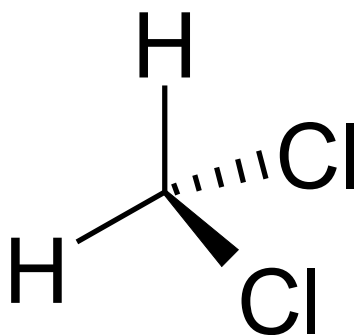# Final Risk Evaluation for
Methylene Chloride

Systematic Review Supplemental File:

Data Quality Evaluation of Environmental Fate and

Transport Studies

CASRN: 75-09-2

June 2020

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Study Reference:	AT&T. (1986). Hydrogeologic Assessment and Remedial Action At&T Information Systems Site Indiannapolis, Indiana (Interim Report) with Attachments and Cover Letter Dated 020690. (OTS: OTS0522315; 8EHQ Num: NA; DCN: 86-900000083; TSCATS RefID: 405919; CIS: NA). **HERO ID: 4214315**					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	Not rated	The metric is not applicable to this study on an environmental sample.	NR	NR	NR
Test Design	3. Study Controls	Not rated	The study did not require concurrent control groups.	NR	NR	NR
	4. Test Substance Stability	Medium	The stability of the test substance in the environment was not tested, but this was unlikely to have affected the results.	2	1	2
Test Conditions	5. Test Method Suitability	Not rated	The metric is not applicable to this study on an environmental sample.	NR	NR	NR
	6. Testing Conditions	Not rated	The metric is not applicable to this study on an environmental sample.	NR	NR	NR
	7. Testing Consistency	Not rated	The metric is not applicable to this study on an environmental sample.	NR	NR	NR
	8. System Type and Design	Not rated	The metric is not applicable to this study on an environmental sample.	NR	NR	NR

Test Organisms	9. Test Organism Degradation	Not rated	The metric is not applicable to this study type.	NR	NR	NR
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	High	The outcome assessment was appropriate for this study.	1	1	1
	12. Sampling Methods	Medium	Inconsistencies were noted in some samples	2	1	2
Confounding / Variable Control	13. Confounding Variables	Low	The results were inconclusive.	3	1	3
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	High	Records were kept for sampling at several dates and locations.	1	2	2
	16. Statistical Methods and Kinetic Calculations	Not rated	Not applicable; result was based only on the presence or absence of the chemical.	NR	NR	NR
Other	17. Verification or Plausibility of Results	Low	The results were inconclusive.	3	1	3
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	13	9	15
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.67	**Overall Score (Rounded):**	1.7
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	Medium

Study Reference:	**Thiébaud, H; Merlin, G; Capovilla, MP; Blake, G. (1994). Fate of a volatile chlorinated solvent in indoor aquatic microcosms: Sublethal and static exposure to [14C]dichloromethane. Ecotoxicol Environ Saf 28: 71-81. http://dx.doi.org/10.1006/eesa.1994.1035 HERO ID: 3588425**					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	Medium	The source and purity of the test substance were not reported but this was unlikely to have influenced the study results.	2	1	2
Test Design	3. Study Controls	High	The study included negative controls.	1	2	2
	4. Test Substance Stability	High	The study characterized test substance stability using a sublethal, static system and radiolabeled DCM; volatilization was measured, and recovery was determined to be 88-98% in biomass.	1	1	1
Test Conditions	5. Test Method Suitability	High	The test method was suitable for the test substance.	1	1	1
	6. Testing Conditions	High	Test conditions were monitored and reported, including temperature, pH, dissolved oxygen, and conductivity.	1	2	2
	7. Testing Consistency	High	Differences in the biomass in each microcosm were reported. No other inconsistencies were noted.	1	1	1

	8. System Type and Design	High	Test system was described in great detail and was capable of maintaining appropriate substance concentrations.	1	1	1
Test Organisms	9. Test Organism Degradation	Not rated	The metric is not applicable to this study type.	NR	NR	NR
	10. Test Organism Partitioning	High	Test organism information was reported, including biomass, biotic composition of test microcosms, and sample preparations.	1	2	2
Outcome Assessment	11. Outcome Assessment Methodology	High	The outcome assessment methodology addressed the intended outcome of interest.	1	1	1
	12. Sampling Methods	Medium	Minor limitations existed in sampling methods, but they were not likely to have had a substantial impact on the study results.	2	1	2
Confounding/ Variable Control	13. Confounding Variables	High	Sources of variability and uncertainty in the study were considered and accounted for in data evaluation. No confounding variables were noted.	1	1	1
	14. Outcomes Unrelated to Exposure	High	There were multiple organisms in three experimental mesocosms, and no differences among the mesocosms occurred that would have influenced the study results.	1	1	1

Data Presentation and Analysis	15. Data Reporting	High	Transformation product concentrations were not reported; however, the concentration of DCM and [14C] in the medium were very similar, and therefore, it can be assumed that most of the [14C] remained as [14C]DCM.	1	2	2
	16. Statistical Methods and Kinetic Calculations	High	Statistical methods were clearly described and adequately addressed the dataset.	1	1	1
Other	17. Verification or Plausibility of Results	High	Study results were in agreement with earlier estimates that >80% of DCM volatilized into the atmosphere.	1	1	1
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	18	21	23
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.1	**Overall Score (Rounded):**	1.1
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	High

Study Reference:	ECHA (European Chemicals Agency). (2017). Bioaccumulation: aquatic/sediment: Dichloromethane. Helsinki, Finland. Retrieved from https://echa.europa.eu/registration-dossier/-/registered-dossier/15182/5/4/2# HERO ID: 3970721					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name and CASRN.	1	2	2
	2. Test Substance Purity	High	Test substance purity was reported as >99%.	1	1	1
Test Design	3. Study Controls	Medium	Not reported, likely because only the summary was translated from Japanese. However, the test guideline cited called for use of a control group.	2	2	4
	4. Test Substance Stability	High	Stability of the test substance was confirmed before and after the experiment by IR spectra.	1	1	1
Test Conditions	5. Test Method Suitability	High	The test method was suitable for the test substance.	1	1	1
	6. Testing Conditions	Medium	Not reported, likely because only the summary was translated from Japanese. The study took place in natural freshwater at a temperature of 25 degrees C (+/- 2 degrees).	2	2	4
	7. Testing Consistency	High	Test was run using 2 exposure concentrations; each group of fish was exposed under similar test conditions.	1	1	1

	8. System Type and Design	Medium	Equilibrium was not reported, likely because only the summary was translated from Japanese. However, the test system reported (semi-static, 6 week exposure) was not likely to have had a substantial impact on the study results.	2	1	2
Test Organisms	9. Test Organism Degradation	Not rated	The metric is not applicable to this study type.	NR	NR	NR
	10. Test Organism Partitioning	High	Test species was reported, along with average length and weight.	1	2	2
Outcome Assessment	11. Outcome Assessment Methodology	Medium	Outcome assessment methodology was not reported, likely because only the summary was translated from Japanese.	2	1	2
	12. Sampling Methods	Medium	Not reported, likely because only the summary was translated from Japanese. However, the test guideline (OECD Guideline 305) was listed and certified as GLP compliant.	2	1	2
Confounding/ Variable Control	13. Confounding Variables	Medium	No discussion of uncertainty or variability was included, likely because only the summary was translated from Japanese.	2	1	2
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR

Data Presentation and Analysis	15. Data Reporting	High	Data reporting was adequate: nominal concentrations were reported, as well as the lipid content, and concentrations in test water and BCFs at 2, 3, 4, and 6 weeks of exposure.	1	2	2
	16. Statistical Methods and Kinetic Calculations	Medium	Not reported, likely because only the summary was translated from Japanese.	2	1	2
Other	17. Verification or Plausibility of Results	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	22	20	29
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.45	**Overall Score (Rounded):**	1.5
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	High

Study Reference:	Peijnenburg, W; Eriksson, L; De Groot, A; Sjöström, M; Verboom, H. (1998). The kinetics of reductive dehalogenation of a set of halogenated aliphatic hydrocarbons in anaerobic sediment slurries. Environ Sci Pollut Res Int 5: 12-16. http://dx.doi.org/10.1007/BF02986368 HERO ID: 2300821					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	Medium	The test substance source was reported without specifics given: 'common commercial sources and were of analytical grade.'	2	1	2
Test Design	3. Study Controls	Medium	Some concurrent control group details were not included regarding toxicity.	2	2	4
	4. Test Substance Stability	High	Hydrolysis control was provided. Protection from light/photolysis was not addressed; however, this was not likely to be a concern.	1	1	1
Test Conditions	5. Test Method Suitability	High	The test method was suitable for the test substance.	1	1	1
	6. Testing Conditions	High	The conditions were suitable for the test substance.	1	2	2
	7. Testing Consistency	Medium	Test conditions across samples and study groups were not reported, but these discrepancies were not likely to have had a substantial impact on the study results.	2	1	2

	8. System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Test Organisms	9. Test Organism Degradation	High	The test organism information or inoculum source were reported.	1	2	2
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	12. Sampling Methods	Medium	Sampling time and frequency were not reported in method; they were inferred from figure.	2	1	2
Confounding/ Variable Control	13. Confounding Variables	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	Medium	The target chemical and transformation product(s) concentrations, extraction efficiency, percent recovery, and mass balance were not reported; however, relative concentration was reported.	2	2	4
	16. Statistical Methods and Kinetic Calculations	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1

Other	17. Verification or Plausibility of Results	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	20	20	27
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.35	**Overall Score (Rounded):**	1.4
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	High

Study Reference:	**Melin, ES; Puhakka, JA; Strand, SE; Rockne, KJ; Ferguson, JF. (1996). Fluidized-bed enrichment of marine ammonia-to-nitrite oxidizers and their ability to degrade chloroaliphatics. Int Biodeterior Biodegradation 38: 9-18. http://dx.doi.org/10.1016/S0964-8305(96)00004-2 HERO ID: 2310715**				
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name and CASRN.	1	2	2
	2. Test Substance Purity	High	The test substance purity and source were reported.	1	1	1
Test Design	3. Study Controls	Not rated	Controls were not reported; however, they were not required for this experimental study type.	NR	NR	NR
	4. Test Substance Stability	Medium	The test substance stability, homogeneity, preparation and storage conditions were not reported; however, these factors were not likely to have influenced the test substance or were not likely to have had a substantial impact on the study results.	2	1	2
Test Conditions	5. Test Method Suitability	High	The test method was suitable for the test substance.	1	1	1
	6. Testing Conditions	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2

