

Nearthes 9/6/18-02.4  
W.O.# 940225



Setup #1 - Day 20

RESULTS OF ANALYSIS - Water

File No. E1362

		DAC-HY 15T N	DAC-HY 24T N	DAC-HY 18T N	DAC-HY 13T N
<hr/>					
<b><u>Nutrients</u></b>					
Ammonia Nitrogen	N	0.14	3.61	1.52	0.24
<b><u>Inorganic Parameters</u></b>					
Sulphide	S	<0.02	<0.02	<0.02	<0.02

Results are expressed as milligrams per litre.  
< = Less than the detection limit indicated.

00618

Neontales 9/10/18-01.4  
W.D. # 940225

Sept 41 - Day 30



## **METHODOLOGY**

File No. E1362

Samples were analyzed by methods acceptable to the appropriate regulatory agency. Outlines of the methodologies utilized are as follows:

### **Conventional Parameters in Water**

These analyses are carried out in accordance with procedures described in "Standard Methods for the Examination of Water and Wastewater" 18th Ed. published by the American Public Health Association, 1992. Further details are available on request.

**End of Report**

00619

**EVS CONSULTANTS**

Dry Weight Data

Client: NOAA - Setup #2  
 Project #: 9618-02.4  
 Work Order: 040775  
 Test Type: 20-d sediment toxicity test

Test Species: Neomysis americana  
 Date Initiated: June 3, 1994  
 Date To be Initiated: June 23, 1994

Number of Animals/rep: 5

Sample ID	Rep	Survivors	# of Animals Weighed	Pan Weight (g)	Final Weight (pan + biomass) (g)	Total Biomass (mg)	Individual Biomass (mg)	Mean Survival (%)	Mean Individual Biomass (mg)
Initial Dry Weight N-D	A	5	5	0.9927	0.9936	0.90	0.18	100.00	0.18
Initial Dry Weight N-E	B	5	5	0.9957	0.9960	0.90	0.06		
Initial Dry Weight N-F	C	5	5	0.9990	0.9998	0.80	0.16		

00640

for data entry  
 certified JLC  
 1-10-1994

**EVS CONSULTANTS**

**Dry Weight Data**

Client: NOAA - Setup #2  
 Project #: 9618-02.4  
 Work Order: 040025  
 Test Type: 20-d sediment toxicity test

Test Species: *Neanthes arenaceodentata*  
 Date Initiated: June 3, 1994  
 Date Terminated: June 23, 1994

Number of Animals/rep: 5

Sample ID	Rep	Survivors	# of Animals Weighed	Pan Weight (g)	Final Weight (pan + biomass) (g)	Total Biomass (mg)	Individual Biomass (mg)	Mean Survival (%)	Mean Individual Biomass (mg)
Control 1	A	5	5	1.0000	1.0978	50.90	10.06	100.00	10.22
	B	5	5	1.0051	1.0567	51.60	10.32		
	C	5	5	1.0052	1.0580	52.80	10.56		
	D	5	5	1.0017	1.0480	46.30	9.26		
	E	5	5	1.0010	1.0555	54.50	10.90		
DAC-HY-4T	A	5	5	1.0018	1.0610	39.20	11.84	100.00	10.14
	B	5	5	1.0035	1.0546	51.10	10.22		
	C	5	5	1.0032	1.0424	39.20	7.84		
	D	5	5	1.0100	1.0600	50.00	10.00		
	E	5	5	1.0000	1.0540	54.00	10.80		
DAC-HY-6T	A	5	5	0.9989	1.0554	56.50	11.30	100.00	11.42
	B	5	5	0.9966	1.0494	52.80	10.56		
	C	5	5	0.9933	1.0581	64.80	12.96		
	D	5	5	0.9987	1.0528	54.10	10.82		
	E	5	5	0.9924	1.0496	57.20	11.44		
DAC-HY-7T	A	5	5	1.0027	1.0614	58.70	11.74	100.00	10.20
	B	5	5	0.9954	1.0434	48.00	9.60		
	C	5	5	1.0000	1.0510	51.00	10.20		
	D	5	5	0.9962	1.0424	46.20	9.24		
	E	5	5	1.0035	1.0546	51.10	10.22		

00621

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 LLC Aug 17, 1994

**EVS CONSULTANTS**

**Dry Weight Data**

Client: NOAA - Setup #2 Test Species: *Neanthes arenaceodentata*  
 Project #: 9618-02.4 Date Initiated: June 3, 1994  
 Work Order: 940225 Date Terminated: June 23, 1994  
 Test Type: 20-d sediment toxicity test  
 Number of Animals/rep: 5

Sample ID	Rep	Survivors	# of Animals Weighed	Pan Weight (g)	Final Weight (pan + biomass) (g)	Total Biomass (mg)	Individual Biomass (mg)	Mean Survival (%)	Mean Individual Biomass (mg)
DAC-HY-9T	A	5	5	1.0073	1.0693	62.00	12.40	100.00	9.98
	B	5	5	1.0002	1.0143	14.10	2.82		
	C	5	5	1.0008	1.0606	59.80	11.96		
	D	5	5	1.0048	1.0595	54.70	10.94		
	E	5	5	1.0000	1.0590	59.00	11.80		
DAC-HY-10T	A	5	5	1.0020	1.0512	49.20	9.84	96.00	9.33
	B	4	4	1.0008	1.0405	39.70	9.93		
	C	5	5	1.0027	1.0476	44.90	8.98		
	D	5	5	0.9973	1.0475	50.20	10.04		
	E	5	5	0.9983	1.0377	39.40	7.88		
DAC-HY-12T	A	5	5	1.0002	1.0528	52.60	10.52	100.00	10.73
	B	5	5	0.9928	1.0269	34.10	6.82		
	C	5	5	1.0031	1.0690	65.90	13.18		
	D	5	5	0.9942	1.0546	60.40	12.08		
	E	5	5	0.9998	1.0490	33.20	6.64		
DAC-HY-26T	A	5	5	1.0000	1.0454	45.40	9.08	100.00	10.07
	B	5	5	0.9967	1.0394	42.70	8.54		
	C	5	5	1.0094	1.0603	35.90	7.18		
	D	5	5	1.0026	1.0616	59.00	11.80		
	E	5	5	1.0036	1.0724	68.80	13.76		

1. This replicate (DAC-HY-9T-A) was missing a small piece of one of the organisms.

00622

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 JLC Aug 17, 1994

**EVS CONSULTANTS**

**Dry Weight Data**

Client: NOAA - Setup #2 Test Species: Neanthes arenaceodentata  
 Project #: 94518-02.4 Date Initiated: June 3, 1994  
 Work Order: 940225 Date Terminated: June 23, 1994  
 Test Type: 20-d sediment toxicity test  
 Number of Animals/rep: 5

Sample ID	Rep	Survivors	# of Animals Weighed	Pan Weight (g)	Final Weight (pan + biomass) (g)	Total Biomass (mg)	Individual Biomass (mg)	Mean Survival (%)	Mean Individual Biomass (mg)
DAC-HY-27T	A	5	5	0.9982	1.0361	37.90	7.58	100.00	6.15
	B <sup>2</sup>	10	10	0.9984	1.0512	62.80	6.28		
	C <sup>3</sup>	0	0	1.0010	—	—	—		
	D	5	5	0.9940	1.0387	44.70	8.94		
	E	5	5	0.9936	1.0334	39.80	7.96		
DAC-HY-28T	A	5	5	0.9970	1.0522	35.20	11.04	100.00	10.00
	B	5	5	0.9987	1.0474	48.70	9.74		
	C	5	5	1.0005	1.0368	36.30	7.26		
	D <sup>4</sup>	5	5	1.0038	1.0546	50.80	10.16		
	E	5	5	0.9957	1.0548	59.10	11.82		

2. This replicate (DAC-HY-27T-B) was double seeded with 10 organisms.
3. This replicate (DAC-HY-27T-C) was missed in the seeding process. All calculations for this sample (DAC-HY-27T) are based on 4 replicates.
4. This replicate (DAC-HY-28T-D) appeared to be missing a small piece of one of the organisms.

00623

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 Aug 18, 1994 XRC C

RVS CONSULTANTS

Dry Weight Data

Client: NOAA - Setup #2 Test Species: *Nematode arcuoculatus*  
 Project #: 9618-02.4 Date Initiated: June 3, 1994  
 Work Order: 940225 Date Terminated: June 23, 1994  
 Test Type: 20-d sediment toxicity test

Number of Animals/rep: 5

Sample ID	Rep	Survivors	# of Animals Weighed	Pan Weight (g)	Final Weight (pan + biomass) (g)	Total Biomass (mg)	Individual Biomass (mg)	Mean Survival (%)	Mean Individual Biomass (mg)
Control 2	A	5	5	1.0033	1.0404	37.10	7.42	100.00	9.67
	B	5	5	0.9993	1.0443	45.00	9.00		
	C	5	5	1.0018	1.0522	50.40	10.08		
	D	5	5	0.9972	1.0450	47.80	9.56		
	E	5	5	1.0043	1.0657	61.40	12.28		
DAC-HY-1T	A	5	5	0.9999	1.0517	51.80	10.36	100.00	10.12
	B <sup>5</sup>	5	5	0.9951	1.0514	56.30	11.26		
	C	5	5	1.0024	1.0514	49.00	9.80		
	D <sup>5</sup>	5	5	0.9977	1.0452	47.50	9.50		
	E	5	5	1.0002	1.0485	48.30	9.66		
DAC-HY-2T	A	5	5	0.9990	1.0406	41.60	8.32	96.00	7.36
	B	4	4	1.0010	1.0215	20.50	5.13		
	C	5	5	0.9988	1.0454	46.60	9.32		
	D	5	5	1.0010	1.0346	33.60	6.72		
	E	5	5	1.0073	1.0438	36.50	7.30		
DAC-HY-3T	A	5	5	1.0006	1.0571	56.50	11.30	100.00	10.37
	B	5	5	1.0047	1.0454	40.70	8.14		
	C	5	5	1.0045	1.0608	56.30	11.26		
	D	5	5	1.0015	1.0632	61.70	12.34		
	E	5	5	1.0000	1.0440	44.00	8.80		

5. These replicates (DAC-HY-1T-B, D) were missing pieces of some of the organisms.

00624

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 ALK Aug 17, 1994

**EVS CONSULTANTS**

**Dry Weight Data**

Client: NOAA - Setup #2 Test Species: *Neomysis americana*  
 Project #: 9618-024 Date Initiated: June 3, 1994  
 Work Order: 940225 Date Terminated: June 23, 1994  
 Test Type: 20-d sediment toxicity test  
 Number of Animals/rep: 5

Sample ID	Rep	Survivors	# of Animals Weighed	Pan Weight (g)	Final Weight (pan + biomass) (g)	Total Biomass (mg)	Individual Biomass (mg)	Mean Survival (%)	Mean Individual Biomass (mg)
DAC-HY-5T	A	5	5	1.0017	1.0506	58.90	11.78	92.00	12.58
	B	5	5	1.0024	1.0520	59.60	11.92		
	C <sup>6</sup>	5	5	1.0061	1.0525	56.40	11.28		
	D	4	4	1.0064	1.0593	52.90	13.22		
	E	4	4	1.0007	1.0594	58.70	14.67		
DAC-HY-8T	A <sup>6</sup>	5	5	1.0003	1.0585	58.20	11.64	96.00	11.48
	B	5	5	1.0036	1.0658	62.20	12.44		
	C	5	5	1.0037	1.0648	61.10	12.22		
	D	4	4	1.0052	1.0427	37.50	9.37		
	E	5	5	1.0057	1.0643	58.60	11.72		
DAC-HY-11T	A	5	5	1.0016	1.0490	47.40	9.48	100.00	9.10
	B	5	5	0.9973	1.0467	49.40	9.88		
	C	5	5	1.0000	1.0391	39.10	7.82		
	D	5	5	1.0041	1.0450	40.90	8.18		
	E	5	5	1.0003	1.0509	50.60	10.12		
DAC-HY-25T	A <sup>7</sup>	5	5	0.9952	1.0476	52.40	10.48	96.00	9.18
	B	5	5	0.9953	1.0523	36.80	7.36		
	C <sup>7</sup>	5	5	0.9965	1.0362	39.70	7.94		
	D	5	5	1.0006	1.0528	52.20	10.44		
	E	4	4	0.9936	1.0323	38.70	9.67		

6. These replicates (DAC-HY-8T-A and DAC-HY-5T-C) were missing pieces of some of the organisms.

7. These replicates (DAC-HY-25T-A,C) were missing pieces of some of the organisms.

00625

*certified for data entry only*  
*Aug. 17, 1994*



Durham 381-71018-UL-7  
W.O.# 940225

Setp# 2 48-h



RESULTS OF ANALYSIS - Water

File No. E1141

		Control Sediment #2 EL 94 06 11	Control Seawater #1 EL 94 06 11	Control Seawater #2 EL 94 06 11	DAC-HY- 14T EL 94 06 11
<b>Nutrients</b>					
Ammonia Nitrogen	N	0.05	0.09	0.10	0.08
<b>Inorganic Parameters</b>					
Sulphide	S	<0.02	<0.02	<0.02	<0.02

Remarks regarding the analyses appear at the beginning of this report.  
Results are expressed as milligrams per litre.  
< = Less than the detection limit indicated.

