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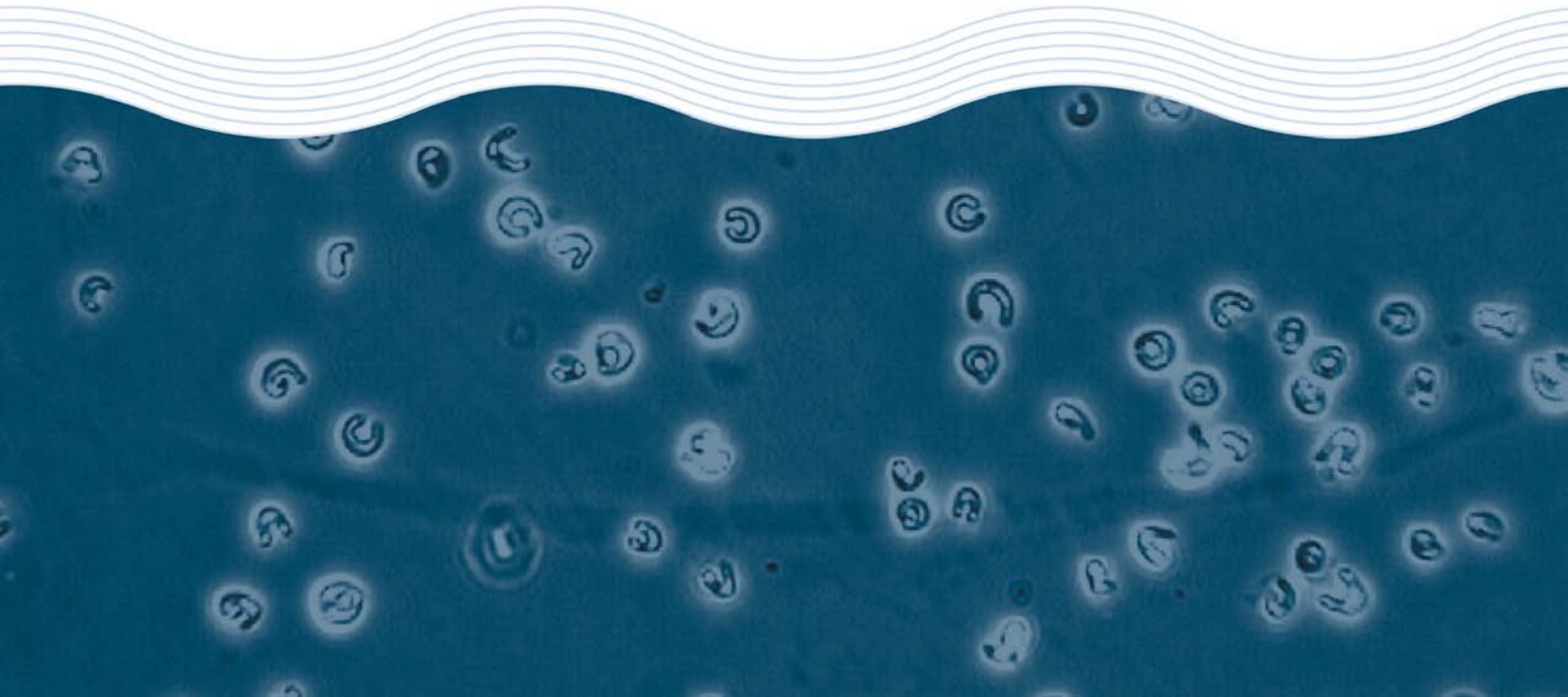
Toxicity Assessment of Oil Spill Dispersants Finasol OSR51 and Finasol OSR 52

Total Fluids SAS

Test Report

January 2014



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January 2014

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Toxicity Test Report: TR1061/1

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Client:	Total Fluids SAS 24, Cours Michelet – La Défense 92069 Paris La defense- Cedex, France	**ESA Job #:**	PR1061
		Date Sampled:	Not supplied
		Date Received:	13 September 2013
Attention:	John-Philippe Robinson	**Sampled By:**	Client
Client Ref:	4505225065	**ESA Quote #:**	PL1061_q02

Lab ID No.:	Sample Name:	Sample Description:
6278	Finasol OSR 52	Chemical received at room temperature in apparent good condition
6279	Finasol OSR 51	Chemical received at room temperature in apparent good condition

Test Performed:	48-hr larval development test using the mussel *Mytilus galloprovincialis*
Test Protocol:	ESA SOP 106 (ESA 2011), based on APHA (1998) and USEPA (1996)
Test Temperature:	The test was performed at 20±1°C.
Deviations from Protocol:	The test was extended to 72 hours.
Comments on Solution Preparation:	The highest test concentration was prepared by adding a weighed aliquot of either sample 6278 'Finasol OSR 52' or sample 6279 'Finasol OSR 51' 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 samples.
Source of Test Organisms:	Farm-reared, Mercury Passage, TAS
Test Initiated:	16 October 2013 at 1430h

Sample 6278: *Finasol OSR 52*

Concentration (mg/L)	% Normal larvae (Mean ± SD)
FSW Control	75.8 ± 5.9
1.3	77.5 ± 5.2
2.5	78.3 ± 4.7
5.0	78.0 ± 4.4
10.0	71.8 ± 2.2
20.0	0.0 ± 0.0

72-hr IC10 = 10.1 (8.0-10.2)mg/L
72-hr EC50 = 13.4 (13.2-13.7)mg/L
NOEC = 10.0mg/L
LOEC = 20.0mg/L

Sample 6279: *Finasol OSR 51*

Concentration (mg/L)	% Normal larvae (Mean ± SD)
FSW Control	75.8 ± 5.9
1.3	74.5 ± 3.7
2.5	75.5 ± 6.6
5.0	76.0 ± 5.4
10.0	73.8 ± 4.7
20.0	1.0 ± 2.0 *

72-hr EC10 = 11.3 (9.0-12.8)mg/L
72-hr EC50 = 13.9 (12.0-15.2)mg/L
NOEC = 10.0mg/L
LOEC = 20.0mg/L

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

Toxicity Test Report: TR1061/1

QA/QC Parameter	Criterion	This Test	Criterion met?
FSW Control mean % normal	≥70%	75.8%	Yes
Reference Toxicant within cusum chart limits	6.7-18.2µg Cu/L	8.3µg Cu/L	Yes

Test Report Authorised by: Dr Rick Krassoi, Director on 5 November 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) *Standard Methods for the Examination of Water and Wastewate*r. 20th Ed. American Public Health Association, American Water Works Association and the Water Environment Federation, Washington, DC, USA.

ESA (2011) *Bivalve Larval Development Test*. Issue No. 10. Ecotox Services Australasia, Sydney, NSW

USEPA (1996) *Bivalve acute toxicity test (embryo larval) OPPTS 850.1055. Ecological Effects Test Guidelines.* United States Environmental Protection Agency. Prevention, Pesticides and Toxic Substances. EPA/712/C-96/137.

Toxicity Test Report: TR1061/2

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

Client:	Total Fluids SAS 24, Cours Michelet – La Défense 92069 Paris La defense- Cedex, France	**ESA Job #:**	PR1061
		Date Sampled:	Not supplied
		Date Received:	13 September 2013
Attention:	John-Philippe Robinson	**Sampled By:**	Client
Client Ref:	4505225065	**ESA Quote #:**	PL1061_q02

Lab ID No.:	Sample Name:	Sample Description:
6278	Finasol OSR 52	Chemical received at room temperature in apparent good condition
6279	Finasol OSR 51	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 either sample 6278 'Finasol OSR 52' or sample 6279 'Finasol OSR 51' 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 samples.
Source of Test Organisms:	In-house culture, originally sourced from CSIRO Microalgae Supply Service, TAS
Test Initiated:	1 October 2013 at 1445h

Sample 6278: *Finasol OSR 52*

Concentration (mg/L)	Cell Yield (Mean number of cells/mL x10^4 ± SD)	
FSW Control	110.9 ± 6.7	
1.3	102.1 ± 11.9	
2.5	117.1 ± 8.3	
5.0	123.8 ± 10.2	
10.0	90.9 ± 6.5	*
20.0	32.2 ± 7.1	*

72-hr IC10 = 7.5 (6.5-8.6)mg/L
72-hr IC50 = 15.8 (14.4-16.8)mg/L
NOEC = 5.0mg/L
LOEC = 10.0mg/L

Sample 6279: *Finasol OSR 51*

Concentration (mg/L)	Cell Yield (Mean number of cells/mL x10^4 ± SD)	
FSW Control	110.9 ± 6.7	
1.3	101.7 ± 12.0	
2.5	104.6 ± 13.3	
5.0	106.4 ± 9.2	
10.0	102.3 ± 10.6	
20.0	85.2 ± 5.1	*

72-hr IC10 = 11.5mg/L**
72-hr IC50 = >20.0mg/L
NOEC = 10.0mg/L
LOEC = 20.0mg/L

*Significantly lower cell yield compared with the FSW Control (Bonferroni t Test, 1-tailed, P=0.05)
**95% confidence limits are not reliable

Toxicity Test Report: TR1061/2

QA/QC Parameter	Criterion	This Test	Criterion met?
Control mean cell density	≥16.0x10^4 cells/mL	111.9x10^4 cells/mL	Yes
Control coefficient of variation	<20%	6.1%	Yes
Reference Toxicant within cusum chart limits	1.0-14.1µg Cu/L	4.3µg Cu/L	Yes

Test Report Authorised by: Dr Rick Krassoi, Director on 5 November 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: TR1061/3

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Client:	Total Fluids SAS	**ESA Job #:**	PR1061
	24, Cours Michelet – La Défense	**Date Sampled:**	Not supplied
	92069 Paris La defense- Cedex, France	**Date Received:**	13 September 2013
Attention:	John-Philippe Robinson	**Sampled By:**	Client
Client Ref:	4505225065	**ESA Quote #:**	PL1061_q02

Lab ID No.:	**Sample Name:**	**Sample Description:**
6278	Finasol OSR 52	Chemical received at room temperature in apparent good condition
6279	Finasol OSR 51	Chemical received at room temperature in apparent good condition

Test Performed:	96-hr acute toxicity test using the amphipod *Allorchestes compressa*
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 either sample 6278 'Finasol OSR 52' or sample 6279 'Finasol OSR 51' 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 samples.
Source of Test Organisms:	In-house culture, originally sourced from Queenscliff, VIC
Test Initiated:	26 September 2013 at 1430h

Sample 6278: *Finasol OSR 52*

Concentration (mg/L)	**% Unaffected (Mean ± SD)**	
FSW Control	100 ± 0.0	
1.3	95.0 ± 10.0	
2.5	80.0 ± 0.0	*
5.0	0.0 ± 0.0	
10.0	0.0 ± 0.0	
20.0	0.0 ± 0.0	

96-hr EC10 = 1.9 (1.3-2.3)mg/L
96-hr EC50 = 2.9 (2.4-3.4)mg/L
NOEC = 1.3mg/L
LOEC = 2.5mg/L

Sample 6279: *Finasol OSR 51*

Concentration (mg/L)	**% Unaffected (Mean ± SD)**	
FSW Control	100 ± 0.0	
1.3	100 ± 0.0	
2.5	70.0 ± 20.0	*
5.0	50.0 ± 20.0	*
10.0	0.0 ± 0.0	
20.0	0.0 ± 0.0	

96-hr EC10 = 2.0 (1.3-2.6)mg/L
96-hr EC50 = 4.0 (3.3-4.9)mg/L
NOEC = 1.3mg/L
LOEC = 2.5mg/L

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

Toxicity Test Report: TR1061/3

QA/QC Parameter	Criterion	This Test	Criterion met?
Control mean % unaffected	≥90.0%	100%	Yes
Reference Toxicant within cusum chart limits	0.4-4.9mg SDS/L	1.8mg SDS/L	Yes

Test Report Authorised by:  Dr Rick Krassoi, Director on 5 November 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: TR1061/4

Client:	Total Fluids SAS	**ESA Job #:**	PR1061
	24, Cours Michelet – La Défense	**Date Sampled:**	Not supplied
	92069 Paris La defense- Cedex, France	**Date Received:**	13 September 2013
Attention:	John-Philippe Robinson	**Sampled By:**	Client
Client Ref:	4505225065	**ESA Quote #:**	PL1061_q02

Lab ID No.:	**Sample Name:**	**Sample Description:**
6278	Finasol OSR 52	Chemical received at room temperature in apparent good condition
6279	Finasol OSR 51	Chemical received at room temperature in apparent good condition

Test Performed:	48-hr acute survival test using the copepod *Parvocalanus crassirostris*
Test Protocol:	ESA SOP 124 (2012)
Test Temperature:	The test was performed at 27±1°C.
Deviations from Protocol:	Nil
Comments on Solution Preparation:	The highest test concentration was prepared by adding a weighed aliquot of either sample 6278 'Finasol OSR 52' or sample 6279 'Finasol OSR 51' 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 samples.
Source of Test Organisms:	In house culture
Age of Test Organisms:	<7 days old
Test Initiated:	22 October 2013 at 1200h

Sample 6278: *Finasol OSR 52*

Concentration (mg/L)	**% Survival (Mean ± SD)**	
FSW Control	100 ± 0.0	
0.16	100 ± 0.0	
0.31	95.0 ± 10.0	
0.63	100 ± 0.0	
1.30	90.0 ± 11.6	
2.50	5.0 ± 10.0	*
5.00	0.0 ± 0.0	

48-hr IC10 = 1.3 (0.8-1.9)mg/L
48-hr EC50 = 1.7 (1.5-1.9)mg/L
NOEC = 1.3mg/L
LOEC = 2.5mg/L

Sample 6279: *Finasol OSR 51*

Concentration (mg/L)	**% Survival (Mean ± SD)**	
FSW Control	100 ± 0.0	
0.16	95.0 ± 10.0	
0.31	95.0 ± 10.0	
0.63	80.0 ± 0.0	*
1.30	60.0 ± 23.1	*
2.50	0.0 ± 0.0	
5.00	0.0 ± 0.0	

48-hr EC10 = 0.4mg/L**
48-hr EC50 = 1.1 (0.4-2.9)mg/L
NOEC = 0.3mg/L
LOEC = 0.6mg/L

*Significantly lower percent survival compared with the FSW Control (Steel's Many One-Rank Test, 1-tailed, P=0.05)
**95%confidence limits are not reliable

QA/QC Parameter	**Criterion**	**This Test**	**Criterion met?**
Control mean % survival	≥80.0%	100%	Yes
Reference Toxicant within cusum chart limits	5.0-29.1µg Cu/L	6.7µg Cu/L	Yes

Toxicity Test Report: TR1061/4

Test Report Authorised by:  Dr Rick Krassoi, Director on 5 November 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 124 – Acute toxicity test using the copepod Gladioferens imparipes*. Issue No. 1. Ecotox Services Australasia, Sydney, New South Wales.

Toxicity Test Report: TR1061/5 (Page 1 of 2)

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Client:	Total Fluids SAS	**ESA Job #:**	PR1061
	24, Cours Michelet – La Défense	**Date Sampled:**	Not supplied
	92069 Paris La defense- Cedex, France	**Date Received:**	13 September 2013
Attention:	John-Philippe Robinson	**Sampled By:**	Client
Client Ref:	4505225065	**ESA Quote #:**	PL1061_q02

Lab ID No.:	**Sample Name:**	**Sample Description:**
6278	Finasol OSR 52	Chemical received at room temperature in apparent good condition
6279	Finasol OSR 51	Chemical received at room temperature in apparent good condition

Test Performed:	72-hr macroalgal germination success test using *Ecklonia radiata*
Test Protocol:	ESA SOP 116 (ESA 2012), based on Bidwell *et al*. (1998) and Burridge *et al.* (1999)
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 either sample 6278 'Finasol OSR 52' or sample 6279 'Finasol OSR 51' 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 samples.
Source of Test Organisms:	Field collected from Mercury Passage, TAS
Test Initiated:	9 October 2013 at 1400h

Sample 6278: *Finasol OSR 52*

Concentration (mg/L)	**% Germination (Mean ± SD)**	
FSW Control	89.0 ± 4.8	
1.3	87.5 ± 1.0	
2.5	84.5 ± 10.1	
5.0	91.0 ± 5.0	
10.0	88.5 ± 5.0	
20.0	49.0 ± 8.3	*

72-hr EC10 = 12.3 (10.1-13.2)mg/L
72-hr EC50 = >20.0mg/L
NOEC = 10.0mg/L
LOEC = 20.0mg/L

Sample 6279: *Finasol OSR 51*

Concentration (mg/L)	**% Germination (Mean ± SD)**	
FSW Control	89.0 ± 4.8	
1.3	92.5 ± 2.5	
2.5	90.0 ± 2.8	
5.0	92.0 ± 3.7	
10.0	82.5 ± 17.2	
20.0	68.0 ± 13.4	*

72-hr EC10 = 10.4 (5.3-19.4)mg/L
72-hr EC50 = >20.0mg/L
NOEC = 10.0mg/L
LOEC = 20.0mg/L

*Significantly lower percentage of germinated spores compared with the FSW Control (Dunnett's Test, 1-tailed, P=0.05)

Toxicity Test Report: TR1061/5 (Page 2 of 2)

QA/QC Parameter	Criterion	This Test	Criterion met?
FSW Control mean % germination	≥70%	89.0%	Yes
Reference Toxicant within cusum chart limits	187.4-855.9µg Cu/L	197.2µg Cu/L	Yes

Test Report Authorised by:  Dr Rick Krassoi, Director on 5 November 2013

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

NATA Accredited Laboratory Number: 14709

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Citations:

Bidwell, J. R., Wheeler, K. W., & Burridge, T. R. (1998). Toxicant effects on the zoospore stage of the marine maroalga Ecklonia radiata (Phaeophyta:Laminariales). *Marine Ecology Progress Series.Vol 163* , 259-265.