	7. Testing Consistency	High	Test conditions were consistent across samples or study groups. The conditions of the exposure were documented.	1	1	1
	8. System Type and Design	Medium	Equilibrium was not reported.	2	1	2
Test Organisms	9. Test Organism Degradation	High	The test organism information or inoculum source were reported.	1	2	2
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	High	The outcome assessment methodology addressed the intended outcome of interest.	1	1	1
	12. Sampling Methods	High	The study reported the use of sampling methods that address the outcome(s) of interest, and used widely accepted methods/approaches for the chemical and media being analyzed.	1	1	1
Confounding/ Variable Control	13. Confounding Variables	Medium	Sources of variability and uncertainty in the measurements and statistical techniques and between study groups were reported in the study. The minor deviations or omissions were not likely to have had a substantial impact on the study results.	2	1	2
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR

		High/Medium/Low				
Data Presentation and Analysis	15. Data Reporting	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	16. Statistical Methods and Kinetic Calculations	High	Kinetic calculations were clearly described and address the dataset(s).	1	1	1
Other	17. Verification or Plausibility of Results	Medium	The study results were reasonable. No serious study deficiencies were identified, and the value was plausible.	2	1	2
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	18	18	22
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.22	**Overall Score (Rounded):**	1.2
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	High

Study Reference:	Long, JL; Stensel, HD; Ferguson, JF; Strand, SE; Ongerth, JE. (1993). Anaerobic and aerobic treatment of chlorinated aliphatic compounds. J Environ Eng 119: 300-320. http://dx.doi.org/10.1061/(ASCE)0733-9372(1993)119:2(300) HERO ID: 1717600					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	Not rated	Not applicable, the test substance was formed as a degradation byproduct.	NR	NR	NR
Test Design	3. Study Controls	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	4. Test Substance Stability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	7. Testing Consistency	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	8. System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1

Test Organisms	9. Test Organism Degradation	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	Low	The quantitative data presented were of limited use. Analytical methods were not sensitive enough to measure low concentrations of DCM formed and DCM was formed as a byproduct, so an initial concentration was unknown.	3	1	3
	12. Sampling Methods	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Confounding/ Variable Control	13. Confounding Variables	Not rated	No confounding variables were noted.	NR	NR	NR
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	16. Statistical Methods and Kinetic Calculations	Medium	Some details were omitted; however, these omissions were not likely to have had a substantial impact on the study results.	2	1	2
Other	17. Verification or Plausibility of Results	Low	The analytical methods were not sensitive enough to measure low concentrations of DCM formed; the quantitative data presented were of limited use.	3	1	3

	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	18	18	23
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.28	**Overall Score (Rounded):**	1.7
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	Medium[1]

[1]The reviewer downgraded this study's overall quality rating. They noted: Methylene chloride is a byproduct and not the chemical being studied in this report.

Study Reference:	Long, JL; Stensel, HD; Ferguson, JF; Strand, SE; Ongerth, JE. (1993). Anaerobic and aerobic treatment of chlorinated aliphatic compounds. J Environ Eng 119: 300-320. http://dx.doi.org/10.1061/(ASCE)0733-9372(1993)119:2(300) HERO ID: 1717600					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	Not rated	Not applicable, the test substance was formed as a degradation byproduct.	NR	NR	NR
Test Design	3. Study Controls	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	4. Test Substance Stability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	7. Testing Consistency	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	8. System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Test Organisms	9. Test Organism Degradation	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2

	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	Low	The quantitative data presented were of limited use. Analytical methods were not sensitive enough to measure low concentrations of DCM formed and DCM was formed as a byproduct, so an initial concentration was unknown.	3	1	3
	12. Sampling Methods	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Confounding/ Variable Control	13. Confounding Variables	Not rated	No confounding variables were noted.	NR	NR	NR
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	16. Statistical Methods and Kinetic Calculations	Medium	Some details were omitted; however, these omissions were not likely to have had a substantial impact on the study results.	2	1	2
Other	17. Verification or Plausibility of Results	Low	The analytical methods were not sensitive enough to measure low concentrations of DCM formed; the quantitative data presented were of limited use.	3	1	3
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	18	18	23

High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.28	**Overall Score (Rounded):**	1.7
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	Medium[1]

[1]The reviewer downgraded this study's overall quality rating. They noted: Methylene chloride is a byproduct and not the chemical being studied in this report.

Study Reference:	Long, JL; Stensel, HD; Ferguson, JF; Strand, SE; Ongerth, JE. (1993). Anaerobic and aerobic treatment of chlorinated aliphatic compounds. J Environ Eng 119: 300-320. http://dx.doi.org/10.1061/(ASCE)0733-9372(1993)119:2(300) HERO ID: 1717600					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	Not rated	Not applicable, the test substance was formed as a degradation byproduct.	NR	NR	NR
Test Design	3. Study Controls	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	4. Test Substance Stability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	7. Testing Consistency	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	8. System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1

Test Organisms	9. Test Organism Degradation	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	Low	The quantitative data presented were of limited use. Analytical methods were not sensitive enough to measure low concentrations of DCM formed and DCM was formed as a byproduct, so an initial concentration was unknown.	3	1	3
	12. Sampling Methods	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Confounding/ Variable Control	13. Confounding Variables	Not rated	No confounding variables were noted.	NR	NR	NR
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	16. Statistical Methods and Kinetic Calculations	Medium	Some details were omitted; however, these omissions were not likely to have had a substantial impact on the study results.	2	1	2

Other	17. Verification or Plausibility of Results	Low	The analytical methods were not sensitive enough to measure low concentrations of DCM formed; the quantitative data presented were of limited use.	3	1	3
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	18	18	23
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.28	**Overall Score (Rounded):**	1.7
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	Medium [1]

[1] The reviewer downgraded this study's overall quality rating. They noted: Methylene chloride is a byproduct and not the chemical being studied in this report.

Study Reference:	Long, JL; Stensel, HD; Ferguson, JF; Strand, SE; Ongerth, JE. (1993). Anaerobic and aerobic treatment of chlorinated aliphatic compounds. J Environ Eng 119: 300-320. http://dx.doi.org/10.1061/(ASCE)0733-9372(1993)119:2(300) HERO ID: 1717600

Domain	Metric	Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]	Comments	Metric Score	Metric Weighting Factor	Weighted Score
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	Not rated	Not applicable; the test substance was formed as a degradation byproduct.	NR	NR	NR
Test Design	3. Study Controls	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	4. Test Substance Stability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	7. Testing Consistency	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	8. System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1

Test Organisms	9. Test Organism Degradation	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	Low	Analytical methods were not sensitive enough to measure low concentrations of DCM formed; quantitative data presented were of limited use; DCM was formed as a byproduct, so an initial concentration was unknown.	3	1	3
	12. Sampling Methods	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Confounding/ Variable Control	13. Confounding Variables	Not rated	No confounding variables were noted.	NR	NR	NR
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	16. Statistical Methods and Kinetic Calculations	Medium	Some details were omitted; however, these omissions were not likely to have had a substantial impact on the study results.	2	1	2
Other	17. Verification or Plausibility of Results	Low	Quantitative data presented were of limited use; DCM was formed as a byproduct so an initial concentration was unknown.	3	1	3

	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	18	18	23
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.28	**Overall Score (Rounded):**	1.7
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	Medium[1]

[1]The reviewer downgraded this study's overall quality rating. They noted: Methylene chloride is a byproduct and not the chemical being studied in this report.

Study Reference:	Deipser, A; Stegmann, R. (1997). Biological degradation of VCCs and CFCs under simulated anaerobic landfill conditions in laboratory test digesters. Environ Sci Pollut Res Int 4: 209-216. http://dx.doi.org/10.1007/BF02986348 HERO ID: 1739087					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	Low	The source and purity of the test substance were not reported nor verified by analytical means.	3	1	3
Test Design	3. Study Controls	Unacceptable	The study did not include or report control groups to validate the system used	4	2	8
	4. Test Substance Stability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	Medium	Some details were omitted (temp); however, sufficient data were presented to determine that the omissions were not likely to have had a substantial impact on the study results.	2	2	4
	7. Testing Consistency	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1

	8. System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Test Organisms	9. Test Organism Degradation	Unacceptable	The test inoculum was not routinely used for similar study types; degradation capability was not confirmed using controls.	4	2	8
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	Unacceptable	Outcome assessment was unable to be evaluated due to no detail or reference to methods for analysis besides a statement that "standard analytical methods used."	4	1	4
	12. Sampling Methods	Low	Details regarding sampling and analysis methods of the outcome were not fully reported, and the omissions were likely to have had a substantial impact on the study results.	3	1	3
Confounding/ Variable Control	13. Confounding Variables	Low	Only very low concentrations of perc initially added were found in the gas phase, attributed to adsorption and rapid decomposition; no validation with quantitative data.	3	1	3
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR

Data Presentation and Analysis	15. Data Reporting	Unacceptable	The target chemical and transformation product concentrations, extraction efficiency, percent recovery, and mass balance were not reported; it is unclear if this chemical was added initially to the system or present as a degradation product.	4	2	8
	16. Statistical Methods and Kinetic Calculations	Low	Statistical analysis or kinetic calculations were not fully described, and the omissions may have had a substantial impact on the study results.	3	1	3
Other	17. Verification or Plausibility of Results	Not rated	Due to limited information, evaluation of the reasonableness of the study results was not possible.	NR	NR	NR
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	35	19	50
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	2.63	**Overall Score (Rounded):**	4
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	Unacceptable[1]

[1]The study did not include or report control groups to validate the system used. Consistent with our Application of Systematic Review in TSCA Risk Evaluations document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, four of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

Study Reference:	Kim, Y; Arp, DJ; Semprini, L. (2000). Chlorinated solvent cometabolism by butane- grown mixed culture. J Environ Eng 126: 934-942. http://dx.doi.org/10.1061/(ASCE)0733-9372(2000)126:10(934) HERO ID: 1747865					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	High	The test substance source and purity were reported.	1	1	1
Test Design	3. Study Controls	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	4. Test Substance Stability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	Medium	There were omissions in the reporting of test conditions.	2	2	4
	7. Testing Consistency	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	8. System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1

Test Organisms	9. Test Organism Degradation	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	12. Sampling Methods	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Confounding/ Variable Control	13. Confounding Variables	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	16. Statistical Methods and Kinetic Calculations	Medium	Kinetic calculations were not clearly described.	2	1	2
Other	17. Verification or Plausibility of Results	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	17	20	23
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.15	**Overall Score (Rounded):**	1.2
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	High

Study Reference:	Stover, EL; Kincannon, DF. (1983). Biological treatability of specific organic compounds found in chemical industry wastewaters. J Water Pollut Control Fed 55: 97-109. HERO ID: 18214					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	Medium	The test substance source and purity were not reported.	2	1	2
Test Design	3. Study Controls	Medium	There were some omissions in the reporting of study controls.	2	2	4
	4. Test Substance Stability	Medium	Details regarding this metric were omitted; however, this was not likely to have influenced the interpretation of the results.	2	1	2
Test Conditions	5. Test Method Suitability	Medium	Limited details on the test method were reported.	2	1	2
	6. Testing Conditions	Medium	There were some omissions in the reporting of test conditions, such as pH and darkness.	2	2	4
	7. Testing Consistency	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	8. System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1

