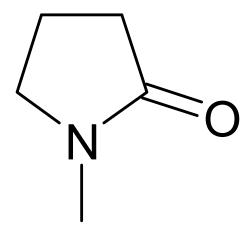
Final Risk Evaluation for n-Methylpyrrolidone

Systematic Review Supplemental File:

Data Quality Evaluation of Ecological Hazard Studies

CASRN: 872-50-4



December 2020

EPA's Office of Pollution Prevention and Toxics (OPPT) developed data quality criteria for ecological hazard studies, presented in the *Application of Systematic Review in TSCA Risk Evaluations* document (EPA Document #740-P1-8001).

This document presents data quality evaluation results for ecological hazard studies evaluated for the NMP Risk Evaluation.

Table of Contents

HERO ID	Data Type	Reference	
3539870	Acute (0-96 hour); Aquatic; Invertebrates	C. H. Lan, C. Y. Peng, T. S. Lin. 2004. Acute aquatic toxicity of N-methyl-2-pyrrolidinone to Daphnia magna. Bulletin of Environmental Contamination and Toxicology 73:392-397	4
4259519	Acute (0-96 hour); Aquatic; Fish	BASF AG. 1983. Unpublished data, study No. 83/112, 31 Aug 1983.	8
4259520	Acute (0-96 hour); Aquatic; Fish	BASF AG. 1986. Department of Toxicology study no. $85/289$, 05 Feb 1986 (unpublished).	11
5079088	Acute (0-96 hour); Aquatic; other NMP- Dap (original)	GAF. 1979. Aquatic Toxicology Laboratory, contract No. L1393-05.	14
5079088	Acute (0-96 hour); Aquatic; other NMP- fathead minnows (Pimephales promelas)	GAF. 1979. Aquatic Toxicology Laboratory, contract No. L1393-05.	17
5079088	Acute (0-96 hour); Aquatic; other NMP- Rainbow trout (Salmo gaird- neri)	GAF. 1979. Aquatic Toxicology Laboratory, contract No. L1393-05.	20
5079088	Acute (0-96 hour); Aquatic; other NMP- Gammarus sp (scud)	GAF. 1979. Aquatic Toxicology Laboratory, contract No. L1393-05.	23
5079088	Acute (0-96 hour); Aquatic; other NMP- mud crabs (Neopanope texana sayi)	GAF. 1979. Aquatic Toxicology Laboratory, contract No. L1393-05.	26
5079088	Acute (0-96 hour); Aquatic; other NMP- grass shrimp (Palaemonetes vulgaris)	GAF. 1979. Aquatic Toxicology Laboratory, contract No. L1393-05.	29
5079089	Chronic (>21 days); Aquatic; Invertebrates	BASF AG. 2001. Department of Experimental Toxicology and Ecology, unpublished data, project No. $00/0969/51/1$.	32
5079090	Acute (0-96 hour); Aquatic; Plants	BASF AG. 1989. Department of Ecology, unpublished data, project No. $1035/88$.	35

Study Citation:		C. Y. Peng, T. S. Lin. 2004. Acute aquatic to: ntamination and Toxicology 73:392-397	xicity of N-methy	yl-2-pyrro	olidinone	e to Daphnia magna. Bulletin of Environ-
Data Type: Hero ID:		6 hour); Aquatic; Invertebrates				
Domain		Metric	Rating [†]	MWF*	Score	Comments ^{††}
Domain 1: Test S	Substance					
20110111 17 1000 8	Metric 1:	Test Substance Identity	High	$\times 2$	2	The test substance is NMP.
	Metric 2:	Test Substance Source	High	\times 1	1	The NMP (test substance) was purchased from Sigma- Aldrich.
	Metric 3:	Test Substance Purity	High	\times 1	1	The purity is reported as >99.9 percent.
Domain 2: Test I	Design Metric 4:	Negative Controls	Medium	$\times 2$	4	A second to a control of the lead of the libration
	Metric 4.	Negative Controls	Medium	X 2	4	A negative control was included as the dilution water. Information on the condition of the test organisms was not provided to assess any difference between those allocated to treatment groups versus controls.
	Metric 5:	Negative Control Response	Low	× 1	3	The control results were only in the text and as always being "100 percent" and "meeting EPA criteria".
	Metric 6:	Randomized Allocation	Low	× 1	3	The study did not report any information on the allocation of test organisms. Further the study provided little to no information on the study design except for referencing two different EPA acute study manuals.
	~					
Domain 3: Expos	sure Charact Metric 7:	erization Experimental System/Test Media Preparation	Unacceptable	× 2	8	NMP test exposure concentrations were not measured. NMP is reported to degrade rapidly in the aquatic environment and measurements should be made to ensure that nominal (targeted exposure concentrations) were obtained during the test period over 48 hours. NMP was measured only in the stock solution used to prepare the nominal dilution series nominal test exposure concentrations. NMP concentrations were not measured in each of the test exposures. The test system did not consider the physical-chemical properties of NMP.
		Continued on next page				

Study Citation:		C. Y. Peng, T. S. Lin. 2004. Acute aquatic tox tamination and Toxicology 73:392-397	cicity of N-methy	yl-2-pyrro	olidinone	e to Daphnia magna. Bulletin of Environ-
Data Type: Hero ID:	Acute (0-96 3539870	5 hour); Aquatic; Invertebrates				
Domain		Metric	Rating [†]	MWF*	Score	$\mathrm{Comments}^{\dagger\dagger}$
	Metric 8:	Consistency of Exposure Administration	Low	× 1	3	The details of exposure conditions for testing are not reported in detail. There is not enough information to assess if exposure administration was consistent across treatment groups and the control. The study does report some general information on temperature, pH, dissolved oxygen and conductivity of the test exposures but numerical values are not reported. There is only a statement in the text that these measurements were "stable".
	Metric 9:	Measurement of Test Substance Concentration	Unacceptable	× 1	4	Exposure test concentrations were not measured. NMP is reported to degrade rapidly in water.
	Metric 10:	Exposure Duration and Frequency	High	\times 2	2	The duration of exposure was included (24-h and 48-h).
	Metric 11:	Number of Exposure Groups/Spacing of Exposure Levels	Low	× 1	3	The text reports exposure groups as "five organisms per five different NMP concentrations in quadruple groups". The authors did not provide a rationale for selection of the range of tested nominal NMP concentrations (06, 1.25, 2.5, 5, and 10 mg/L) in the dilution series. Other available acute and chronic toxicity studies do not show effects within this range of NMP concentrations (effects are observed at much higher concentrations >500 mg/L.
	Metric 12:	Testing at or Below Solubility Limit	High	× 1	1	Tested below the water solubility of NMP (1000 g/ L).
Domain 4: Test (Organism					
	Metric 13:	Test Organism Characteristics	Medium	× 2	4	The authors report that the test organisms were originally obtained from LUZCOGI Inc., Germany and were cultured in their laboratory over "many generations" and were subjected to reference toxicity testing using sodium chloride but the results of this testing are not reported.
	Metric 14:	Acclimatization and Pretreatment Conditions	Medium	× 1	2	Some pretreatment conditions are described for the test organisms including photoperiod and temperature. "Growth and life span were stable" is reported in the text but data are not provided. Acclimation is not discussed and data are not provided to assessment any pretreatment differences between control and test exposure treatment groups.
		Continued on next page				

Study Citation:		C. Y. Peng, T. S. Lin. 2004. Acute aquatic tox tamination and Toxicology 73:392-397	cicity of N-methy	yl-2-pyrro	olidinone	e to Daphnia magna. Bulletin of Environ-
Data Type: Hero ID:		i hour); Aquatic; Invertebrates				
Domain		Metric	Rating [†]	MWF*	Score	$\mathrm{Comments}^{\dagger\dagger}$
	Metric 15:	Number of Organisms and Replicates per Group	Low	× 1	3	The number of test organisms and replicates are reported in the text as 5 organisms per exposure chamber with 4 replicates per nominal treatment concentration. However, the quantitative responses of the test organisms (deaths) between replicates and NMP treatment groups are not reported. There is not sufficient information to assess if the number of organisms and/or replicates are sufficient to provide power for statistical analyses.
	Metric 16:	Adequacy of Test Conditions	Unacceptable	× 1	4	Organism housing, environmental conditions, food, photoperiod, and temperature were adequately described to maintain the health of test organisms. The handling of test organisms is not described, nor the type of exposure chamber (vessel). The dilution water is only described in the text as being prepared according to an EPA guideline. The text does not describe feeding, nutrients, and maintenance of the test organism cultures. Feeding is described in the text as "minimal algae food".
Domain 5: Outco	omo Assossmo	ant				
Domain 9. Outco	Metric 17:	Outcome Assessment Methodology	Unacceptable	\times 2	8	The outcome assessment methodology was not reported and the results are not reported.
	Metric 18:	Consistency of Outcome Assessment	Unacceptable	× 1	4	Outcome assessments were not adequately reported for interpretation of the results.
Domain 6: Confo	unding / Vai	riable Control				
	Metric 19:	Confounding Variables in Test Design and Procedures	Unacceptable	\times 2	8	The study did not report results by control, treatment group or replicate group. It is not possible to assess confounding variables in the test design and procedures.
	Metric 20:	Outcomes Unrelated to Exposure	Unacceptable	× 1	4	The study did not report results by control, treatment group or replicate group. It is not possible to assess outcomes unrelated to exposure.
Domain 7: Data l	Presentation	and Analysis				
	Metric 21:	Statistical Methods	Low	× 1	3	The text states that statistical analysis was conducted using the Probit Procedure according to Gulley 1996. However there are no results reported making an independent statistical analyses impossible.
		Continued on next page				

