BIOMONITORING REPORT

KIN-BUC LANDFILL
383 MEADOW ROAD
EDISON, NJ 08817

September 19, 1996

JOB #96-312

562217

499 Point Breeze Road ◦ Flemington, New Jersey 08822 ◦ Telephone (908) 788-8700 FAX (908) 788-9165

NJDEP BIOMONITORING REPORT FORM - ACUTE BIOASSAY

NJPDES PERMIT #: NJPermit Equivalent DSN 001

FACILITY NAME: Kin-Buc Landfill
FACILITY ADDRESS: 383 Meadow Road
Edison, NJ 08818

FACILITY CONTACT PERSON: Pete Watkins PHONE #: 908 561-7600

ACUTE TOXICITY LABORATORY: AQUA SURVEY INC.
499 Point Breeze Road
Flemington, NJ 08822

ACUTE LABORATORY CERTIFICATION NO.: 10309

TEST SPECIFICATIONS

Effluent Type (e.g., final, predisinfection): Final

Test Type: Static Daily Renewal

TEST RESULTS

Test Starting Date: 8/26/96 Completion Date: 8/30/96

Test Endpoint: LC_{50} x
NMAT ____
EC_{50} ____

LC_{50}/EC_{50} (% effluent): 55.5% 95% Confidence Interval: 47.0-65.5

Highest percent mortality in any test concentration (if applicable): 100%
Test concentration: 100

Test Organism: Mysid shrimp (common name) *Mysidopsis bahia* (scientific name)

QUALITY CONTROL SUMMARY

Control mortality: zero

Temperature maintained within 20° +/- 2°C?: Yes

Dissolved Oxygen Levels always greater than 40% saturation? Yes

Two or more concentrations exhibit a trend deviation? No

CERTIFICATION

Accuracy of report certified by: Thomas J. Dolce 9/20/96
Thomas J. Dolce Date
Supervising Biologist

TEST ORGANISM DATA

Test Organism Source: Culture x Commercial hatchery __ (Specify) __

Test Organism Acclimation

Is the culture water and test dilution water the same and are the culture water temperature and dilution water temperature identical? Yes __ No x

If yes, proceed to Test Design section.

Fish and Grass Shrimp

Initial number of organisms:
Total acclimation period:
Acclimation period to 100 percent dilution water at the specified test temperature and test salinity:
Number of mortalities:
Test organism age at start of test (days):

Mysid and Cladoceran

Initial number of organisms:	150
Test organism age at start of test (days):	3
Culture water source:	Forty Fathoms
Culture water salinity: 25.0 ppt; Culture water temperature:	23.5°C
Dilution water source:	Manasquan Inlet
Dilution water salinity upon collection:	29.0
Number of mortalities:	zero %

TEST DESIGN

Number of effluent test concentrations:	5
Number of replicates/test concentration:	2
Number of test organisms/replicate:	10
Volume of liquid test chamber (liters):	0.5
Flowthrough bioassay exchange rate (replacements/day):	N/A

EFFLUENT SAMPLING

Plant sampling location: Final effluent just before weir

Effluent type: Final

Discharge (check one) Continuous x Intermittent _____

Effluent sample type: 24 composite

Sample Collection		Sample Data taken upon arrival at laboratory		Use in Toxicity Test	
Beginning Date/Time	Ending Date/Time	D.O.	pH	Date(s)	Time(s)
8/25 - 12:00 pm	8/26 - 12:00 pm	-	-	8/26/96	4:30 pm
8/26 - 12:00 pm	8/27 - 12:00 pm	-	-	8/27/96	-
8/27 - 12:00 pm	8/28 - 12:00 pm	-	-	8/28/96	-
8/28 - 12:00 pm	8/29 - 12:00 pm	-	-	8/29/96	-

Maximum sample holding time (hours): <24
Testing location: Aqua Survey, Inc., Flemington, NJ

EFFLUENT SAMPLE ADJUSTMENTS

Were any salinity adjustments made? Yes _x_ No ___
If yes, specify the source of sea salts, brine or water used: Forty Fathoms, Marine Enterprises, MD

Were any pH adjustments made? Yes ___ No _x_
If yes, specify the reagent used _____, the amount used _____.
The pH level upon sample collection (initial pH) _____.
The pH level after the addition of the sea salts (drifted pH) _____.
The adjusted pH level ____.

Was the effluent sample filtered in any manner? Yes ___ No _x_
If yes, please specify the mesh size: _____.

Were any adjustments to the levels of chlorine made? Yes ___ No _x_
If yes, specify the dechlorination agent used _____; and the amount of reagent used _____
Specify the chlorine levels prior to _____; and after addition of the reagent _____
Was an additional control included in the test containing the dechlorination agent? Yes ___ No ___

DILUTION WATER

Effluent Receiving Water: Raritan River

Dilution Water Source: Manasquan Inlet
(If reconstituted water is used specify type)

If a substitute dilution water (i.e. not the receiving water) was used, had its use been approved by NJDEP in the acute methodology questionnaire? Yes _x_ No ___

Collection Location: Manasquan Inlet; 3rd Avenue and Riverside Drive

Collection Date(s): 8/26/96; 1:45 pm

TEST RESULTS

	24 hour	48 hour	72 hour	96 hour
LC_{50}/EC_{50} (% Effluent)	**>100	**>100	*61.6	*55.5

Calculation Method:
- Probit Method ___
- The Trimmed Spearman Karber Method _*_
- Graphical Interpolation ___
- Visual Inspection _**_

NOTE: Attach the statistical printouts used to determine the LC_{50} value and the mortality data sheets.