Test Organisms	9. Test Organism Degradation	Medium	Details regarding the inoculum were not reported; however, their omission was not expected to have impacted the interpretation of the study results.	2	2	4
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	12. Sampling Methods	Medium	Sampling technique and timing was not well reported; however, the omissions did not likely impact the interpretation of the study results.	2	1	2
Confounding/ Variable Control	13. Confounding Variables	Low	Sources of variability and uncertainty in the measurements and statistical techniques and between study groups/controls were not reported.	3	1	3
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	Medium	Some data were not reported, but omissions were unlikely to have substantially impacted the results.	2	2	4
	16. Statistical Methods and Kinetic Calculations	High	Calculations were summarized; all experimental values were not reported.	1	1	1

Other	17. Verification or Plausibility of Results	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	25	20	34
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.7	**Overall Score (Rounded):**	1.7
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	Medium

Study Reference:	Namkung, E; Rittmann, BE. (1987). Estimating Volatile Organic Compound Emissions from Publicly Owned Treatment Works (pp. 670-678). (NIOSH/00172323). Namkung, E; Rittmann, BE. HERO ID: 2800806					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by common name.	1	2	2
	2. Test Substance Purity	Medium	The test substance was collected from a monitoring samples, chemical purity was not reported but was not likely to have impacted the study results.	2	1	2
Test Design	3. Study Controls	Medium	Control was not used but was not likely to have impacted the study results.	2	2	4
	4. Test Substance Stability	Not rated	The metric is not applicable to this study type (monitoring).	NR	NR	NR
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	Medium	Some testing conditions were not reported but were unlikely to have impacted the study results.	2	2	4
	7. Testing Consistency	Not rated	Not applicable; multiple study groups were not reported.	NR	NR	NR

	8. System Type and Design	Medium	Some system design details were not provided; however, this was not likely to have influenced the interpretation of the results.	2	1	2
Test Organisms	9. Test Organism Degradation	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	Medium	Multiple removal processes using specific WWTP operational conditions were considered in this study that may have caused incomplete reporting of the biodegradation outcome.	2	1	2
	12. Sampling Methods	Medium	Sampling methods were not clearly reported but were not likely to have had a substantial impact on the results.	2	1	2
Confounding/ Variable Control	13. Confounding Variables	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR

				High	Medium	Low
Data Presentation and Analysis	15. Data Reporting	Low	DCM was likely an intermediate in the transformation of other VOCs present in the reactors, which made DCM influent/effluent concentrations an inaccurate representation of the removal efficiency. The model's predicted removal for all VOCs was within 10% of the actual removal so using the models prediction for DCM was likely much more accurate.	3	2	6
	16. Statistical Methods and Kinetic Calculations	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Other	17. Verification or Plausibility of Results	Medium	The plausibility of the measured removal efficiency being accurate was low due to the strong possibility of intermediates being formed during the treatment and impacting the effluent concentrations. The model presented a much more plausible outcome that was somewhat verified by its overall VOC removal prediction being within 10% for both WWTPs.	2	1	2
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	22	18	31
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.72	**Overall Score (Rounded):**	1.7

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≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	Medium

Study Reference:	Kim, JY; Park, JK; Emmons, B; Armstrong, DE. (1995). Survey of volatile organic compounds at a municipal solid waste cocomposting facility. Water Environ Res 67: 1044-1051. http://dx.doi.org/10.2175/106143095X133284 HERO ID: 2802998					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	Medium	The test substance was collected from monitoring samples; chemical purity was not reported but was not likely to have impacted the study results.	2	1	2
Test Design	3. Study Controls	High	CS2 blanks were analyzed every sixth sample for gas and solid samples and showed "no significant peaks." Reagent water blanks and 10 ug/L standards in water were analyzed every 10th sample during liquid sample analysis. sample for gas and solid samples and showed "no significant peaks." Reagent water blanks and 10 ug/L standards in water were analyzed every 10th sample during liquid sample analysis.	1	2	2
	4. Test Substance Stability	Not rated	The metric is not applicable to this study type (monitoring).	NR	NR	NR
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1

	6. Testing Conditions	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	7. Testing Consistency	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	8. System Type and Design	Medium	Some details regarding this metric were omitted; however, these omissions were not likely to have had a substantial impact on the study results.	2	1	2
Test Organisms	9. Test Organism Degradation	High	Inoculum source was reported.	1	2	2
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	12. Sampling Methods	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Confounding/Variable Control	13. Confounding Variables	Medium	Sources of variability were mentioned, such as VOCs that adsorbed to solids during composting not being differentiable from VOCs that were present in the solids initially. The authors noted that the concentration of VOCs in solids was low, so it was unlikely to have impacted the results.	2	1	2
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR

Data Presentation and Analysis	15. Data Reporting	Medium	Transformation product concentrations were not reported but their omission was not likely to have affected the study results.	2	2	4
	16. Statistical Methods and Kinetic Calculations	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Other	17. Verification or Plausibility of Results	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	18	19	24
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.26	**Overall Score (Rounded):**	1.3
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	High

Study Reference:	Klecka, GM. (1982). Fate and effects of methylene chloride in activated sludge. Appl Environ Microbiol 44: 701-707. HERO ID: 29181					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	Low	The source and purity of the test substance were not reported nor verified by analytical means.	3	1	3
Test Design	3. Study Controls	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	4. Test Substance Stability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	7. Testing Consistency	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	8. System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Test Organisms	9. Test Organism Degradation	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2

				NR	NR	NR
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	12. Sampling Methods	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Confounding/ Variable Control	13. Confounding Variables	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	16. Statistical Methods and Kinetic Calculations	High	The analysis of data was clearly described.	1	1	1
Other	17. Verification or Plausibility of Results	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	17	20	22
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.1	**Overall Score (Rounded):**	1.1
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	High

Study Reference:	Rittmann, BE; McCarty, PL. (1980). Utilization of dichloromethane by suspended and fixed-film bacteria. Appl Environ Microbiol 39: 1225-1226. HERO ID: 29191					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	Low	The source and purity of the test substance were not reported nor verified by analytical means.	3	1	3
Test Design	3. Study Controls	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	4. Test Substance Stability	High	This metric met the criteria for high confidence as expected for this type of study; volatilization loss was minimized.	1	1	1
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	7. Testing Consistency	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	8. System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1

Test Organisms	9. Test Organism Degradation	Medium	Adapted inoculum was used in this study that was not representative of natural environmental conditions.	2	2	4
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	Low	Quantitative results were not reported; CO_2 evolution and intermediate formation were not examined.	3	1	3
	12. Sampling Methods	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Confounding/ Variable Control	13. Confounding Variables	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	Medium	Steady state conditions were suggested; however, data were not presented to confirm.	2	2	4
	16. Statistical Methods and Kinetic Calculations	Medium	Kinetic calculations were not included, quantifiable rate constants could not be calculated due to plate count method limitations.	2	1	2

Other	17. Verification or Plausibility of Results	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	22	20	29
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.45	**Overall Score (Rounded):**	2.3
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	Low[1]

[1]The reviewer downgraded this study's overall quality rating. They noted: Quantitative results were not reported. The reported qualitative results are not representative of natural environmental conditions.

Study Reference:	**Tobajas, M; Verdugo, V; Polo, AM; Rodriguez, JJ; Mohedano, AF. (2016). Assessment of toxicity and biodegradability on activated sludge of priority and emerging pollutants. Environ Technol 37: 713-721. http://dx.doi.org/10.1080/09593330.2015.1079264** **HERO ID: 3070754**					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	High	The test substance source and purity were reported.	1	1	1
Test Design	3. Study Controls	Medium	OECD 302 B requires blank controls but their use was not reported in this study.	2	2	4
	4. Test Substance Stability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	7. Testing Consistency	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	8. System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1

Test Organisms	9. Test Organism Degradation	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	12. Sampling Methods	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Confounding/ Variable Control	13. Confounding Variables	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	Medium	Percent recovery was not reported but was unlikely to have impacted the results.	2	2	4
	16. Statistical Methods and Kinetic Calculations	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Other	17. Verification or Plausibility of Results	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	17	20	24

High	Medium	Low	Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:	1.2	Overall Score (Rounded):	1.2
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			Overall Quality Level:	High

Study Reference:	Lee, W; Park, SH; Kim, J; Jung, JY. (2015). Occurrence and removal of hazardous chemicals and toxic metals in 27 industrial wastewater treatment plants in Korea. Desalination Water Treat 54: 1141-1149. http://dx.doi.org/10.1080/19443994.2014.935810 HERO ID: 3580141					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	Medium	The test substance was collected from monitoring samples; chemical purity was not reported but not likely to have impacted the study results.	2	1	2
Test Design	3. Study Controls	Medium	The use of controls was not reported but likely did not impact the study results.	2	2	4
	4. Test Substance Stability	Medium	Sample storage conditions were not reported but were unlikely to have influenced the study results.	2	1	2
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	Medium	As this was a screening study looking at several WWTPs, specific conditions were not reported but were not critical to the study results.	2	2	4
	7. Testing Consistency	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1

	8. System Type and Design	Medium	Some system details were omitted but these omissions were unlikely to have impacted the study results.	2	1	2
Test Organisms	9. Test Organism Degradation	Medium	Details regarding the inoculum at each WWTP were not given but their omission did not likely impact the study results.	2	2	4
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	12. Sampling Methods	Medium	Some sampling details were omitted but this was unlikely to have impacted the study results.	2	1	2
Confounding/ Variable Control	13. Confounding Variables	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	Medium	Transformation products were not reported, and volatilization was likely a factor in the lower effluent concentrations since the removal rates were proportional to air to water ratios.	2	2	4
	16. Statistical Methods and Kinetic Calculations	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1

Other	17. Verification or Plausibility of Results	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	23	20	32
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.6	**Overall Score (Rounded):**	1.6
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	High

Study Reference:	Krausova, VI; Robb, FT; Gonzalez, JM. (2006). Biodegradation of dichloromethane in an estuarine environment. Hydrobiologia 559: 77-83. http://dx.doi.org/10.1007/s10750-004-0571-5 **HERO ID: 3589334**					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by common name.	1	2	2
	2. Test Substance Purity	Medium	The test substance source and purity were not reported, but were not likely to have affected the result.	2	1	2
Test Design	3. Study Controls	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	4. Test Substance Stability	High	Lack of degradation in the controls established the test material's stability to the reaction conditions.	1	1	1
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	Medium	Not reported, but not likely to have affected the result.	2	2	4
	7. Testing Consistency	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	8. System Type and Design	Medium	Some test conditions, such as light control, were not reported; however, these omissions were not likely to have had a substantial impact on the study results.	2	1	2

