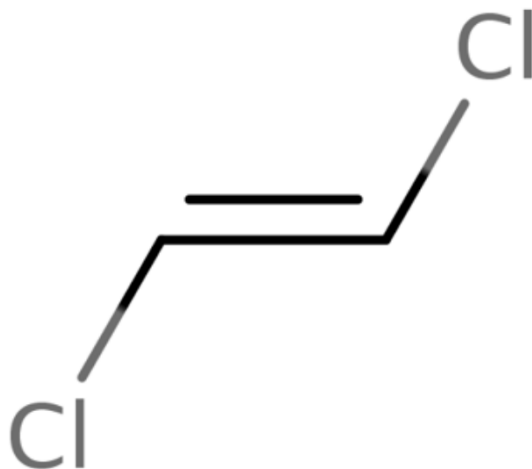

**Draft Data Quality Evaluation Information for
Environmental Hazard for
trans-1,2-Dichloroethylene**

Systematic Review Support Document for the Draft Risk Evaluation

CASRN: 156-60-5



June 2026

This supplemental file contains information regarding the data quality evaluation results relevant to the analysis of environmental hazard for the *Draft Human Health and Environmental Hazard Assessment for trans-1,2-Dichloroethylene*. Due to data gaps identified for trans-1,2-dichloroethylene, analog data from trichloroethylene and cis-1,2-dichloroethylene were included for read-across in the *Draft Human Health and Environmental Hazard Assessment for trans-1,2-Dichloroethylene*. EPA conducted data quality evaluation based on author-reported descriptions and results; additional analyses (e.g., statistical analyses performed during data integration into the risk evaluation) potentially conducted by EPA are not contained in this supplemental file. EPA used the TSCA systematic review process described in the *Draft Systematic Review Protocol Supporting TSCA Risk Evaluations for Chemical Substances* (referred to hereafter as the '2021 Draft Systematic Review Protocol'). Any updated steps in the systematic review process since the publication of the 2021 Draft Systematic Review Protocol will be described in the *Draft Systematic Review Protocol for trans-1,2-Dichloroethylene*, to be released with the risk evaluation.

Different data quality evaluation forms were used for different organism as described in the PECO statement in Appendix H.5.7 of the 2021 Draft Systematic Review Protocol. Each health outcome was evaluated independently within a given reference; therefore, each reference may have more than one overall quality determination (OQD) to more appropriately reflect the quality of each health outcome and the respective hazard endpoints as described by the study authors. Some data evaluation forms have general additional comments presented adjacent to the OQD to add further context. No OQD is determined for each reference as a whole, if it contains data from more than one evidence stream. Data quality evaluation results were organized by first presenting the data for the target compound (trans-1,2-dichloroethylene) followed by a separate section for analog data (trichloroethylene and cis-1,2-dichloroethylene). The table of contents lists references based on chemical, broad habitat (i.e., aquatic, terrestrial), taxa, taxonomic group, exposure duration, and health outcome (e.g., mortality) categories relevant to the endpoint being evaluated.

trans-1,2-Dichloroethylene

Table of Contents

HERO ID	Reference	Page
trans-1,2-Dichloroethylene		
Habitat: Aquatic (freshwater)		
Taxa: Vertebrates		
	<i>Ambystoma maculatum</i>	
3543916	McDaniel, T. V., Martin, P. A., Ross, N., Brown, S., Lesage, S., Pauli, B. D. (2004). Effects of chlorinated solvents on four species of North American amphibians. Archives of Environmental Contamination and Toxicology 47(1):101-109.	5
	<i>Bufo americanus</i>	
3543916	McDaniel, T. V., Martin, P. A., Ross, N., Brown, S., Lesage, S., Pauli, B. D. (2004). Effects of chlorinated solvents on four species of North American amphibians. Archives of Environmental Contamination and Toxicology 47(1):101-109.	7
	<i>Rana clamitans</i>	
3543916	McDaniel, T. V., Martin, P. A., Ross, N., Brown, S., Lesage, S., Pauli, B. D. (2004). Effects of chlorinated solvents on four species of North American amphibians. Archives of Environmental Contamination and Toxicology 47(1):101-109.	15
	<i>Rana sylvatica</i>	
3543916	McDaniel, T. V., Martin, P. A., Ross, N., Brown, S., Lesage, S., Pauli, B. D. (2004). Effects of chlorinated solvents on four species of North American amphibians. Archives of Environmental Contamination and Toxicology 47(1):101-109.	23
Taxa: Invertebrates		
	<i>Daphnia magna</i>	
7508	Leblanc, G. A. (1980). Acute toxicity of priority pollutants to water flea (Daphnia magna). Bulletin of Environmental Contamination and Toxicology 24(5):684-691.	31
Taxa: Plants (Non-vascular)		
	<i>Pseudokirchneriella subcapitata</i>	
3617867	Tsai, K. P., Chen, C. Y. (2007). An algal toxicity database of organic toxicants derived by a closed-system technique. Environmental Toxicology and Chemistry 26(9):1931-1939.	33
Habitat: Terrestrial		
Taxa: Invertebrates		

trans-1,2-Dichloroethylene

Table of Contents

	<i>Eisenia fetida</i>	
3625226	Neuhauser, E. F., Loehr, R. C., Malecki, M. R., Milligan, D. L., Durkin, P. R. (1985). The toxicity of selected organic chemicals to the earthworm <i>Eisenia fetida</i> . <i>Journal of Environmental Quality</i> 14(3):383-388.	35
Taxa: Plants (Vascular)		
	<i>Nicotiana tabacum L.</i>	
1022795	Schubert, U., Wisanowsky, L., Kull, U. (1995). Determination of phytotoxicity of several volatile organic compounds by investigating the germination pattern of tobacco pollen. <i>Journal of Plant Physiology</i> 145(4):514-518.	37
	<i>Populus deltoides x nigra</i>	
42313	Dietz, A. C., Schnoor, J. L. (2001). Phytotoxicity of chlorinated aliphatics to hybrid poplar (<i>Populus deltoides x nigra</i> DN34). <i>Environmental Toxicology and Chemistry</i> 20(2):389-393.	40

Study Citation:	Mcdaniel, T. V., Martin, P. A., Ross, N., Brown, S., Lesage, S., Pauli, B. D. (2004). Effects of chlorinated solvents on four species of North American amphibians. Archives of Environmental Contamination and Toxicology 47(1):101-109.			
Duration:	Overall Duration: 0 - 4 days (0-96h); Exposure Duration: 0 - 4 days (0-96h)			
Exposure Route, Media, Path:	Aquatic (freshwater); Water; Not determined by study authors (i.e., chemical of interest in exposure water, but unable to determine exact uptake route)			
Taxa, Species, Age:	Vertebrate; Amphibian; <i>Ambystoma maculatum</i> ; Embryo			
Health Outcome:	Development/Growth			
Chemical:	trans-1,2-dichloroethylene-Other (metabolite, degradant, etc.)			
HERO ID:	3543916			
Domain	Metric	Rating	Comments	
Domain 1: Test Substance				
	Metric 1: Test Substance Identity	Medium	Chemical identified as cis dichloroethylene.	
	Metric 2: Test Substance Source	Low	The test substance identity was not analytically verified by the performing laboratory	
	Metric 3: Test Substance Purity	High	Purity and grade of test substance was reported	
Domain 2: Test Design				
	Metric 4: Negative Controls	High	Study authors reported using an appropriate concurrent negative control group	
	Metric 5: Negative Control Response	Low	The biological response of the negative control groups was not reported	
	Metric 6: Randomized Allocation	Low	Researchers did not report how organisms were allocated to study groups	
Domain 3: Exposure Characterization				
	Metric 7: Experimental System/Test Media Preparation	High	The experimental system and methods for preparation of test media were described in adequate detail	
	Metric 8: Consistency of Exposure Administration	Medium	Details of exposure administration were reported, but minor issues in administration of exposures among study groups were identified	
	Metric 9: Measurement of Test Substance Concentration	Low	Concentrations were measured but considerable loss during the test lends uncertainty to the results	
	Metric 10: Exposure Duration and Frequency	Medium	Exposure was shorter than time to hatch	
	Metric 11: Number of Exposure Groups/Spacing of Exposure Levels	Medium	There were minor limitations (solubility) regarding the number of exposure groups	
	Metric 12: Testing at or Below Solubility Limit	High	Exposure concentrations were at or below the water solubility limit	
Domain 4: Test Organism				
	Metric 13: Test Organism Characteristics	Medium	There are minor reservations about the source of test organisms	
	Metric 14: Acclimatization and Pretreatment Conditions	Low	The study did not report whether test organisms were acclimatized	
	Metric 15: Number of Organisms and Replicates per Group	Low	The numbers of test organisms and replicates were lower than the typical number (5-10 per replicate)	
Domain 5: Outcome Assessment				
	Metric 16: Adequacy of Test Conditions	Medium	Minor uncertainties were identified regarding organism housing and environmental conditions based on high number of deformities	
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Study Citation:	Mcdaniel, T. V., Martin, P. A., Ross, N., Brown, S., Lesage, S., Pauli, B. D. (2004). Effects of chlorinated solvents on four species of North American amphibians. Archives of Environmental Contamination and Toxicology 47(1):101-109.
Duration:	Overall Duration: 0 - 4 days (0-96h); Exposure Duration: 0 - 4 days (0-96h)
Exposure Route, Media, Path:	Aquatic (freshwater); Water; Not determined by study authors (i.e., chemical of interest in exposure water, but unable to determine exact uptake route)
Taxa, Species, Age:	Vertebrate; Amphibian; <i>Ambystoma maculatum</i> ; Embryo
Health Outcome:	Development/Growth
Chemical:	trans-1,2-dichloroethylene-Other (metabolite, degradant, etc.)
HERO ID:	3543916

Domain	Metric	Rating	Comments
	Metric 17: Outcome Assessment Methodology	Medium	The outcome assessment methodology partially addressed or reported the intended outcomes, no significant effects reported
	Metric 18: Consistency of Outcome Assessment	Medium	Outcome assessment protocol was reported but not in detail, outcomes were assessed consistently
Domain 6: Confounding / Variable Control			
	Metric 19: Confounding Variables in Test Design and Procedures	High	There were no reported differences among the study groups in environmental conditions
	Metric 20: Outcomes Unrelated to Exposure	Low	Reported information indicated that one or more study groups experienced disproportionate test organism deformity but few details were provided regarding frequency for each concentration
Domain 7: Data Presentation and Analysis			
	Metric 21: Statistical Methods	High	Statistical methods were reasonably well described
	Metric 22: Reporting of Data	Low	Data for exposure-related findings were not shown for each treatment and control group
	Metric 23: Explanation of Unexpected Outcomes	Low	Insufficient information was provided to determine if excessive variability or unexpected outcomes occurred.

Additional Comments: This form represents spotted salamander (*Ambystoma maculatum*) growth data (EC50, deformities) to Cis 1,2, DCE. The data are located in Table 3.

