Appendix C

Test Data and Summary of Statistics for the Evaluation of the Toxicity of the Hercules Pipeline Sediment Elutriate to Mysids (*Americamysis bahia*)

CETIS Summary Report

Acute Mysid Survival Test — **Pacific EcoRisk**

Batch ID:	00-4262-4422	**Test Type:**	Survival (96h)	**Analyst:**	Melinda Hooper
Start Date:	04 Apr-13 16:00	**Protocol:**	EPA-821-R-02-012 (2002)	**Diluent:**	Laboratory Water
Ending Date:	08 Apr-13 14:45	**Species:**	Americamysis bahia	**Brine:**	Crystal Sea
Duration:	95h	**Source:**	Aquatic Indicators, FL	**Age:**	4

Sample ID:	03-8524-1696	**Code:**	Elutriate	**Client:**	Boudreau Associates
Sample Date:	25 Mar-13 08:45	**Material:**	Sediment/Elutriate	**Project:**	20792
Receive Date:	25 Mar-13 12:00	**Source:**	Boudreau Associates		
Sample Age:	10d 7h (1 °C)	**Station:**	HP-COMP		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
03-3699-6049	96h Survival Rate	100	>100	NA	4.2%	1	Steel Many-One Rank Sum Test
14-0186-1882	96h Survival Rate	0	>0		4.74%		Wilcoxon Rank Sum Two-Sample Test

96h Survival Rate Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Lab Water Contr	5	1	1	1	1	1	0	0	0.0%	0.0%
0	Site Water	5	0.98	0.963	0.997	0.9	1	0.02	0.0447	4.56%	2.0%
1		5	0.98	0.963	0.997	0.9	1	0.02	0.0447	4.56%	2.0%
10		5	1	1	1	1	1	0	0	0.0%	0.0%
50		5	1	1	1	1	1	0	0	0.0%	0.0%
100		5	1	1	1	1	1	0	0	0.0%	0.0%

96h Survival Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Contr	1	1	1	1	1
0	Site Water	1	1	1	1	0.9
1		0.9	1	1	1	1
10		1	1	1	1	1
50		1	1	1	1	1
100		1	1	1	1	1

96h Survival Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
0	Lab Water Contr	10/10	10/10	10/10	10/10	10/10
0	Site Water	10/10	10/10	10/10	10/10	9/10
1		9/10	10/10	10/10	10/10	10/10
10		10/10	10/10	10/10	10/10	10/10
50		10/10	10/10	10/10	10/10	10/10
100		10/10	10/10	10/10	10/10	9/9

Acute Mysid Survival Test — **Pacific EcoRisk**

Analysis ID:	14-0186-1882	**Endpoint:**	96h Survival Rate	**CETIS Version:**	CETISv1.8.5
Analyzed:	16 Apr-13 16:15	**Analysis:**	Nonparametric-Two Sample	**Official Results:**	Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	Test Result
Angular (Corrected)	NA	C > T	NA	NA	4.74%	Passes 96h survival rate

Wilcoxon Rank Sum Two-Sample Test

Control	vs	Control	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		Site Water	25	NA	1	8	0.5000	Exact	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.002655933	0.002655933	1	1	0.3466	Non-Significant Effect
Error	0.02124747	0.002655933	8			
Total	0.0239034		9			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Mod Levene Equality of Variance	1	13.7	0.3559	Equal Variances
Variances	Levene Equality of Variance	7.11	11.3	0.0285	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.625	0.741	0.0001	Non-normal Distribution