Burridge, T. R., Karistanios, M., & Bidwell, J. (1999). The use of aquatic macrophyte ecotoxicological assays inmonitoring coastal effluent discharges in southern Australia. *Marine Pollution Bulletin. Vol 39* , 1-12.

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

Toxicity Test Report: TR1061/6

Client:	Total Fluids SAS	**ESA Job #:**	PR1061
	24, Cours Michelet – La Défense	**Date Sampled:**	Not supplied
	92069 Paris La defense- Cedex, France	**Date Received:**	13 September 2013
Attention:	John-Philippe Robinson	**Sampled By:**	Client
Client Ref:	4505225065	**ESA Quote #:**	PL1061_q02

Lab ID No.:	**Sample Name:**	**Sample Description:**
6278	Finasol OSR 52	Chemical received at room temperature in apparent good condition
6279	Finasol OSR 51	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 either sample 6278 'Finasol OSR 52' or sample 6279 'Finasol OSR 51' 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 samples.
Source of Test Organisms:	Hatchery reared, SA
Test Initiated:	22 October 2013 at 1330h

Sample 6278: *Finasol OSR 52*

Concentration (mg/L)	**% Unaffected (Mean ± SD)**
FSW Control	90.0 ± 11.6
1.3	70.0 ± 25.8
2.5	85.0 ± 10.0
5.0	85.0 ± 19.2
10.0	80.0 ± 16.3
20.0	95.0 ± 10.0

96-hr EC10 = >20.0mg/L
96-hr EC50 = >20.0mg/L
NOEC = 20.0mg/L
LOEC = >20.0mg/L

Sample 6279: *Finasol OSR 51*

Concentration (mg/L)	**% Unaffected (Mean ± SD)**
FSW Control	90.0 ± 11.6
1.3	90.0 ± 11.6
2.5	90.0 ± 11.6
5.0	95.0 ± 10.0
10.0	90.0 ± 11.6
20.0	90.0 ± 11.6

96-hr EC10 = >20.0mg/L
96-hr EC50 = >20.0mg/L
NOEC = 20.0mg/L
LOEC = >20.0mg/L

Toxicity Test Report: TR1061/6

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 5 November 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: TR1061/7

Client:	Total Fluids SAS	**ESA Job #:**	PR1061
	24, Cours Michelet – La Défense	**Date Sampled:**	Not supplied
	92069 Paris La defense- Cedex, France	**Date Received:**	13 September 2013
Attention:	John-Philippe Robinson	**Sampled By:**	Client
Client Ref:	4505225065	**ESA Quote #:**	PL1061_q02

Lab ID No.:	**Sample Name:**	**Sample Description:**
6278	Finasol OSR 52	Chemical received at room temperature in apparent good condition
6279	Finasol OSR 51	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 either sample 6278 'Finasol OSR 52' or sample 6279 'Finasol OSR 51' 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 samples.
Source of Test Organisms:	Hatchery reared, NSW
Test Initiated:	17 October 2013 at 1345h

Sample 6278: *Finasol OSR 52*

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

Sample 6279: *Finasol OSR 51*

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: TR1061/7

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

Test Report Authorised by: Dr Rick Krassoi, Director on 5 November 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: TR1061/8

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

Client:	Total Fluids SAS	**ESA Job #:**	PR1061
	24, Cours Michelet – La Défense	**Date Sampled:**	Not supplied
	92069 Paris La defense- Cedex, France	**Date Received:**	13 September 2013
Attention:	John-Philippe Robinson	**Sampled By:**	Client
Client Ref:	4505225065	**ESA Quote #:**	PL1061_q02

Lab ID No.:	Sample Name:	Sample Description:
6278	Finasol OSR 52	Chemical received at room temperature in apparent good condition
6279	Finasol OSR 51	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 either sample 6278 'Finasol OSR 52' or sample 6279 'Finasol OSR 51' 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 samples.
Source of Test Organisms:	Hatchery reared, QLD
Test Initiated:	15 January 2014 at 1300h

Sample 6278: *Finasol OSR 52*

Concentration (mg/L)	% Unaffected (Mean ± SD)
FSW Control	90.0 ± 11.6
1.3	85.0 ± 19.2
2.5	95.0 ± 10.0
5.0	70.0 ± 11.6
10.0	65.0 ± 19.2
20.0	90.0 ± 11.6

96-hr IC10 = Not reliable*
96-hr IC50 = >20.0mg/L
NOEC = 20mg/L
LOEC = >20mg/L

Sample 6279: *Finasol OSR 51*

Concentration (mg/L)	% Unaffected (Mean ± SD)
FSW Control	90.0 ± 11.6
1.3	80.0 ± 16.3
2.5	80.0 ± 28.3
5.0	80.0 ± 16.3
10.0	70.0 ± 20.0
20.0	80.0 ± 16.3

96-hr IC10 = Not reliable*
96-hr IC50 = >20mg/L
NOEC = 20mg/L
LOEC = >20mg/L

*IC10 values are not reliable due to variability within each concentration.

QA/QC Parameter	Criterion	This Test	Criterion met?
Control mean % unaffected	≥90.0%	90%	Yes
Reference Toxicant within cusum chart limits	1.3-34.3mg SDS/L	10.2mg SDS/L	Yes

Toxicity Test Report: TR1061/8

Test Report Authorised by: Dr Rick Krassoi, Director on 22 January 2014

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 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.

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Statistical Printouts for the Mussel Toxicity Tests

Bivalve Larval Development Test-Proportion Normal

Start Date:	16/10/2013 14:30	Test ID:	PR1061/03	Sample ID:	Finasol OSR 52
End Date:	19/10/2013 14:30	Lab ID:	6278	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 106	Test Species:	MG-Mytilus galloprovincialis
Comments:					

Conc-mg/L	1	2	3	4
FSW Control	0.7100	0.7600	0.8400	0.7200
1.3	0.7600	0.8000	0.8300	0.7100
2.5	0.8000	0.8300	0.7200	0.7800
5	0.7600	0.8300	0.8000	0.7300
10	0.6900	0.7300	0.7100	0.7400
20	0.0000	0.0000	0.0000	0.0000

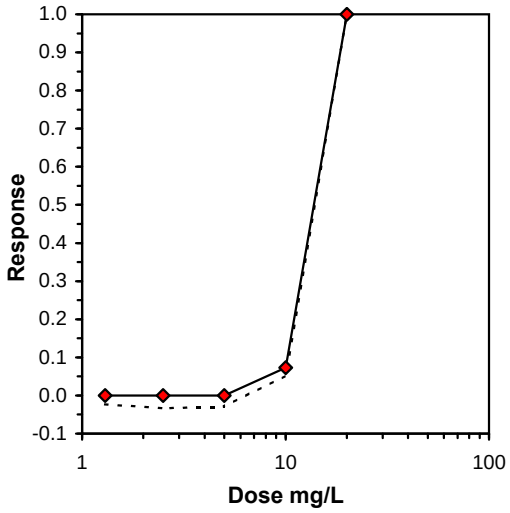
			Transform: Arcsin Square Root					1-Tailed			Number	Total
Conc-mg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Resp	Number
FSW Control	0.7575	1.0000	1.0584	1.0021	1.1593	6.767	4				97	400
1.3	0.7750	1.0231	1.0785	1.0021	1.1458	5.759	4	-0.510	2.360	0.0931	90	400
2.5	0.7825	1.0330	1.0872	1.0132	1.1458	5.130	4	-0.731	2.360	0.0931	87	400
5	0.7800	1.0297	1.0840	1.0244	1.1458	4.923	4	-0.651	2.360	0.0931	88	400
10	0.7175	0.9472	1.0106	0.9803	1.0357	2.432	4	1.210	2.360	0.0931	113	400
20	0.0000	0.0000	0.0500	0.0500	0.0500	0.000	4				400	400

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.972263	0.905	0.215374	-0.6098
Bartlett's Test indicates equal variances (p = 0.61)	2.675503	13.2767		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	10	20	14.14214		0.083556	0.110001	0.004028	0.00311	0.316025	4, 15
Treatments vs FSW Control										

Trimmed Spearman-Karber

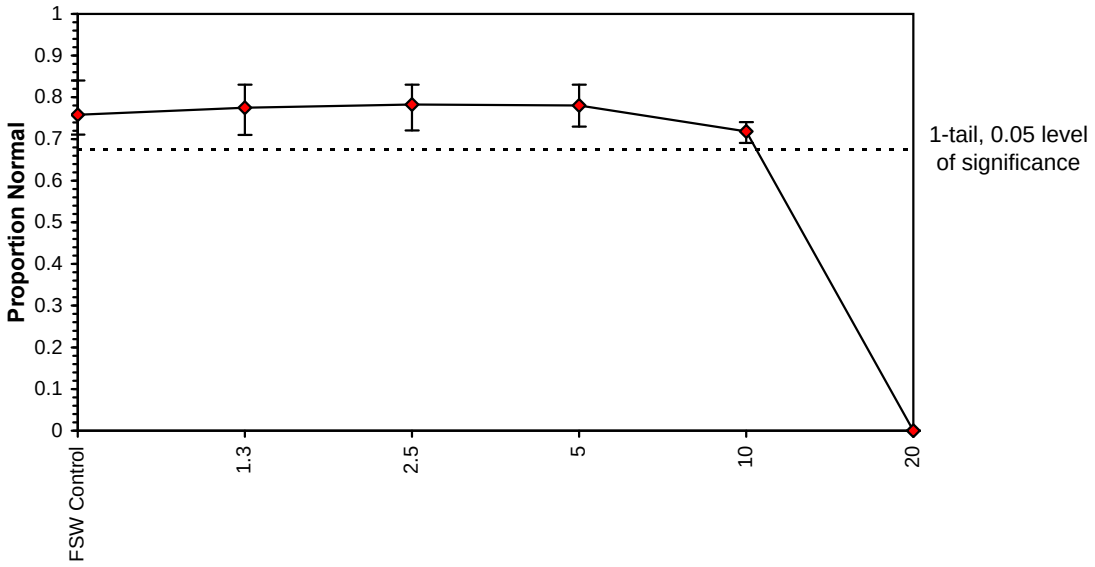
Trim Level	EC50	95% CL	
0.0%	13.447	13.207	13.691
5.0%	13.728	13.394	14.072
10.0%	13.763	13.620	13.908
20.0%	13.763	13.620	13.908
Auto-0.0%	13.447	13.207	13.691



Bivalve Larval Development Test-Proportion Normal

Start Date:	16/10/2013 14:30	Test ID:	PR1061/03	Sample ID:	Finasol OSR 52
End Date:	19/10/2013 14:30	Lab ID:	6278	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 106	Test Species:	MG-Mytilus galloprovincialis
Comments:					

Dose-Response Plot



Bivalve Larval Development Test-Proportion Normal

Start Date:	16/10/2013 14:30	Test ID:	PR1061/03	Sample ID:	Finasol OSR 52
End Date:	19/10/2013 14:30	Lab ID:	6278	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 106	Test Species:	MG-Mytilus galloprovincialis
Comments:					

		Auxiliary Data Summary					
Conc-mg/L	**Parameter**	**Mean**	**Min**	**Max**	**SD**	**CV%**	**N**
FSW Control	% Normal	75.75	71.00	84.00	5.91	3.21	4
1.3		77.50	71.00	83.00	5.20	2.94	4
2.5		78.25	72.00	83.00	4.65	2.75	4
5		78.00	73.00	83.00	4.40	2.69	4
10		71.75	69.00	74.00	2.22	2.08	4
20		0.00	0.00	0.00	0.00		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		8.10	8.10	8.10	0.00	0.00	1
5		8.10	8.10	8.10	0.00	0.00	1
10		8.10	8.10	8.10	0.00	0.00	1
20		8.10	8.10	8.10	0.00	0.00	1
FSW Control	Salinity ppt	34.90	34.90	34.90	0.00	0.00	1
1.3		35.10	35.10	35.10	0.00	0.00	1
2.5		35.20	35.20	35.20	0.00	0.00	1
5		35.30	35.30	35.30	0.00	0.00	1
10		35.40	35.40	35.40	0.00	0.00	1
20		35.40	35.40	35.40	0.00	0.00	1
FSW Control	DO %	97.10	97.10	97.10	0.00	0.00	1
1.3		97.70	97.70	97.70	0.00	0.00	1
2.5		95.20	95.20	95.20	0.00	0.00	1
5		96.20	96.20	96.20	0.00	0.00	1
10		96.80	96.80	96.80	0.00	0.00	1
20		96.90	96.90	96.90	0.00	0.00	1

Bivalve Larval Development Test-Proportion Normal

Start Date:	16/10/2013 14:30	Test ID:	PR1061/03	Sample ID:	Finasol OSR 52
End Date:	19/10/2013 14:30	Lab ID:	6278	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 106	Test Species:	MG-Mytilus galloprovincialis
Comments:					

Conc-mg/L	1	2	3	4
FSW Control	0.7100	0.7600	0.8400	0.7200
1.3	0.7600	0.8000	0.8300	0.7100
2.5	0.8000	0.8300	0.7200	0.7800
5	0.7600	0.8300	0.8000	0.7300
10	0.6900	0.7300	0.7100	0.7400
20	0.0000	0.0000	0.0000	0.0000

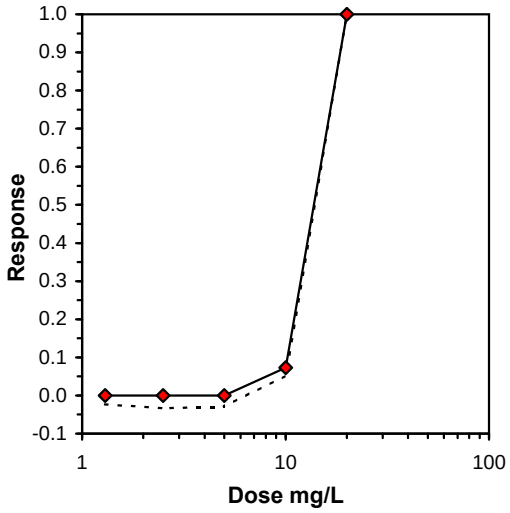
			Transform: Arcsin Square Root					1-Tailed			Isotonic	
Conc-mg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
FSW Control	0.7575	1.0000	1.0584	1.0021	1.1593	6.767	4				0.7738	1.0000
1.3	0.7750	1.0231	1.0785	1.0021	1.1458	5.759	4	-0.510	2.360	0.0931	0.7738	1.0000
2.5	0.7825	1.0330	1.0872	1.0132	1.1458	5.130	4	-0.731	2.360	0.0931	0.7738	1.0000
5	0.7800	1.0297	1.0840	1.0244	1.1458	4.923	4	-0.651	2.360	0.0931	0.7738	1.0000
10	0.7175	0.9472	1.0106	0.9803	1.0357	2.432	4	1.210	2.360	0.0931	0.7175	0.9273
20	0.0000	0.0000	0.0500	0.0500	0.0500	0.000	4				0.0000	0.0000

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.972263	0.905	0.215374	-0.6098
Bartlett's Test indicates equal variances (p = 0.61)	2.675503	13.2767		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	10	20	14.14214		0.083556	0.110001	0.004028	0.00311	0.316025	4, 15
Treatments vs FSW Control										

Log-Logit Interpolation (200 Resamples)

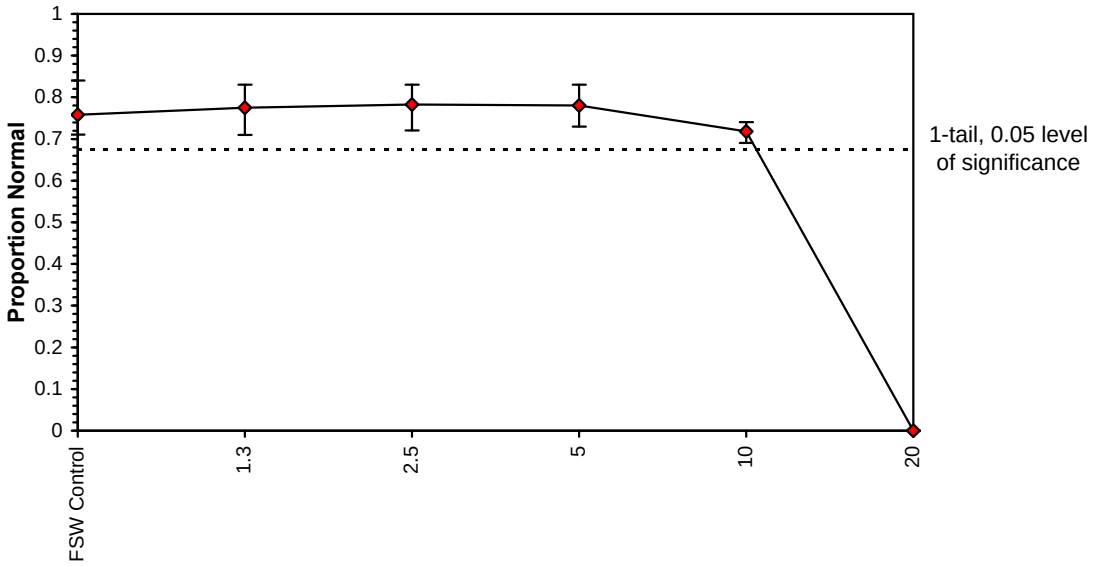
Point	mg/L	SD	95% CL(Exp)		Skew
IC05	8.188	1.790	0.000	11.149	-1.1450
IC10	10.072	0.451	7.976	10.222	-4.2507
IC15	10.197	0.052	10.020	10.339	0.0177
IC20	10.318	0.050	10.146	10.454	0.0232
IC25	10.435	0.047	10.273	10.567	0.0247
IC40	10.781	0.042	10.639	10.899	0.0183
IC50	11.021	0.040	10.889	11.135	0.0113



