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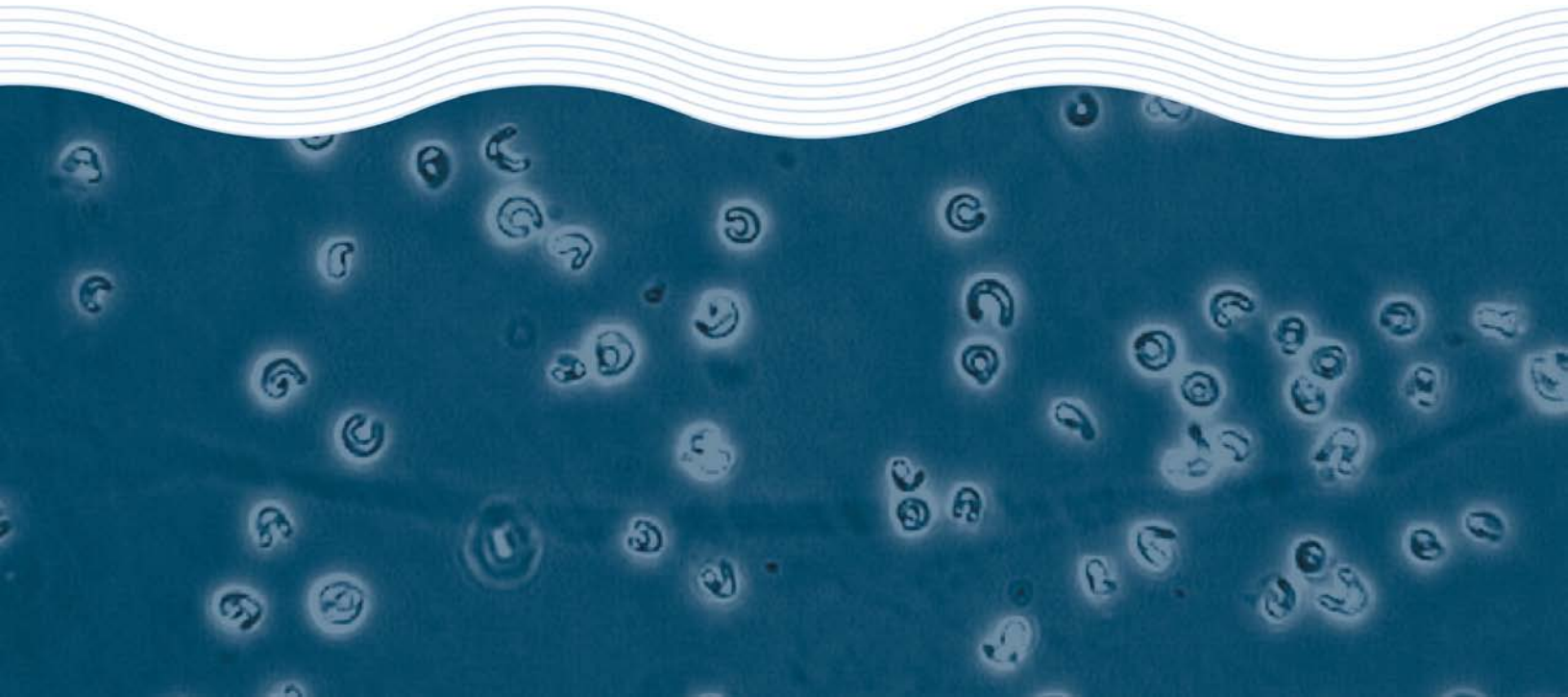
Toxicity Assessment of Oil Spill Dispersant Corexit 9500A

Australian Marine Oil Spill Centre

Test Report

October 2013



Toxicity Assessment of Oil Spill Dispersant Corexit 9500A

Australian Marine Oil Spill Centre

Test Report

October 2013

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Toxicity Test Report: TR1085/1

This document is issued in accordance with NATA's accreditation requirements

Client:	Australian Marine Oil Spill Centre Pty Ltd PO Box 1497 Geelong VIC 3220	**ESA Job #:** **Date Sampled:** **Date Received:**	PR1085 Not supplied 27 August 2013
Attention:	Nick Quinn	**Sampled By:**	Client
Client Ref:	9511	**ESA Quote #:**	PL1085_q01

Lab ID No.:	**Sample Name:**	**Sample Description:**
6239	Corexit 9500A	Chemical received at room temperature in apparent good condition

Test Performed:	72-hr sea urchin larval development test using *Heliocidaris tuberculata*
Test Protocol:	ESA SOP 105 (ESA 2010), based on APHA (1998), Simon and Laginestra (1996) and Doyle *et al*. (2003)
Test Temperature:	The test was performed at 20±1°C.
Deviations from Protocol:	Nil
Comments on Solution Preparation:	The highest test concentration was prepared by adding a weighed aliquot of sample 6239 'Corexit 9500A' into filtered seawater (FSW). The remaining test concentrations were achieved by serially diluting the highest test concentration with FSW. A FSW control was tested concurrently with the prepared sample.
Source of Test Organisms:	Field collected from South Maroubra, NSW.
Test Initiated:	4 September 2013 at 1330h

Sample 6239: *Corexit 9500A* **Concentration (mg/L)**	**% Normal larvae (Mean ± SD)**	*Vacant*	Vacant
FSW Control	97.5 ± 1.3		
1.3	97.5 ± 1.3		
2.5	96.8 ± 1.7		
5.0	97.8 ± 1.3		
10.0	98.0 ± 0.8		
20.0	97.3 ± 1.7		
72-hr EC10 = >20.0mg/L **72-hr EC50 = >20.0mg/L** **NOEC = 20.0mg/L** **LOEC = >20.0mg/L**			

Toxicity Test Report: TR1085/1

QA/QC Parameter	Criterion	This Test	Criterion met?
Control mean % normal larvae	≥70.0%	97.5%	Yes
Reference Toxicant within cusum chart limits	5.7-29.2µg Cu/L	16.5µg Cu/L	Yes

Test Report Authorised by:  Dr Rick Krassoi, Director on 31 October 2013

Results are based on the samples in the condition as received by ESA.

NATA Accredited Laboratory Number: 14709

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Citations:

APHA (1998) Method 8810 D. Echinoderm Embryo Development Test. In Standard Methods for the Examination of Water and Wastewater, 20th Ed. American Public Health Association, American Water Works Association and the Water Environment Federation, USA.

Doyle, C.J., Pablo, F., Lim, R.P. and Hyne, R.V. (2003) Assessment of metal toxicity in sediment pore water from Lake Macquarie, Australia. *Arch. Environ. Contam. Toxicology*, 44(3): 343-350.

ESA (2010) *ESA SOP 105 - Sea Urchin Larval Development Test*. Issue No. 9. Ecotox Services Australasia, Sydney NSW.

Simon, J. and Laginestra, E.(1997) Bioassay for testing sublethal toxicity in effluents, using gametes of sea urchin *Heliocidaris tuberculata*. National Pulp Mills Research Program Technical Report No. 20. CSIRO, Canberra, ACT.

Toxicity Test Report: TR1085/2

This document is issued in accordance with NATA's accreditation requirements

Client:	Australian Marine Oil Spill Centre Pty Ltd PO Box 1497 Geelong VIC 3220	**ESA Job #:** **Date Sampled:** **Date Received:**	PR1085 Not supplied 27 August 2013
Attention:	Nick Quinn	**Sampled By:**	Client
Client Ref:	9511	**ESA Quote #:**	PL1085_q01

Lab ID No.:	**Sample Name:**	**Sample Description:**
6239	Corexit 9500A	Chemical received at room temperature in apparent good condition

Test Performed:	72-hr marine algal growth test using *Nitzschia closterium*
Test Protocol:	ESA SOP 110 (ESA 2011), based on Stauber *et al*. (1994)
Test Temperature:	The test was performed at 21±1°C.
Deviations from Protocol:	Nil
Comments on Solution Preparation:	The highest test concentration was prepared by adding a weighed aliquot of sample 6239 'Corexit 9500A' into filtered seawater (FSW). The remaining test concentrations were achieved by serially diluting the highest test concentration with FSW. A FSW control was tested concurrently with the prepared sample.
Source of Test Organisms:	In-house culture, originally sourced from CSIRO Microalgae Supply Service, TAS
Test Initiated:	20 September 2013 at 1400h

Sample 6239: *Corexit 9500A* **Concentration (mg/L)**	**Cell Yield (Mean number of cells/mL x10^4 ± SD)**	*Vacant*	*Vacant*
FSW Control	52.4 ± 2.1		
1.3	57.7 ± 2.1		
2.5	57.3 ± 2.3		
5.0	48.4 ± 3.0		
10.0	41.5 ± 1.2 *		
20.0	17.8 ± 2.9 *		
72-hr IC10 = 4.4 (3.6-6.0)mg/L **72-hr IC50 = 15.7 (14.9-16.9)mg/L** **NOEC = 5.0mg/L** **LOEC = 10.0mg/L**			

*Significantly lower cell yield compared with the FSW Control (Dunnett's Test, 1-tailed, P=0.05)

Toxicity Test Report: TR1085/2

QA/QC Parameter	Criterion	This Test	Criterion met?
Control mean cell density	≥16.0x10^4 cells/mL	53.4x10^4 cells/mL	Yes
Control coefficient of variation	<20%	4.0%	Yes
Reference Toxicant within cusum chart limits	1.0-19.9µg Cu/L	2.2µg Cu/L	Yes

Test Report Authorised by: Dr Rick Krassoi, Director on 31 October 2013

Results are based on the samples in the condition as received by ESA.