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Study Citation: Data Type: Hero ID:	mental Con	C. Y. Peng, T. S. Lin. 2004. Acute aquatic tamination and Toxicology 73:392-397 hour); Aquatic; Invertebrates	toxicity of N-methy	vl-2-pyrro	olidinone	e to Daphnia magna. Bulletin of Environ-
Domain		Metric	$\mathrm{Rating}^{\dagger}$	MWF^{\star}	Score	$\mathrm{Comments}^{\dagger\dagger}$
	Metric 22:	Reporting of Data	Unacceptable	× 2	8	The results of the testing are not reported for any of the treatment groups or control groups. The text only states that the authors calculated 24 and 48 hour EC50 values.
	Metric 23:	Explanation of Unexpected Outcomes	Unacceptable	× 1	4	The results of the testing are not reported for any of the treatment groups or control groups. It is not possible to assess the occurrence of unexpected outcomes.
Overall Quality I	Determination	‡	Unacceptable		4.0	Metric mean score**: 2.8.
Extracted			No			

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

$$\text{Overall rating} = \left\{ \begin{array}{ll} 4 & \text{if any metric is Unacceptable} \\ \\ \left\lfloor \sum_{i} \left(\text{Metric Score}_{i} \times \text{MWF}_{i} \right) / \sum_{j} \text{MWF}_{j} \right\rfloor_{0.1} & \text{(round to the nearest tenth) otherwise} \end{array} \right.,$$

^{*} MWF = Metric Weighting Factor

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

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

^{††} Metrics that are rated 'High' met the criteria for high confidence as expected for this type of study, and may not require additional comments.

Study Citation: Data Type: Hero ID:		1983. Unpublished data, study No. 83/112, 31 i hour); Aquatic; Fish	Aug 1983.			
Domain		Metric	Rating [†]	MWF*	Score	$Comments^{\dagger\dagger}$
Domain 1: Test S	Substance					
	Metric 1:	Test Substance Identity	High	\times 2	2	$\mbox{N-}$ Methylpyrrolidone (NMP) was identified as the test substance
	Metric 2:	Test Substance Source	Low	\times 1	3	The source of test substance was not provided.
	Metric 3:	Test Substance Purity	High	× 1	1	The test substance's purity was reported as 99.8 percent.
Domain 2: Test I	Design					
	Metric 4:	Negative Controls	High	$\times 2$	2	The control (0 mg/L) was used.
	Metric 5:	Negative Control Response	High	\times 1	1	The control results were reported.
	Metric 6:	Randomized Allocation	Low	× 1	3	The randomized allocation was not mentioned in the report.
Domain 3: Expos	sure Characte	erization				
•	Metric 7:	Experimental System/Test Media Preparation	High	\times 2	2	The experimental system and methods for preparation of test media were described in adequate detail in the report.
	Metric 8:	Consistency of Exposure Administration	High	\times 1	1	Exposure information was reported and exposures were consistent across the study groups.
	Metric 9:	Measurement of Test Substance Concentration	Medium	× 1	2	This fish test was a limit test, but the measurement of test substance was taken.
	Metric 10:	Exposure Duration and Frequency	High	\times 2	2	The duration of exposure and frequency were reported appropriately for the study (acute fish study 96-hour duration).
	Metric 11:	Number of Exposure Groups/Spacing of Exposure Levels	Low	× 1	3	This fish test was a limit test. The centrations tested were 0 mg/L (control) and 500 mg/L.
	Metric 12:	Testing at or Below Solubility Limit	High	× 1	1	Exposure concentrations were at below the water solubility of NMP (1000 g/L).
Domain 4: Test (Organism					
	Metric 13:	Test Organism Characteristics	High	\times 2	2	The test organisms were described adequately and appropriate for this study.
		Continued on next page				

Study Citation: Data Type: Hero ID:		1983. Unpublished data, study No. 83/112, 31 hour); Aquatic; Fish	Aug 1983.			
Domain		Metric	Rating [†]	MWF*	Score	Comments ^{††}
	Metric 14:	Acclimatization and Pretreatment Conditions	High	× 1	1	The test organisms were acclimatized to test conditions and all the pretreatment conditions were the same.
	Metric 15:	Number of Organisms and Replicates per Group	Low	× 1	3	This test was a limit test (one control of 0 mg/L and three replicates for 500 mg/L).
	Metric 16:	Adequacy of Test Conditions	High	× 1	1	Organisms housing, conditions, food, and test media were described and adequate to maintain the health of test organisms.
Domain 5: Outcom	me Assessme	nt				
	Metric 17:	Outcome Assessment Methodology	High	\times 2	2	The outcome assessment methodology addressed the intended outcomes of interest.
	Metric 18:	Consistency of Outcome Assessment	High	× 1	1	The outcome assessment was carried out consistently across study groups. using the same protocol in all study groups.
Domain 6: Confo	unding / Var	iable Control				
	Metric 19:	Confounding Variables in Test Design and Procedures	High	\times 2	2	No reported differences were noted among the study groups in environmental conditions or any other factors.
	Metric 20:	Outcomes Unrelated to Exposure	High	× 1	1	No report or details were noted for test organism attrition or health outcomes unrelated to exposure.
Domain 7: Data I	Presentation	and Analysis				
Domain (. Data I	Metric 21:	Statistical Methods	High	× 1	1	The statistical method was used (probit analysis Finney (1971)).
	Metric 22:	Reporting of Data	High	\times 2	2	Data for exposure-related findings were presented for the treatment and control group and were ad- equate to determine the endpoint
	Metric 23:	Explanation of Unexpected Outcomes	High	× 1	1	There were no unexpected outcomes.
Overall Quality D	etermination	‡	High		1.3	
Extracted			Yes			
		Continued on next page				

Study Citation: BASF AG. 1983. Unpublished data, study No. 83/112, 31 Aug 1983.

Data Type: Acute (0-96 hour); Aquatic; Fish

Hero ID: 4259519

Domain Metric Rating † MWF * Score Comments ††

$$\text{Overall rating} = \left\{ \begin{array}{ll} 4 & \text{if any metric is Unacceptable} \\ \\ \left\lfloor \sum_{i} \left(\text{Metric Score}_{i} \times \text{MWF}_{i} \right) / \sum_{j} \text{MWF}_{j} \right\rceil_{0.1} & \text{(round to the nearest tenth) otherwise} \end{array} \right.,$$

 $^{^{\}star}$ MWF = Metric Weighting Factor

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

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

^{††} Metrics that are rated 'High' met the criteria for high confidence as expected for this type of study, and may not require additional comments.

Study Citation: Data Type: Hero ID:		1986. Department of Toxicology study no. 85/2 hour); Aquatic; Fish	289, 05 Feb	1986 (ur	ıpublish	ed).
Domain		Metric	Rating [†]	MWF*	Score	$Comments^{\dagger\dagger}$
Domain 1: Test S	Substance					
	Metric 1:	Test Substance Identity	High	\times 2	2	$\mbox{N-}$ Methylpyrrolidone (NMP) was identified as the test substance
	Metric 2:	Test Substance Source	Low	$\times 1$	3	The source of test substance was not provided.
	Metric 3:	Test Substance Purity	High	× 1	1	The test substance's purity was reported as 99.8 percent.
Domain 2: Test I	Design					
	Metric 4:	Negative Controls	High	$\times 2$	2	The control (0 mg/L) was used.
	Metric 5:	Negative Control Response	High	$\times 1$	1	The control results were reported (no mortality).
	Metric 6:	Randomized Allocation	Low	× 1	3	The randomized allocation was not mentioned in the report.
Domain 3: Expos	ure Characte	erization				
	Metric 7:	Experimental System/Test Media Preparation	High	\times 2	2	The experimental system and methods for preparation of test media were described in adequate detail in the report.
	Metric 8:	Consistency of Exposure Administration	High	× 1	1	Exposure information was reported and exposures were consistent across the study groups.
	Metric 9:	Measurement of Test Substance Concentration	Medium	× 1	2	Test concentrations were reported as nominal concentrations. By the Henry's Law of NMP (3.2 " 10-9 atm m3/mole), the test substance is not considered to be volatile, thus, actual concentrations are likely to be similar to nominal concentrations.
	Metric 10:	Exposure Duration and Frequency	High	\times 2	2	The duration of exposure and frequency were reported appropriately for the study (acute fish study 96-hour duration).
	Metric 11:	Number of Exposure Groups/Spacing of Exposure Levels	High	× 1	1	The number of exposure groups and spacing of exposure levels were adequate to address the purpose of the study and to obtain the toxicity endpoint.
	Metric 12:	Testing at or Below Solubility Limit	High	× 1	1	Exposure concentrations were at below the water solubility of NMP (1000 g/L).
Domain 4: Test C	Organism					
	Metric 13:	Test Organism Characteristics	High	× 2	2	The test organisms were described adequately and appropriate for this study.
		Continued on next page				

