study collected a total of 518 individual marine organisms to make up 151 samples. The number of zoo-plankton samples is presumably 3. No replicate samples collected.
	Metric 7:	Exposure Scenario	Medium	The potential consumption of the studied species is a relevant exposure scenario. The source can be inferred as the widespread use of D4 in industrial applications and consumer products. Overall, because the study's objective was to measure D4 in biota, there is missing information relevant to this metric.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Raw data were not reported. The study reported the mean and range.
	Metric 9:	Quality Assurance	High	The study authors reported most QA/QC techniques, such as field and procedural blanks, spiked sampling, methods to reduce contamination, and acceptable recoveries. Both the main text and the supplemental explain QA/QC techniques.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Medium	Variance was characterized by SD. The study authors described one uncertainty as the varying level of biota exposure because the location is ringed by multiple ports.

Overall Quality Determination — Medium

Study Citation:	Wang, X. M., Lee, S. C., Sheng, G. Y., Chan, L. Y., Fu, J. M., Li, X. D., Min, Y. S. (2001). Cyclic organosilicon compounds in ambient air in Guangzhou, Macau and Nanhai, Pearl River Delta. Applied Geochemistry 16(11-12):1447-1454.
HERO ID:	6834054

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	The air sampling methodology describes the equipment, sampling preparation and calibration, and site characteristics. However, sample storage conditions and duration were not reported.
	Metric 2:	Analytical Methodology	Low	The analytical methods briefly described the instrumentation and techniques but LOD/LOQs and recoveries were not reported.
	Metric 3:	Biomarker Selection	N/A	The authors analyzed the parent chemical in ambient air.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected from the Pearl River Delta in southern China.
	Metric 5:	Currency	Low	The air samples were collected in 1995 and 1996.
	Metric 6:	Spatial and Temporal Variability	Low	Across the three different cities and the different types of microenvironments within each one, 104 samples were collected. Each microenvironment, when specified had 2-32 samples. No replicates were reported.
	Metric 7:	Exposure Scenario	Medium	The data likely represent relevant exposure scenarios related to airborne D4 in South China. Exposure sources were hypothesized as industrial activities and personal care products.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Summary statistics (mean, SD, range) are provided in Table 3 by the different microenvironments. Raw data are not reported.
	Metric 9:	Quality Assurance	Low	QA/QC techniques were only briefly described.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Variability was characterized (SD). Limitations and uncertanties were not discussed.

Overall Quality Determination Low

Study Citation: Mcgoldrick, D. J., Durham, J., Leknes, H., Kierkegaard, A., Gerhards, R., Powell, D. E., Mclachlan, M. S. (2011). Assessing inter-laboratory comparability and limits of determination for the analysis of cyclic volatile methyl siloxanes in whole Rainbow Trout (Oncorhynchus mykiss). Chemosphere 85(8):1241-1247.

HERO ID: 6834476

Domain	Metric		Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	Sampling method described, including sample procedure, storage, and equipment.
	Metric 2:	Analytical Methodology	High	Analytical methods and procedures provided in Table S1. MDL and LOQ provided.
	Metric 3:	Biomarker Selection	N/A	Study measured parent chemical in fish samples.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	Critically Deficient	The text discusses sending samples to a Canadian center to be processed and dispersed to labs. However, the paper does not specify the location of the commercial fish farm where the fish samples were collected.
	Metric 5:	Currency	Low	No sampling date is provided. The paper was published in 2011.
	Metric 6:	Spatial and Temporal Variability	Medium	Each lab measured concentrations in 7 replicate subsamples. 4 fish were used for controls.
	Metric 7:	Exposure Scenario	Medium	This is a method development paper, however control fish taken from a commercial fish farm. The other fish were fed spiked food which is not PECO relevant.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	High	Summary statistics provided, including mean and SD. Concentrations by all labs provided in the SI.
	Metric 9:	Quality Assurance	High	Key QA/QC reported including blanks, recoveries, and baseline samples.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	High	Variation, such as SD, comparison to other labs and control were reported. Key uncertainties, limitations, and data gaps were discussed.

Overall Quality Determination Uninformative

Study Citation:	Li, Q., Lan, Y., Liu, Z., Wang, X., Wang, X., Hu, J., Geng, H. (2020). Cyclic volatile methylsiloxanes (cVMSs) in the air of the wastewater treatment plants in Dalian, China: Levels, emissions, and trends. Chemosphere 256:127064.
HERO ID:	6834672

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	Most necessary sampling methods (e.g., site characteristics, equipment, sampler calibration) were reported. The studydid not report sample storage conditions.
	Metric 2:	Analytical Methodology	Medium	The analytical instrumentation, methods, and LOD were reported. Recovery samples were not reported.
	Metric 3:	Biomarker Selection	N/A	The parent chemical was measured in the air above aeration tanks at WWTPs.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	The study was conducted in Dalian, China.
	Metric 5:	Currency	High	The samples were collected in 2016 and 2017.
	Metric 6:	Spatial and Temporal Variability	Medium	142 samples were collected. Replicate sampling was not reported.
	Metric 7:	Exposure Scenario	Low	Outdoor air is a media of interest, but exposure potential to air above an aeration tank is unclear. There was one background sample collected from a university roof that can be relevant to general population exposure.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Raw data were reported in Table S3, and summary statistics by site are in Table S4.
	Metric 9:	Quality Assurance	Medium	Some QA/QC techniques were reported in the supplemental.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Table S4 reported the variance by site (i.e., SD and range). However, the study reported few gaps, limitations, and uncertainties.
Overall Quality Determination			**Medium**	

Study Citation:	Borgå, K., Fjeld, E., Kierkegaard, A., Mclachlan, M. S. (2013). Consistency in trophic magnification factors of cyclic methyl siloxanes in pelagic freshwater food webs leading to Brown Trout. Environmental Science & Technology 47(24):14394.
HERO ID:	6834960

Domain	Metric		Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	Methods for each of the different types of species for which samples were collected from were detailed in the supplemental. Information included site and matrix characteristics, equipment, storage conditions (although missing duration), citation to previously cited methods, and methods to reduce contamination.
	Metric 2:	Analytical Methodology	High	The study authors reported all key analytical methods including the instrumentation, extraction, LOQ, and recoveries.
	Metric 3:	Biomarker Selection	N/A	The parent chemical was tested in aquatic biota.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	This study was conducted in two Norwegian lakes and one reference lake.
	Metric 5:	Currency	Medium	The samples were collected in 2012.
	Metric 6:	Spatial and Temporal Variability	Medium	The study authors collected >10 samples (the number of samples per species is reported in Table 1), but there were no replicate samples collected.
	Metric 7:	Exposure Scenario	Medium	The study was primarily a monitoring study of fish samples and did not explicitly explore exposure scenarios. However, scenario is likely relevant given that some of the sampled species are edible fish.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Raw data were reported in Table S12. The mean and SE by species were reported in Table 1.
	Metric 9:	Quality Assurance	Medium	QA/QC methods were detailed in both the main paper and supplemental.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Medium	The study authors reported few gaps, limitations or uncertainties.
Overall Quality Determination			**Medium**	

Study Citation:	Hong, W. J., Jia, H., Liu, C., Zhang, Z., Sun, Y., Li, Y. F. (2014). Distribution, source, fate and bioaccumulation of methyl siloxanes in marine environment. Environmental Pollution 191:175-181.
HERO ID:	6835730

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Low	The sampling methodology was described but some details were missing: storage conditions during sample collection and transportation, collection of fish and seawater, the type of fish species, and details about sampling equipment. Effluent was also collected from five WWTPs to determine a siloxane source to seawater, but no information was provided about the sampling of the effluent.
	Metric 2:	Analytical Methodology	High	Seawater and sludge samples were extracted with the same methods, while fish and sediment samples were extracted with a different one. All media used the same analytical techniques (Thermo Trace gas chromatograph coupled with a Polaris Q mass spectrometer). Detection limits and recoveries are in the supplemental.
	Metric 3:	Biomarker Selection	N/A	The authors analyzed the parent compound in environmental samples (surface seawater, sediment, fish, treated sewage effluent).
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected in Northeast China.
	Metric 5:	Currency	Medium	The samples were collected in 2011.
	Metric 6:	Spatial and Temporal Variability	Medium	The number of samples from 29 different sites varied by media (n=29 for seawater, n=20 for sediment, and n=6 for fish). No replicates were reported.
	Metric 7:	Exposure Scenario	Medium	The authors aimed to characterize the siloxane sources to the marine environment, which their data indicated are from urban areas. Environmental data of D4 in fish, sediment, and seawater are likely relevant scenarios.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Only summary statistics were reported (mean, range, SD).
	Metric 9:	Quality Assurance	High	QA/QC techniques were described in detail (e.g., instrument contamination tests, measures to reduce contamination, acceptable recoveries, field and procedural blanks, matrix spikes).
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Variability was characterized (range, SD). Uncertainties, limitations, and gaps were not discussed.

Overall Quality Determination Medium

Study Citation:	Lee, I., Rittmann, B. E. (2016). Using Focused Pulsed Technology to Remove Siloxane from Municipal Sewage Sludge. Journal of Environmental Engineering 142(1):04015056.
HERO ID:	6835742

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Low	Besides sample storage, temperature, and location, no other sampling methodology was reported.
	Metric 2:	Analytical Methodology	Low	Analytical method described, such as extraction method and analytical instrumentation; however, LOD not reported.
	Metric 3:	Biomarker Selection	N/A	Study measured parent chemical in municipal sewage sludge.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples collected in a Water Reclamation Plant located in Mesa, Arizona.
	Metric 5:	Currency	Low	The paper was published in 2016. No date of sample collection was provided.
	Metric 6:	Spatial and Temporal Variability	Critically Deficient	The paper discusses taking samples from the anoxic and aeration tanks, return activated sludge, and thickened mixed sludge. Triplicate batch tests were also prepared. However, the sample size was not reported nor can it be inferred.
	Metric 7:	Exposure Scenario	Low	The study mostly evaluated the economic costs of siloxane loading in biogas production. It is assumed that the wastewater sludge is used for biogas. Subsequent usage/application of the biogas is also unclear. Thus, little can be said regarding the relevance of this study to exposure.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Low	Raw data not reported and summary statistics are missing most parameters.
	Metric 9:	Quality Assurance	Medium	Little reporting of QA/QC. Calibration discussed, but no recoveries specific to this project.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Gaps and limitations not reported. Variation, such as SD and comparison to other studies, were reported.