NATA Accredited Laboratory Number: 14709

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Citations:

ESA (2011) SOP 110 – *Marine Algal Growth Test*. Issue No. 8. Ecotox Services Australasia, Sydney NSW

Stauber, J.L., Tsai, J., Vaughan, G.T., Peterson, S.M. and Brockbank, C.I. (1994) Algae as indicators of toxicity of the effluent from bleached eucalypt kraft pulp mills. National Pulp Mills Research Program, Technical Report No. 3. CSIRO, Canberra, ACT

Toxicity Test Report: TR1085/3

This document is issued in accordance with NATA's accreditation requirements

Client:	Australian Marine Oil Spill Centre Pty Ltd PO Box 1497 Geelong VIC 3220	**ESA Job #:** **Date Sampled:** **Date Received:**	PR1085 Not supplied 27 August 2013
Attention:	Nick Quinn	**Sampled By:**	Client
Client Ref:	9511	**ESA Quote #:**	PL1085_q01

Lab ID No.:	**Sample Name:**	**Sample Description:**
6239	Corexit 9500A	Chemical received at room temperature in apparent good condition

Test Performed:	72-hr macroalgal germination success test using *Hormosira banksii*
Test Protocol:	ESA SOP 116 (ESA 2012), based on Kevekordes and Clayton (1996) and Gunthorpe *et al*. (1997)
Test Temperature:	The test was performed at 18±1°C.
Deviations from Protocol:	Nil
Comments on Solution Preparation:	The highest test concentration was prepared by adding a weighed aliquot of sample 6239 'Corexit 9500A' into filtered seawater (FSW). The remaining test concentrations were achieved by serially diluting the highest test concentration with FSW. A FSW control was tested concurrently with the prepared sample.
Source of Test Organisms:	Field collected from Bilgola, NSW.
Test Initiated:	17 October 2013 at 1245h

Sample 6239: *Corexit 9500A* **Concentration (mg/L)**	**% Germination (Mean ± SD)**	*Vacant*	*Vacant*
FSW Control	97.5 ± 0.6		
1.3	97.8 ± 1.3		
2.5	97.5 ± 1.3		
5.0	97.0 ± 2.2		
10.0	97.8 ± 1.0		
20.0	56.3 ± 17.8 *		
72-hr EC10 = 14.1 (12.6-15.7)mg/L **72-hr EC50 = >20.0mg/L** **NOEC = 10.0mg/L** **LOEC = 20.0mg/L**			

*Significantly lower percentage of germinated zygotes compared with the FSW Control (Steel's Many-One Rank Test, 1-tailed, P=0.05)

Toxicity Test Report: TR1085/3

QA/QC Parameter	Criterion	This Test	Criterion met?
Control mean % germination	≥70.0%	97.5%	Yes
Reference Toxicant within cusum chart limits	33.9-592.8µg Cu/L	206.9µg Cu/L	Yes

Test Report Authorised by:  Dr Rick Krassoi, Director on 31 October 2013

Results are based on the samples in the condition as received by ESA.

NATA Accredited Laboratory Number: 14709

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Citations:

ESA (2012) *SOP 116 – Macroalgal Germination Success Test*. Issue No. 12. Ecotox Services Australasia, Sydney.

Gunthorpe L, Nottage M, Palmer D, and Wu R (1997) *Testing for Sublethal Toxicity Using Gametes of Hormosira banksii: protocol*. National Pulp Mills Research Program Technical Report No. 22, CSIRO, Canberra.

Kevekordes K and Clayton MN (1996) Using developing embryos of *Hormosira banksii* (Phaeophyta) as a marine bioassay system. *International Journal of Plant Science*, 157: 582-585.

Toxicity Test Report: TR1085/4

This document is issued in accordance with NATA's accreditation requirements

Client:	Australian Marine Oil Spill Centre Pty Ltd PO Box 1497 Geelong VIC 3220	**ESA Job #:** **Date Sampled:** **Date Received:**	PR1085 Not supplied 27 August 2013
Attention:	Nick Quinn	**Sampled By:**	Client
Client Ref:	9511	**ESA Quote #:**	PL1085_q01

Lab ID No.:	**Sample Name:**	**Sample Description:**
6239	Corexit 9500A	Chemical received at room temperature in apparent good condition

Test Performed:	96-hr acute toxicity test using the amphipod *Melita plumulosa*
Test Protocol:	ESA SOP 108 (ESA 2011), based on USEPA (2002) and Department of Transport and Communications (1990)
Test Temperature:	The test was performed at 20±1°C.
Deviations from Protocol:	Nil
Comments on Solution Preparation:	The highest test concentration was prepared by adding a weighed aliquot of sample 6239 'Corexit 9500A' into filtered seawater (FSW). The remaining test concentrations were achieved by serially diluting the highest test concentration with FSW. A FSW control was tested concurrently with the prepared sample.
Source of Test Organisms:	In-house culture, originally sourced from Hawkesbury River, NSW
Test Initiated:	5 September 2013 at 1315h

Sample 6239: *Corexit 9500A* **Concentration (mg/L)**	**% Unaffected (Mean ± SD)**	*Vacant*	*Vacant*
FSW Control	95.0 ± 10.0		
1.3	95.0 ± 10.0		
2.5	100 ± 0.0		
5.0	90.0 ± 11.6		
10.0	40.0 ± 23.1 *		
20.0	0.0 ± 0.0		
96-hr EC10 = 5.8 (3.0-7.3)mg/L **96-hr EC50 = 9.0 (7.0-10.8)mg/L** **NOEC = 5.0mg/L** **LOEC = 10.0mg/L**			

*Significantly lower percent survival compared with the FSW Control (Steel's Many-One Rank Test, 1-tailed, P=0.05)

Toxicity Test Report: TR1085/4

QA/QC Parameter	Criterion	This Test	Criterion met?
Control mean % unaffected	≥90.0%	95.0%	Yes
Reference Toxicant within cusum chart limits	85.7-448.5µg Cu/L	172.7µg Cu/L	Yes

Test Report Authorised by:  Dr Rick Krassoi, Director on 31 October 2013

Results are based on the samples in the condition as received by ESA.

NATA Accredited Laboratory Number: 14709

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Citations:

Department of Transport and Communications (1990) Guidelines for Acceptance of Oil Spill Dispersants in Australian Waters. Pollution Prevention Section, Department of Transport and Communications, Canberra ACT.

ESA (2011) SOP 108 – *Amphipod Acute Toxicity Test*. Issue No 8. Ecotox Services Australasia, Sydney, NSW.

USEPA (2002) Methods for measuring the acute toxicity of effluents and receiving waters to freshwater and marine organisms. Fifth Edition. United States Environmental Protection Agency, Office of Research and Development, Washington DC, EPA/600/4-90/027F.

Toxicity Test Report: TR1085/5

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Client:	Australian Marine Oil Spill Centre Pty Ltd PO Box 1497 Geelong VIC 3220	**ESA Job #:** **Date Sampled:** **Date Received:**	PR1085 Not supplied 27 August 2013
Attention:	Nick Quinn	**Sampled By:**	Client
Client Ref:	9511	**ESA Quote #:**	PL1085_q01

Lab ID No.:	**Sample Name:**	**Sample Description:**
6239	Corexit 9500A	Chemical received at room temperature in apparent good condition

Test Performed:	96-hr acute survival test using the tiger prawn *Penaeus monodon*
Test Protocol:	ESA SOP 107 (ESA 2011), based on methods described by the USEPA (1996) and the Department of Transport and Communications (1990)
Test Temperature:	The test was performed at 25±1°C.
Deviations from Protocol:	Nil
Comments on Solution Preparation:	The highest test concentration was prepared by adding a weighed aliquot of sample 6239 'Corexit 9500A' into filtered seawater (FSW). The remaining test concentrations were achieved by serially diluting the highest test concentration with FSW. A FSW control was tested concurrently with the prepared sample.
Source of Test Organisms:	Hatchery reared, QLD
Test Initiated:	17 September 2013 at 1300h

Sample 6239: *Corexit 9500A* **Concentration (mg/L)**	**% Unaffected (Mean ± SD)**	*Vacant*	*Vacant*
FSW Control	95.0 ± 10.0		
1.3	80.0 ± 28.3		
2.5	70.0 ± 11.6		
5.0	70.0 ± 11.6		
10.0	55.0 ± 19.2 *		
20.0	45.0 ± 30.0 *		

96-hr EC10 = <1.3mg/L
96-hr EC50 = 18.0mg/L**
NOEC = 5.0mg/L
LOEC = 10.0mg/L

*Significantly lower percentage of unaffected prawns compared with the FSW Control (Dunnett's Test, 1-tailed, P=0.05)
**95% confidence limits are not reliable

QA/QC Parameter	**Criterion**	**This Test**	**Criterion met?**
Control mean % unaffected	≥80.0%	95.0%	Yes
Reference Toxicant within cusum chart limits	1.5-31.9mg SDS/L	2.9mg SDS/L	Yes

Toxicity Test Report: TR1085/5

Test Report Authorised by:  Dr Rick Krassoi, Director on 31 October 2013

Results are based on the samples in the condition as received by ESA.

NATA Accredited Laboratory Number: 14709

Citations:

ESA (2011) SOP 107 –*Juvenile Tiger Prawn Toxicity Test.* Issue No 7. Ecotox Services Australasia, Sydney, NSW

Department of Transport and Communications (1990) Guidelines for Acceptance of Oil Spill Dispersants in Australian Waters. Pollution Prevention Section, Department of Transport and Communications, Canberra ACT.

USEPA (1996) Ecological Effects Test Guidelines, OPPTS 850.1045, Penaeid Acute Toxicity Test. Public Draft. United States Environmental Protection Agency, Washington DC.

Toxicity Test Report: TR1085/6

Client:	Australian Marine Oil Spill Centre Pty Ltd	**ESA Job #:**	PR1085
	PO Box 1497	**Date Sampled:**	Not supplied
	Geelong VIC 3220	**Date Received:**	27 August 2013
Attention:	Nick Quinn	**Sampled By:**	Client
Client Ref:	9511	**ESA Quote #:**	PL1085_q01

Lab ID No.:	**Sample Name:**	**Sample Description:**
6239	Corexit 9500A	Chemical received at room temperature in apparent good condition

Test Performed:	96-hr fish imbalance toxicity test using Australian bass *Macquaria novemaculeata*
Test Protocol:	ESA SOP 117 (ESA 2012), based on USEPA (2002)
Test Temperature:	The test was performed at 20±2°C.
Deviations from Protocol:	Nil
Comments on Solution Preparation:	The highest test concentration was prepared by adding a weighed aliquot of sample 6239 'Corexit 9500A' into filtered seawater (FSW). The remaining test concentrations were achieved by serially diluting the highest test concentration with FSW. A FSW control was tested concurrently with the prepared sample.
Source of Test Organisms:	Hatchery reared, SA
Test Initiated:	17 October 2013 at 1345h

Sample 6239: *Corexit 9500A*		*Vacant*	*Vacant*
Concentration (mg/L)	**% Unaffected (Mean ± SD)**		
FSW Control	100 ± 0.0		
1.3	100 ± 0.0		
2.5	100 ± 0.0		
5.0	100 ± 0.0		
10.0	100 ± 0.0		
20.0	100 ± 0.0		
96-hr EC10 = >20.0mg/L			
96-hr EC50 = >20.0mg/L			
NOEC = 20.0mg/L			
LOEC = >20.0mg/L			

Toxicity Test Report: TR1085/6

QA/QC Parameter	Criterion	This Test	Criterion met?
Control mean % unaffected	≥80.0%	100%	Yes

Test Report Authorised by: Dr Rick Krassoi, Director on 31 October 2013

Results are based on the samples in the condition as received by ESA. This document shall not be reproduced except in full.