Overall Quality Determination**Medium**

Study Citation:	Medaniel, T. V., Martin, P. A., Ross, N., Brown, S., Lesage, S., Pauli, B. D. (2004). Effects of chlorinated solvents on four species of North American amphibians. Archives of Environmental Contamination and Toxicology 47(1):101-109.			
Duration:	Overall Duration: 0 - 4 days (0-96h); Exposure Duration: 0 - 4 days (0-96h)			
Exposure Route, Media, Path:	Aquatic (freshwater); Water; Not determined by study authors (i.e., chemical of interest in exposure water, but unable to determine exact uptake route)			
Taxa, Species, Age:	Vertebrate; Amphibian; <i>Bufo americanus</i> ; Embryo			
Health Outcome:	Development/Growth			
Chemical:	trans-1,2-dichloroethylene-Parent compound			
HERO ID:	3543916			
Domain	Metric	Rating	Comments	
Domain 1: Test Substance				
Metric 1:	Test Substance Identity	Medium	Chemical identified as trans dichloroethylene.	
Metric 2:	Test Substance Source	Low	The test substance identity was not analytically verified by the performing laboratory	
Metric 3:	Test Substance Purity	High	Purity and grade of test substance was reported	
Domain 2: Test Design				
Metric 4:	Negative Controls	High	Study authors reported using an appropriate concurrent negative control group	
Metric 5:	Negative Control Response	Low	The biological response of the negative control groups was not reported	
Metric 6:	Randomized Allocation	Low	Researchers did not report how organisms were allocated to study groups	
Domain 3: Exposure Characterization				
Metric 7:	Experimental System/Test Media Preparation	High	The experimental system and methods for preparation of test media were described in adequate detail	
Metric 8:	Consistency of Exposure Administration	Medium	Details of exposure administration were reported, but minor issues in administration of exposures among study groups were identified	
Metric 9:	Measurement of Test Substance Concentration	Low	Concentrations were measured but considerable loss during the test lends uncertainty to the results	
Metric 10:	Exposure Duration and Frequency	High	The duration of exposure and/or exposure frequency were reported and appropriate for the study type	
Metric 11:	Number of Exposure Groups/ Spacing of Exposure Levels	Medium	There were minor limitations (solubility, effects) regarding the number of exposure groups	
Metric 12:	Testing at or Below Solubility Limit	High	Exposure concentrations were at or below the water solubility limit	
Domain 4: Test Organism				
Metric 13:	Test Organism Characteristics	Medium	There are minor reservations about the source of test organisms	
Metric 14:	Acclimatization and Pretreatment Conditions	Low	The study did not report whether test organisms were acclimatized	
Metric 15:	Number of Organisms and Replicates per Group	Medium	The numbers of test organisms and replicates were adequate	
Domain 5: Outcome Assessment				
Metric 16:	Adequacy of Test Conditions	Medium	Minor uncertainties were identified regarding organism housing and environmental conditions based on high number of deformities	

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Study Citation:	Mcdaniel, T. V., Martin, P. A., Ross, N., Brown, S., Lesage, S., Pauli, B. D. (2004). Effects of chlorinated solvents on four species of North American amphibians. Archives of Environmental Contamination and Toxicology 47(1):101-109.
Duration:	Overall Duration: 0 - 4 days (0-96h); Exposure Duration: 0 - 4 days (0-96h)
Exposure Route, Media, Path:	Aquatic (freshwater); Water; Not determined by study authors (i.e., chemical of interest in exposure water, but unable to determine exact uptake route)
Taxa, Species, Age:	Vertebrate; Amphibian; <i>Bufo americanus</i> ; Embryo
Health Outcome:	Development/Growth
Chemical:	trans-1,2-dichloroethylene-Parent compound
HERO ID:	3543916

Domain	Metric	Rating	Comments
	Metric 17: Outcome Assessment Methodology	Medium	The outcome assessment methodology partially addressed or reported the intended outcomes, no significant effects reported
	Metric 18: Consistency of Outcome Assessment	Medium	Outcome assessment protocol was reported but not in detail, outcomes were assessed consistently
Domain 6: Confounding / Variable Control			
	Metric 19: Confounding Variables in Test Design and Procedures	High	There were no reported differences among the study groups in environmental conditions
	Metric 20: Outcomes Unrelated to Exposure	Low	Reported information indicated that one or more study groups experienced disproportionate test organism deformity but few details were provided regarding frequency for each concentration
Domain 7: Data Presentation and Analysis			
	Metric 21: Statistical Methods	High	Statistical methods were reasonably well described
	Metric 22: Reporting of Data	Low	Data for exposure-related findings were not shown for each treatment and control group
	Metric 23: Explanation of Unexpected Outcomes	Low	Insufficient information was provided to determine if excessive variability or unexpected outcomes occurred.

Additional Comments: None

Overall Quality Determination**Medium**

Study Citation:	McDaniel, T. V., Martin, P. A., Ross, N., Brown, S., Lesage, S., Pauli, B. D. (2004). Effects of chlorinated solvents on four species of North American amphibians. Archives of Environmental Contamination and Toxicology 47(1):101-109.			
Duration:	Overall Duration: 0 - 4 days (0-96h); Exposure Duration: 0 - 4 days (0-96h)			
Exposure Route, Media, Path:	Aquatic (freshwater); Water; Not determined by study authors (i.e., chemical of interest in exposure water, but unable to determine exact uptake route)			
Taxa, Species, Age:	Vertebrate; Amphibian; <i>Bufo americanus</i> ; Embryo			
Health Outcome:	Mortality			
Chemical:	trans-1,2-dichloroethylene-Parent compound			
HERO ID:	3543916			
Domain	Metric	Rating	Comments	
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	Medium	Chemical identified as trans dichloroethylene.
	Metric 2:	Test Substance Source	Low	The test substance identity was not analytically verified by the performing laboratory
	Metric 3:	Test Substance Purity	High	Purity and grade of test substance was reported
Domain 2: Test Design				
	Metric 4:	Negative Controls	High	Study authors reported using an appropriate concurrent negative control group
	Metric 5:	Negative Control Response	High	The biological response of the negative control groups was adequate
	Metric 6:	Randomized Allocation	Low	Researchers did not report how organisms were allocated to study groups
Domain 3: Exposure Characterization				
	Metric 7:	Experimental System/Test Media Preparation	High	The experimental system and methods for preparation of test media were described in adequate detail
	Metric 8:	Consistency of Exposure Administration	Medium	Details of exposure administration were reported, but minor issues in administration of exposures among study groups were identified
	Metric 9:	Measurement of Test Substance Concentration	Low	Concentrations were measured but considerable loss during the test lends uncertainty to the results
	Metric 10:	Exposure Duration and Frequency	High	The duration of exposure and/or exposure frequency were reported and appropriate for the study type
	Metric 11:	Number of Exposure Groups/ Spacing of Exposure Levels	Medium	There were minor limitations (solubility) regarding the number of exposure groups
	Metric 12:	Testing at or Below Solubility Limit	High	Exposure concentrations were at or below the water solubility limit
Domain 4: Test Organism				
	Metric 13:	Test Organism Characteristics	Medium	There are minor reservations about the source of test organisms
	Metric 14:	Acclimatization and Pretreatment Conditions	Low	The study did not report whether test organisms were acclimatized
	Metric 15:	Number of Organisms and Replicates per Group	Medium	The numbers of test organisms and replicates were adequate
Domain 5: Outcome Assessment				
	Metric 16:	Adequacy of Test Conditions	Medium	Minor uncertainties were identified regarding organism housing and environmental conditions based on high number of deformities
	Metric 17:	Outcome Assessment Methodology	Medium	The outcome assessment methodology partially addressed or reported the intended outcomes

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Study Citation:	Mcdaniel, T. V., Martin, P. A., Ross, N., Brown, S., Lesage, S., Pauli, B. D. (2004). Effects of chlorinated solvents on four species of North American amphibians. Archives of Environmental Contamination and Toxicology 47(1):101-109.
Duration:	Overall Duration: 0 - 4 days (0-96h); Exposure Duration: 0 - 4 days (0-96h)
Exposure Route, Media, Path:	Aquatic (freshwater); Water; Not determined by study authors (i.e., chemical of interest in exposure water, but unable to determine exact uptake route)
Taxa, Species, Age:	Vertebrate; Amphibian; <i>Bufo americanus</i> ; Embryo
Health Outcome:	Mortality
Chemical:	trans-1,2-dichloroethylene-Parent compound
HERO ID:	3543916

Domain	Metric	Rating	Comments
	Metric 18: Consistency of Outcome Assessment	Medium	Outcome assessment protocol was reported but not in detail, outcomes were assessed consistently
Domain 6: Confounding / Variable Control			
	Metric 19: Confounding Variables in Test Design and Procedures	High	There were no reported differences among the study groups in environmental conditions
	Metric 20: Outcomes Unrelated to Exposure	Low	Reported information indicated that one or more study groups experienced disproportionate test organism deformity but few details were provided regarding frequency for each concentration
Domain 7: Data Presentation and Analysis			
	Metric 21: Statistical Methods	Low	Statistical methods were reasonably well described but not it wasn't clear if they were applied to mortality
	Metric 22: Reporting of Data	Low	Data for exposure-related findings were not shown for each treatment and control group
	Metric 23: Explanation of Unexpected Outcomes	Low	Only mean values and range were reported

Additional Comments: None

Overall Quality Determination**Medium**

Study Citation:	Mcdaniel, T. V., Martin, P. A., Ross, N., Brown, S., Lesage, S., Pauli, B. D. (2004). Effects of chlorinated solvents on four species of North American amphibians. Archives of Environmental Contamination and Toxicology 47(1):101-109.			
Duration:	Overall Duration: 0 - 4 days (0-96h); Exposure Duration: 0 - 4 days (0-96h)			
Exposure Route, Media, Path:	Aquatic (freshwater); Water; Not determined by study authors (i.e., chemical of interest in exposure water, but unable to determine exact uptake route)			
Taxa, Species, Age:	Vertebrate; Amphibian; <i>Bufo americanus</i> ; Embryo			
Health Outcome:	Mortality			
Chemical:	trans-1,2-dichloroethylene-Parent compound			
HERO ID:	3543916			
Domain	Metric	Rating	Comments	
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	Medium	Chemical identified as cis dichloroethylene.
	Metric 2:	Test Substance Source	Low	The test substance identity was not analytically verified by the performing laboratory
	Metric 3:	Test Substance Purity	High	Purity and grade of test substance was reported
Domain 2: Test Design				
	Metric 4:	Negative Controls	High	Study authors reported using an appropriate concurrent negative control group
	Metric 5:	Negative Control Response	High	The biological response of the negative control groups was adequate
	Metric 6:	Randomized Allocation	Low	Researchers did not report how organisms were allocated to study groups
Domain 3: Exposure Characterization				
	Metric 7:	Experimental System/Test Media Preparation	High	The experimental system and methods for preparation of test media were described in adequate detail
	Metric 8:	Consistency of Exposure Administration	Medium	Details of exposure administration were reported, but minor issues in administration of exposures among study groups were identified
	Metric 9:	Measurement of Test Substance Concentration	Low	Concentrations were measured but considerable loss during the test lends uncertainty to the results
	Metric 10:	Exposure Duration and Frequency	High	The duration of exposure and/or exposure frequency were reported and appropriate for the study type
	Metric 11:	Number of Exposure Groups/ Spacing of Exposure Levels	Medium	There were minor limitations (solubility) regarding the number of exposure groups
	Metric 12:	Testing at or Below Solubility Limit	High	Exposure concentrations were at or below the water solubility limit
Domain 4: Test Organism				
	Metric 13:	Test Organism Characteristics	Medium	There are minor reservations about the source of test organisms
	Metric 14:	Acclimatization and Pretreatment Conditions	Low	The study did not report whether test organisms were acclimatized
	Metric 15:	Number of Organisms and Replicates per Group	Medium	The numbers of test organisms and replicates were adequate
Domain 5: Outcome Assessment				
	Metric 16:	Adequacy of Test Conditions	Medium	Minor uncertainties were identified regarding organism housing and environmental conditions based on high number of deformities
	Metric 17:	Outcome Assessment Methodology	Medium	The outcome assessment methodology partially addressed or reported the intended outcomes
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Study Citation:	Mcdaniel, T. V., Martin, P. A., Ross, N., Brown, S., Lesage, S., Pauli, B. D. (2004). Effects of chlorinated solvents on four species of North American amphibians. Archives of Environmental Contamination and Toxicology 47(1):101-109.
Duration:	Overall Duration: 0 - 4 days (0-96h); Exposure Duration: 0 - 4 days (0-96h)
Exposure Route, Media, Path:	Aquatic (freshwater); Water; Not determined by study authors (i.e., chemical of interest in exposure water, but unable to determine exact uptake route)
Taxa, Species, Age:	Vertebrate; Amphibian; <i>Bufo americanus</i> ; Embryo
Health Outcome:	Mortality
Chemical:	trans-1,2-dichloroethylene-Parent compound
HERO ID:	3543916

Domain	Metric	Rating	Comments
	Metric 18: Consistency of Outcome Assessment	Medium	Outcome assessment protocol was reported but not in detail, outcomes were assessed consistently
Domain 6: Confounding / Variable Control			
	Metric 19: Confounding Variables in Test Design and Procedures	High	There were no reported differences among the study groups in environmental conditions
	Metric 20: Outcomes Unrelated to Exposure	Low	Reported information indicated that one or more study groups experienced disproportionate test organism deformity but few details were provided regarding frequency for each concentration
Domain 7: Data Presentation and Analysis			
	Metric 21: Statistical Methods	Low	Statistical methods were reasonably well described but not it wasn't clear if they were applied to mortality
	Metric 22: Reporting of Data	Low	Data for exposure-related findings were not shown for each treatment and control group
	Metric 23: Explanation of Unexpected Outcomes	Low	Only mean values and range were reported