Study Citation: Data Type: Hero ID:		1986. Department of Toxicology study no. 85/2 hour); Aquatic; Fish	289, 05 Feb	1986 (ur	publish	ed).
Domain		Metric	Rating [†]	MWF*	Score	$\mathrm{Comments}^{\dagger\dagger}$
	Metric 14:	Acclimatization and Pretreatment Conditions	High	× 1	1	The test organisms were acclimatized to test conditions and all the pretreatment conditions were the same.
	Metric 15:	Number of Organisms and Replicates per Group	Low	× 1	3	The numbers of test organisms (10/treatment) without any replicates were reported, however, the information provided were sufficient to characterize toxicological effects of test substance.
	Metric 16:	Adequacy of Test Conditions	High	× 1	1	Organisms housing, conditions, food, and test media were described and adequate to maintain the health of test organisms.
Domain 5: Outco	ome Assessme	ent				
	Metric 17:	Outcome Assessment Methodology	High	\times 2	2	The outcome assessment methodology addressed the intended outcomes of interest.
	Metric 18:	Consistency of Outcome Assessment	High	× 1	1	The outcome assessment was carried out consistently across study groups. using the same protocol in all study groups.
Domain 6: Confo	ounding / Var	riable Control				
	Metric 19:	Confounding Variables in Test Design and Procedures	High	\times 2	2	No reported differences were noted among the study groups in environmental conditions or any other fac- tors.
	Metric 20:	Outcomes Unrelated to Exposure	High	× 1	1	No report or details were noted for test organism attrition or health outcomes unrelated to exposure.
Domain 7: Data	Procentation	and Analysis				
Domain 7. Data	Metric 21:	Statistical Methods	High	× 1	1	The statistical method was used (probit analysis Finney (1971)).
	Metric 22:	Reporting of Data	High	\times 2	2	Data for exposure-related findings were presented for the treatment and control group and were adequate to determine the endpoint
	Metric 23:	Explanation of Unexpected Outcomes	High	× 1	1	There were no unexpected outcomes.
Overall Quality I	Determination	[‡]	High		1.2	
Extracted			Yes			
		Continued on next page				

Study Citation: BASF AG. 1986. Department of Toxicology study no. 85/289, 05 Feb 1986 (unpublished).

Data Type: Acute (0-96 hour); Aquatic; Fish

Hero ID: 4259520

Domain Metric Rating † MWF * Score Comments ††

$$\text{Overall rating} = \left\{ \begin{array}{ll} 4 & \text{if any metric is Unacceptable} \\ \\ \left\lfloor \sum_{i} \left(\text{Metric Score}_{i} \times \text{MWF}_{i} \right) / \sum_{j} \text{MWF}_{j} \right\rceil_{0.1} & \text{(round to the nearest tenth) otherwise} \end{array} \right.,$$

 $^{^{\}star}$ MWF = Metric Weighting Factor

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

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

^{††} Metrics that are rated 'High' met the criteria for high confidence as expected for this type of study, and may not require additional comments.