Overall Quality Determination Uninformative

Study Citation:	Li, B., Li, W. L., Sun, S. J., Qi, H., Ma, W. L., Liu, L. Y., Zhang, Z. F., Zhu, N. Z., Li, Y. F. (2016). The occurrence and fate of siloxanes in wastewater treatment plant in Harbin, China. Environmental Science and Pollution Research 23(13):13200-13209.
HERO ID:	6835872

Domain	Metric		Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	Some sampling methods were described, such as equipment, procedure and frequency. However, no information was provided regarding storage conditions and duration.
	Metric 2:	Analytical Methodology	Medium	Analytical methods (e.g., instrumentation, sample extraction/treatment) were described, but LOQs and recoveries were only reported as a sum of all siloxanes.
	Metric 3:	Biomarker Selection	N/A	The study measured the parent chemical in wastewater influent, effluent, soil, and sludge, and air.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected from Harbin, China.
	Metric 5:	Currency	Medium	Samples were collected in 2012.
	Metric 6:	Spatial and Temporal Variability	Medium	Replicate sampling was not reported. For each media, the number of samples ranged from 8 to 36.
	Metric 7:	Exposure Scenario	Low	The exposure scenario for soil is not relevant because the soil originated from within the WWTP and its intended use was not explained. Wastewater influent, effluent, and surrounding air are potentially relevant, where the source is broadly explained as siloxane's widespread use in furniture, electronics, personal care products, and more.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Mean, min, and max were reported but not the raw data.
	Metric 9:	Quality Assurance	High	QA/QC techniques (e.g., use of blanks, matrix spikes, measures to avoid contamination) were described.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Variance was reported with a range, but gaps and limitations were not discussed.

Overall Quality Determination Medium

Study Citation:	Zhi, L., Xu, L., He, X., Zhang, C., Cai, Y. (2019). Distribution of methylsiloxanes in benthic mollusks from the Chinese Bohai Sea. Journal of Environmental Sciences 76:199-207.
HERO ID:	6836339

Domain	Metric		Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	Some sampling methodology was described but details on sampling frequency, storage duration, and equipment for sediment collection were missing.
	Metric 2:	Analytical Methodology	High	The analytical methods were described and included pretreatment and extraction methods, instrumentation, recoveries, and LOQ.
	Metric 3:	Biomarker Selection	N/A	The authors analyzed the parent chemical in mollusk and sediment samples.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected from Bohai Sea, China.
	Metric 5:	Currency	High	Samples were collected in 2015.
	Metric 6:	Spatial and Temporal Variability	Medium	A total of 205 mollusk 35 sediment samples were collected. However, replicates were not reported.
	Metric 7:	Exposure Scenario	Medium	The data likely represent relevant exposure scenarios related to mollusk and sediment contaminated with D4, but details about the population of interest were not reported.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Low	Only summary statistics were reported (mean, SD, min, median, max) for the mollusks, which are not relevant. For sediment, authors reported a total of 35 samples collected but Table 2 only shows seven samples, or one for each city. Presumably, samples for each of the city are a composite of five sediment samples. Given the uncertainty and lack of summary statistics, metric is being scored low.
	Metric 9:	Quality Assurance	High	QA/QC techniques included duplicate sample analysis, precautions to reduce cross contamination, procedural blanks, and acceptable recoveries.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Variability was not characterized but could be calculated. Uncertainties and limitations were not discussed.

Overall Quality Determination Medium

Study Citation:	Xu, L., Xu, S., Zhi, L., He, X., Zhang, C., Cai, Y. (2017). Methylsiloxanes release from one landfill through yearly cycle and their removal mechanisms (especially hydroxylation) in leachates. Environmental Science & Technology 51(21):12337-12346.
HERO ID:	6836342

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	Study collected samples from multiple matrices (biogas, influent/effluent of leachate storage pond and WWTP). The sample methods were described for each matrix, as well as site characteristics. Storage conditions and duration were not reported.
	Metric 2:	Analytical Methodology	High	The study described extraction, instrumentation, LOQs, and recoveries for air and gas samples.
	Metric 3:	Biomarker Selection	N/A	The study measured the parent chemical in landfill leachate, biogas, and WWTP influent and effluent.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	This study was conducted in Shandong Province, China.
	Metric 5:	Currency	High	Samples were collected in 2016.
	Metric 6:	Spatial and Temporal Variability	High	Thirty six samples each were collected from the landfill biogas, influents/effluents of the leachate storage pond, and influent/effluent of a WWTP within the landfill's catchment area and that treats the landfill's effluent. However, the WWTP's influent was sampled before mixing with the landfill's leachate. Therefore, the results of the WWTP's influent are not influenced by the landfill.
	Metric 7:	Exposure Scenario	Low	This study mostly focused on characterizing seasonal trends of siloxane emissions to landfill and evaluate possible removal mechanisms. As such, exposure scenarios, populations of interest, and sources were not relevant and not described.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Summary statistics were not provided but can be calculated from raw data in Tables S4 and S5.
	Metric 9:	Quality Assurance	High	The study authors reported QA/QC (e.g., procedural blanks, field blanks, acceptable recoveries) for air and aqueous samples.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	The study did not characterize variance nor report gaps, limitations, or uncertainties.

Overall Quality Determination Medium

Study Citation:	Shi, Y., Xu, S., Xu, L., Cai, Y. (2015). Distribution, Elimination, and Rearrangement of Cyclic Volatile Methylsiloxanes in Oil-Contaminated Soil of the Shengli Oilfield, China. Environmental Science & Technology 49(19):11527-11535.
HERO ID:	6836343

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Low	Most sampling methods were not reported aside from describing that the samples were stored in sealed glass tubes without headspace at -18C.
	Metric 2:	Analytical Methodology	Low	Extraction was done according to US EPA method 8015B. Analysis performed via GC-FID, 7890A, Agilent. LODs were reported by the total petroleum hydrocarbon content. However, it is unclear which value should be used for the references samples which are of primary interest in this study.
	Metric 3:	Biomarker Selection	N/A	The study measured the parent chemical in the media.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	This study was conducted in Shengli Oilfield in China.
	Metric 5:	Currency	Medium	Samples were collected between 2008 and 2013.
	Metric 6:	Spatial and Temporal Variability	High	Each year, eight samples were collected from the reference area for a total of 48 samples collected over the study period. No replicates were reported.
	Metric 7:	Exposure Scenario	Medium	Samples collected from within the vast oil field are not relevant. Samples from the reference area can be relevant as background levels despite its proximity to the oilfield.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Raw data were not reported. Mean and median were provided.
	Metric 9:	Quality Assurance	High	The study reported sufficient QA/QC, which included laboratory blanks, field blanks, and acceptable recoveries.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	The study did not report gaps, limitations, or uncertainties. A range was provided.

Overall Quality Determination Medium

Study Citation:	Guo, J., Zhou, Y., Cui, J., Zhang, B., Zhang, J. (2019). Assessment of volatile methylsiloxanes in environmental matrices and human plasma. Science of the Total Environment 668:1175-1182.
HERO ID:	6836347

Domain	Metric		Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	The sampling methodology was mostly adequate, except for some missing details on sampling equipment and sample storage duration.
	Metric 2:	Analytical Methodology	High	The analytical methods were described in detail in the supplemental. LOD/LOQs for each matrix are reported by chemical, as well as recoveries, are in the supplemental as well.
	Metric 3:	Biomarker Selection	N/A	The parent chemical was analyzed in the plasma samples.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected in Southwestern China.
	Metric 5:	Currency	High	Samples were collected in 2017.
	Metric 6:	Spatial and Temporal Variability	Medium	The authors collected 570 environmental samples (n=228 for gas-phase, n=228 for PM2.5, (n=57 for soil and dust each) and 270 plasma samples (n=100 from non-occupational group and n=170 for workers). Samples from workers and industrial sites are not relevant. Replicates were not reported.
	Metric 7:	Exposure Scenario	High	The data closely represent relevant exposure scenarios related to D4 exposure in southwestern China. Correlation studies for the general population support the association between D4 exposure and use of personal care products.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Summary statistics only reported for the sum of cyclic VMSs or require digitization. Individual sample concentrations were not reported.
	Metric 9:	Quality Assurance	High	QA/QC techniques were described in detail, including the use of field blanks, spiked samples, and acceptable recoveries.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Limited characterization was reported (range). Uncertainties were not discussed.