Additional Comments: None

Overall Quality Determination**Medium**

Study Citation:	Mcdaniel, T. V., Martin, P. A., Ross, N., Brown, S., Lesage, S., Pauli, B. D. (2004). Effects of chlorinated solvents on four species of North American amphibians. Archives of Environmental Contamination and Toxicology 47(1):101-109.			
Duration:	Overall Duration: 0 - 4 days (0-96h); Exposure Duration: 0 - 4 days (0-96h)			
Exposure Route, Media, Path:	Aquatic (freshwater); Water; Not determined by study authors (i.e., chemical of interest in exposure water, but unable to determine exact uptake route)			
Taxa, Species, Age:	Vertebrate; Amphibian; <i>Bufo americanus</i> ; Embryo			
Health Outcome:	Development/Growth			
Chemical:	trans-1,2-dichloroethylene-Other (metabolite, degradant, etc.)			
HERO ID:	3543916			
Domain	Metric	Rating	Comments	
Domain 1: Test Substance				
	Metric 1: Test Substance Identity	Medium	Chemical identified as cis dichloroethylene.	
	Metric 2: Test Substance Source	Low	The test substance identity was not analytically verified by the performing laboratory	
	Metric 3: Test Substance Purity	High	Purity and grade of test substance was reported	
Domain 2: Test Design				
	Metric 4: Negative Controls	High	Study authors reported using an appropriate concurrent negative control group	
	Metric 5: Negative Control Response	Low	The biological response of the negative control groups was not reported	
	Metric 6: Randomized Allocation	Low	Researchers did not report how organisms were allocated to study groups	
Domain 3: Exposure Characterization				
	Metric 7: Experimental System/Test Media Preparation	High	The experimental system and methods for preparation of test media were described in adequate detail	
	Metric 8: Consistency of Exposure Administration	Medium	Details of exposure administration were reported, but minor issues in administration of exposures among study groups were identified	
	Metric 9: Measurement of Test Substance Concentration	Low	Concentrations were measured but considerable loss during the test lends uncertainty to the results	
	Metric 10: Exposure Duration and Frequency	High	The duration of exposure and/or exposure frequency were reported and appropriate for the study type	
	Metric 11: Number of Exposure Groups/ Spacing of Exposure Levels	Medium	There were minor limitations (solubility, effects) regarding the number of exposure groups	
	Metric 12: Testing at or Below Solubility Limit	High	Exposure concentrations were at or below the water solubility limit	
Domain 4: Test Organism				
	Metric 13: Test Organism Characteristics	Medium	There are minor reservations about the source of test organisms	
	Metric 14: Acclimatization and Pretreatment Conditions	Low	The study did not report whether test organisms were acclimatized	
	Metric 15: Number of Organisms and Replicates per Group	Medium	The numbers of test organisms and replicates were adequate	
Domain 5: Outcome Assessment				
	Metric 16: Adequacy of Test Conditions	Medium	Minor uncertainties were identified regarding organism housing and environmental conditions based on high number of deformities	
	Metric 17: Outcome Assessment Methodology	Medium	The outcome assessment methodology partially addressed or reported the intended outcomes, no significant effects reported	

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Study Citation:	Mcdaniel, T. V., Martin, P. A., Ross, N., Brown, S., Lesage, S., Pauli, B. D. (2004). Effects of chlorinated solvents on four species of North American amphibians. Archives of Environmental Contamination and Toxicology 47(1):101-109.
Duration:	Overall Duration: 0 - 4 days (0-96h); Exposure Duration: 0 - 4 days (0-96h)
Exposure Route, Media, Path:	Aquatic (freshwater); Water; Not determined by study authors (i.e., chemical of interest in exposure water, but unable to determine exact uptake route)
Taxa, Species, Age:	Vertebrate; Amphibian; <i>Bufo americanus</i> ; Embryo
Health Outcome:	Development/Growth
Chemical:	trans-1,2-dichloroethylene-Other (metabolite, degradant, etc.)
HERO ID:	3543916

Domain	Metric	Rating	Comments
	Metric 18: Consistency of Outcome Assessment	Medium	Outcome assessment protocol was reported but not in detail, outcomes were assessed consistently
Domain 6: Confounding / Variable Control			
	Metric 19: Confounding Variables in Test Design and Procedures	High	There were no reported differences among the study groups in environmental conditions
	Metric 20: Outcomes Unrelated to Exposure	Low	Reported information indicated that one or more study groups experienced disproportionate test organism deformity but few details were provided regarding frequency for each concentration
Domain 7: Data Presentation and Analysis			
	Metric 21: Statistical Methods	High	Statistical methods were reasonably well described
	Metric 22: Reporting of Data	Low	Data for exposure-related findings were not shown for each treatment and control group
	Metric 23: Explanation of Unexpected Outcomes	Low	Insufficient information was provided to determine if excessive variability or unexpected outcomes occurred.

Additional Comments: This form represents *Bufo americanus* (American Toad) growth data (EC50, deformities) to Cis 1,2, DCE. The data are located in Table 3.

Overall Quality Determination

Medium

Study Citation:	Mcdaniel, T. V., Martin, P. A., Ross, N., Brown, S., Lesage, S., Pauli, B. D. (2004). Effects of chlorinated solvents on four species of North American amphibians. Archives of Environmental Contamination and Toxicology 47(1):101-109.			
Duration:	Overall Duration: 0 - 4 days (0-96h); Exposure Duration: 0 - 4 days (0-96h)			
Exposure Route, Media, Path:	Aquatic (freshwater); Water; Not determined by study authors (i.e., chemical of interest in exposure water, but unable to determine exact uptake route)			
Taxa, Species, Age:	Vertebrate; Amphibian; <i>Rana clamitans</i> ; Embryo			
Health Outcome:	Development/Growth			
Chemical:	trans-1,2-dichloroethylene-Parent compound			
HERO ID:	3543916			
Domain	Metric	Rating	Comments	
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	Medium	Chemical identified as trans dichloroethylene.
	Metric 2:	Test Substance Source	Low	The test substance identity was not analytically verified by the performing laboratory
	Metric 3:	Test Substance Purity	High	Purity and grade of test substance was reported
Domain 2: Test Design				
	Metric 4:	Negative Controls	High	Study authors reported using an appropriate concurrent negative control group
	Metric 5:	Negative Control Response	Low	The biological response of the negative control groups was not reported
	Metric 6:	Randomized Allocation	Low	Researchers did not report how organisms were allocated to study groups
Domain 3: Exposure Characterization				
	Metric 7:	Experimental System/Test Media Preparation	High	The experimental system and methods for preparation of test media were described in adequate detail
	Metric 8:	Consistency of Exposure Administration	Medium	Details of exposure administration were reported, but minor issues in administration of exposures among study groups were identified
	Metric 9:	Measurement of Test Substance Concentration	Low	Concentrations were measured but considerable loss during the test lends uncertainty to the results
	Metric 10:	Exposure Duration and Frequency	High	The duration of exposure and/or exposure frequency were reported and appropriate for the study type
	Metric 11:	Number of Exposure Groups/ Spacing of Exposure Levels	Medium	There were minor limitations (solubility) regarding the number of exposure groups
	Metric 12:	Testing at or Below Solubility Limit	High	Exposure concentrations were at or below the water solubility limit
Domain 4: Test Organism				
	Metric 13:	Test Organism Characteristics	Medium	There are minor reservations about the source of test organisms
	Metric 14:	Acclimatization and Pretreatment Conditions	Low	The study did not report whether test organisms were acclimatized
	Metric 15:	Number of Organisms and Replicates per Group	Medium	The numbers of test organisms and replicates were adequate
Domain 5: Outcome Assessment				
	Metric 16:	Adequacy of Test Conditions	Medium	Minor uncertainties were identified regarding organism housing and environmental conditions based on high number of deformities

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Study Citation:	Mcdaniel, T. V., Martin, P. A., Ross, N., Brown, S., Lesage, S., Pauli, B. D. (2004). Effects of chlorinated solvents on four species of North American amphibians. Archives of Environmental Contamination and Toxicology 47(1):101-109.
Duration:	Overall Duration: 0 - 4 days (0-96h); Exposure Duration: 0 - 4 days (0-96h)
Exposure Route, Media, Path:	Aquatic (freshwater); Water; Not determined by study authors (i.e., chemical of interest in exposure water, but unable to determine exact uptake route)
Taxa, Species, Age:	Vertebrate; Amphibian; <i>Rana clamitans</i> ; Embryo
Health Outcome:	Development/Growth
Chemical:	trans-1,2-dichloroethylene-Parent compound
HERO ID:	3543916

Domain	Metric	Rating	Comments
	Metric 17: Outcome Assessment Methodology	Medium	The outcome assessment methodology partially addressed or reported the intended outcomes
	Metric 18: Consistency of Outcome Assessment	Medium	Outcome assessment protocol was reported but not in detail, outcomes were assessed consistently
Domain 6: Confounding / Variable Control			
	Metric 19: Confounding Variables in Test Design and Procedures	High	There were no reported differences among the study groups in environmental conditions
	Metric 20: Outcomes Unrelated to Exposure	Low	Reported information indicated that one or more study groups experienced disproportionate test organism deformity but few details were provided regarding frequency for each concentration
Domain 7: Data Presentation and Analysis			
	Metric 21: Statistical Methods	High	Statistical methods were reasonably well described
	Metric 22: Reporting of Data	Low	Data for exposure-related findings were not shown for each treatment and control group
	Metric 23: Explanation of Unexpected Outcomes	Medium	Insufficient information was provided to determine if excessive variability or unexpected outcomes occurred.

Additional Comments: None

Overall Quality Determination**Medium**

Study Citation:	McDaniel, T. V., Martin, P. A., Ross, N., Brown, S., Lesage, S., Pauli, B. D. (2004). Effects of chlorinated solvents on four species of North American amphibians. Archives of Environmental Contamination and Toxicology 47(1):101-109.			
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Taxa, Species, Age:	Vertebrate; Amphibian; <i>Rana clamitans</i> ; Embryo			
Health Outcome:	Mortality			
Chemical:	trans-1,2-dichloroethylene-Parent compound			
HERO ID:	3543916			
Domain	Metric	Rating	Comments	
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	Medium	Chemical identified as trans dichloroethylene.
	Metric 2:	Test Substance Source	Low	The test substance identity was not analytically verified by the performing laboratory
	Metric 3:	Test Substance Purity	High	Purity and grade of test substance was reported
Domain 2: Test Design				
	Metric 4:	Negative Controls	High	Study authors reported using an appropriate concurrent negative control group
	Metric 5:	Negative Control Response	High	The biological response of the negative control groups was adequate
	Metric 6:	Randomized Allocation	Low	Researchers did not report how organisms were allocated to study groups
Domain 3: Exposure Characterization				
	Metric 7:	Experimental System/Test Media Preparation	High	The experimental system and methods for preparation of test media were described in adequate detail
	Metric 8:	Consistency of Exposure Administration	Medium	Details of exposure administration were reported, but minor issues in administration of exposures among study groups were identified
	Metric 9:	Measurement of Test Substance Concentration	Low	Concentrations were measured but considerable loss during the test lends uncertainty to the results
	Metric 10:	Exposure Duration and Frequency	High	The duration of exposure and/or exposure frequency were reported and appropriate for the study type
	Metric 11:	Number of Exposure Groups/ Spacing of Exposure Levels	Medium	There were minor limitations (solubility) regarding the number of exposure groups
	Metric 12:	Testing at or Below Solubility Limit	High	Exposure concentrations were at or below the water solubility limit
Domain 4: Test Organism				
	Metric 13:	Test Organism Characteristics	Medium	There are minor reservations about the source of test organisms
	Metric 14:	Acclimatization and Pretreatment Conditions	Low	The study did not report whether test organisms were acclimatized
	Metric 15:	Number of Organisms and Replicates per Group	Medium	The numbers of test organisms and replicates were adequate
Domain 5: Outcome Assessment				
	Metric 16:	Adequacy of Test Conditions	Medium	Minor uncertainties were identified regarding organism housing and environmental conditions based on high number of deformities
	Metric 17:	Outcome Assessment Methodology	Medium	The outcome assessment methodology partially addressed or reported the intended outcomes

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Taxa, Species, Age:	Vertebrate; Amphibian; <i>Rana clamitans</i> ; Embryo
Health Outcome:	Mortality
Chemical:	trans-1,2-dichloroethylene-Parent compound
HERO ID:	3543916

Domain	Metric	Rating	Comments
	Metric 18: Consistency of Outcome Assessment	Medium	Outcome assessment protocol was reported but not in detail, outcomes were assessed consistently
Domain 6: Confounding / Variable Control			
	Metric 19: Confounding Variables in Test Design and Procedures	High	There were no reported differences among the study groups in environmental conditions
	Metric 20: Outcomes Unrelated to Exposure	Low	Reported information indicated that one or more study groups experienced disproportionate test organism deformity but few details were provided regarding frequency for each concentration
Domain 7: Data Presentation and Analysis			
	Metric 21: Statistical Methods	Low	Statistical methods were reasonably well described but not it wasn't clear if they were applied to mortality
	Metric 22: Reporting of Data	Low	Data for exposure-related findings were not shown for each treatment and control group
	Metric 23: Explanation of Unexpected Outcomes	Low	Only mean values and range were reported