Test Organisms	9. Test Organism Degradation	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	12. Sampling Methods	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Confounding/ Variable Control	13. Confounding Variables	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	Medium	Some details were lacking, but this was not likely to have affected the results.	2	2	4
	16. Statistical Methods and Kinetic Calculations	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Other	17. Verification or Plausibility of Results	Medium	Results were difficult to compare as the media were atypical.	2	1	2
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	20	20	27
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.35	**Overall Score (Rounded):**	1.4
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	High

Study Reference:	ECHA (European Chemicals Agency). (2017). Biodegradation in water: Dichloromethane. Helsinki, Finland. Retrieved from https://echa.europa.eu/registration-dossier/-/registered-dossier/15182/5/3/2# HERO ID: 3970719					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	High	The source and purity of the test substance were reported.	1	1	1
Test Design	3. Study Controls	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	4. Test Substance Stability	Medium	Not reported, but not likely to have impacted the results.	2	1	2
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	7. Testing Consistency	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	8. System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Test Organisms	9. Test Organism Degradation	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR

Outcome Assessment	11. Outcome Assessment Methodology	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	12. Sampling Methods	Medium	Details regarding this metric were not reported; however, this was not likely to have influenced the interpretation of the results.	2	1	2
Confounding/ Variable Control	13. Confounding Variables	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	16. Statistical Methods and Kinetic Calculations	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Other	17. Verification or Plausibility of Results	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	17	20	22
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.1	**Overall Score (Rounded):**	1.1
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	High

Study Reference:	**Davis, EM; Murray, HE; Liehr, JG. (1981). Basic microbial degradation rates and chemical byproducts of selected organic compounds. Water Resources 15. http://dx.doi.org/10.1016/0043-1354(81)90082-8 HERO ID: 4140320**					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	Medium	The test substance source and purity were not reported; however, test substance was measured by GC-MS.	2	1	2
Test Design	3. Study Controls	Low	Control details were missing, which may have had an impact of the study result interpretation.	3	2	6
	4. Test Substance Stability	Medium	The test substance stability, homogeneity, preparation and storage conditions were not reported; however, these factors were not likely to have influenced the test substance or were not likely to have had a substantial impact on the study results.	2	1	2
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	Medium	There were some omissions in the reporting of test conditions. Light/dark conditions, and pH were not reported.	2	2	4

	7. Testing Consistency	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	8. System Type and Design	Medium	The control of volatility was slow stirring; there may have been loss of test substance by volatility.	2	1	2
Test Organisms	9. Test Organism Degradation	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	12. Sampling Methods	Low	Sampling technique and timing was not well reported.	3	1	3
Confounding/ Variable Control	13. Confounding Variables	Low	Sources of variability and uncertainty in the measurements and statistical techniques and between study groups/controls were not considered or accounted for in data evaluation, resulting in some uncertainty.	3	1	3
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR

Data Presentation and Analysis	15. Data Reporting	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	16. Statistical Methods and Kinetic Calculations	Not rated	Not performed in this study.	NR	NR	NR
Other	17. Verification or Plausibility of Results	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	24	19	32
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.68	**Overall Score (Rounded):**	1.7
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	Medium

Study Reference:	Freedman, DL; Gossett, JM. (1991). Biodegradation of dichloromethane and its utilization as a growth substrate under methanogenic conditions. Appl Environ Microbiol 57: 2847-2857. HERO ID: 4140322					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	High	The test substance source was reported, and a non-radiolabeled impurity was identified.	1	1	1
Test Design	3. Study Controls	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	4. Test Substance Stability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	Medium	Protection from light or use of amber bottles was not reported.	2	2	4
	7. Testing Consistency	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	8. System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1

Test Organisms	9. Test Organism Degradation	Low	Source and type of organism were not well described beyond enrichment cultures and methanogens/nonmethanogens. The omission may have had a substantial impact on the study results.	3	2	6
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	12. Sampling Methods	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Confounding/ Variable Control	13. Confounding Variables	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	Medium	Data were summarized in figures; all experimental values were not reported.	2	2	4
	16. Statistical Methods and Kinetic Calculations	Medium	Calculations were summarized; all experimental values were not reported.	2	1	2
Other	17. Verification or Plausibility of Results	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1

	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	20	20	29
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.45	**Overall Score (Rounded):**	1.5
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	High

Study Reference:	**Gossett, JM. (1985). Anaerobic degradation of C1 and C2 chlorinated hydrocarbons. (ESL-TR-85-38). Tyndal AFB, FL: Air Force Engineering & Services Center.** **HERO ID: 4140341**					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	Medium	The test substance source was reported but the purity was not reported.	2	1	2
Test Design	3. Study Controls	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	4. Test Substance Stability	Medium	The test substance stability, homogeneity, preparation and storage conditions were not reported; however, these factors were not likely to have influenced the test substance or were not likely to have had a substantial impact on the study results.	2	1	2
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	Medium	There were some omissions in the reporting of test conditions, such as protection from light/amber bottles.	2	2	4
	7. Testing Consistency	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1

				1	1	1
	8. System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Test Organisms	9. Test Organism Degradation	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	12. Sampling Methods	Medium	Sampling times were summarized in figures, not well described in study; however, the limitations were not likely to have had a substantial impact on the results.	2	1	2
Confounding/ Variable Control	13. Confounding Variables	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	16. Statistical Methods and Kinetic Calculations	Medium	Calculations were summarized, all experimental values were not reported.	2	1	2

Other	17. Verification or Plausibility of Results	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	20	20	26
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.3	**Overall Score (Rounded):**	1.3
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	High

Study Reference:	Gossett, JM. (1985). Anaerobic degradation of C1 and C2 chlorinated hydrocarbons. (ESL-TR-85-38). Tyndal AFB, FL: Air Force Engineering & Services Center. HERO ID: 4140341					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by common name.	1	2	2
	2. Test Substance Purity	Medium	The test substance source was reported but the purity was not reported.	2	1	2
Test Design	3. Study Controls	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	4. Test Substance Stability	Medium	The test substance stability, homogeneity, preparation and storage conditions were not reported; however, these factors were not likely to have influenced the test substance or were not likely to have had a substantial impact on the study results.	2	1	2
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	Medium	There were some omissions in the reporting of test conditions, such as protection from light/amber bottles.	2	2	4
	7. Testing Consistency	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1

	8. System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Test Organisms	9. Test Organism Degradation	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	12. Sampling Methods	Medium	Sampling times were summarized in figures, not well described in study; however, the limitations were not likely to have had a substantial impact on the results.	2	1	2
Confounding/ Variable Control	13. Confounding Variables	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	16. Statistical Methods and Kinetic Calculations	Medium	Calculations were summarized; all experimental values were not reported.	2	1	2

Other	17. Verification or Plausibility of Results	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	20	20	26
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.3	**Overall Score (Rounded):**	1.3
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	High

Study Reference:	Gossett, JM. (1985). Anaerobic degradation of C1 and C2 chlorinated hydrocarbons. (ESL-TR-85-38). Tyndal AFB, FL: Air Force Engineering & Services Center. HERO ID: 4140341					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	Unacceptable	The test substance identity could not be verified from the information provided.	4	2	8
	2. Test Substance Purity	Medium	The test substance was formed as a biodegradation intermediate.	2	1	2
Test Design	3. Study Controls	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	4. Test Substance Stability	Not rated	Not applicable; the test substance was formed as a biodegradation intermediate.	NR	NR	NR
Test Conditions	5. Test Method Suitability	Unacceptable	The test method suitability for the test substance was not able to be evaluated due to limited information.	4	1	4
	6. Testing Conditions	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	7. Testing Consistency	Not rated	Not applicable; multiple study groups were not reported.	NR	NR	NR
	8. System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1

Test Organisms	9. Test Organism Degradation	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	Unacceptable	Assumptions made about the test substance were likely to have had a substantial impact on the results. This was a serious flaw that made the study unusable.	4	1	4
	12. Sampling Methods	Medium	This metric met the criteria for high confidence as expected for this type of study.	2	1	2
Confounding/ Variable Control	13. Confounding Variables	Not rated	No confounding variables were noted.	NR	NR	NR
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	Medium	There were omissions in the results details however, these were not likely to have had a substantial impact on the study results.	2	2	4
	16. Statistical Methods and Kinetic Calculations	Medium	Calculations were summarized; all experimental values were not reported.	2	1	2

Other	17. Verification or Plausibility of Results	Not rated	Due to limited information, evaluation of the reasonableness of the study results was not possible.	NR	NR	NR
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	24	16	33
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	2.06	**Overall Score (Rounded):**	4
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	Unacceptable[1]

[1]The test substance identity could not be verified from the information provided. Consistent with our Application of Systematic Review in TSCA Risk Evaluations document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, three of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

Study Reference:	Lapertot, ME; Pulgarin, C. (2006). Biodegradability assessment of several priority hazardous substances: Choice, application and relevance regarding toxicity and bacterial activity. Chemosphere 65: 682-690. http://dx.doi.org/10.1016/j.chemosphere.2006.01.046 HERO ID: 4140358					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	High	The test substance source and purity were reported.	1	1	1
Test Design	3. Study Controls	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	4. Test Substance Stability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	Medium	Protection from light or use of amber bottles was not reported.	2	2	4
	7. Testing Consistency	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	8. System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1

Test Organisms	9. Test Organism Degradation	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	12. Sampling Methods	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Confounding/ Variable Control	13. Confounding Variables	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	16. Statistical Methods and Kinetic Calculations	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Other	17. Verification or Plausibility of Results	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	16	20	22

High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.1	**Overall Score (Rounded):**	1.1
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	High

Study Reference:	Chang, YC; Hatsu, M; Jung, K; Yoo, YS; Takamizawa, K. (1998). Degradation of a variety of halogenated aliphatic compounds by an anaerobic mixed culture. J Ferment Bioeng 86: 410-412. http://dx.doi.org/10.1016/S0922-338X(99)89015-1 HERO ID: 4140393					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	Medium	The test substance source and purity were not reported; however, analytical techniques were used to measure test substance concentrations.	2	1	2
Test Design	3. Study Controls	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	4. Test Substance Stability	Medium	The test substance stability was not addressed but was not expected to have impacted study results.	2	1	2
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	7. Testing Consistency	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	8. System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1

Test Organisms	9. Test Organism Degradation	Medium	A nonstandard inoculum was used in the study; however, the deviation was not likely to have had a substantial impact on the study results.	2	2	4
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	12. Sampling Methods	Medium	Limited details about sampling method and frequency were reported.	2	1	2
Confounding/ Variable Control	13. Confounding Variables	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	16. Statistical Methods and Kinetic Calculations	Not rated	Statistics and kinetics were not reported for the test substance.	NR	NR	NR
Other	17. Verification or Plausibility of Results	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	18	19	24