Bivalve Larval Development Test-Proportion Normal

Start Date:	16/10/2013 14:30	Test ID:	PR1061/03	Sample ID:	Finasol OSR 52
End Date:	19/10/2013 14:30	Lab ID:	6278	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 106	Test Species:	MG-Mytilus galloprovincialis
Comments:					

Dose-Response Plot



Bivalve Larval Development Test-Proportion Normal

Start Date:	16/10/2013 14:30	Test ID:	PR1061/03	Sample ID:	Finasol OSR 52
End Date:	19/10/2013 14:30	Lab ID:	6278	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 106	Test Species:	MG-Mytilus galloprovincialis
Comments:					

		Auxiliary Data Summary					
Conc-mg/L	**Parameter**	**Mean**	**Min**	**Max**	**SD**	**CV%**	**N**
FSW Control	% Normal	75.75	71.00	84.00	5.91	3.21	4
1.3		77.50	71.00	83.00	5.20	2.94	4
2.5		78.25	72.00	83.00	4.65	2.75	4
5		78.00	73.00	83.00	4.40	2.69	4
10		71.75	69.00	74.00	2.22	2.08	4
20		0.00	0.00	0.00	0.00		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		8.10	8.10	8.10	0.00	0.00	1
5		8.10	8.10	8.10	0.00	0.00	1
10		8.10	8.10	8.10	0.00	0.00	1
20		8.10	8.10	8.10	0.00	0.00	1
FSW Control	Salinity ppt	34.90	34.90	34.90	0.00	0.00	1
1.3		35.10	35.10	35.10	0.00	0.00	1
2.5		35.20	35.20	35.20	0.00	0.00	1
5		35.30	35.30	35.30	0.00	0.00	1
10		35.40	35.40	35.40	0.00	0.00	1
20		35.40	35.40	35.40	0.00	0.00	1
FSW Control	DO %	97.10	97.10	97.10	0.00	0.00	1
1.3		97.70	97.70	97.70	0.00	0.00	1
2.5		95.20	95.20	95.20	0.00	0.00	1
5		96.20	96.20	96.20	0.00	0.00	1
10		96.80	96.80	96.80	0.00	0.00	1
20		96.90	96.90	96.90	0.00	0.00	1

Bivalve Larval Development Test-Proportion Normal

Start Date:	16/10/2013 14:30	Test ID:	PR1061/02	Sample ID:	Finasol OSR 51
End Date:	19/10/2013 14:30	Lab ID:	6279	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 106	Test Species:	MG-Mytilus galloprovincialis
Comments:					

Conc-mg/L	1	2	3	4
FSW Control	0.7100	0.7600	0.8400	0.7200
1.3	0.7600	0.7100	0.7900	0.7200
2.5	0.7700	0.8400	0.7200	0.6900
5	0.7500	0.7000	0.8300	0.7600
10	0.7400	0.6900	0.8000	0.7200
20	0.0000	0.0400	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	0.7575	1.0000	1.0584	1.0021	1.1593	6.767	4			97	400
1.3	0.7450	0.9835	1.0422	1.0021	1.0948	4.103	4	17.50	10.00	102	400
2.5	0.7550	0.9967	1.0558	0.9803	1.1593	7.426	4	18.00	10.00	98	400
5	0.7600	1.0033	1.0607	0.9912	1.1458	6.028	4	17.50	10.00	96	400
10	0.7375	0.9736	1.0341	0.9803	1.1071	5.199	4	16.50	10.00	105	400
*20	0.0100	0.0132	0.0879	0.0500	0.2014	86.129	4	10.00	10.00	396	400

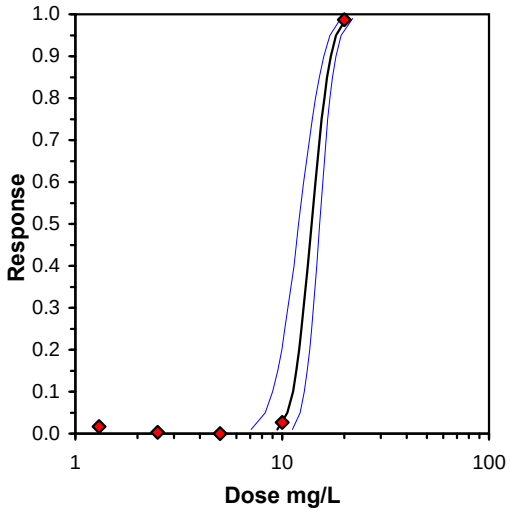
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.890273	0.916	0.781989	-0.62371
Bartlett's Test indicates equal variances (p = 0.94)	1.287674	15.08627		

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

Maximum Likelihood-Probit

Parameter	Value	SE	95% Fiducial Limits		Control	Chi-Sq	Critical	P-value	Mu	Sigma	Iter
Slope	14.03755	2.108162	9.905557	18.16955	0.2425	0.25888	7.814728	0.97	1.142981	0.071237	6
Intercept	-11.0447	2.67868	-16.2949	-5.79444							
TSCR	0.245625	0.010761	0.224533	0.266717							

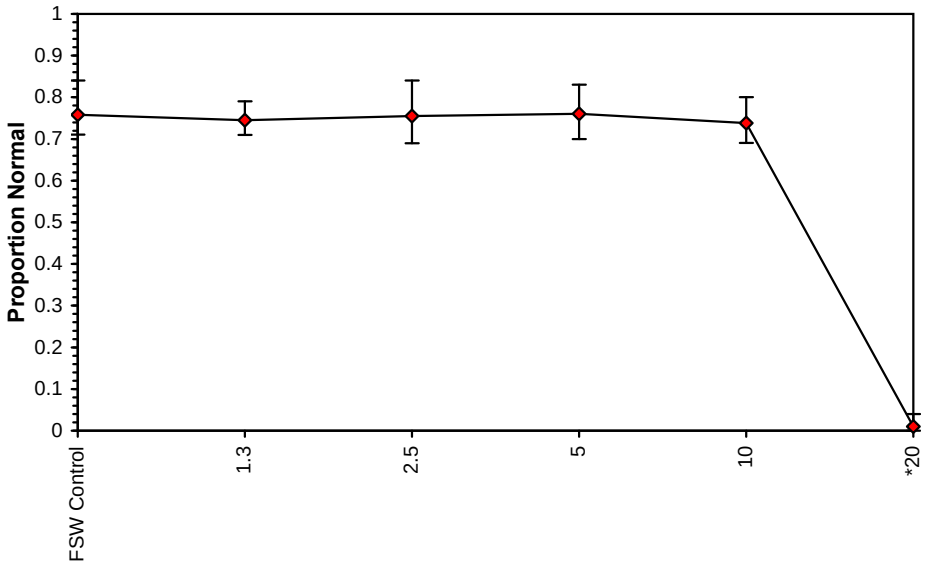
Point	Probits	mg/L	95% Fiducial Limits	
EC01	2.674	9.489809	7.074377	11.18177
EC05	3.355	10.6122	8.275415	12.21
EC10	3.718	11.26383	8.994573	12.79961
EC15	3.964	11.72594	9.513405	13.21531
EC20	4.158	12.1067	9.945988	13.55671
EC25	4.326	12.44319	10.33184	13.85783
EC40	4.747	13.33315	11.36652	14.65344
EC50	5.000	13.89891	12.03304	15.16044
EC60	5.253	14.48867	12.73284	15.69212
EC75	5.674	15.52493	13.9668	16.64195
EC80	5.842	15.95643	14.47859	17.04692
EC85	6.036	16.47455	15.08811	17.54391
EC90	6.282	17.15043	15.86944	18.21526
EC95	6.645	18.20354	17.0379	19.33092
EC99	7.326	20.35653	19.17472	21.9405



Bivalve Larval Development Test-Proportion Normal

Start Date:	16/10/2013 14:30	Test ID:	PR1061/02	Sample ID:	Finasol OSR 51
End Date:	19/10/2013 14:30	Lab ID:	6279	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 106	Test Species:	MG-Mytilus galloprovincialis
Comments:					

Dose-Response Plot



Bivalve Larval Development Test-Proportion Normal

Start Date:	16/10/2013 14:30	Test ID:	PR1061/02	Sample ID:	Finasol OSR 51
End Date:	19/10/2013 14:30	Lab ID:	6279	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 106	Test Species:	MG-Mytilus galloprovincialis
Comments:					

Auxiliary Data Summary

Conc-mg/L	Parameter	Mean	Min	Max	SD	CV%	N
FSW Control	% Normal	75.75	71.00	84.00	5.91	3.21	4
1.3		74.50	71.00	79.00	3.70	2.58	4
2.5		75.50	69.00	84.00	6.56	3.39	4
5		76.00	70.00	83.00	5.35	3.04	4
10		73.75	69.00	80.00	4.65	2.92	4
20		1.00	0.00	4.00	2.00	141.42	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		8.10	8.10	8.10	0.00	0.00	1
5		8.10	8.10	8.10	0.00	0.00	1
10		8.10	8.10	8.10	0.00	0.00	1
20		8.10	8.10	8.10	0.00	0.00	1
FSW Control	Salinity ppt	34.90	34.90	34.90	0.00	0.00	1
1.3		35.30	35.30	35.30	0.00	0.00	1
2.5		35.20	35.20	35.20	0.00	0.00	1
5		35.30	35.30	35.30	0.00	0.00	1
10		35.40	35.40	35.40	0.00	0.00	1
20		35.40	35.40	35.40	0.00	0.00	1
FSW Control	DO %	97.10	97.10	97.10	0.00	0.00	1
1.3		97.70	97.70	97.70	0.00	0.00	1
2.5		97.90	97.90	97.90	0.00	0.00	1
5		97.00	97.00	97.00	0.00	0.00	1
10		97.20	97.20	97.20	0.00	0.00	1
20		97.20	97.20	97.20	0.00	0.00	1

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Statistical Printouts for the *Nitzschia* Growth Inhibition Tests

Marine Algal Growth Test-Cell Yield

Start Date:	1/10/2013 14:45	Test ID:	PR1061/05	Sample ID:	Finasol OSR 52
End Date:	4/10/2013 15:30	Lab ID:	6278	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 110	Test Species:	NC-Nitzschia closterium
Comments:					

Conc-mg/L	1	2	3	4	5	6	7	8
FSW Control	104.33	112.93	116.13	98.93	108.53	119.73	111.73	114.73
1.3	96.13	88.53	108.93	114.73				
2.5	107.73	127.93	115.73	117.13				
5	125.93	121.73	136.13	111.53				
10	91.93	81.53	95.73	94.53				
20	33.93	21.73	36.53	36.73				

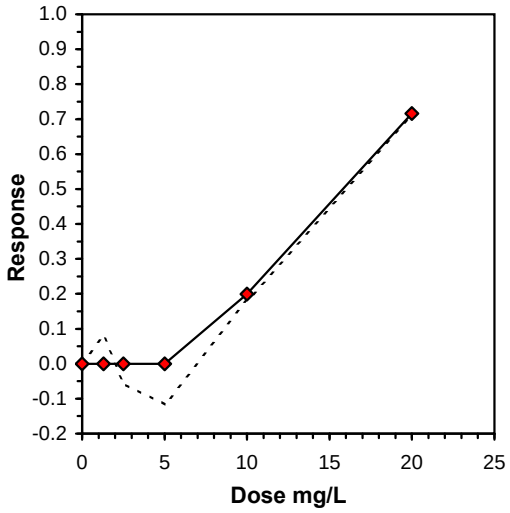
			Transform: Untransformed					1-Tailed			Isotonic	
Conc-mg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
FSW Control	110.88	1.0000	110.88	98.93	119.73	6.068	8				113.48	1.0000
1.3	102.08	0.9206	102.08	88.53	114.73	11.673	4	1.718	2.508	12.84	113.48	1.0000
2.5	117.13	1.0564	117.13	107.73	127.93	7.091	4	-1.221	2.508	12.84	113.48	1.0000
5	123.83	1.1168	123.83	111.53	136.13	8.228	4	-2.529	2.508	12.84	113.48	1.0000
*10	90.93	0.8201	90.93	81.53	95.73	7.109	4	3.896	2.508	12.84	90.93	0.8013
*20	32.23	0.2907	32.23	21.73	36.73	22.077	4	15.359	2.508	12.84	32.23	0.2840

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.950308	0.924	-0.24827	-0.78761
Bartlett's Test indicates equal variances (p = 0.84)	2.048028	15.08627		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Bonferroni t Test	5	10	7.071068		12.8447	0.115844	4605.368	69.92773	1.7E-12	5, 22
Treatments vs FSW Control										

Linear Interpolation (200 Resamples)

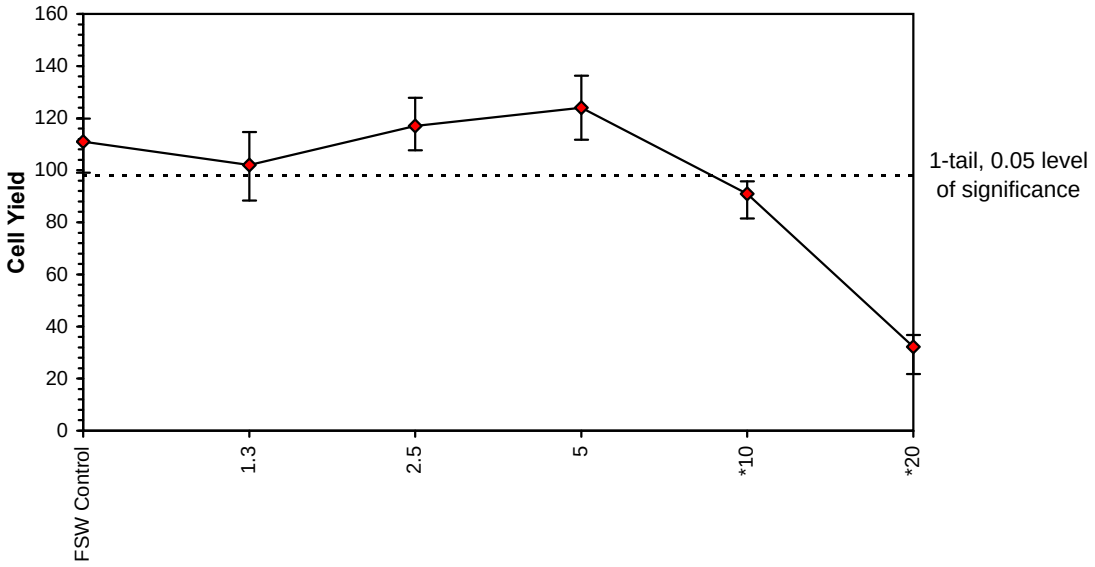
Point	mg/L	SD	95% CL(Exp)		Skew
IC05	6.258	0.228	5.352	6.789	-0.5469
IC10	7.516	0.372	6.491	8.577	0.1845
IC15	8.774	0.568	7.267	10.446	0.2475
IC20	10.025	0.590	8.027	11.279	-0.2593
IC25	10.991	0.552	9.030	12.141	-0.3948
IC40	13.891	0.451	12.262	14.946	-0.3034
IC50	15.824	0.430	14.376	16.830	-0.2906



Marine Algal Growth Test-Cell Yield

Start Date:	1/10/2013 14:45	Test ID:	PR1061/05	Sample ID:	Finasol OSR 52
End Date:	4/10/2013 15:30	Lab ID:	6278	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 110	Test Species:	NC-Nitzschia closterium
Comments:					

Dose-Response Plot



Marine Algal Growth Test-Cell Yield

Start Date:	1/10/2013 14:45	Test ID:	PR1061/05	Sample ID:	Finasol OSR 52
End Date:	4/10/2013 15:30	Lab ID:	6278	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	110.88	98.93	119.73	6.73	2.34	8
1.3		102.08	88.53	114.73	11.92	3.38	4
2.5		117.13	107.73	127.93	8.31	2.46	4
5		123.83	111.53	136.13	10.19	2.58	4
10		90.93	81.53	95.73	6.46	2.80	4
20		32.23	21.73	36.73	7.12	8.28	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		8.20	8.20	8.20	0.00	0.00	1
FSW Control	Salinity ppt	35.00	35.00	35.00	0.00	0.00	1
1.3		35.40	35.40	35.40	0.00	0.00	1
2.5		35.30	35.30	35.30	0.00	0.00	1
5		35.40	35.40	35.40	0.00	0.00	1
10		35.50	35.50	35.50	0.00	0.00	1
20		35.50	35.50	35.50	0.00	0.00	1

Marine Algal Growth Test-Cell Yield

Start Date:	1/10/2013 14:45	Test ID:	PR1061/04	Sample ID:	Finasol OSR 51
End Date:	4/10/2013 15:30	Lab ID:	6279	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 110	Test Species:	NC-Nitzschia closterium
Comments:					

Conc-mg/L	1	2	3	4	5	6	7	8
FSW Control	104.33	112.93	116.13	98.93	108.53	119.73	111.73	114.73
1.3	97.53	119.53	96.53	93.33				
2.5	87.93	118.13	100.73	111.73				
5	93.73	110.13	115.33	106.53				
10	106.13	87.33	103.53	112.13				
20	82.33	92.73	83.53	82.13				