Is the calculated LC_{50}/EC_{50} valid according to the specifications of the method used? Yes _x_ No ___

MISCELLANEOUS

Were any exposure chambers aerated during the test? Yes ___ No _x_
If yes, specify concentrations and duration, including the lowest percent saturation reached prior to aeration and at what time: _____.

Were test organisms observed for appearance and behavior at least daily? Yes ___ No _x_
NOTE: Attach a copy of the acute toxicity test benchsheets with observation coded for each day.

NOTE: Attach a copy of the raw data sheets for physical-chemical measurements taken during the test to the test report form.

CT-TOX: BINOMIAL, MOVING AVERAGE, PROBIT, AND SPEARMAN METHODS

SPEARMAN-KARBER

TRIM: .00%
LC50: 61.557
95% LOWER CONFIDENCE: 54.379
95% UPPER CONFIDENCE: 69.683

CONC. %	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(%)
6.25	20.	0.	.00	.9537D-04
12.50	20.	0.	.00	.9537D-04
25.00	20.	0.	.00	.9537D-04
50.00	20.	4.	20.00	.5909D+00
100.00	20.	20.	100.00	.9537D-04

THE BINOMIAL TEST SHOWS THAT 50.00 AND 100.00 CAN BE USED AS STATISTICALLY
SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS SINCE THE ACTUAL CONFIDENCE
LEVEL ASSOCIATED WITH THESE LIMITS IS 99.4090 PERCENT.
AN APPROXIMATE LC50 FOR THIS DATA SET IS 62.024

WHEN THERE ARE LESS THAN TWO CONCENTRATIONS AT WHICH THE PERCENT DEAD IS BETWEEN 0 AND 100, NEITHER THE MOVING AVERAGE NOR THE PROBIT METHOD CAN GIVE ANY STATISCALLY SOUND RESULTS.

DATE: 8/26/96 TEST NUMBER: 96-312 DURATION: 96 hours
SAMPLE: 72h SPECIES: M. bahia

METHOD	LC50	CONFIDENCE LIMITS LOWER	UPPER	SPAN
BINOMIAL	62.024	50.000	100.000	50.000
MAA	*******	*******	*******	*******
PROBIT	*******	*******	*******	*******
SPEARMAN	61.557	54.379	69.683	15.305

**** = LIMIT DOES NOT EXIST

CT-TOX: BINOMIAL, MOVING AVERAGE, PROBIT, AND SPEARMAN METHODS

SPEARMAN-KARBER

TRIM: .00%
LC50: 55.478
95% LOWER CONFIDENCE: 46.983
95% UPPER CONFIDENCE: 65.510

CONC. %	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(%)
6.25	20.	0.	.00	.9537D-04
12.50	20.	0.	.00	.9537D-04
25.00	20.	3.	15.00	.1288D+00
50.00	20.	4.	20.00	.5909D+00
100.00	20.	20.	100.00	.9537D-04

THE BINOMIAL TEST SHOWS THAT 50.00 AND 100.00 CAN BE USED AS STATISTICALLY
SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS SINCE THE ACTUAL CONFIDENCE
LEVEL ASSOCIATED WITH THESE LIMITS IS 99.4090 PERCENT.
AN APPROXIMATE LC50 FOR THIS DATA SET IS 62.024

RESULTS USING MOVING AVERAGE

SPAN	G	LC50	95% CONFIDENCE LIMIT	
3	.051	49.87	41.68	61.95

****** RESULTS CALCULATED BY PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT
8	1.323	3.41	.02

SINCE THE PROBABILITY IS LESS THAN 0.05,
RESULTS CALCULATED USING THE PROBIT METHOD
PROBABLY SHOULD NOT BE USED.

SLOPE = 4.78
95% CONFIDENCE LIMITS: -.72 AND 10.29

LC50= 53.65
95% CONFIDENCE LIMITS: 0 AND + INFINITY

LC1 = 17.50
95% CONFIDENCE LIMITS: 0 AND 35.80

DATE: 8/26/96 TEST NUMBER: 96-312 DURATION: 96 96 hours
SAMPLE: 96h SPECIES: M. bahia

METHOD	LC50	CONFIDENCE LIMITS		
		LOWER	UPPER	SPAN
BINOMIAL	62.024	50.000	100.000	50.000
MAA	49.874	41.678	61.947	20.269
PROBIT	53.646	*******	*******	*******
SPEARMAN	55.478	46.983	65.510	18.527

**** = LIMIT DOES NOT EXIST

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96 HOUR BIOASSAY
AQUA SURVEY, INC