High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.26	**Overall Score (Rounded):**	1.3
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	High

Study Reference:	Braus-Stromeyer, SA; Hermann, R; Cook, AM; Leisinger, T. (1993). Dichloromethane as the sole carbon source for an acetogenic mixed culture and isolation of a fermentative, dichloromethane-degrading bacterium. Appl Environ Microbiol 59: 3790-3797. HERO ID: 4140400					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	High	The test substance source and purity were reported.	1	1	1
Test Design	3. Study Controls	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	4. Test Substance Stability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	7. Testing Consistency	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	8. System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1

Test Organisms	9. Test Organism Degradation	Medium	An enriched, nonstandard organism was used in the study; however, the deviation was not likely to have had a substantial impact on the study results.	2	2	4
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	12. Sampling Methods	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Confounding/ Variable Control	13. Confounding Variables	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	16. Statistical Methods and Kinetic Calculations	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Other	17. Verification or Plausibility of Results	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR

			Sum of scores:	16	20	22
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.1	**Overall Score (Rounded):**	1.1
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	High

Study Reference:	Dow Chem Co. (1977). The Inhibition of Anaerobic Sludge Gas Production By 1,1,1-Trichloroethane, Methylene Chloride, Trichloroethylene and Perchloroethylene, Part 2. (OTS: OTS0517178; 8EHQ Num: NA; DCN: 86- 870002089; TSCATS RefID: 309930; CIS: NA). HERO ID: 4213887					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	Low	The test substance source and purity were not reported or verified by analytical means.	3	1	3
Test Design	3. Study Controls	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	4. Test Substance Stability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	7. Testing Consistency	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	8. System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1

Test Organisms	9. Test Organism Degradation	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	Low	Study described inhibition of gas production, not biodegradation.	3	1	3
	12. Sampling Methods	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Confounding/ Variable Control	13. Confounding Variables	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	16. Statistical Methods and Kinetic Calculations	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Other	17. Verification or Plausibility of Results	Medium	The study results were reasonable, and the reported value was outside expected range (the extraction recovery was 50%); however, no serious study deficiencies were identified.	2	1	2
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	20	20	25

High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.25	**Overall Score (Rounded):**	2.3
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	Low[1]

[1]The reviewer downgraded this study's overall quality rating. They noted: Study describes inhibition of gas production not biodegradation rates or transformation pathways.

Study Reference:	Dow Chem Co. (1982). Fate and Effects of Methylene Chloride in Activated Sludge (See Cover Letter Dated 060382). (OTS: OTS0509180; 8EHQ Num: 47004 F1-7; DCN: 40-8224284; TSCATS RefID: 206792; CIS: NA). HERO ID: 4214069					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	High	Test substance source and purity were reported.	1	1	1
Test Design	3. Study Controls	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	4. Test Substance Stability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	7. Testing Consistency	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	8. System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1

Test Organisms	9. Test Organism Degradation	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	12. Sampling Methods	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Confounding/ Variable Control	13. Confounding Variables	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	16. Statistical Methods and Kinetic Calculations	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Other	17. Verification or Plausibility of Results	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	15	20	20

High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1	**Overall Score (Rounded):**	1
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	High

Study Reference:	Dow Chemical (Dow Chemical Company). (1980). Introductory study of the biodegradation of the chlorinated methane, ethane and ethene compounds: Progress report CR806890-01 coop agreement [TSCA Submission]. (OTS: OTS0509177; 8EHQ Num: 47004 F1-2A; DCN: 40-8024098; TSCATS RefID: 200511; CIS: NA). Midland, MI. HERO ID: 4215582					
Domain	Metric	Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]	Comments	Metric Score	Metric Weighting Factor	Weighted Score
Test Substance	1. Test Substance Identity	High	The test substance was identified definitively by chemical name.	1	2	2
	2. Test Substance Purity	Low	The source and purity of the test substance were not reported.	3	1	3
Test Design	3. Study Controls	High	A concurrent positive control and results from controls were within the ranges specified for test validity.	1	2	2
	4. Test Substance Stability	Medium	The test substance stability, homogeneity, preparation and storage conditions were not reported; however, these factors were not likely to have influenced the test substance or were not likely to have had a substantial impact on the study results.	2	1	2
Test Conditions	5. Test Method Suitability	High	The test method was suitable for the test substance and the target chemical was tested at concentrations below its aqueous solubility.	1	1	1
	6. Testing Conditions	Unacceptable	Testing conditions were not reported, and data provided were insufficient to interpret results.	4	2	8

	7. Testing Consistency	Medium	Test conditions appeared to be consistent across samples; however, details of the test conditions, such as pH, temperature, aerobic/anaerobic, etc., were not provided.	2	1	2
	8. System Type and Design	Unacceptable	System type and design details were not definitively reported.	4	1	4
Test Organisms	9. Test Organism Degradation	Medium	The inoculum source was reported, but is not routinely used for similar study types; however, the deviation was not likely to have had a substantial impact on the study results.	2	2	4
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	High	The outcome assessment methodology reported the intended outcome of interest.	1	1	1
	12. Sampling Methods	Low	Details regarding sampling methods were not fully reported, and the omissions were likely to have had a substantial impact on the study results.	3	1	3
Confounding/ Variable Control	13. Confounding Variables	Low	Sources of variability and uncertainty in the measurements and statistical techniques and between study groups (if applicable) were not considered or accounted for in data evaluation resulting in some uncertainty.	3	1	3

	Metric	Rating	Description			
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	High	Test substance and transformation product concentrations were reported along with suitable detection methods.	1	2	2
	16. Statistical Methods and Kinetic Calculations	Not rated	Statistical methods or kinetic calculations were not reported.	NR	NR	NR
Other	17. Verification or Plausibility of Results	Low	Limited information was provided about the test system. Samples were taken from a new vial at each testing period.	3	1	3
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	31	19	40
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	2.11	**Overall Score (Rounded):**	4
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	Unacceptable[1]

[1]Testing conditions were not reported, and data provided were insufficient to interpret results. Consistent with our Application of Systematic Review in TSCA Risk Evaluations document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, two of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

Study Reference:	Tabak, HH; Quave, SA; Mashni, CI; Barth, EF. (1981). Biodegradability studies with organic priority pollutant compounds. J Water Pollut Control Fed 53: 1503-1518. HERO ID: 9861					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	Medium	The test substance source and purity were not reported.	2	1	2
Test Design	3. Study Controls	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	4. Test Substance Stability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	7. Testing Consistency	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	8. System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1

Category	Metric	Rating	Description			
Test Organisms	9. Test Organism Degradation	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	12. Sampling Methods	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Confounding/ Variable Control	13. Confounding Variables	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	Medium	Some quantitative details were omitted; however, overall results were clearly reported.	2	2	4
	16. Statistical Methods and Kinetic Calculations	High	The analysis of data was clearly described.	1	1	1
Other	17. Verification or Plausibility of Results	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	17	20	23
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.15	**Overall Score (Rounded):**	1.2
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	High

Study Reference:	Wood, PR; Parsons, FZ; DeMarco, J; Harween, HJ; Lang, RF; Payan, IL; Ruiz, MC. (1981). Introductory study of the biodegradation of the chlorinated methane, ethane and ethene compounds. Paper presented at American Water Works Association Annual Conference and Exposition, June 7-11, 1981, St. Louis, MO. HERO ID: 9881					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	Medium	Methylene chloride was formed as a transformation product and detected by GC-MS analytical technique.	2	1	2
Test Design	3. Study Controls	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	4. Test Substance Stability	Not rated	Not applicable; methylene chloride was a transformation product from carbon tetrachloride in this study.	NR	NR	NR
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	Low	Some test conditions, such as pH, specific temperature and light control, were not reported.	3	2	6
	7. Testing Consistency	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1

	8. System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Test Organisms	9. Test Organism Degradation	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	12. Sampling Methods	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Confounding/ Variable Control	13. Confounding Variables	High	Absorption concerns were discussed in the study.	1	1	1
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	Medium	Specific chemical concentrations were not reported.	2	2	4
	16. Statistical Methods and Kinetic Calculations	Medium	Half-life calculation was not described.	2	1	2
Other	17. Verification or Plausibility of Results	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR

			Sum of scores:	19	19	27
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.42	**Overall Score (Rounded):**	1.7
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	Medium[1]

[1]The reviewer downgraded this study's overall quality rating. They noted: Methylene chloride was studied as a transformation product.

Study Reference:	Marrone, PA; Gschwend, PM; Swallow, KC; Peters, WA; Tester, JW. (1998). Product distribution and reaction pathways for methylene chloride hydrolysis and oxidation under hydrothermal conditions. Journal of Supercritical Fluids 12: 239-254. HERO ID: 1183338					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	Low	The source and purity of the test substance were not reported or verified by analytical means.	3	1	3
Test Design	3. Study Controls	Not rated	The study did not require concurrent control groups.	NR	NR	NR
	4. Test Substance Stability	Medium	The test substance stability, homogeneity, preparation, and storage conditions were not reported; however, these factors were not likely to have influenced the test substance or were not likely to have had a substantial impact on the study results.	2	1	2
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	Medium	There were omissions in testing conditions; however, omissions were not likely to have had a substantial impact on study results.	2	2	4
	7. Testing Consistency	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1

	8. System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Test Organisms	9. Test Organism Degradation	Not rated	The metric is not applicable to this study type.	NR	NR	NR
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	Low	The assessment methodology did not address or report the outcome of interest; analytical methods were not detailed; no rate constant or half-life was determined; however, transformation products and a proposed mechanism for hydrolysis were reported.	3	1	3
	12. Sampling Methods	Low	Details regarding sampling methods were not included.	3	1	3
Confounding/ Variable Control	13. Confounding Variables	Not rated	No confounding variables were noted.	NR	NR	NR
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	Low	Limited supporting data were included for the detection and identification of the transformation products were reported.	3	2	6
	16. Statistical Methods and Kinetic Calculations	Medium	Statistical analysis and kinetic calculations were not clearly described.	2	1	2

Other	17. Verification or Plausibility of Results	Low	Identification of transformation products was not detailed.	3	1	3
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	25	15	31
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	2.07	**Overall Score (Rounded):**	2.3
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	Low[1]

[1]The reviewer downgraded this study's overall quality rating. They noted: Limited supporting data were included for the detection and identification of the transformation products; analytical methods were not detailed and neither a rate constant nor half-life were determined.