			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	110.88	1.0000	110.879	98.929	119.729	6.068	8				110.88	1.0000
1.3	101.73	0.9175	101.729	93.329	119.529	11.797	4	1.590	2.508	14.439	104.26	0.9403
2.5	104.63	0.9436	104.629	87.929	118.129	12.665	4	1.086	2.508	14.439	104.26	0.9403
5	106.43	0.9599	106.429	93.729	115.329	8.649	4	0.773	2.508	14.439	104.26	0.9403
10	102.28	0.9224	102.279	87.329	112.129	10.361	4	1.494	2.508	14.439	102.28	0.9224
*20	85.18	0.7682	85.179	82.129	92.729	5.954	4	4.465	2.508	14.439	85.18	0.7682

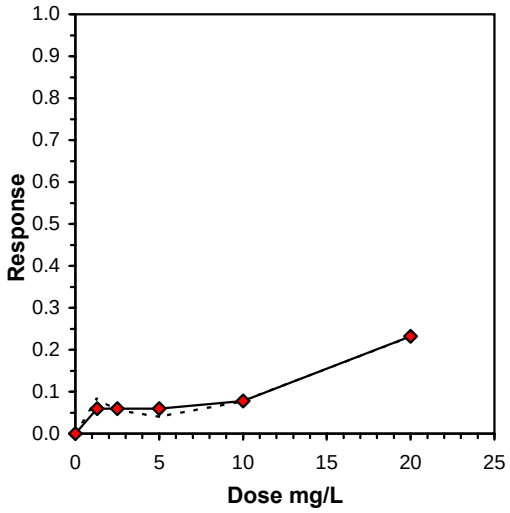
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.985869	0.924	-0.0919	-0.28492
Bartlett's Test indicates equal variances (p = 0.58)	3.816985	15.08627		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Bonferroni t Test	10	20	14.14214		14.43882	0.130222	366.5189	88.36182	0.008334	5, 22
Treatments vs FSW Control										

Linear Interpolation (200 Resamples)

Point	mg/L	SD	95% CL(Exp)		Skew
IC05*	1.089	3.865	0.247	19.049	0.8980
IC10	11.455	3.478	0.000	17.522	-1.3040
IC15	14.697				
IC20	17.939				
IC25	>20				
IC40	>20				
IC50	>20				

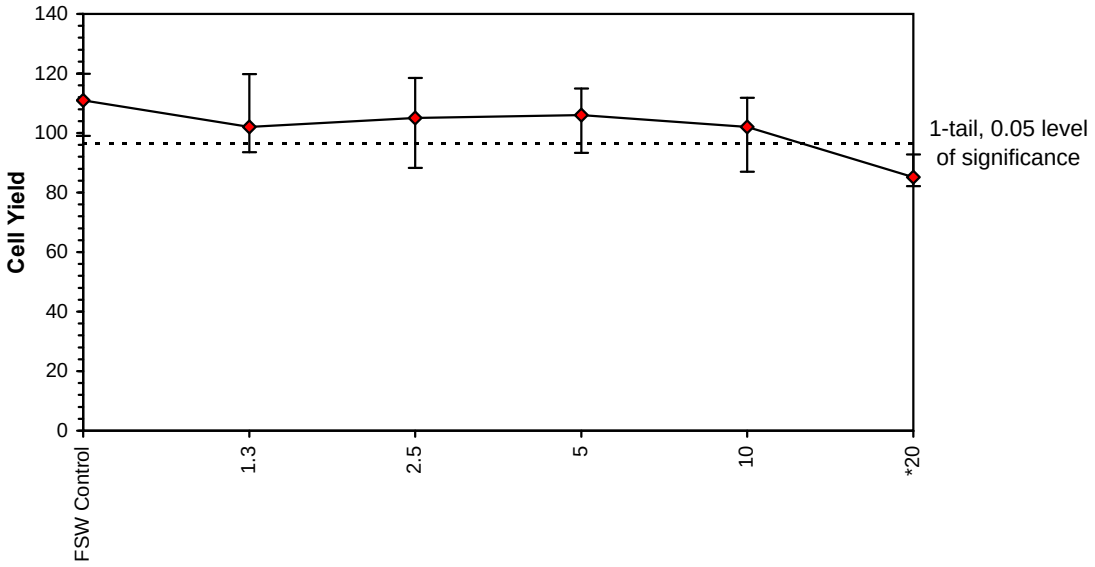
* indicates IC estimate less than the lowest concentration



Marine Algal Growth Test-Cell Yield

Start Date:	1/10/2013 14:45	Test ID:	PR1061/04	Sample ID:	Finasol OSR 51
End Date:	4/10/2013 15:30	Lab ID:	6279	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 110	Test Species:	NC-Nitzschia closterium
Comments:					

Dose-Response Plot



Marine Algal Growth Test-Cell Yield

Start Date:	1/10/2013 14:45	Test ID:	PR1061/04	Sample ID:	Finasol OSR 51
End Date:	4/10/2013 15:30	Lab ID:	6279	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	110.88	98.93	119.73	6.73	2.34	8
1.3		101.73	93.33	119.53	12.00	3.41	4
2.5		104.63	87.93	118.13	13.25	3.48	4
5		106.43	93.73	115.33	9.21	2.85	4
10		102.28	87.33	112.13	10.60	3.18	4
20		85.18	82.13	92.73	5.07	2.64	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	35.00	35.00	35.00	0.00	0.00	1
1.3		35.40	35.40	35.40	0.00	0.00	1
2.5		35.30	35.30	35.30	0.00	0.00	1
5		35.40	35.40	35.40	0.00	0.00	1
10		35.50	35.50	35.50	0.00	0.00	1
20		35.50	35.50	35.50	0.00	0.00	1

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Statistical Printouts for the Acute *Allorchestes* Toxicity Test

Amphipod Acute Toxicity Test-96 hr survival

Start Date:	26/09/2013 14:30	Test ID:	PR1061/03	Sample ID:	Finasol OSR 52
End Date:	30/09/2013 14:00	Lab ID:	6278	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 108	Test Species:	AC-Allorchestes compressa
Comments:					

Conc-mg/L	1	2	3	4
FSW Control	1.0000	1.0000	1.0000	1.0000
1.3	1.0000	1.0000	0.8000	1.0000
2.5	0.8000	0.8000	0.8000	0.8000
5	0.0000	0.0000	0.0000	0.0000
10	0.0000	0.0000	0.0000	0.0000
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	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4			0	20
1.3	0.9500	0.9500	1.2857	1.1071	1.3453	9.261	4	16.00	11.00	1	20
*2.5	0.8000	0.8000	1.1071	1.1071	1.1071	0.000	4	10.00	11.00	4	20
5	0.0000	0.0000	0.2255	0.2255	0.2255	0.000	4			20	20
10	0.0000	0.0000	0.2255	0.2255	0.2255	0.000	4			20	20
20	0.0000	0.0000	0.2255	0.2255	0.2255	0.000	4			20	20

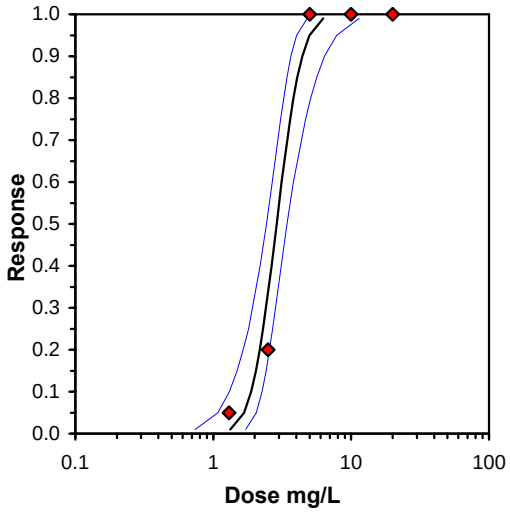
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.633513	0.859	-2.29783	7.088889
Equality of variance cannot be confirmed				

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	1.3	2.5	1.802776	
Treatments vs FSW Control				

Maximum Likelihood-Probit

Parameter	Value	SE	95% Fiducial Limits		Control	Chi-Sq	Critical	P-value	Mu	Sigma	Iter
Slope	6.909343	1.476511	4.01538	9.803305	0	6.770727	7.814728	0.08	0.459547	0.144732	7
Intercept	1.824832	0.711583	0.430128	3.219535							
TSCR											

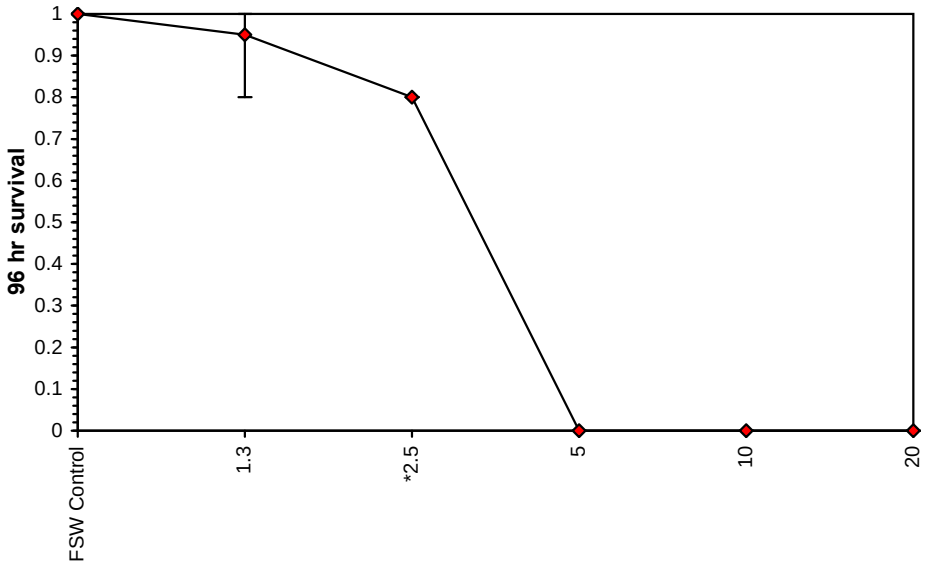
Point	Probits	mg/L	95% Fiducial Limits	
EC01	2.674	1.32694	0.738529	1.723283
EC05	3.355	1.665271	1.077299	2.049394
EC10	3.718	1.879603	1.311745	2.257612
EC15	3.964	2.039588	1.493607	2.41719
EC20	4.158	2.176396	1.651761	2.558518
EC25	4.326	2.301056	1.796397	2.692803
EC40	4.747	2.647767	2.188626	3.106541
EC50	5.000	2.881026	2.433707	3.428605
EC60	5.253	3.134833	2.677814	3.824218
EC75	5.674	3.607174	3.077139	4.67754
EC80	5.842	3.813786	3.235184	5.092569
EC85	6.036	4.0696	3.421057	5.637209
EC90	6.282	4.41599	3.659675	6.424368
EC95	6.645	4.984359	4.0281	7.829056
EC99	7.326	6.255228	4.786432	11.42972



Amphipod Acute Toxicity Test-96 hr survival

Start Date:	26/09/2013 14:30	Test ID:	PR1061/03	Sample ID:	Finasol OSR 52
End Date:	30/09/2013 14:00	Lab ID:	6278	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 108	Test Species:	AC-Allorchestes compressa
Comments:					

Dose-Response Plot



Amphipod Acute Toxicity Test-96 hr survival

Start Date:	26/09/2013 14:30	Test ID:	PR1061/03	Sample ID:	Finasol OSR 52
End Date:	30/09/2013 14:00	Lab ID:	6278	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 108	Test Species:	AC-Allorchestes compressa
Comments:					

Auxiliary Data Summary

Conc-mg/L	Parameter	Mean	Min	Max	SD	CV%	N
FSW Control	% Non-immobilised	100.00	100.00	100.00	0.00	0.00	4
1.3		95.00	80.00	100.00	10.00	3.33	4
2.5		80.00	80.00	80.00	0.00	0.00	4
5		0.00	0.00	0.00	0.00		4
10		0.00	0.00	0.00	0.00		4
20		0.00	0.00	0.00	0.00		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		8.20	8.20	8.20	0.00	0.00	1
FSW Control	DO %	106.90	106.90	106.90	0.00	0.00	1
1.3		101.70	101.70	101.70	0.00	0.00	1
2.5		101.70	101.70	101.70	0.00	0.00	1
5		101.20	101.20	101.20	0.00	0.00	1
10		100.60	100.60	100.60	0.00	0.00	1
20		100.10	100.10	100.10	0.00	0.00	1
FSW Control	Salinity ppt	35.20	35.20	35.20	0.00	0.00	1
1.3		35.20	35.20	35.20	0.00	0.00	1
2.5		35.20	35.20	35.20	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

Amphipod Acute Toxicity Test-96 hr survival

Start Date:	26/09/2013 14:30	Test ID:	PR1061/02	Sample ID:	Finasol OSR 51
End Date:	30/09/2013 14:00	Lab ID:	6279	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 108	Test Species:	AC-Allorchestes compressa
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	0.4000	0.8000	0.8000	0.8000
5	0.4000	0.4000	0.8000	0.4000
10	0.0000	0.0000	0.0000	0.0000
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	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4			0	20
1.3	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4	18.00	10.00	0	20
*2.5	0.7000	0.7000	1.0015	0.6847	1.1071	21.089	4	10.00	10.00	6	20
*5	0.5000	0.5000	0.7903	0.6847	1.1071	26.725	4	10.00	10.00	10	20
10	0.0000	0.0000	0.2205	0.2056	0.2255	4.522	4			21	21
20	0.0000	0.0000	0.2255	0.2255	0.2255	0.000	4			20	20

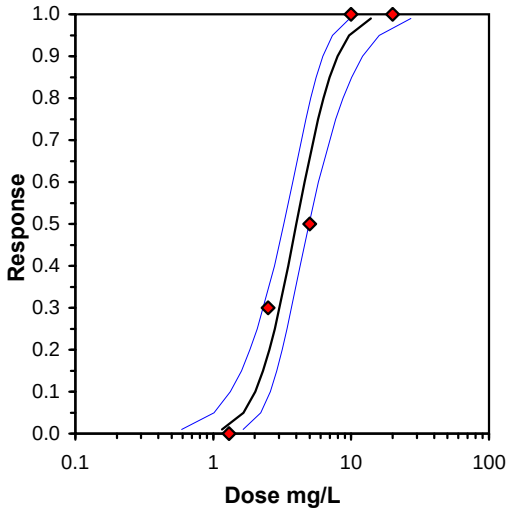
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.875391	0.887	1.22E-15	2.82967
Equality of variance cannot be confirmed				

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	1.3	2.5	1.802776	
Treatments vs FSW Control				

Maximum Likelihood-Probit

Parameter	Value	SE	95% Fiducial Limits		Control	Chi-Sq	Critical	P-value	Mu	Sigma	Iter
Slope	4.300588	0.733242	2.863433	5.737744	0	5.242217	7.814728	0.15	0.603561	0.232526	6
Intercept	2.404334	0.481665	1.46027	3.348398							
TSCR											

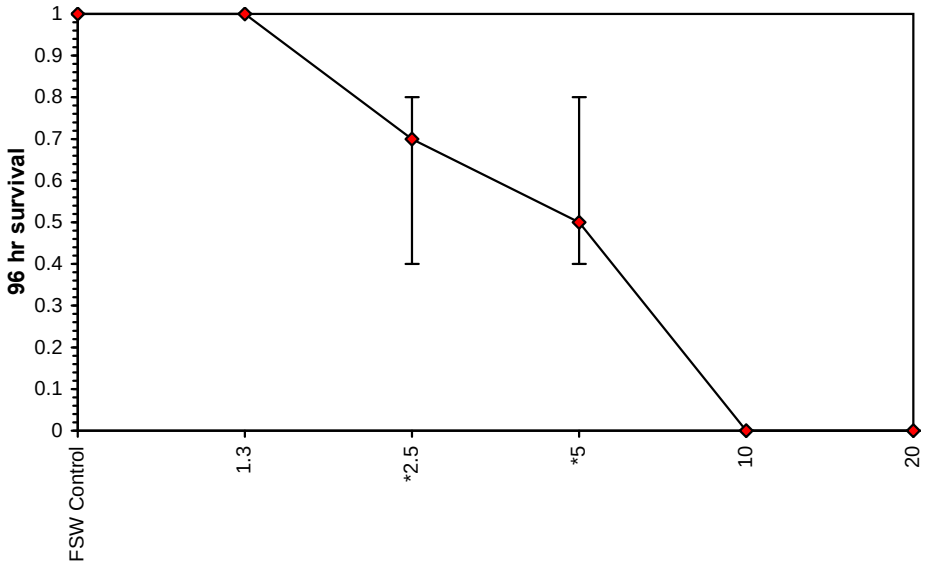
Point	Probits	mg/L	95% Fiducial Limits	
EC01	2.674	1.15511	0.590417	1.651045
EC05	3.355	1.663753	1.005232	2.205083
EC10	3.718	2.020999	1.328205	2.585952
EC15	3.964	2.304425	1.597369	2.889371
EC20	4.158	2.55777	1.844371	3.164809
EC25	4.326	2.797203	2.080863	3.431218
EC40	4.747	3.504699	2.776135	4.272932
EC50	5.000	4.013845	3.254874	4.946107
EC60	5.253	4.596957	3.769651	5.795993
EC75	5.674	5.759665	4.697605	7.727288
EC80	5.842	6.298827	5.094007	8.716459
EC85	6.036	6.991311	5.580564	10.06257
EC90	6.282	7.971774	6.236331	12.09987
EC95	6.645	9.683499	7.314609	15.98502
EC99	7.326	13.94754	9.770628	27.21166