Additional Comments: None

Overall Quality Determination**Medium**

Study Citation:	Mcdaniel, T. V., Martin, P. A., Ross, N., Brown, S., Lesage, S., Pauli, B. D. (2004). Effects of chlorinated solvents on four species of North American amphibians. Archives of Environmental Contamination and Toxicology 47(1):101-109.			
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Taxa, Species, Age:	Vertebrate; Amphibian; <i>Rana clamitans</i> ; Embryo			
Health Outcome:	Development/Growth			
Chemical:	trans-1,2-dichloroethylene-Parent compound			
HERO ID:	3543916			
Domain	Metric	Rating	Comments	
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	Medium	Chemical identified as trans dichloroethylene.
	Metric 2:	Test Substance Source	Low	The test substance identity was not analytically verified by the performing laboratory
	Metric 3:	Test Substance Purity	High	Purity and grade of test substance was reported
Domain 2: Test Design				
	Metric 4:	Negative Controls	High	Study authors reported using an appropriate concurrent negative control group
	Metric 5:	Negative Control Response	Low	The biological response of the negative control groups was not reported
	Metric 6:	Randomized Allocation	Low	Researchers did not report how organisms were allocated to study groups
Domain 3: Exposure Characterization				
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Domain 4: Test Organism				
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	Metric 15:	Number of Organisms and Replicates per Group	Medium	The numbers of test organisms and replicates were adequate
Domain 5: Outcome Assessment				
	Metric 16:	Adequacy of Test Conditions	Medium	Minor uncertainties were identified regarding organism housing and environmental conditions based on high number of deformities
	Metric 17:	Outcome Assessment Methodology	Medium	The outcome assessment methodology partially addressed or reported the intended outcomes

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Taxa, Species, Age:	Vertebrate; Amphibian; <i>Rana clamitans</i> ; Embryo
Health Outcome:	Development/Growth
Chemical:	trans-1,2-dichloroethylene-Parent compound
HERO ID:	3543916

Domain	Metric	Rating	Comments
	Metric 18: Consistency of Outcome Assessment	Medium	Outcome assessment protocol was reported but not in detail, outcomes were assessed consistently
Domain 6: Confounding / Variable Control			
	Metric 19: Confounding Variables in Test Design and Procedures	High	There were no reported differences among the study groups in environmental conditions
	Metric 20: Outcomes Unrelated to Exposure	Low	Reported information indicated that one or more study groups experienced disproportionate test organism deformity but few details were provided regarding frequency for each concentration
Domain 7: Data Presentation and Analysis			
	Metric 21: Statistical Methods	High	Statistical methods were reasonably well described
	Metric 22: Reporting of Data	Low	Data for exposure-related findings were not shown for each treatment and control group
	Metric 23: Explanation of Unexpected Outcomes	Medium	Insufficient information was provided to determine if excessive variability or unexpected outcomes occurred.

Additional Comments: None

Overall Quality Determination**Medium**

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Exposure Route, Media, Path:	Aquatic (freshwater); Water; Not determined by study authors (i.e., chemical of interest in exposure water, but unable to determine exact uptake route)			
Taxa, Species, Age:	Vertebrate; Amphibian; <i>Rana clamitans</i> ; Embryo			
Health Outcome:	Mortality			
Chemical:	trans-1,2-dichloroethylene-Parent compound			
HERO ID:	3543916			
Domain	Metric	Rating	Comments	
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	Medium	Chemical identified as cis dichloroethylene.
	Metric 2:	Test Substance Source	Low	The test substance identity was not analytically verified by the performing laboratory
	Metric 3:	Test Substance Purity	High	Purity and grade of test substance was reported
Domain 2: Test Design				
	Metric 4:	Negative Controls	High	Study authors reported using an appropriate concurrent negative control group
	Metric 5:	Negative Control Response	High	The biological response of the negative control groups was adequate
	Metric 6:	Randomized Allocation	Low	Researchers did not report how organisms were allocated to study groups
Domain 3: Exposure Characterization				
	Metric 7:	Experimental System/Test Media Preparation	High	The experimental system and methods for preparation of test media were described in adequate detail
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	Metric 15:	Number of Organisms and Replicates per Group	Medium	The numbers of test organisms and replicates were adequate
Domain 5: Outcome Assessment				
	Metric 16:	Adequacy of Test Conditions	Medium	Minor uncertainties were identified regarding organism housing and environmental conditions based on high number of deformities
	Metric 17:	Outcome Assessment Methodology	Medium	The outcome assessment methodology partially addressed or reported the intended outcomes

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Health Outcome:	Mortality
Chemical:	trans-1,2-dichloroethylene-Parent compound
HERO ID:	3543916

Domain	Metric	Rating	Comments
	Metric 18: Consistency of Outcome Assessment	Medium	Outcome assessment protocol was reported but not in detail, outcomes were assessed consistently
Domain 6: Confounding / Variable Control			
	Metric 19: Confounding Variables in Test Design and Procedures	High	There were no reported differences among the study groups in environmental conditions
	Metric 20: Outcomes Unrelated to Exposure	Low	Reported information indicated that one or more study groups experienced disproportionate test organism deformity but few details were provided regarding frequency for each concentration
Domain 7: Data Presentation and Analysis			
	Metric 21: Statistical Methods	Low	Statistical methods were reasonably well described but not it wasn't clear if they were applied to mortality
	Metric 22: Reporting of Data	Low	Data for exposure-related findings were not shown for each treatment and control group
	Metric 23: Explanation of Unexpected Outcomes	Low	Only mean values and range were reported

Additional Comments: None

Overall Quality Determination**Medium**

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Exposure Route, Media, Path:	Aquatic (freshwater); Water; Not determined by study authors (i.e., chemical of interest in exposure water, but unable to determine exact uptake route)			
Taxa, Species, Age:	Vertebrate; Amphibian; <i>Rana sylvatica</i> ; Embryo			
Health Outcome:	Mortality			
Chemical:	trans-1,2-dichloroethylene-Parent compound			
HERO ID:	3543916			
Domain	Metric	Rating	Comments	
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	Medium	Chemical identified as trans dichloroethylene.
	Metric 2:	Test Substance Source	Low	The test substance identity was not analytically verified by the performing laboratory
	Metric 3:	Test Substance Purity	High	Purity and grade of test substance was reported
Domain 2: Test Design				
	Metric 4:	Negative Controls	High	Study authors reported using an appropriate concurrent negative control group
	Metric 5:	Negative Control Response	High	The biological response of the negative control groups was adequate
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	Metric 15:	Number of Organisms and Replicates per Group	Medium	The numbers of test organisms and replicates were adequate
Domain 5: Outcome Assessment				
	Metric 16:	Adequacy of Test Conditions	Medium	Minor uncertainties were identified regarding organism housing and environmental conditions based on high number of deformities

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Taxa, Species, Age:	Vertebrate; Amphibian; <i>Rana sylvatica</i> ; Embryo
Health Outcome:	Mortality
Chemical:	trans-1,2-dichloroethylene-Parent compound
HERO ID:	3543916

Domain	Metric	Rating	Comments
	Metric 17: Outcome Assessment Methodology	Medium	The outcome assessment methodology partially addressed or reported the intended outcomes
	Metric 18: Consistency of Outcome Assessment	Medium	Outcome assessment protocol was reported but not in detail, outcomes were assessed consistently
Domain 6: Confounding / Variable Control			
	Metric 19: Confounding Variables in Test Design and Procedures	High	There were no reported differences among the study groups in environmental conditions
	Metric 20: Outcomes Unrelated to Exposure	Low	Reported information indicated that one or more study groups experienced disproportionate test organism deformity but few details were provided regarding frequency for each concentration
Domain 7: Data Presentation and Analysis			
	Metric 21: Statistical Methods	Low	Statistical methods were reasonably well described but not it wasn't clear if they were applied to mortality
	Metric 22: Reporting of Data	Low	Data for exposure-related findings were not shown for each treatment and control group
	Metric 23: Explanation of Unexpected Outcomes	Low	Only mean values and range were reported
Additional Comments: None			

Overall Quality Determination**Medium**

Study Citation:	McDaniel, T. V., Martin, P. A., Ross, N., Brown, S., Lesage, S., Pauli, B. D. (2004). Effects of chlorinated solvents on four species of North American amphibians. Archives of Environmental Contamination and Toxicology 47(1):101-109.			
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Taxa, Species, Age:	Vertebrate; Amphibian; <i>Rana sylvatica</i> ; Embryo			
Health Outcome:	Development/Growth			
Chemical:	trans-1,2-dichloroethylene-Parent compound			
HERO ID:	3543916			
Domain	Metric	Rating	Comments	
Domain 1: Test Substance				
	Metric 1: Test Substance Identity	Medium	Chemical identified as trans dichloroethylene.	
	Metric 2: Test Substance Source	Low	The test substance identity was not analytically verified by the performing laboratory	
	Metric 3: Test Substance Purity	High	Purity and grade of test substance was reported	
Domain 2: Test Design				
	Metric 4: Negative Controls	High	Study authors reported using an appropriate concurrent negative control group	
	Metric 5: Negative Control Response	Low	The biological response of the negative control groups was not reported	
	Metric 6: Randomized Allocation	Low	Researchers did not report how organisms were allocated to study groups	
Domain 3: Exposure Characterization				
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	Metric 10: Exposure Duration and Frequency	High	The duration of exposure and/or exposure frequency were reported and appropriate for the study type	
	Metric 11: Number of Exposure Groups/ Spacing of Exposure Levels	Medium	There were minor limitations (solubility, effects) regarding the number of exposure groups	
	Metric 12: Testing at or Below Solubility Limit	High	Exposure concentrations were at or below the water solubility limit	
Domain 4: Test Organism				
	Metric 13: Test Organism Characteristics	Medium	There are minor reservations about the source of test organisms	
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	Metric 15: Number of Organisms and Replicates per Group	Medium	The numbers of test organisms and replicates were adequate	
Domain 5: Outcome Assessment				
	Metric 16: Adequacy of Test Conditions	Medium	Minor uncertainties were identified regarding organism housing and environmental conditions based on high number of deformities	
	Metric 17: Outcome Assessment Methodology	Medium	The outcome assessment methodology partially addressed or reported the intended outcomes, no significant effects reported	

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Taxa, Species, Age:	Vertebrate; Amphibian; <i>Rana sylvatica</i> ; Embryo
Health Outcome:	Development/Growth
Chemical:	trans-1,2-dichloroethylene-Parent compound
HERO ID:	3543916

Domain	Metric	Rating	Comments
	Metric 18: Consistency of Outcome Assessment	Medium	Outcome assessment protocol was reported but not in detail, outcomes were assessed consistently
Domain 6: Confounding / Variable Control			
	Metric 19: Confounding Variables in Test Design and Procedures	High	There were no reported differences among the study groups in environmental conditions
	Metric 20: Outcomes Unrelated to Exposure	Low	Reported information indicated that one or more study groups experienced disproportionate test organism deformity but few details were provided regarding frequency for each concentration
Domain 7: Data Presentation and Analysis			
	Metric 21: Statistical Methods	High	Statistical methods were reasonably well described
	Metric 22: Reporting of Data	Low	Data for exposure-related findings were not shown for each treatment and control group
	Metric 23: Explanation of Unexpected Outcomes	Low	Insufficient information was provided to determine if excessive variability or unexpected outcomes occurred.