Study Reference:	Oshima, Y; Bijanto, B; Koda, S. (2001). Kinetics of methylene chloride hydrolysis and the salt effect under hydrothermal conditions. Ind Eng Chem Res 40: 1026-1031. HERO ID: 3590244					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	Low	The source and purity of the test substance were not reported or verified by analytical means.	3	1	3
Test Design	3. Study Controls	Medium	Concurrent control group details were not included; however, the lack of data was not likely to have had a substantial impact on the study results.	2	2	4
	4. Test Substance Stability	Medium	The test substance stability, homogeneity, preparation, and storage conditions were not reported; however, these factors were not likely to have influenced the test substance or were not likely to have had a substantial impact on the study results.	2	1	2
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	Medium	The pH was not reported for this hydrolysis study.	2	2	4

	7. Testing Consistency	Medium	The test conditions across samples or study groups were not reported.	2	1	2
	8. System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Test Organisms	9. Test Organism Degradation	Not rated	The metric is not applicable to this study type.	NR	NR	NR
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	Unacceptable	The temperature range is too high to be relevant to typical environmental conditions.	4	1	4
	12. Sampling Methods	Medium	Some details regarding this metric were not reported; however, the omissions were unlikely to have hindered the interpretation of results.	2	1	2
Confounding/ Variable Control	13. Confounding Variables	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	16. Statistical Methods and Kinetic Calculations	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1

Other	17. Verification or Plausibility of Results	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	24	18	30
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.67	**Overall Score (Rounded):**	4
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	Unacceptable[1]

[1]The temperature range is too high to be relevant for typical environmental conditions. Consistent with our Application of Systematic Review in TSCA Risk Evaluations document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, one of the metrics was rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

Study Reference:	ECHA (European Chemicals Agency). (2017). Hydrolysis: Dichloromethane. Helsinki, Finland. Retrieved from https://echa.europa.eu/registration-dossier/-/registered-dossier/15182/5/2/3# HERO ID: 3970734					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name and CASRN.	1	2	2
	2. Test Substance Purity	Medium	Test substance purity was not reported.	2	1	2
Test Design	3. Study Controls	Medium	Concurrent control group details were not included; however, the lack of data was not likely to have had a substantial impact on the study results.	2	2	4
	4. Test Substance Stability	Medium	The test substance preparation was not specified, but was not likely to have affected the results.	2	1	2
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	7. Testing Consistency	Medium	The testing consistency was not specified, but was not likely to have affected the results.	2	1	2
	8. System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1

Test Organisms	9. Test Organism Degradation	Not rated	The metric is not applicable to this study type.	NR	NR	NR
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	Medium	Not specified, but not likely to have affected the results.	2	1	2
	12. Sampling Methods	Medium	Not specified, but not likely to have affected the results.	2	1	2
Confounding/ Variable Control	13. Confounding Variables	Low	The title of the primary source indicated that the study was an evaporation study, but was filed in ECHA as a hydrolysis study. The test details also indicated that it was a hydrolysis study.	3	1	3
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	Medium	Not specified, but not likely to have affected the results.	2	2	4
	16. Statistical Methods and Kinetic Calculations	Low	Pseudo-first-order kinetics were assumed, but the basis for this assumption was not specified.	3	1	3
Other	17. Verification or Plausibility of Results	Medium	No serious study deficiencies were identified, and the value was plausible; however, limited details were available in this secondary source.	2	1	2

	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	26	18	32
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.78	**Overall Score (Rounded):**	1.8
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	Medium[1]

[1]Secondary source (ECHA) citing primary source (HERO ID 58054, Dilling, W. L., et al. (1975). "Evaporation rates and reactivities of methylene chloride, chloroform, 1,1,1-trichloroethane, trichloroethylene, tetrachloroethylene, and other chlorinated compounds in dilute aqueous solutions." Environmental Science and Technology 9(9): 833-838.).

Study Reference:	Dilling, WL; Tefertiller, NB; Kallos, GJ. (1975). Evaporation rates and reactivities of methylene chloride, chloroform, 1,1,1-trichloroethane, trichloroethylene, tetrachloroethylene, and other chlorinated compounds in dilute aqueous solutions. Environ Sci Technol 9: 833-838. http://dx.doi.org/10.1021/es60107a008 HERO ID: 58054					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	Medium	Purity was not reported; however, MS analysis was performed at start of study. The detection method was specifically at the m/z of the desired compound, so the purity was not likely to have affected the results.	2	1	2
Test Design	3. Study Controls	Not rated	Controls were not reported for the hydrolysis study. Methanol was used as a co-solvent.	NR	NR	NR
	4. Test Substance Stability	High	MS analysis performed at start of study.	1	1	1
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	High	Water was purged with air 15 min prior to initiation of study; the authors appeared to be assuming that hydrolysis was followed by oxidation; thus, by having an abundance of oxygen, they ensured that the rate-determining step was hydrolysis.	1	2	2

	7. Testing Consistency	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	8. System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Test Organisms	9. Test Organism Degradation	Not rated	The metric is not applicable to this study type.	NR	NR	NR
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	High	The outcome of interest and its basis were reported.	1	1	1
	12. Sampling Methods	Medium	Sampling methods were omitted. Sampling timing was suitable.	2	1	2
Confounding/ Variable Control	13. Confounding Variables	Medium	Transformation products were assumed; however, they were never determined experimentally.	2	1	2
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	Medium	Transformation products not identified.	2	2	4
	16. Statistical Methods and Kinetic Calculations	Medium	Statistical methods or kinetic calculations were not reported.	2	1	2

Other	17. Verification or Plausibility of Results	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	18	16	22
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.38	**Overall Score (Rounded):**	1.4
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	High

Study Reference:	Schreier, CG; Reinhard, M. (1994). Transformation of chlorinated organic compounds by iron and manganese powders in buffered water and in landfill leachate. Chemosphere 29: 1743-1753. http://dx.doi.org/10.1016/0045-6535(94)90320-4 HERO ID: 1740898					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	Low	There was uncertainty regarding the radiolabeling and source of the test substance.	3	2	6
	2. Test Substance Purity	Low	The source and purity of the test substance were not reported or verified by analytical means.	3	1	3
Test Design	3. Study Controls	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	4. Test Substance Stability	Medium	Protection from light/photolysis was not addressed; however, not likely to have been a concern.	2	1	2
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	7. Testing Consistency	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1

	8. System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Test Organisms	9. Test Organism Degradation	Not rated	The metric is not applicable to this study type.	NR	NR	NR
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	Low	Incomplete reporting of outcome assessment methods; however, such differences or absence of details were not likely to have been severe or to have had a substantial impact on the study results. Could have been considered hydrolysis study but buffer was used.	3	1	3
	12. Sampling Methods	Medium	Sampling time and frequency were not reported in method, inferred from figure.	2	1	2
Confounding/ Variable Control	13. Confounding Variables	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	Medium	Quantitative data for DCM were not fully reported or discussed beyond figures.	2	2	4
	16. Statistical Methods and Kinetic Calculations	Medium	Quantitative calculations for DCM were not fully reported or discussed beyond figures.	2	1	2

Other	17. Verification or Plausibility of Results	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	24	18	31
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.72	**Overall Score (Rounded):**	1.7
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	Medium

Study Reference:	**Dilling, WL. (1977). Interphase transfer processes. II. Evaporation rates of chloro methanes, ethanes, ethylenes, propanes, and propylenes from dilute aqueous solutions. Comparisons with theoretical predictions. Environ Sci Technol 11: 405-409.**					
	http://dx.doi.org/10.1021/es60127a009					
	HERO ID: 18370					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	Low	There were possible mixture concerns since two to five compounds were run together.	3	1	3
Test Design	3. Study Controls	Medium	A series of compounds were run, but no mention of controls.	2	2	4
	4. Test Substance Stability	Medium	Not discussed but were not likely to have influenced the test results.	2	1	2
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	7. Testing Consistency	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	8. System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Test Organisms	9. Test Organism Degradation	Not rated	The metric is not applicable to this study type.	NR	NR	NR
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR

Outcome Assessment	11. Outcome Assessment Methodology	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	12. Sampling Methods	Low	Sampling was not described and may have influenced the test results.	3	1	3
Confounding/ Variable Control	13. Confounding Variables	Low	Sources of variability and uncertainty in the measurements and statistical techniques and between study groups were not considered or accounted for in data evaluation.	3	1	3
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	16. Statistical Methods and Kinetic Calculations	Medium	Statistics were not conducted/reported for the experimental study.	2	1	2
Other	17. Verification or Plausibility of Results	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	23	18	28
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.56	**Overall Score (Rounded):**	1.6
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	High

Study Reference:	Leighton, DT, Jr; Calo, JM. (1981). Distribution coefficients of chlorinated hydrocarbons in dilute air-water systems for groundwater contamination applications. Journal of Chemical and Engineering Data 26: 382-585. http://dx.doi.org/10.1021/je00026a010 HERO ID: 194928					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	Low	The test substance source and purity were not reported, and analytical data were not reported to verify the test substance.	3	1	3
Test Design	3. Study Controls	Low	Controls were not included.	3	2	6
	4. Test Substance Stability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Test Conditions	5. Test Method Suitability	Medium	Some test method details were not provided; however, the omissions were not likely to have had a substantial impact on the study results.	2	1	2
	6. Testing Conditions	Medium	Concentration of test material was vague; some details were omitted (pH).	2	2	4
	7. Testing Consistency	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	8. System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1

Test Organisms	9. Test Organism Degradation	Not rated	The metric is not applicable to this study type.	NR	NR	NR
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	12. Sampling Methods	Medium	Some sampling details were omitted.	2	1	2
Confounding/ Variable Control	13. Confounding Variables	Not rated	No confounding variables were noted.	NR	NR	NR
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	Medium	Some results details were omitted; but this was not likely to have impacted the interpretation of study results.	2	2	4
	16. Statistical Methods and Kinetic Calculations	Medium	Some results details were omitted, but this was not likely to have impacted the interpretation of study results.	2	1	2
Other	17. Verification or Plausibility of Results	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	22	17	29

High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.76	**Overall Score (Rounded):**	1.8
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	Medium

Study Reference:	U.S. EPA (U.S. Environmental Protection Agency). (2012). Estimation Programs Interface Suite™ for Microsoft® Windows, v 4.11 [Computer Program]. Washington, DC. Retrieved from https://www.epa.gov/tsca-screening-tools/epi-suitetm-estimation-program- interface HERO ID: 2347246					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	Not rated	The metric is not applicable to this study type (SAR).	NR	NR	NR
Test Design	3. Study Controls	Not rated	The metric is not applicable to this study type (SAR).	NR	NR	NR
	4. Test Substance Stability	Not rated	The metric is not applicable to this study type (SAR).	NR	NR	NR
Test Conditions	5. Test Method Suitability	Not rated	The metric is not applicable to this study type (SAR).	NR	NR	NR
	6. Testing Conditions	Not rated	The metric is not applicable to this study type (SAR).	NR	NR	NR
	7. Testing Consistency	Not rated	The metric is not applicable to this study type (SAR).	NR	NR	NR
	8. System Type and Design	Not rated	The metric is not applicable to this study type (SAR).	NR	NR	NR
Test Organisms	9. Test Organism Degradation	Not rated	The metric is not applicable to this study type.	NR	NR	NR
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	Not rated	The metric is not applicable to this study type (SAR).	NR	NR	NR
	12. Sampling Methods	Not rated	The metric is not applicable to this study type (SAR).	NR	NR	NR