Metric 3: Test Substance Purity Low × 1 3 The test substance's purity was not reported. Domain 2: Test Design Metric 4: Negative Controls Metric 5: Negative Control Response Metric 6: Randomized Allocation Metric 6: Randomized Allocation Metric 7: Experimental System/Test Media Preparation Metric 7: Experimental System/Test Media Preparation Metric 8: Consistency of Exposure Administration Metric 9: Measurement of Test Substance Concentration Metric 9: Measurement of Test Substance Concentration Metric 10: Exposure Duration and Frequency Metric 11: Number of Exposure Groups/Spacing of Exposure Substance Concentrations Metric 12: Testing at or Below Solubility Limit Metric 13: Test Organism Metric 13: Test Organism Metric 13: Test Organism Metric 13: Test Organism Characteristics Metric 14: Down × 1	Study Citation: Data Type: Hero ID:		Aquatic Toxicology Laboratory, contract No. 15 hour); Aquatic; other NMP- Dap (original)	L1393-05.			
Metric 1: Test Substance Identity Metric 2: Test Substance Source High × 1 1 The test substance as provided by GAP Corporation. Metric 3: Test Substance Purity Low × 1 3 The test substance was provided by GAP Corporation. Metric 3: Test Design Metric 4: Negative Controls Metric 5: Negative Control Response High × 2 2 The control (0 mg/L) was used. Metric 6: Randomized Allocation Low × 1 3 The randomized allocation was not mentioned in the report. Metric 6: Randomized Allocation Domain 3: Exposure Characterization Metric 7: Experimental System/Test Media Preparation Metric 8: Consistency of Exposure Administration Metric 9: Measurement of Test Substance Concentration Metric 9: Measurement of Test Substance Concentration Metric 10: Exposure Duration and Frequency Metric 10: Exposure Groups/Spacing of Exposure Groups/Spacing of Exposure Levels Metric 12: Testing at or Below Solubility Limit Metric 13: Test Organism Metric 13: Test Organism Characteristics High × 2 2 The test concentrations were adequately described an were appropriate for this study.	Domain		Metric	$\mathrm{Rating}^{\dagger}$	MWF*	Score	$Comments^{\dagger\dagger}$
Metric 2: Test Substance Source Metric 3: Test Substance Purity Low × 1 3 The test substance was provided by GAF Corporation. Domain 2: Test Design Metric 4: Negative Controls Metric 5: Negative Control Response Metric 6: Randomized Allocation Domain 3: Exposure Characterization Metric 7: Experimental System/Test Media Preparation Metric 8: Consistency of Exposure Administration Metric 9: Measurement of Test Substance Concentration Metric 10: Exposure Duration and Frequency Metric 10: Exposure Groups/Spacing of Exposure Groups/Spacing of Exposure Levels Metric 12: Testing at or Below Solubility Limit Metric 13: Test Organism Metric 13: Test Organism Metric 13: Test Organism Metric 13: Test Organism Substance Concentration and Frequency High × 2 2 2 The control (0 mg/L) was used. The control (0 mg/L)	Domain 1: Test S	Substance					
Metric 3: Test Substance Purity Low × 1 3 The test substance's purity was not reported. Domain 2: Test Design Metric 4: Negative Controls Metric 5: Negative Control Response Metric 6: Randomized Allocation Metric 6: Randomized Allocation Metric 7: Experimental System/Test Media Preparation Metric 7: Experimental System/Test Media Preparation Metric 8: Consistency of Exposure Administration Metric 9: Measurement of Test Substance Concentration Metric 9: Measurement of Test Substance Concentration Metric 10: Exposure Duration and Frequency Metric 11: Number of Exposure Groups/Spacing of Exposure Substance Concentrations Metric 12: Testing at or Below Solubility Limit Metric 13: Test Organism Metric 13: Test Organism Metric 13: Test Organism Metric 13: Test Organism Characteristics Metric 14: Negative Controls High × 2 2 The control (0 mg/L) was used. The test outside were reported (no mortality). The underion was reported and exposure were adequately described and was used. The underion of exposure and frequency were reported on the toxicity endpoint. The number of exposure groups and spacing of exposure levels The test organism were adequately described and obtained from a reliable source. The test organism were appropriate for this study.		Metric 1:	Test Substance Identity	High	$\times 2$	2	NMP was identified as the test substance
Domain 2: Test Design Metric 4: Negative Controls Metric 5: Negative Control Response Metric 6: Randomized Allocation Domain 3: Exposure Characterization Metric 7: Experimental System/Test Media Preparation Metric 8: Consistency of Exposure Administration Metric 9: Measurement of Test Substance Concentration Metric 9: Measurement of Test Substance Concentration Metric 10: Exposure Duration and Frequency Metric 11: Number of Exposure Groups/Spacing of Exposure Levels Metric 12: Testing at or Below Solubility Limit Metric 13: Test Organism Metric 13: Test Organism Metric 13: Test Organism Characteristics Metric S. Negative Controls High × 2 2 2 The control (0 mg/L) was used. The control results were reported (no mortality). The control results were reported (no mortality). The control results were reported and exposure at tion of test media were described in adequate detain in the report. Medium × 1 2 Test concentrations was reported and exposure were consistent across the study groups. Medium × 1 2 Test concentrations were reported an omninal concentrations. Medium × 1 2 Test duration of exposure and frequency were reported appropriately for the study (at the Maphinic study 48-hour duration). Metric 11: Number of Exposure Groups/Spacing of Exposure Below Solubility Limit High × 1 1 The number of exposure groups and spacing of exposure Levels Metric 12: Testing at or Below Solubility Limit High × 1 1 Exposure concentrations were at below the water solubility of NMP (1000 g/L). Domain 4: Test Organism Metric 13: Test Organism Characteristics High × 2 2 The test organisms were adequately described and obtained from a reliable source. The test organism were appropriate for this study.		Metric 2:	Test Substance Source	High	\times 1	1	The test substance was provided by GAF Corporation.
Metric 4: Negative Controls Metric 5: Negative Control Response Metric 6: Randomized Allocation Metric 6: Randomized Allocation Domain 3: Exposure Characterization Metric 7: Experimental System/Test Media Preparation Metric 8: Consistency of Exposure Administration Metric 9: Measurement of Test Substance Concentration Metric 9: Measurement of Test Substance Concentration Metric 10: Exposure Duration and Frequency Metric 10: Exposure Groups/Spacing of Exposure Groups/Spacing of Exposure Levels Metric 12: Testing at or Below Solubility Limit Metric 13: Test Organism Metric 14: Negative Control (8 mg/L) was used. The control (0 mg/L) was used. The control (n mclosition was not mentioned in the report. The control (1 mg/L) was used. The experimental system and methods for preparation of test under the report. The control (1 mg/L) was used. The experimental system and methods for preparation of the various of the subdy and to obtain the toxicity endpoint. The number of exposure groups and spa		Metric 3:	Test Substance Purity	Low	× 1	3	The test substance's purity was not reported.
Metric 4: Negative Controls Metric 5: Negative Control Response Metric 6: Randomized Allocation Metric 6: Randomized Allocation Domain 3: Exposure Characterization Metric 7: Experimental System/Test Media Preparation Metric 8: Consistency of Exposure Administration Metric 9: Measurement of Test Substance Concentration Metric 9: Measurement of Test Substance Concentration Metric 10: Exposure Duration and Frequency Metric 10: Exposure Groups/Spacing of Exposure Groups/Spacing of Exposure Levels Metric 12: Testing at or Below Solubility Limit Metric 13: Test Organism Metric 14: Negative Control (8 mg/L) was used. The control (0 mg/L) was used. The control (n mclosition was not mentioned in the report. The control (1 mg/L) was used. The experimental system and methods for preparation of test under the report. The control (1 mg/L) was used. The experimental system and methods for preparation of the various of the subdy and to obtain the toxicity endpoint. The number of exposure groups and spa	Domain 2: Test l	Design					
Metric 5: Negative Control Response Metric 6: Randomized Allocation Domain 3: Exposure Characterization Metric 7: Experimental System/Test Media Preparation Metric 8: Consistency of Exposure Administration Metric 9: Measurement of Test Substance Concentration Metric 10: Exposure Duration and Frequency Metric 10: Exposure Duration and Frequency Metric 11: Number of Exposure Groups/Spacing of Exposure Levels Metric 12: Testing at or Below Solubility Limit Metric 13: Test Organism Metric 13: Test Organism Metric 13: Test Organism Characteristics Metric 4: Test organism Metric 10: Test organism were appropriate for this study. Metric 10: Test Organism Metric 13: Test Organism Metric 13: Test Organism Characteristics Metric 14: Test organism Metric 15: Test organism Metric 16: Test organism were appropriate for this study. Metric 16: Test Organism Metric 17: Test organism Metric 18: Test Organism Metric 19: Test organism Were appropriate for this study.			Negative Controls	High	$\times 2$	2	The control (0 mg/L) was used.
Metric 6: Randomized Allocation Low × 1 3 The randomized allocation was not mentioned in the report. Domain 3: Exposure Characterization Metric 7: Experimental System/Test Media Preparation Metric 8: Consistency of Exposure Administration Metric 9: Measurement of Test Substance Concentration Metric 9: Measurement of Test Substance Concentration Metric 10: Exposure Duration and Frequency Metric 10: Exposure Duration and Frequency Metric 11: Number of Exposure Groups/Spacing of Exposure Groups/Spacing of Exposure Levels Metric 12: Testing at or Below Solubility Limit Metric 13: Test Organism Metric 13: Test Organism Characteristics Metric 15: Metric 16: Exposure and predention and Frequency Medium Metric 17: The test organism were adequately described an obtained from a reliable source. The test organism were appropriate for this study.		Metric 5:	9	_			· · · · · ·
Metric 7: Experimental System/Test Media Preparation Metric 8: Consistency of Exposure Administration Metric 9: Measurement of Test Substance Concentration Metric 9: Measurement of Test Substance Concentration Metric 10: Exposure Duration and Frequency Metric 11: Number of Exposure Groups/Spacing of Exposure Groups/Spacing of Exposure Levels Metric 12: Testing at or Below Solubility Limit Metric 13: Test Organism Metric 13: Test Organism Metric 13: Test Organism Metric 13: Test Organism Metric 13: Test Organism Characteristics Metric 14: Test organism were adequately described and cobtained from a reliable source. The test organism were appropriate for this study.		Metric 6:	•	Low	× 1	3	The randomized allocation was not mentioned in the report.
Metric 7: Experimental System/Test Media Preparation Metric 8: Consistency of Exposure Administration Metric 9: Measurement of Test Substance Concentration Metric 9: Measurement of Test Substance Concentration Metric 10: Exposure Duration and Frequency Metric 11: Number of Exposure Groups/Spacing of Exposure Groups/Spacing of Exposure Levels Metric 12: Testing at or Below Solubility Limit Metric 13: Test Organism Metric 13: Test Organism Metric 13: Test Organism Metric 13: Test Organism Metric 13: Test Organism Characteristics Metric 14: Test organism were adequately described and cobtained from a reliable source. The test organism were appropriate for this study.	Domain 3: Expos	sure Characte	erization				
Metric 8: Consistency of Exposure Administration High × 1 1 Exposure information was reported and exposures were consistent across the study groups. Metric 9: Measurement of Test Substance Concentration Medium × 1 2 Test concentrations. By the Henry's Law of NMP (3.2 " 10-6 atm m3/mole), the test substance is not considered to be volatile, thus, actual concentrations are likely to be similar to nominal concentrations. Metric 10: Exposure Duration and Frequency High × 2 2 The duration of exposure and frequency were reported appropriately for the study (acute daphnic study 48-hour duration). Metric 11: Number of Exposure Groups/Spacing of Exposure Levels Metric 12: Testing at or Below Solubility Limit High × 1 1 Exposure concentrations were adequate to address the purpose of the study and to obtain the toxicity endpoint. Metric 13: Test Organism Metric 13: Test Organism Characteristics High × 2 2 The test organisms were adequately described and obtained from a reliable source. The test organisms were appropriate for this study.	Bollium of Empor		Experimental System/Test Media Prepara-	High	\times 2	2	The experimental system and methods for preparation of test media were described in adequate detail in the report.
tion centrations. By the Henry's Law of NMP (3.2" 10-6 atm m3/mole), the test substance is not considered to be volatile, thus, actual concentrations are likely to be similar to nominal concentrations are likely to be similar to nominal concentrations. Metric 10: Exposure Duration and Frequency High × 2 2 The duration of exposure and frequency were reported appropriately for the study (acute daphnic study 48-hour duration). Metric 11: Number of Exposure Groups/Spacing of Exposure Levels Metric 12: Testing at or Below Solubility Limit High × 1 1 Exposure concentrations were abelow the water solubility of NMP (1000 g/L). Domain 4: Test Organism Metric 13: Test Organism Characteristics High × 2 2 The test organisms were adequately described and obtained from a reliable source. The test organisms were appropriate for this study.		Metric 8:	Consistency of Exposure Administration	High	× 1	1	Exposure information was reported and exposures
Metric 11: Number of Exposure Groups/Spacing of Exposure Groups/Spacing of Exposure Levels Metric 12: Testing at or Below Solubility Limit Metric 13: Test Organism Metric 13: Test Organism Characteristics Metric 14: Number of Exposure Groups/Spacing of Exposure Groups/Spacing of Exposure High		Metric 9:		Medium	× 1	2	Test concentrations were reported as nominal concentrations. By the Henry's Law of NMP (3.2" 10-9 atm m3/mole), the test substance is not considered to be volatile, thus, actual concentrations are likely to be similar to nominal concentrations.
posure Levels Metric 12: Testing at or Below Solubility Limit High × 1 1 Exposure concentrations were at below the water solubility of NMP (1000 g/L). Domain 4: Test Organism Metric 13: Test Organism Characteristics High × 2 2 The test organisms were adequately described and obtained from a reliable source. The test organisms were appropriate for this study.		Metric 10:	Exposure Duration and Frequency	High	\times 2	2	The duration of exposure and frequency were reported appropriately for the study (acute daphnid study 48-hour duration).
Metric 12: Testing at or Below Solubility Limit High × 1 1 Exposure concentrations were at below the water solubility of NMP (1000 g/L). Domain 4: Test Organism Metric 13: Test Organism Characteristics High × 2 2 The test organisms were adequately described and obtained from a reliable source. The test organisms were appropriate for this study.		Metric 11:		High	× 1	1	The number of exposure groups and spacing of exposure levels were adequate to address the purpose of the study and to obtain the toxicity endpoint.
Metric 13: Test Organism Characteristics High × 2 2 The test organisms were adequately described and obtained from a reliable source. The test organisms were appropriate for this study.		Metric 12:	Testing at or Below Solubility Limit	High	× 1	1	Exposure concentrations were at below the water
Continued on next page	Domain 4: Test 0	_	Test Organism Characteristics	High	\times 2	2	The test organisms were adequately described and obtained from a reliable source. The test organisms were appropriate for this study.
			Continued on next page				

Study Citation: Data Type: Hero ID:		Aquatic Toxicology Laboratory, contract No. I hour); Aquatic; other NMP- Dap (original)	L1393-05.			
Domain		Metric	$\mathrm{Rating}^{\dagger}$	MWF^{\star}	Score	$Comments^{\dagger\dagger}$
	Metric 14:	Acclimatization and Pretreatment Conditions	High	× 1	1	The test organisms were acclimatized to test conditions and all the pretreatment conditions were the same.
	Metric 15:	Number of Organisms and Replicates per Group	High	× 1	1	The numbers of test organisms and replicates were reported and sufficient to characterize toxicologica effects.
	Metric 16:	Adequacy of Test Conditions	High	× 1	1	Organisms housing, conditions, food, and test media were described and adequate to maintain the health of test organisms.
Domain 5: Outco	ome Assessme	ent				
	Metric 17:	Outcome Assessment Methodology	High	\times 2	2	The outcome assessment methodology addressed the intended outcomes of interest.
	Metric 18:	Consistency of Outcome Assessment	High	× 1	1	The outcome assessment was carried out consistently across study groups. using the same protoco in all study groups.
Domain 6: Confo	ounding / Var	riable Control				
	Metric 19:	Confounding Variables in Test Design and Procedures	High	\times 2	2	No reported differences were noted among the study groups in environmental conditions or any other fac- tors.
	Metric 20:	Outcomes Unrelated to Exposure	Medium	× 1	2	No report or details were noted for test organism attrition or health outcomes unrelated to exposure.
Domain 7: Data	Presentation	and Analysis				
Dollain (Dava)	Metric 21:	Statistical Methods	High	× 1	1	The statistical method was used (moving average method of Thompson (1947)).
	Metric 22:	Reporting of Data	High	\times 2	2	Data for exposure-related findings were presented for each treatment and control group and were ade- quate to determine the endpoint values
	Metric 23:	Explanation of Unexpected Outcomes	High	× 1	1	The unexpected outcomes were satisfactorily explained.
Overall Quality I	Determination	i [‡]	High		1.2	
Extracted			Yes			
		Continued on next page				

Study Citation: GAF. 1979. Aquatic Toxicology Laboratory, contract No. L1393-05.