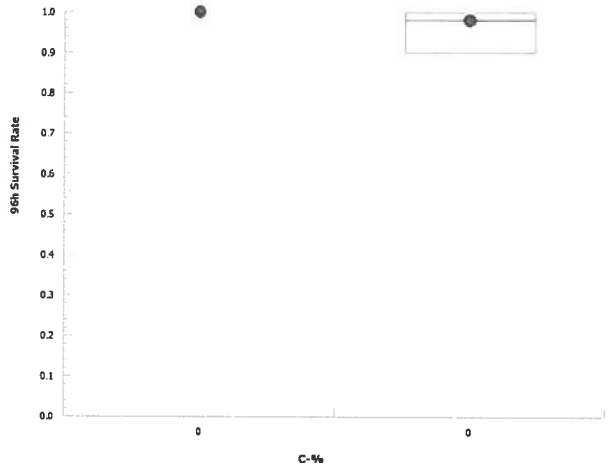
96h Survival Rate Summary

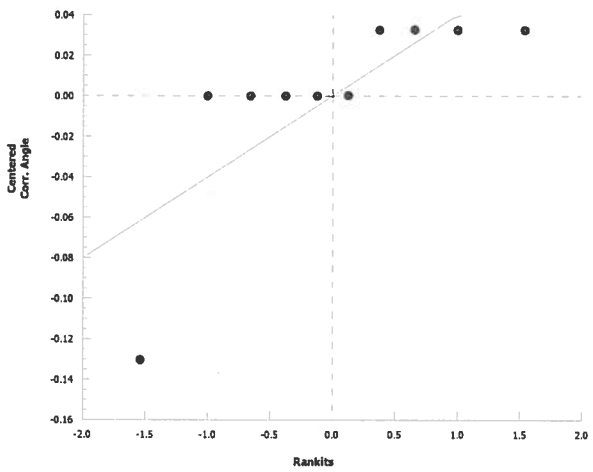
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Site Water	5	0.98	0.924	1	1	0.9	1	0.02	4.56%	0.0%
0	Lab Water Contr	5	1	1	1	1	1	1	0	0.0%	-2.04%

Angular (Corrected) Transformed Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Site Water	5	1.38	1.29	1.47	1.41	1.25	1.41	0.0326	5.28%	0.0%
0	Lab Water Cont	5	1.41	1.41	1.41	1.41	1.41	1.41	0	0.0%	-2.36%

Graphics





Acute Mysid Survival Test — **Pacific EcoRisk**

Analysis ID: 03-3699-6049 Endpoint: 96h Survival Rate CETIS Version: CETISv1.8.5
Analyzed: 16 Apr-13 16:16 Analysis: Nonparametric-Control vs Treatments Official Results: Yes

Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Angular (Corrected)	NA	C > T	NA	NA	4.2%	100	>100	NA	1

Steel Many-One Rank Sum Test

Control	vs	C-%	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)
Lab Water Control		1	25	17	1	8	0.5912	Asymp	Non-Significant Effect
		10	27.5	17	1	8	0.8000	Asymp	Non-Significant Effect
		50	27.5	17	1	8	0.8000	Asymp	Non-Significant Effect
		100	27.5	17	1	8	0.8000	Asymp	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.004148506	0.001037126	4	0.973	0.4439	Non-Significant Effect
Error	0.02130757	0.001065379	20			
Total	0.02545608		24			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Mod Levene Equality of Variance	0.973	4.89	0.4509	Equal Variances
Variances	Levene Equality of Variance	6.92	4.43	0.0011	Unequal Variances
Distribution	Shapiro-Wilk W Normality	0.475	0.888	<0.0001	Non-normal Distribution