Overall Quality Determination High

Study Citation:	Xu, L., Huang, Z., Zhang, Q., Xiang, X., Zhang, S., Cai, Y. (2020). Methylsiloxanes and their brominated products in one e-waste recycling area in china: emission, environmental distribution, and elimination. Environmental Science & Technology 54(7):4267-4274.
HERO ID:	6836349

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	The methodology included a description of the studied areas, sampling equipment, storage conditions and duration. However, information about the e-waste recycling area is insufficient to conclude if there are any non-occupational activities.
	Metric 2:	Analytical Methodology	High	Pertinent analytical methods (e.g., instrumentation, calibration) were reported. LODs and recoveries were provided in Table S2.
	Metric 3:	Biomarker Selection	N/A	The study tested for the parent chemical in dust and soil.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	The study was conducted in China.
	Metric 5:	Currency	High	The study was conducted in 2018 to 2019.
	Metric 6:	Spatial and Temporal Variability	Medium	Among the samples that are relevant to exposure assessors, 48 were from surrounding soils, 10 from indoor dusts from resident residents, 10 from soil from a reference area without influence from the e-waste recycling area. Samples that are not relevant are the 31 indoor dust samples from recycling workshops and 20 samples from waste printed wiring board. Replicates were not reported.
	Metric 7:	Exposure Scenario	Medium	The exposure source is the e-waste recycling industry. Samples collected within the recycling area may be relevant because there could be residences from within in. Reference area is relevant to general population exposure, but possible sources of exposure for that environment were not discussed.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	High	The main text reports only the mean, but additional statistics can be calculated from the raw data in Tables S5 and S6.
	Metric 9:	Quality Assurance	High	QA/QC reported in the main text and supplemental.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	The study did not characterize variance nor report gaps, limitations, or uncertainties.

Overall Quality Determination High

Study Citation:	Horii, Y., Nojiri, K., Minomo, K., Motegi, M., Kannan, K. (2019). Volatile methylsiloxanes in sewage treatment plants in Saitama, Japan: Mass distribution and emissions. Chemosphere 233:677-686.
HERO ID:	6836350

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	All necessary sampling methods were reported, including characteristics of the nine STPs studied, equipment for grab or composite wastewater sampling (based on STP) and aeration gas, and storage conditions.
	Metric 2:	Analytical Methodology	High	Extraction methods, instrumentation (GC/MS), LOD/LOQ, and recoveries were provided for wastewater, sludge, incineration ash, and gas samples.
	Metric 3:	Biomarker Selection	N/A	The study tested for the parent chemical in environmental media.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	This study was conducted in Saitama, Japan.
	Metric 5:	Currency	Medium	Samples were collected between 2013 and 2014 (for sewage treatment plant #2).
	Metric 6:	Spatial and Temporal Variability	Medium	Composite (STP #2) or grab (STP1-9 except 2) samples were collected from nine sewage treatment plants. The study did not report replicate samples.
	Metric 7:	Exposure Scenario	Low	This study was focused on monitoring and treatment efficiency and did not examine specific sources of exposure.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Raw data were not reported. The study authors reported the mean, median, minimum, and maximum.
	Metric 9:	Quality Assurance	High	The study authors reported all key QA (e.g., field blanks, procedural blanks, recoveries which were acceptable).
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	The study did not report gaps, limitations, or uncertainties.

Overall Quality Determination Medium

Study Citation:	Schlabach, M., Andersen, M. S., Green, N., Schøyen, M., Kaj, L. (2007). Siloxanes in the environment of the inner Oslofjord (Statlig program for forurensningsoverv{\r{a}}king). :0-0.
HERO ID:	6989160

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	Sampling methodology is the same as that reported in TemaNord, 2005. (The link provided in References is broken, but source can be found by searching by name of publication). This cited publication corresponds to HERO ID 7002477, which scored a medium for this metric because of the uncertainty in whether the authors followed the recommended sampling methodologies exactly.
	Metric 2:	Analytical Methodology	Low	Analytical methods were described but limits of detection were not provided for each media type (i.e., biota, seawater, sediment, sewage sludge, and sewage water).
	Metric 3:	Biomarker Selection	N/A	The authors analyzed the parent chemical in environmental media.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected in Norway.
	Metric 5:	Currency	Medium	Sampling was conducted from 2004-2006, mostly in 2006.
	Metric 6:	Spatial and Temporal Variability	Low	Thirty samples were collected across all media type based on Table 2: four for sewage water, four for sludge, four for sea water, six for sediment, and the remainder for biota.
	Metric 7:	Exposure Scenario	Medium	Overall study aimed at confirming high concentrations in cod liver from a previous study and gaining a broad overview of siloxane contamination of the Inner Oslofjord. Samples are most relevant for background concentrations, and no population of interest was described.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Only reported individual sample concentrations and no summary statistics.
	Metric 9:	Quality Assurance	Low	Limited QA/QC techniques, specifically use of blanks and calibration, were described. The authors may have followed the same reference from HERO ID 7002477. However, no recoveries were provided in either studies.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Variance was not characterized but can be calculated from the raw data. Uncertainties were briefly discussed.

Overall Quality Determination — Medium

Study Citation:	Evenset, A., Leknes, H., Christensen, G. N., Warner, N., Remberger, M., Gabrielsen, G. W. (2009). Screening of new contaminants in samples from the Norwegian Arctic: Silver, platinum, sucralose, bisphenol A, tetrabrombisphenol A, siloxanes, phtalates (DEHP), phosphororganic flame retardants.
HERO ID:	6992056

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	The sampling methodology is clear and appropriate. All relevant details are included. Method is described on pages 15 to 20.
	Metric 2:	Analytical Methodology	High	The analytical methodology is clear and appropriate. Limits of detection are provided in each table.
	Metric 3:	Biomarker Selection	N/A	Study is testing parent chemical presence in the muscle of fish, liver of fish, whole fish, and liver of seabirds.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were taken in the Norwegian Arctic, in the Barents Sea and around Spitsbergen.
	Metric 5:	Currency	Medium	Samples were collected in 2004 and 2008.
	Metric 6:	Spatial and Temporal Variability	Medium	Number of samples varies by media; however, all scenarios have at least three samples. Sediment, fish and birds have at least 6 samples for chemicals of interest. Replicates are not reported.
	Metric 7:	Exposure Scenario	Low	The exposure scenario is not well characterized. Few details on the route of exposure are given.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	High	Raw data is presented in Tables 13, 14, and 15.
	Metric 9:	Quality Assurance	Low	QA/QC measures were not discussed and issues were not identified.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Characterization of variability is absent. No standard deviations or coefficients of variance were provided.

Overall Quality Determination Medium

Study Citation:	Bohlin-Nizzetto, P., Aas, W., Nikiforov, V. (2019). Monitoring of Environmental Contaminants in Air and Precipitation, 2018.
HERO ID:	6994279

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	Air samples were collected using high volume air samplers. All important details were reported and the methodology was scientifically sound.
	Metric 2:	Analytical Methodology	Low	Samples were spiked with internal standards, extracted, and quantified using UPLC-MSMS. All important details were reported and the methodology is scientifically sound. However, while LOD and LOQ were referenced throughout the report, the specific values of these limits were not reported.
	Metric 3:	Biomarker Selection	N/A	This study was testing for the chemical of interest in environmental media.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected in Norway.
	Metric 5:	Currency	High	Samples were collected in 2017-2018.
	Metric 6:	Spatial and Temporal Variability	Medium	Active air samples were collected over on a weekly basis over the course of a year. The number of samples per year was reported to be compound and site specific, between 12 and 52, but not explicitly reported for each compound. Further, use of replicates was not reported.
	Metric 7:	Exposure Scenario	High	Air samples were well characterized and highly relevant for possible exposure.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Raw data were not reported. Summary statistics included detection frequency and mean concentrations.
	Metric 9:	Quality Assurance	Medium	Analyses were carried out by NILU laboratories, which were accredited in accordance with NS-EN ISO/IEC 17025. QC measures included field and lab blank samples, but were not further explained.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Medium	Variability was characterized qualitatively over time. There was brief discussion of uncertainty inherent in the more newly developed procedures for "organic contaminants of emerging concern," but was not further explained.

Overall Quality Determination Medium

Study Citation:	Powell, D. E., Durham, J., Huff, D. W. (2010). Preliminary assessment of cyclic volatile methylsiloxane (cVMS) materials in surface sediments, cores, zooplankton, and fish of Lake Opeongo, Ontario, Canada. :0-0.
HERO ID:	6996285

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	The sediment, zooplankton and fish sampling methodology is described in detail. While storage duration was not reported, the level of detail available for other sampling aspects still warrants a high.
	Metric 2:	Analytical Methodology	High	The analytical methods were scientifically sound, including extraction, instrumentation (GC-MS, Agilent 6890 interfaced to an Agilent 5973), recoveries (top of pg 20 and Table 2) and LOD (Table 2).
	Metric 3:	Biomarker Selection	N/A	The authors analyzed the parent chemical in sediment, fish and zooplankton samples.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected from a relatively remote lake in Canada.
	Metric 5:	Currency	Medium	The samples were collected in 2007.
	Metric 6:	Spatial and Temporal Variability	Medium	A total of 31 samples were collected, 3 from zooplankton, 9 from surface sediment, and 5-7 from various fish species. Replicate sampling appeared to have been collected.
	Metric 7:	Exposure Scenario	Medium	The data likely represent a relevant exposure scenario related to D4 contamination of biota and sediment in Canada, but details about the population at exposure are missing.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Only summary statistics were reported (mean, SE). No raw data were provided.
	Metric 9:	Quality Assurance	High	QA/QC techniques were described in detail and results were reported.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Variability was characterized and uncertainties were discussed in detail. One of the primary uncertainties is the potential for contamination of fish samples. No field QC samples were collected, thus the extent of contamination during collection, storage, and shipment could be not assessed.