Data Type: Acute (0-96 hour); Aquatic; other NMP- Dap (original)

Hero ID: 5079088

Domain Metric Rating † MWF * Score Comments ††

$$\text{Overall rating} = \left\{ \begin{array}{ll} 4 & \text{if any metric is Unacceptable} \\ \\ \left\lfloor \sum_{i} \left(\text{Metric Score}_{i} \times \text{MWF}_{i} \right) / \sum_{j} \text{MWF}_{j} \right\rceil_{0.1} & \text{(round to the nearest tenth) otherwise} \end{array} \right.,$$

 $^{^{\}star}$ MWF = Metric Weighting Factor

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

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

^{††} Metrics that are rated 'High' met the criteria for high confidence as expected for this type of study, and may not require additional comments.

Study Citation: Data Type: Hero ID:		Aquatic Toxicology Laboratory, contract No. I hour); Aquatic; other NMP- fathead minnows		s promel	as)	
Domain		Metric	Rating [†]	MWF*	Score	$\mathrm{Comments}^{\dagger\dagger}$
Domain 1: Test S	Substance					
	Metric 1:	Test Substance Identity	High	$\times 2$	2	NMP was identified as the test substance
	Metric 2:	Test Substance Source	High	\times 1	1	The test substance was provided by GAF Corporation.
	Metric 3:	Test Substance Purity	Low	× 1	3	The test substance's purity was not reported.
Domain 2: Test I	Design					
	Metric 4:	Negative Controls	High	$\times 2$	2	The control (0 mg/L) was used.
	Metric 5:	Negative Control Response	High	$\times 1$	1	The control results were reported (no mortality).
	Metric 6:	Randomized Allocation	Low	× 1	3	The randomized allocation was not mentioned in the report.
Domain 3: Expos	sure Characte	erization				
zomani or znpos	Metric 7:	Experimental System/Test Media Preparation	High	\times 2	2	The experimental system and methods for prepara- tion of test media were described in adequate detail in the report.
	Metric 8:	Consistency of Exposure Administration	High	× 1	1	Exposure information was reported and exposures were consistent across the study groups.
	Metric 9:	Measurement of Test Substance Concentration	Medium	× 1	2	Test concentrations were reported as nominal concentrations. By the Henry's Law of NMP (3.2" 10-9 atm m3/mole), the test substance is not considered to be volatile, thus, actual concentrations are likely to be similar to nominal concentrations.
	Metric 10:	Exposure Duration and Frequency	High	\times 2	2	The duration of exposure and frequency were reported appropriately for the study (acute fish study 96-hour duration).
	Metric 11:	Number of Exposure Groups/Spacing of Exposure Levels	High	× 1	1	The number of exposure groups and spacing of exposure levels were adequate to address the purpose of the study and to obtain the toxicity endpoint.
	Metric 12:	Testing at or Below Solubility Limit	High	× 1	1	Exposure concentrations were at below the water solubility of NMP (1000 g/L).
Domain 4: Test (Organism Metric 13:	Test Organism Characteristics	High	× 2	2	The test organisms were adequately described and obtained from a reliable source. The test organisms were appropriate for this study.
		Continued on next page				

Study Citation: Data Type: Hero ID:		Aquatic Toxicology Laboratory, contract No. I hour); Aquatic; other NMP- fathead minnows		es promel	as)	
Domain		Metric	$\mathrm{Rating}^{\dagger}$	MWF*	Score	$\mathrm{Comments}^{\dagger\dagger}$
	Metric 14:	Acclimatization and Pretreatment Conditions	High	× 1	1	The test organisms were acclimatized to test conditions and all the pretreatment conditions were the same.
	Metric 15:	Number of Organisms and Replicates per Group	High	× 1	1	The numbers of test organisms and replicates were reported and sufficient to characterize toxicological effects.
	Metric 16:	Adequacy of Test Conditions	High	× 1	1	Organisms housing, conditions, food, and test media were described and adequate to maintain the health of test organisms.
Domain 5: Outco	me Assessme	ent				
	Metric 17:	Outcome Assessment Methodology	High	\times 2	2	The outcome assessment methodology addressed the intended outcomes of interest.
	Metric 18:	Consistency of Outcome Assessment	High	× 1	1	The outcome assessment was carried out consistently across study groups. using the same protocol in all study groups.
Domain 6: Confo	unding / Var	iable Control				
	Metric 19:	Confounding Variables in Test Design and Procedures	High	\times 2	2	No reported differences were noted among the study groups in environmental conditions or any other fac- tors.
	Metric 20:	Outcomes Unrelated to Exposure	Medium	× 1	2	No report or details were noted for test organism attrition or health outcomes unrelated to exposure.
Domain 7: Data l	Presentation	and Analysis				
Domain 7. Dava 1	Metric 21:	Statistical Methods	High	\times 1	1	The statistical method was used (moving average method of Thompson (1947)).
	Metric 22:	Reporting of Data	High	\times 2	2	Data for exposure-related findings were presented for each treatment and control group and were ade- quate to determine the endpoint values
	Metric 23:	Explanation of Unexpected Outcomes	High	× 1	1	The unexpected outcomes were satisfactorily explained.
Overall Quality I	Determination	±	High		1.2	
Extracted			Yes			
		Continued on next page				

Study Citation: GAF. 1979. Aquatic Toxicology Laboratory, contract No. L1393-05.

Data Type: Acute (0-96 hour); Aquatic; other NMP- fathead minnows (Pimephales promelas)

Hero ID: 5079088

Domain Metric Rating † MWF * Score Comments ††

$$\text{Overall rating} = \left\{ \begin{array}{ll} 4 & \text{if any metric is Unacceptable} \\ \\ \left\lfloor \sum_{i} \left(\text{Metric Score}_{i} \times \text{MWF}_{i} \right) / \sum_{j} \text{MWF}_{j} \right\rceil_{0.1} & \text{(round to the nearest tenth) otherwise} \end{array} \right.,$$

 $^{^\}star$ MWF = Metric Weighting Factor

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

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

^{††} Metrics that are rated 'High' met the criteria for high confidence as expected for this type of study, and may not require additional comments.

Study Citation: Data Type: Hero ID:		Aquatic Toxicology Laboratory, contract No. I hour); Aquatic; other NMP- Rainbow trout (S		neri)		
Domain		Metric	$\mathrm{Rating}^{\dagger}$	MWF*	Score	${\rm Comments}^{\dagger\dagger}$
Domain 1: Test S	ubstance					
	Metric 1:	Test Substance Identity	High	$\times 2$	2	NMP was identified as the test substance
	Metric 2:	Test Substance Source	High	\times 1	1	The test substance was provided by GAF Corporation.
	Metric 3:	Test Substance Purity	Low	× 1	3	The test substance's purity was not reported.
Domain 2: Test D	Design					
	Metric 4:	Negative Controls	High	$\times 2$	2	The control (0 mg/L) was used.
	Metric 5:	Negative Control Response	High	$\times 1$	1	The control results were reported (no mortality).
	Metric 6:	Randomized Allocation	Low	× 1	3	The randomized allocation was not mentioned in the report.
Domain 3: Expos	ure Characte	prization				
Domain 6. Expos	Metric 7:	Experimental System/Test Media Preparation	High	\times 2	2	The experimental system and methods for prepara- tion of test media were described in adequate detail in the report.
	Metric 8:	Consistency of Exposure Administration	High	\times 1	1	Exposure information was reported and exposures were consistent across the study groups.
	Metric 9:	Measurement of Test Substance Concentration	Medium	× 1	2	Test concentrations were reported as nominal concentrations. By the Henry's Law of NMP (3.2 " 10-9 atm m3/mole), the test substance is not considered to be volatile, thus, actual concentrations are likely to be similar to nominal concentrations.
	Metric 10:	Exposure Duration and Frequency	High	\times 2	2	The duration of exposure and frequency were reported appropriately for the study (acute fish study 96-hour duration).
	Metric 11:	Number of Exposure Groups/Spacing of Exposure Levels	High	× 1	1	The number of exposure groups and spacing of exposure levels were adequate to address the purpose of the study and to obtain the toxicity endpoint.
	Metric 12:	Testing at or Below Solubility Limit	High	× 1	1	Exposure concentrations were at below the water solubility of NMP (1000 g/L).
Domain 4: Test C	Organism Metric 13:	Test Organism Characteristics	High	\times 2	2	The test organisms were adequately described and obtained from a reliable source. The test organisms were appropriate for this study.
		Continued on next page				

Study Citation: Data Type: Hero ID:		Aquatic Toxicology Laboratory, contract No. I hour); Aquatic; other NMP- Rainbow trout (S.		neri)		
Domain		Metric	Rating [†]	MWF*	Score	$\mathrm{Comments}^{\dagger\dagger}$
	Metric 14:	Acclimatization and Pretreatment Conditions	High	× 1	1	The test organisms were acclimatized to test conditions and all the pretreatment conditions were the same.
	Metric 15:	Number of Organisms and Replicates per Group	Low	× 1	3	The number of test organisms or replicates was not reported. However, the results were reported
	Metric 16:	Adequacy of Test Conditions	High	× 1	1	Organisms housing, conditions, food, and test media were described and adequate to maintain the health of test organisms.
Domain 5: Outco	ome Assessme	ent				
	Metric 17:	Outcome Assessment Methodology	High	\times 2	2	The outcome assessment methodology addressed the intended outcomes of interest.
	Metric 18:	Consistency of Outcome Assessment	High	× 1	1	The outcome assessment was carried out consistently across study groups. using the same protoco in all study groups.
Domain 6: Confo	unding / Var	iable Control				
Bolliani G. Como	Metric 19:	Confounding Variables in Test Design and Procedures	High	\times 2	2	No reported differences were noted among the study groups in environmental conditions or any other fac- tors.
	Metric 20:	Outcomes Unrelated to Exposure	Medium	× 1	2	No report or details were noted for test organism attrition or health outcomes unrelated to exposure
Domain 7: Data l	Presentation	and Analysis				
	Metric 21:	Statistical Methods	High	\times 1	1	The statistical method was used (moving average method of Thompson (1947)).
	Metric 22:	Reporting of Data	High	\times 2	2	Data for exposure-related findings were presented for each treatment and control group and were ade- quate to determine the endpoint values
	Metric 23:	Explanation of Unexpected Outcomes	High	× 1	1	The unexpected outcomes were satisfactorily explained.
Overall Quality I	Determination	‡	High		1.3	
Extracted			Yes			
		Continued on next page				

Study Citation: GAF. 1979. Aquatic Toxicology Laboratory, contract No. L1393-05.