00718

EVS CONSULTANTS  
 SEDIMENT TOXICITY TESTS - SURVIVAL AND FINAL WATER QUALITY DATA

00627  
 1/8

Client NOFH  
 EVS Project Number 01618-03-4  
 EVS W.O. No. 940225

Start Date (Day 0) June 3 = Day 0  
 End Date June 23 = 20 days  
 Test Type/Species Monkeys at various densities

*See end of #2*

Sample ID.	Rep.	Pan No.	No. Alive	No. Dead	Total Recovered	No. Missing	Tech. Init.	pH	Dissolved Oxygen (mg/L)	Temp. (°C)	Cond. (µmhos/cm) <input type="checkbox"/> Salinity (ppt) <input type="checkbox"/>
Control sub#1	80	A	5	0	5	0	J	7.9	7.5	20	28
	81	B	5	0	5	0	J	7.8	7.4	20	28
	82	C	5	0	5	0	J	7.7	7.2	20	28
	83	D	5	0	5	0	J	7.8	7.2	20	28
	84	E	5	0	5	0	J	7.9	7.2	20	28
	85	A	5	0	5	0	J	7.8	7.2	20	28
	86	B	5	0	5	0	J	7.9	7.3	20	29
	87	C	5	0	5	0	J	8.0	7.4	20	29
	88	D	5	0	5	0	J	8.0	7.4	20	29
	89	E	5	0	5	0	J	7.9	7.2	20	28
JTC-Hy-qt	90	A	5	0	5	0	J	7.9	6.3	20	32
	91	B	5	0	5	0	J	7.4	2.0	20	32
	92	C	5	0	5	0	J	8.1	6.0	20	33
	93	D	5	0	5	0	J	8.0	6.2	20	32
	94	E	5	0	5	0	J	8.1	6.4	20	33

by BAC-Hy-qt H = NAD - Control  
 Control and H<sub>1</sub>-E = from final count of 1st room  
 Water Quality Instruments: pH 1. A. 16 #9 D.O. 1-A-3  
 Cond./Salinity 1-A-3 2 1-A-16  
 (A) can't have more than 1/2 of the N. W. ...  
 Conductivity 1-A-3

W.D. # 940225

JCH/ML 48-N



RESULTS OF ANALYSIS - Water

File No. E1141

DAC-HY- 6T EL	DAC-HY- 28T EL	DAC-HY- 3T EL	DAC-HY- 7T EL	DAC-HY- 4T EL
94 06 11	94 06 11	94 06 11	94 06 11	94 06 11

Nutrients

Ammonia Nitrogen

N

0.10

0.17

0.12

0.10

0.21

Inorganic Parameters

Sulphide S

<0.02

<0.02

<0.02

<0.02

<0.02

Remarks regarding the analyses appear at the beginning of this report.  
Results are expressed as milligrams per litre.  
< = Less than the detection limit indicated.

00716



DETECTIVE W.D.# 940225

TO



**REMARKS**

File No. E1141

As indicated on the sample submission form, these samples are identified as "Day 48-h Teardown (June 11, 1994) Echinoderm Larval".

00714



Dandraster sop. 9/618-02.A  
W.O. # 940226



Setup # 2 Day 0

**METHODOLOGY**

File No. E1112

Samples were analyzed by methods acceptable to the appropriate regulatory agency. Outlines of the methodologies utilized are as follows:

**Conventional Parameters in Water**

These analyses are carried out in accordance with procedures described in "Standard Methods for the Examination of Water and Wastewater" 18th Ed. published by the American Public Health Association, 1992. Further details are available on request.

**End of Report**

00712

**EVS CONSULTANTS  
SEDIMENT TOXICITY TESTS - SURVIVAL AND FINAL WATER QUALITY DATA**

3333  
3333  
7/4

Client NORR  
EVS Project Number 9/16/18-02-4  
EVS W.O. No. 94025-

Start Date (Day 0) June 3 = Day 0  
End Date June 23 = 20 Day  
Test Type/Species Neonfishes *Procambarus bartoli*

*Subpop #1*

*\* WQ Flipped.*

Sample ID.	Rep.	Pan No.	No. Alive	No. Dead	Total Recovered	No. Missing	Tech. Init.	pH	Dissolved Oxygen (mg/L)	Temp. (°C)	Conc. Sulfosocin (ppb)
<del>DAE-CR-24T</del> (4th/16th Starts.)	A	160	5	0	5	0	RM	8.0	6.0	20	29
	B	161	4	0	4	1	MM	8.0	6.4	20	30
	C	162	4	0	0	1	MM	8.1	6.2	20	29
	D	163	5	0	5	0	MM	8.0	6.3	20	30
	E	164	5	0	5	0	MM	8.0	7.2	20	30
DAE-CR-24T (4th/16th Starts.)	A	165	5	0	5	0	MM	7.9	6.7	20	30
	B	166	5	0	5	0	MM	8.2	7.2	20	30
	C	167	5	0	5	0	MM	8.2	7.1	20	29
	D	168	4	0	4	1	MM	8.1	7.2	20	30
	E	169	4	0	4	1	MM	8.1	7.2	20	30
DAE-H4-1T	A	170	5	0	5	0	MM	8.0	7.2	20	30
	B	171	5	0	5	0	MM	8.1	7.3	20	30
	C	172	5	0	5	0	MM	8.0	7.2	20	30
	D	173	5	0	5	0	MM	8.1	7.4	20	31
	E	174	5	0	5	0	MM	8.1	7.4	20	31

Technician's Initials

\* hr: all starts left on pan 5 w/ 132 + w/ 193.5  
Water Quality Instruments: pH #A-16 #9 DO. #A-3 Cond/Salinity #C-12  
Sediment #1001 (1) very small bottle after found in the sample. (2) DAE-H4-1T #B-N-14 - duplicate  
#112 - 45.00. show red from pan 5



Dendroaster spp. 4/018-02.A  
W.O. # 940225

Setup # 2 Day 0



RESULTS OF ANALYSIS - Water

File/No. E1112

	DAC-HY- 1T EL	DAC-HY- 2T EL	DAC-HY- 26T EL	DAC-HY- 5T EL	Control Sediment #1 EL
	94 06 09	94 06 09	94 06 09	94 06 09	94 06 09
<u>Nutrients</u>					
Ammonia Nitrogen N	0.12	0.17	0.20	0.35	0.07
<u>Inorganic Parameters</u>					
Sulphide S	0.05	0.03	0.03	0.07	<0.02

Remarks regarding the analyses appear at the beginning of this report.  
Results are expressed as milligrams per litre.  
< = Less than the detection limit indicated.

00710



Dendraster sp. 9/6/18-02.4  
W.D. # 940225

Setup # 2 Day 0



RESULTS OF ANALYSIS - Water

File/No. E1112

DAC-HY- 25T EL	DAC-HY- 24T EL	DAC-CR- 2T EL	DAC-CR- 2AT EL	DAC-HY- 27T EL
94 06 09	94 06 09	94 06 09	94 06 09	94 06 09

Nutrients

Ammonia Nitrogen	N	0.19	0.21	0.45	0.42	0.35
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Inorganic Parameters

Sulphide	S	0.02	0.03	0.08	0.05	0.03
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Remarks regarding the analyses appear at the beginning of this report.  
Results are expressed as milligrams per litre.  
< = Less than the detection limit indicated.

00708



1988 Triumph Street, Vancouver, B.C., Canada V5L 1K5

analytical

JUN 27 1994  
FAX: (604) 253-6700 TEL: (604) 253-4188

*Dendriaster spp. 9/618-02.4* service

*W.O.# 940225*

laboratories

ltd.



## CHEMICAL ANALYSIS REPORT

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**Date:** June 20, 1994  
**ASL File No.** E1112  
**Report On:** 9/618-02.4 Water Analysis  
**Report To:** **EVS Environment Consultants**  
195 Pemberton Avenue  
North Vancouver, BC  
V7P 2R4  
**Attention:** **Mr. Todd Shannon**  
**Received:** June 10, 1994

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**ASL ANALYTICAL SERVICE LABORATORIES LTD.**  
per:

*Heather A. Ross*  
Heather A. Ross, B.Sc.  
Project Chemist

*Katherine Thomas*  
Katherine Thomas, B.Sc.  
Project Chemist

00706



ECHINODERM LARVAL DEVELOPMENT TOXICITY TEST - 48 h

Client:	NOAA	Date Initiated:	June 9, 1994
Project Number:	9/618-02.4	Date Terminated:	June 11, 1994
Work Order Number:	940225	Termination Method:	Direct pipette
Test Species:	<i>Dendraster excentricus</i>	Initial Density:	18500 embryos/L
Book: 5 Page: 45		Aliquot Size (mL):	10
		Test Volume (mL):	1000

Sample ID	Rep/ Conc	pH	D.O. (mg/L)	Temperature (°C)	Salinity (ppt)
Control Sediment 1	A	7.6	7.8	16.0	31
	B	7.6	7.8	16.0	31
	C	7.6	7.8	16.0	31
	D	7.6	7.7	16.0	31
	E	7.6	7.8	16.0	31
	WQ	7.6	7.7	16.0	31
Control Sediment 2	A	7.4	7.1	16.0	31
	B	7.6	7.4	16.0	31
	C	7.4	7.0	16.0	31
	D	7.6	7.5	16.0	31
	E	7.7	7.6	16.0	31
	WQ	7.7	7.6	16.0	31
Control Seawater 1	A	7.5	7.7	16.0	30
	B	7.6	7.8	16.0	30
	C	7.5	7.8	16.0	30
	D	7.5	7.8	16.0	30
	E	7.5	7.8	16.0	30
	WQ	7.4	7.5	16.0	30
Control Seawater 2	A	7.5	7.6	16.0	31
	B	7.7	7.6	16.0	31
	C	7.7	7.7	16.0	31
	D	7.7	7.7	16.0	31
	E	7.7	7.7	16.0	31
	WQ	7.5	7.6	16.0	30

00704

Certified by: *Blonder*  
Jan. 6/95

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LC50:STEPHEN IBM/AT VERS 1.0  
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FILE: NOAA 9/618-02.4 940225  
TEST: Reference Toxicant . DATE: June 3, 1994  
SPECIES: Neanthes arenaceodentata DURATION: 96 hr  
CHEMICAL: Cadmium  
CARRIER: Seawater CARRIER CONC: 28 ppt

Sample: Reference Toxicant

Conc ----	Number exposed	Number dead	Percent dead	Binomial prob(percent) -----
32.00	10	10	100.0	0.0977
18.00	10	10	100.0	0.0977
10.00	10	10	100.0	0.0977
5.60	10	2	20.0	5.4687
3.20	10	0	0.0	0.0977
1.80	10	0	0.0	0.0977

The binom test shows that 3.200 and 10.000 can be used as statistically sound at 95 conf since the actual conf level associated with these limits is 99.805

An approx LC50 is 6.721 *ng/L*

\* warning:probit/mov av fail to give statsound results \*  
Less than 2 conc where %dead between 0-100

00841

*Certified LC*  
*Aug 11, 1994*



CHINODERM LARVAL DEVELOPMENT TOXICITY TEST - 48 h

Client:	<u>NOAA</u>	Date Initiated:	<u>June 9, 1994</u>
Project Number:	<u>9/618-02.4</u>	Date Terminated:	<u>June 11, 1994</u>
Work Order Number:	<u>940225</u>	Termination Method:	<u>Direct pipette</u>
Test Species:	<u>Dendraster excentricus</u>	Initial Density:	<u>18500 embryos/L</u>
Book: 5 Page: 45		Aliquot Size (mL):	<u>10</u>
		Test Volume (mL):	<u>1000</u>

Sample ID	Rep/ Conc	pH	D.O. (mg/L)	Temperature (°C)	Salinity (ppt)
AC-HY-6T	A	7.5	6.6	16.0	31
	B	7.8	7.3	16.0	31
	C	7.7	7.5	16.0	31
	D	7.7	7.5	16.0	31
	E	7.8	7.6	16.0	31
	WQ	7.8	7.4	16.0	31
AC-HY-7T	A	7.6	7.6	16.0	31
	B	7.6	7.7	16.0	31
	C	7.6	7.6	16.0	31
	D	7.7	7.6	16.0	31
	E	7.7	7.6	16.0	31
	WQ	7.6	7.5	16.0	31
AC-HY-14T	A	7.5	7.6	16.0	31
	B	7.3	7.5	16.0	31
	C	7.2	7.1	16.0	31
	D	7.1	6.2	16.0	31
	E	7.3	7.2	16.0	31
	WQ	7.5	7.6	16.0	31
AC-HY-24T	A	7.5	7.6	16.0	30
	B	7.7	7.4	16.0	31
	C	7.7	7.6	16.0	30
	D	7.6	7.6	16.0	30
	E	7.6	7.6	16.0	30
	WQ	7.6	7.6	16.0	30
AC-HY-25T	A	7.6	7.6	16.0	31
	B	7.7	7.6	16.0	31
	C	7.6	7.5	16.0	31
	D	7.6	7.5	16.0	31
	E	7.3	5.9	16.0	31
	WQ	7.6	7.7	16.0	31

00702

certified by: *Shander*  
Jan. 6/95

Neerthes 9/18-02.4  
W.O.# 940225



Setup #2, Day 0

RESULTS OF ANALYSIS - Water

File No. D9893

	DAC-HY-4T	DAC-HY-4TN	DAC-HY-5T	DAC-HY-5TN	DAC-HY-6T
	94 06 02	94 06 02	94 06 02	94 06 02	94 06 02
<hr/>					
<u>Nutrients</u>					
Ammonia Nitrogen N	0.690	0.860	0.930	0.840	0.580
<u>Inorganic Parameters</u>					
Sulphide S	<0.02	<0.02	<0.02	<0.02	<0.02

Results are expressed as milligrams per litre.  
< = Less than the detection limit indicated.