Overall Quality Determination Medium

Study Citation:	Powell, D. E., Woodburn, K. B., Drotar, K. D., Durham, J., Huff, D. W. (2009). Trophic dilution of cyclic volatile methylsiloxane (cVMS) materials in a temperate freshwater lake. :0-0.
HERO ID:	6996286

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	The fish, sediment and benthic macroinvertebrates sampling methodology was described in detail.
	Metric 2:	Analytical Methodology	High	The analytical methods were described in detail and included LOD and recoveries (Table 7).
	Metric 3:	Biomarker Selection	N/A	The authors analyzed the parent chemical in environmental samples (sediment, fish, macroinvertebrates)
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected from Lake Pepin, MN, USA.
	Metric 5:	Currency	Medium	Samples were collected in 2007 and 2008.
	Metric 6:	Spatial and Temporal Variability	Medium	25 sediment samples were collected, and 1-3 samples were collected from the various fish species.
	Metric 7:	Exposure Scenario	High	The data closely represent a relevant exposure scenario related to fish, macroinvertebrates, and sediment contamination with D4 in Lake Pepin, USA. Fish data will inform human exposure via fish consumption.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	High	Reported individual sample concentrations for sediment in Table 5b and pooled samples for fish species (i.e., no individual concentrations). Summary statistics and SDs were provided.
	Metric 9:	Quality Assurance	High	QA/QC techniques were described and included the use of field and procedural blanks.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Medium	Variability was characterized (SD). Uncertainties and limitations were briefly discussed.

Overall Quality Determination High

Study Citation:	Kim, J. (2018). Long-term research monitoring of octamethylcyclotetrasiloxane (D4) in Lake Ontario. trend analyses for sample collection years 2011-2016. :0-0.
HERO ID:	6997440

Domain	Metric		Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	Sampling methodology discussed for both sediment and biota, including sampling equipment, procedure, and storage conditions.
	Metric 2:	Analytical Methodology	High	Analytical method for both sediment and biota discussed, including extraction method and analytical instrumentation. Detection limits provided in the tables at the end by media and year/location.
	Metric 3:	Biomarker Selection	N/A	Study measured parent chemical in sediment and biota.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples collected in Lake Ontario. Based on visual interpretation, samples were collected from both the US and Canadian side.
	Metric 5:	Currency	High	Samples collected from 2011 to 2016.
	Metric 6:	Spatial and Temporal Variability	High	Sediments collected from 5 locations and sample size from each location reported in Tables 17-22. Sample size reported in Tables 2-9 for biota. Number of samples were high for each media; replicate samples were reported. Samples collected over multiple years.
	Metric 7:	Exposure Scenario	High	Long-term monitoring of sediment and biota from Lake Ontario to determine if D4 was stable or changing over a 5-year period.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Mean and S.D. provided in tables at the end. Raw data not provided.
	Metric 9:	Quality Assurance	Low	Paper discusses QC procedures, including field blanks and lab controls. No QC issues identified. However, recoveries were mentioned but not reported.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Medium	Variability discussed, including std and between-year variability. Uncertainty was not fully discussed except in terms of the possible need to extend the long term monitoring beyond the current study.

Overall Quality Determination High

Study Citation:	Kim, J. (2018). Long-term research monitoring of octamethylcyclotetrasiloxane (D4) in Lake Pepin. Trend analyses for sample collection years 2011-2016. :0-0.
HERO ID:	6997514

Domain	Metric		Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	Sampling methodology provided, including sampling equipment, procedure, and storage conditions.
	Metric 2:	Analytical Methodology	High	Analytical method was discussed, including extraction method and analytical instrumentation. Detection limit provided in the tables at the end of the document.
	Metric 3:	Biomarker Selection	N/A	Parent chemical measured in sediment and biota.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples collected in Lake Pepin, in the upper Mississippi River, in the Twin Cities area of Minnesota.
	Metric 5:	Currency	High	Samples collected from 2011 through 2016.
	Metric 6:	Spatial and Temporal Variability	High	Samples collected over 5 years. Sample size, all high, provided in tables at the end of the document. Replicate samples used.
	Metric 7:	Exposure Scenario	High	Measured sediment and biota in upper Mississippi River to perform a temporal analysis to determine if concentrations were stable or changing.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Mean and std deviation for concentrations provided in tables at the end of the document. Biota data provided broken down by species and year. Sediment provided by site and year. Raw data not provided.
	Metric 9:	Quality Assurance	Low	Study applied stringent QA/QC measures, including field and lab control samples. However, not all QA/QC results were provided such as recoveries.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Medium	Variance characterized by standard deviation. The study did not fully discuss uncertainties except in regard to whether more long-term monitoring is needed.

Overall Quality Determination High

Study Citation: Kim, J. (2018). Long-term research monitoring of octamethylcyclotetrasiloxane (D4) in the Inner Oslofjord. Trend analyses for sample collection years 2011-2016. :0-0.

HERO ID: 6997730

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	Sampling methodology discussed, including sampling equipment, procedures, and storage conditions.
	Metric 2:	Analytical Methodology	High	Analytical methodology was discussed, including extraction method and analytical instrumentation. Detection limits provided in tables at the end of the document.
	Metric 3:	Biomarker Selection	N/A	Parent chemical measured in biota and sediments.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected in Inner Oslofjord, Norway.
	Metric 5:	Currency	High	Samples were collected from 2011 through 2016.
	Metric 6:	Spatial and Temporal Variability	High	Samples were collected over 5 year period. Various fish species were collected and sediments collected from 5 locations. Tables at the end of the document provide the sample size which were high for the most part. Replicate samples used.
	Metric 7:	Exposure Scenario	High	Measured chemical in surface sediment and biota samples over 5-year period to determine if concentration stable or changing.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Mean and std deviation reported in tables at the end of the document. Biota data reported by species and year. Sediment data reported by core location and year. Raw data not provided.
	Metric 9:	Quality Assurance	Low	QA/QC control measures discussed, including field and lab control samples. However, the authors stated that detailed results for the QC programs will not be provided in this report but made available in individual laboratory report for each year of sample collection. As such, parameters like recovery was not reported.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Medium	Standard deviations are provided in the tables. Uncertainty was not fully discussed except in terms of needing to extend or not the long-term monitoring beyond the 5-years.

Overall Quality Determination High

Study Citation:	Lee, S. Y., Lee, S., Choi, M., Kannan, K., Moon, H. B. (2018). An optimized method for the analysis of cyclic and linear siloxanes and their distribution in surface and core sediments from industrialized bays in Korea. Environmental Pollution 236:111-118.
HERO ID:	6998301

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	Most sampling methods were reported, but some details were missing (e.g., specifics on equipment used to collect and slice sediment samples, storage duration).
	Metric 2:	Analytical Methodology	High	Key analytical methods were reported (e.g., extraction, instrumentation - GC/MS and GC/MS/MS, LOQ, and recoveries).
	Metric 3:	Biomarker Selection	N/A	Study measured parent chemical in sediment.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	This study was conducted in the Ulsan and Onsan Bays in South Korea.
	Metric 5:	Currency	High	The samples were collected in 2014 and 2015.
	Metric 6:	Spatial and Temporal Variability	Medium	42 surface sediments were collected without replicates.
	Metric 7:	Exposure Scenario	High	The study linked local industrialization with sediment concentrations of siloxanes, which is a relevant exposure pathway because of the connection to aquatic species.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Raw data were not reported. The study reported the mean, median, and range.
	Metric 9:	Quality Assurance	High	The study reported key QA, which includes use procedural blanks, blank correction, and acceptable recoveries.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	The study reported no gaps, limitations, or uncertainties.

Overall Quality Determination High

Study Citation:	NYIEQ, (2005). Indoor environmental quality: Assessing and mitigating the impact of exposure to multiple indoor contaminants. Phase I: Collection of multiple pollutants from indoor and laboratory evaluated sources (compiles). Final report.. :0-0.
HERO ID:	7002239

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	The study authors reported their sample equipment, collection regimen, storage condition and duration, as well as location characteristics. Sampling information provided in the Summary of Research Project Activities and on pg 18. Serum and urine samples were also collected, but the compounds measured in these matrices are not relevant. Pg 18 describes indoor air sample collection.
	Metric 2:	Analytical Methodology	Low	Recoveries and LODs/LOQs/MDLs were not reported. MDLs were only reported for particulate matter, nitrogen dioxide, and allergens.
	Metric 3:	Biomarker Selection	N/A	The study measured the parent chemical in the indoor air.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	The study was conducted in Syracuse, New York.
	Metric 5:	Currency	Low	Samples were collected between 2001 and 2004.
	Metric 6:	Spatial and Temporal Variability	High	Samples were collected from 150 homes, as reported on pg 37. Table B-3 only reports summary statistics for VOCs with high occurrence ratios (i.e., gather than 0.06).
	Metric 7:	Exposure Scenario	Medium	This was a monitoring study but there was limited linkages between the sources of exposures and concentrations.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Raw data were not reported by study authors. Median, mean, min and max were reported.
	Metric 9:	Quality Assurance	Low	Some QA/QC methods were discussed, including a QAPP that was submitted to an EPA project officer to review which ”conforms to EPA requirements for Quality Management Plans for organizations that receive funding from EPA.” However, no recoveries were mentioned.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Medium	Some gaps, limitations, and uncertainties were reported throughout the document. Min and max were provided to characterize variance.

Overall Quality Determination Medium

Study Citation:	Wang, D.,eGao, Du, J., Pei, W.,ei, Liu, Y., Guo, M. (2015). Modeling and monitoring cyclic and linear volatile methylsiloxanes in a wastewater treatment plant using constant water level sequencing batch reactors. Science of the Total Environment 512:472-479.
HERO ID:	7002250

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	The study reported necessary sample methods, including equipment, site characteristics, and storage conditions/duration.
	Metric 2:	Analytical Methodology	High	Analytical methods included a description of extraction techniques, instrumentation, LOQ (in SI), and recoveries (in SI).
	Metric 3:	Biomarker Selection	N/A	The parent compound was analyzed in WWTP influent, effluent, and sludge.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	This study was conducted in Dailan, China.
	Metric 5:	Currency	Medium	This study was conducted in 2014.
	Metric 6:	Spatial and Temporal Variability	Medium	Samples were collected from wastewater treatment plant for seven days. There were 7 samples each for influent, effluent, and sludge. Replicates were not reported.
	Metric 7:	Exposure Scenario	Low	The WWTP treats wastewater from homes and food processing facilities, which is the source for the WWTP. The WWTP then discharges to SW (Bohai Sea), which creates a possible exposure opportunity for general population using the water.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	High	Summary statistics (mean) were reported in the main text, while raw data were provided in Table S2.
	Metric 9:	Quality Assurance	High	Acceptable QA/QC was reported by the study authors.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Some limitations were reported for the modeling, but not the sample collection/monitoring data. The study did not report gaps or uncertainties either. Variance can be determined by the range or the SD calculated based on the raw data. Note that Table S2 provides an SD, but it is for each individual sample.