Data Type: Acute (0-96 hour); Aquatic; other NMP- Rainbow trout (Salmo gairdneri)

Hero ID: 5079088

Domain Metric Rating † MWF * Score Comments ††

$$\text{Overall rating} = \left\{ \begin{array}{ll} 4 & \text{if any metric is Unacceptable} \\ \\ \left\lfloor \sum_{i} \left(\text{Metric Score}_{i} \times \text{MWF}_{i} \right) / \sum_{j} \text{MWF}_{j} \right\rceil_{0.1} & \text{(round to the nearest tenth) otherwise} \end{array} \right.,$$

 $^{^\}star$ MWF = Metric Weighting Factor

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

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

^{††} Metrics that are rated 'High' met the criteria for high confidence as expected for this type of study, and may not require additional comments.

Study Citation: Data Type: Hero ID:		Aquatic Toxicology Laboratory, contract No. I hour); Aquatic; other NMP- Gammarus sp (sc				
Domain		Metric	Rating [†]	MWF*	Score	$\mathrm{Comments}^{\dagger\dagger}$
Domain 1: Test S	Substance					
	Metric 1:	Test Substance Identity	High	$\times 2$	2	NMP was identified as the test substance
	Metric 2:	Test Substance Source	High	\times 1	1	The test substance was provided by GAF Corporation.
	Metric 3:	Test Substance Purity	Low	× 1	3	The test substance's purity was not reported.
Domain 2: Test I	Design					
	Metric 4:	Negative Controls	High	$\times 2$	2	The control (0 mg/L) was used.
	Metric 5:	Negative Control Response	High	\times 1	1	The control results were reported (no mortality).
	Metric 6:	Randomized Allocation	Low	× 1	3	The randomized allocation was not mentioned in the report.
Domain 3: Expos	sure Characte	erization				
1	Metric 7:	Experimental System/Test Media Preparation	High	\times 2	2	The experimental system and methods for preparation of test media were described in adequate detain the report.
	Metric 8:	Consistency of Exposure Administration	High	× 1	1	Exposure information was reported and exposure were consistent across the study groups.
	Metric 9:	Measurement of Test Substance Concentration	Medium	× 1	2	Test concentrations were reported as nominal concentrations. By the Henry's Law of NMP (3.2" 10-atm m3/mole), the test substance is not considered to be volatile, thus, actual concentrations are likely to be similar to nominal concentrations.
	Metric 10:	Exposure Duration and Frequency	High	\times 2	2	The duration of exposure and frequency were reported appropriately for the study (acute scud study 96-hour duration).
	Metric 11:	Number of Exposure Groups/Spacing of Exposure Levels	High	× 1	1	The number of exposure groups and spacing of exposure levels were adequate to address the purpose of the study and to obtain the toxicity endpoint
	Metric 12:	Testing at or Below Solubility Limit	High	× 1	1	Exposure concentrations were at below the water solubility of NMP (1000 g/L).
Domain 4: Test (Organism					
	Metric 13:	Test Organism Characteristics	High	\times 2	2	The test organisms were adequately described and obtained from a reliable source. The test organism were appropriate for this study.
		Continued on next page				

Study Citation: Data Type: Hero ID:		Aquatic Toxicology Laboratory, contract No. l hour); Aquatic; other NMP- Gammarus sp (sc				
Domain		Metric	Rating [†]	MWF*	Score	$\mathrm{Comments}^{\dagger\dagger}$
	Metric 14:	Acclimatization and Pretreatment Conditions	High	× 1	1	The test organisms were acclimatized to test conditions and all the pretreatment conditions were the same.
	Metric 15:	Number of Organisms and Replicates per Group	High	× 1	1	The numbers of test organisms and replicates were reported and sufficient to characterize toxicologica effects.
	Metric 16:	Adequacy of Test Conditions	High	× 1	1	Organisms housing, conditions, food, and test media were described and adequate to maintain the health of test organisms.
Domain 5: Outco	ome Assessme	ent				
	Metric 17:	Outcome Assessment Methodology	High	\times 2	2	The outcome assessment methodology addressed the intended outcomes of interest.
	Metric 18:	Consistency of Outcome Assessment	High	× 1	1	The outcome assessment was carried out consistently across study groups. using the same protoco in all study groups.
Domain 6: Confo	ounding / Var	iable Control				
	Metric 19:	Confounding Variables in Test Design and Procedures	High	\times 2	2	No reported differences were noted among the study groups in environmental conditions or any other fac- tors.
	Metric 20:	Outcomes Unrelated to Exposure	Medium	× 1	2	No report or details were noted for test organism attrition or health outcomes unrelated to exposure
Domain 7: Data	Procentation	and Analysis				
Domain 7. Data	Metric 21:	Statistical Methods	High	\times 1	1	The statistical method was used (moving average method of Thompson (1947)).
	Metric 22:	Reporting of Data	High	\times 2	2	Data for exposure-related findings were presented for each treatment and control group and were adequate to determine the endpoint values
	Metric 23:	Explanation of Unexpected Outcomes	High	× 1	1	The unexpected outcomes were satisfactorily explained.
Overall Quality I	Determination	[‡]	High		1.2	
Extracted			Yes			
		Continued on next page				

Study Citation: GAF. 1979. Aquatic Toxicology Laboratory, contract No. L1393-05. Data Type: Acute (0-96 hour); Aquatic; other NMP- Gammarus sp (scud)

Hero ID: 5079088

Domain Metric $Rating^{\dagger}$ MWF^{\star} Score $Comments^{\dagger\dagger}$

$$\text{Overall rating} = \left\{ \begin{array}{ll} 4 & \text{if any metric is Unacceptable} \\ \\ \left\lfloor \sum_{i} \left(\text{Metric Score}_{i} \times \text{MWF}_{i} \right) / \sum_{j} \text{MWF}_{j} \right\rceil_{0.1} & \text{(round to the nearest tenth) otherwise} \end{array} \right.,$$

 $^{^{\}star}$ MWF = Metric Weighting Factor

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

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

^{††} Metrics that are rated 'High' met the criteria for high confidence as expected for this type of study, and may not require additional comments.

Study Citation: Data Type: Hero ID:		Aquatic Toxicology Laboratory, contract No. I hour); Aquatic; other NMP- mud crabs (Neopa		na sayi)		
Domain		Metric	$\mathrm{Rating}^{\dagger}$	MWF*	Score	${\rm Comments}^{\dagger\dagger}$
Domain 1: Test S	Substance					
	Metric 1:	Test Substance Identity	High	$\times 2$	2	NMP was identified as the test substance
	Metric 2:	Test Substance Source	High	\times 1	1	The test substance was provided by GAF Corporation.
	Metric 3:	Test Substance Purity	Low	× 1	3	The test substance's purity was not reported.
Domain 2: Test D)esign					
2. 1000 E	Metric 4:	Negative Controls	High	$\times 2$	2	The control (0 mg/L) was used.
	Metric 5:	Negative Control Response	High	$\times 1$	1	The control results were reported (no mortality).
	Metric 6:	Randomized Allocation	Low	× 1	3	The randomized allocation was not mentioned in the report.
Domain 3: Expos	ure Characte	prization				
Domain 6. Expos	Metric 7:	Experimental System/Test Media Preparation	High	\times 2	2	The experimental system and methods for prepara- tion of test media were described in adequate detail in the report.
	Metric 8:	Consistency of Exposure Administration	High	\times 1	1	Exposure information was reported and exposures were consistent across the study groups.
	Metric 9:	Measurement of Test Substance Concentration	Medium	× 1	2	Test concentrations were reported as nominal concentrations. By the Henry's Law of NMP (3.2 " 10-9 atm m3/mole), the test substance is not considered to be volatile, thus, actual concentrations are likely to be similar to nominal concentrations.
	Metric 10:	Exposure Duration and Frequency	High	\times 2	2	The duration of exposure and frequency were reported appropriately for the study (acute study 96-hour duration).
	Metric 11:	Number of Exposure Groups/Spacing of Exposure Levels	High	× 1	1	The number of exposure groups and spacing of exposure levels were adequate to address the purpose of the study and to obtain the toxicity endpoint.
	Metric 12:	Testing at or Below Solubility Limit	High	× 1	1	Exposure concentrations were at below the water solubility of NMP (1000 g/L).
Domain 4: Test C	Organism Metric 13:	Test Organism Characteristics	High	× 2	2	The test organisms were adequately described and obtained from a reliable source. The test organisms were appropriate for this study.
		Continued on next page				