Citations:

ESA (2012) SOP 117 –*Freshwater and Marine Fish Imbalance Test*. Issue No 9. Ecotox Services Australasia, Sydney, NSW

USEPA (2002) Methods for measuring the acute toxicity of effluents and receiving waters to freshwater and marine organisms. Fifth edition EPA-821-R-02-012. United States Environmental Protection Agency, Office of Research and Development, Washington FC, USA

Toxicity Test Report: TR1085/7

Client:	Australian Marine Oil Spill Centre Pty Ltd	**ESA Job #:**	PR1085
	PO Box 1497	**Date Sampled:**	Not supplied
	Geelong VIC 3220	**Date Received:**	27 August 2013
Attention:	Nick Quinn	**Sampled By:**	Client
Client Ref:	9511	**ESA Quote #:**	PL1085_q01

Lab ID No.:	**Sample Name:**	**Sample Description:**
6239	Corexit 9500A	Chemical received at room temperature in apparent good condition

Test Performed:	96-hr fish imbalance toxicity test using barramundi *Lates calcarifer*
Test Protocol:	ESA SOP 117 (ESA 2012), based on USEPA (2002)
Test Temperature:	The test was performed at 25±2°C.
Deviations from Protocol:	Nil
Comments on Solution Preparation:	The highest test concentration was prepared by adding a weighed aliquot of sample 6239 'Corexit 9500A' into filtered seawater (FSW). The remaining test concentrations were achieved by serially diluting the highest test concentration with FSW. A FSW control was tested concurrently with the prepared sample.
Source of Test Organisms:	Hatchery reared, SA
Test Initiated:	22 October 2013 at 1330h

Sample 6239: *Corexit 9500A* **Concentration (mg/L)**	**% Unaffected (Mean ± SD)**	*Vacant*	*Vacant*
FSW Control	90.0 ± 11.6		
1.3	85.0 ± 10.0		
2.5	80.0 ± 23.1		
5.0	80.0 ± 28.3		
10.0	90.0 ± 20.0		
20.0	40.0 ± 16.3 *		
96-hr IC10 = 10.6mg/L**			
96-hr EC50 = 18.5mg/L**			
NOEC = 10.0mg/L			
LOEC = 20.0mg/L			

*Significantly lower percentage of unaffected larval fish compared with the FSW Control (Dunnett's Test, 1-tailed, P=0.05)
**95% confidence limits are not reliable

Toxicity Test Report: TR1085/7

QA/QC Parameter	Criterion	This Test	Criterion met?
Control mean % unaffected	≥80.0%	90.0%	Yes

Test Report Authorised by: Dr Rick Krassoi, Director on 31 October 2013

Results are based on the samples in the condition as received by ESA. This document shall not be reproduced except in full.

Citations:

ESA (2012) SOP 117 –*Freshwater and Marine Fish Imbalance Test*. Issue No 9. Ecotox Services Australasia, Sydney, NSW

USEPA (2002) Methods for measuring the acute toxicity of effluents and receiving waters to freshwater and marine organisms. Fifth edition EPA-821-R-02-012. United States Environmental Protection Agency, Office of Research and Development, Washington FC, USA

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Statistical Printouts for the Sea Urchin Larval Development Test

Sea Urchin Larval Development Test-Proportion Normal

Start Date:	4/09/2013 13:30	Test ID:	PR1085/02	Sample ID:	Corexit 9500
End Date:	7/09/2013 13:30	Lab ID:	6239	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 105	Test Species:	HT-Heliocidaris tuberculata
Comments:					

Conc-mg/L	1	2	3	4
FSW Control	0.9700	0.9800	0.9600	0.9900
1.3	0.9800	0.9900	0.9700	0.9600
2.5	0.9700	0.9600	0.9500	0.9900
5	0.9800	0.9900	0.9800	0.9600
10	0.9800	0.9800	0.9700	0.9900
20	0.9900	0.9800	0.9700	0.9500

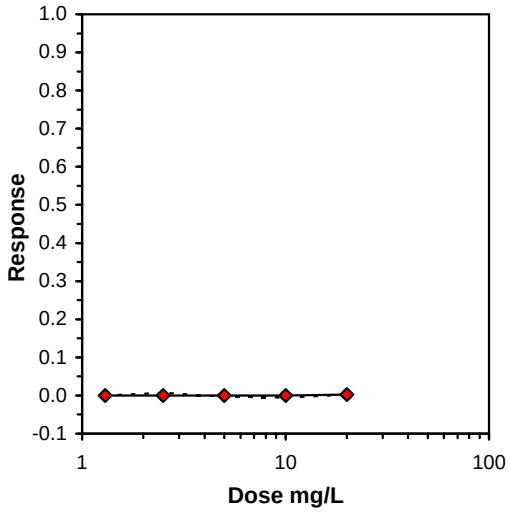
			Transform: Arcsin Square Root					1-Tailed			Isotonic	
Conc-mg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
FSW Control	0.9750	1.0000	1.4164	1.3694	1.4706	3.075	4				0.9750	1.0000
1.3	0.9750	1.0000	1.4164	1.3694	1.4706	3.075	4	0.000	2.410	0.0768	0.9750	1.0000
2.5	0.9675	0.9923	1.3955	1.3453	1.4706	3.891	4	0.656	2.410	0.0768	0.9750	1.0000
5	0.9775	1.0026	1.4245	1.3694	1.4706	2.922	4	-0.252	2.410	0.0768	0.9750	1.0000
10	0.9800	1.0051	1.4313	1.3967	1.4706	2.117	4	-0.466	2.410	0.0768	0.9750	1.0000
20	0.9725	0.9974	1.4104	1.3453	1.4706	3.751	4	0.189	2.410	0.0768	0.9725	0.9974

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.961665	0.916	0.207284	-0.87087
Bartlett's Test indicates equal variances (p = 0.96)	1.059596	15.08627		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	20	>20			0.028862	0.029561	0.000605	0.002032	0.907757	5, 18
Treatments vs FSW Control										

Log-Logit Interpolation (200 Resamples)

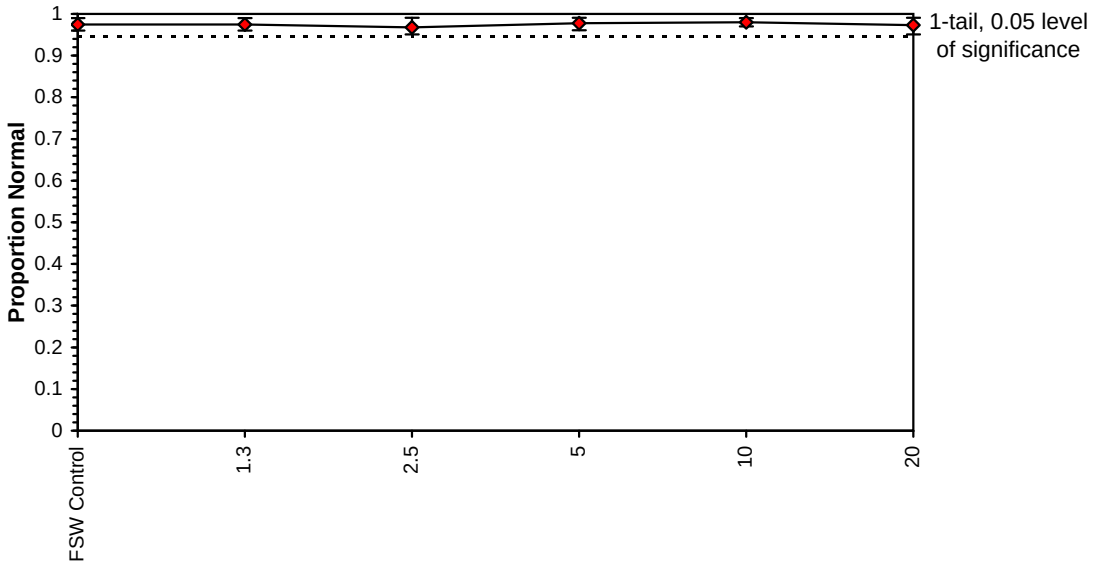
Point	mg/L	SD	95% CL(Exp)	Skew
IC05	>20			
IC10	>20			
IC15	>20			
IC20	>20			
IC25	>20			
IC40	>20			
IC50	>20			



Sea Urchin Larval Development Test-Proportion Normal

Start Date:	4/09/2013 13:30	Test ID:	PR1085/02	Sample ID:	Corexit 9500
End Date:	7/09/2013 13:30	Lab ID:	6239	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 105	Test Species:	HT-Heliocidaris tuberculata
Comments:					

Dose-Response Plot



Sea Urchin Larval Development Test-Proportion Normal

Start Date:	4/09/2013 13:30	Test ID:	PR1085/02	Sample ID:	Corexit 9500
End Date:	7/09/2013 13:30	Lab ID:	6239	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 105	Test Species:	HT-Heliocidaris tuberculata
Comments:					

Auxiliary Data Summary

Conc-mg/L	Parameter	Mean	Min	Max	SD	CV%	N
FSW Control	% Normal	97.50	96.00	99.00	1.29	1.17	4
1.3		97.50	96.00	99.00	1.29	1.17	4
2.5		96.75	95.00	99.00	1.71	1.35	4
5		97.75	96.00	99.00	1.26	1.15	4
10		98.00	97.00	99.00	0.82	0.92	4
20		97.25	95.00	99.00	1.71	1.34	4
FSW Control	pH	8.30	8.30	8.30	0.00	0.00	1
1.3		8.30	8.30	8.30	0.00	0.00	1
2.5		8.30	8.30	8.30	0.00	0.00	1
5		8.30	8.30	8.30	0.00	0.00	1
10		8.30	8.30	8.30	0.00	0.00	1
20		8.30	8.30	8.30	0.00	0.00	1
FSW Control	Salinity ppt	34.70	34.70	34.70	0.00	0.00	1
1.3		34.80	34.80	34.80	0.00	0.00	1
2.5		34.90	34.90	34.90	0.00	0.00	1
5		34.90	34.90	34.90	0.00	0.00	1
10		35.00	35.00	35.00	0.00	0.00	1
20		35.00	35.00	35.00	0.00	0.00	1
FSW Control	DO %	103.30	103.30	103.30	0.00	0.00	1
1.3		101.20	101.20	101.20	0.00	0.00	1
2.5		99.40	99.40	99.40	0.00	0.00	1
5		99.00	99.00	99.00	0.00	0.00	1
10		98.40	98.40	98.40	0.00	0.00	1
20		99.10	99.10	99.10	0.00	0.00	1