Confounding/ Variable Control	13. Confounding Variables	Not rated	The metric is not applicable to this study type (SAR).	NR	NR	NR
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	Not rated	The metric is not applicable to this study type (SAR).	NR	NR	NR
	16. Statistical Methods and Kinetic Calculations	Not rated	The metric is not applicable to this study type (SAR).	NR	NR	NR
Other	17. Verification or Plausibility of Results	Not rated	The metric is not applicable to this study type (SAR).	NR	NR	NR

	18. QSAR Models	High	The models in EPI SuiteTM have defined endpoints. Chemical domain and performance statistics for each model are known, and unambiguous algorithms are available in the EPI SuiteTM documentation and/or cited references to establish their scientific validity. Many EPI SuiteTM models have correlation coefficients >0.7, cross-validated correlation coefficients >0.5, and standard error values <0.3; however, correlation coefficients ($r2$, $q2$) for the regressions of some environmental fate models (i.e. BIOWIN) are lower, as expected, compared to regressions which have specific experimental values such as water solubility or log Kow (octanol-water partition coefficient).	1	1	1
			Sum of scores:	2	3	1
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1	**Overall Score (Rounded):**	1
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	High

Study Reference:	Soltanali, S; Hagani, ZS. (2008). Modeling of air stripping from volatile organic compounds in biological treatment processes. Int J Environ Sci Tech 5: 353-360. HERO ID: 2529433					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	Not rated	The test substance was identified by analytical means.	NR	NR	NR
Test Design	3. Study Controls	Medium	Study control was not reported but was not likely to have had a substantial impact on the study results.	2	2	4
	4. Test Substance Stability	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Test Conditions	5. Test Method Suitability	High	The test method measured influent, effluent and VOCs.	1	1	1
	6. Testing Conditions	Low	Some test conditions were reported but not all (i.e. unnamed facilities).	3	2	6
	7. Testing Consistency	High	The metric is not applicable to this study type.	1	1	1
	8. System Type and Design	Medium	Retention time and temperature were not reported.	2	1	2
Test Organisms	9. Test Organism Degradation	Low	Not clear of test organism source (domestic or industrial sewage).	3	2	6
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR

Outcome Assessment	11. Outcome Assessment Methodology	Low	May have given site-/WWTP-specific results.	3	1	3
	12. Sampling Methods	Low	Sample timing was not well described.	3	1	3
Confounding/ Variable Control	13. Confounding Variables	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	Low	Sampling results were not clearly reported.	3	2	6
	16. Statistical Methods and Kinetic Calculations	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Other	17. Verification or Plausibility of Results	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	25	18	36

High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	2.06	**Overall Score (Rounded):**	2.3
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	Low[1]

[1]The reviewer downgraded this study's overall quality rating. They noted: Modeling study that did not report the related experimental details well.

Study Reference:	Parker, WJ; Thompson, DJ; Bell, JP; Melcer, H. (1993). Fate of volatile organic compounds in municipal activated sludge plants. Water Environ Res 65: 58-65. HERO ID: 2803053					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	High	The test substance was identified by analytical means.	1	1	1
Test Design	3. Study Controls	Medium	Chemical name(s) of external control(s) not reported.	2	2	4
	4. Test Substance Stability	Not rated	This was a field type study were stability was not considered.	NR	NR	NR
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	Unacceptable	Testing conditions not well reported (pH, temperature, sludge concentrations).	4	2	8
	7. Testing Consistency	Not rated	The metric is not applicable to this study type.	NR	NR	NR
	8. System Type and Design	Medium	Likely an open system where test material could have been lost.	2	1	2
Test Organisms	9. Test Organism Degradation	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR

				High	Medium	Low
Outcome Assessment	11. Outcome Assessment Methodology	Unacceptable	The extent of air stripping was a function of the compound physical-chemical properties and a function of WWTP design and operation.	4	1	4
	12. Sampling Methods	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Confounding/ Variable Control	13. Confounding Variables	Medium	This metric met the criteria for high confidence as expected for this type of study.	2	1	2
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	Medium	Some information was not reported; however, these omissions were not likely to have had a substantial impact on the study results.	2	2	4
	16. Statistical Methods and Kinetic Calculations	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Other	17. Verification or Plausibility of Results	Not rated	Due to limited information, evaluation of the reasonableness of the study results was not possible.	NR	NR	NR
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	22	17	32
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.88	**Overall Score (Rounded):**	4

≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	Unacceptable[1]

[1]Study evaluates removal based on air stripping. The extent of air stripping is a function of the compound pchem properties and a function of WWTP design and operation. Consistent with our Application of Systematic Review in TSCA Risk Evaluations document, if a metric for a data source receives a score of Unacceptable (score = 4), EPA will determine the study to be unacceptable. In this case, two of the metrics were rated as unacceptable. As such, the study is considered unacceptable and the score is presented solely to increase transparency.

Study Reference:	Keefe, SH; Barber, LB; Runkel, RL; Ryan, JN. (2004). Fate of volatile organic compounds in constructed wastewater treatment wetlands. Environ Sci Technol 38: 2209-2216. http://dx.doi.org/10.1021/es034661i HERO ID: 3566693					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	Not rated	The metric is not applicable to this study type (field samples).	NR	NR	NR
Test Design	3. Study Controls	Not rated	The metric is not applicable to this study type (field samples).	NR	NR	NR
	4. Test Substance Stability	Not rated	The metric is not applicable to this study type (field samples).	NR	NR	NR
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	Not rated	The metric is not applicable to this study type (field samples).	NR	NR	NR
	7. Testing Consistency	Not rated	The metric is not applicable to this study type (field samples).	NR	NR	NR
	8. System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Test Organisms	9. Test Organism Degradation	Not rated	The metric is not applicable to this study type (field samples).	NR	NR	NR
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type (field samples).	NR	NR	NR

Outcome Assessment	11. Outcome Assessment Methodology	High	This was primarily a modeling study based on field samples.	1	1	1
	12. Sampling Methods	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Confounding/ Variable Control	13. Confounding Variables	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	16. Statistical Methods and Kinetic Calculations	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Other	17. Verification or Plausibility of Results	Medium	The study results were reasonable.	2	1	2
	18. QSAR Models	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
			Sum of scores:	11	12	13
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.08	**Overall Score (Rounded):**	1.1
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	High

Study Reference:	Blaney, BL. (1989). Applicability of steam stripping to organics removal from wastewater streams. (EPA/600/9-89/072). Cincinnati, OH: Blaney, BL. http://infohouse.p2ric.org/ref/23/22522.pdf HERO ID: 3986884					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	High	The test substance was identified by analytical means.	1	1	1
Test Design	3. Study Controls	Medium	Some concurrent control group details were not included; however, the lack of data was not likely to have had a substantial impact on the study results.	2	2	4
	4. Test Substance Stability	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	Low	There were reported deviations or omissions in testing conditions, and these were likely to have had a substantial impact on the results (temperature).	3	2	6
	7. Testing Consistency	Medium	There were omissions in the reporting across study groups, but these not likely to have had a substantial impact on the study results.	2	1	2

	8. System Type and Design	Medium	The system designs were not described well but the omission was not likely to have had a substantial impact on the study results.	2	1	2
Test Organisms	9. Test Organism Degradation	Not rated	The metric is not applicable to this study type.	NR	NR	NR
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	12. Sampling Methods	Low	Details regarding sampling methods of the outcome(s) were not fully reported, and the omissions were likely to have had a substantial impact on the study results.	3	1	3
Confounding/ Variable Control	13. Confounding Variables	Low	Sources of variability and uncertainty in the measurements and statistical techniques and between study groups (if applicable) were not considered or accounted for in data evaluation resulting in some uncertainty.	3	1	3
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR

Data Presentation and Analysis	15. Data Reporting	Low	There was insufficient evidence presented to confirm that parent compound disappearance was not likely to have been due to some other process. Analytical details were not well reported.	3	2	6
	16. Statistical Methods and Kinetic Calculations	Medium	Statistical analysis or kinetic calculations were not conducted or were not described clearly.	2	1	2
Other	17. Verification or Plausibility of Results	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	25	17	34
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	2	**Overall Score (Rounded):**	2
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	Medium

Study Reference:	**Dobbs, RA; Wang, L; Govind, R. (1989). Sorption of toxic organic compounds on wastewater solids: Correlation with fundamental properties. Environ Sci Technol 23: 1092-1097. http://dx.doi.org/10.1021/es00067a004** **HERO ID: 4140494**					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	High	The test substance was identified by analytical means.	1	1	1
Test Design	3. Study Controls	Medium	Study control results not discussed.	2	2	4
	4. Test Substance Stability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	7. Testing Consistency	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	8. System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Test Organisms	9. Test Organism Degradation	Not rated	The metric is not applicable to this study type.	NR	NR	NR
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR

Outcome Assessment	11. Outcome Assessment Methodology	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	12. Sampling Methods	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Confounding/ Variable Control	13. Confounding Variables	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	Medium	Kinetics data for DCM were not fully reported.	2	2	4
	16. Statistical Methods and Kinetic Calculations	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Other	17. Verification or Plausibility of Results	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	16	18	22
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.22	**Overall Score (Rounded):**	1.2
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	High

Study Reference:	Dow Chem Co. (1983). Nonenzymatic Reductive Dechlorination of Chlorinated Methanes and Ethanes in Aqueous Solution. (OTS: OTS0517182; 8EHQ Num: NA; DCN: 86-870002093; TSCATS RefID: 309938; CIS: NA). HERO ID: 4213888					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	Medium	The test substance source and purity were not reported; however, GC-ECD analytical method was used to detect compound.	2	1	2
Test Design	3. Study Controls	Medium	Reference compound was unnamed.	2	2	4
	4. Test Substance Stability	Medium	Limited details provided however; the omission was not expected to have impacted the results.	2	1	2
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	7. Testing Consistency	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	8. System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1

Test Organisms	9. Test Organism Degradation	Not rated	The metric is not applicable to this study type.	NR	NR	NR
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	12. Sampling Methods	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Confounding/ Variable Control	13. Confounding Variables	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	16. Statistical Methods and Kinetic Calculations	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Other	17. Verification or Plausibility of Results	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	17	18	22
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.22	**Overall Score (Rounded):**	1.2
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	High