Study Citation: Data Type: Hero ID:		Aquatic Toxicology Laboratory, contract No. I hour); Aquatic; other NMP- mud crabs (Neopa		na sayi)		
Domain		Metric	Rating [†]	MWF*	Score	$\mathrm{Comments}^{\dagger\dagger}$
	Metric 14:	Acclimatization and Pretreatment Conditions	High	× 1	1	The test organisms were acclimatized to test conditions and all the pretreatment conditions were the same.
	Metric 15:	Number of Organisms and Replicates per Group	High	× 1	1	The numbers of test organisms and replicates were reported and sufficient to characterize toxicological effects.
	Metric 16:	Adequacy of Test Conditions	High	× 1	1	Organisms housing, conditions, food, and test media were described and adequate to maintain the health of test organisms.
Domain 5: Outco	ome Assessme	ent				
	Metric 17:	Outcome Assessment Methodology	High	\times 2	2	The outcome assessment methodology addressed the intended outcomes of interest.
	Metric 18:	Consistency of Outcome Assessment	High	× 1	1	The outcome assessment was carried out consistently across study groups. using the same protocol in all study groups.
Domain 6: Confo	unding / Var	iable Control				
	Metric 19:	Confounding Variables in Test Design and Procedures	High	\times 2	2	No reported differences were noted among the study groups in environmental conditions or any other fac- tors.
	Metric 20:	Outcomes Unrelated to Exposure	Medium	× 1	2	No report or details were noted for test organism attrition or health outcomes unrelated to exposure.
Domain 7: Data	Presentation	and Analysis				
Dollain (Dava)	Metric 21:	Statistical Methods	High	\times 1	1	The statistical method was used (moving average method of Thompson (1947)).
	Metric 22:	Reporting of Data	High	\times 2	2	Data for exposure-related findings were presented for each treatment and control group and were ade- quate to determine the endpoint values
	Metric 23:	Explanation of Unexpected Outcomes	High	× 1	1	The unexpected outcomes were satisfactorily explained.
Overall Quality I	Determination	±	High		1.2	
Extracted			Yes			
		Continued on next page				

Study Citation: GAF. 1979. Aquatic Toxicology Laboratory, contract No. L1393-05.

Data Type: Acute (0-96 hour); Aquatic; other NMP- mud crabs (Neopanope texana sayi)

Hero ID: 5079088

Domain Metric Rating † MWF * Score Comments ††

$$\text{Overall rating} = \left\{ \begin{array}{ll} 4 & \text{if any metric is Unacceptable} \\ \\ \left\lfloor \sum_{i} \left(\text{Metric Score}_{i} \times \text{MWF}_{i} \right) / \sum_{j} \text{MWF}_{j} \right\rceil_{0.1} & \text{(round to the nearest tenth) otherwise} \end{array} \right.,$$

 $^{^{\}star}$ MWF = Metric Weighting Factor

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

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

^{††} Metrics that are rated 'High' met the criteria for high confidence as expected for this type of study, and may not require additional comments.

Study Citation: Data Type: Hero ID:		Aquatic Toxicology Laboratory, contract No. I hour); Aquatic; other NMP- grass shrimp (Pal		vulgaris)		
Domain		Metric	$\mathrm{Rating}^{\dagger}$	MWF*	Score	${\rm Comments}^{\dagger\dagger}$
Domain 1: Test S	ubstance					
	Metric 1:	Test Substance Identity	High	$\times 2$	2	NMP was identified as the test substance
	Metric 2:	Test Substance Source	High	\times 1	1	The test substance was provided by GAF Corporation.
	Metric 3:	Test Substance Purity	Low	× 1	3	The test substance's purity was not reported.
Domain 2: Test D	Design					
	Metric 4:	Negative Controls	High	$\times 2$	2	The control (0 mg/L) was used.
	Metric 5:	Negative Control Response	High	\times 1	1	The control results were reported (no mortality).
	Metric 6:	Randomized Allocation	Low	× 1	3	The randomized allocation was not mentioned in the report.
Domain 3: Expos	ure Characte	erization				
	Metric 7:	Experimental System/Test Media Preparation	High	\times 2	2	The experimental system and methods for preparation of test media were described in adequate detail in the report.
	Metric 8:	Consistency of Exposure Administration	High	\times 1	1	Exposure information was reported and exposures were consistent across the study groups.
	Metric 9:	Measurement of Test Substance Concentration	Medium	× 1	2	Test concentrations were reported as nominal concentrations. By the Henry's Law of NMP (3.2 " 10-9 atm m3/mole), the test substance is not considered to be volatile, thus, actual concentrations are likely to be similar to nominal concentrations.
	Metric 10:	Exposure Duration and Frequency	High	\times 2	2	The duration of exposure and frequency were reported appropriately for the study (acute study 96-hour duration).
	Metric 11:	Number of Exposure Groups/Spacing of Exposure Levels	High	× 1	1	The number of exposure groups and spacing of exposure levels were adequate to address the purpose of the study and to obtain the toxicity endpoint.
	Metric 12:	Testing at or Below Solubility Limit	High	× 1	1	Exposure concentrations were at below the water solubility of NMP (1000 g/L).
Domain 4: Test C	Organism Metric 13:	Test Organism Characteristics	High	× 2	2	The test organisms were adequately described and obtained from a reliable source. The test organisms were appropriate for this study.
		Continued on next page				

Study Citation: Data Type: Hero ID:		Aquatic Toxicology Laboratory, contract No. I hour); Aquatic; other NMP- grass shrimp (Pale		vulgaris)		
Domain		Metric	$\mathrm{Rating}^{\dagger}$	MWF^{\star}	Score	Comments ^{††}
	Metric 14:	Acclimatization and Pretreatment Conditions	High	× 1	1	The test organisms were acclimatized to test conditions and all the pretreatment conditions were the same.
	Metric 15:	Number of Organisms and Replicates per Group	High	× 1	1	The numbers of test organisms and replicates were reported and sufficient to characterize toxicologica effects.
	Metric 16:	Adequacy of Test Conditions	High	× 1	1	Organisms housing, conditions, food, and test media were described and adequate to maintain the health of test organisms.
Domain 5: Outco	ome Assessme	ent				
	Metric 17:	Outcome Assessment Methodology	High	\times 2	2	The outcome assessment methodology addressed the intended outcomes of interest.
	Metric 18:	Consistency of Outcome Assessment	High	× 1	1	The outcome assessment was carried out consistently across study groups. using the same protoco in all study groups.
Domain 6: Confo	unding / Var	iable Control				
	Metric 19:	Confounding Variables in Test Design and Procedures	High	\times 2	2	No reported differences were noted among the study groups in environmental conditions or any other fac- tors.
	Metric 20:	Outcomes Unrelated to Exposure	Medium	× 1	2	No report or details were noted for test organism attrition or health outcomes unrelated to exposure
Domain 7: Data l	Presentation	and Analysis				
Domain 1. Data	Metric 21:	Statistical Methods	High	× 1	1	The statistical method was used (moving average method of Thompson (1947)).
	Metric 22:	Reporting of Data	High	\times 2	2	Data for exposure-related findings were presented for each treatment and control group and were adequate to determine the endpoint values
	Metric 23:	Explanation of Unexpected Outcomes	High	× 1	1	The unexpected outcomes were satisfactorily explained.
Overall Quality I	Determination	[‡]	High		1.2	
Extracted			Yes			
		Continued on next page				

Study Citation: GAF. 1979. Aquatic Toxicology Laboratory, contract No. L1393-05.

Data Type: Acute (0-96 hour); Aquatic; other NMP- grass shrimp (Palaemonetes vulgaris)

Hero ID: 5079088

Domain Metric $Rating^{\dagger}$ MWF^{\star} Score $Comments^{\dagger\dagger}$

$$\text{Overall rating} = \left\{ \begin{array}{ll} 4 & \text{if any metric is Unacceptable} \\ \\ \left\lfloor \sum_{i} \left(\text{Metric Score}_{i} \times \text{MWF}_{i} \right) / \sum_{j} \text{MWF}_{j} \right\rceil_{0.1} & \text{(round to the nearest tenth) otherwise} \end{array} \right.,$$

 $^{^{\}star}$ MWF = Metric Weighting Factor

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

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

^{††} Metrics that are rated 'High' met the criteria for high confidence as expected for this type of study, and may not require additional comments.