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Statistical Printouts for the *Nitzschia* Growth Inhibition Tests

Microalgal Growth inhibition Test-Growth-Cell Yield

Start Date:	20/09/2013 14:00	Test ID:	PR1085/12	Sample ID:	Corexit 9500
End Date:	23/09/2013 14:30	Lab ID:	6239	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 110	Test Species:	NC-Nitzschia closterium
Comments:					

Conc-mg/L	1	2	3	4
FSW Control	551675	527675	507675	507675
1.3	551675	591675	567675	597675
2.5	541675	595675	581675	571675
5	465675	499675	451675	517675
10	421675	425675	399675	411675
20	219675	155675	161675	173675

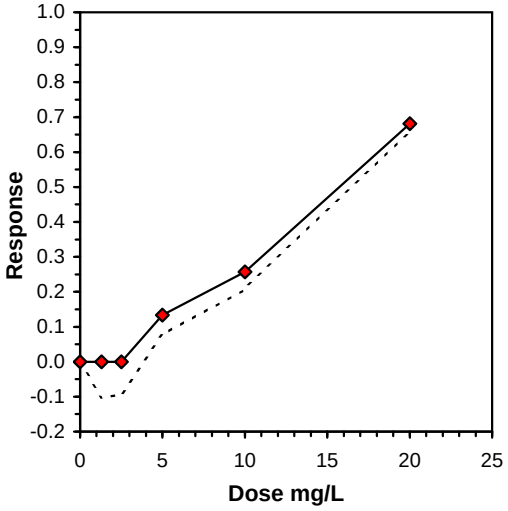
			Transform: Untransformed					1-Tailed			Isotonic	
Conc-mg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
FSW Control	523675	1.0000	523675	507675	551675	3.993	4				557841.7	1.0000
1.3	577175	1.1022	577175	551675	597675	3.704	4	-3.220	2.410	40043.97	557841.7	1.0000
2.5	572675	1.0936	572675	541675	595675	3.997	4	-2.949	2.410	40043.97	557841.7	1.0000
5	483675	0.9236	483675	451675	517675	6.271	4	2.407	2.410	40043.97	483675	0.8670
*10	414675	0.7919	414675	399675	425675	2.798	4	6.560	2.410	40043.97	414675	0.7434
*20	177675	0.3393	177675	155675	219675	16.312	4	20.824	2.410	40043.97	177675	0.3185

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.966043	0.916	0.282509	-0.82172
Bartlett's Test indicates equal variances (p = 0.77)	2.537958	15.08627		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test Treatments vs FSW Control	5	10	7.071068		40043.97	0.076467	9.02E+10	5.52E+08	2.4E-14	5, 18

Linear Interpolation (200 Resamples)

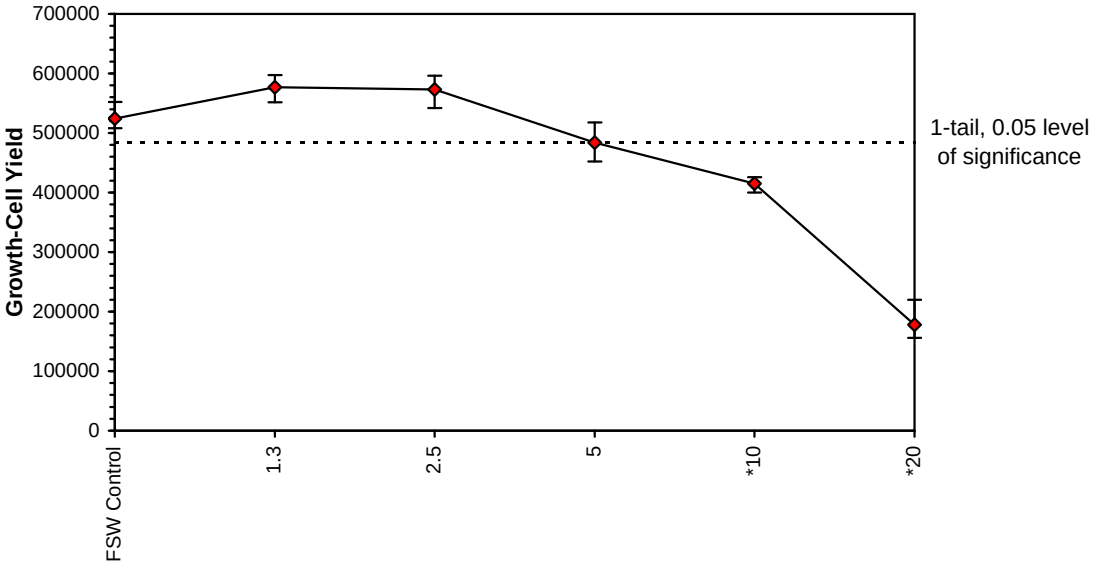
Point	mg/L	SD	95% CL(Exp)		Skew
IC05	3.440	0.201	3.051	4.244	1.2128
IC10	4.380	0.396	3.649	5.993	1.0733
IC15	5.689	0.716	4.002	7.614	0.3136
IC20	7.710	0.603	5.703	9.191	-0.4565
IC25	9.731	0.389	8.415	10.709	-0.6749
IC40	13.374	0.250	12.707	14.122	0.2284
IC50	15.728	0.324	14.886	16.876	0.7287



Microalgal Growth inhibition Test-Growth-Cell Yield

Start Date:	20/09/2013 14:00	Test ID:	PR1085/12	Sample ID:	Corexit 9500
End Date:	23/09/2013 14:30	Lab ID:	6239	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 110	Test Species:	NC-Nitzschia closterium
Comments:					

Dose-Response Plot



Microalgal Growth inhibition Test-Growth-Cell Yield

Start Date:	20/09/2013 14:00	Test ID:	PR1085/12	Sample ID:	Corexit 9500
End Date:	23/09/2013 14:30	Lab ID:	6239	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 110	Test Species:	NC-Nitzschia closterium
Comments:					

Auxiliary Data Summary

Conc-mg/L	Parameter	Mean	Min	Max	SD	CV%	N
FSW Control	Cell Yield	52.37	50.77	55.17	2.09	2.76	4
1.3		57.72	55.17	59.77	2.14	2.53	4
2.5		57.27	54.17	59.57	2.29	2.64	4
5		48.37	45.17	51.77	3.03	3.60	4
10		41.47	39.97	42.57	1.16	2.60	4
20		17.77	15.57	21.97	2.90	9.58	4
FSW Control	pH	8.20	8.20	8.20	0.00	0.00	1
1.3		8.20	8.20	8.20	0.00	0.00	1
2.5		8.20	8.20	8.20	0.00	0.00	1
5		8.20	8.20	8.20	0.00	0.00	1
10		8.20	8.20	8.20	0.00	0.00	1
20		8.30	8.30	8.30	0.00	0.00	1
FSW Control	Salinity ppt	34.50	34.50	34.50	0.00	0.00	1
1.3		34.50	34.50	34.50	0.00	0.00	1
2.5		34.60	34.60	34.60	0.00	0.00	1
5		35.00	35.00	35.00	0.00	0.00	1
10		35.00	35.00	35.00	0.00	0.00	1
20		35.00	35.00	35.00	0.00	0.00	1

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Statistical Printouts for the Acute *Hormosira* Cell Germination Test

Macroalgal Germination Success Test-Proportion Germinated

Start Date:	17/10/2013 12:45	Test ID:	PR1085/02	Sample ID:	Corexit 9500
End Date:	20/10/2013 12:45	Lab ID:	6239	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 116	Test Species:	HB-Hormosira banksii
Comments:					

Conc-mg/L	1	2	3	4
FSW Control	0.9800	0.9700	0.9700	0.9800
1.3	0.9800	0.9600	0.9900	0.9800
2.5	0.9800	0.9700	0.9600	0.9900
5	0.9800	0.9400	0.9700	0.9900
10	0.9900	0.9800	0.9700	0.9700
20	0.3400	0.5000	0.6900	0.7200

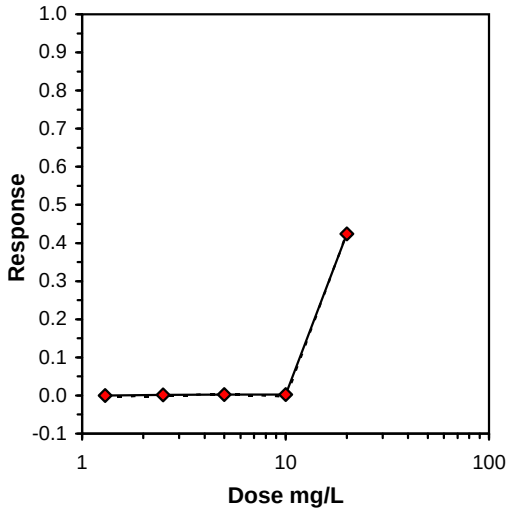
			Transform: Arcsin Square Root					Rank	1-Tailed	Isotonic	
Conc-mg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
FSW Control	0.9750	1.0000	1.4128	1.3967	1.4289	1.315	4			0.9763	1.0000
1.3	0.9775	1.0026	1.4245	1.3694	1.4706	2.922	4	20.00	10.00	0.9763	1.0000
2.5	0.9750	1.0000	1.4164	1.3694	1.4706	3.075	4	18.00	10.00	0.9750	0.9987
5	0.9700	0.9949	1.4049	1.3233	1.4706	4.429	4	18.00	10.00	0.9738	0.9974
10	0.9775	1.0026	1.4232	1.3967	1.4706	2.463	4	19.00	10.00	0.9738	0.9974
*20	0.5625	0.5769	0.8504	0.6225	1.0132	21.419	4	10.00	10.00	0.5625	0.5762

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.913136	0.916	-0.67023	3.624403
Bartlett's Test indicates unequal variances (p = 3.92E-03)	17.32408	15.08627		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	10	20	14.14214	
Treatments vs FSW Control				

Log-Logit Interpolation (200 Resamples)