Overall Quality Determination Medium

Study Citation:	Green, N. W., Schøyen, M., Hjermann, D. Ø., Ruus, A., Lusher, A., Beylich, B., Lund, E., Tveiten, L., Håvardstun, J., Jenssen, M. T. S., Ribeiro, A. L., Bæk, K. (2021). Contaminants in coastal waters of Norway 2017, revised. NIVA-report :0-0.
HERO ID:	7002448

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Low	Coastal Atlantic cod were caught by local fisherman and prepared by NIVA, but specific methodology of sample preparation is not reported. Because specific methodologies are not reported, but sampling was carried out by a trusted authoritative source, this metric receives a low score.
	Metric 2:	Analytical Methodology	High	D4 was analyzed by Norwegian Institute for Air Research (NILU). Already established methods based on liquid/liquid extraction (Warner et al. 2010, 2012) were used to extract and quantify D4. Biota tissues were extracted using solid-liquid extraction with a biphasic solvent system of acetonitrile and hexane. Collected extracts from biota tissues were analyzed using concurrent solvent recondensation large volume injection gas chromatography mass spectrometry. LOQ is reported.
	Metric 3:	Biomarker Selection	N/A	This study was testing for the parent chemical of interest in biota along the coast of Norway, which would be considered environmental media relative to a human exposure scenario.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected in specific locations across Norway.
	Metric 5:	Currency	High	All sample types were collected between 2017 and 2018.
	Metric 6:	Spatial and Temporal Variability	Medium	Cod livers were analyzed from four sampling stations across Norway, which utilized a mixture of pooled and individual samples. These numbers are summarized in Table 21. Use of replicates was not reported.
	Metric 7:	Exposure Scenario	High	This study was testing for the parent chemical of interest in biota along the coast of Norway, which would be considered environmental media relative to a human exposure scenario. The coastal Atlantic cod represent a likely exposure source for the local population, based on catches from local fisherman being the source for these samples.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Raw data are not reported. Summary statistics presented in Table 21 include median and standard deviation for each sample type for each location.
	Metric 9:	Quality Assurance	Medium	Results considered acceptable by QUASIMEME Round 2017-1, corresponding to the analyses of the 2016-samples (Green et al. 2017 – M-856|2017). Internal QA/QC methods were reported to be used in each laboratory but not otherwise specified. Estimated uncertainty was reported to be 20%.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Medium	Quantitative characterization of variability is reported as standard deviation, and trends over time are discussed qualitatively in light of sampling from previous years. However, limitations or uncertainties are not robustly discussed.

Overall Quality Determination Medium

Study Citation:	Heimstad, E. S., Nygård, T., Herzke, D., Bohlin-Nizzetto, P. (2019). Environmental pollutants in the terrestrial and urban environment, 2018.
HERO ID:	7002451

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	Sampling methodology included location, number of samples. Date and sampling strategy were reported in section 2.1 and tables 2, 3, 4, and 5. Coordinates were reported in Appendix 2.
	Metric 2:	Analytical Methodology	High	LOD was reported in appendix 1, page 161 for a range of matrices. Analytical methodology for OPFR was reported in page 36.
	Metric 3:	Biomarker Selection	N/A	Analysis of D4 in a range of environmental samples included soil, eggs, and biological media.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Data were collected in Norway; locations coordinates were reported in Appendix 2.
	Metric 5:	Currency	High	Samples were collected in 2018.
	Metric 6:	Spatial and Temporal Variability	Medium	Number of samples per media were reported in table 2. The number of samples ranged from 5 to 10. Sample replicates were only reported for analytical methods.
	Metric 7:	Exposure Scenario	High	Analysis was conducted for next 20 chemicals in several trophic levels of a terrestrial food web in Norway. It closely represented relevant exposure scenario.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	High	Individual data points were reported in appendix 1. Summary data of siloxanes were reported in table 15 (mean, min and max) and figure 12. Detection rate was reported in table 6.
	Metric 9:	Quality Assurance	High	QA was well described in page 36. The study used SRM, laboratory blanks, procedural blanks, replicates and field blanks.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	High	Recommendations for continuing the monitoring program were reported in page 104. Sample variability for D4 was reported in figure 12.

Overall Quality Determination High

Study Citation:	Horii, Y., Motegi, M., Minomo, K., Ohtsuka, N., Nojiri, K., Yamashita, N. (2016). Annual profiles of volatile methylsiloxanes in atmospheric environment in Saitama, Japan. Organohalogen Compounds 78:986-989.
HERO ID:	7002456

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	Sampling methodology was described, including procedures, location, equipment, and calibration.
	Metric 2:	Analytical Methodology	Low	Analytical methodology was discussed, including instrumentation and recovery samples. Only a MDL range provided. The specific MDL for D4 was not provided.
	Metric 3:	Biomarker Selection	N/A	Study measured parent chemical in ambient air.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples collected at the Center for Environmental Science in Saitama, Japan.
	Metric 5:	Currency	High	Samples collected from February 2014 to February 2015.
	Metric 6:	Spatial and Temporal Variability	Low	The exact sample size was not reported, but it can be inferred that about 52 samples were collected based on the statement that "One day sampling collected every week for a year." Replicate analysis was performed, but replicate sampling was not reported.
	Metric 7:	Exposure Scenario	High	Samples collected from ambient air in Japan. Relevant exposure population will be the general population.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Raw data were not provided. Some summary statistics - the mean and range - were provided.
	Metric 9:	Quality Assurance	High	QA/QC discussed, including recoveries and procedural blanks.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Medium	Few uncertainties were described. The study's results were compared to other studies, but minimal data variance was provided besides the range.

Overall Quality Determination Medium

Study Citation:	Norwegian Environment Agency, (2019). Monitoring of environmental contaminants in freshwater ecosystems 2018 - Occurrence and biomagnification.
HERO ID:	7002468

Domain	Metric		Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	The sampling methodology including equipment, location and time is reported in section 2.1 on page 20.
	Metric 2:	Analytical Methodology	Medium	Analytical methodology for siloxanes is reported on page 22, section 2.2.3. LOD is reported in appendix A (raw data for 2018).
	Metric 3:	Biomarker Selection	N/A	Concentrations of D4 were measured in zooplankton, Mysis, E.smelt, Vendance and Brown trout.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples was collected in Lake Mjosa and Lake Femunden in Norway. Location coordinates is reported in table 1 and table 2.
	Metric 5:	Currency	High	Samples were collected in 2018.
	Metric 6:	Spatial and Temporal Variability	Medium	Number of samples ranged from 3-15 and there were no sample replicates.
	Metric 7:	Exposure Scenario	High	D4 concentrations in a freshwater ecosystems in two large lakes in Norway. One lake had several sources of contamination including urban, industrial, wastewater treatment plans and agricultural. The other lake did not have any important contamination sources.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	High	Raw data reported in Appendix A. Summary of statistics reported in table 9 and figures 11, 12, and 13. Detection frequency reported in Table 4.
	Metric 9:	Quality Assurance	Medium	The study doesn't report clear QA/QC procedures, but it can be implied by the use of standardized methods by the Norwegian Institute for Water Research.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Medium	Key limitations are not reported and variability for D4 in 2018 is reported in boxplots in figure 11.

Overall Quality Determination High

Study Citation:	Kaj, L., Andersson, J., Cousins, A. P., Remberger, M., Brorström-Lundén, E., Cato, I. (2005). Results from the Swedish National Screening Programme 2004. Subreport 4: Siloxanes. :0-0.
HERO ID:	7002474

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	Sampling followed a predefined methodology, which was not provided. Only brief descriptions of each methodology was presented, including equipment and some other elements (e.g., storage conditions, sampling duration) that varied by media.
	Metric 2:	Analytical Methodology	Low	Analytical methodology discussed; however, only LODs for fish muscle (Table 14) and milk (pg 2) were provided.
	Metric 3:	Biomarker Selection	N/A	Study measured parent chemical in air, water, sediment, fish muscle, sludge and breast milk.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected in Sweden.
	Metric 5:	Currency	Medium	Samples were collected for the 2004/2005 national screening program.
	Metric 6:	Spatial and Temporal Variability	Medium	138 samples were collected for air, water (n=6?), sludge (n=54), sediment, and fish. In addition, 49 samples of human milk were collected. No mention of replicates.
	Metric 7:	Exposure Scenario	High	Data represent concentration at a national level in various ambient media. Microenvironment/matrix provided in Tables at the end of the document.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Only some summary statistics were provided (i.e., mean and average for sludge samples from regional and national program in Table 15). However, summary statistics can be calculated using the raw data provided in Table A3 - A5.
	Metric 9:	Quality Assurance	Low	QA/QC not discussed in detail. Limited discussion of method blanks, field blanks, and calibrations.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	No discussion of uncertainty or variance. Limited discussion of variation in samples (such as air and sludge)

Overall Quality Determination Medium

Study Citation:	Norwegian Environment Agency, (2019). Environmental contaminants in an urban fjord, 2018.
HERO ID:	7002475

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	Table 1 gives an overview of the samples collected, matrix, locality, frequency and No. for analysis.
	Metric 2:	Analytical Methodology	High	Siloxanes analysis reported in section 2.2.7 page 25. LOD for D4 reported in table 12 for herring gull blood and eggs.
	Metric 3:	Biomarker Selection	N/A	D4 measured in code liver (table 11), herring gull blood and egg (table 12), storm water and effluent water (table 14).
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples collected in Oslofjord, Oslo, Norway. Figure 1 A and B reports the sample location.
	Metric 5:	Currency	High	Sampling was conducted in 2018.
	Metric 6:	Spatial and Temporal Variability	Medium	No sample replicates reported, sample size ranged from 1 (composite of 4 grabs) to 15 (see table 1).
	Metric 7:	Exposure Scenario	High	Monitoring of the anthropogenic chemicals discharged into a fjord system and the implications on the fjord ecosystem, including food web, water and sediment.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Low	Raw data is not reported, data reported as range and mean for blood and egg samples, water and sediment reported as one data point.
	Metric 9:	Quality Assurance	Low	Recoveries are not reported, the laboratories that conducted the study are accredited for the analysis of siloxanes and reports field blanks.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Variability reported in terms of matrices, key limitations not reported.