Amphipod Acute Toxicity Test-96 hr survival

Start Date:	26/09/2013 14:30	Test ID:	PR1061/02	Sample ID:	Finasol OSR 51
End Date:	30/09/2013 14:00	Lab ID:	6279	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 108	Test Species:	AC-Allorchestes compressa
Comments:					

Dose-Response Plot



Amphipod Acute Toxicity Test-96 hr survival

Start Date:	26/09/2013 14:30	Test ID:	PR1061/02	Sample ID:	Finasol OSR 51
End Date:	30/09/2013 14:00	Lab ID:	6279	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 108	Test Species:	AC-Allorchestes compressa
Comments:					

Auxiliary Data Summary

Conc-mg/L	Parameter	Mean	Min	Max	SD	CV%	N
FSW Control	% Non-immobilised	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		70.00	40.00	80.00	20.00	6.39	4
5		50.00	40.00	80.00	20.00	8.94	4
10		0.00	0.00	0.00	0.00		4
20		0.00	0.00	0.00	0.00		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		8.20	8.20	8.20	0.00	0.00	1
FSW Control	DO %	106.90	106.90	106.90	0.00	0.00	1
1.3		100.60	100.60	100.60	0.00	0.00	1
2.5		99.10	99.10	99.10	0.00	0.00	1
5		100.30	100.30	100.30	0.00	0.00	1
10		99.30	99.30	99.30	0.00	0.00	1
20		99.30	99.30	99.30	0.00	0.00	1
FSW Control	Salinity ppt	35.20	35.20	35.20	0.00	0.00	1
1.3		35.20	35.20	35.20	0.00	0.00	1
2.5		35.20	35.20	35.20	0.00	0.00	1
5		35.20	35.20	35.20	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

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Statistical Printouts for the Juvenile Copepod Tests

Marine Copepod Acute Test-48-hr Survival

Start Date:	22/10/2013 12:00	Test ID:	PR1061/16	Sample ID:	FINASOL OSR2
End Date:	24/10/2013 11:20	Lab ID:	6278	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 124	Test Species:	PC-Parvocalanus crassirostris
Comments:					

Conc-mg/L	1	2	3	4
FSW Control	1.0000	1.0000	1.0000	1.0000
0.16	1.0000	1.0000	1.0000	1.0000
0.31	1.0000	0.8000	1.0000	1.0000
0.63	1.0000	1.0000	1.0000	1.0000
1.3	1.0000	1.0000	0.8000	0.8000
2.5	0.0000	0.0000	0.2000	0.0000
5	0.0000	0.0000	0.0000	0.0000

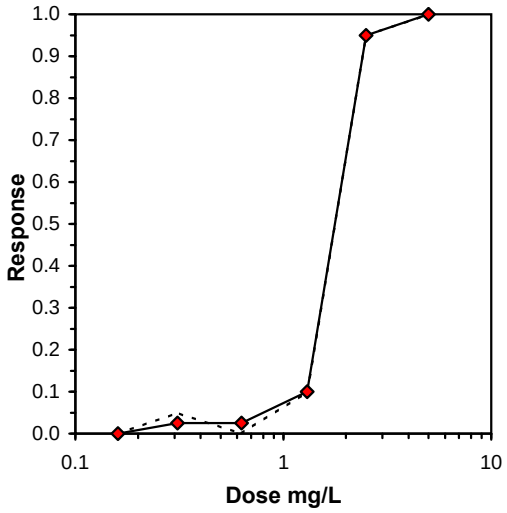
			Transform: Arcsin Square Root					Rank	1-Tailed	Number	Total
Conc-mg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Resp	Number
FSW Control	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4			0	20
0.16	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4	18.00	10.00	0	20
0.31	0.9500	0.9500	1.2857	1.1071	1.3453	9.261	4	16.00	10.00	1	20
0.63	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4	18.00	10.00	0	20
1.3	0.9000	0.9000	1.2262	1.1071	1.3453	11.212	4	14.00	10.00	2	20
*2.5	0.0500	0.0500	0.2850	0.2255	0.4636	41.771	4	10.00	10.00	19	20
5	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 non-normal distribution (p <= 0.05)	0.914881	0.916	-2.1E-14	0.896104
Equality of variance cannot be confirmed				

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	1.3	2.5	1.802776	
Treatments vs FSW Control				

Trimmed Spearman-Karber

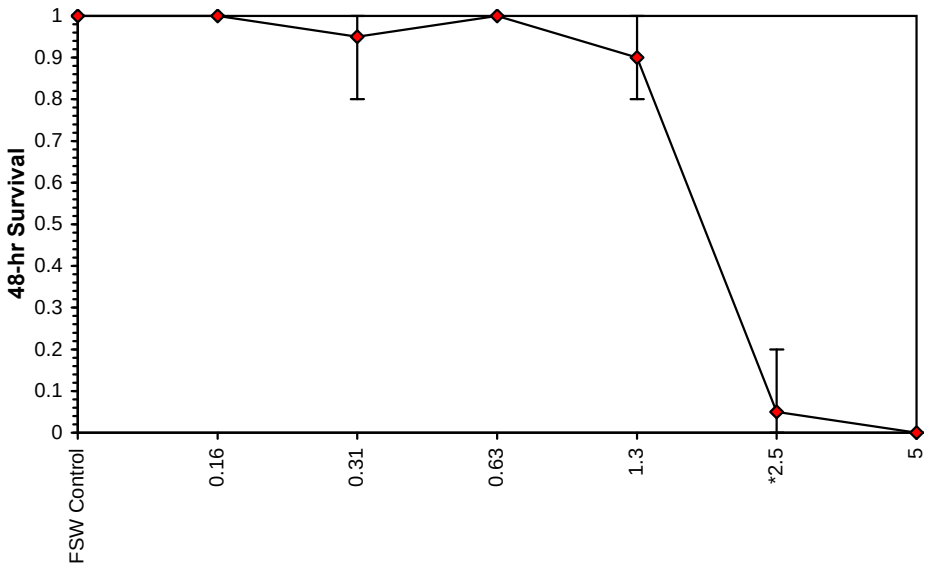
Trim Level	EC50	95% CL	
0.0%	1.6804	1.4713	1.9192
5.0%	1.7467	1.5569	1.9597
10.0%	1.7684	1.6571	1.8873
20.0%	1.7684	1.6571	1.8873
Auto-0.0%	1.6804	1.4713	1.9192



Marine Copepod Acute Test-48-hr Survival

Start Date:	22/10/2013 12:00	Test ID:	PR1061/16	Sample ID:	FINASOL OSR2
End Date:	24/10/2013 11:20	Lab ID:	6278	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 124	Test Species:	PC-Parvocalanus crassirostris
Comments:					

Dose-Response Plot



Marine Copepod Acute Test-48-hr Survival

Start Date:	22/10/2013 12:00	Test ID:	PR1061/16	Sample ID:	FINASOL OSR2
End Date:	24/10/2013 11:20	Lab ID:	6278	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 124	Test Species:	PC-Parvocalanus crassirostris
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
0.16		100.00	100.00	100.00	0.00	0.00	4
0.31		95.00	80.00	100.00	10.00	3.33	4
0.63		100.00	100.00	100.00	0.00	0.00	4
1.3		90.00	80.00	100.00	11.55	3.78	4
2.5		5.00	0.00	20.00	10.00	63.25	4
5		0.00	0.00	0.00	0.00		4
FSW Control	pH	8.20	8.20	8.20	0.00	0.00	1
0.16		8.20	8.20	8.20	0.00	0.00	1
0.31		8.20	8.20	8.20	0.00	0.00	1
0.63		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
FSW Control	Salinity ppt	35.00	35.00	35.00	0.00	0.00	1
0.16		35.30	35.30	35.30	0.00	0.00	1
0.31		35.50	35.50	35.50	0.00	0.00	1
0.63		35.60	35.60	35.60	0.00	0.00	1
1.3		35.70	35.70	35.70	0.00	0.00	1
2.5		35.70	35.70	35.70	0.00	0.00	1
5		35.80	35.80	35.80	0.00	0.00	1
FSW Control	DO %	98.10	98.10	98.10	0.00	0.00	1
0.16		98.60	98.60	98.60	0.00	0.00	1
0.31		98.20	98.20	98.20	0.00	0.00	1
0.63		98.10	98.10	98.10	0.00	0.00	1
1.3		97.90	97.90	97.90	0.00	0.00	1
2.5		98.30	98.30	98.30	0.00	0.00	1
5		98.50	98.50	98.50	0.00	0.00	1

Marine Copepod Acute Test-48-hr Survival

Start Date:	22/10/2013 12:00	Test ID:	PR1061/16	Sample ID:	FINASOL OSR2
End Date:	24/10/2013 11:20	Lab ID:	6278	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 124	Test Species:	PC-Parvocalanus crassirostris
Comments:					

Conc-mg/L	1	2	3	4
FSW Control	1.0000	1.0000	1.0000	1.0000
0.16	1.0000	1.0000	1.0000	1.0000
0.31	1.0000	0.8000	1.0000	1.0000
0.63	1.0000	1.0000	1.0000	1.0000
1.3	1.0000	1.0000	0.8000	0.8000
2.5	0.0000	0.0000	0.2000	0.0000
5	0.0000	0.0000	0.0000	0.0000

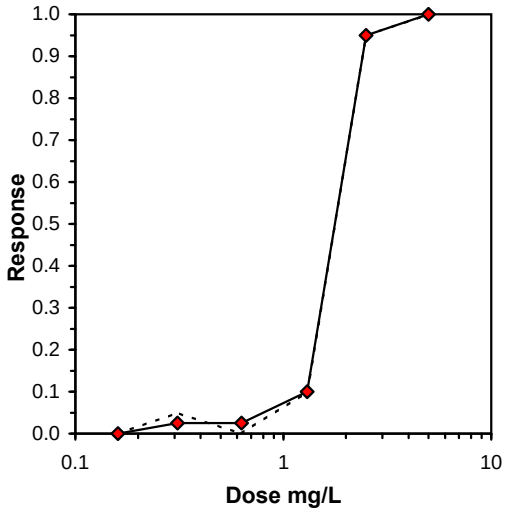
			Transform: Arcsin Square Root					Rank	1-Tailed	Isotonic	
Conc-mg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
FSW Control	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4			1.0000	1.0000
0.16	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4	18.00	10.00	1.0000	1.0000
0.31	0.9500	0.9500	1.2857	1.1071	1.3453	9.261	4	16.00	10.00	0.9750	0.9750
0.63	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4	18.00	10.00	0.9750	0.9750
1.3	0.9000	0.9000	1.2262	1.1071	1.3453	11.212	4	14.00	10.00	0.9000	0.9000
*2.5	0.0500	0.0500	0.2850	0.2255	0.4636	41.771	4	10.00	10.00	0.0500	0.0500
5	0.0000	0.0000	0.2255	0.2255	0.2255	0.000	4			0.0000	0.0000

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.914881	0.916	-2.1E-14	0.896104
Equality of variance cannot be confirmed				

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	1.3	2.5	1.802776	
Treatments vs FSW Control				

Log-Logit Interpolation (200 Resamples)

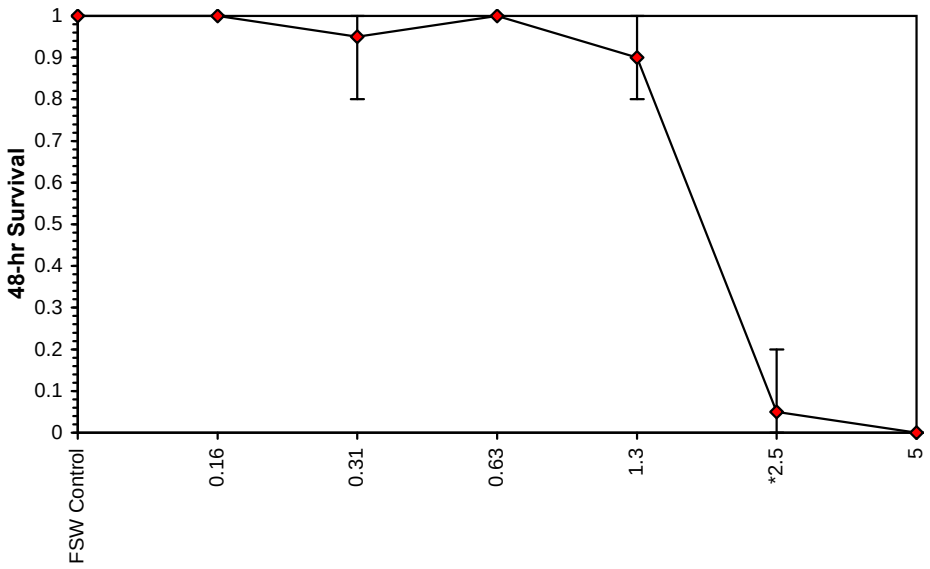
Point	mg/L	SD	95% CL(Exp)		Skew
IC05	0.9299	0.3145	0.0000	2.0870	-0.0909
IC10	1.3000	0.1735	0.8460	1.9379	0.4230
IC15	1.3885	0.1291	1.0581	1.9305	1.9412
IC20	1.4575	0.1261	1.2055	1.9239	1.9408
IC25	1.5159	0.1301	1.2601	1.9178	1.5652
IC40	1.6624	0.1516	1.2739	2.0242	0.5898
IC50	1.7520	0.1713	1.2809	2.1416	0.2008



Marine Copepod Acute Test-48-hr Survival

Start Date:	22/10/2013 12:00	Test ID:	PR1061/16	Sample ID:	FINASOL OSR2
End Date:	24/10/2013 11:20	Lab ID:	6278	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 124	Test Species:	PC-Parvocalanus crassirostris
Comments:					

Dose-Response Plot



Marine Copepod Acute Test-48-hr Survival

Start Date:	22/10/2013 12:00	Test ID:	PR1061/16	Sample ID:	FINASOL OSR2
End Date:	24/10/2013 11:20	Lab ID:	6278	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 124	Test Species:	PC-Parvocalanus crassirostris
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
0.16		100.00	100.00	100.00	0.00	0.00	4
0.31		95.00	80.00	100.00	10.00	3.33	4
0.63		100.00	100.00	100.00	0.00	0.00	4
1.3		90.00	80.00	100.00	11.55	3.78	4
2.5		5.00	0.00	20.00	10.00	63.25	4
5		0.00	0.00	0.00	0.00		4
FSW Control	pH	8.20	8.20	8.20	0.00	0.00	1
0.16		8.20	8.20	8.20	0.00	0.00	1
0.31		8.20	8.20	8.20	0.00	0.00	1
0.63		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
FSW Control	Salinity ppt	35.00	35.00	35.00	0.00	0.00	1
0.16		35.30	35.30	35.30	0.00	0.00	1
0.31		35.50	35.50	35.50	0.00	0.00	1
0.63		35.60	35.60	35.60	0.00	0.00	1
1.3		35.70	35.70	35.70	0.00	0.00	1
2.5		35.70	35.70	35.70	0.00	0.00	1
5		35.80	35.80	35.80	0.00	0.00	1
FSW Control	DO %	98.10	98.10	98.10	0.00	0.00	1
0.16		98.60	98.60	98.60	0.00	0.00	1
0.31		98.20	98.20	98.20	0.00	0.00	1
0.63		98.10	98.10	98.10	0.00	0.00	1
1.3		97.90	97.90	97.90	0.00	0.00	1
2.5		98.30	98.30	98.30	0.00	0.00	1
5		98.50	98.50	98.50	0.00	0.00	1

Marine Copepod Acute Test-48-hr Survival

Start Date:	22/10/2013 12:00	Test ID:	PR1061/15	Sample ID:	Finasol OSR 51
End Date:	24/10/2013 11:20	Lab ID:	6279	Sample Type:	CP-Chemical Product
Sample Date:		Protocol:	ESA 124	Test Species:	PC-Parvocalanus crassirostris
Comments:					

Conc-mg/L	1	2	3	4
FSW Control	1.0000	1.0000	1.0000	1.0000
0.16	1.0000	0.8000	1.0000	1.0000
0.31	1.0000	0.8000	1.0000	1.0000
0.63	0.8000	0.8000	0.8000	0.8000
1.3	0.4000	0.4000	0.8000	0.8000
2.5	0.0000	0.0000	0.0000	0.0000
5	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	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4			0	20
0.16	0.9500	0.9500	1.2857	1.1071	1.3453	9.261	4	16.00	10.00	1	20
0.31	0.9500	0.9500	1.2857	1.1071	1.3453	9.261	4	16.00	10.00	1	20
*0.63	0.8000	0.8000	1.1071	1.1071	1.1071	0.000	4	10.00	10.00	4	20
*1.3	0.6000	0.6000	0.8959	0.6847	1.1071	27.222	4	10.00	10.00	8	20
2.5	0.0000	0.0000	0.2255	0.2255	0.2255	0.000	4			20	20
5	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 non-normal distribution (p <= 0.05)	0.854776	0.905	-0.36263	0.243222
Equality of variance cannot be confirmed				

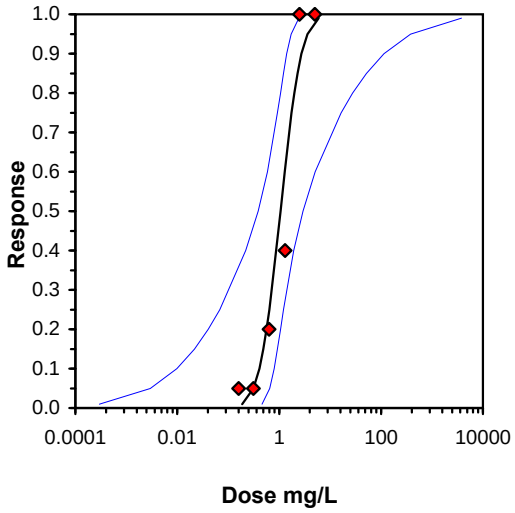
Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU
Steel's Many-One Rank Test	0.31	0.63	0.441928	
Treatments vs FSW Control				