Additional Comments: None

Overall Quality Determination**Medium**

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Taxa, Species, Age:	Vertebrate; Amphibian; <i>Rana sylvatica</i> ; Embryo			
Health Outcome:	Mortality			
Chemical:	trans-1,2-dichloroethylene-Other (metabolite, degradant, etc.)			
HERO ID:	3543916			
Domain	Metric	Rating	Comments	
Domain 1: Test Substance				
	Metric 1: Test Substance Identity	Medium	Chemical identified as cis dichloroethylene.	
	Metric 2: Test Substance Source	Low	The test substance identity was not analytically verified by the performing laboratory	
	Metric 3: Test Substance Purity	High	Purity and grade of test substance was reported	
Domain 2: Test Design				
	Metric 4: Negative Controls	High	Study authors reported using an appropriate concurrent negative control group	
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	Metric 17: Outcome Assessment Methodology	Medium	The outcome assessment methodology partially addressed or reported the intended outcomes	

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Taxa, Species, Age:	Vertebrate; Amphibian; <i>Rana sylvatica</i> ; Embryo
Health Outcome:	Mortality
Chemical:	trans-1,2-dichloroethylene-Other (metabolite, degradant, etc.)
HERO ID:	3543916

Domain	Metric	Rating	Comments
	Metric 18: Consistency of Outcome Assessment	Medium	Outcome assessment protocol was reported but not in detail, outcomes were assessed consistently
Domain 6: Confounding / Variable Control			
	Metric 19: Confounding Variables in Test Design and Procedures	High	There were no reported differences among the study groups in environmental conditions
	Metric 20: Outcomes Unrelated to Exposure	Low	Reported information indicated that one or more study groups experienced disproportionate test organism deformity but few details were provided regarding frequency for each concentration
Domain 7: Data Presentation and Analysis			
	Metric 21: Statistical Methods	Low	Statistical methods were reasonably well described but not it wasn't clear if they were applied to mortality
	Metric 22: Reporting of Data	Low	Data for exposure-related findings were not shown for each treatment and control group
	Metric 23: Explanation of Unexpected Outcomes	Low	Only mean values and range were reported

Additional Comments: This form represents wood frog (was names *Rana sylvatica* now *Lithobates sylvatica*) mortality data to Cis 1,2, DCE. The data are located in Table 2.

Overall Quality Determination**Medium**

Study Citation:	McDaniel, T. V., Martin, P. A., Ross, N., Brown, S., Lesage, S., Pauli, B. D. (2004). Effects of chlorinated solvents on four species of North American amphibians. Archives of Environmental Contamination and Toxicology 47(1):101-109.			
Duration:	Overall Duration: 0 - 4 days (0-96h); Exposure Duration: 0 - 4 days (0-96h)			
Exposure Route, Media, Path:	Aquatic (freshwater); Water; Not determined by study authors (i.e., chemical of interest in exposure water, but unable to determine exact uptake route)			
Taxa, Species, Age:	Vertebrate; Amphibian; <i>Rana sylvatica</i> ; Embryo			
Health Outcome:	Development/Growth			
Chemical:	trans-1,2-dichloroethylene-Other (metabolite, degradant, etc.)			
HERO ID:	3543916			
Domain	Metric	Rating	Comments	
Domain 1: Test Substance				
	Metric 1: Test Substance Identity	Medium	Chemical identified as cis dichloroethylene.	
	Metric 2: Test Substance Source	Low	The test substance identity was not analytically verified by the performing laboratory	
	Metric 3: Test Substance Purity	High	Purity and grade of test substance was reported	
Domain 2: Test Design				
	Metric 4: Negative Controls	High	Study authors reported using an appropriate concurrent negative control group	
	Metric 5: Negative Control Response	Low	The biological response of the negative control groups was not reported	
	Metric 6: Randomized Allocation	Low	Researchers did not report how organisms were allocated to study groups	
Domain 3: Exposure Characterization				
	Metric 7: Experimental System/Test Media Preparation	High	The experimental system and methods for preparation of test media were described in adequate detail	
	Metric 8: Consistency of Exposure Administration	Medium	Details of exposure administration were reported, but minor issues in administration of exposures among study groups were identified	
	Metric 9: Measurement of Test Substance Concentration	Low	Concentrations were measured but considerable loss during the test lends uncertainty to the results	
	Metric 10: Exposure Duration and Frequency	High	The duration of exposure and/or exposure frequency were reported and appropriate for the study type	
	Metric 11: Number of Exposure Groups/ Spacing of Exposure Levels	Medium	There were minor limitations (solubility, effects) regarding the number of exposure groups	
	Metric 12: Testing at or Below Solubility Limit	High	Exposure concentrations were at or below the water solubility limit	
Domain 4: Test Organism				
	Metric 13: Test Organism Characteristics	Medium	There are minor reservations about the source of test organisms	
	Metric 14: Acclimatization and Pretreatment Conditions	Low	The study did not report whether test organisms were acclimatized	
	Metric 15: Number of Organisms and Replicates per Group	Medium	The numbers of test organisms and replicates were adequate	
Domain 5: Outcome Assessment				
	Metric 16: Adequacy of Test Conditions	Medium	Minor uncertainties were identified regarding organism housing and environmental conditions based on high number of deformities	
	Metric 17: Outcome Assessment Methodology	Medium	The outcome assessment methodology partially addressed or reported the intended outcomes, no significant effects reported	

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Study Citation:	Mcdaniel, T. V., Martin, P. A., Ross, N., Brown, S., Lesage, S., Pauli, B. D. (2004). Effects of chlorinated solvents on four species of North American amphibians. Archives of Environmental Contamination and Toxicology 47(1):101-109.
Duration:	Overall Duration: 0 - 4 days (0-96h); Exposure Duration: 0 - 4 days (0-96h)
Exposure Route, Media, Path:	Aquatic (freshwater); Water; Not determined by study authors (i.e., chemical of interest in exposure water, but unable to determine exact uptake route)
Taxa, Species, Age:	Vertebrate; Amphibian; <i>Rana sylvatica</i> ; Embryo
Health Outcome:	Development/Growth
Chemical:	trans-1,2-dichloroethylene-Other (metabolite, degradant, etc.)
HERO ID:	3543916

Domain	Metric	Rating	Comments
	Metric 18: Consistency of Outcome Assessment	Medium	Outcome assessment protocol was reported but not in detail, outcomes were assessed consistently
Domain 6: Confounding / Variable Control			
	Metric 19: Confounding Variables in Test Design and Procedures	High	There were no reported differences among the study groups in environmental conditions
	Metric 20: Outcomes Unrelated to Exposure	Low	Reported information indicated that one or more study groups experienced disproportionate test organism deformity but few details were provided regarding frequency for each concentration
Domain 7: Data Presentation and Analysis			
	Metric 21: Statistical Methods	High	Statistical methods were reasonably well described
	Metric 22: Reporting of Data	Low	Data for exposure-related findings were not shown for each treatment and control group
	Metric 23: Explanation of Unexpected Outcomes	Low	Insufficient information was provided to determine if excessive variability or unexpected outcomes occurred.

Additional Comments: This form is for the wood frog (*L. sylvaticus*) exposed to cis 1,2 DCE and morphology (deformations) EC50s.

Overall Quality Determination

Medium

Study Citation:	Leblanc, G. A. (1980). Acute toxicity of priority pollutants to water flea (<i>Daphnia magna</i>). Bulletin of Environmental Contamination and Toxicology 24(5):684-691.			
Duration:	Overall Duration: 0 - 4 days (0-96h); Exposure Duration: 0 - 4 days (0-96h)			
Exposure Route, Media, Path:	Aquatic (freshwater); Water; Not determined by study authors (i.e., chemical of interest in exposure water, but unable to determine exact uptake route)			
Taxa, Species, Age:	Invertebrate; Arthropods; <i>Daphnia magna</i> ; Not Applicable (e.g., fungi or algae studies) or Not Reported			
Health Outcome:	Mortality			
Chemical:	trans-1,2-dichloroethylene-Parent compound			
HERO ID:	7508; Linked HERO ID(s): 7508, 18050, 18064, 18110, 628983, 3617735			
Domain	Metric	Rating	Comments	
Domain 1: Test Substance				
	Metric 1: Test Substance Identity	Low	The chemical was identified by name only.	
	Metric 2: Test Substance Source	Low	The test substance identity was not analytically verified by the performing laboratory.	
	Metric 3: Test Substance Purity	Low	Purity and/or grade of test substance were not reported.	
Domain 2: Test Design				
	Metric 4: Negative Controls	High	Study authors reported using an appropriate concurrent negative control group.	
	Metric 5: Negative Control Response	High	Mortality among water flea control populations never exceeded 10% in any test.	
	Metric 6: Randomized Allocation	Low	Researchers did not report how organisms were allocated to study groups.	
Domain 3: Exposure Characterization				
	Metric 7: Experimental System/Test Media Preparation	Low	The study provided only limited details on the measures taken to appropriately prepare test concentrations. Methods were generalized for multiple chemicals.	
	Metric 8: Consistency of Exposure Administration	Medium	Reporting omissions could have a substantial impact on results.	
	Metric 9: Measurement of Test Substance Concentration	Low	Exposure concentrations were not measured.	
	Metric 10: Exposure Duration and Frequency	High	The duration of exposure was reported and appropriate for the study type.	
	Metric 11: Number of Exposure Groups/Spacing of Exposure Levels	Low	Range or spacing of test concentrations was not reported.	
	Metric 12: Testing at or Below Solubility Limit	Low	Reporting omissions prevented determination of whether exposure concentrations exceeded the water solubility limit.	
Domain 4: Test Organism				
	Metric 13: Test Organism Characteristics	Medium	The original source was not reported.	
	Metric 14: Acclimatization and Pretreatment Conditions	Low	The study did not report whether test organisms were acclimatized.	
	Metric 15: Number of Organisms and Replicates per Group	Low	The number of test organisms and/or replicates was not reported.	
Domain 5: Outcome Assessment				
	Metric 16: Adequacy of Test Conditions	High	Environmental conditions of the test system were conducive to maintenance of organism health.	
	Metric 17: Outcome Assessment Methodology	High	The outcome assessment methodology addressed the intended outcome of interest.	

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Study Citation:	Leblanc, G. A. (1980). Acute toxicity of priority pollutants to water flea (<i>Daphnia magna</i>). Bulletin of Environmental Contamination and Toxicology 24(5):684-691.
Duration:	Overall Duration: 0 - 4 days (0-96h); Exposure Duration: 0 - 4 days (0-96h)
Exposure Route, Media, Path:	Aquatic (freshwater); Water; Not determined by study authors (i.e., chemical of interest in exposure water, but unable to determine exact uptake route)
Taxa, Species, Age:	Invertebrate; Arthropods; <i>Daphnia magna</i> ; Not Applicable (e.g., fungi or algae studies) or Not Reported
Health Outcome:	Mortality
Chemical:	trans-1,2-dichloroethylene-Parent compound
HERO ID:	7508; Linked HERO ID(s): 7508, 18050, 18064, 18110, 628983, 3617735

Domain	Metric	Rating	Comments
	Metric 18: Consistency of Outcome Assessment	High	Details regarding the execution of the study protocol for outcome assessment (observation of heartbeat) were limited.
Domain 6: Confounding / Variable Control			
	Metric 19: Confounding Variables in Test Design and Procedures	Low	The study did not provide enough information to allow a comparison of environmental conditions.
	Metric 20: Outcomes Unrelated to Exposure	Medium	There was no information in the study to suggest differences among groups.
Domain 7: Data Presentation and Analysis			
	Metric 21: Statistical Methods	Low	Not including control mortality in final calculation was reason to downgrade this.
	Metric 22: Reporting of Data	Low	Data for exposure-related findings were not shown for each treatment and control group.
	Metric 23: Explanation of Unexpected Outcomes	High	There were no unexpected outcomes.

Additional Comments: None

Overall Quality Determination**Medium**

Study Citation:	Tsai, K. P., Chen, C. Y. (2007). An algal toxicity database of organic toxicants derived by a closed-system technique. Environmental Toxicology and Chemistry 26(9):1931-1939.			
Duration:	Overall Duration: 0 - 4 days (0-96h); Exposure Duration: 0 - 4 days (0-96h)			
Exposure Route, Media, Path:	Aquatic (freshwater); Cell Culture Media; Not determined by study authors (i.e., chemical of interest in exposure water, but unable to determine exact uptake route)			
Taxa, Species, Age:	Vegetation; Non-vascular Plants; <i>Pseudokirchneriella subcapitata</i> ; Not Applicable (e.g., fungi or algae studies) or Not Reported			
Health Outcome:	Development/Growth			
Chemical:	trans-1,2-dichloroethylene-Parent compound-Other (metabolite, degradant, etc.)			
HERO ID:	3617867			
Domain	Metric	Rating	Comments	
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	Low	The test substance was identified by name only.
	Metric 2:	Test Substance Source	High	Chemical was analyzed using HPLC prior to conducting experiments.
	Metric 3:	Test Substance Purity	High	The purity of the trans 1,2 dichloroethylene was stated as reagent grade.
Domain 2: Test Design				
	Metric 4:	Negative Controls	High	Study authors report the use of a negative control.
	Metric 5:	Negative Control Response	Low	The biological response of the negative control was not reported.
	Metric 6:	Randomized Allocation	Low	It was not reported how the algae was allocated into study groups.
Domain 3: Exposure Characterization				
	Metric 7:	Experimental System/Test Media Preparation	High	Experimental design described adequately.
	Metric 8:	Consistency of Exposure Administration	Medium	All exposures were for 48h in closed systems to prevent volatilization. Test bottles contained no headspace and were shaken during the duration of exposure.
	Metric 9:	Measurement of Test Substance Concentration	Medium	Stock solutions and test concentrations were reported to be measured using HPLC.
	Metric 10:	Exposure Duration and Frequency	High	The exposure duration was reported to be 48h, which was adequate for the outcome of interest.
	Metric 11:	Number of Exposure Groups/ Spacing of Exposure Levels	Uninformative	The number of exposure levels and the spacing of the levels were not reported. Test concentrations were not reported.
	Metric 12:	Testing at or Below Solubility Limit	Low	Test concentrations were not reported, so it was uncertain if the test concentrations were below the water solubility limit.
Domain 4: Test Organism				
	Metric 13:	Test Organism Characteristics	High	The algae was reported to be from the University of Texas-Austin in Austin, TX, USA.
	Metric 14:	Acclimatization and Pretreatment Conditions	Low	It was not reported if the algae were acclimated.
	Metric 15:	Number of Organisms and Replicates per Group	Medium	The starting algae concentrations were reported to be 15,000cells/mL. Each concentrations was repeated in triplicate.
Domain 5: Outcome Assessment				
	Metric 16:	Adequacy of Test Conditions	High	Algae was tested at 24C on an orbital shaker in a closed system with 65uE/m^2/s. pH and starting cell density stated.