00643

**ECHINODERM LARVAL DEVELOPMENT TOXICITY TEST - 24 h**

Client:	<u>NOAA</u>	Date Initiated:	<u>June 9, 1994</u>
Project Number:	<u>9/818-02.4</u>	Date Terminated:	<u>June 11, 1994</u>
Work Order Number:	<u>940225</u>	Termination Method:	<u>Direct pipette</u>
Test Species:	<u><i>Dendraster excentricus</i></u>	Initial Density:	<u>18500 embryos/L</u>
Book: 5 Page: 45		Aliquot Size (mL):	<u>10</u>
		Test Volume (mL):	<u>1000</u>

Sample ID	Rep/ Conc	pH	D.O. (mg/L)	Temperature (°C)	Salinity (ppt)
DAC-HY-1T	WQ	7.8	8.1	16.0	31
DAC-HY-2T	WQ	7.6	8.0	16.0	31
DAC-HY-3T	WQ	7.6	7.0	16.0	31
DAC-HY-4T	WQ	7.5	7.4	16.0	31
DAC-HY-5T	WQ	7.7	8.0	16.0	30
DAC-HY-6T	WQ	7.8	7.9	16.0	31
DAC-HY-7T	WQ	7.7	7.8	16.0	31
DAC-HY-14T	WQ	7.8	8.0	16.0	31
DAC-HY-24T	WQ	7.5	7.8	16.0	31
DAC-HY-25T	WQ	7.7	7.9	16.0	31
DAC-HY-26T	WQ	7.8	8.0	16.0	30
DAC-HY-27T	WQ	7.6	7.8	16.0	31
DAC-HY-28T	WQ	7.6	7.8	16.0	31
DAC-CR-2AT	WQ	7.6	8.0	16.0	31
DAC-CR-2T	WQ	7.7	7.8	16.0	30
Control Sediment 1	WQ	7.7	8.0	16.0	31
Control Sediment 2	WQ	7.6	7.4	16.0	31
Control Seawater 1	WQ	7.6	8.0	16.0	30
Control Seawater 2	WQ	7.6	7.0	16.0	30
Reference Toxicant (SDS in mg/L)	WQ 10.0	7.8	8.0	16.0	31
	WQ 5.6	7.8	8.0	16.0	31
	WQ 3.2	7.7	8.0	16.0	31
	WQ 1.8	7.7	8.0	16.0	31
	WQ 1.0	7.7	8.0	16.0	31

00700

certified by: Blander  
Jan 6, 1995

Neantes 9/18-02.4  
W.O. # 940225



Setup #2 Day 2

RESULTS OF ANALYSIS - Water

File No. D9893

	DAC-HY-9T	DAC-HY-9TN	DAC-HY-10T	DAC-HY-10TN	DAC-HY-11T	
	94 06 02	94 06 02	94 06 02	94 06 02	94 06 02	
<hr/>						
<u>Nutrients</u>						
Ammonia Nitrogen	N	0.680	0.730	0.710	0.720	0.580
<u>Inorganic Parameters</u>						
Sulphide	S	<0.02	<0.02	<0.02	<0.02	0.02

Results are expressed as milligrams per litre.  
< = Less than the detection limit indicated.

00645

-----  
LC50:STEPHEN IBM/AT VERS 1.0  
-----

FILE: 9/618-02.4 940225 NOAA  
TEST: Abnormality - EC50 DATE: June 9, 1994  
SPECIES: Dendraster excentricus DURATION: 48 hr  
CHEMICAL: SDS  
CARRIER: Seawater CARRIER CONC: 30 ppt

Conc ----	Number exposed -----	Number dead -----	Percent dead -----	Binomial prob(percent) -----
10.00	100	59	59.3	2.8444
5.60	100	9	8.5	less
3.20	100	15	14.8	less
1.80	100	0.	0.3	less
1.00	100	0	0.0	less

\*WARNING: no percent dead is greater then 65 \*

The binom test shows that 5.600 and +infinity can be used as statistically sound at 95 conf since the actual conf level associated with these limits is 100.000

An approx LC50 is 9.108 mg/L SDS

-----RESULTS USING THE MOVING AVERAGE METHOD-----  
span g lc50 95% conf limits  
-----  
1 0.057810 9.108 8.446 10.063

-----RESULTS USING THE PROBIT METHOD-----  
iterations g h p(good. of fit)  
-----  
8 1.0708 8.388 0.000

a prob of 0 means that is less than 0.001

\* probit warning: prob is less than .05 \*

slope= 3.150  
95 confidence limits= -0.110 and 6.409

lc50= 9.560  
95 confidence limits= 5.484 and infinity

lc1= 1.745  
95 confidence limits= 0 and 3.683

00698

certified by: *B. Spencer*  
Jan 16 1995

Xeanthes 9/6/18-02.4  
W.O.# 940225



Set# 2 Day 0

RESULTS OF ANALYSIS - Water

File No. D9893

	DAC-HY- 26T	DAC-HY- 26TN	DAC-HY- 27T	DAC-HY- 27TN	DAC-HY- 28T
	94 06 02	94 06 02	94 06 02	94 06 02	94 06 02
<hr/>					
<u>Nutrients</u>					
Ammonia Nitrogen      N	0.590	0.750	0.600	0.700	0.740
<u>Inorganic Parameters</u>					
Sulphide      S	<0.02	0.03	<0.02	<0.02	<0.02

Results are expressed as milligrams per litre.  
< = Less than the detection limit indicated.

00647

QA/QC Summary Sheet

Client : ~~NOSS~~ <sup>QIS</sup> NOAA  
 Project No. : 9/618-02.4  
 Work Order : 940225

Summary of sediment toxicity test results. *Setup #2*

Sample ID.	Mean Value <sup>QIS</sup> ± S.D.		% Comb. Mort.
	% Abn. Survival <sub>96h</sub>	% Mort. Dry Weight <sub>96h</sub>	
CONTROL S.W. #2	4.7	-11.0	-5.8
CONTROL Sed. #2	5.6	-9.4	-3.2
DACHY-1T	8.0	-9.3	-0.5
DAC-HV-2T <sup>3NS</sup>	9.6	5.6	14.7
DAC-HV-4T	4.2	17.8	21.3
DAC-HV-6T	8.8	4.9	13.2
DAC-HV-7T	7.4	6.6	13.5
DAC-HV-14T	4.2	8.2	12.1
DAC-HV-25T	9.8	29.7	36.6
DAC-HV-27T	9.8	25.8	33.1
DAC-HV-28T	3.4	7.8	10.9

WATER QUALITY PARAMETERS: (Reftox 0,24+48-h)

Dissolved Oxygen : 5.0-8.0 mg/L  
 pH : 7.0-7.8  
~~Salinity~~  
 Conductivity : 29-31 ppt  
 Temperature : 16-17 °C

LC50 (48h, 96h) :  
 (Cd, Zn)

Ammonia

Day 0 : 0.02-0.45 mg/L  
 48-h : 0.36-0.05 mg/L

Sulfide

Day 0 : 2.02-0.10 mg/L  
 48-h : 2.02 <sup>NS</sup> mg/L

00696

certified by

Neantles 9/16/18-02.4  
W.D. # 940225



Setup #2 Day 0

RESULTS OF ANALYSIS - Water

File No. D9893

	DAC-HY-3T	DAC-HY-3TN	DAC-HY-2T	DAC-HY-2TN	DAC-HY-1T
	94 06 02	94 06 02	94 06 02	94 06 02	94 06 02
<hr/>					
<u>Nutrients</u>					
Ammonia Nitrogen N	0.480	0.570	0.260	0.190	0.130
<u>Inorganic Parameters</u>					
Sulphide S	<0.02	<0.02	<0.02	<0.02	<0.02

Results are expressed as milligrams per litre.  
< = Less than the detection limit indicated.

00649



ECHINODERM LARVAL DEVELOPMENT TOXICITY TEST RAW DATA RECORD

Client: NOAA  
 Project Number: 9/618-02.4  
 Work Order Number: 940225  
 Test Species: Dendraster excentricus  
 Book: 5 Page: 45

Date Initiated: June 9, 1994  
 Date Terminated: June 11, 1994  
 Termination Method: Direct pipette  
 Initial Density (embryos/L): 18500  
 Aliquot Size (mL): 10  
 Test Volume (mL): 1000

Sample ID	Rep/Conc	Normal Larvae	Abnormal Larvae	Total Larvae	% Abnormal Larvae	Mean % Abnormal	Mean % Abnormal	% Mortality	Mean % Mortality	% Combined Mortality	Mean % Combined Mortality	Mean % Combined Mortality
DAC-HY-25T	A	112	14	126	11.1	9.8	NA	31.9	29.7	29.7	39.5	36.6
	B	124	6	130	4.6						33.0	
	C	108	19	127	15.0			31.4	31.4	41.6		
	D	116	14	130	10.8			29.7	29.7	37.3		
	E	126	11	137	8.0			25.9	25.9	31.9		
DAC-HY-27T	A	108	22	130	16.9	9.8	NA	29.7	25.8	25.8	41.6	33.1
	B	132	21	153	13.7			17.3		28.6		
	C	129	11	140	7.9			24.3	24.3	30.3		
	D	140	6	146	4.1			21.1	21.1	24.3		
	E	110	7	117	6.0			36.8	36.8	40.5		
DAC-HY-28T	A	157	5	162	3.1	3.4	NA	12.4	7.8	7.8	15.1	10.9
	B	208	8	216	3.7			-16.8		-12.4		
	C	199	8	207	3.9			-11.9		-7.6		
	D	134	5	139	3.6			24.9	24.9	27.6		
	E	126	3	129	2.3			30.3	30.3	31.9		

NA - Not Applicable

469900

*certified by: Blaney  
 Jan. 6/95*

Neantles 9/18-02.4  
W.O.# 940225



Delo # 2 Day 0

**METHODOLOGY**

File No. D9893

Samples were analyzed by methods acceptable to the appropriate regulatory agency. Outlines of the methodologies utilized are as follows:

**Conventional Parameters in Water**

These analyses are carried out in accordance with procedures described in "Standard Methods for the Examination of Water and Wastewater" 18th Ed. published by the American Public Health Association, 1992. Further details are available on request.

**End of Report**

00651

ECHINODERM LARVAL DEVELOPMENT TOXICITY TEST RAW DATA RECORD

Client: NOAA  
 Project Number: 9/618-02.4  
 Work Order Number: 940225  
 Test Species: Dendroaster excentricus  
 Book: 5 Page: 45

Date Initiated: June 9, 1994  
 Date Terminated: June 11, 1994  
 Termination Method: Direct pipette  
 Initial Density (embryos/L): 18500  
 Aliquot Size (mL): 10  
 Test Volume (mL): 1000

Sample ID	Rep/Conc	Normal Larvae	Abnormal Larvae	Total Larvae	% Abnormal Larvae	Mean % Abnormal	Mean Net Abnormal	% Abnormal	Mortality	% Combined Mortality	Mean % Combined Mortality	Mean % Combined Mortality
Control	A	173	8	181	4.4	4.7	NA	2.2	-11.0	6.5	6.5	-5.8
Seawater 2	B	207	14	221	6.3			-19.5		-11.9		
	C	200	8	208	3.8			-12.4		-8.1		
	D	192	9	201	4.5			-8.6		-3.8		
	E	207	9	216	4.2			-16.8		-11.9		
Control	A	195	12	207	5.8	5.6	NA	-11.9	-9.4	-5.4	-5.4	-3.2
Sediment 2	B	168	11	179	6.1			3.2		9.2		
	C	216	12	228	5.3			-23.2		-16.8		
	D	179	8	187	4.3			-1.1		3.2		
	E	197	14	211	6.6			-14.1		-6.5		
DAC-HY-1T	A	197	14	211	6.6	8.0	NA	-14.1	-9.3	-6.5	-6.5	-0.5
	B	172	11	183	6.0			1.1		7.0		
	C	181	23	204	11.3			-10.3		2.2		
	D	190	15	205	7.3			-10.8		-2.7		
	E	190	18	208	8.7			-12.4		-2.7		
DAC-HY-3T	A	145	17	162	10.5	9.6	NA	12.4	5.6	21.6	21.6	14.7
	B	189	13	202	6.4			-9.2		-2.2		
	C	130	16	146	11.0			21.1		29.7		
	D	158	23	181	12.7			2.2		14.6		
	E	167	15	182	8.2			1.6		9.7		

NA - Not Applicable

*certified by: Blanked  
 1 Foot 1cc*

Neantles 9/6/18-02.4  
W.O.# 940225



Setup #2 Day 20

**REMARKS**

File No. E1482

As per the sample submission form, these samples are identified as "20 day  
Neaathis June 23, 1994 Teardown".