Maximum Likelihood-Probit

Parameter	Value	SE	95% Fiducial Limits		Control	Chi-Sq	Critical	P-value	Mu	Sigma	Iter
Slope	3.09096	0.8734	0.666013	5.515907	0	14.14804	9.487729	6.8E-03	0.024852	0.323524	5
Intercept	4.923183	0.304191	4.078614	5.767752							
TSCR											

Point	Probits	mg/L	95% Fiducial Limits	
EC01	2.674	0.187164	0.000296	0.462044
EC05	3.355	0.310958	0.002954	0.648899
EC10	3.718	0.407605	0.009864	0.794038
EC15	3.964	0.489261	0.021899	0.924602
EC20	4.158	0.565676	0.040651	1.059553
EC25	4.326	0.640676	0.067986	1.210646
EC40	4.747	0.876775	0.219761	1.915011
EC50	5.000	1.058893	0.385198	2.915836
EC60	5.253	1.27884	0.586056	5.11484
EC75	5.674	1.750112	0.92631	16.54626
EC80	5.842	1.982152	1.058235	27.6769
EC85	6.036	2.29173	1.21254	51.38389
EC90	6.282	2.750837	1.411776	114.0863
EC95	6.645	3.605802	1.727397	381.0306
EC99	7.326	5.990759	2.425794	3804.476

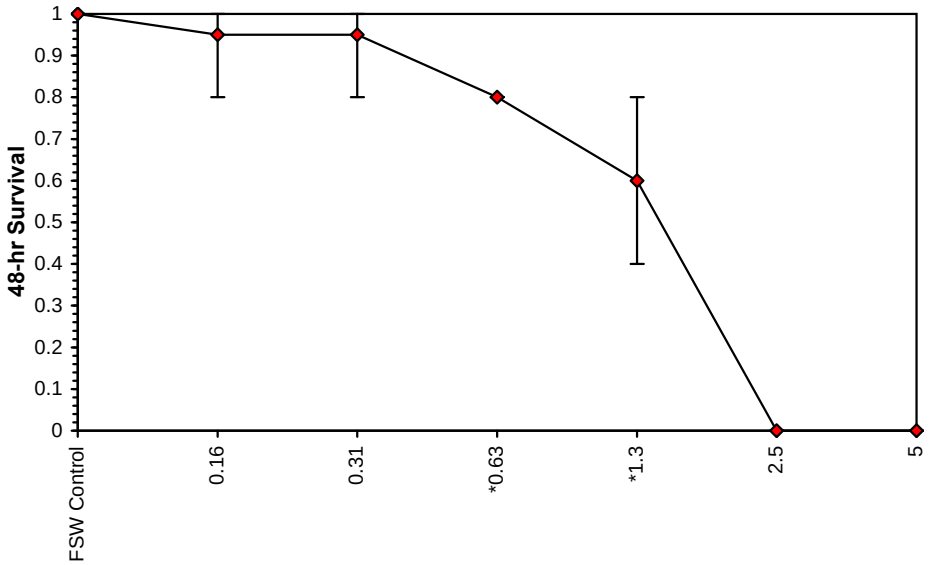
Significant heterogeneity detected (p = 6.84E-03)



Marine Copepod Acute Test-48-hr Survival

Start Date:	22/10/2013 12:00	Test ID:	PR1061/15	Sample ID:	Finasol OSR 51
End Date:	24/10/2013 11:20	Lab ID:	6279	Sample Type:	CP-Chemical Product
Sample Date:		Protocol:	ESA 124	Test Species:	PC-Parvocalanus crassirostris
Comments:					

Dose-Response Plot



Marine Copepod Acute Test-48-hr Survival

Start Date:	22/10/2013 12:00	Test ID:	PR1061/15	Sample ID:	Finasol OSR 51
End Date:	24/10/2013 11:20	Lab ID:	6279	Sample Type:	CP-Chemical Product
Sample Date:		Protocol:	ESA 124	Test Species:	PC-Parvocalanus crassirostris
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
0.16		95.00	80.00	100.00	10.00	3.33	4
0.31		95.00	80.00	100.00	10.00	3.33	4
0.63		80.00	80.00	80.00	0.00	0.00	4
1.3		60.00	40.00	80.00	23.09	8.01	4
2.5		0.00	0.00	0.00	0.00		4
5		0.00	0.00	0.00	0.00		4
FSW Control	pH	8.20	8.20	8.20	0.00	0.00	1
0.16		8.20	8.20	8.20	0.00	0.00	1
0.31		8.20	8.20	8.20	0.00	0.00	1
0.63		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
FSW Control	Salinity ppt	35.00	35.00	35.00	0.00	0.00	1
0.16		35.30	35.30	35.30	0.00	0.00	1
0.31		35.50	35.50	35.50	0.00	0.00	1
0.63		35.60	35.60	35.60	0.00	0.00	1
1.3		35.60	35.60	35.60	0.00	0.00	1
2.5		35.60	35.60	35.60	0.00	0.00	1
5		35.70	35.70	35.70	0.00	0.00	1
FSW Control	DO %	98.10	98.10	98.10	0.00	0.00	1
0.16		98.20	98.20	98.20	0.00	0.00	1
0.31		98.10	98.10	98.10	0.00	0.00	1
0.63		97.70	97.70	97.70	0.00	0.00	1
1.3		98.20	98.20	98.20	0.00	0.00	1
2.5		97.90	97.90	97.90	0.00	0.00	1
5		98.60	98.60	98.60	0.00	0.00	1

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Statistical Printouts for the kelp*Ecklonia radiata* Germination Test

Macroalgal Germination Success Test-Proportion Germinated

Start Date:	9/10/2013 14:00	Test ID:	PR1061/17	Sample ID:	Finasol OSR 52
End Date:	12/10/2013 14:00	Lab ID:	6278	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 116	Test Species:	ER-Ecklonia radiata
Comments:					

Conc-mg/L	1	2	3	4
FSW Control	0.8400	0.8600	0.9400	0.9200
1.3	0.8800	0.8800	0.8800	0.8600
2.5	0.7200	0.8200	0.9600	0.8800
5	0.8600	0.9800	0.9000	0.9000
10	0.9000	0.8200	0.9400	0.8800
20	0.6000	0.4800	0.4800	0.4000

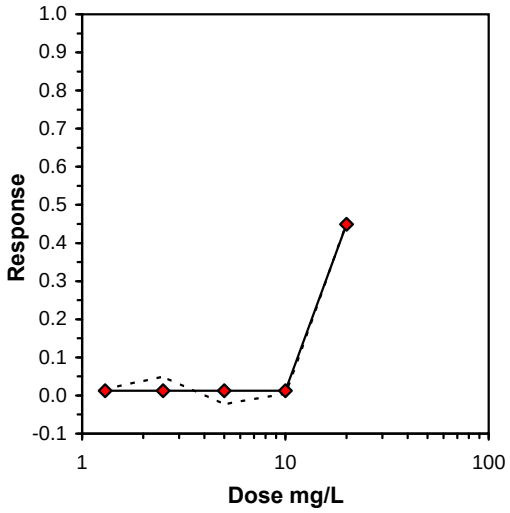
			Transform: Arcsin Square Root					1-Tailed			Isotonic	
Conc-mg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
FSW Control	0.8900	1.0000	1.2385	1.1593	1.3233	6.283	4				0.8900	1.0000
1.3	0.8750	0.9831	1.2096	1.1873	1.2171	1.230	4	0.436	2.410	0.1598	0.8788	0.9874
2.5	0.8450	0.9494	1.1831	1.0132	1.3694	12.659	4	0.836	2.410	0.1598	0.8788	0.9874
5	0.9100	1.0225	1.2786	1.1873	1.4289	8.162	4	-0.605	2.410	0.1598	0.8788	0.9874
10	0.8850	0.9944	1.2305	1.1326	1.3233	6.419	4	0.120	2.410	0.1598	0.8788	0.9874
*20	0.4900	0.5506	0.7754	0.6847	0.8861	10.706	4	6.986	2.410	0.1598	0.4900	0.5506

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.97421	0.916	0.382797	0.283373
Bartlett's Test indicates equal variances (p = 0.10)	9.26299	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		0.116778	0.130686	0.140624	0.008788	4.5E-06	5, 18
Treatments vs FSW Control										

Log-Logit Interpolation (200 Resamples)

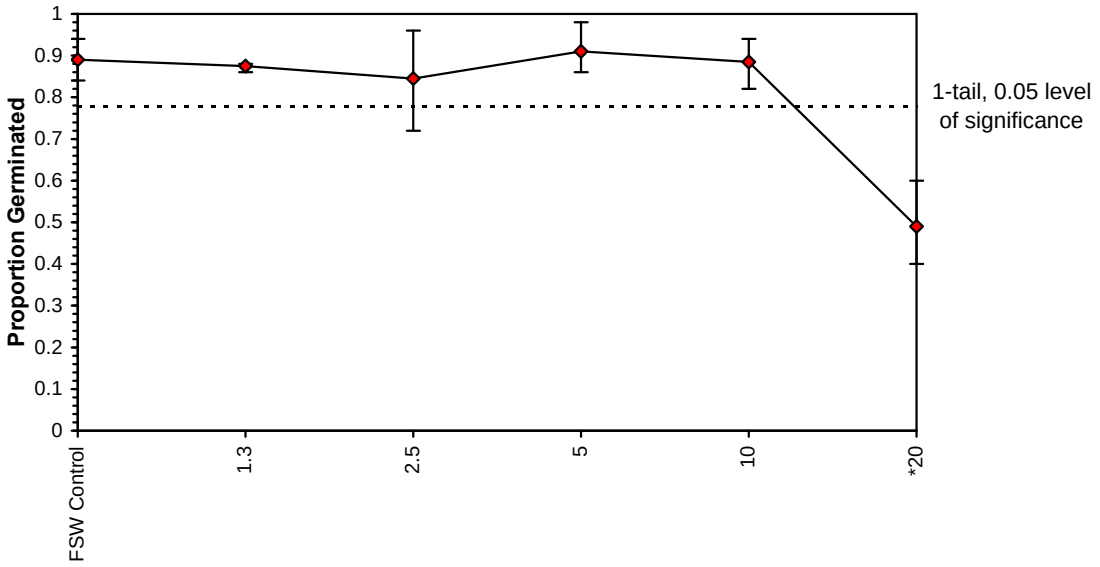
Point	mg/L	SD	95% CL(Exp)		Skew
IC05	11.035	2.486	0.000	11.743	-2.8219
IC10	12.278	0.525	10.122	13.184	-0.5054
IC15	13.425	0.530	11.333	14.551	-0.3452
IC20	14.519	0.569	12.460	15.877	-0.0855
IC25	15.588	0.639	13.546	17.246	0.1969
IC40	18.849				
IC50	>20				



Macroalgal Germination Success Test-Proportion Germinated

Start Date:	9/10/2013 14:00	Test ID:	PR1061/17	Sample ID:	Finasol OSR 52
End Date:	12/10/2013 14:00	Lab ID:	6278	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 116	Test Species:	ER-Ecklonia radiata
Comments:					

Dose-Response Plot



Macroalgal Germination Success Test-Proportion Germinated

Start Date:	9/10/2013 14:00	Test ID:	PR1061/17	Sample ID:	Finasol OSR 52
End Date:	12/10/2013 14:00	Lab ID:	6278	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 116	Test Species:	ER-Ecklonia radiata
Comments:					

Auxiliary Data Summary

Conc-mg/L	Parameter	Mean	Min	Max	SD	CV%	N
FSW Control	Germination, %	89.00	84.00	94.00	4.76	2.45	4
1.3		87.50	86.00	88.00	1.00	1.14	4
2.5		84.50	72.00	96.00	10.12	3.76	4
5		91.00	86.00	98.00	5.03	2.47	4
10		88.50	82.00	94.00	5.00	2.53	4
20		49.00	40.00	60.00	8.25	5.86	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		8.10	8.10	8.10	0.00	0.00	1
5		8.10	8.10	8.10	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	35.10	35.10	35.10	0.00	0.00	1
1.3		35.20	35.20	35.20	0.00	0.00	1
2.5		35.40	35.40	35.40	0.00	0.00	1
5		35.60	35.60	35.60	0.00	0.00	1
10		35.70	35.70	35.70	0.00	0.00	1
20		35.70	35.70	35.70	0.00	0.00	1
FSW Control	DO %	93.20	93.20	93.20	0.00	0.00	1
1.3		95.10	95.10	95.10	0.00	0.00	1
2.5		94.20	94.20	94.20	0.00	0.00	1
5		94.20	94.20	94.20	0.00	0.00	1
10		93.80	93.80	93.80	0.00	0.00	1
20		94.00	94.00	94.00	0.00	0.00	1

Macroalgal Germination Success Test-Proportion Germinated

Start Date:	9/10/2013 14:00	Test ID:	PR1061/18	Sample ID:	Finasol OSR 51
End Date:	12/10/2013 14:00	Lab ID:	6279	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 116	Test Species:	ER-Ecklonia radiata
Comments:					

Conc-mg/L	1	2	3	4
FSW Control	0.8400	0.8600	0.9400	0.9200
1.3	0.9000	0.9600	0.9200	0.9200
2.5	0.9400	0.8800	0.8800	0.9000
5	0.9600	0.9400	0.9000	0.8800
10	0.6000	0.7800	0.9600	0.9600
20	0.7600	0.5000	0.8000	0.6600

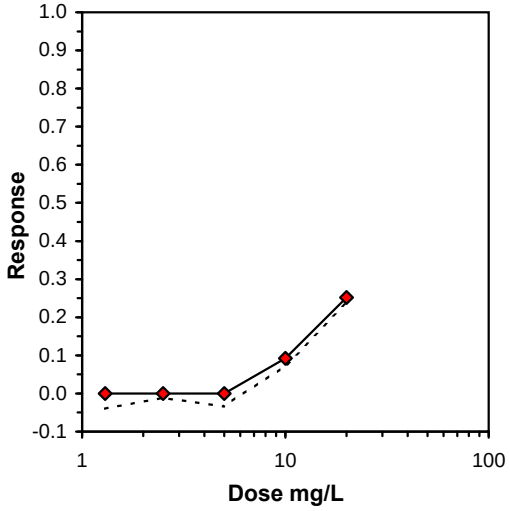
			Transform: Arcsin Square Root					1-Tailed			Isotonic	
Conc-mg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	t-Stat	Critical	MSD	Mean	N-Mean
FSW Control	0.8900	1.0000	1.2385	1.1593	1.3233	6.283	4				0.9088	1.0000
1.3	0.9250	1.0393	1.2966	1.2490	1.3694	3.953	4	-0.663	2.410	0.2113	0.9088	1.0000
2.5	0.9000	1.0112	1.2516	1.2171	1.3233	4.005	4	-0.150	2.410	0.2113	0.9088	1.0000
5	0.9200	1.0337	1.2897	1.2171	1.3694	5.375	4	-0.584	2.410	0.2113	0.9088	1.0000
10	0.8250	0.9270	1.1769	0.8861	1.3694	20.084	4	0.703	2.410	0.2113	0.8250	0.9078
*20	0.6800	0.7640	0.9749	0.7854	1.1071	14.645	4	3.006	2.410	0.2113	0.6800	0.7483

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.952443	0.916	-0.51551	1.190788
Bartlett's Test indicates equal variances (p = 0.05)	10.89065	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		0.161114	0.180302	0.058082	0.015376	0.016292	5, 18
Treatments vs FSW Control										

Log-Logit Interpolation (200 Resamples)

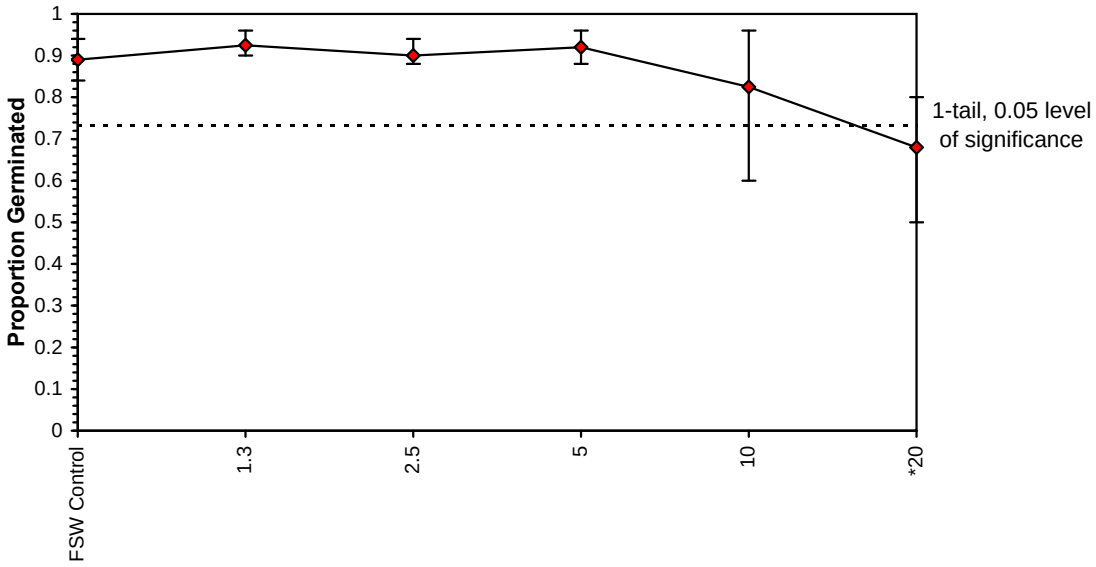
Point	mg/L	SD	95% CL(Exp)		Skew
IC05	7.678	2.415	4.853	16.146	0.3159
IC10	10.442	2.800	5.281	19.381	0.1262
IC15	13.360				
IC20	16.486				
IC25	19.878				
IC40	>20				
IC50	>20				