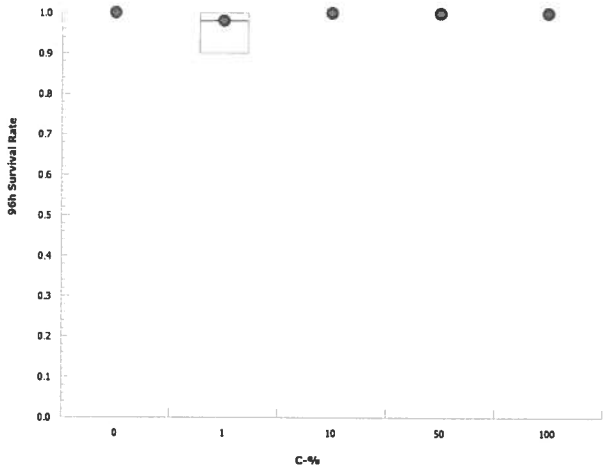
96h Survival Rate Summary

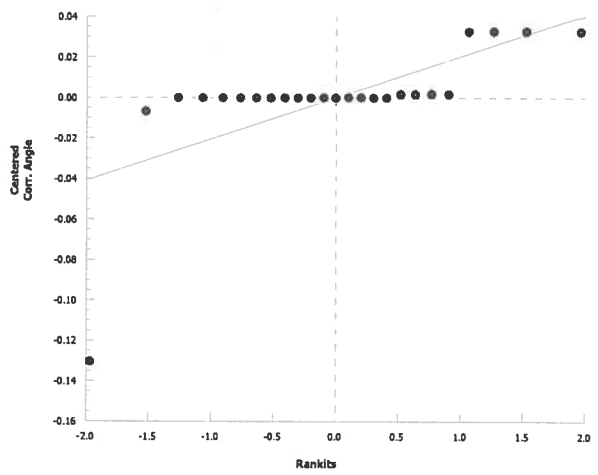
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Contr	5	1	1	1	1	1	1	0	0.0%	0.0%
1		5	0.98	0.924	1	1	0.9	1	0.02	4.56%	2.0%
10		5	1	1	1	1	1	1	0	0.0%	0.0%
50		5	1	1	1	1	1	1	0	0.0%	0.0%
100		5	1	1	1	1	1	1	0	0.0%	0.0%

Angular (Corrected) Transformed Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Lab Water Cont	5	1.41	1.41	1.41	1.41	1.41	1.41	0	0.0%	0.0%
1		5	1.38	1.29	1.47	1.41	1.25	1.41	0.0326	5.28%	2.31%
10		5	1.41	1.41	1.41	1.41	1.41	1.41	0	0.0%	0.0%
50		5	1.41	1.41	1.41	1.41	1.41	1.41	0	0.0%	0.0%
100		5	1.41	1.41	1.42	1.41	1.4	1.41	0.00174	0.28%	0.12%

Graphics





96 Hour Acute *Americamysis bahia* Water Column Toxicity Test

Client: Boudreau and Associates - Hercules Pipeline
Test Material: HP-COMP
Test ID#: 51355 Project # 20792
Test Date: 4/4/13 Randomization: 5.7.1

Organism Log #: 7177 Age: 4d
Organism Supplier: Aquatic Indicators
Control/Diluent: 25 ppt
Control Water Batch: 919

Treatment (% Elutriate)	Temp (°C)	pH new	pH old	D.O. (mg/L) new	D.O. (mg/L) old	Salinity (ppt) new	Salinity (ppt) old	# Live Organisms Rep A	Rep B	Rep C	Rep D	Rep E	SIGN-OFF
Control	20.2	8.00		7.7		24.4		10	10	10	10	10	Test Solution Prep: DG
1	20.2	8.07		7.9		24.7		10	10	10	10	10	New WQ: AF
10	20.2	8.07		7.6		24.7		10	10	10	10	10	Initiation Date: 4/4/13
50	20.2	8.03		7.1		24.5		10	10	10	10	10	Initiation Time: 1600
100	20.2	7.98		6.4		24.6		10	10	10	10	10	Initiation Signoff: MK
Meter ID	38A	PH19		RD07		EC06							a.m. Feeding MK
													p.m. Feeding AL
Control	20.5		7.39		6.3		25.2	10	10	10	10	10	Count Date: 4.5.13
1	20.5		7.32		5.5		25.4	9	10	10	10	10	Count Time: 1530
10	20.5		7.30		5.9		25.4	10	10	10	10	10	Count Signoff: MM
50	20.5		7.29		5.5		25.5	10	10	10	10	10	Old WQ: PJ
100	20.5		7.51		5.8		25.6	10	10	10	10	10	a.m. Feeding 1515
Meter ID	38A		PH19		RD05		EC08						p.m. Feeding MK
Control	20.4		7.55		6.3		25.3	10	10	10	10	10	Count Date: 4/6/13
1	20.4		7.59		7.0		25.4	9	10	10	10	10	Count Time: 1425
10	20.4		7.66		7.1		25.6	10	10	10	10	10	Count Signoff: AL
50	20.4		7.55		6.1		25.8	10	10	10	10	10	Old WQ: CO
100	20.4		7.45		3.5		26.2	10	10	10	10	10	a.m. Feeding MM
Meter ID	38A		pH16		RD04		EC04						p.m. Feeding SS
Control	20.9		7.67		7.1		25.3	10	10	10	10	10	Count Date: 4.7.13
1	20.9		7.61		7.0		26.4	9	10	10	10	10	Count Time: 1145
10	20.9		7.70		7.0		26.5	10	10	10	10	10	Count Signoff: PP
50	20.9		7.77		7.3		26.4	10	10	10	10	10	Old WQ: CE
100	20.9		7.88		7.4		26.6	10	10	10	10	10	a.m. Feeding MF
Meter ID	38A		PH18		RD05		EC08						p.m. Feeding KB
Control	20.0		7.47		5.1		29.5	10	10	10	10	10	Termination Date: 4/8/13
1	20.0		7.47		5.5		29.0	9	10	10	10	10	Termination Time: 1445
10	20.0		7.55		5.2		29.1	10	10	10	10	10	Termination Signoff: MF
50	20.0		7.61		5.2		28.9	10	10	10	10	10	Old WQ: MC
100	20.0		7.57		4.0		30.1	10	10	10	10	9	a.m. Feeding MF
Meter ID	38A		Ph15		RD05		EC08						