00653

ECHINODERM LARVAL DEVELOPMENT TOXICITY TEST RAW DATA RECORD

Client: NOAA  
 Project Number: 9/618-02.4  
 Work Order Number: 940225  
 Test Species: Dendroaster excentricus  
 Book: 5 Page: 45

Date Initiated: June 9, 1994  
 Date Terminated: June 11, 1994  
 Termination Method: Direct pipette  
 Initial Density (embryos/L): 18500  
 Aliquot Size (mL): 10  
 Test Volume (mL): 1000

Sample ID	Rep/Conc	Normal Larvae	Abnormal Larvae	Total Larvae	% Abnormal Larvae	Mean % Abnormal	Mean Net % Abnormal	% Mortality	Mortality	Mean % Mortality	% Combined Mortality	Mean % Combined Mortality
Control Seawater 1	A	193	7	200	3.5	2.7	NA	-8.1	-10.1	-4.3	-7.1	-7.1
	B	182	7	189	3.7			-2.2		1.6		
	C	183	7	190	3.7			-2.7		1.1		
	D	216	3	219	1.4			-18.4		-16.8		
	E	217	3	220	1.4			-18.9		-17.3		
Control Sediment 1	A	169	6	175	3.4	5.0	NA	5.4	-6.5	8.6	-1.2	-1.2
	B	184	14	198	7.1			-7.0		0.5		
	C	194	10	204	4.9			-10.3		-4.9		
	D	199	12	211	5.7			-14.1		-7.6		
	E	190	7	197	3.6			-6.5		-2.7		
DAC-HY-2T	A	189	15	204	7.4	8.5	NA	-10.3	-6.3	-2.2	2.8	2.8
	B	201	14	215	6.5			-16.2		-8.6		
	C	174	15	189	7.9			-2.2		5.9		
	D	166	17	183	9.3			1.1		10.3		
	E	169	23	192	12.0			-3.8		8.6		
DAC-HY-5T	A	168	14	182	7.7	8.8	NA	1.6	6.4	9.2	14.6	14.6
	B	160	14	174	8.0			5.9		13.5		
	C	148	21	169	12.4			8.6		20.0		
	D	140	13	153	8.5			17.3		24.3		
	E	174	14	188	7.4			-1.6		5.9		

NA - Not Applicable

*certified by: P. Sander  
 Jan 1, 1995*

Neenkes 9/10/18-02.4  
W.D.# 940225



Setup #12 Jugo

RESULTS OF ANALYSIS - Water

File No. E1482

	DAC-HY- 26T N	DAC-HY- 4T N	DAC-HY- 10T N	DAC-HY- 28T N	DAC-HY- 27T N
	94 06 23	94 06 23	94 06 23	94 06 23	94 06 23
<b><u>Nutrients</u></b>					
Ammonia Nitrogen N	5.21	0.540	0.910	5.23	4.31
<b><u>Inorganic Parameters</u></b>					
Sulphide S	<0.02	<0.02	<0.02	<0.02	<0.02

Remarks regarding the analyses appear at the beginning of this report.  
Results are expressed as milligrams per litre.  
< = Less than the detection limit indicated.

00655

ZOHINDUIM 11018-067  
W.D. # 940225

Sept 1 78-h



RESULTS OF ANALYSIS - Water

File No. E1143

		Control Sediment #1 EL 94 06 10	Control Sediment #2 EL 94 06 10	Control Seawater #1 EL 94 06 10	Control Seawater #2 EL 94 06 10
<hr/>					
<b>Nutrients</b>					
Ammonia Nitrogen	N	0.24	0.29	0.15	0.14
<b>Inorganic Parameters</b>					
Sulphide	S	<0.02	<0.02	<0.02	0.02

Remarks regarding the analyses appear at the beginning of this report.  
Results are expressed as milligrams per litre.  
< = Less than the detection limit indicated.

00688

Nearthes 9/10/18-02.4  
W.O.# 940225



Setup #2 Day 20

RESULTS OF ANALYSIS - Water

File No. E1482

		DAC-HY- 1T N	DAC-HY- 2T N	DAC-HY- 3T N	DAC-CR- 2T N	DAC-CR- 2AT N
		94 06 23	94 06 23	94 06 23	94 06 23	94 06 23
<b>Nutrients</b>						
Ammonia Nitrogen	N	0.143	0.126	1.00	1.76	0.180
<b>Inorganic Parameters</b>						
Sulphide	S	<0.02	<0.02	<0.02	<0.02	<0.02

Remarks regarding the analyses appear at the beginning of this report.  
Results are expressed as milligrams per litre.  
< = Less than the detection limit indicated.

00657



Echinoderm 4/18/18 UCT  
W.O. # 940225

Jetty # 1 48-L



RESULTS OF ANALYSIS - Water

File No. E1143

	DAC-HY- 8T EL	DAC-HY- 13T EL	DAC-HY- 12T EL	DAC-HY- 11T EL	DAC-HY- 22T EL
	94 06 10	94 06 10	94 06 10	94 06 10	94 06 10
<b>Nutrients</b>					
Ammonia Nitrogen N	0.34	0.19	0.24	0.24	0.35
<b>Inorganic Parameters</b>					
Sulphide S	<0.02	0.02	<0.02	<0.02	<0.02

Remarks regarding the analyses appear at the beginning of this report.  
Results are expressed as milligrams per litre.  
< = Less than the detection limit indicated.

00686

**APPENDIX C**  
***Echinoderm Larvae Bioassay***  
**RAW DATA**

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2/618-02.1 Bioassay Report  
April 1995

**PRIVILEGED ATTORNEY WORK PRODUCT - FOIA EXEMPT - DO NOT DISCLOSE**

00659

Echinoderm 41018-U2.4  
W.O. # 940225

Setg" 1 48-h



**REMARKS**

File No. E1143

As indicated on the sample submission form, these samples are identified as "Day 48-h Teardown (June 10, 1994), Echinoderm Larval".

00684

ECHINODERM LARVAL DEVELOPMENT TOXICITY TEST RAW DATA RECORD

Client: NOAA  
 Project Number: 9/618-02.4  
 Work Order Number: 940225  
 Test Species: Dendroster excentricus  
 Book: 5 Page: 39

Date Initiated: June 8, 1994  
 Date Terminated: June 10, 1994  
 Termination Method: Direct pipette  
 Initial Density (embryos/L): 15400  
 Aliquot Size (mL): 10  
 Test Volume (mL): 1000

Sample ID	Rep/ Conc	Normal Larvae	Abnormal Larvae	Total Larvae	% Abnormal Larvae	Mean % Abnormal	Mean Net % Abnormal	% Mortality	Mean % Mortality	% Combined Mortality	Mean % Combined Mortality
DAC-HY-10T	A	111	9	120	7.5	8.7	NA	22.1	26.5	27.9	32.9
	B	118	11	129	8.5			16.2		23.4	
	C	94	13	107	12.1			30.5		39.0	
	D	95	9	104	8.7			32.5		38.3	
	E	99	7	106	6.6			31.2		35.7	
DAC-HY-11T	A	132	6	138	4.3	3.2	NA	10.4	17.9	14.3	20.5
	B	113	5	118	4.2			23.4		26.6	
	C	105	2	107	1.9			30.5		31.8	
	D	132	3	135	2.2			12.3		14.3	
	E	130	4	134	3.0			13.0		15.6	
DAC-HY-12T	A	120	3	123	2.4	4.5	NA	20.1	8.2	22.1	12.3
	B	162	10	172	5.8			-11.7		-5.2	
	C	138	7	145	4.8			5.8		10.4	
	D	121	9	130	6.9			15.6		21.4	
	E	134	3	137	2.2			11.0		13.0	
DAC-HY-13T	A	113	10	123	8.1	8.4	NA	20.1	19.7	26.6	26.5
	B	126	8	134	6.0			13.0		18.2	
	C	109	7	116	6.0			24.7		29.2	
	D	94	8	102	7.8			33.8		39.0	
	E	124	19	143	13.3			7.1		19.5	

NA - Not Applicable  
 00661

certified by: *Blander*  
 Jan. 6/95

Echinoderm 4/6/18-02.4  
W.O.# 940225

Setup + 1 Day 0



**METHODOLOGY**

File No. E1113

Samples were analyzed by methods acceptable to the appropriate regulatory agency. Outlines of the methodologies utilized are as follows:

**Conventional Parameters in Water**

These analyses are carried out in accordance with procedures described in "Standard Methods for the Examination of Water and Wastewater" 18th Ed. published by the American Public Health Association, 1992. Further details are available on request.

**End of Report**

00682

**ECHINODERM LARVAL DEVELOPMENT TOXICITY TEST - 0 h**

Client:	<u>NOAA</u>	Date Initiated:	<u>June 8, 1994</u>
Project Number:	<u>9/618-02.4</u>	Date Terminated:	<u>June 10, 1994</u>
Work Order Number:	<u>940225</u>	Termination Method:	<u>Direct pipette</u>
Test Species:	<u><i>Dendraster excentricus</i></u>	Initial Density:	<u>15400 embryos/L</u>
Book: 5 Page: 39		Aliquot Size (mL):	<u>10</u>
		Test Volume (mL):	<u>1000</u>

Sample ID	Rep/ Conc.	pH	D.O. (mg/L)	Temperature (°C)	Salinity (ppt)
DAC-IY-8T	WQ	7.7	5.8	15.0	30
DAC-HY-9T	WQ	7.7	6.0	16.0	31
DAC-HY-10T	WQ	7.9	5.4	15.0	31
DAC-HY-11T	WQ	7.7	6.2	15.0	30
DAC-HY-12T	WQ	7.7	5.8	15.0	31
DAC-HY-13T	WQ	7.7	6.4	15.0	30
DAC-HY-15T	WQ	7.6	5.7	15.5	31
DAC-HY-16T	WQ	7.7	5.4	15.0	31
DAC-HY-17T	WQ	7.7	6.2	15.0	32
DAC-HY-18T	WQ	7.6	5.2	15.0	31
DAC-HY-19T	WQ	7.6	5.4	15.0	32
DAC-HY-20T	WQ	7.6	5.4	15.0	32
DAC-HY-21T	WQ	7.7	5.2	15.0	31
DAC-HY-22T	WQ	7.7	5.2	15.0	32
DAC-HY-23T	WQ	7.6	5.0	15.0	31
Control Sediment 1	WQ	7.6	7.3	15.0	31
Control Sediment 2	WQ	7.6	7.2	15.0	30
Control Seawater 1	WO	7.7	7.7	15.0	30
Control Seawater 2	WQ	7.7	7.8	15.0	30
Reference Toxicant (SDS in mg/L)	WQ 10.0	7.6	7.4	16.5	32
	WQ 5.6	7.6	7.5	16.5	32
	WQ 3.2	7.6	7.4	16.5	32
	WQ 1.8	7.6	7.4	16.5	31
	WQ 1.0	7.6	7.5	16.5	30

00669

Certified by: *Blander*

Echinoderid 4/10/82  
W.O.# 940225

Sept 71 say 0



RESULTS OF ANALYSIS - Water

File No. E1113

		DAC-HY- 21T EL	DAC-HY- 19T EL	DAC-HY- 17T EL	DAC-HY- 18T EL	DAC-HY- 20T EL
		94 06 08	94 06 08	94 06 08	94 06 08	94 06 08
<u>Nutrients</u>						
Ammonia Nitrogen	N	0.22	0.28	0.10	0.25	0.23
<u>Inorganic Parameters</u>						
Sulphide	S	0.02	<0.02	<0.02	<0.02	<0.02

Remarks regarding the analyses appear at the beginning of this report.  
Results are expressed as milligrams per litre.  
< - Less than the detection limit indicated.

00600

**ECHINODERM LARVAL DEVELOPMENT TOXICITY TEST - 48 h**

Client:	<u>NOAA</u>	Date Initiated:	<u>June 8, 1994</u>
Project Number:	<u>9/618-02.4</u>	Date Terminated:	<u>June 10, 1994</u>
Work Order Number:	<u>940225</u>	Termination Method:	<u>Direct pipette</u>
Test Species:	<u><i>Dendraster excentricus</i></u>	Initial Density:	<u>15400 embryos/L</u>
Book: 5 Page: 39		Allquot Size (mL):	<u>10</u>
		Test Volume (mL):	<u>1000</u>

Sample ID	Rep/ Conc	pH	D.O. (mg/L)	Temperature (°C)	Salinity (ppt)
DAC-HY-13T	A	7.5	8.0	16.0	30
	B	7.4	8.0	16.0	30
	C	7.4	7.8	16.0	30
	D	7.6	8.0	16.0	30
	E	7.7	8.0	16.0	30
	WQ	7.5	8.0	16.0	30
DAC-HY-15T	A	7.5	7.8	16.0	29
	B	7.5	7.9	16.0	29
	C	7.4	7.8	16.0	29
	D	7.5	7.8	16.0	29
	E	7.5	7.8	16.0	29
	WQ	7.4	7.8	16.0	29
DAC-HY-16T	A	7.5	7.9	16.0	30
	B	7.5	8.0	16.0	30
	C	7.5	8.0	16.0	30
	D	7.4	8.0	16.0	30
	E	7.4	7.8	16.0	30
	WQ	7.5	7.9	16.0	30
DAC-HY-17T	A	7.4	7.8	16.0	29
	B	7.5	7.6	16.0	29
	C	7.5	7.9	16.0	29
	D	7.5	7.8	16.0	29
	E	7.5	7.8	16.0	29
	WQ	7.6	8.0	16.0	29
DAC-HY-18T	A	7.5	7.8	16.0	29
	B	7.5	7.8	16.0	29
	C	7.4	5.8	16.0	29
	D	7.4	6.8	16.0	29
	E	7.3	5.8	16.0	29
	WQ	7.5	7.7	16.0	29

00673

*Certified by  
Blair*



Echinoderm 9/6/8-02.4  
W.O. # 940225

Setp#1 Day 0



RESULTS OF ANALYSIS - Water

File No. E1113

		DAC-HY- 9T EL	DAC-HY- 15T EL	DAC-HY- 23T EL	DAC-HY- 16T EL	DAC-HY- 10T EL
		94 06 08	94 06 08	94 06 08	94 06 08	94 06 08
<hr/>						
<b>Nutrients</b>						
Ammonia Nitrogen	N	0.21	0.21	0.23	0.12	0.17
<b>Inorganic Parameters</b>						
Sulphide	S	0.03	0.04	<0.02	0.02	0.02

Remarks regarding the analyses appear at the beginning of this report.  
Results are expressed as milligrams per litre.  
< = Less than the detection limit indicated.