Overall Quality Determination Medium

Study Citation:	Kaj, L., Schlabach, M., Andersson, J., Cousins, A. P., Schmidbauer, N., Brorström-Lundén, E. (2005). Siloxanes in the Nordic environment. TemaNord :593.
HERO ID:	7002477

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	The sampling methodology was described in detail in Appendix 3. Section 4.1 describes the sampling sites. While authors did not explicitly indicate their storage conditions and duration, the sampling manual in Appendix 3 provides recommendations; presumably the authors followed those guidelines.
	Metric 2:	Analytical Methodology	Medium	The analytical methods were described in detail, including extraction and instrumentation. However, recoveries were not provided. LOD/LOQ values were unclear for some of the media. There is also a frequent mention of individual LOQs in Appendix 2 that couldn't be found. LOD/LOQ were scattered throughout the report.
	Metric 3:	Biomarker Selection	N/A	The authors analyzed the parent chemical in environmental media (sludge, sediment, water, air, biota).
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected from the Nordic countries: Denmark, Faroe Islands, Finland, Iceland, Norway, Sweden.
	Metric 5:	Currency	Medium	Sampling occurred during 2003-2005 (varied by media and location, observed in Table A2).
	Metric 6:	Spatial and Temporal Variability	Medium	Sample size includes 24 air samples, 2 soil samples, approximately 78 samples between sludge and water (which includes influent, effluent, landfill, seawater, a few surface water), 11 marine fish, 10 freshwater fish, 7 marine fish, 17 seabird eggs. The number of samples not reported but raw data provided. No replicates reported.
	Metric 7:	Exposure Scenario	High	The data closely represent relevant exposure scenarios related to D4 contamination of environmental media in Nordic European countries.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Low	Individual data points were reported. Summary statistics were mostly missing.
	Metric 9:	Quality Assurance	Low	QA/QC techniques were described in detail, including the use of laboratory and field blanks. Recoveries were not mentioned.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Variability was characterized with IQR and error bars only for sludge. Uncertainties were not discussed.

Overall Quality Determination Medium

Study Citation:	Sanchís, J., Martínez, E., Ginebreda, A., Farré, M., Barceló, D. (2013). Occurrence of linear and cyclic volatile methylsiloxanes in wastewater, surface water and sediments from Catalonia. Science of the Total Environment 443:530-538.
HERO ID:	7002481

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	The sampling methodology was described and included site characteristics, sampling frequency, equipment, and storage conditions.
	Metric 2:	Analytical Methodology	High	The analytical methodology included a description of extraction methods, instrumentation, LODs, and recoveries.
	Metric 3:	Biomarker Selection	N/A	Parent chemical analyzed in environmental media (water and sediment).
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected in Spain.
	Metric 5:	Currency	Medium	Samples were taken in 2011.
	Metric 6:	Spatial and Temporal Variability	Medium	Three samples each were collected from 17 wastewater treatment plants, six from river water, and six from sediment. Replicates were not reported.
	Metric 7:	Exposure Scenario	High	Data represent relevant exposure scenarios related to D4 in sediment and water impacted by wastewater effluent released to the environment in Spain.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Summary statistics across all 17 WWTPs were provided but not their associated variance. For individual WWTP, it appears that the researchers collected three samples from each and reported a central tendency value for the three combined. Because the above is not entirely clear, and, strictly speaking, not raw data, this metric is being rated as medium. Raw data but no summary statistics were provided for surface water and sediment samples.
	Metric 9:	Quality Assurance	High	QA/QC techniques were described in detail, including the use of validation experiments, blanks, and spiked samples.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Medium	Variability was characterized (SD) and study limitations were briefly discussed.

Overall Quality Determination High

Study Citation:	Heimstad, E. S., Nygård, T., Herzke, D., Bohlin-Nizzetto, P. (2018). Environmental pollutants in the terrestrial and urban environment, 2017.
HERO ID:	7296058

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	All sample collection (air, soil, terrestrial biota) included adherence to a publicly available SOP that is scientifically sound and widely accepted, "Guidelines for field work in connection with environmental monitoring" (JAMP; OSPAR, 2009).
	Metric 2:	Analytical Methodology	Low	Samples were analyzed by accredited laboratories (NINA, NIVA, and NILU), so it is assumed that scientifically sound analytical methods were conducted. Procedures are described on pages 36-39. However, while LOD and LOQ are referenced throughout the report, the specific values for these limits are not stated.
	Metric 3:	Biomarker Selection	N/A	The study tested for the parent chemical in environmental media (air, soil, terrestrial biota).
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected in Oslo, Norway.
	Metric 5:	Currency	High	The samples were collected in 2017 (June to September).
	Metric 6:	Spatial and Temporal Variability	Medium	Air, soil, and terrestrial biota samples were collected from up to 10 locations in Oslo, Norway. Number of samples for each sample type ranged from 3 to 10, and specific sample number and sampling strategy (e.g., pooled vs. individual) are reported for each. However, use of replicates was not reported.
	Metric 7:	Exposure Scenario	High	This study collected air, soil, and terrestrial biota samples from well documented areas around Oslo, Norway to characterize concentrations of the chemical of interest in several trophic levels of a terrestrial food web. As a result, the context of each sample type is well documented and easily extrapolated to other scenarios.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	High	Raw data is reported in Appendix 1 pages 195 to 199. Summary statistics were described in text on pages 94-98, including mean, median, minimum, and maximum concentrations, where applicable.
	Metric 9:	Quality Assurance	High	Applied QA/QC measures by following recommendations of the Arctic Monitoring and Assessment Programme (AMAP) and the requirements in the European quality norm EN 17049. Additionally, samples were analyzed by accredited laboratories (NINA, NIVA, and NILU).
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Variability is characterized for certain samples in text on pages 94-98. Uncertainty is briefly discussed regarding the application of uptake rates to passive air samplers. Additionally, uncertainty in air samples is noted, as "D4 cannot be compared to background air as the adsorbent used in active air samplers at the background site do not give trustworthy results for D4." This introduces moderate uncertainty in the results, meriting a low score.

Overall Quality Determination High

Study Citation:	Lee, S., Moon, H. B., Song, G. J., Ra, K., Lee, W. C., Kannan, K. (2014). A nationwide survey and emission estimates of cyclic and linear siloxanes through sludge from wastewater treatment plants in Korea. Science of the Total Environment 497:106-112.
HERO ID:	7296367

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	Sampling methodology provided, including sampling equipment, procedure, storage, and calibration. Study site characteristics provided in Table S1.
	Metric 2:	Analytical Methodology	Medium	Analytical methods sufficiently provided, including analytical instrumentation and calibration. Only a range for the LOQ for all 5 cyclic siloxanes was provided, rather than an LOQ by individual chemicals.
	Metric 3:	Biomarker Selection	N/A	Study measured parent chemical in sludge.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples collected in Korea.
	Metric 5:	Currency	Medium	Samples collected from July-October 2011.
	Metric 6:	Spatial and Temporal Variability	Medium	40 samples were collected from 40 WWTPs. Representative samples taken from each WWTP in three consecutive days and homogenized. No replicates were reported.
	Metric 7:	Exposure Scenario	High	Data represent exposure from domestic, industrial, and mixed WWTPs.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Raw data not indicated in the main document. Summary statistics provided in Table 1, including mean, median, and range.
	Metric 9:	Quality Assurance	Medium	Key QA/QC were reported including use of procedural blanks and recoveries. However, recoveries only reported for D5 which was used as the surrogate standard and spiked into each sample.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Medium	Characterized variability between domestic, industrial, and mixed WWTP sludges. Also compared results to other studies. Range reported to characterize data variance. There is no discussion of uncertainty, gaps in the study, or limitations.

Overall Quality Determination Medium

Study Citation:	Simon, P. B., Paulson, E. B. (1985). Organosiloxanes in fresh water and salt water sediments. :0-0.
HERO ID:	7303019

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	Sampling methodology discussed, including equipment, study site characteristics, and storage conditions.
	Metric 2:	Analytical Methodology	Medium	Analytical methodology discussed, including extraction method, instrumentation, and calibration. The LODs are not reported but can be inferred by the results tables (<0.05 mg/kg in sediment and <0.5 ug/L in WWTP samples).
	Metric 3:	Biomarker Selection	N/A	This paper measured parent chemical in sediment and WWTP samples.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Sediment collected from Curtis Bay, Delaware and Potomac Rivers, the Great Lakes, and Saginaw Bay. WWTP samples collected in Washington, DC, Ann Arbor, and Detrioit.
	Metric 5:	Currency	Low	Per Tables at the end of the document, samples collected in 1985.
	Metric 6:	Spatial and Temporal Variability	Medium	Sediment samples collected from 6 locations: three grab samples from each location; 2 grab samples from dredged soil; and 3 WWTP sampled. 50 subsamples taken from each of the 24 solid samples. No replicate samples were reported.
	Metric 7:	Exposure Scenario	High	Sediment samples collected from various freshwater and saltwater waterbodies/waterways. Samples of WWTP sludge also taken.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	No summary statistics but raw data were presented in Tables 1-3.
	Metric 9:	Quality Assurance	Low	QC discussed and Tables 4-7 provide analysis of QC analysis. Recovery was under 70% for several samples but there was no discussion of how that was addressed.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Variability minimally discussed. Results section compares results to another study. Gaps and limiations not reported.