Macroalgal Germination Success Test-Proportion Germinated

Start Date:	9/10/2013 14:00	Test ID:	PR1061/18	Sample ID:	Finasol OSR 51
End Date:	12/10/2013 14:00	Lab ID:	6279	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 116	Test Species:	ER-Ecklonia radiata
Comments:					

Dose-Response Plot



Macroalgal Germination Success Test-Proportion Germinated

Start Date:	9/10/2013 14:00	Test ID:	PR1061/18	Sample ID:	Finasol OSR 51
End Date:	12/10/2013 14:00	Lab ID:	6279	Sample Type:	CP-Chemical product
Sample Date:		Protocol:	ESA 116	Test Species:	ER-Ecklonia radiata
Comments:					

		Auxiliary Data Summary					
Conc-mg/L	**Parameter**	**Mean**	**Min**	**Max**	**SD**	**CV%**	**N**
FSW Control	Germination, %	89.00	84.00	94.00	4.76	2.45	4
1.3		92.50	90.00	96.00	2.52	1.72	4
2.5		90.00	88.00	94.00	2.83	1.87	4
5		92.00	88.00	96.00	3.65	2.08	4
10		82.50	60.00	96.00	17.23	5.03	4
20		68.00	50.00	80.00	13.37	5.38	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		8.10	8.10	8.10	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	35.10	35.10	35.10	0.00	0.00	1
1.3		35.50	35.50	35.50	0.00	0.00	1
2.5		35.70	35.70	35.70	0.00	0.00	1
5		35.80	35.80	35.80	0.00	0.00	1
10		35.90	35.90	35.90	0.00	0.00	1
20		35.90	35.90	35.90	0.00	0.00	1
FSW Control	DO %	93.20	93.20	93.20	0.00	0.00	1
1.3		93.30	93.30	93.30	0.00	0.00	1
2.5		94.60	94.60	94.60	0.00	0.00	1
5		94.70	94.70	94.70	0.00	0.00	1
10		95.60	95.60	95.60	0.00	0.00	1
20		97.60	97.60	97.60	0.00	0.00	1

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Statistical Printouts for the Larval Fish Imbalance Tests

Fish Imbalance Test-96 hr Imbalance

Start Date:	22/10/2013 13:30	Test ID:	PR1061/12	Sample ID:	Finasol OSR 51
End Date:	26/10/2013 13:30	Lab ID:	6279	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	1.0000	0.8000	0.4000	0.6000
2.5	0.8000	0.8000	0.8000	1.0000
5	0.6000	1.0000	0.8000	1.0000
10	0.8000	0.8000	1.0000	0.6000
20	1.0000	0.8000	1.0000	1.0000

			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	0.7000	0.7778	1.0058	0.6847	1.3453	28.293	4	1.658	2.410	0.3204	0.8300	0.9222
2.5	0.8500	0.9444	1.1667	1.1071	1.3453	10.206	4	0.448	2.410	0.3204	0.8300	0.9222
5	0.8500	0.9444	1.1709	0.8861	1.3453	18.840	4	0.416	2.410	0.3204	0.8300	0.9222
10	0.8000	0.8889	1.1114	0.8861	1.3453	16.874	4	0.864	2.410	0.3204	0.8300	0.9222
20	0.9500	1.0556	1.2857	1.1071	1.3453	9.261	4	-0.448	2.410	0.3204	0.8300	0.9222

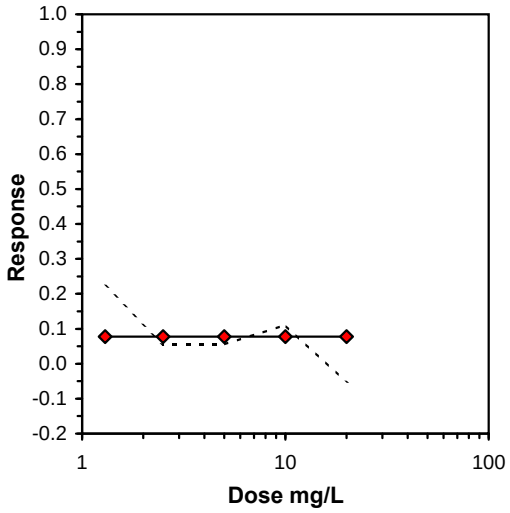
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.983316	0.916	-0.06276	-0.39818
Bartlett's Test indicates equal variances (p = 0.63)	3.47678	15.08627		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	20	>20			0.266619	0.300962	0.037192	0.035346	0.418288	5, 18
Treatments vs FSW Control										

Log-Logit Interpolation (200 Resamples)

Point	mg/L	SD	95% CL(Exp)	Skew
IC05*	0.7787			
IC10	>20			
IC15	>20			
IC20	>20			
IC25	>20			
IC40	>20			
IC50	>20			

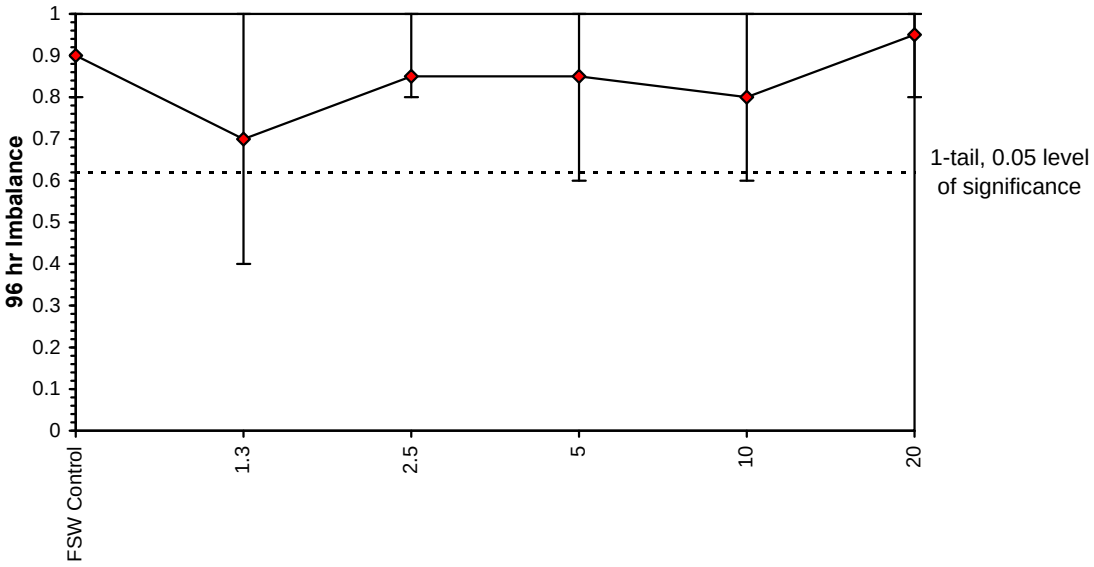
* indicates IC estimate less than the lowest concentration



Fish Imbalance Test-96 hr Imbalance

Start Date:	22/10/2013 13:30	Test ID:	PR1061/12	Sample ID:	Finasol OSR 51
End Date:	26/10/2013 13:30	Lab ID:	6279	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:	PR1061/12	Sample ID:	Finasol OSR 51
End Date:	26/10/2013 13:30	Lab ID:	6279	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		70.00	40.00	100.00	25.82	7.26	4
2.5		85.00	80.00	100.00	10.00	3.72	4
5		85.00	60.00	100.00	19.15	5.15	4
10		80.00	60.00	100.00	16.33	5.05	4
20		95.00	80.00	100.00	10.00	3.33	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		35.70	35.70	35.70	0.00	0.00	1
2.5		35.40	35.40	35.40	0.00	0.00	1
5		35.40	35.40	35.40	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 %	102.40	102.40	102.40	0.00	0.00	1
1.3		101.60	101.60	101.60	0.00	0.00	1
2.5		101.30	101.30	101.30	0.00	0.00	1
5		101.50	101.50	101.50	0.00	0.00	1
10		102.40	102.40	102.40	0.00	0.00	1
20		104.20	104.20	104.20	0.00	0.00	1

Fish Imbalance Test-96 hr Imbalance

Start Date:	22/10/2013 13:30	Test ID:	PR1061/13	Sample ID:	Finasol OSR 51
End Date:	26/10/2013 13:30	Lab ID:	6279	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	1.0000	1.0000	0.8000	0.8000
2.5	0.8000	0.8000	1.0000	1.0000
5	1.0000	0.8000	1.0000	1.0000
10	0.8000	1.0000	1.0000	0.8000
20	0.8000	1.0000	0.8000	1.0000

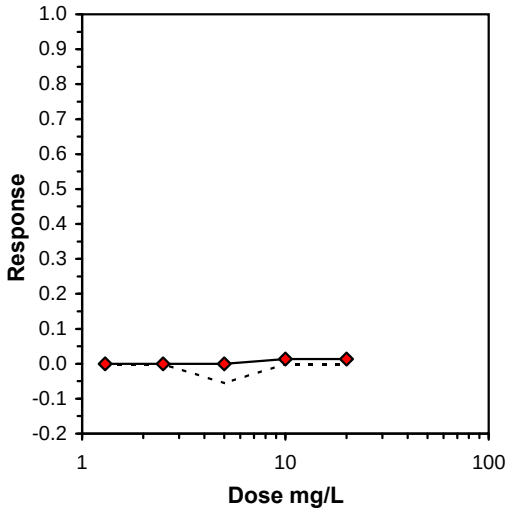
			Transform: Arcsin Square Root					Rank	1-Tailed	Isotonic	
Conc-mg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
FSW Control	0.9000	1.0000	1.2262	1.1071	1.3453	11.212	4			0.9125	1.0000
1.3	0.9000	1.0000	1.2262	1.1071	1.3453	11.212	4	18.00	10.00	0.9125	1.0000
2.5	0.9000	1.0000	1.2262	1.1071	1.3453	11.212	4	18.00	10.00	0.9125	1.0000
5	0.9500	1.0556	1.2857	1.1071	1.3453	9.261	4	20.00	10.00	0.9125	1.0000
10	0.9000	1.0000	1.2262	1.1071	1.3453	11.212	4	18.00	10.00	0.9000	0.9863
20	0.9000	1.0000	1.2262	1.1071	1.3453	11.212	4	18.00	10.00	0.9000	0.9863

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.732154	0.916	-0.14229	-2.00932
Bartlett's Test indicates equal variances (p = 1.00)	0.085845	15.08627		

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)

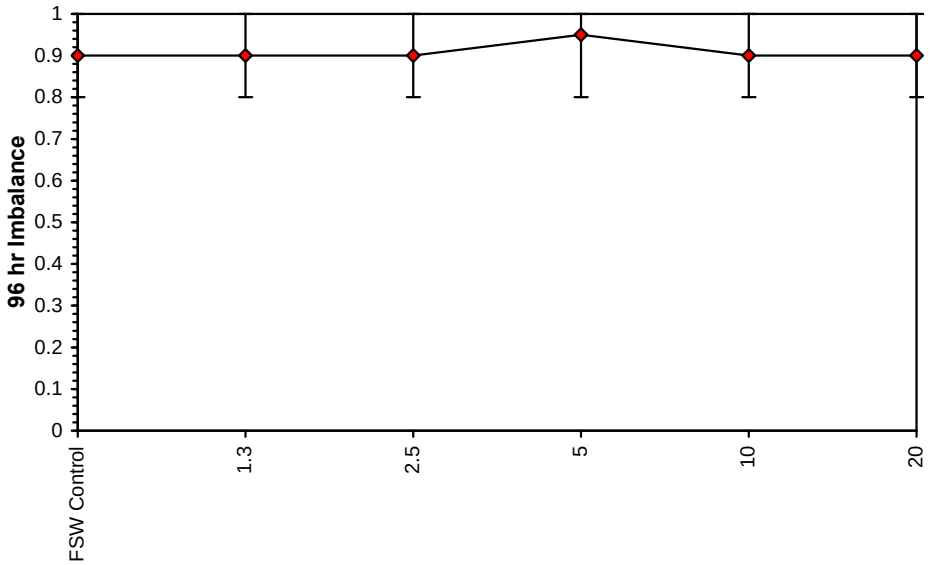
Point	mg/L	SD	95% CL(Exp)	Skew
IC05	>20			
IC10	>20			
IC15	>20			
IC20	>20			
IC25	>20			
IC40	>20			
IC50	>20			



Fish Imbalance Test-96 hr Imbalance

Start Date:	22/10/2013 13:30	Test ID:	PR1061/13	Sample ID:	Finasol OSR 51
End Date:	26/10/2013 13:30	Lab ID:	6279	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:	PR1061/13	Sample ID:	Finasol OSR 51
End Date:	26/10/2013 13:30	Lab ID:	6279	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		90.00	80.00	100.00	11.55	3.78	4
2.5		90.00	80.00	100.00	11.55	3.78	4
5		95.00	80.00	100.00	10.00	3.33	4
10		90.00	80.00	100.00	11.55	3.78	4
20		90.00	80.00	100.00	11.55	3.78	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		35.60	35.60	35.60	0.00	0.00	1
2.5		35.50	35.50	35.50	0.00	0.00	1
5		35.40	35.40	35.40	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 %	102.40	102.40	102.40	0.00	0.00	1
1.3		100.20	100.20	100.20	0.00	0.00	1
2.5		100.20	100.20	100.20	0.00	0.00	1
5		98.60	98.60	98.60	0.00	0.00	1
10		101.70	101.70	101.70	0.00	0.00	1
20		104.00	104.00	104.00	0.00	0.00	1

Fish Imbalance Test-96 hr Imbalance

Start Date:	17/10/2013 13:45	Test ID:	PR1061/11	Sample ID:	Finasol OSR 52
End Date:	21/10/2013 13:45	Lab ID:	6278	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

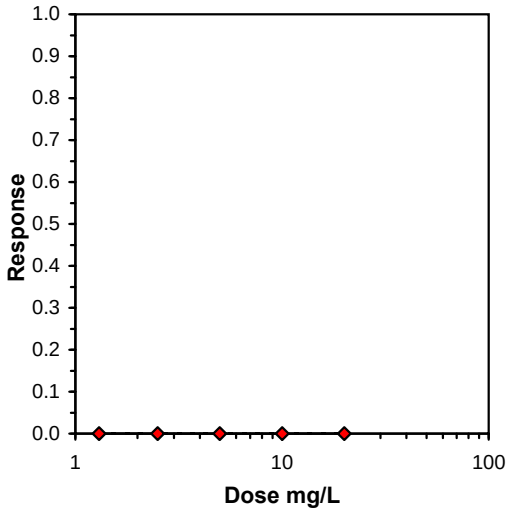
			Transform: Arcsin Square Root					Rank	1-Tailed	Isotonic	
Conc-mg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
FSW Control	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4			1.0000	1.0000
1.3	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4	18.00	10.00	1.0000	1.0000
2.5	1.0000	1.0000	1.3453	1.3453	1.3453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

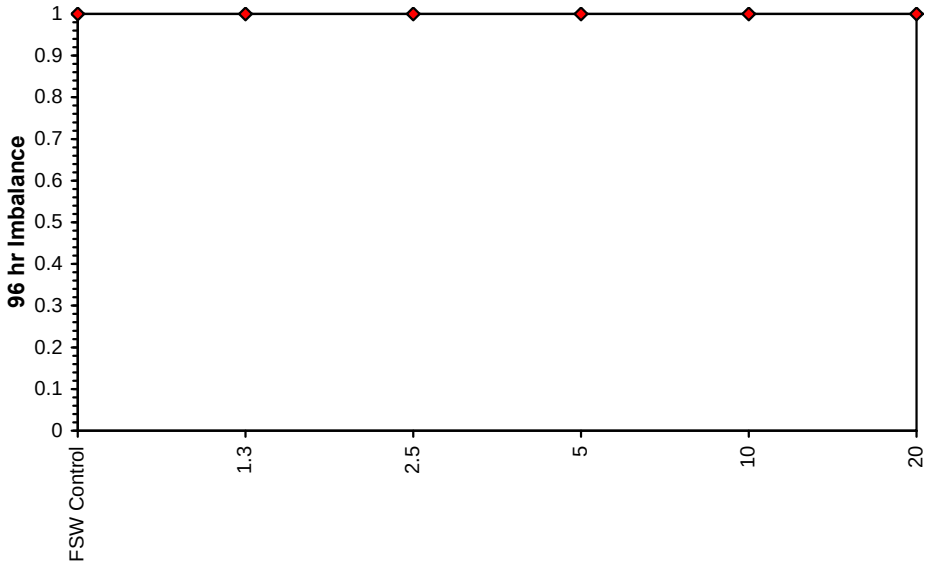
Point	mg/L	SD	95% CL(Exp)	Skew
IC05	>20			
IC10	>20			
IC15	>20			
IC20	>20			
IC25	>20			
IC40	>20			
IC50	>20			