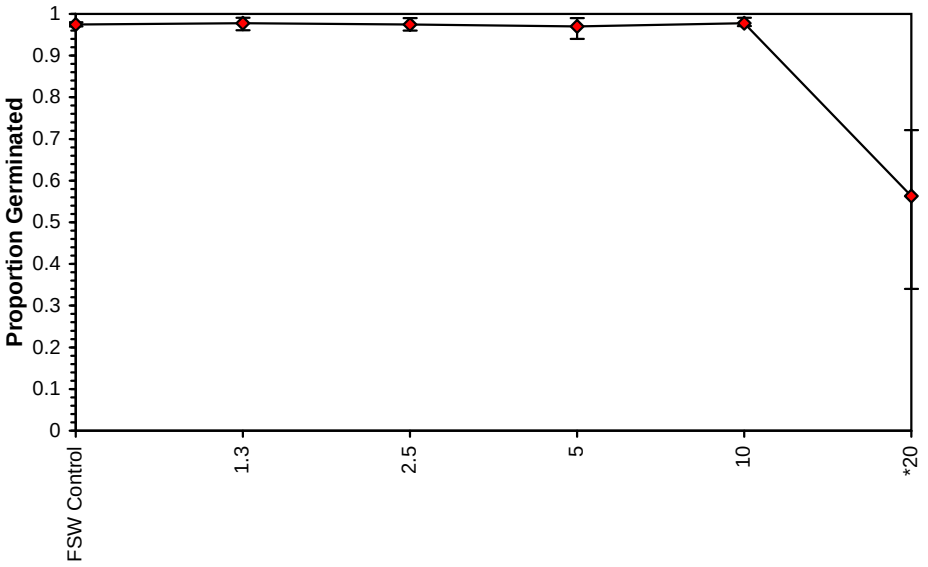
Point	mg/L	SD	95% CL(Exp)		Skew
IC05	12.502	0.346	11.242	13.463	0.0987
IC10	14.062	0.474	12.637	15.701	0.3626
IC15	15.251	0.607	13.479	17.536	0.4555
IC20	16.259	0.736	14.226	19.104	0.5047
IC25	17.164	0.861	14.892	20.529	0.5376
IC40	19.619				
IC50	>20				



Macroalgal Germination Success Test-Proportion Germinated

Start Date:	17/10/2013 12:45	Test ID:	PR1085/02	Sample ID:	Corexit 9500
End Date:	20/10/2013 12:45	Lab ID:	6239	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 116	Test Species:	HB-Hormosira banksii
Comments:					

Dose-Response Plot



Macroalgal Germination Success Test-Proportion Germinated

Start Date:	17/10/2013 12:45	Test ID:	PR1085/02	Sample ID:	Corexit 9500
End Date:	20/10/2013 12:45	Lab ID:	6239	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 116	Test Species:	HB-Hormosira banksii
Comments:					

Auxiliary Data Summary

Conc-mg/L	Parameter	Mean	Min	Max	SD	CV%	N
FSW Control	Germination, %	97.50	97.00	98.00	0.58	0.78	4
1.3		97.75	96.00	99.00	1.26	1.15	4
2.5		97.50	96.00	99.00	1.29	1.17	4
5		97.00	94.00	99.00	2.16	1.52	4
10		97.75	97.00	99.00	0.96	1.00	4
20		56.25	34.00	72.00	17.75	7.49	4
FSW Control	pH	8.10	8.10	8.10	0.00	0.00	1
1.3		8.20	8.20	8.20	0.00	0.00	1
2.5		8.20	8.20	8.20	0.00	0.00	1
5		8.20	8.20	8.20	0.00	0.00	1
10		8.20	8.20	8.20	0.00	0.00	1
20		8.20	8.20	8.20	0.00	0.00	1
FSW Control	Salinity ppt	35.30	35.30	35.30	0.00	0.00	1
1.3		35.50	35.50	35.50	0.00	0.00	1
2.5		35.30	35.30	35.30	0.00	0.00	1
5		35.30	35.30	35.30	0.00	0.00	1
10		35.30	35.30	35.30	0.00	0.00	1
20		35.30	35.30	35.30	0.00	0.00	1
FSW Control	DO %	103.40	103.40	103.40	0.00	0.00	1
1.3		104.60	104.60	104.60	0.00	0.00	1
2.5		104.10	104.10	104.10	0.00	0.00	1
5		104.20	104.20	104.20	0.00	0.00	1
10		104.50	104.50	104.50	0.00	0.00	1
20		105.00	105.00	105.00	0.00	0.00	1

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Statistical Printouts for the Juvenile *Melita plumulosa* Tests

Amphipod Acute Toxicity Test-96 hr survival

Start Date:	5/09/2013 13:15	Test ID:	PR1085/02	Sample ID:	COREXIT 9500
End Date:	9/09/2013 13:30	Lab ID:	6239	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 108	Test Species:	ML-Melita Plumulosa
Comments:					

Conc-mg/L	1	2	3	4
FSW Control	0.8000	1.0000	1.0000	1.0000
1.3	0.8000	1.0000	1.0000	1.0000
2.5	1.0000	1.0000	1.0000	1.0000
5	1.0000	0.8000	1.0000	0.8000
10	0.6000	0.2000	0.2000	0.6000
20	0.0000	0.0000	0.0000	0.0000

			Transform: Arcsin Square Root					Rank	1-Tailed	Number	Total
Conc-mg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Resp	Number
FSW Control	0.9500	1.0000	1.2857	1.1071	1.3453	9.261	4			1	20
1.3	0.9500	1.0000	1.2857	1.1071	1.3453	9.261	4	18.00	10.00	1	20
2.5	1.0000	1.0526	1.3453	1.3453	1.3453	0.000	4	20.00	10.00	0	20
5	0.9000	0.9474	1.2262	1.1071	1.3453	11.212	4	16.00	10.00	2	20
*10	0.4000	0.4211	0.6749	0.4636	0.8861	36.139	4	10.00	10.00	12	20
20	0.0000	0.0000	0.2255	0.2255	0.2255	0.000	4			20	20

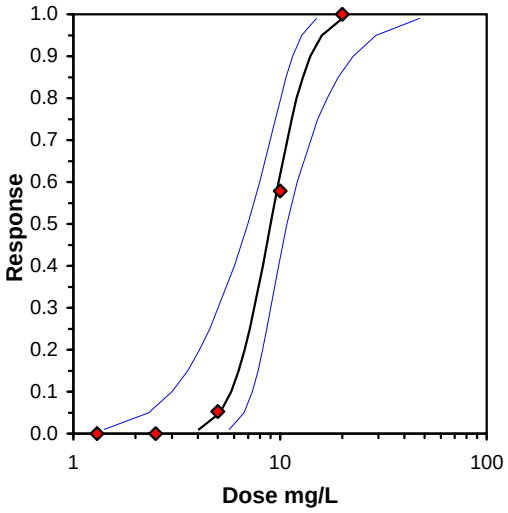
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.915979	0.905	-0.2707	-0.77337
Equality of variance cannot be confirmed				

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	5	10	7.071068	
Treatments vs FSW Control				

Maximum Likelihood-Probit

Parameter	Value	SE	95% Fiducial Limits		Control	Chi-Sq	Critical	P-value	Mu	Sigma	Iter
Slope	6.698272	1.827536	3.116301	10.28024	0.05	1.289506	7.814728	0.73	0.954512	0.149292	6
Intercept	-1.39358	1.817809	-4.95649	2.169323							
TSCR	0.036198	0.023791	-0.01043	0.082827							

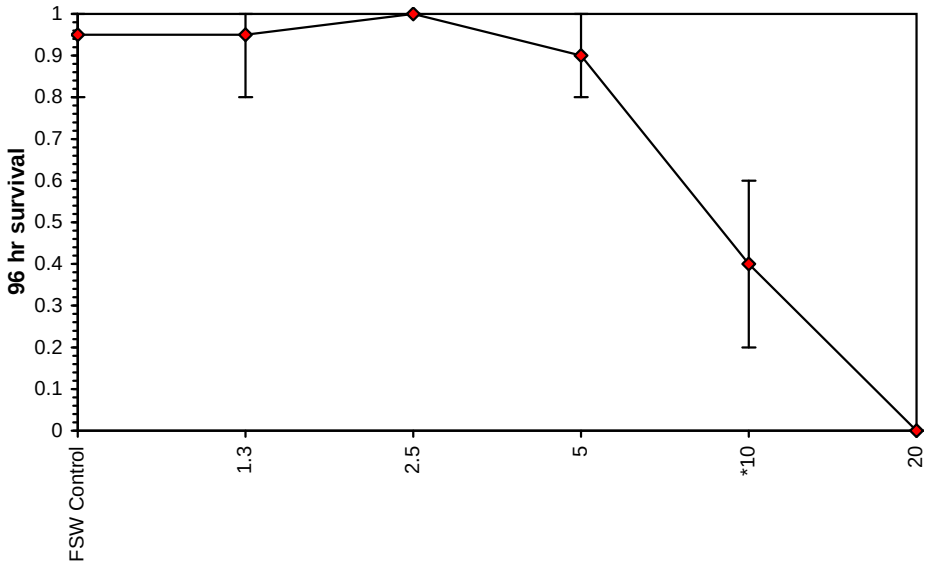
Point	Probits	mg/L	95% Fiducial Limits	
EC01	2.674	4.047683	1.414029	5.693703
EC05	3.355	5.116209	2.314676	6.704115
EC10	3.718	5.796775	3.000112	7.338633
EC15	3.964	6.306388	3.565574	7.818504
EC20	4.158	6.743179	4.081798	8.238833
EC25	4.326	7.141938	4.574627	8.634762
EC40	4.747	8.254474	6.015295	9.850476
EC50	5.000	9.00559	6.984688	10.82701
EC60	5.253	9.825054	7.96988	12.11003
EC75	5.674	11.35555	9.507338	15.22812
EC80	5.842	12.02707	10.07346	16.88166
EC85	6.036	12.86008	10.71284	19.14933
EC90	6.282	13.99065	11.5029	22.58141
EC95	6.645	15.85171	12.68041	29.06338
EC99	7.326	20.03632	15.02599	47.27322



Amphipod Acute Toxicity Test-96 hr survival

Start Date:	5/09/2013 13:15	Test ID:	PR1085/02	Sample ID:	COREXIT 9500
End Date:	9/09/2013 13:30	Lab ID:	6239	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 108	Test Species:	ML-Melita Plumulosa
Comments:					

Dose-Response Plot



Amphipod Acute Toxicity Test-96 hr survival

Start Date:	5/09/2013 13:15	Test ID:	PR1085/02	Sample ID:	COREXIT 9500
End Date:	9/09/2013 13:30	Lab ID:	6239	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 108	Test Species:	ML-Melita Plumulosa
Comments:					