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Study Citation:	Tsai, K. P., Chen, C. Y. (2007). An algal toxicity database of organic toxicants derived by a closed-system technique. Environmental Toxicology and Chemistry 26(9):1931-1939.			
Duration:	Overall Duration: 0 - 4 days (0-96h); Exposure Duration: 0 - 4 days (0-96h)			
Exposure Route, Media, Path:	Aquatic (freshwater); Cell Culture Media; Not determined by study authors (i.e., chemical of interest in exposure water, but unable to determine exact uptake route)			
Taxa, Species, Age:	Vegetation; Non-vascular Plants; <i>Pseudokirchneriella subcapitata</i> ; Not Applicable (e.g., fungi or algae studies) or Not Reported			
Health Outcome:	Development/Growth			
Chemical:	trans-1,2-dichloroethylene-Parent compound-Other (metabolite, degradant, etc.)			
HERO ID:	3617867			
Domain	Metric	Rating	Comments	
	Metric 17:	Outcome Assessment Methodology	High	The outcome assessment methodology addressed or reported the intended outcome of interest–algae density.
	Metric 18:	Consistency of Outcome Assessment	High	Details of the outcome assessment protocol were reported, and outcomes were assessed consistently across study groups–algae density was determined using a particle counter and then calculate inhibition.
Domain 6: Confounding / Variable Control				
	Metric 19:	Confounding Variables in Test Design and Procedures	Medium	Data on attrition and/or outcomes unrelated to controlled variables for each study group were not reported because only substantial differences among groups were noted (as indicated by study authors), and it is unlikely there were any substantial impacts on results.
	Metric 20:	Outcomes Unrelated to Exposure	Medium	There was no information in the study to suggest differences among groups in animal attrition or health outcomes unrelated to exposure.
Domain 7: Data Presentation and Analysis				
	Metric 21:	Statistical Methods	High	EC50 values were calculated using probit analysis.
	Metric 22:	Reporting of Data	Medium	EC50 values were reported in the Appendix.
	Metric 23:	Explanation of Unexpected Outcomes	Low	The study did not report any measures of variability.
Additional Comments:	This evaluation was on the effect of trans 1,2 dichloroethylene and cis 1,2-dichloroethylene on density of P. subcapitata. Development/growth was selected as the outcome of interest. The study received and unacceptable ranking due to the lack of information regarding the test concentrations and the spacing of them. Study authors reported on other chlorinated solvents, but it appears that primary data was only generated for 2 in this study. Data regarding the others was pulled from previous studies and recalculated in current study.			

Overall Quality Determination**Uninformative**

Study Citation:	Neuhauser, E. F., Loehr, R. C., Malecki, M. R., Milligan, D. L., Durkin, P. R. (1985). The toxicity of selected organic chemicals to the earthworm <i>Eisenia fetida</i> . <i>Journal of Environmental Quality</i> 14(3):383-388.			
Duration:	Overall Duration: 0 - 4 days (0-96h); Exposure Duration: 0 - 4 days (0-96h)			
Exposure Route, Media, Path:	Terrestrial; N/A (e.g., injection); Not determined by study authors (i.e., chemical of interest in exposure water, but unable to determine exact uptake route)			
Taxa, Species, Age:	Invertebrate; Worms (e.g., Annelids, Nematodes); <i>Eisenia fetida</i> ; Adult			
Health Outcome:	Mortality			
Chemical:	trans-1,2-dichloroethylene-Parent compound			
HERO ID:	3625226			
Domain	Metric	Rating	Comments	
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance was identified by name and by CASRN.
	Metric 2:	Test Substance Source	Low	The test substances came from three different sources, but it does not appear that they were analytically verified by the performing laboratory.
	Metric 3:	Test Substance Purity	High	
Domain 2: Test Design				
	Metric 4:	Negative Controls	High	The study reported the use of a concurrent negative control.
	Metric 5:	Negative Control Response	Low	The biological response of the negative control was not reported.
	Metric 6:	Randomized Allocation	Low	It was not reported how the organisms were allocated into study groups.
Domain 3: Exposure Characterization				
	Metric 7:	Experimental System/Test Media Preparation	High	The experimental test methods were described in adequate detail. The preparation of the filter paper was reported and it was determined gravimetrically that organic did not volatilize with the organic solvents.
	Metric 8:	Consistency of Exposure Administration	High	All exposures were for 48h at 20C in the dark with one adult earthworm per vessel.
	Metric 9:	Measurement of Test Substance Concentration	Low	Exposure concentrations were not measured, though gravimetric analysis was used to determine if there was chemical loss due to solvent loss.
	Metric 10:	Exposure Duration and Frequency	High	A 48h acute exposure appeared to be sufficient.
	Metric 11:	Number of Exposure Groups/Spacing of Exposure Levels	Low	There were 5 exposure groups plus a negative control.
	Metric 12:	Testing at or Below Solubility Limit	Low	Test substance concentrations were not reported and thus it could not be determined if exposure concentrations exceeded the water solubility limit.
Domain 4: Test Organism				
	Metric 13:	Test Organism Characteristics	High	The test organisms were adequately described and obtained from an in laboratory culture.
	Metric 14:	Acclimatization and Pretreatment Conditions	High	Pretreatment culture conditions appeared to be the same as test conditions. Culturing conditions were described and similar to the test conditions.
	Metric 15:	Number of Organisms and Replicates per Group	Medium	10 replicates or more were used for each test concentration.
Domain 5: Outcome Assessment				

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Study Citation:	Neuhauser, E. F., Loehr, R. C., Malecki, M. R., Milligan, D. L., Durkin, P. R. (1985). The toxicity of selected organic chemicals to the earthworm <i>Eisenia fetida</i> . <i>Journal of Environmental Quality</i> 14(3):383-388.			
Duration:	Overall Duration: 0 - 4 days (0-96h); Exposure Duration: 0 - 4 days (0-96h)			
Exposure Route, Media, Path:	Terrestrial; N/A (e.g., injection); Not determined by study authors (i.e., chemical of interest in exposure water, but unable to determine exact uptake route)			
Taxa, Species, Age:	Invertebrate; Worms (e.g., Annelids, Nematodes); <i>Eisenia fetida</i> ; Adult			
Health Outcome:	Mortality			
Chemical:	trans-1,2-dichloroethylene-Parent compound			
HERO ID:	3625226			
Domain	Metric	Rating	Comments	
	Metric 16:	Adequacy of Test Conditions	High	Organisms housing was adequate to maintain organism health during the test.
	Metric 17:	Outcome Assessment Methodology	High	The outcome assessment methodology addressed or reported the intended outcome of interest—mortality was assessed after 48h and LC50s were determined.
	Metric 18:	Consistency of Outcome Assessment	High	Mortality was assessed for after the 48h exposure by gentle prodding of each organism.
Domain 6: Confounding / Variable Control				
	Metric 19:	Confounding Variables in Test Design and Procedures	High	No differences in environmental conditions among study groups was reported.
	Metric 20:	Outcomes Unrelated to Exposure	Medium	There was no information in the study to suggest differences among groups in animal attrition or health outcomes unrelated to exposure
Domain 7: Data Presentation and Analysis				
	Metric 21:	Statistical Methods	High	LC50s were determined using the Litchfield and Wilcoxon method.
	Metric 22:	Reporting of Data	Medium	LC50s were reported, but there was no control data reported.
	Metric 23:	Explanation of Unexpected Outcomes	High	No unexpected outcomes were reported.
Additional Comments:	The study reported 1,2-trans-dichloroethylene as CAS 540-59-0. However, CAS number 156605 is 1,2-trans-Dichloroethene, while CAS 540590 is 1,2-Dichloroethene. When there is a discrepancy between a chemical name and CAS number, the more specific chemical form is extracted. This is consistent with ECOTOX Knowledgebase. Therefore, because the trans form is more specific, the data was extracted to CAS 156-60-5, 1,2-trans-dichloroethylene.			