Overall Quality Determination Medium

Study Citation:	COWI AS, (2018). Screening programme 2017: Suspected PBT compounds. :0-0.
HERO ID:	7303021

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	High	The sampling methodology is clear and appropriate. Details such as sample storage, sampling protocol, and sampling personnel were described.
	Metric 2:	Analytical Methodology	Low	The analytical methodology is clear and appropriate; however, the LOQ is not provided. The calculation to obtain the LOQ is described, but the LOQ itself is not given.
	Metric 3:	Biomarker Selection	N/A	Study is testing for parent chemical in an environmental media.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected in Norway.
	Metric 5:	Currency	High	Samples were collected in 2017.
	Metric 6:	Spatial and Temporal Variability	Critically Deficient	Samples size is not provided for all media.
	Metric 7:	Exposure Scenario	Medium	The exposure scenario is the parent chemical in marine and freshwater environments. Although this is a scenario of interest, the exposure pathway is not well characterized.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	High	Data are provided in the attachments section. Some of the data is clearly raw data; while other data are unclear.
	Metric 9:	Quality Assurance	Medium	The use of controls and blanks is reported in the methods and results section. QA/QC issues were not identified.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	The characterization of variability is absent. No standard deviations were provided.

Overall Quality Determination Uninformative

Study Citation:	Goldschmidt Chemical, (2005). Letter: Re: TSCA Section 8e: Notification of substantial risk; detection of decamethylcyclopentasiloxane and octamethylcyclotetrasiloxane in the tissue of fish from the Rhine River in Germany.
HERO ID:	7307183

Domain	Metric		Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Critically Deficient	The sampling methodology was not discussed. Authors indicated that the samples were not collected as part of any environmental monitoring studies and good laboratory practices related to sample collected were not followed. The samples were collected as part of analytical method development.
	Metric 2:	Analytical Methodology	Critically Deficient	The analytical methods were not described.
	Metric 3:	Biomarker Selection	N/A	The authors analyzed the parent compound in fish samples.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected in Germany.
	Metric 5:	Currency	Low	The document was published in 2005. Sample collection time was not provided.
	Metric 6:	Spatial and Temporal Variability	Low	Results were reported for eleven samples. That is presumably the number of samples, but it could be higher if there was compositing.
	Metric 7:	Exposure Scenario	Low	The data may represent a relevant exposure scenario related to D4-contaminated fish in Germany but the lack of methodological details limit the results' interpretation and validity.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Only individual sample concentrations were reported. Summary statistics were not reported.
	Metric 9:	Quality Assurance	Low	QA/QC techniques were not discussed.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Variance was not characterized. Uncertainties and limitations were not discussed.

Overall Quality Determination Uninformative

Study Citation:	Evonik Goldschmidt GmbH, (2009). Measurements of food-web related data on cVMS distribution in environmental samples collected in Oslo Fjord.
HERO ID:	7307354

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	The sampling methodology was adequately described for sediment and fish, but some information like sample site characteristics were missing.
	Metric 2:	Analytical Methodology	Medium	The analytical methods were described but recoveries were missing and detection limits were only provided for cod and shrimp. However, authors explained that the expected concentrations in fish were far above the detection limits, thus other species were not evaluated.
	Metric 3:	Biomarker Selection	N/A	The authors analyzed the parent chemical in sediment, air, and marine animal.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected in Norway.
	Metric 5:	Currency	Medium	Sampling was conducted in 2008.
	Metric 6:	Spatial and Temporal Variability	Low	The sample size was not reported but can be estimated based on the raw data in Tables 4 and 5 for fish and Table 6 for sediment. There are at least 27 and 14 samples for fish and sediment, respectively.
	Metric 7:	Exposure Scenario	Medium	The data may represent a relevant exposure scenario related to D4 contamination of marine animals and sediment.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	It seems that only individual sample concentrations were reported.
	Metric 9:	Quality Assurance	Low	QA/QC techniques were described but recoveries were not mentioned.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Variability was not characterized. Uncertainties were briefly discussed.

Overall Quality Determination Medium

Study Citation:	Dow Corning, (2009). Contributing scientist report: analytical results cyclic volatile methylsiloxanes (cVMS) in biota and sediment obtained from Oslofjord, Norway.
HERO ID:	7307355

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Low	The sampling methodology is not well described. Sample collection is not reported, but other details such as sample storage are provided. Samples were collected from the Norwegian Institute for Water Research - a research organization that presumably had sound methodology.
	Metric 2:	Analytical Methodology	High	The analytical methodology is clear and appropriate, including thorough discussion of how samples from different media were prepared and analyzed. LODs are reported on page 13 and Table 5.
	Metric 3:	Biomarker Selection	N/A	Study is testing for the parent chemical in an environmental media.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples were collected in Norway.
	Metric 5:	Currency	Medium	Samples were collected in 2008.
	Metric 6:	Spatial and Temporal Variability	Medium	Each scenario has 1 to 6 samples.
	Metric 7:	Exposure Scenario	Medium	The exposure scenario is D4 in aquatic species and ocean sediments. This scenario is of interest for the chemical, but exposure sources and population of interest - even a very broad discussion - was not provided.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Raw data is provided in Tables 2 and 3, but no summary statistics were reported.
	Metric 9:	Quality Assurance	High	The use of quality control methods, controls, and field blanks is reported.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	The characterization of variability is absent. No measures of variance or discussion of uncertainty is present.

Overall Quality Determination Medium

Study Citation:	Dow Corning, (2015). Non-regulated study: Screening monitoring of trimethylsilanol and dimethylsilanediol in river water, lake water, and waste water treatment plant effluent.
HERO ID:	9644511

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	Sampling methodology described in terms of sampling equipment, procedures, study site characteristics and sample storage conditions. Details regarding duration of sample storage prior to analysis lacking.
	Metric 2:	Analytical Methodology	High	Limits of detection and quantification reported for DMSD. Analytical methodology noted in terms of instrumentation, calibration, extraction and recoveries.
	Metric 3:	Biomarker Selection	N/A	Sampling for parent chemical of interest in environmental media.
Domain 2: Representativeness				
	Metric 4:	Geographic Area	High	Samples described as collected from Spring Creek, Lake Pepin and Red Wing WWTP in Minnesota, USA.
	Metric 5:	Currency	Medium	Sampling dates reported as October of 2014.
	Metric 6:	Spatial and Temporal Variability	Medium	Sampling conducted only over a period of one month in 2014 for n=12 river water, n=14 lake water and n=14 WWTP samples. Replicate sampling not conducted. Lake water samples described as taken from two different sites (coordinates provided within PDF) at depths of at least 10 cm.
	Metric 7:	Exposure Scenario	Medium	This is a Screening monitoring study of dimethylsilanediol (DMSD) in river water, lake water and wastewater treatment plant (WWTP) effluent in Minnesota. Exposure sources detailed briefly as Spring Creek samples near surrounding agricultural area with biosolids, Lake Pepin fed by Spring Creek, and Red Wing WWTP fed by nearby tannery and food processing waste sites.
Domain 3: Accessibility/Clarity				
	Metric 8:	Reporting of Results	Medium	Raw data not reported. Data reported in Table 1 with means and standard deviations. Number of samples reported in Table 1 as n=12 river water, n=14 lake water and n=14 WWTP samples. Frequency of detection not noted.
	Metric 9:	Quality Assurance	Medium	Quality assurance discussed with use of field and trip blanks reported. Recoveries not reported.
Domain 4: Variability and Uncertainty				
	Metric 10:	Variability and Uncertainty	Low	Variability of results reported within statistical summary measure of standard deviation. Potential study limitations not detailed.

Overall Quality Determination Medium

Study Citation:	Horii, Y., Kannan, K. (2008). Survey of Organosilicone Compounds, Including Cyclic and Linear Siloxanes, in Personal-Care and Household Products. Archives of Environmental Contamination and Toxicology 55(4):701-710.
HERO ID:	6833916

Domain	Metric		Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology and Conditions	Medium	Most necessary sampling methods were reported by the the study authors. However, the study authors did not report the sample storage conditions or duration.
	Metric 2:	Analytical Methodology	High	Instrumentation, extraction, LOQ (351 ng/g for D4) and recoveries were reported.
	Metric 3:	Biomarker Selection	N/A	The authors tested the parent compound in consumer products.
Domain 2: Representative				
	Metric 4:	Testing Scenario	Medium	Testing for concentrations in consumer products represents a relevant exposure scenario.
	Metric 5:	Sample Size and Variability	High	13 relevant household product samples were collected (the remainder of the samples were for personal care products). Table 1 shows sample counts by product type.
	Metric 6:	Temporality	Medium	This study was conducted in 2006.
Domain 3: Accessibility/Clarity				
	Metric 7:	Reporting of Results	Medium	The study reported the median, mean, and range in Table 3 and stratified by the consumer product type. Raw data were not reported.
	Metric 8:	Quality Assurance	High	QA/QC were mostly reported, including acceptable recoveries, spiked samples, procedural blanks, and checking for instrumental background, carryover, and stability.
Domain 4: Variability and Uncertainty				
	Metric 9:	Variability and Uncertainty	Low	The study did not report gaps, limitations, or uncertainties. Variance characterized by range.