Auxiliary Data Summary

Conc-mg/L	Parameter	Mean	Min	Max	SD	CV%	N
FSW Control	% Non-immobilised	95.00	80.00	100.00	10.00	3.33	4
1.3		95.00	80.00	100.00	10.00	3.33	4
2.5		100.00	100.00	100.00	0.00	0.00	4
5		90.00	80.00	100.00	11.55	3.78	4
10		40.00	20.00	60.00	23.09	12.01	4
20		0.00	0.00	0.00	0.00		4
FSW Control	pH	8.30	8.30	8.30	0.00	0.00	1
1.3		8.40	8.40	8.40	0.00	0.00	1
2.5		8.40	8.40	8.40	0.00	0.00	1
5		8.40	8.40	8.40	0.00	0.00	1
10		8.40	8.40	8.40	0.00	0.00	1
20		8.40	8.40	8.40	0.00	0.00	1
FSW Control	DO %	109.80	109.80	109.80	0.00	0.00	1
1.3		101.90	101.90	101.90	0.00	0.00	1
2.5		100.80	100.80	100.80	0.00	0.00	1
5		101.60	101.60	101.60	0.00	0.00	1
10		102.30	102.30	102.30	0.00	0.00	1
20		102.50	102.50	102.50	0.00	0.00	1
FSW Control	Salinity ppt	34.60	34.60	34.60	0.00	0.00	1
1.3		34.50	34.50	34.50	0.00	0.00	1
2.5		34.70	34.70	34.70	0.00	0.00	1
5		34.70	34.70	34.70	0.00	0.00	1
10		34.70	34.70	34.70	0.00	0.00	1
20		34.70	34.70	34.70	0.00	0.00	1

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Statistical Printouts for the Juvenile Tiger Prawn Tests

Juvenile Tiger Prawn Acute Test-96 hr Survival

Start Date:	17/09/2013 13:00	Test ID:	PR1085/10	Sample ID:	Corexit 9500
End Date:	21/09/2013 13:00	Lab ID:	6239	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 107	Test Species:	PM-Penaeus monodon
Comments:					

Conc-mg/L	1	2	3	4
FSW Control	1.0000	1.0000	1.0000	0.8000
1.3	1.0000	0.4000	0.8000	1.0000
2.5	0.8000	0.8000	0.6000	0.6000
5	0.8000	0.6000	0.8000	0.6000
10	0.4000	0.8000	0.4000	0.6000
20	0.6000	0.8000	0.2000	0.2000

			Transform: Arcsin Square Root						1-Tailed		Number	Total
Conc-mg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Resp	Number
FSW Control	0.9500	1.0000	1.2857	1.1071	1.3453	9.261	4				1	20
1.3	0.8000	0.8421	1.1206	0.6847	1.3453	27.799	4	1.067	2.410	0.3728	4	20
2.5	0.7000	0.7368	0.9966	0.8861	1.1071	12.807	4	1.869	2.410	0.3728	6	20
5	0.7000	0.7368	0.9966	0.8861	1.1071	12.807	4	1.869	2.410	0.3728	6	20
*10	0.5500	0.5789	0.8407	0.6847	1.1071	23.960	4	2.877	2.410	0.3728	9	20
*20	0.4500	0.4737	0.7301	0.4636	1.1071	43.920	4	3.591	2.410	0.3728	11	20

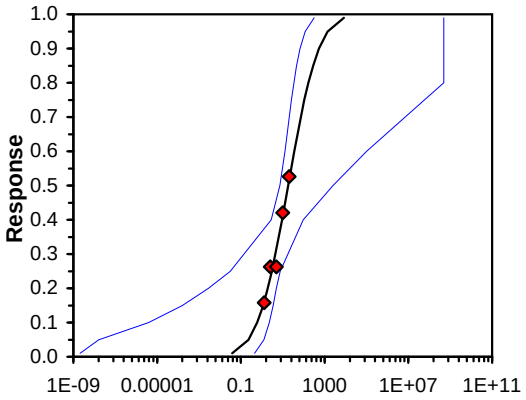
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.976077	0.916	-0.22395	-0.19381
Bartlett's Test indicates equal variances (p = 0.36)	5.488034	15.08627		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test Treatments vs FSW Control	5	10	7.071068		0.294792	0.320104	0.155434	0.047868	0.029042	5, 18

Maximum Likelihood-Probit

Parameter	Value	SE	95% Fiducial Limits		Control	Chi-Sq	Critical	P-value	Mu	Sigma	Iter
Slope	0.870762	0.367424	0.150611	1.590914	0.05	0.336224	7.814728	0.95	1.255153	1.148419	3
Intercept	3.90706	0.337052	3.246438	4.567682							
TSCR	0.050463	0.048859	-0.0453	0.146227							

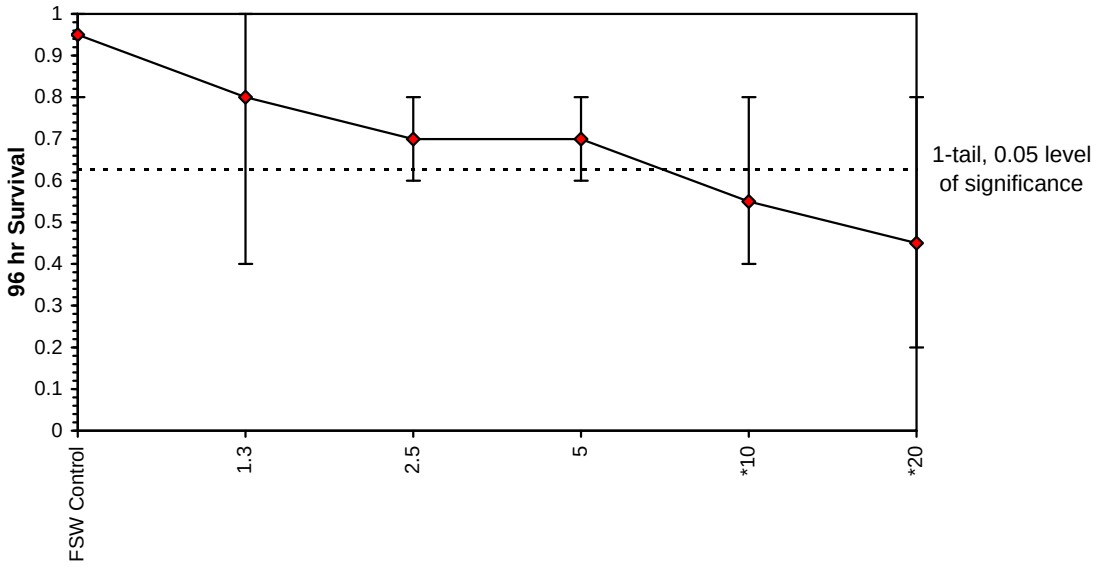
Point	Probits	mg/L	95% Fiducial Limits	
EC01	2.674	0.038329	2.06E-09	0.447367
EC05	3.355	0.232366	1.62E-08	1.260648
EC10	3.718	0.607289	3.97E-06	2.254021
EC15	3.964	1.161164	0.000157	3.441644
EC20	4.158	1.943657	0.002803	5.032422
EC25	4.326	3.023824	0.030779	7.513559
EC40	4.747	9.208837	2.811355	94.65439
EC50	5.000	17.99507	7.250428	2547.249
EC60	5.253	35.16431	12.59631	101758.4
EC75	5.674	107.0903	26.1031	56503046
EC80	5.842	166.6047	34.08362	4.85E+08
EC85	6.036	278.8775	46.17294	4.85E+08
EC90	6.282	533.2263	67.16633	4.85E+08
EC95	6.645	1393.589	116.0163	4.85E+08
EC99	7.326	8448.432	318.5977	4.85E+08



Juvenile Tiger Prawn Acute Test-96 hr Survival

Start Date:	17/09/2013 13:00	Test ID:	PR1085/10	Sample ID:	Corexit 9500
End Date:	21/09/2013 13:00	Lab ID:	6239	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 107	Test Species:	PM-Penaeus monodon
Comments:					

Dose-Response Plot



Juvenile Tiger Prawn Acute Test-96 hr Survival

Start Date:	17/09/2013 13:00	Test ID:	PR1085/10	Sample ID:	Corexit 9500
End Date:	21/09/2013 13:00	Lab ID:	6239	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 107	Test Species:	PM-Penaeus monodon
Comments:					

Auxiliary Data Summary

Conc-mg/L	Parameter	Mean	Min	Max	SD	CV%	N
FSW Control	% Survival	95.00	80.00	100.00	10.00	3.33	4
1.3		80.00	40.00	100.00	28.28	6.65	4
2.5		70.00	60.00	80.00	11.55	4.85	4
5		70.00	60.00	80.00	11.55	4.85	4
10		55.00	40.00	80.00	19.15	7.96	4
20		45.00	20.00	80.00	30.00	12.17	4
FSW Control	pH	8.50	8.50	8.50	0.00	0.00	1
1.3		8.20	8.20	8.20	0.00	0.00	1
2.5		8.30	8.30	8.30	0.00	0.00	1
5		8.30	8.30	8.30	0.00	0.00	1
10		8.40	8.40	8.40	0.00	0.00	1
20		8.50	8.50	8.50	0.00	0.00	1
FSW Control	Salinity ppt	34.60	34.60	34.60	0.00	0.00	1
1.3		34.70	34.70	34.70	0.00	0.00	1
2.5		34.70	34.70	34.70	0.00	0.00	1
5		34.70	34.70	34.70	0.00	0.00	1
10		34.70	34.70	34.70	0.00	0.00	1
20		34.70	34.70	34.70	0.00	0.00	1
FSW Control	DO %	109.80	109.80	109.80	0.00	0.00	1
1.3		98.40	98.40	98.40	0.00	0.00	1
2.5		98.90	98.90	98.90	0.00	0.00	1
5		99.30	99.30	99.30	0.00	0.00	1
10		101.80	101.80	101.80	0.00	0.00	1
20		107.80	107.80	107.80	0.00	0.00	1

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Statistical Printouts for the Fish Imbalance Tests

Fish Imbalance Test-96 hr Imbalance

Start Date:	17/09/2013 13:45	Test ID:	PR1085/11	Sample ID:	Corexit 9500
End Date:	21/09/2013 13:45	Lab ID:	6239	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 117	Test Species:	MN-Macquaria novemaculeata
Comments:					