Fish Imbalance Test-96 hr Imbalance

Start Date:	17/10/2013 13:45	Test ID:	PR1061/11	Sample ID:	Finasol OSR 52
End Date:	21/10/2013 13:45	Lab ID:	6278	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:	17/10/2013 13:45	Test ID:	PR1061/11	Sample ID:	Finasol OSR 52
End Date:	21/10/2013 13:45	Lab ID:	6278	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		8.10	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		8.20	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		35.40	35.40	35.40	0.00	0.00	1
2.5		35.30	35.30	35.30	0.00	0.00	1
5		35.40	35.40	35.40	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		102.80	102.80	102.80	0.00	0.00	1
2.5		103.20	103.20	103.20	0.00	0.00	1
5		103.90	103.90	103.90	0.00	0.00	1
10		104.30	104.30	104.30	0.00	0.00	1
20		103.50	103.50	103.50	0.00	0.00	1

Fish Imbalance Test-96 hr Imbalance

Start Date:	17/10/2013 13:45	Test ID:	PR1061/10	Sample ID:	Finasol OSR 51
End Date:	21/10/2013 13:45	Lab ID:	6279	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

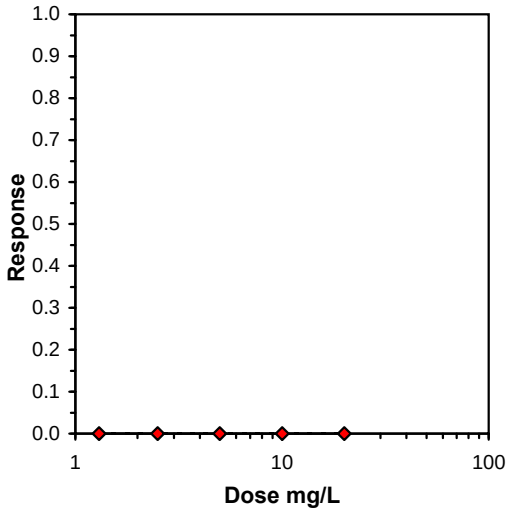
			Transform: Arcsin Square Root					Rank	1-Tailed	Isotonic	
Conc-mg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
FSW Control	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4			1.0000	1.0000
1.3	1.0000	1.0000	1.3453	1.3453	1.3453	0.000	4	18.00	10.00	1.0000	1.0000
2.5	1.0000	1.0000	1.3453	1.3453	1.3453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

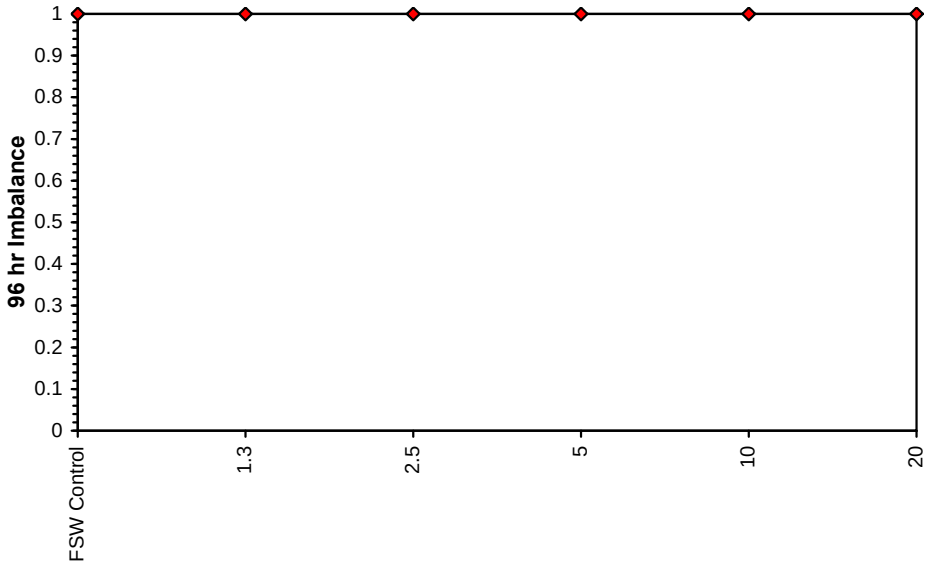
Point	mg/L	SD	95% CL(Exp)	Skew
IC05	>20			
IC10	>20			
IC15	>20			
IC20	>20			
IC25	>20			
IC40	>20			
IC50	>20			



Fish Imbalance Test-96 hr Imbalance

Start Date:	17/10/2013 13:45	Test ID:	PR1061/10	Sample ID:	Finasol OSR 51
End Date:	21/10/2013 13:45	Lab ID:	6279	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:	17/10/2013 13:45	Test ID:	PR1061/10	Sample ID:	Finasol OSR 51
End Date:	21/10/2013 13:45	Lab ID:	6279	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		8.10	8.10	8.10	0.00	0.00	1
2.5		8.10	8.10	8.10	0.00	0.00	1
5		8.10	8.10	8.10	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		35.40	35.40	35.40	0.00	0.00	1
2.5		35.40	35.40	35.40	0.00	0.00	1
5		35.40	35.40	35.40	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		103.00	103.00	103.00	0.00	0.00	1
2.5		102.30	102.30	102.30	0.00	0.00	1
5		103.10	103.10	103.10	0.00	0.00	1
10		103.60	103.60	103.60	0.00	0.00	1
20		105.40	105.40	105.40	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:	15/01/2014 13:00	Test ID:	PR1061/03	Sample ID:	Finasol OSR 51
End Date:	19/01/2014 12:00	Lab ID:	6279	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	0.8000	0.8000
1.3	0.6000	0.8000	1.0000	0.8000
2.5	0.4000	0.8000	1.0000	1.0000
5	1.0000	0.6000	0.8000	0.8000
10	0.6000	0.6000	0.6000	1.0000
20	0.8000	1.0000	0.8000	0.6000

			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	0.8000	0.8889	1.1114	0.8861	1.3453	16.874	4	0.759	2.410	0.3643	0.8000	0.8889
2.5	0.8000	0.8889	1.1206	0.6847	1.3453	27.799	4	0.699	2.410	0.3643	0.8000	0.8889
5	0.8000	0.8889	1.1114	0.8861	1.3453	16.874	4	0.759	2.410	0.3643	0.8000	0.8889
10	0.7000	0.7778	1.0009	0.8861	1.3453	22.940	4	1.491	2.410	0.3643	0.7500	0.8333
20	0.8000	0.8889	1.1114	0.8861	1.3453	16.874	4	0.759	2.410	0.3643	0.7500	0.8333

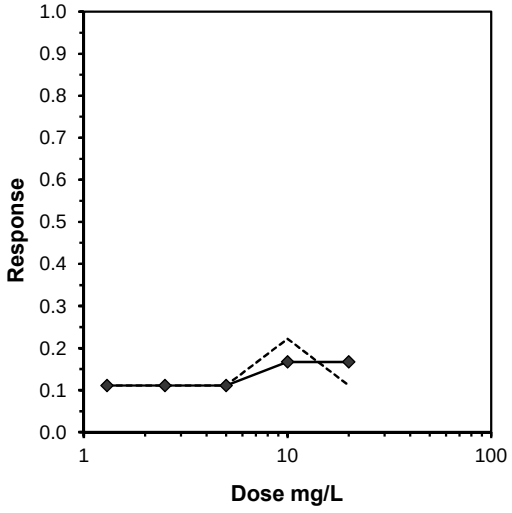
Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates normal distribution (p > 0.05)	0.950268	0.916	-0.13872	-0.19879
Bartlett's Test indicates equal variances (p = 0.84)	2.050408	15.08627		

Hypothesis Test (1-tail, 0.05)	NOEC	LOEC	ChV	TU	MSDu	MSDp	MSB	MSE	F-Prob	df
Dunnett's Test	20	>20			0.309654	0.34954	0.020361	0.045696	0.810871	5, 18
Treatments vs FSW Control										

Log-Logit Interpolation (200 Resamples)

Point	mg/L	SD	95% CL(Exp)	Skew
IC05*	0.5439			
IC10*	1.1543			
IC15	8.2609			
IC20	>20			
IC25	>20			
IC40	>20			
IC50	>20			

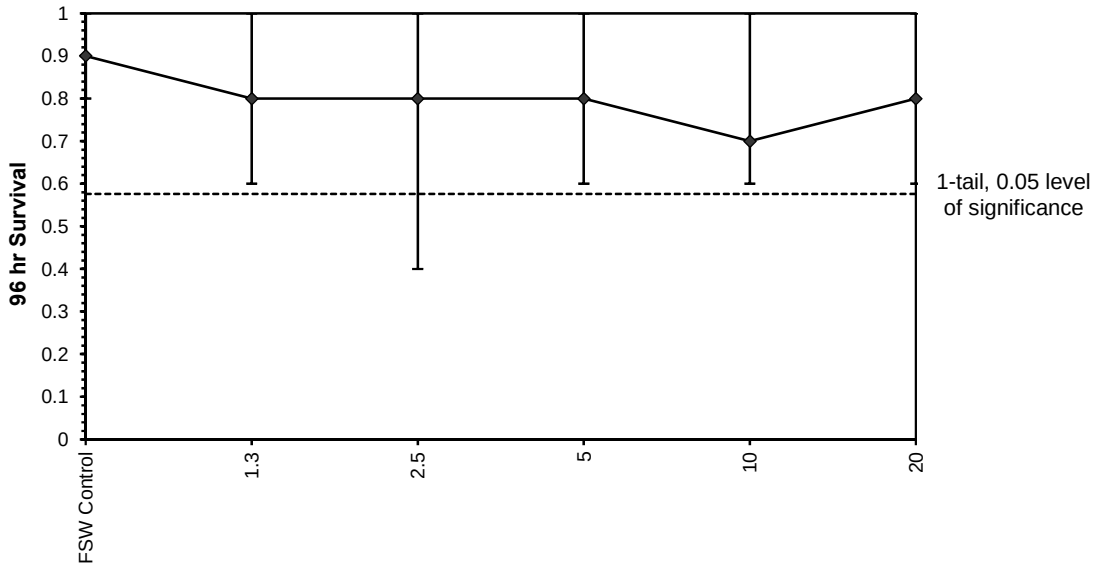
* indicates IC estimate less than the lowest concentration



Juvenile Tiger Prawn Acute Test-96 hr Survival

Start Date:	15/01/2014 13:00	Test ID:	PR1061/03	Sample ID:	Finasol OSR 51
End Date:	19/01/2014 12:00	Lab ID:	6279	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:	15/01/2014 13:00	Test ID:	PR1061/03	Sample ID:	Finasol OSR 51
End Date:	19/01/2014 12:00	Lab ID:	6279	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	90.00	80.00	100.00	11.55	3.78	4
1.3		80.00	60.00	100.00	16.33	5.05	4
2.5		80.00	40.00	100.00	28.28	6.65	4
5		80.00	60.00	100.00	16.33	5.05	4
10		70.00	60.00	100.00	20.00	6.39	4
20		80.00	60.00	100.00	16.33	5.05	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		8.10	8.10	8.10	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		8.10	8.10	8.10	0.00	0.00	1
FSW Control	Salinity ppt	34.60	34.60	34.60	0.00	0.00	1
1.3		34.60	34.60	34.60	0.00	0.00	1
2.5		34.60	34.60	34.60	0.00	0.00	1
5		34.50	34.50	34.50	0.00	0.00	1
10		34.60	34.60	34.60	0.00	0.00	1
20		34.60	34.60	34.60	0.00	0.00	1
FSW Control	DO %	104.20	104.20	104.20	0.00	0.00	1
1.3		104.40	104.40	104.40	0.00	0.00	1
2.5		105.80	105.80	105.80	0.00	0.00	1
5		106.40	106.40	106.40	0.00	0.00	1
10		106.50	106.50	106.50	0.00	0.00	1
20		106.40	106.40	106.40	0.00	0.00	1

Juvenile Tiger Prawn Acute Test-96 hr Survival

Start Date:	15/01/2014 13:00	Test ID:	PR1061/02	Sample ID:	Finasol OSR 52
End Date:	19/01/2014 12:00	Lab ID:	6278	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	0.8000	0.8000
1.3	0.8000	0.6000	1.0000	1.0000
2.5	1.0000	1.0000	0.8000	1.0000
5	0.8000	0.6000	0.6000	0.8000
10	0.6000	0.4000	0.8000	0.8000
20	1.0000	0.8000	1.0000	0.8000

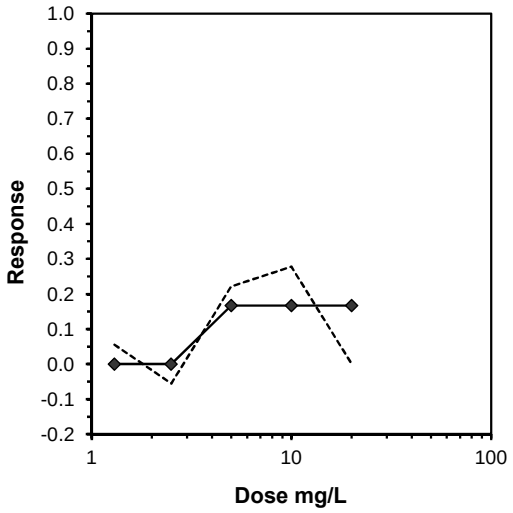
			Transform: Arcsin Square Root					Rank	1-Tailed	Isotonic	
Conc-mg/L	Mean	N-Mean	Mean	Min	Max	CV%	N	Sum	Critical	Mean	N-Mean
FSW Control	0.9000	1.0000	1.2262	1.1071	1.3453	11.212	4			0.9000	1.0000
1.3	0.8500	0.9444	1.1709	0.8861	1.3453	18.840	4	17.00	10.00	0.9000	1.0000
2.5	0.9500	1.0556	1.2857	1.1071	1.3453	9.261	4	20.00	10.00	0.9000	1.0000
5	0.7000	0.7778	0.9966	0.8861	1.1071	12.807	4	12.00	10.00	0.7500	0.8333
10	0.6500	0.7222	0.9463	0.6847	1.1071	21.467	4	12.00	10.00	0.7500	0.8333
20	0.9000	1.0000	1.2262	1.1071	1.3453	11.212	4	18.00	10.00	0.7500	0.8333

Auxiliary Tests	Statistic	Critical	Skew	Kurt
Shapiro-Wilk's Test indicates non-normal distribution (p <= 0.05)	0.889675	0.916	-0.44206	-1.08242
Bartlett's Test indicates equal variances (p = 0.87)	1.877591	15.08627		

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)

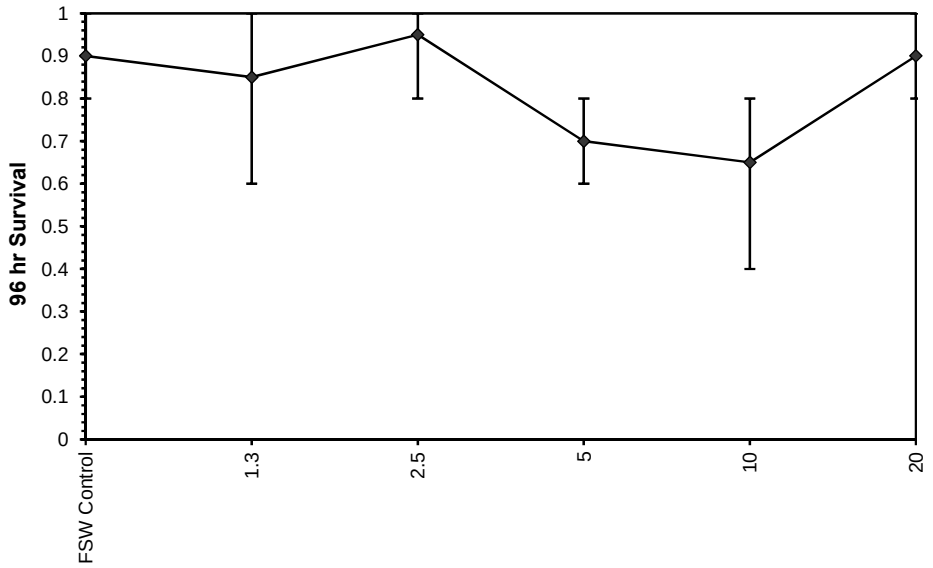
Point	mg/L	SD	95% CL(Exp)		Skew
IC05	3.3069	1.1053	0.0000	4.4500	-0.6885
IC10	4.0498				
IC15	4.7643				
IC20	>20				
IC25	>20				
IC40	>20				
IC50	>20				



Juvenile Tiger Prawn Acute Test-96 hr Survival

Start Date:	15/01/2014 13:00	Test ID:	PR1061/02	Sample ID:	Finasol OSR 52
End Date:	19/01/2014 12:00	Lab ID:	6278	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:	15/01/2014 13:00	Test ID:	PR1061/02	Sample ID:	Finasol OSR 52
End Date:	19/01/2014 12:00	Lab ID:	6278	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	90.00	80.00	100.00	11.55	3.78	4
1.3		85.00	60.00	100.00	19.15	5.15	4
2.5		95.00	80.00	100.00	10.00	3.33	4
5		70.00	60.00	80.00	11.55	4.85	4
10		65.00	40.00	80.00	19.15	6.73	4
20		90.00	80.00	100.00	11.55	3.78	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		8.10	8.10	8.10	0.00	0.00	1
5		8.10	8.10	8.10	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	34.60	34.60	34.60	0.00	0.00	1
1.3		34.60	34.60	34.60	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		34.90	34.90	34.90	0.00	0.00	1
FSW Control	DO %	104.20	104.20	104.20	0.00	0.00	1
1.3		101.40	101.40	101.40	0.00	0.00	1
2.5		101.50	101.50	101.50	0.00	0.00	1
5		101.70	101.70	101.70	0.00	0.00	1
10		102.80	102.80	102.80	0.00	0.00	1
20		104.30	104.30	104.30	0.00	0.00	1