Overall Quality Determination**High**

Study Citation:	Schubert, U., Wisanowsky, L., Kull, U. (1995). Determination of phytotoxicity of several volatile organic compounds by investigating the germination pattern of tobacco pollen. Journal of Plant Physiology 145(4):514-518.			
Duration:	Overall Duration: 0 - 4 days (0-96h); Exposure Duration: 0 - 4 days (0-96h)			
Exposure Route, Media, Path:	Terrestrial; Air; Not determined by study authors (i.e., chemical of interest in exposure water, but unable to determine exact uptake route)			
Taxa, Species, Age:	Vegetation; Vascular Plants; <i>Nicotiana tabacum</i> L.; (var. xanthi nc); Not Applicable (e.g., fungi or algae studies) or Not Reported			
Health Outcome:	Reproductive/Teratogenic			
Chemical:	trans-1,2-dichloroethylene-Parent compound			
HERO ID:	1022795			
Domain	Metric	Rating	Comments	
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	Low	Test substance was identified as identified as trans-1,2-dichloroethene. No other information (CASRN, structure, etc.) was provided.
	Metric 2:	Test Substance Source	Low	Test substance was obtained from Merck-Darmstadt. No other details or analytical verification was provided.
	Metric 3:	Test Substance Purity	Low	Purity and/or grade of test substance were not reported.
Domain 2: Test Design				
	Metric 4:	Negative Controls	High	Concurrent negative and solvent control group (acetone) were used. The solvent was used with other chemicals in the test.
	Metric 5:	Negative Control Response	Low	The biological response of the negative control groups was not reported.
	Metric 6:	Randomized Allocation	Low	Researchers did not report how organisms were allocated to study groups.
Domain 3: Exposure Characterization				
	Metric 7:	Experimental System/Test Media Preparation	Medium	The experimental system and/or test media preparation methods were adequately reported but did not completely account for physical-chemical properties. The test material was injected into a sealed container and the concentrations were estimated based on the volume of the test material and the volume of the container. No analytical verification was carried out to confirm that this was an accurate estimation, but based on the clear dose-response this did not seem to have an effect on the results.
	Metric 8:	Consistency of Exposure Administration	High	Details of exposure administration were reported and exposures were administered consistently across study groups.
	Metric 9:	Measurement of Test Substance Concentration	Medium	Exposure concentrations were not measured but based on professional judgment of experimental design and nature of test substance, actual concentrations are likely to be similar to nominal concentrations.
	Metric 10:	Exposure Duration and Frequency	Medium	This is an atypical study design, so it is impossible to tell if this is reasonable for this type of study, but the 2 hour exposure duration is very short. This was sufficient to establish a dose and effect relationship, so this exposure duration was sufficient for the goals of this study.
	Metric 11:	Number of Exposure Groups/ Spacing of Exposure Levels	Low	Exposure groups are not explicitly specified and are difficult to determine from the tables due to inconsistent spacing in the X axis.
	Metric 12:	Testing at or Below Solubility Limit	N/A	Exposure via vapor, so solubility limit is not relevant.
Domain 4: Test Organism				
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Study Citation:	Schubert, U., Wisanowsky, L., Kull, U. (1995). Determination of phytotoxicity of several volatile organic compounds by investigating the germination pattern of tobacco pollen. Journal of Plant Physiology 145(4):514-518.			
Duration:	Overall Duration: 0 - 4 days (0-96h); Exposure Duration: 0 - 4 days (0-96h)			
Exposure Route, Media, Path:	Terrestrial; Air; Not determined by study authors (i.e., chemical of interest in exposure water, but unable to determine exact uptake route)			
Taxa, Species, Age:	Vegetation; Vascular Plants; <i>Nicotiana tabacum</i> L.; (var. xanthi nc); Not Applicable (e.g., fungi or algae studies) or Not Reported			
Health Outcome:	Reproductive/Teratogenic			
Chemical:	trans-1,2-dichloroethylene-Parent compound			
HERO ID:	1022795			
Domain	Metric	Rating	Comments	
	Metric 13: Test Organism Characteristics	Low	The source of the test plants was not reported. They appeared to be from an in-house collection.	
	Metric 14: Acclimatization and Pretreatment Conditions	High	Pollen was placed into 3.5 cm Petri dishes and held in a water saturated atmosphere for one hour. This pre-treatment ensured even hydration of the pollen grains.	
	Metric 15: Number of Organisms and Replicates per Group	Low	The number of pollen grains in each replicate was not reported. Authors used 0.5 mg of pollen in each replicate. Given the small size of pollen, this was likely an adequate measure of test organisms except that the paper indicated the grains were counted but count this was not reported in the final report.	
Domain 5: Outcome Assessment				
	Metric 16: Adequacy of Test Conditions	High	Housing conditions for the pollen appear to be adequate. This study is not typical so there is no basis for comparison.	
	Metric 17: Outcome Assessment Methodology	High	The outcome assessment methodology addressed or reported the intended outcome(s) of interest and the assessment methodology was sensitive and appropriate for the outcomes(s) of interest.	
	Metric 18: Consistency of Outcome Assessment	Low	Details regarding the execution of the study protocol for outcome assessment (i.e. exposure concentrations) were confusing, limited, or not reported.	
Domain 6: Confounding / Variable Control				
	Metric 19: Confounding Variables in Test Design and Procedures	High	There were no reported differences among the study groups in environmental conditions or other factors that could influence the outcome assessment. There are no limitations that would result in a substantial impact on results.	
	Metric 20: Outcomes Unrelated to Exposure	Medium	There was no information in the study to suggest differences among groups in animal attrition or health outcomes unrelated to exposure (e.g., infection) that could influence the outcome assessment.	
Domain 7: Data Presentation and Analysis				
	Metric 21: Statistical Methods	Low	Statistical analysis was performed to calculate a dose response curve but not described adequately.	
	Metric 22: Reporting of Data	Low	Data for exposure-related findings were not shown for each treatment and control group, but results were described in the text. Data (inhibition of germination) were presented as percentage of control. ED 50 and ED 25 values were presented without measures of variability.	
	Metric 23: Explanation of Unexpected Outcomes	High	There were no unexpected outcomes, or unexpected outcomes were satisfactorily explained.	
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Study Citation:	Schubert, U., Wisanowsky, L., Kull, U. (1995). Determination of phytotoxicity of several volatile organic compounds by investigating the germination pattern of tobacco pollen. Journal of Plant Physiology 145(4):514-518.
Duration:	Overall Duration: 0 - 4 days (0-96h); Exposure Duration: 0 - 4 days (0-96h)
Exposure Route, Media, Path:	Terrestrial; Air; Not determined by study authors (i.e., chemical of interest in exposure water, but unable to determine exact uptake route)
Taxa, Species, Age:	Vegetation; Vascular Plants; <i>Nicotiana tabacum</i> L.; (var. xanthi nc); Not Applicable (e.g., fungi or algae studies) or Not Reported
Health Outcome:	Reproductive/Teratogenic
Chemical:	trans-1,2-dichloroethylene-Parent compound
HERO ID:	1022795

Domain	Metric	Rating	Comments
Additional Comments:	While pollen germination is not typically considered an apical endpoint, this study indicated that pollen germination could serve as a potential benchmark dose for plant germination.		

Overall Quality Determination**Medium**

Study Citation:	Dietz, A. C., Schnoor, J. L. (2001). Phytotoxicity of chlorinated aliphatics to hybrid poplar (<i>Populus deltoides</i> x <i>nigra</i> DN34). <i>Environmental Toxicology and Chemistry</i> 20(2):389-393.			
Duration:	Overall Duration: 11 - 21 days; Exposure Duration: 11 - 21 days			
Exposure Route, Media, Path:	Terrestrial; Water; Root uptake			
Taxa, Species, Age:	Vegetation; Vascular Plants; <i>Populus deltoides</i> x <i>nigra</i> ; DN34; Juvenile			
Health Outcome:	Respiratory			
Chemical:	trans-1,2-dichloroethylene-Parent compound			
HERO ID:	42313			
Domain	Metric	Rating	Comments	
Domain 1: Test Substance	Metric 1: Test Substance Identity	High	The test substance (i.e., chemical of interest) was identified.	
	Metric 2: Test Substance Source	High	The source of the test substance was reported as a manufacturer.	
	Metric 3: Test Substance Purity	High	Chemical was analytical grade (>99%).	
Domain 2: Test Design	Metric 4: Negative Controls	High	Study authors reported using an appropriate concurrent negative control group (i.e. all conditions equal except chemical exposure). Reported as one set of undosed reactors; carrier solvents were avoided.	
	Metric 5: Negative Control Response	Low	Control response not shown.	
	Metric 6: Randomized Allocation	Low	Researchers did not report how organisms were allocated to study groups, only that n-15 cuttings were used.	
Domain 3: Exposure Characterization	Metric 7: Experimental System/Test Media Preparation	Medium	The experimental system and/or test media preparation methods were adequately reported but did not completely account for physical-chemical properties.	
	Metric 8: Consistency of Exposure Administration	High	Details of exposure administration were reported and exposures were administered consistently across study groups.	
	Metric 9: Measurement of Test Substance Concentration	Medium	Concentrations in dosing feed solutions were measured using gas chromatography. Unclear if nominal or measured concentrations reported.	
	Metric 10: Exposure Duration and Frequency	High	Exposure was 2 weeks.	
	Metric 11: Number of Exposure Groups/Spacing of Exposure Levels	High	Concentrations were based on a preliminary concentration-response (range-finding) experiment. Groups were established for each of the 5 different chemical concentrations, and were replicated 3 times.	
	Metric 12: Testing at or Below Solubility Limit	High	Exposure concentrations were at or below the water solubility limit (or dispersibility limit if applicable), as reported.	
Domain 4: Test Organism	Metric 13: Test Organism Characteristics	High	The test organisms were adequately described and were obtained from a reliable source.	
	Metric 14: Acclimatization and Pretreatment Conditions	High	The test organisms were acclimatized to test conditions and all pretreatment conditions were the same for control and exposed organisms, such that the only difference was exposure to test substance.	
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Study Citation:	Dietz, A. C., Schnoor, J. L. (2001). Phytotoxicity of chlorinated aliphatics to hybrid poplar (Populus deltoides x nigra DN34). Environmental Toxicology and Chemistry 20(2):389-393.			
Duration:	Overall Duration: 11 - 21 days; Exposure Duration: 11 - 21 days			
Exposure Route, Media, Path:	Terrestrial; Water; Root uptake			
Taxa, Species, Age:	Vegetation; Vascular Plants; <i>Populus deltoides x nigra</i> ; DN34; Juvenile			
Health Outcome:	Respiratory			
Chemical:	trans-1,2-dichloroethylene-Parent compound			
HERO ID:	42313			
Domain	Metric	Rating	Comments	
	Metric 15: Number of Organisms and Replicates per Group	Low	N=1 cuttings were included in each group. Groups were established for each of the 5 different chemical concentrations, and were replicated 3 times.	
Domain 5: Outcome Assessment				
	Metric 16: Adequacy of Test Conditions	Medium	Temperature not stated. Other conditions described.	
	Metric 17: Outcome Assessment Methodology	Medium	"To determine transpiration rates, reactors were weighed every 2 d and water loss was calculated"	
	Metric 18: Consistency of Outcome Assessment	High	Details of the outcome assessment protocol were reported, and outcomes were assessed consistently across study groups (e.g., at the same time after initial exposure) using the same protocol in all study groups.	
Domain 6: Confounding / Variable Control				
	Metric 19: Confounding Variables in Test Design and Procedures	Medium	Data on attrition and/or outcomes unrelated to controlled variables for each study group were not reported because only substantial differences among groups were noted (as indicated by study authors), and it is unlikely there were any substantial impacts on results.	
	Metric 20: Outcomes Unrelated to Exposure	Medium	There was no information in the study to suggest differences among groups in animal attrition or health outcomes unrelated to exposure (e.g., infection) that could influence the outcome assessment.	
Domain 7: Data Presentation and Analysis				
	Metric 21: Statistical Methods	Low	Data for transpiration IC50 values are reported; no regression data are presented.	
	Metric 22: Reporting of Data	Low	IC50 values (Concn.50%T) shown in Figure 3 but no graphs presented nor results discussed in text.	
	Metric 23: Explanation of Unexpected Outcomes	Medium	Variation shown in Table 3; unclear whether this is standard error or standard deviation.	
Additional Comments:	Authors examined change in cutting mass for a 2 week exposure to chemicals. Transpiration rates of the cuttings were also measured every 2 days over the 2 week period and IC50 of transpiration were calculated for chemicals.			

Overall Quality Determination**Medium**

Study Citation:	Dietz, A. C., Schnoor, J. L. (2001). Phytotoxicity of chlorinated aliphatics to hybrid poplar (<i>Populus deltoides</i> x <i>nigra</i> DN34). Environmental Toxicology and Chemistry 20(2):389-393.			
Duration:	Overall Duration: 11 - 21 days; Exposure Duration: 11 - 21 days			
Exposure Route, Media, Path:	Terrestrial; Water; Root uptake			
Taxa, Species, Age:	Vegetation; Vascular Plants; <i>Populus deltoides</i> x <i>nigra</i> ; DN34; Juvenile			
Health Outcome:	Development/Growth			
Chemical:	trans-1,2-dichloroethylene-Parent compound			
HERO ID:	42313			
Domain	Metric	Rating	Comments	
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance (i.e., chemical of interest) was identified.
	Metric 2:	Test Substance Source	High	The source of the test substance was reported as a manufacturer.
	Metric 3:	Test Substance Purity	High	Chemical was analytical grade (>99%).
Domain 2: Test Design				
	Metric 4:	Negative Controls	High	Study authors reported using an appropriate concurrent negative control group (i.e. all conditions equal except chemical exposure). Reported as one set of undosed reactors; carrier solvents were avoided.
	Metric 5:	Negative Control Response	High	The biological responses of the negative control group were reported and adequate.
	Metric 6:	Randomized Allocation	Low	Researchers did not report how organisms were allocated to study groups, only that n-15 cuttings were used.
Domain 3: Exposure Characterization				
	Metric 7:	Experimental System/Test Media Preparation	Medium	The experimental system and/or test media preparation methods were adequately reported but did not completely account for physical-chemical properties.
	Metric 8:	Consistency of Exposure Administration	High	Details of exposure administration were reported and exposures were administered consistently across study groups.
	Metric 9:	Measurement of Test Substance Concentration	High	Concentrations in dosing feed solutions were measured using gas chromatography.
	Metric 10:	Exposure Duration and Frequency	High	Exposure was 2 weeks.
	Metric 11:	Number of Exposure Groups/ Spacing of Exposure Levels	High	Concentrations were based on a preliminary concentration-response (range-finding) experiment. Groups were established for each of the 5 different chemical concentrations, and were replicated 3 times.
	Metric 12:	Testing at or Below Solubility Limit	High	Exposure concentrations were at or below the water solubility limit (or dispersibility limit if applicable), as reported.
Domain 4: Test Organism				
	Metric 13:	Test Organism Characteristics	High	The test organisms were adequately described and were obtained from a reliable source.
	Metric 14:	Acclimatization and Pretreatment Conditions	High	The test organisms were acclimatized to test conditions and all pretreatment conditions were the same for control and exposed organisms, such that the only difference was exposure to test substance.
	Metric 15:	Number of Organisms and Replicates per Group	Low	N=1 cuttings were included in each group. Groups were established for each of the 5 different chemical concentrations, and were replicated 3 times.
Domain 5: Outcome Assessment				

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Study Citation:	Dietz, A. C., Schnoor, J. L. (2001). Phytotoxicity of chlorinated aliphatics to hybrid poplar (<i>Populus deltoides</i> x <i>nigra</i> DN34). <i>Environmental Toxicology and Chemistry</i> 20(2):389-393.
Duration:	Overall Duration: 11 - 21 days; Exposure Duration: 11 - 21 days
Exposure Route, Media, Path:	Terrestrial; Water; Root uptake
Taxa, Species, Age:	Vegetation; Vascular Plants; <i>Populus deltoides</i> x <i>nigra</i> ; DN34; Juvenile
Health Outcome:	Development/Growth
Chemical:	trans-1,2-dichloroethylene-Parent compound
HERO ID:	42313

Domain	Metric	Rating	Comments
	Metric 16: Adequacy of Test Conditions	Medium	Temperature not stated. Other conditions described.
	Metric 17: Outcome Assessment Methodology	High	Cuttings were weighed at start and conclusion of experiment and results presented as change in mass.
	Metric 18: Consistency of Outcome Assessment	High	Details of the outcome assessment protocol were reported, and outcomes were assessed consistently across study groups (e.g., at the same time after initial exposure) using the same protocol in all study groups.
Domain 6: Confounding / Variable Control			
	Metric 19: Confounding Variables in Test Design and Procedures	High	There were no reported differences among the study groups in environmental conditions or other factors that could influence the outcome assessment. There are no limitations that would result in a substantial impact on results.
	Metric 20: Outcomes Unrelated to Exposure	Medium	There was no information in the study to suggest differences among groups in animal attrition or health outcomes unrelated to exposure (e.g., infection) that could influence the outcome assessment.
Domain 7: Data Presentation and Analysis			
	Metric 21: Statistical Methods	High	A regression was performed and presented. Regression lines shown in Figure 3 could be reconstructed from Data presented in Table 2.
	Metric 22: Reporting of Data	High	Zero Growth concentrations shown in Table 3 with standard deviation and change in Cutting mass vs Exposure concentration shown in Figure 3 and Table 2.
	Metric 23: Explanation of Unexpected Outcomes	Medium	Standard error was reported within the graphs but not Table 2. Unclear if Table 3 variation represents standard error or standard deviation.