Overall Quality Determination Medium

Study Citation:	U.S. EPA, U.,.S.G.S. and National Water Quality Monitoring Council (2022). Octamethylcyclotetrasiloxane (D4) (CAS RN: 556-67-2): WQP Output (NWIS, STEWARDS {\&} STORET), Site data {\&} sample results (physical/chemical metadata).
HERO ID:	10709397

Domain		Metric	Rating	Comments
Domain 1: Reliability				
	Metric 1:	Sampling Methodology	Medium	Sampling methodology information is provided in columns AF to AJ, including the sampling method code and the equipment used. No information was provided on transportation or storage conditions for any sample.
	Metric 2:	Analytical Methodology	High	Description of the methods reported in column BQ and detection limit in column BY. A detection limit was not provided for all samples. While there is heterogeneity in the information provided, the confidence rating of high is based on the samples with the most complete data.
Domain 2: Representative				
	Metric 3:	Geographic Area	High	Column X reports the location identifier code. All samples are from the U.S. The information of each code can be found at https://waterdata.usgs.gov/nwis/si
	Metric 4:	Temporal	High	Data was collected from 2002 to 2018. The date is reported in column G.
	Metric 5:	Exposure Scenario	Medium	Media are reported in column E and F; location and time are also reported. There is no information provided on sources of chemicals.
Domain 3: Accessibility/Clarity				
	Metric 6:	Availability of Database and Supporting Documents	High	The database is widely accepted, and a user guide is available which describes all of the data fields.
	Metric 7:	Reporting Results	Medium	The database does not report summary of statistics, only point values. While the data are well organized, since the data originates from numerous different entities (states) and monitoring programs, some data may be difficult to interpret due to the lack of populated data fields or discrepancies between columns.
Domain 4: Variability and Uncertainty				
	Metric 8:	Variability and Uncertainty	Medium	Uncertainty is characterized by the inclusion of data qualifier column AR; however, it was not expected for all rows to have a data qualifier code. Column AS reports the results status identifier that indicates the acceptability of the result with respect to QA/QC criteria.

Overall Quality Determination High

Study Citation:	Brooke, D. N., Crookes, M. J., Gray, D., Robertson, S. (2009). Environmental risk assessment report: Octamethylcyclotetrasiloxane. :0-0.
HERO ID:	6994688

Domain	Metric		Rating	Comments
Domain 1: Reliability				
	Metric 1:	Methodology	Medium	There are no primary monitoring data. Discussion of modeling and assumptions are presented in Section 3.
Domain 2: Representative				
	Metric 2:	Exposure Scenario	High	The exposure scenario is D4 in the environment and organisms. This scenario is of interest for the chemical.
Domain 3: Accessibility/Clarity				
	Metric 3:	Documentation of References	High	References for reported data are provided and publicly available.
Domain 4: Variability and Uncertainty				
	Metric 4:	Variability and Uncertainty	Low	The characterization of variability is absent. Key uncertainties and limitations are discussed.

Overall Quality Determination Medium

Study Citation:	Danish EPA, (2012). Survey No. 117: Exposure of pregnant consumers to suspected endocrine disruptors.
HERO ID:	10622425

Domain		Metric	Rating	Comments
Domain 1: Reliability	Metric 1:	Methodology	High	The assessment reports the methodology to assess concentrations in selected consumer products and the methods to evaluate the exposure.
Domain 2: Representative	Metric 2:	Exposure Scenario	High	This health assessment evaluates the exposure of pregnant women to a selected chemicals by the use of consumer products.
Domain 3: Accessibility/Clarity	Metric 3:	Documentation of References	High	References are available for all reported data, inputs, and defaults.
Domain 4: Variability and Uncertainty	Metric 4:	Variability and Uncertainty	Medium	Variability of concentrations is reported for selected consumer products, but the results do not report statistical variability. Some limitations are reported in the conclusion section.

Overall Quality Determination High

Study Citation:	Sha, B., Dahlberg, A. K., Wiberg, K., Ahrens, L. (2018). Fluorotelomer alcohols (FTOHs), brominated flame retardants (BFRs), organophosphorus flame retardants (OPFRs) and cyclic volatile methylsiloxanes (cVMSs) in indoor air from occupational and home environments. Environmental Pollution 241:319-330.
HERO ID:	5083520

Domain	Metric		Rating	Comments
Domain 1: Reliability				
	Metric 1:	Mathematical Equations	High	Daily exposure dose (DED) equation provided and described, described, and scientifically sound with a 1989 EPA citation. Air concentration equation also provided for relationship to disk samples, sampling duration, and sampling/uptake rate.
	Metric 2:	Model Evaluation	Medium	Model is cited from EPA indicating acceptance in scientific/regulatory community, but limited comparison of DED values against other studies for the specific scenario(s) of the study.
Domain 2: Representative				
	Metric 3:	Exposure Scenario	Medium	2018 study estimating exposure via inhalation in homes and offices, but all samples are from Sweden, potentially limiting the relevance to US scenarios.
Domain 3: Accessibility/Clarity				
	Metric 4:	Model and Model Documentation Availability	High	Model equations and inputs are all provided and can be followed and/or replicated as needed.
	Metric 5:	Model Inputs and Defaults	High	Inputs all described and values provided, either via sampling, questionnaire, or secondary data source.
Domain 4: Variability and Uncertainty				
	Metric 6:	Variability and Uncertainty	Medium	Limited variability in sampling, with some discussion of uncertainties and gaps in the results, including a discussion of the limitations of the exposure estimates.

Overall Quality Determination High

Table 107: Glossary of Select Terms for Data Evaluation

Term	Definition
ADME	Absorption, distribution, metabolism, and excretion
ADAF	Age-dependent adjustment factors
BAF	Bioaccumulation factor
BCF	Bioconcentration factor
BMF	Biomagnification factor
BOD	Biochemical oxygen demand
$BW_{3/4}$	Body weight scaling to the 3/4 power
CASRN	Chemical Abstracts Service Registry Number
CBI	Confidential business information
CDR	Chemical Data Reporting
CFR	Code of Federal Regulations
ChemSTEER	Chemical Screening Tool for Exposure and Environmental Releases
COC	Concentration(s) of concern
CPCat	Chemical and Product Categories
CPSC	Consumer Product Safety Commission
CSCL	Chemical Substances Control Law
CSF	Cancer slope factor
CWA	Clean Water Act
D4	Octamethylcyclotetra- siloxane (Cyclotetrasiloxane, 2,2,4,4,6,6,8,8-octamethyl-)
DMSD	Dimethylsilanediol
ECHA	European Chemicals Agency
EC	European Commission
ECx	Effective Concentration that causes a response that is x% of the maximum
EPA	Environmental Protection Agency
ERG	Eastern Research Group
ESD	Emission Scenario Document
EU	European Union
FDA	Food and Drug Administration
FFDCA	Federal Food, Drug, and Cosmetic Act
FR	Federal Register
GC	Gas chromatography
GDIT	General Dynamics Information Technology
GS	Generic Scenario
HAWC	Health Assessment Workplace Collaborative
HERO	Health and Environmental Research Online (Database)
Hg	Mercury
HHE	Health Hazard Evaluation

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Table 107 . . . continued from previous page

Term	Definition
HQ	Headquarters
HSDB	Hazardous Substances Data Bank
ICF	ICF (a global consulting company)
IMAP	Inventory Multi-Tiered Assessment and Prioritisation (Australia)
IMIS	Integrated Management Information System
IUR	Inhalation unit risk
K_{OC}	Organic carbon: water partition coefficient
K_{OW}	Octanol: water partition coefficient
LC_{50}	Lethal Concentration of 50% test organisms
LOAEL	Lowest observed adverse effect level
LOEC	Lowest observed effect concentration
MITI	Ministry of International Trade and Industry
MOA	Mode of action
MOE	Margin of exposure
MP	Melting point
MRSA	Maine Revised Statutes Annotated
NHANES	National Health and Nutrition Examination Survey
NICNAS	National Industrial Chemicals Notification and Assessment Scheme (Australia)
NIOSH	National Institute for Occupational Safety and Health
NITE	National Institute of Technology and Evaluation
NLM	National Library of Medicine
NOAEL	No observed adverse effect level
NOEC	No observed effect concentration
NPDES	National Pollutant Discharge Elimination System
OCSPP	Office of Chemical Safety and Pollution Prevention
OECD	Organisation for Economic Co-operation and Development
OEL	Occupational Exposure Limit
ONU	Occupational non-user
OPPT	Office of Pollution Prevention and Toxics
OSF	Oral slope factor
OSHA	Occupational Safety and Health Administration
PBPK	Physiologically based pharmacokinetic
PBT	Persistent, bioaccumulative, toxic
PDMS	Polydimethylsiloxane
PECO	Population, exposure, comparator, and outcome
PESO	Pathways and processes, exposure, setting/scenario, and outcomes
PESS	Potentially exposed or susceptible subpopulation(s)
POD	Point(s) of departure
POTW	Publicly owned treatment works
PPE	Personal protective equipment
PVC	Polyvinyl chloride

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Table 107 . . . continued from previous page

Term	Definition
RCRA	Resource Conservation and Recovery Act
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals (European Union)
RESO	Receptor, exposure, setting/scenario, and outcome
RQ	Risk quotient
SDS	Safety Data Sheet
SEHSC	Silicones Environmental, Health, and Safety Center
SMILES	Simplified molecular-input line-entry system SRC SRC, Inc., formerly Syracuse Research Corporation
$T_{1/2}$	Half-life
TCCR	Transparent, clear, consistent, and reasonable
TIAB	Title and abstract
TMF	Trophic magnification factor(s)
TRI	Toxics Release Inventory
TSCA	Toxic Substances Control Act
U.S.C.	United States Code
VP	Vapor pressure
WS	Water solubility
WWTP	Wastewater treatment plant