96 Hour Acute *Americamysis bahia* Water Column Toxicity Test

Client: Boudreau and Associates - Hercules Pipeline
Test Material: Controls
Test ID#: 51355 Project #: 20792
Test Date: 4/4/13 Randomization: 5.7.1

Organism Log #: 7177 Age: 4d
Organism Supplier: Aquatic Indicators
Control/Diluent: 25 ppt
Control Water Batch: 919

Treatment	Temp (°C)	pH new	pH old	D.O. (mg/L) new	D.O. (mg/L) old	Salinity (ppt) new	Salinity (ppt) old	# Live Organisms Rep A	Rep B	Rep C	Rep D	Rep E	SIGN-OFF
Control	20.2	8.00		7.7		24.4		10	10	10	10	10	Test Solution Prep: DG
Site Water	20.2	7.92		8.6		24.3		10	10	10	10	10	New WQ: AF
													Initiation Date: 4/4/13
													Initiation Time: 1600
													Initiation Signoff: MK
													a.m. Feeding Signoff: MK
Meter ID	38A	PH19		RD07		EC06							p.m. Feeding Signoff: YL
Control	20.5		7.36		6.3		25.2	10	10	10	10	10	Count Date: 4-5-13
Site Water	20.5		7.47		6.6		25.6	10	10	10	10	10	Count Time: 1530
													Count Signoff: MM
													Old WQ: PD
													a.m. Feeding Signoff: 1515
													p.m. Feeding Signoff: MK
Meter ID	39A		pH19		RD05		EC08						
Control	20.4		7.55		6.3		25.3	10	10	10	10	10	Count Date: 4/6/13
Site Water	20.4		7.58		6.7		25.8	10	10	10	10	10	Count Time: 1425
													Count Signoff: RC
													Old WQ: CO
													a.m. Feeding Signoff:
Meter ID	38A		pH16		RD04		EC04						p.m. Feeding Signoff: SS
Control	20.9		7.67		7.1		25.3	10	10	10	10	10	Count Date: 4.7.13
Site Water	20.9		7.79		7.2		27.4	10	10	10	10	10	Count Time: 1175
													Count Signoff: PD
													Old WQ: CE
													a.m. Feeding Signoff: MF
Meter ID	39A		PH18		RD05		EC08						p.m. Feeding Signoff: KB
Control	20.0		7.47		5.1		29.5	10	10	10	10	10	Termination Date: 4/8/13
Site Water	20.0		7.66		5.5		29.0	10	10	10	10	9	Termination Time: 1445
													Termination Signoff: MF
													Old WQ: YL
Meter ID	38A		PH15		RD05		EC08						a.m. Feeding Signoff: MF