Additional Comments: None

Overall Quality Determination**Medium**

Study Citation:	Dietz, A. C., Schnoor, J. L. (2001). Phytotoxicity of chlorinated aliphatics to hybrid poplar (<i>Populus deltoides</i> x <i>nigra</i> DN34). <i>Environmental Toxicology and Chemistry</i> 20(2):389-393.			
Duration:	Overall Duration: 11 - 21 days; Exposure Duration: 11 - 21 days			
Exposure Route, Media, Path:	Terrestrial; Water; Root uptake			
Taxa, Species, Age:	Vegetation; Vascular Plants; <i>Populus deltoides</i> x <i>nigra</i> ; DN34; Juvenile			
Health Outcome:	Respiratory			
Chemical:	trans-1,2-dichloroethylene-Other (metabolite, degradant, etc.)			
HERO ID:	42313			
Domain	Metric	Rating	Comments	
Domain 1: Test Substance				
	Metric 1:	Test Substance Identity	High	The test substance (i.e., chemical of interest) was identified.
	Metric 2:	Test Substance Source	High	The source of the test substance was reported as a manufacturer.
	Metric 3:	Test Substance Purity	High	Chemical was analytical grade (>99%).
Domain 2: Test Design				
	Metric 4:	Negative Controls	High	Study authors reported using an appropriate concurrent negative control group (i.e. all conditions equal except chemical exposure). Reported as one set of undosed reactors; carrier solvents were avoided.
	Metric 5:	Negative Control Response	Low	Control response not shown.
	Metric 6:	Randomized Allocation	Low	Researchers did not report how organisms were allocated to study groups, only that n-15 cuttings were used.
Domain 3: Exposure Characterization				
	Metric 7:	Experimental System/Test Media Preparation	Medium	The experimental system and/or test media preparation methods were adequately reported but did not completely account for physical-chemical properties.
	Metric 8:	Consistency of Exposure Administration	High	Details of exposure administration were reported and exposures were administered consistently across study groups.
	Metric 9:	Measurement of Test Substance Concentration	Medium	Concentrations in dosing feed solutions were measured using gas chromatography. Unclear if nominal or measured concentrations reported.
	Metric 10:	Exposure Duration and Frequency	High	Exposure was 2 weeks.
	Metric 11:	Number of Exposure Groups/ Spacing of Exposure Levels	High	Concentrations were based on a preliminary concentration-response (range-finding) experiment. Groups were established for each of the 5 different chemical concentrations, and were replicated 3 times.
	Metric 12:	Testing at or Below Solubility Limit	High	Exposure concentrations were at or below the water solubility limit (or dispersibility limit if applicable), as reported.
Domain 4: Test Organism				
	Metric 13:	Test Organism Characteristics	High	The test organisms were adequately described and were obtained from a reliable source.
	Metric 14:	Acclimatization and Pretreatment Conditions	High	The test organisms were acclimatized to test conditions and all pretreatment conditions were the same for control and exposed organisms, such that the only difference was exposure to test substance.
	Metric 15:	Number of Organisms and Replicates per Group	Low	N=1 cuttings were included in each group. Groups were established for each of the 5 different chemical concentrations, and were replicated 3 times.
Domain 5: Outcome Assessment				
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Study Citation:	Dietz, A. C., Schnoor, J. L. (2001). Phytotoxicity of chlorinated aliphatics to hybrid poplar (Populus deltoides x nigra DN34). Environmental Toxicology and Chemistry 20(2):389-393.			
Duration:	Overall Duration: 11 - 21 days; Exposure Duration: 11 - 21 days			
Exposure Route, Media, Path:	Terrestrial; Water; Root uptake			
Taxa, Species, Age:	Vegetation; Vascular Plants; <i>Populus deltoides x nigra</i> ; DN34; Juvenile			
Health Outcome:	Respiratory			
Chemical:	trans-1,2-dichloroethylene-Other (metabolite, degradant, etc.)			
HERO ID:	42313			
Domain	Metric	Rating	Comments	
	Metric 16:	Adequacy of Test Conditions	Medium	Temperature not stated. Other conditions described.
	Metric 17:	Outcome Assessment Methodology	Medium	"To determine transpiration rates, reactors were weighed every 2 d and water loss was calculated"
	Metric 18:	Consistency of Outcome Assessment	High	Details of the outcome assessment protocol were reported, and outcomes were assessed consistently across study groups (e.g., at the same time after initial exposure) using the same protocol in all study groups.
Domain 6: Confounding / Variable Control				
	Metric 19:	Confounding Variables in Test Design and Procedures	Medium	Data on attrition and/or outcomes unrelated to controlled variables for each study group were not reported because only substantial differences among groups were noted (as indicated by study authors), and it is unlikely there were any substantial impacts on results.
	Metric 20:	Outcomes Unrelated to Exposure	Medium	There was no information in the study to suggest differences among groups in animal attrition or health outcomes unrelated to exposure (e.g., infection) that could influence the outcome assessment.
Domain 7: Data Presentation and Analysis				
	Metric 21:	Statistical Methods	Low	Data for transpiration IC50 values are reported; no regression data are presented.
	Metric 22:	Reporting of Data	Low	IC50 values (Concn.50%T) shown in Figure 3 but no graphs presented nor results discussed in text.
	Metric 23:	Explanation of Unexpected Outcomes	Medium	Variation shown in Table 3; unclear whether this is standard error or standard deviation.
Additional Comments:	Authors examined change in cutting mass for a 2 week exposure to chemicals. Transpiration rates of the cuttings were also measured every 2 days over the 2 week period and IC50 of transpiration were calculated for chemicals. This form applies to cis-1,2-dichloroethylene.			

Overall Quality Determination**Medium**

Study Citation:	Dietz, A. C., Schnoor, J. L. (2001). Phytotoxicity of chlorinated aliphatics to hybrid poplar (<i>Populus deltoides</i> x <i>nigra</i> DN34). <i>Environmental Toxicology and Chemistry</i> 20(2):389-393.
Duration:	Overall Duration: 11 - 21 days; Exposure Duration: 11 - 21 days
Exposure Route, Media, Path:	Terrestrial; Water; Root uptake
Taxa, Species, Age:	Vegetation; Vascular Plants; <i>Populus deltoides</i> x <i>nigra</i> ; DN34; Juvenile
Health Outcome:	Development/Growth
Chemical:	trans-1,2-dichloroethylene-Other (metabolite, degradant, etc.)
HERO ID:	42313

Domain	Metric	Rating	Comments
Domain 1: Test Substance			
	Metric 1: Test Substance Identity	High	The test substance (i.e., chemical of interest) was identified.
	Metric 2: Test Substance Source	High	The source of the test substance was reported as a manufacturer.
	Metric 3: Test Substance Purity	High	Chemical was analytical grade (>99%).
Domain 2: Test Design			
	Metric 4: Negative Controls	High	Study authors reported using an appropriate concurrent negative control group (i.e. all conditions equal except chemical exposure). Reported as one set of undosed reactors; carrier solvents were avoided.
	Metric 5: Negative Control Response	High	The biological responses of the negative control group were reported and adequate.
	Metric 6: Randomized Allocation	Low	Researchers did not report how organisms were allocated to study groups, only that n-15 cuttings were used.
Domain 3: Exposure Characterization			
	Metric 7: Experimental System/Test Media Preparation	Medium	The experimental system and/or test media preparation methods were adequately reported but did not completely account for physical-chemical properties.
	Metric 8: Consistency of Exposure Administration	High	Details of exposure administration were reported and exposures were administered consistently across study groups.
	Metric 9: Measurement of Test Substance Concentration	High	Concentrations in dosing feed solutions were measured using gas chromatography.
	Metric 10: Exposure Duration and Frequency	High	Exposure was 2 weeks.
	Metric 11: Number of Exposure Groups/Spacing of Exposure Levels	High	Concentrations were based on a preliminary concentration-response (range-finding) experiment. Groups were established for each of the 5 different chemical concentrations, and were replicated 3 times.
	Metric 12: Testing at or Below Solubility Limit	High	Exposure concentrations were at or below the water solubility limit (or dispersibility limit if applicable), as reported.
Domain 4: Test Organism			
	Metric 13: Test Organism Characteristics	High	The test organisms were adequately described and were obtained from a reliable source.
	Metric 14: Acclimatization and Pretreatment Conditions	High	The test organisms were acclimatized to test conditions and all pretreatment conditions were the same for control and exposed organisms, such that the only difference was exposure to test substance.
	Metric 15: Number of Organisms and Replicates per Group	Low	N=1 cuttings were included in each group. Groups were established for each of the 5 different chemical concentrations, and were replicated 3 times.
Domain 5: Outcome Assessment			

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Study Citation:	Dietz, A. C., Schnoor, J. L. (2001). Phytotoxicity of chlorinated aliphatics to hybrid poplar (<i>Populus deltoides</i> x <i>nigra</i> DN34). Environmental Toxicology and Chemistry 20(2):389-393.
Duration:	Overall Duration: 11 - 21 days; Exposure Duration: 11 - 21 days
Exposure Route, Media, Path:	Terrestrial; Water; Root uptake
Taxa, Species, Age:	Vegetation; Vascular Plants; <i>Populus deltoides</i> x <i>nigra</i> ; DN34; Juvenile
Health Outcome:	Development/Growth
Chemical:	trans-1,2-dichloroethylene-Other (metabolite, degradant, etc.)
HERO ID:	42313

Domain	Metric	Rating	Comments
	Metric 16: Adequacy of Test Conditions	Medium	Temperature not stated. Other conditions described.
	Metric 17: Outcome Assessment Methodology	High	Cuttings were weighed at start and conclusion of experiment and results presented as change in mass.
	Metric 18: Consistency of Outcome Assessment	High	Details of the outcome assessment protocol were reported, and outcomes were assessed consistently across study groups (e.g., at the same time after initial exposure) using the same protocol in all study groups.
Domain 6: Confounding / Variable Control			
	Metric 19: Confounding Variables in Test Design and Procedures	High	There were no reported differences among the study groups in environmental conditions or other factors that could influence the outcome assessment. There are no limitations that would result in a substantial impact on results.
	Metric 20: Outcomes Unrelated to Exposure	Medium	There was no information in the study to suggest differences among groups in animal attrition or health outcomes unrelated to exposure (e.g., infection) that could influence the outcome assessment.
Domain 7: Data Presentation and Analysis			
	Metric 21: Statistical Methods	High	A regression was performed and presented. Regression lines shown in Figure 3 could be reconstructed from Data presented in Table 2.
	Metric 22: Reporting of Data	High	Zero Growth concentrations shown in Table 3 with standard deviation and change in Cutting mass vs Exposure concentration shown in Figure 3 and Table 2.
	Metric 23: Explanation of Unexpected Outcomes	Medium	Standard error was reported within the graphs but not Table 2. Unclear if Table 3 variation represents standard error or standard deviation.

Additional Comments: This form applies to cis-1,2-dichloroethylene.

Overall Quality Determination

Medium