00678

**ECHINODERM LARVAL DEVELOPMENT TOXICITY TEST - 48 h**

Client:	<u>NOAA</u>	Date Initiated:	<u>June 8, 1994</u>
Project Number:	<u>9/618-02.4</u>	Date Terminated:	<u>June 10, 1994</u>
Work Order Number:	<u>940225</u>	Termination Method:	<u>Direct pipette</u>
Test Species:	<u><i>Dendraster excentricus</i></u>	Initial Density:	<u>15400 embryos/L</u>
Book: 5 Page: 39		Aliquot Size (mL):	<u>10</u>
		Test Volume (mL):	<u>1000</u>

Sample ID	Rep/ Conc	pH	D.O. (mg/L)	Temperature (°C)	Salinity (ppt)
Reference	A 10.0	7.5	8.0	16.0	31
Toxicant (SDS in mg/L)	B	7.5	8.0	16.0	31
	WQ	7.5	8.0	16.0	31
	A 5.6	7.4	8.0	16.0	31
	B	7.5	8.0	16.0	31
	WQ	7.4	8.0	16.0	31
	A 3.2	7.4	8.0	16.0	31
	B	7.5	8.0	16.0	31
	WQ	7.3	8.0	16.0	31
	A 1.8	7.3	8.0	16.0	31
	B	7.3	8.0	16.0	31
	WQ	7.3	8.0	16.0	31
	A 1.0	7.3	8.0	16.0	31
	B	7.3	8.0	16.0	31
	WQ	7.3	8.0	16.0	31

00675

certified by: *Blanke*  
Jan. 6/95

1988 Triumph Street, Vancouver, B.C., Canada V5L 1K5

*Echinoderin 9/618-02.4*  
*W.O. # 940225*

analytical

service

laboratories

FAX: (604) 253-6700 TEL: (604) 253-4188

*Setup #1 Day 0*

ltd.



## CHEMICAL ANALYSIS REPORT

---

**Date:** June 20, 1994  
**ASL File No.** E1113  
**Report On:** 9/618-02.4 Water Analysis  
**Report To:** **EVS Environment Consultants**  
195 Pemberton Avenue  
North Vancouver, BC  
V7P 2R4  
**Attention:** **Mr. Todd Shannon**  
**Received:** June 10, 1994

---

**ASL ANALYTICAL SERVICE LABORATORIES LTD.**  
per:

*Heather Ross*  
Heather A. Ross, B.Sc.  
Project Chemist

*Katherine Thomas*  
Katherine Thomas, B.Sc.  
Project Chemist

00676

Echinoderm 4/618-02-1  
W.D.# 940225

Setup # 1 Day 0



**REMARKS**

File No. E1113

As indicated on the sample submission form, these samples are identified as "Day 0, Set up #1 (June 8, 1994), Echinoderm Larval".

00677

CHINODERM LARVAL DEVELOPMENT TOXICITY TEST -- 48 h

Client:	<u>NOAA</u>	Date Initiated:	<u>June 8, 1994</u>
Project Number:	<u>9/618-02.4</u>	Date Terminated:	<u>June 10, 1994</u>
Work Order Number:	<u>940225</u>	Termination Method:	<u>Direct pipette</u>
Test Species:	<u><i>Dendraster excentricus</i></u>	Initial Density:	<u>15400 embryos/l.</u>
Book: 5 Page: 39		Aliquot Size (mL):	<u>10</u>
		Test Volume (mL):	<u>1000</u>

Sample ID	Rep/ Conc	pH	D.O. (mg/L)	Temperature (°C)	Salinity (ppt)
AC-HY-19T	A	7.4	7.8	16.5	29
	B	7.4	6.6	16.0	29
	C	7.4	7.6	16.0	29
	D	7.4	7.2	16.0	29
	E	7.4	6.4	16.0	30
	WQ	7.4	7.8	16.0	30
AC-HY-20T	A	7.4	7.6	16.0	29
	B	7.3	5.8	16.0	29
	C	7.3	5.6	16.0	29
	D	7.3	5.6	16.0	29
	E	7.5	5.8	16.0	29
	WQ	7.6	8.0	16.0	29
AC-HY-21T	A	7.5	7.8	16.5	29
	B	7.5	7.8	16.5	29
	C	7.5	8.0	16.0	29
	D	7.6	7.9	16.0	29
	E	7.3	6.4	16.0	29
	WQ	7.6	7.8	16.0	29
AC-HY-22T	A	7.5	7.9	16.0	30
	B	7.3	5.9	16.5	30
	C	7.3	7.1	16.5	30
	D	7.4	7.4	16.5	30
	E	7.4	7.6	16.5	30
	WQ	7.6	8.0	16.5	30
AC-HY-23T	A	7.5	7.8	16.0	29
	B	7.5	7.8	16.0	29
	C	7.3	6.2	16.0	29
	D	7.3	6.6	16.0	29
	E	7.4	7.0	16.0	29
	WQ	7.5	8.0	16.0	29

00674

Certified by: *Blair*  
Jan. 6. 95

Echinoderm 4/16/802.4  
W.O.# 940225

Setup "1" day 0



RESULTS OF ANALYSIS - Water

File No. E1113

		DAC-HY- 8T EL	DAC-HY- 13T EL	DAC-HY- 12T EL	DAC-HY- 11T EL	DAC-HY- 22T EL
		94 06 08	94 06 08	94 06 08	94 06 08	94 06 08
<hr/>						
<b>Nutrients</b>						
Ammonia Nitrogen	N	0.21	0.11	0.14	0.17	0.24
<b>Inorganic Parameters</b>						
Sulphide	S	<0.02	0.02	0.03	<0.02	<0.02

Remarks regarding the analyses appear at the beginning of this report.  
Results are expressed as milligrams per litre.  
< - Less than the detection limit indicated.

00679

CHINODERM LARVAL DEVELOPMENT TOXICITY TEST - 48 h

Client:  
 Project Number:  
 Work Order Number:  
 Test Species:  
 Book: 5 Page: 39

NOAA	Date Initiated:	June 8, 1994
9/618-02.4	Date Terminated:	June 10, 1994
940225	Termination Method:	Direct pipette
<i>Dendraster excentricus</i>	Initial Density:	15400 embryos/l.
	Aliquot Size (mL):	10
	Test Volume (mL):	1000

Sample ID	Rep/ Conc	pH	D.O. (mg/L)	Temperature (°C)	Salinity (ppt)
AC-HY-8T	A	7.5	7.8	16.0	30
	B	7.6	7.9	16.0	30
	C	7.6	8.0	16.0	30
	D	7.6	8.1	16.0	30
	E	7.5	7.8	16.0	30
	WQ	7.5	7.6	16.0	30
AC-HY-9T	A	7.6	8.0	16.0	29
	B	7.4	7.8	16.0	29
	C	7.3	6.4	16.0	29
	D	7.5	7.6	16.0	29
	E	7.4	7.2	16.0	29
	WQ	7.6	8.0	16.0	29
AC-HY-10T	A	7.5	7.9	16.0	30
	B	7.5	7.9	16.0	30
	C	7.4	7.2	16.0	30
	D	7.5	7.8	16.0	30
	E	7.5	7.9	16.0	30
	WQ	7.5	7.8	16.0	30
AC-HY-11T	A	7.6	8.0	16.0	30
	B	7.4	7.4	16.0	30
	C	7.4	7.6	16.0	30
	D	7.5	7.8	16.0	30
	E	7.4	7.6	16.0	30
	WQ	7.4	8.0	16.0	30
AC-HY-12T	A	7.3	6.4	16.0	30
	B	7.4	7.4	16.0	30
	C	7.3	6.8	16.0	30
	D	7.5	7.7	16.0	30
	E	7.5	7.8	16.0	30
	WQ	7.3	6.4	16.0	30

00672

certified by: Blarke  
 Jan 6/95

Echinoderid 4/6/18-02.A  
W.O.# 940225

Setup 1 Day 0



RESULTS OF ANALYSIS - Water

File No. E1113

		Control Sediment #1 EL 94 06 08	Control Sediment #2 EL 94 06 08	Control Seawater #1 EL 94 06 08	Control Seawater #2 EL 94 06 08
<hr/>					
<u>Nutrients</u>					
Ammonia Nitrogen	N	0.12	0.11	0.02	0.03
<u>Inorganic Parameters</u>					
Sulphide	S	<0.02	<0.02	<0.02	<0.02

Remarks regarding the analyses appear at the beginning of this report.  
Results are expressed as milligrams per litre.  
< = Less than the detection limit indicated.

00681



-----  
LC50:STEPHEN IBM/AT VERS 1.0  
-----

FILE: 9/618-02.4 940225 NOAA  
TEST: Abnormality - EC50 DATE: June 8, 1994  
SPECIES: Dendraster excentricus DURATION: 48 hr  
CHEMICAL: SDS  
CARRIER: Seawater CARRIER CONC: 30 ppt

Conc -----	Number exposed	Number dead	Percent dead	Binomial prob(percent)
10.00	100	99	98.9	less
5.60	100	88	87.7	less
3.20	100	24	24.1	less
1.80	100	9	9.2	less
1.00	100	0	0.0	less

The binom test shows that 3.200 and 5.600 can be used as statistically sound at 95 conf since the actual conf level associated with these limits is 100.000

An approx LC50 is 3.980 mg/L SDS

-----RESULTS USING THE MOVING AVERAGE METHOD-----

span	g	lc50	95% conf limits	
4	0.009802	3.680	3.411	3.981
3	0.014937	3.739	3.444	4.043
2	0.024027	3.842	3.554	4.193
1	0.040055	3.980	3.744	4.209

-----RESULTS USING THE PROBIT METHOD-----

iterations	g	h	p(good. of fit)
10	0.2734	4.347	0.000

a prob of 0 means that is less than 0.001  
\* probit warning: prob is less than .05 \*

slope= 5.316  
95 confidence limits= 2.537 and 8.096

lc50= 3.738  
95 confidence limits= 2.804 and 4.988

lc1= 1.365  
95 confidence limits= 0.428 and 2.038

00668

certified by:  
Blander  
Jan. 5/95

1988 Triumph Street, Vancouver, B.C., Canada V5L 1K5

*Echinodem 9/618-02.4*  
*W.O.# 940225*

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FAX: (604) 253-6700 TEL: (604) 253-4188

*Setup # 1*  
*48-h*  
*JUN 27 1994*

ltd.



## CHEMICAL ANALYSIS REPORT

---

**Date:** June 20, 1994  
**ASL File No.** E1143  
**Report On:** 9/618-02.4 Water Analysis  
**Report To:** **EVS Environment Consultants**  
195 Pemberton Avenue  
North Vancouver, BC  
V7P 2R4  
**Attention:** **Mr. Todd Shannon**  
**Received:** June 13, 1994

---

**ASL ANALYTICAL SERVICE LABORATORIES LTD.**  
per:

*Heather A. Ross*  
Heather A. Ross, B.Sc.  
Project Chemist

*Katherine Thomas*  
Katherine Thomas, B.Sc.  
Project Chemist

00683

ECHINODERM LARVAL DEVELOPMENT TOXICITY TEST RAW DATA RECORD

Client: NOAA  
 Project Number: 9/618-02.4  
 Work Order Number: 940225  
 Test Species: Dendraster excentricus  
 Book: 5 Page: 39

Date Initiated: June 8, 1994  
 Date Terminated: June 10, 1994  
 Termination Method: Direct pipette  
 Initial Density (embryos/L): 15400  
 Aliquot Size (mL): 10  
 Test Volume (mL): 1000

Sample ID	Rep/Conc	Normal Larvae		Abnormal Larvae		Total Larvae	% Abnormal Larvae		Mean % Abnormal	Mean Net % Abnormal	% Mortality	Mean % Mortality	% Combined Mortality		Mean % Combined Mortality
		Larvae	Larvae	Larvae	Larvae		Mortality	Mortality							
Control	A	200	5	205	2.4	4.7	NA	NA	-33.1	-200	-29.9	-14.4			
Sediment 1	B	166	11	177	6.2				-14.9		-7.8				
	C	181	10	191	5.2				-24.0		-17.5				
	D	156	12	168	7.1				-9.1		-1.3				
	E	178	5	183	2.7				-18.8		-15.6				
Control Seawater 1	A	186	6	192	3.1	2.3	NA	NA	-24.7	-122	-20.8	-9.6			
	B	152	4	156	2.6				-1.3		1.3				
	C	179	5	184	2.7				-19.5		-16.2				
	D	153	2	155	1.3				-0.6		0.6				
	E	174	3	177	1.7				-14.9		-13.0				
DAC-HY-8T	A	131	12	143	8.4	8.7	NA	NA	7.1	2.5	14.9	11.0			
	B	124	7	131	5.3				14.9		19.5				
	C	144	18	162	11.1				-5.2		6.5				
	D	137	10	147	6.8				4.5		11.0				
	E	149	18	167	10.8				-8.4		3.2				
DAC-HY-9T	A	140	39	179	21.8	17.9	NA	NA	-16.2	-12.6	9.1	7.5			
	B	151	22	173	12.7				-12.3		1.9				
	C	147	22	169	13.0				-9.7		4.5				
	D	126	46	172	26.7				-11.7		18.2				
	E	148	26	174	14.9				-13.0		3.9				

00 Not Applicable  
 00

Certified by: *[Signature]* Jan 4/95

Echinoderid 4/16/18-02.4  
W.D.# 940225

Setup # 1 48-h



RESULTS OF ANALYSIS - Water

File No. E1143

	DAC-HY- 9T EL	DAC-HY- 15T EL	DAC-HY- 23T EL	DAC-HY- 16T EL	DAC-HY- 10T EL	
	94 06 10	94 06 10	94 06 10	94 06 10	94 06 10	
<hr/>						
<b>Nutrients</b>						
Ammonia Nitrogen	N	0.28	0.26	0.37	0.17	0.25
<b>Inorganic Parameters</b>						
Sulphide	S	<0.02	<0.02	<0.02	<0.02	<0.02

Remarks regarding the analyses appear at the beginning of this report.  
Results are expressed as milligrams per litre.  
< = Less than the detection limit indicated.