Study Citation: Data Type: Hero ID:		2001. Department of Experimental Toxicology a 21 days); Aquatic; Invertebrates	and Ecolog	y, unpubl	ished da	ata, project No. 00/0969/51/1.
Domain		Metric	Rating [†]	MWF*	Score	$\mathrm{Comments}^{\dagger\dagger}$
Domain 1: Test S	Substance					
	Metric 1:	Test Substance Identity	High	\times 2	2	The test substance is identified as N-Methylpyrrolidon, NMP, CAS No. 872-50-4.
	Metric 2:	Test Substance Source	High	\times 1	1	The test substance's date of production and Batch number are provided.
	Metric 3:	Test Substance Purity	High	× 1	1	The purity is reported as 98.8 area percent.
Domain 2: Test I	Design					
	Metric 4:	Negative Controls	High	$\times 2$	2	The control (0 mg/L) was used.
	Metric 5:	Negative Control Response	High	\times 1	1	The control results are reported and adequately described (parent survival and reproduction rates).
	Metric 6:	Randomized Allocation	Low	× 1	3	Researcher did not report the randomized allocation of test organisms.
Domain 3: Expos	sure Characte	erization				
Bomain 9. Bapon	Metric 7:	Experimental System/Test Media Preparation	High	\times 2	2	The experimental system and methods for preparation of test media were described in adequate detail in the report.
	Metric 8:	Consistency of Exposure Administration	High	\times 1	1	Exposure information was reported and exposures were consistent across the study groups.
	Metric 9:	Measurement of Test Substance Concentration	High	× 1	1	Test concentrations were reported. Control, 100 mg/L, 12.5 mg/L and 1.56 mg/L were analyzed as concentration control analysis.
	Metric 10:	Exposure Duration and Frequency	High	\times 2	2	The duration of exposure and frequency were reported appropriately for the study (chronic daphnid study 21-day duration).
	Metric 11:	Number of Exposure Groups/Spacing of Exposure Levels	High	× 1	1	The number of exposure groups and spacing of exposure levels were adequate to address the purpose of the study and to obtain the toxicity endpoints
	Metric 12:	Testing at or Below Solubility Limit	High	× 1	1	Exposure concentrations were at below the water solubility of NMP (1000 g/L).
Domain 4: Test (Organism					
=======================================	Metric 13:	Test Organism Characteristics	High	\times 2	2	The test organisms were adequately described and obtained from a reliable source. The test organisms were appropriate for this study.
		Continued on next page				

Study Citation: Data Type: Hero ID:		2001. Department of Experimental Toxicology a 21 days); Aquatic; Invertebrates	and Ecolog	y, unpub	lished d	ata, project No. 00/0969/51/1.
Domain		Metric	$\mathrm{Rating}^{\dagger}$	MWF*	Score	$\rm Comments^{\dagger\dagger}$
	Metric 14:	Acclimatization and Pretreatment Conditions	High	× 1	1	The test organisms were acclimatized to test conditions (the 3rd breed of parent animals were used) and all the pretreatment conditions were the same.
	Metric 15:	Number of Organisms and Replicates per Group	High	× 1	1	The numbers of test organisms and replicates were reported and sufficient to characterize toxicological effects.
	Metric 16:	Adequacy of Test Conditions	High	× 1	1	Organisms housing, conditions, food, and test media were described and adequate to maintain the health of test organisms.
Domain 5: Outco	ome Assessme	ent				
	Metric 17:	Outcome Assessment Methodology	High	\times 2	2	The outcome assessment methodology addressed the intended outcomes of interest.
	Metric 18:	Consistency of Outcome Assessment	High	× 1	1	The outcome assessment was carried out consistently across study groups. using the same protocol in all study groups.
Domain 6: Confo	unding / Var	iable Control				
	Metric 19:	Confounding Variables in Test Design and Procedures	High	\times 2	2	No reported differences were noted among the study groups in environmental conditions or any other fac- tors.
	Metric 20:	Outcomes Unrelated to Exposure	Medium	× 1	2	No report or details were noted for test organism attrition or health outcomes unrelated to exposure.
Domain 7: Data	Presentation	and Analysis				
Domain , Dava	Metric 21:	Statistical Methods	High	\times 1	1	The statistical evaluation was used (Duncan's multiple range test).
	Metric 22:	Reporting of Data	High	\times 2	2	Data for exposure-related findings were presented for each treatment and control group and were ade- quate to determine the endpoint values.
	Metric 23:	Explanation of Unexpected Outcomes	High	× 1	1	There were no unexpected outcomes
Overall Quality I	Determination	;	High		1.1	
Extracted			Yes			
		Continued on next page				

Study Citation: BASF AG. 2001. Department of Experimental Toxicology and Ecology, unpublished data, project No. 00/0969/51/1.

Data Type: Chronic (>21 days); Aquatic; Invertebrates

Hero ID: 5079089

Domain Metric Rating[†] MWF* Score Comments^{††}

$$\text{Overall rating} = \left\{ \begin{array}{ll} 4 & \text{if any metric is Unacceptable} \\ \\ \left\lfloor \sum_{i} \left(\text{Metric Score}_{i} \times \text{MWF}_{i} \right) / \sum_{j} \text{MWF}_{j} \right\rceil_{0.1} & \text{(round to the nearest tenth) otherwise} \end{array} \right.,$$

 $^{^{\}star}$ MWF = Metric Weighting Factor

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

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

^{††} Metrics that are rated 'High' met the criteria for high confidence as expected for this type of study, and may not require additional comments.

Study Citation: Data Type: Hero ID:		1989. Department of Ecology, unpublished data hour); Aquatic; Plants	ı, project N	o. 1035/	88.	
Domain		Metric	Rating [†]	MWF*	Score	$\mathrm{Comments}^{\dagger\dagger}$
Domain 1: Test S	Substance					
	Metric 1:	Test Substance Identity	High	\times 2	2	$1\mbox{-}Methyl\mbox{-}2\mbox{-}pyrrolidone was identified as the test substance}$
	Metric 2:	Test Substance Source	Low	$\times 1$	3	The source of test substance was not provided.
	Metric 3:	Test Substance Purity	Low	\times 1	3	It is reported as the purity was not stated.
Domain 2: Test I	Design					
	Metric 4:	Negative Controls	High	$\times 2$	2	The control (0 mg/L) was used.
	Metric 5:	Negative Control Response	High	\times 1	1	The control results were reported.
	Metric 6:	Randomized Allocation	Low	× 1	3	The randomized allocation was not mentioned in the report.
Domain 3: Expos	uro Characte	prization				
Domain 6. Expos	Metric 7:	Experimental System/Test Media Preparation	High	\times 2	2	The experimental system and methods for prepara- tion of test media were described in adequate detai in the report.
	Metric 8:	Consistency of Exposure Administration	High	\times 1	1	Exposure information was reported and exposure were consistent across the study groups.
	Metric 9:	Measurement of Test Substance Concentration	Medium	× 1	2	Test concentrations were reported as nominal concentrations. By the Henry's Law of NMP (3.2 " 10-9 atm m3/mole), the test substance is not considered to be volatile, thus, actual concentrations are likely to be similar to nominal concentrations.
	Metric 10:	Exposure Duration and Frequency	High	\times 2	2	The duration of exposure and frequency were reported appropriately for the study (algal study 72 hour duration).
	Metric 11:	Number of Exposure Groups/Spacing of Exposure Levels	High	× 1	1	The number of exposure groups and spacing of exposure levels were adequate to address the purpose of the study and to obtain the toxicity endpoint
	Metric 12:	Testing at or Below Solubility Limit	High	× 1	1	Exposure concentrations were at below the water solubility of NMP (1000 g/L).
Domain 4: Test (Organism Metric 13:	Test Organism Characteristics	High	\times 2	2	The test organisms were described adequately and appropriate for this study.
		Continued on next page				

Study Citation: Data Type: Hero ID:	BASF AG. 1989. Department of Ecology, unpublished data, project No. 1035/88. Acute (0-96 hour); Aquatic; Plants 5079090					
Domain		Metric	Rating [†]	MWF*	Score	$\mathrm{Comments}^{\dagger\dagger}$
	Metric 14:	Acclimatization and Pretreatment Conditions	Low	× 1	3	The test organisms were acclimatized to test conditions and all the pretreatment conditions were the same.
	Metric 15:	Number of Organisms and Replicates per Group	High	× 1	1	The numbers of test organisms (10000 cells/mL) and replicates (4) were reported and sufficient to characterize toxicological effects.
	Metric 16:	Adequacy of Test Conditions	High	× 1	1	OECD culture medium, test conditions, and test duration were described and adequate to maintain the health of test organisms.
Domain 5: Outco	ome Assessme	ent				
	Metric 17:	Outcome Assessment Methodology	High	\times 2	2	The outcome assessment methodology addressed the intended outcomes of interest.
	Metric 18:	Consistency of Outcome Assessment	High	× 1	1	The outcome assessment was carried out consistently across study groups. using the same protoco in all study groups.
Domain 6: Confo	ounding / Var	riable Control				
	Metric 19:	Confounding Variables in Test Design and Procedures	High	\times 2	2	No reported differences were noted among the study groups in environmental conditions or any other fac- tors.
	Metric 20:	Outcomes Unrelated to Exposure	Medium	× 1	2	No report or details were noted for test organism attrition or health outcomes unrelated to exposure.
Domain 7: Data	Presentation	and Analysis				
Bomain , Basa	Metric 21:	Statistical Methods	High	× 1	1	The statistical method was used (ToxRat Pro (Version 2.08)).
	Metric 22:	Reporting of Data	High	\times 2	2	Data for exposure-related findings were presented for the treatment and control group and were adequate to determine the endpoint
	Metric 23:	Explanation of Unexpected Outcomes	High	× 1	1	There were no unexpected outcomes.
Overall Quality Determination [‡]			High		1.3	
Extracted			Yes			
		Continued on next page				-

Study Citation: BASF AG. 1989. Department of Ecology, unpublished data, project No. 1035/88.

Data Type: Acute (0-96 hour); Aquatic; Plants

Hero ID: 5079090

Domain Metric Rating † MWF * Score Comments ††

$$\text{Overall rating} = \left\{ \begin{array}{ll} 4 & \text{if any metric is Unacceptable} \\ \\ \left\lfloor \sum_{i} \left(\text{Metric Score}_{i} \times \text{MWF}_{i} \right) / \sum_{j} \text{MWF}_{j} \right\rceil_{0.1} & \text{(round to the nearest tenth) otherwise} \end{array} \right.,$$

 $^{^{\}star}$ MWF = Metric Weighting Factor

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

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

^{††} Metrics that are rated 'High' met the criteria for high confidence as expected for this type of study, and may not require additional comments.