Conc-mg/L	1	2	3	4
FSW Control	1.0000	1.0000	1.0000	1.0000
1.3	1.0000	1.0000	1.0000	1.0000
2.5	1.0000	1.0000	1.0000	1.0000
5	1.0000	1.0000	1.0000	1.0000
10	1.0000	1.0000	1.0000	1.0000
20	1.0000	1.0000	1.0000	1.0000

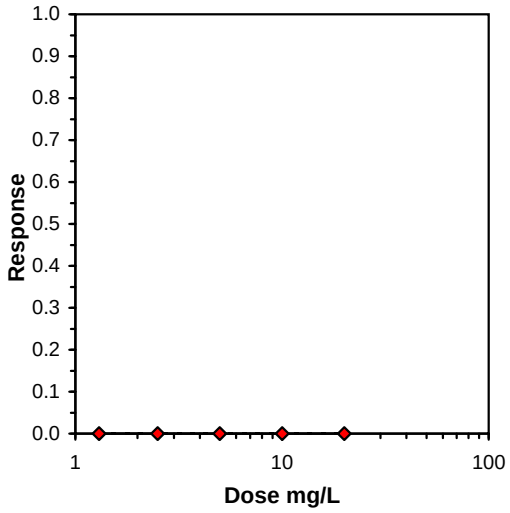
			Transform: Arcsin Square Root					Rank	1-Tailed	Isotonic	
Conc-mg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
FSW Control	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4			1.0000	1.0000
1.3	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4	18.00	10.00	1.0000	1.0000
2.5	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4	18.00	10.00	1.0000	1.0000
5	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4	18.00	10.00	1.0000	1.0000
10	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4	18.00	10.00	1.0000	1.0000
20	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4	18.00	10.00	1.0000	1.0000

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	1	0.916		
Equality of variance cannot be confirmed				

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	20	>20		
Treatments vs FSW Control				

Log-Logit Interpolation (200 Resamples)

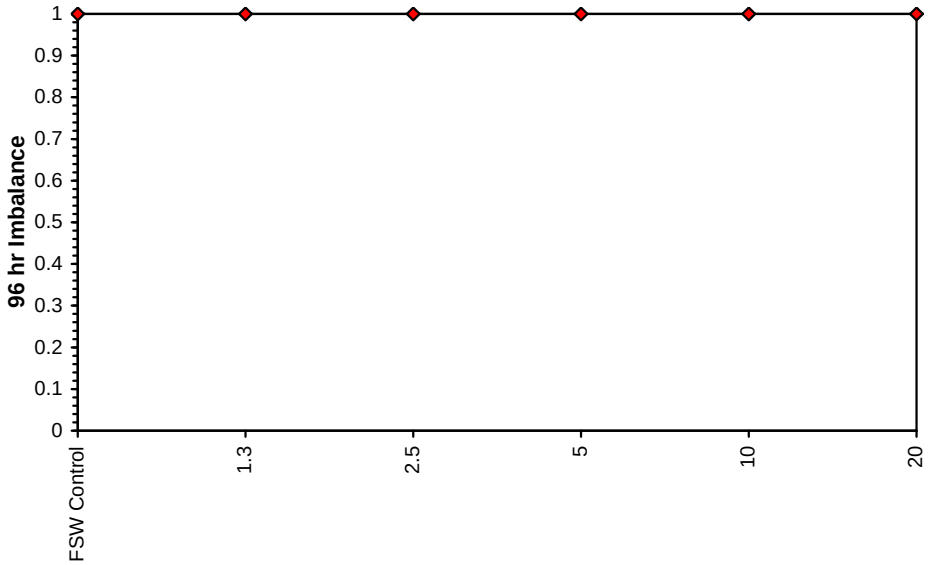
Point	mg/L	SD	95% CL(Exp)	Skew
IC05	>20			
IC10	>20			
IC15	>20			
IC20	>20			
IC25	>20			
IC40	>20			
IC50	>20			



Fish Imbalance Test-96 hr Imbalance

Start Date:	17/09/2013 13:45	Test ID:	PR1085/11	Sample ID:	Corexit 9500
End Date:	21/09/2013 13:45	Lab ID:	6239	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 117	Test Species:	MN-Macquaria novemaculeata
Comments:					

Dose-Response Plot



Fish Imbalance Test-96 hr Imbalance

Start Date:	17/09/2013 13:45	Test ID:	PR1085/11	Sample ID:	Corexit 9500
End Date:	21/09/2013 13:45	Lab ID:	6239	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 117	Test Species:	MN-Macquaria novemaculeata
Comments:					

Auxiliary Data Summary

Conc-mg/L	Parameter	Mean	Min	Max	SD	CV%	N
FSW Control	% Un-affected	100.00	100.00	100.00	0.00	0.00	4
1.3		100.00	100.00	100.00	0.00	0.00	4
2.5		100.00	100.00	100.00	0.00	0.00	4
5		100.00	100.00	100.00	0.00	0.00	4
10		100.00	100.00	100.00	0.00	0.00	4
20		100.00	100.00	100.00	0.00	0.00	4
FSW Control	pH	8.10	8.10	8.10	0.00	0.00	1
1.3		8.20	8.20	8.20	0.00	0.00	1
2.5		8.20	8.20	8.20	0.00	0.00	1
5		8.20	8.20	8.20	0.00	0.00	1
10		8.20	8.20	8.20	0.00	0.00	1
20		8.20	8.20	8.20	0.00	0.00	1
FSW Control	Salinity ppt	35.30	35.30	35.30	0.00	0.00	1
1.3		35.50	35.50	35.50	0.00	0.00	1
2.5		35.30	35.30	35.30	0.00	0.00	1
5		35.30	35.30	35.30	0.00	0.00	1
10		35.30	35.30	35.30	0.00	0.00	1
20		35.30	35.30	35.30	0.00	0.00	1
FSW Control	DO %	103.40	103.40	103.40	0.00	0.00	1
1.3		104.60	104.60	104.60	0.00	0.00	1
2.5		104.10	104.10	104.10	0.00	0.00	1
5		104.20	104.20	104.20	0.00	0.00	1
10		104.50	104.50	104.50	0.00	0.00	1
20		105.00	105.00	105.00	0.00	0.00	1

Fish Imbalance Test-96 hr Imbalance

Start Date:	22/10/2013 13:30	Test ID:	PR1085/20	Sample ID:	Corexit 9500
End Date:	26/10/2013 13:30	Lab ID:	6239	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 117	Test Species:	LT-Lates calcarifer
Comments:					

Conc-mg/L	1	2	3	4
FSW Control	0.8000	0.8000	1.0000	1.0000
1.3	0.8000	0.8000	1.0000	0.8000
2.5	0.6000	0.6000	1.0000	1.0000
5	0.4000	0.8000	1.0000	1.0000
10	1.0000	1.0000	0.6000	1.0000
20	0.2000	0.6000	0.4000	0.4000

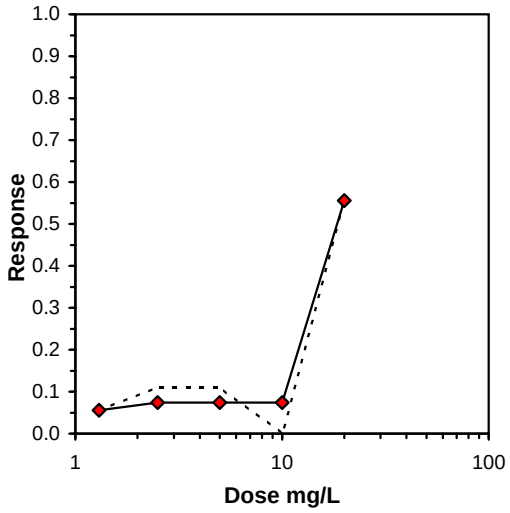
			Transform: Arcsin Square Root						1-Tailed		Number	Total
Conc-mg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Resp	Number
FSW Control	0.9000	1.0000	1.2262	1.1071	1.3453	11.212	4				2	20
1.3	0.8500	0.9444	1.1667	1.1071	1.3453	10.206	4	0.388	2.410	0.3700	3	20
2.5	0.8000	0.8889	1.1157	0.8861	1.3453	23.763	4	0.720	2.410	0.3700	4	20
5	0.8000	0.8889	1.1206	0.6847	1.3453	27.799	4	0.688	2.410	0.3700	4	20
10	0.9000	1.0000	1.2305	0.8861	1.3453	18.660	4	-0.028	2.410	0.3700	2	20
*20	0.4000	0.4444	0.6798	0.4636	0.8861	25.383	4	3.559	2.410	0.3700	12	20

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.924763	0.916	-0.62032	-0.41807
Bartlett's Test indicates equal variances (p = 0.61)	3.566237	15.08627		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	10	20	14.14214		0.315348	0.355967	0.17123	0.047151	0.019042	5, 18
Treatments vs FSW Control										

Trimmed Spearman-Karber

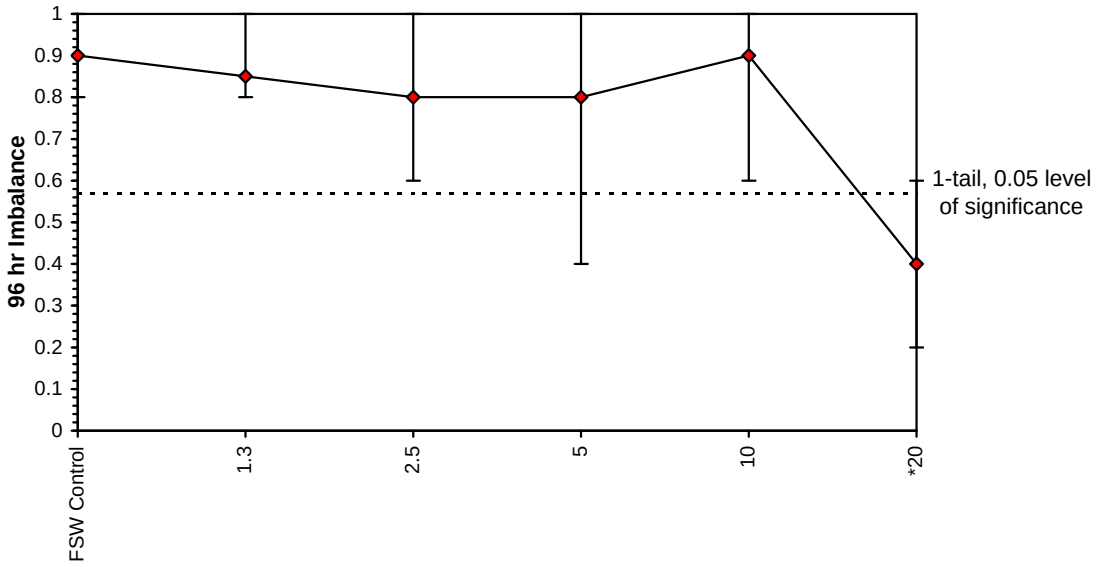
Trim Level	EC50	95% CL	
0.0%			
5.0%			
10.0%			
20.0%			
Auto-44.4%	18.463	13.903	24.518