00685

Neanthes 9/6/18-02A  
W.O.# 940225



Setup # 2 Day 20

## **METHODOLOGY**

File No. E1482

Samples were analyzed by methods acceptable to the appropriate regulatory agency. Outlines of the methodologies utilized are as follows:

### **Conventional Parameters in Water**

These analyses are carried out in accordance with procedures described in "Standard Methods for the Examination of Water and Wastewater" 18th Ed. published by the American Public Health Association, 1992. Further details are available on request.

**End of Report**

00658

Setij# Echinoderm 9/10/18-024  
W.O.# 940225

Setij# 1 48-1



RESULTS OF ANALYSIS - Water

File No. E1143

		DAC-HY- 21T EL	DAC-HY- 19T EL	DAC-HY- 17T EL	DAC-HY- 18T EL	DAC-HY- 20T EL
		94 06 10	94 06 10	94 06 10	94 06 10	94 06 10
<hr/>						
<u>Nutrients</u>						
Ammonia Nitrogen	N	0.32	0.34	0.20	0.38	0.49
<u>Inorganic Parameters</u>						
Sulphide	S	<0.02	<0.02	<0.02	<0.02	<0.02

Remarks regarding the analyses appear at the beginning of this report.  
Results are expressed as milligrams per litre.  
< = Less than the detection limit indicated.

00687

Neantkes 9/16/18-02.4  
W.O.# 940225



Setup #2 Day 20

RESULTS OF ANALYSIS - Water

File No. E1482

DAC-HY- 6T N	DAC-HY- 25T N	DAC-HY- 11T N	DAC-HY- 8T N	DAC-HY- 5T N
94 06 23	94 06 23	94 06 23	94 06 23	94 06 23

Nutrients

Ammonia Nitrogen	N	1.33	3.23	2.05	0.152	0.131
------------------	---	------	------	------	-------	-------

Inorganic Parameters

Sulphide	S	<0.02	<0.02	<0.02	<0.02	<0.02
----------	---	-------	-------	-------	-------	-------

Remarks regarding the analyses appear at the beginning of this report.  
Results are expressed as milligrams per litre.  
< = Less than the detection limit indicated.

00656

Echinoderid 9/6/18-024  
W.D.# 940225



Seteg# 1 A8-h

**METHODOLOGY**

File No. E1143

Samples were analyzed by methods acceptable to the appropriate regulatory agency. Outlines of the methodologies utilized are as follows:

**Conventional Parameters in Water**

These analyses are carried out in accordance with procedures described in "Standard Methods for the Examination of Water and Wastewater" 18th Ed. published by the American Public Health Association, 1992. Further details are available on request.

**End of Report**

00689



Neantles 9/16/18-02.4  
W.O. # 940225



Setup # 2 Day 10

RESULTS OF ANALYSIS - Water

File No. E1482

Control Sediment #1 N 94 06 23	Control Sediment #2 N 94 06 23	DAC-HY- 9T N 94 06 23	DAC-HY- 7T N 94 06 23	DAC-HY- 12T N 94 06 23
-----------------------------------------	-----------------------------------------	-----------------------------	-----------------------------	------------------------------

Nutrients

Ammonia Nitrogen

N	5.86	7.66	0.189	0.670	0.240
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Inorganic Parameters

Sulphide S

	<0.02	<0.02	<0.02	<0.02	<0.02
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Remarks regarding the analyses appear at the beginning of this report.  
Results are expressed as milligrams per litre.  
< = Less than the detection limit indicated.

00654

ECHINODERM LARVAL DEVELOPMENT TOXICITY TEST RAW DATA RECORD

Client: NOAA  
 Project Number: 9/618-02.4  
 Work Order Number: 940225  
 Test Species: Dendroster exocetriscus  
 Book: 5 Page: 45

Date Initiated: June 9, 1994  
 Date Terminated: June 11, 1994  
 Termination Method: Direct pipette  
 Initial Density (embryos/L): 18500  
 Aliquot Size (mL): 10  
 Test Volume (mL): 1000

Sample ID	Rep/Conc	Normal Larvae		Abnormal Larvae		Total Larvae	% Abnormal Larvae	Mean % Abnormal	Mean % Abnormal	% Mortality	Mean % Mortality	% Combined Mortality	Mean % Combined Mortality
		Larvae	Larvae	Larvae	Larvae								
DAC-HY-24T	A	133	7	140	5.0	7.7	NA	24.3	24.6	28.1	30.5		
	B	147	11	158	7.0			14.6		20.5			
	C	110	14	124	11.3			33.0		40.5			
	D	132	11	143	7.7			22.7		28.6			
	E	121	11	132	8.3			28.6		34.6			
DAC-HY-26T	A	190	22	212	10.4	10.9	NA	-14.6	-9.2	-2.7	2.7		
	B	191	25	216	11.6			-16.8		-3.2			
	C	154	17	171	9.9			7.6		16.8			
	D	179	20	199	10.1			-7.6		3.2			
	E	186	26	212	12.3			-14.6		-0.5			
DAC-CR-2T	A	138	11	149	7.4	9.1	NA	19.5	33.4	25.4	39.5		
	B	110	9	119	7.6			35.7		40.5			
	C	98	11	109	10.1			41.1		47.0			
	D	115	10	125	8.0			32.4		37.8			
	E	99	15	114	13.2			38.4		46.5			
DAC-CR-2AT	A	175	13	188	6.9	6.6	NA	-1.6	-1.9	5.4	4.8		
	B	197	14	211	6.6			-14.1		-6.5			
	C	168	14	182	7.7			1.6		9.2			
	D	170	14	184	7.6			0.5		8.1			
	E	171	7	178	3.9			3.8		7.6			

NA - Not Applicable

Certified by: *R. Sander*

1988 Triumph Street, Vancouver, B.C., Canada V5L 1K5

*Neantles 9/618-02.4*  
*W.O. # 940225*

analytical  
service  
laboratories

FAX: (604) 253-6700 TEL: (604) 253-4188

*Setup #2 Day 20*

ltd.



## CHEMICAL ANALYSIS REPORT

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**Date:** July 6, 1994  
**ASL File No.** E1482  
**Report On:** 9/618-02-4 Water Analysis  
**Report To:** **EVS Environment Consultants**  
195 Pemberton Avenue  
North Vancouver, BC  
V7P 2R4  
**Attention:** **Mr. Todd Shannon**  
**Received:** June 24, 1994

---

**ASL ANALYTICAL SERVICE LABORATORIES LTD.**  
per:

*Heather A. Ross*  
Heather A. Ross, B.Sc.  
Project Chemist

*Katherine Thomas*  
Katherine Thomas, B.Sc.  
Project Chemist

00652

ECHINODERM LARVAL DEVELOPMENT TOXICITY TEST RAW DATA RECORD

Client:	NOAA	Date Initiated:	June 9, 1994
Project Number:	9/618-02.4	Date Terminated:	June 11, 1994
Work Order Number:	940225	Termination Method:	Direct pipette
Test Species:	<i>Dendroaster excentricus</i>	Initial Density (embryos/L):	18500
Book: 5	Page: 45	Aliquot Size (mL):	10
		Test Volume (mL):	1000

Sample ID	Rep/ Conc	Normal Larvae	Abnormal Larvae	Total Larvae	% Abnormal Larvae	Mean % Abnormal	Mean % Abnormal	% Mortality	Mean % Mortality	% Combined Mortality	Mean % Combined Mortality
DAC-HY-IT	A	171	6	177	3.4	4.2	NA	4.3	17.8	7.6	21.3
	B	132	4	136	2.9			26.5		28.6	
	C	128	9	137	6.6			25.9		30.8	
	D	150	7	157	4.5			15.1		18.9	
	E	147	6	153	3.9			17.3		20.5	
DAC-HY-OT	A	179	17	196	8.7	8.8	NA	-5.9	4.9	3.2	13.2
	B	121	11	132	8.3			28.6		34.6	
	C	170	11	181	6.1			2.2		8.1	
	D	167	15	182	8.2			1.6		9.7	
	E	166	23	189	12.2			-2.2		10.3	
DAC-HY-T	A	141	12	153	7.8	7.4	NA	17.3	6.6	23.8	13.5
	B	168	11	179	6.1			3.2		9.2	
	C	174	14	188	7.4			-1.6		5.9	
	D	148	11	159	6.9			14.1		20.0	
	E	169	16	185	8.6			0.0		8.6	
DAC-HY-IT	A	155	5	160	3.1	4.2	NA	13.5	8.2	16.2	12.1
	B	181	6	187	3.2			-1.1		2.2	
	C	163	10	173	5.8			6.5		11.9	
	D	130	5	135	3.7			27.0		29.7	
	E	184	10	194	5.2			-4.9		0.5	

NA - Not Applicable

*certified by: Blanked*

Neantles 9/6/18-02.4  
W.O.# 940225



Samp # 2 Day 0

RESULTS OF ANALYSIS - Water

File No. D9893

	DAC-HY- 1TN	DAC-CR- 2T	DAC-CR- 2TN	DAC-CR- 2AT	DAC-CR- 2ATN
	94 06 02	94 06 02	94 06 02	94 06 02	94 06 02
<hr/>					
<b>Nutrients</b>					
Ammonia Nitrogen N	0.220	0.160	0.420	0.096	0.250
<b>Inorganic Parameters</b>					
Sulphide S	<0.02	0.03	0.04	0.03	0.03

Results are expressed as milligrams per litre.  
< = Less than the detection limit indicated.

00650

ECHINODERM LARVAL DEVELOPMENT TOXICITY TEST RAW DATA RECORD

Client: NOAA  
 Project Number: 9/618-02.4  
 Work Order Number: 940225  
 Test Species: Dendraster excentricus  
 Book: 5 Page: 45

Date Initiated: June 9, 1994  
 Date Terminated: June 11, 1994  
 Termination Method: Direct pipette  
 Initial Density (embryos/L): 18500  
 Aliquot Size (mL): 10  
 Test Volume (mL): 1000

Sample ID	Rep/ Conc	Normal Larvae	Abnormal Larvae	Total Larvae	% Abnormal Larvae	Mean % Abnormal	Mean Net % Abnormal	% Mortality	Mean % Mortality	% Combined Mortality	Mean % Combined Mortality
Reference Toxicant (SDS in mg/L)	A 100	31	60	91	65.9	61.2	59.3	50.8	45.7	83.2	78.9
	B	47	63	110	57.3			40.5		74.6	
	A 5.6	103	18	121	14.9	12.8	8.5	34.6	28.1	44.3	37.3
	B	129	16	145	11.0			21.6		30.3	
	A 3.2	107	27	134	20.1	18.8	14.8	27.6	22.2	42.2	36.8
	B	127	27	154	17.5			16.8		31.4	
	A 1.8	198	8	206	3.9	5.0	0.3	-11.4	-8.6	-7.0	-3.2
	B	184	12	196	6.1			-5.9		0.5	
	A 1.0	214	14	228	6.1	4.1	-0.6	-23.2	-12.7	-15.7	-8.1
	B	186	3	189	1.6			-2.2		-0.5	

00695

Certified by Blender

Nranthes 9/6/18-02 4  
W.O.# 940225



Setup #2 Day 0

RESULTS OF ANALYSIS - Water

File No. D9893

	DAC-HY- 28TN	Control 1	Control 1N	Control 2	Control 2N	
	94 06 02	94 06 02	94 06 02	94 06 02	94 06 02	
<hr/>						
<b><u>Nutrients</u></b>						
Ammonia Nitrogen	N	0.850	0.260	0.280	0.240	0.230
<b><u>Inorganic Parameters</u></b>						
Sulphide	S	<0.02	<0.02	<0.02	<0.02	<0.02

Results are expressed as milligrams per litre.  
< = Less than the detection limit indicated.