Study Reference:	Bell, J; Melcer, H; Monteith, H; Osinga, I; Steel, P. (1993). Stripping of volatile organic compounds at full-scale municipal wastewater treatment plants. Water Environ Res 65: 708-716. http://dx.doi.org/10.2175/WER.65.6.2 HERO ID: 658661					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	High	The test substance was identified by analytical means.	1	1	1
Test Design	3. Study Controls	Not rated	The metric is not applicable to this study type.	NR	NR	NR
	4. Test Substance Stability	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	Not rated	The metric is not applicable to this study type.	NR	NR	NR
	7. Testing Consistency	Not rated	The metric is not applicable to this study type.	NR	NR	NR
	8. System Type and Design	Medium	Open system where test substance may have been lost.	2	1	2
Test Organisms	9. Test Organism Degradation	Not rated	The metric is not applicable to this study type.	NR	NR	NR
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	12. Sampling Methods	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1

Confounding/ Variable Control	13. Confounding Variables	Not rated	The study noted that design parameters may have impacted the results.	NR	NR	NR
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	16. Statistical Methods and Kinetic Calculations	Medium	Emission rates were estimated by multiplying the average VOC concentrations by the appropriate airflow rates	2	1	2
Other	17. Verification or Plausibility of Results	Medium	The study results were reasonable; however, due to limited information, evaluation of the reasonableness of the study results was not possible.	2	1	2
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	12	11	14
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.27	**Overall Score (Rounded):**	1.3
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	High

Study Reference:	Stubin, AI; Brosnan, TM; Porter, KD; Jimenez, L; Lochan, H. (1996). Organic priority pollutants in New York City municipal wastewaters: 1989-1993. Water Environ Res 68: 1037-1044. http://dx.doi.org/10.2175/106143096X128108 HERO ID: 658797					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	High	The test substance was identified by analytical means.	1	1	1
Test Design	3. Study Controls	Medium	The metric is not applicable to this study type.	2	2	4
	4. Test Substance Stability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	7. Testing Consistency	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	8. System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Test Organisms	9. Test Organism Degradation	Not rated	The metric is not applicable to this study type.	NR	NR	NR
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR

Outcome Assessment	11. Outcome Assessment Methodology	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	12. Sampling Methods	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Confounding/ Variable Control	13. Confounding Variables	High	No confounding variables were noted.	1	1	1
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	16. Statistical Methods and Kinetic Calculations	Not rated	The analysis of data was clearly described.	NR	NR	NR
Other	17. Verification or Plausibility of Results	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	14	17	19

High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.12	**Overall Score (Rounded):**	1.1
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	High

Study Reference:	ECHA (European Chemicals Agency). (2017). Phototransformation in air: Dichloromethane. Helsinki, Finland. Retrieved from https://echa.europa.eu/registration-dossier/-/registered-dossier/15182/5/2/2# HERO ID: 3970733					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	Not rated	The metric is not applicable to this study type (QSAR).	NR	NR	NR
Test Design	3. Study Controls	Not rated	The metric is not applicable to this study type (QSAR).	NR	NR	NR
	4. Test Substance Stability	Not rated	The metric is not applicable to this study type (QSAR).	NR	NR	NR
Test Conditions	5. Test Method Suitability	Not rated	The metric is not applicable to this study type (QSAR).	NR	NR	NR
	6. Testing Conditions	Not rated	The metric is not applicable to this study type (QSAR).	NR	NR	NR
	7. Testing Consistency	Not rated	The metric is not applicable to this study type (QSAR).	NR	NR	NR
	8. System Type and Design	Not rated	The metric is not applicable to this study type (QSAR).	NR	NR	NR
Test Organisms	9. Test Organism Degradation	Not rated	The metric is not applicable to this study type.	NR	NR	NR
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	Not rated	The metric is not applicable to this study type (QSAR).	NR	NR	NR
	12. Sampling Methods	Not rated	The metric is not applicable to this study type (QSAR).	NR	NR	NR
Confounding/ Variable Control	13. Confounding Variables	Not rated	The metric is not applicable to this study type (QSAR).	NR	NR	NR
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR

Data Presentation and Analysis	15. Data Reporting	Medium	Some information was not reported; however, these omissions were not likely to have had a substantial impact on the study results.	2	2	4
	16. Statistical Methods and Kinetic Calculations	Not rated	The metric is not applicable to this study type (QSAR).	NR	NR	NR
Other	17. Verification or Plausibility of Results	Medium	The study results were reasonable; presented in a secondary source.	2	1	2
	18. QSAR Models	High	The QSAR model (AOPWIN v1.91) has a defined, unambiguous endpoint and the model performance was known.	1	1	1
			Sum of scores:	6	6	9
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.5	**Overall Score (Rounded):**	1.5
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	High

Study Reference:	ECHA (European Chemicals Agency). (2017). Phototransformation in water: Dichloromethane. Helsinki, Finland. Retrieved from https://echa.europa.eu/registration-dossier/-/registered-dossier/15182/5/2/4# HERO ID: 3970718					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	Medium	Not reported but not likely to have affected the outcome.	2	1	2
Test Design	3. Study Controls	Low	Consecutive dark controls were not reported.	3	2	6
	4. Test Substance Stability	Low	Test substance stability in water was not established.	3	1	3
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	7. Testing Consistency	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	8. System Type and Design	Medium	Some system design details were not provided; however, the primary source may contain more information.	2	1	2
Test Organisms	9. Test Organism Degradation	Not rated	The metric is not applicable to this study type.	NR	NR	NR
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	Medium	Details were not reported, but this was not likely to have affected the outcome.	2	1	2
	12. Sampling Methods	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1

Confounding/ Variable Control	13. Confounding Variables	Low	The possibility that the results may have been due to other reactions, i.e. hydrolysis or indirect photolysis, was not addressed.	3	1	3
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	Low	Insufficient data were reported to confirm the result.	3	2	6
	16. Statistical Methods and Kinetic Calculations	Low	Insufficient data were reported to confirm the result.	3	1	3
Other	17. Verification or Plausibility of Results	Low	Insufficient data were presented to confirm the results were due to direct photolysis.	3	1	3
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	29	18	37
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	2.06	**Overall Score (Rounded):**	2.1
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	Medium[1]

[1]The reviewer agreed with this study's overall quality level. Secondary source (ECHA) study citing primary source (HERO ID 58054, Dilling, W. L., et al. (1975). "Evaporation rates and reactivities of methylene chloride, chloroform, 1,1,1-trichloroethane, trichloroethylene, tetrachloroethylene, and other chlorinated compounds in dilute aqueous solutions." Environmental Science and Technology 9(9): 833-838.)

Study Reference:	Dilling, WL; Tefertiller, NB; Kallos, GJ. (1975). Evaporation rates and reactivities of methylene chloride, chloroform, 1,1,1-trichloroethane, trichloroethylene, tetrachloroethylene, and other chlorinated compounds in dilute aqueous solutions. Environ Sci Technol 9: 833-838. http://dx.doi.org/10.1021/es60107a008 HERO ID: 58054					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	High	The test substance purity and source were not reported; however, MS analysis was performed at start of study. The detection method was specifically at the m/z of the desired compound, so the purity was not likely to have affected the results.	1	1	1
Test Design	3. Study Controls	Medium	Some concurrent control group details were not included; however, the lack of data was not likely to have had a substantial impact on the study results.	2	2	4
	4. Test Substance Stability	High	Mass spectra analysis was performed at start of study.	1	1	1
Test Conditions	5. Test Method Suitability	High	Methanol was used as a co-solvent.	1	1	1
	6. Testing Conditions	High	Water was purged with air 15 min prior to initiation of study; the authors appear to be assuming that hydrolysis is followed by oxidation; thus, by having an abundance of oxygen, they ensure that the rate-determining step is hydrolysis.	1	2	2

	7. Testing Consistency	High	No inconsistencies were reported or identified.	1	1	1
	8. System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Test Organisms	9. Test Organism Degradation	Not rated	The metric is not applicable to this study type.	NR	NR	NR
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Outcome Assessment	11. Outcome Assessment Methodology	High	The outcome of interest and its basis were reported.	1	1	1
	12. Sampling Methods	Medium	Sampling methods were omitted. Sampling timing was suitable.	2	1	2
Confounding/ Variable Control	13. Confounding Variables	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	Medium	Transformation products were not identified.	2	2	4
	16. Statistical Methods and Kinetic Calculations	Medium	Statistical methods or kinetic calculations were not reported.	2	1	2
Other	17. Verification or Plausibility of Results	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	18	18	25
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.33	**Overall Score (Rounded):**	1.3
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	High[1]

[1]The reviewer agreed with this study's overall quality level. Related HERO ID 3970783, Echa. Phototransformation in water: Tetrachloroethylene. 2017.

Study Reference:	Haag, WR; Yao, CCD. (1992). Rate constants for reaction of hydroxyl radicals with several drinking water contaminants. Environ Sci Technol 26: 1005-1013. http://dx.doi.org/10.1021/es00029a021 HERO ID: 658815					
Domain	**Metric**	**Qualitative Determination [i.e., High, Medium, Low, Unacceptable, or Not rated]**	**Comments**	**Metric Score**	**Metric Weighting Factor**	**Weighted Score**
Test Substance	1. Test Substance Identity	High	The test substance was identified by chemical name.	1	2	2
	2. Test Substance Purity	High	The test substance purity was reported.	1	1	1
Test Design	3. Study Controls	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	4. Test Substance Stability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Test Conditions	5. Test Method Suitability	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	6. Testing Conditions	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	7. Testing Consistency	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	8. System Type and Design	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Test Organisms	9. Test Organism Degradation	Not rated	The metric is not applicable to this study type.	NR	NR	NR
	10. Test Organism Partitioning	Not rated	The metric is not applicable to this study type.	NR	NR	NR

Outcome Assessment	11. Outcome Assessment Methodology	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	12. Sampling Methods	Medium	Some sampling details (timing, methods) not well described.	2	1	2
Confounding/ Variable Control	13. Confounding Variables	Medium	The study did not discuss low pH value of system or report temperature.	2	1	2
	14. Outcomes Unrelated to Exposure	Not rated	The metric is not applicable to this study type.	NR	NR	NR
Data Presentation and Analysis	15. Data Reporting	High	This metric met the criteria for high confidence as expected for this type of study.	1	2	2
	16. Statistical Methods and Kinetic Calculations	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
Other	17. Verification or Plausibility of Results	High	This metric met the criteria for high confidence as expected for this type of study.	1	1	1
	18. QSAR Models	Not rated	The metric is not applicable to this study type.	NR	NR	NR
			Sum of scores:	16	18	20
High	Medium	Low	**Overall Score = Sum of Weighted Scores/Sum of Metric Weighting Factors:**	1.11	**Overall Score (Rounded):**	1.1
≥1 and <1.7	≥1.7 and <2.3	≥2.3 and ≤3			**Overall Quality Level:**	High