Fish Imbalance Test-96 hr Imbalance

Start Date:	22/10/2013 13:30	Test ID:	PR1085/20	Sample ID:	Corexit 9500
End Date:	26/10/2013 13:30	Lab ID:	6239	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 117	Test Species:	LT-Lates calcarifer
Comments:					

Dose-Response Plot



Fish Imbalance Test-96 hr Imbalance

Start Date:	22/10/2013 13:30	Test ID:	PR1085/20	Sample ID:	Corexit 9500
End Date:	26/10/2013 13:30	Lab ID:	6239	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 117	Test Species:	LT-Lates calcarifer
Comments:					

Auxiliary Data Summary

Conc-mg/L	Parameter	Mean	Min	Max	SD	CV%	N
FSW Control	% Un-affected	90.00	80.00	100.00	11.55	3.78	4
1.3		85.00	80.00	100.00	10.00	3.72	4
2.5		80.00	60.00	100.00	23.09	6.01	4
5		80.00	40.00	100.00	28.28	6.65	4
10		90.00	60.00	100.00	20.00	4.97	4
20		40.00	20.00	60.00	16.33	10.10	4
FSW Control	pH	8.10	8.10	8.10	0.00	0.00	1
1.3		8.10	8.10	8.10	0.00	0.00	1
2.5		8.20	8.20	8.20	0.00	0.00	1
5		8.20	8.20	8.20	0.00	0.00	1
10		8.20	8.20	8.20	0.00	0.00	1
20		8.30	8.30	8.30	0.00	0.00	1
FSW Control	Salinity ppt	35.30	35.30	35.30	0.00	0.00	1
1.3		35.30	35.30	35.30	0.00	0.00	1
2.5		35.40	35.40	35.40	0.00	0.00	1
5		35.30	35.30	35.30	0.00	0.00	1
10		35.30	35.30	35.30	0.00	0.00	1
20		35.20	35.20	35.20	0.00	0.00	1
FSW Control	DO %	102.40	102.40	102.40	0.00	0.00	1
1.3		100.30	100.30	100.30	0.00	0.00	1
2.5		100.40	100.40	100.40	0.00	0.00	1
5		101.40	101.40	101.40	0.00	0.00	1
10		102.20	102.20	102.20	0.00	0.00	1
20		104.40	104.40	104.40	0.00	0.00	1

Fish Imbalance Test-96 hr Imbalance

Start Date:	22/10/2013 13:30	Test ID:	PR1085/20	Sample ID:	Corexit 9500
End Date:	26/10/2013 13:30	Lab ID:	6239	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 117	Test Species:	LT-Lates calcarifer
Comments:					

Conc-mg/L	1	2	3	4
FSW Control	0.8000	0.8000	1.0000	1.0000
1.3	0.8000	0.8000	1.0000	0.8000
2.5	0.6000	0.6000	1.0000	1.0000
5	0.4000	0.8000	1.0000	1.0000
10	1.0000	1.0000	0.6000	1.0000
20	0.2000	0.6000	0.4000	0.4000

			Transform: Arcsin Square Root					1-Tailed			Isotonic	
Conc-mg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
FSW Control	0.9000	1.0000	1.2262	1.1071	1.3453	11.212	4				0.9000	1.0000
1.3	0.8500	0.9444	1.1667	1.1071	1.3453	10.206	4	0.388	2.410	0.3700	0.8500	0.9444
2.5	0.8000	0.8889	1.1157	0.8861	1.3453	23.763	4	0.720	2.410	0.3700	0.8333	0.9259
5	0.8000	0.8889	1.1206	0.6847	1.3453	27.799	4	0.688	2.410	0.3700	0.8333	0.9259
10	0.9000	1.0000	1.2305	0.8861	1.3453	18.660	4	-0.028	2.410	0.3700	0.8333	0.9259
*20	0.4000	0.4444	0.6798	0.4636	0.8861	25.383	4	3.559	2.410	0.3700	0.4000	0.4444

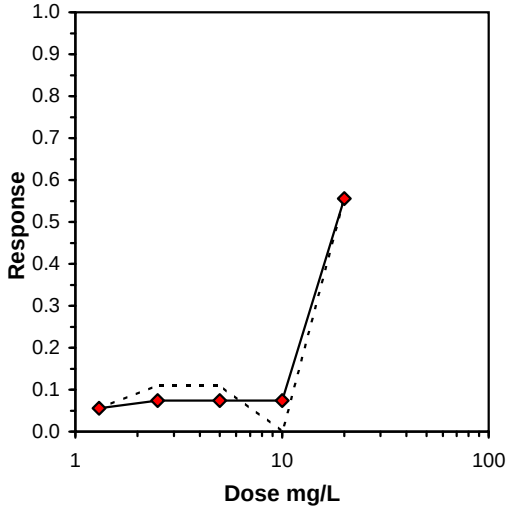
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.924763	0.916	-0.62032	-0.41807
Bartlett's Test indicates equal variances (p = 0.61)	3.566237	15.08627		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	10	20	14.14214		0.315348	0.355967	0.17123	0.047151	0.019042	5, 18
Treatments vs FSW Control										

Log-Logit Interpolation (200 Resamples)

Point	mg/L	SD	95% CL(Exp)		Skew
IC05*	1.141	3.957	0.115	17.308	1.1015
IC10	10.577	4.579	0.000	13.501	-0.0959
IC15	11.624	4.061	0.000	14.528	-1.0312
IC20	12.617	3.418	0.000	15.684	-1.8047
IC25	13.583	2.240	2.803	17.009	-2.2611
IC40	16.513				
IC50	18.664				

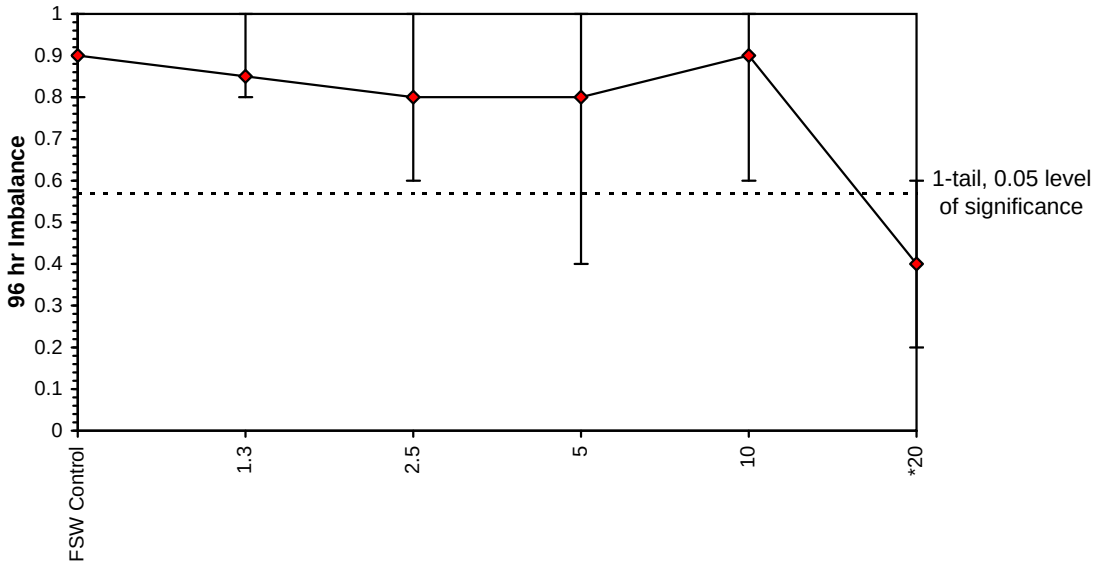
* indicates IC estimate less than the lowest concentration



Fish Imbalance Test-96 hr Imbalance

Start Date:	22/10/2013 13:30	Test ID:	PR1085/20	Sample ID:	Corexit 9500
End Date:	26/10/2013 13:30	Lab ID:	6239	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 117	Test Species:	LT-Lates calcarifer
Comments:					

Dose-Response Plot



Fish Imbalance Test-96 hr Imbalance

Start Date:	22/10/2013 13:30	Test ID:	PR1085/20	Sample ID:	Corexit 9500
End Date:	26/10/2013 13:30	Lab ID:	6239	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 117	Test Species:	LT-Lates calcarifer
Comments:					

Auxiliary Data Summary

Conc-mg/L	Parameter	Mean	Min	Max	SD	CV%	N
FSW Control	% Un-affected	90.00	80.00	100.00	11.55	3.78	4
1.3		85.00	80.00	100.00	10.00	3.72	4
2.5		80.00	60.00	100.00	23.09	6.01	4
5		80.00	40.00	100.00	28.28	6.65	4
10		90.00	60.00	100.00	20.00	4.97	4
20		40.00	20.00	60.00	16.33	10.10	4
FSW Control	pH	8.10	8.10	8.10	0.00	0.00	1
1.3		8.10	8.10	8.10	0.00	0.00	1
2.5		8.20	8.20	8.20	0.00	0.00	1
5		8.20	8.20	8.20	0.00	0.00	1
10		8.20	8.20	8.20	0.00	0.00	1
20		8.30	8.30	8.30	0.00	0.00	1
FSW Control	Salinity ppt	35.30	35.30	35.30	0.00	0.00	1
1.3		35.30	35.30	35.30	0.00	0.00	1
2.5		35.40	35.40	35.40	0.00	0.00	1
5		35.30	35.30	35.30	0.00	0.00	1
10		35.30	35.30	35.30	0.00	0.00	1
20		35.20	35.20	35.20	0.00	0.00	1
FSW Control	DO %	102.40	102.40	102.40	0.00	0.00	1
1.3		100.30	100.30	100.30	0.00	0.00	1
2.5		100.40	100.40	100.40	0.00	0.00	1
5		101.40	101.40	101.40	0.00	0.00	1
10		102.20	102.20	102.20	0.00	0.00	1
20		104.40	104.40	104.40	0.00	0.00	1