00648

8-12 *Paraprionospion caudatus* toxicity test using *P. exaltatus*

QA/QC Summary Sheet

Client : NOAA  
 Project No. : 9/10/18-02.4  
 Work Order. : 940225

Summary of sediment toxicity test results. *Sedyp # 2*

Sample LD.	Mean Value $\pm$ S.D.		% Comb. Mort
	% Abr. Survival	% Mort. Dry Weight	
CONTROL S.W. #1	2.7	-10.1	-7.1
CONTROL SED. #1	5.0	-6.5	-1.2
DAC-HY-2T	8.5	-6.3	2.8
DAC-HY-5T	8.8	6.4	14.6
DAC-HY-26T	7.7	24.6	30.5
DAC-HY-26T	10.9	-9.2	2.7
DAC-CR-2T	9.1	33.4	39.5
DAC-CR-2AT	6.6	-1.9	4.8

WATER QUALITY PARAMETERS: (0, 24 + 48-h) TEST SOLUTIONS

Dissolved Oxygen : 6.0 - 8.1 mg/L  
 pH : 7.0 - 7.8  
 Salinity Conductivity : 30 - 32 ppt  
 Temperature : 15.5 - 16.0 °C  
 LC50 (48h, 96h) (Cd, Zn) SDS : 9.1 mg/L SDS

Cd. Ref tox 48h  
 8.2 mg/L Cd  
 95% C.L. = 3.2 and 32.0 mg/L Cd  
 Lab Mean : 11.2  $\pm$  8.0 mg/L Cd.  
 00697

Lab Mean  
~~2.4  $\pm$  1.0 mg/L SDS~~  
 3.2  $\pm$  3.3 mg/L SDS

95% C.L. = 5.6 and  $\infty$  mg/L SDS  
 Note that values are out of lab range. Indicates animals were more tolerant.

Certified by: *R. R. Anderson*



Nearthes 9/18-02.4  
W.D.# 940225



Schiff # 2 Day 0

RESULTS OF ANALYSIS - Water

File No. D9893

	DAC-HY- 11TN	DAC-HY- 12T	DAC-HY- 12TN	DAC-HY- 25T	DAC-HY- 25TN	
	94 06 02	94 06 02	94 06 02	94 06 02	94 06 02	
<hr/>						
<u>Nutrients</u>						
Ammonia Nitrogen	N	0.640	0.380	0.480	0.260	1.00
<u>Inorganic Parameters</u>						
Sulphide	S	<0.02	<0.02	<0.02	<0.02	<0.02

Results are expressed as milligrams per litre.  
< = Less than the detection limit indicated.

00646

ECHINODERM LARVAL DEVELOPMENT TOXICITY TEST - 0 h

Client:	<u>NOAA</u>	Date Initiated:	<u>June 9, 1994</u>
Project Number:	<u>0/818-02.4</u>	Date Terminated:	<u>June 11, 1994</u>
Work Order Number:	<u>940225</u>	Termination Method:	<u>Direct pipette</u>
Test Species:	<u>Dendraster excentricus</u>	Initial Density:	<u>18500 embryos/L</u>
Book: 5 Page: 45		Alliquot Size (mL):	<u>10</u>
		Test Volume (mL):	<u>1000</u>

Sample ID	Rep/ Conc	pH	D.O. (mg/L)	Temperature (°C)	Salinity (ppt)
DAC-HY-1T	WQ	7.7	6.6	15.5	31
DAC-HY-2T	WQ	7.6	7.0	15.5	31
DAC-HY-3T	WQ	7.7	5.7	15.5	31
DAC-HY-4T	WQ	7.7	6.0	15.5	31
DAC-HY-5T	WQ	7.6	6.2	15.5	31
DAC-HY-6T	WQ	7.7	5.9	15.5	31
DAC-HY-7T	WQ	7.6	6.1	15.5	32
DAC-HY-14T	WQ	7.6	6.1	15.5	31
DAC-HY-24T	WQ	7.6	5.0	15.5	31
DAC-HY-25T	WQ	7.6	5.0	15.5	32
DAC-HY-26T	WQ	7.5	5.1	15.5	31
DAC-HY-27T	WQ	7.5	5.2	15.5	31
DAC-HY-28T	WQ	7.5	5.0	15.5	32
DAC-CR-2T	WQ	7.6	6.8	15.5	32
DAC-CR-2AT	WQ	7.6	6.8	15.5	32
Control Sediment 1	WQ	7.6	7.4	15.5	31
Control Sediment 2	WQ	7.7	7.4	15.5	31
Control Seawater 1	WQ	7.6	7.7	15.5	31
Control Seawater 2	WQ	7.7	7.8	15.5	31
Reference	WQ 10.0	7.6	8.0	16.0	31
Toxicant (SDS in mg/L)	WQ 5.6	7.6	7.8	16.0	30
	WQ 3.2	7.6	7.8	16.0	30
	WQ 1.8	7.6	7.8	16.0	31
	WQ 1.0	7.6	7.9	16.0	30

00699

certified by: Blande /  
Jan. 6 / 95

Neanthes 9/6/18-02.4  
W.O.# 940225



Setup #2 Day 0

RESULTS OF ANALYSIS - Water

File No. D9893

		DAC-HY- 6TN	DAC-HY- 7T	DAC-HY- 7TN	DAC-HY- 8T	DAC-HY- 8TN
		94 06 02	94 06 02	94 06 02	94 06 02	94 06 02
<hr/>						
<b>Nutrients</b>						
Ammonia Nitrogen	N	0.570	0.560	0.670	0.670	0.680
<b>Inorganic Parameters</b>						
Sulphide	S	<0.02	<0.02	<0.02	<0.02	<0.02

Results are expressed as milligrams per litre.  
< = Less than the detection limit indicated.

00644

ECHINODERM LARVAL DEVELOPMENT TOXICITY TEST - 48 h

Client:	NOAA	Date Initiated:	June 9, 1994
Project Number:	9/618-02.4	Date Terminated:	June 11, 1994
Work Order Number:	940225	Termination Method:	Direct pipette
Test Species:	<i>Dendraster excentricus</i>	Initial Density:	18500 embryos/L
Book: 5 Page: 45		Aliquot Size (mL):	10
		Test Volume (mL):	1000

Sample ID	Rep/ Conc	pH	D.O. (mg/L)	Temperature (°C)	Salinity (ppt)
DAC-HY-1T	A	7.6	7.6	16.0	30
	B	7.6	7.6	16.0	30
	C	7.6	7.6	16.0	30
	D	7.4	6.4	16.0	30
	E	7.7	7.4	16.0	30
	WQ	7.7	7.8	16.0	30
DAC-HY-2T	A	7.6	7.6	16.0	31
	B	7.5	7.6	16.0	31
	C	7.7	7.6	16.0	30
	D	7.7	7.6	16.0	31
	E	7.7	7.7	16.0	31
	WQ	7.4	7.6	16.0	31
DAC-HY-3T	A	7.7	7.6	16.0	31
	B	7.6	7.5	16.0	31
	C	7.7	7.6	16.0	31
	D	7.7	7.5	16.0	31
	E	7.7	7.6	16.0	31
	WQ	7.7	7.7	16.0	31
DAC-HY-4T	A	7.5	7.4	16.0	31
	B	7.5	7.4	16.0	31
	C	7.6	7.4	16.0	31
	D	7.7	7.4	16.0	31
	E	7.8	7.6	16.0	31
	WQ	7.4	6.8	16.0	31
DAC-HY-5T	A	7.6	7.7	16.0	30
	B	7.4	6.2	16.0	30
	C	7.5	7.2	16.0	31
	D	7.7	7.5	16.0	30
	E	7.6	7.6	16.0	30
	WQ	7.6	7.7	16.0	31

00701

certified by: *Blands*  
Jan. 6/95

1988 Triumph Street, Vancouver, B.C., Canada V5L 1K5

*Neantles 9/618-02.4*  
*W.O. # 940225*

analytical  
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FAX: (604) 253-6700 TEL: (604) 253-4188

*Setup # 2, Day 0*



## CHEMICAL ANALYSIS REPORT

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**Date:** June 13, 1994  
**ASL File No.** D9893  
**Report On:** 9/618-02.4 Water Analysis  
**Report To:** **EVS Environment Consultants**  
195 Pemberton Avenue  
North Vancouver, BC  
V7P 2R4  
**Received:** June 6, 1994

---

**ASL ANALYTICAL SERVICE LABORATORIES LTD.**  
per:

*Heather A. Ross*  
Heather A. Ross, B.Sc.  
Project Chemist

*Katherine Thomas*  
Katherine Thomas, B.Sc.  
Project Chemist

00642

ECHINODERM LARVAL DEVELOPMENT TOXICITY TEST -- 48 h

Client:	<u>NOAA</u>	Date Initiated:	<u>June 9, 1994</u>
Project Number:	<u>9/618-02.4</u>	Date Terminated:	<u>June 11, 1994</u>
Work Order Number:	<u>840225</u>	Termination Method:	<u>Direct pipette</u>
Test Species:	<u><i>Dendraster excentricus</i></u>	Initial Density:	<u>18500 embryos/L</u>
Book: 5 Page: 45		Aliquot Size (mL):	<u>10</u>
		Test Volume (mL):	<u>1000</u>

Sample ID	Rep/ Conc	pH	D.O. (mg/L)	Temperature (°C)	Salinity (ppt)
DAC-HY-26T	A	7.5	7.4	16.0	31
	B	7.4	7.4	16.0	30
	C	7.5	7.4	16.0	30
	D	7.5	7.4	16.0	30
	E	7.4	6.5	16.0	30
	WQ	7.4	7.4	16.0	30
DAC-HY-27T	A	7.5	7.5	16.0	31
	B	7.0	5.8	16.0	31
	C	7.4	7.2	16.0	31
	D	7.4	7.4	16.0	31
	E	7.5	7.4	16.0	31
	WQ	7.4	7.5	16.0	31
DAC-HY-28T	A	7.6	7.2	16.0	31
	B	7.7	7.5	16.0	31
	C	7.2	5.7	16.0	30
	D	7.5	7.0	16.0	31
	E	7.5	7.4	16.0	30
	WQ	7.4	7.2	16.0	31
DAC-CR-2T	A	7.5	7.6	16.0	30
	B	7.5	7.8	16.0	31
	C	7.6	7.6	16.0	30
	D	7.5	7.6	16.0	31
	E	7.5	7.4	16.0	31
	WQ	7.5	7.8	16.0	30
DAC-CR-2AT	A	7.6	7.4	16.0	30
	B	7.6	7.6	16.0	31
	C	7.6	7.6	16.0	31
	D	7.6	7.8	16.0	31
	E	7.6	7.7	16.0	31
	WQ	7.6	7.8	16.0	31

00703

certified by: *Blander*  
Jan. 6/95

SAMPLE ID: NOAA

DATE COLLECTED: May 27/94

TEST DATE/TIME: June 2 1994 1900h

NO. ORGANISMS/VOLUME: 5 Test Organisms 10/1000 Culture

10/L

Subtype #2

EVS CONSULTANTS  
ACUTE TOXICITY TEST DATA

PROJECT NAME: NOAA

EVS PROJECT NO.: 9/16/18-02-L

WORK ORDER NO.: 9/20/94 540225

TEST SPECIES: Muscle

SOURCE & BATCH: Don Kuhl May 28/94

CONCN	PERCENT SURVIVAL (1 to 96 hours)						DISSOLVED OXYGEN (mg/L)						TEMPERATURE (C)						pH						SALINITY (ppt)	
	1	2	4	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	96		
<u>mg/L Cd</u>																										
<u>0.05</u>				0				7.3	7.3					21	21				7.9	8.0				29		
<u>0.1</u>				0				7.3	7.3					21	21				8.0	8.0				29		
<u>1.0</u>				0				7.3	7.3					21	21				8.0	8.0				29		
<u>5.6</u>				100	100	100		7.3	7.2	7.3	7.7		21.5	20.5	20.5	21		8.0	8.0	7.9	7.8	7.9	29		28	
<u>3.2</u>				100	100	100		7.4	7.2	7.4	7.5		21.5	21	20.5	21		8.0	8.0	7.9	7.9	7.9	29		28	
<u>1.8</u>				100	100	100		7.4	7.0	7.3	7.7		21.5	20.5	20.5	21		7.9	7.9	7.9	7.8	7.9	29		28	
<u>Amstel.</u>				100	100	100		7.3	7.1	7.3	7.8		21	21	20.5	21		7.9	7.9	7.9	7.8	7.8	29		27	
Technician																										

SAMPLE DESCRIPTION  
COMMENTS

TEST SET UP BY: ALL

DATA VERIFIED BY: Subtype Case

DATE VERIFIED: Aug 11, 1994



039900

**ECHINODERM LARVAL DEVELOPMENT TOXICITY TEST - 48 h**

<b>Client:</b>	<u>NOAA</u>	<b>Date Initiated:</b>	<u>June 9, 1994</u>
<b>Project Number:</b>	<u>9/618-02.4</u>	<b>Date Terminated:</b>	<u>June 11, 1994</u>
<b>Work Order Number:</b>	<u>940225</u>	<b>Termination Method:</b>	<u>Direct pipette</u>
<b>Test Species:</b>	<u><i>Dendraster excentricus</i></u>	<b>Initial Density:</b>	<u>18500 embryos/L</u>
<b>Book: 5 Page: 45</b>		<b>Aliquot Size (mL):</b>	<u>10</u>
		<b>Test Volume (mL):</b>	<u>1000</u>

Sample ID	Rep/ Conc	pH	D.O. (mg/L)	Temperature (°C)	Salinity (ppt)
Reference	A 10.0	7.4	7.4	17.0	31
Toxicant (SDS in mg/L)	B	7.0	5.0	17.0	31
	WQ	7.4	7.1	17.0	30
	A 5.6	7.3	7.1	17.0	30
	B	7.4	7.3	17.0	30
	WQ	7.5	7.1	17.0	30
	A 3.2	7.4	7.3	17.0	30
	B	7.4	7.4	17.0	30
	WQ	7.4	7.4	17.0	31
	A 1.8	7.1	7.1	17.0	30
	B	7.4	7.4	17.0	30
	WQ	7.2	6.8	17.0	30
	A 1.0	7.4	7.5	17.0	30
	B	7.3	7.5	17.0	30
	WQ	7.3	7.6	17.0	30

00705

certified by: *Blander*  
Jan 6/95





Dendraster sp. 9/6/88-02.4  
W.O.# 940225



Setup #2 Day 0

**REMARKS**

File No. E1112

As indicated on the chain of custody, these samples are identified as "Day 0, Set up #2 (June 9, 1994) Echinoderm Larval".

00707



Dendroaster Sp. 7/618-UL.T  
W.O.# 940225

Setp# 2 day 0



RESULTS OF ANALYSIS - Water

File No. E1112

	DAC-HY- 6T EL	DAC-HY- 28T EL	DAC-HY- 3T EL	DAC-HY- 7T EL	DAC-HY- 4T EL	
	94 06 09	94 06 09	94 06 09	94 06 09	94 06 09	
<b>Nutrients</b>						
Ammonia Nitrogen	N	0.19	0.20	0.17	0.14	0.19
<b>Inorganic Parameters</b>						
Sulphide	S	0.03	0.04	0.05	0.10	0.04

Remarks regarding the analyses appear at the beginning of this report.  
Results are expressed as milligrams per litre.  
< = Less than the detection limit indicated.

00709

EVS CONSULTANTS  
 SEDIMENT TOXICITY TESTS - SURVIVAL AND FINAL WATER QUALITY DATA

00634

5/8

Client ADDA  
 EVS Project Number 9/6/18-02.4  
 EVS W.O. No. 440225

Start Date (Day 0) June 3 = Day 0  
 End Date June 23 = 30 Day  
 Test Type/Species Headhairs atreamedolabris

*28 Sept*

Sample I.D.	Rep.	Pan No.	No. Alive	No. Dead	Total Recovered	No. Missing	Tech. Init.	Technician's Initials	pH	Dissolved Oxygen (mg/L)	Temp. (°C)	Cond. Salinity (µmhos/cm) □ Salinity (ppt) □
D&E-Hy-2T	A	175	5	0	5	0	g	g	8.2	6.4	20	31
	B	176	11	0	4	1	g		8.2	6.3	20	30
	C	177	5	0	5	0	g		8.2	7.2	20	31
	D	178	5	0	5	0	g		8.2	7.3	20	31
	E	179	5	0	5	0	g		8.3	7.2	20	31
	A	180	5	0	5	0	g		7.9	5.4	20	30
	B	181	5	0	5	0	g		8.0	5.5	20	30
	C	182	5	0	5	0	g		8.3	7.0	20	30
	D	183	5	0	5	0	g		8.2	7.2	20	31
	E	184	5	0	5	0	g		8.2	6.0	20	32
D&E-Hy-3T	A	180	5	0	5	0	g	7.9	5.4	20	30	
	B	181	5	0	5	0	g	8.0	5.5	20	30	
	C	182	5	0	5	0	g	8.3	7.0	20	30	
	D	183	5	0	5	0	g	8.2	7.2	20	31	
	E	184	5	0	5	0	g	8.2	6.0	20	32	

Water Quality Instruments: pH IT-A-16 #9

D.O. IT-A-3

Cond. Salinity IT-C-12

Dendroaster spp. 9/6/18-02.4  
W.O.# 940225

Set # 2 Day 0



RESULTS OF ANALYSIS - Water

File No. E1112

	Control Sediment #2 EL 94 06 09	Control Seawater #1 EL 94 06 09	Control Seawater #2 EL 94 06 09	DAC-HY- 14T EL 94 06 09
<b>Nutrients</b>				
Ammonia Nitrogen N	0.05	0.02	0.03	0.12
<b>Inorganic Parameters</b>				
Sulphide S	<0.02	<0.02	<0.02	0.05

Remarks regarding the analyses appear at the beginning of this report.  
Results are expressed as milligrams per litre.  
< = Less than the detection limit indicated.

00711

**EVS CONSULTANTS  
SEDIMENT TOXICITY TESTS - SURVIVAL AND FINAL WATER QUALITY DATA**

00532

6/3

Client NORAH  
 EVS Project Number 01618-03.4  
 EVS W.O. No. 940225-

Start Date (Day 0) June 3 = Day 0  
 End Date June 23 = 30 Day  
 Test Type/Species 110mm/1000 at various depths for

*Sediment*

Sample ID.	Rep.	Pan No.	No. Alive	No. Dead	Total Recovered	No. Missing	Tech. Init.	Water Quality Parameters			
								pH	Dissolved Oxygen (mg/L)	Temp. (°C)	Cond. (µmhos/cm) □ Salinity (ppt) <input checked="" type="checkbox"/>
<del>TAH-Hy-117</del>	A	145	5	0	5	0	J	7.8	5.0	20	29
	B	146	5	0	5	0	J	8.0	5.8	20	30
	C	147	5	0	5	0	J	8.0	6.0	20	30
	D	148	5	0	5	0	J	8.1	6.2	20	31
	E	149	5	0	5	0	J	8.0	5.5	20	31
TAH-Hy-87	A	150	5	0	5	0	J	8.1	5.9	20	29
	B	151	5	0	5	0	J	8.3	6.0	20	30
	C	152	5	0	5	0	J	8.3	6.0	20	30
	D	153	4	0	4	1	J	8.3	6.2	20	30
	E	154	5	0	5	0	J	8.2	6.2	20	31
TAH-Hy-57	A	155	5	0	5	0	J	8.1	6.2	20	31
	B	156	5	0	5	0	J	8.1	6.4	20	31
	C	157	5	0	5	0	J	8.0	6.3	20	31
	D	158	4	0	4	1	J	8.1	6.2	20	31
	E	159	4	0	4	1	J	8.1	6.1	20	31

Technician's Initials

Water Quality Instruments: pH II-A-16 #9 D.O. II-A-3 Cond./Salinity II-C-12

1988 Triumph Street, Vancouver, B.C., Canada V5L 1K5

*Dendriaster SQD- 9/618-02.4*  
*W.O.# 940225*

analytical

FAX: (604) 253-6700 TEL: (604) 253-4188

service

*Setup # 2 48-h.*

laboratories

**JUN 27 1994**

ltd.



## CHEMICAL ANALYSIS REPORT

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**Date:** June 20, 1994  
**ASL File No.** E1141  
**Report On:** 9/618-02.4 Water Analysis  
**Report To:** **EVS Environment Consultants**  
195 Pemberton Avenue  
North Vancouver, BC  
V7P 2R4  
**Attention:** **Mr. Todd Shannon**  
**Received:** June 13, 1994

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**ASL ANALYTICAL SERVICE LABORATORIES LTD.**  
per:

*Heather Ross*  
Heather A. Ross, B.Sc.  
Project Chemist

*Katherine Thomas*  
Katherine Thomas, B.Sc.  
Project Chemist

00713





Veracruz W-11010-11  
W.O.# 940225

Sept 2 70-11



RESULTS OF ANALYSIS - Water

File No. E1141

DAC-HY- 25T EL	DAC-HY- 24T EL	DAC-CR- 2T EL	DAC-CR- 2AT EL	DAC-HY- 27T EL
94 06 11	94 06 11	94 06 11	94 06 11	94 06 11

Nutrients

Ammonia Nitrogen	N	0.15	0.10	0.19	0.14	0.22
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Inorganic Parameters

Sulphide S		<0.02	<0.02	<0.02	<0.02	<0.02
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Remarks regarding the analyses appear at the beginning of this report.  
Results are expressed as milligrams per litre.  
< = Less than the detection limit indicated.

00715

**EVS CONSULTANTS  
SEDIMENT TOXICITY TESTS - SURVIVAL AND FINAL WATER QUALITY DATA**

2/6  
00520

Client NORR  
 EVS Project Number 9/6/18-03-4  
 EVS W.O. No. 940255

Start Date (Day 0) June 3 = Day 0  
 End Date June 23 = 20 Days  
 Test Type/Species Week 10 survival data

*Subup #2*

Sample ID.	Rep.	Pan No.	No. Alive	No. Dead	Total Recovered	No. Missing	Tech. Init.	pH	Dissolved Oxygen (mg/L)	Temp. (°C)	Cond. (µmhos/cm) □ Salinity (ppt) g
DRC-Hy-45	A.	95	5	0	5	0	3	7.9	5.9	20	32
	B	96	5	0	5	0	3	7.9	6.2	20	31
	C	97	5	0	5	0	3	8.1	6.4	20	32
	D	98	5	0	5	0	3	7.7	6.4	20	31
	E	99	5	0	5	0	3	8.0	5.9	20	31
DRC-Hy-10T	A	100	<	0	5	0	3	8.2	6.2	20	31
	B	101	4	0	4	1	3	8.2	6.2	20	31
	C	102	5	0	5	0	3	8.2	6.2	20	31
	D	103	5	0	5	0	3	8.2	6.5	20	31
	E	104	5	0	5	0	3	8.3	6.7	20	32
DRC-Hy-28T	A	105	5	0	5	0	RM	8.0	6.0	20	29
	B	106	5	0	5	0	RM	8.0	6.1	20	30
	C	107	5	0	5	0	RM	7.5	6.1	20	29
	D	108	5	0	5	0	RM	7.6	5.2	20	29
	E	109	5	0	5	0	RM	8.2	5.7	20	30

Technician's Initials

Water Quality Instruments: pH IT-A-16 #9

D.O. IT-A-3

Cond. Salinity IT-C-12

*centx*

Dendrostar 88- 4/10/18-02 T  
W.O.# 940225

Setup" L 48-12



RESULTS OF ANALYSIS - Water

File No. E1141

	DAC-HY- 1T EL 94 06 11	DAC-HY- 2T EL 94 06 11	DAC-HY- 26T EL 94 06 11	DAC-HY- 5T EL 94 06 11	Control Sediment #1 EL 94 06 11
<u>Nutrients</u>					
Ammonia Nitrogen N	0.12	0.06	0.17	0.36	0.06
<u>Inorganic Parameters</u>					
Sulphide S	<0.02	<0.02	<0.02	<0.02	<0.02

Remarks regarding the analyses appear at the beginning of this report.  
Results are expressed as milligrams per litre.  
< = Less than the detection limit indicated.

00717

**EVS CONSULTANTS**

**Dry Weight Data**

Client: NOAA - Setup #2 Test Species: *Neanthes arenaceodentata*  
 Project #: 9618-02.4 Date Initiated: June 3, 1994  
 Work Order: 96LUZ3 Date Terminated: June 23, 1994  
 Test Type: 20-d sediment toxicity test

Number of Animals/rep: 5

Sample ID	Rep	Survivors	# of Animals Weighed	Pan Weight (g)	Final Weight (pan + biomass) (g)	Total Biomass (mg)	Individual Biomass (mg)	Mean Survival (%)	Mean Individual Biomass (mg)
DAC-CR-2AT	A	5	5	1.0037	1.0062	52.50	10.50	92.00	9.01
	B	5	5	1.0027	1.0470	44.30	8.86		
	C	5	5	0.9999	1.0409	41.00	8.20		
	D	4	4	0.9965	1.0393	40.80	10.20		
	E	4	4	1.0004	1.0296	29.20	7.30		
DAC-CR-2T	A	5	5	1.0060	1.0495	43.50	8.70	92.00	9.93
	B	4	4	1.0051	1.0492	44.10	11.02		
	C	4	4	1.0079	1.0417	33.60	8.40		
	D	5	5	1.0095	1.0690	59.50	11.90		
	E	5	5	1.0059	1.0538	47.90	9.58		
R & D Control	A	4	4	0.9936	1.0279	34.30	8.58	96.00	9.47
	B	5	5	1.0014	1.0533	51.90	10.38		
	C	5	5	1.0046	1.0448	40.20	8.04		
	D	5	5	0.9990	1.0428	43.80	8.76		
	E	5	5	1.0008	1.0617	57.00	11.40		

00626

certified for data entry only  
 All Aug. 17, 1994

*Denaraster 9/24 7/10/02 U.L.T.  
W.O.# 940225*

*Setp# 2 48-h*



**METHODOLOGY**

File No. E1141

Samples were analyzed by methods acceptable to the appropriate regulatory agency. Outlines of the methodologies utilized are as follows:

**Conventional Parameters in Water**

These analyses are carried out in accordance with procedures described in "Standard Methods for the Examination of Water and Wastewater" 18th Ed. published by the American Public Health Association, 1992. Further details are available on request.

**End of Report**

00719