JOB #: 96-312 SPECIES: M. bahia

CLIENT: M. bahia TEST TEMPERATURE: 20 ± 2.0°C

DOSE (%)	LIVE COUNTS						
	INITIAL			24	48	72	96
CONTROL A	10			10	10	10	10
CONTROL B	10			10	10	10	10
6.25 A	10			10	10	10	10
B	10			10	10	10	10[1]
12.5 A	10			10	10	10	10
B	10			10	10	10	10
25 A	10			10	10	10	9[1]
B	10			10	10	10	8[2]
50 A	10			10	10	~~6~~ 7[3] YT	~~6~~ 7 YT
B	10			10	10	~~8~~ 9[1] YT	9
100 A	10			10	9[1]	0[9]	—
B	10			10	8[2]	0[8]	—
NUO	✓			✓	✓	✓	✓
INITIALS	~~KT~~ 8/26			AN 8/27	AN 8/28	AN 8/29	YT 8/30
QA/QC							

(NUO = NOTHING UNUSUAL OBSERVED WITH EXCEPTIONS NOTED BELOW)

NOTES:

UDEP.LC

C:\PC6000\PROBEDAT\READINGS\312-0.DAT

YSI 6000 Time Series Report

Date mm/dd/yy	Time hh:mm:ss	Temp C	Cond uS/cm	Salinity PPT	DO mg/L	pH
8/26/96	16:31:22	21.61	37736.00	25.8	4.93	7.43
8/26/96	16:31:40	21.81	37750.00	25.7	6.19	7.49
8/26/96	16:31:51	21.78	37675.00	25.7	5.88	7.54
8/26/96	16:32:01	21.68	37633.00	25.7	6.11	7.68
8/26/96	16:32:16	21.12	37181.00	25.7	7.34	8.03
8/26/96	16:32:44	19.97	36978.00	26.2	7.57	8.52

C:\PC6000\PROBEDAT\READINGS\31224.DAT

YSI 6000 Time Series Report

Date mm/dd/yy	Time hh:mm:ss	Temp C	Cond uS/cm	Salinity PPT	DO mg/L	pH
8/27/96	10:02:53	19.57	35626.00	25.4	6.31	7.01
8/27/96	10:03:09	19.31	36256.00	26.1	6.00	7.12
8/27/96	10:03:18	19.39	36422.00	26.2	7.03	7.17
8/27/96	10:03:27	19.46	36479.00	26.2	6.12	7.24
8/27/96	10:03:35	19.51	36660.00	26.3	5.99	7.39
8/27/96	10:03:43	19.54	36949.00	26.5	6.13	7.68

C:\PC6000\PROBEDAT\READINGS\31248.DAT

YSI 6000 Time Series Report

Date mm/dd/yy	Time hh:mm:ss		Temp C	Cond uS/cm	Salinity PPT	DO mg/L	pH
8/28/96	9:22:59	0m	19.28	34568.00	24.8	6.73	7.27
8/28/96	9:23:07	6.25	19.28	35493.00	25.5	6.11	7.25
8/28/96	9:23:16	12.5	19.36	35615.00	25.5	6.22	7.24
8/28/96	9:23:26	25	19.46	35658.00	25.5	5.67	7.25
8/28/96	9:23:34	50	19.53	35667.00	25.5	5.17	7.29
8/28/96	9:23:43	100	19.59	35614.00	25.4	4.72	7.52

EC 8/28/96

C:\PC6000\PROBEDAT\READINGS\31272.DAT

YSI 6000 Time Series Report

Date mm/dd/yy	Time hh:mm:ss		Temp C	Cond uS/cm	Salinity PPT	DO mg/L	pH
8/29/96	9:22:36	0m	19.81	34126.00	24.1	6.54	7.55
8/29/96	9:22:42	6.25	19.36	35357.00	25.3	6.26	7.44
8/29/96	9:22:49	12.5	19.27	35545.00	25.5	5.90	7.37
8/29/96	9:22:56	25	19.28	35747.00	25.7	5.03	7.31
8/29/96	9:23:03	50	19.34	36021.00	25.9	4.86	7.31
8/29/96	9:23:11	100	19.45	36863.00	26.5	4.27	7.49

EC 8/29/96

C:\PC6000\PROBEDAT\READINGS\312B96.DAT

YSI 6000 Time Series Report

Date mm/dd/yy	Time hh:mm:ss		Temp C	Cond uS/cm	Salinity PPT	DO mg/L	pH
8/30/96	9:21:09	0m	18.86	35231.00	25.5	6.69	7.12
8/30/96	9:21:17	6.25	18.92	36472.00	26.5	5.96	7.10
8/30/96	9:21:24	12.5	18.94	36764.00	26.7	5.96	7.11
8/30/96	9:21:30	25	19.00	36927.00	26.8	5.55	7.14
8/30/96	9:21:37	50	19.08	37182.00	27.0	5.40	7.19

EL 8/30/96

AQUA SURVEY, INC.
96 HOUR BIOASSAY

Job #: 96-312 Organism: M. bahia

	Residual Chlorine mg/L					Alkalinity mg/L					Hardness mg/L				
Conc	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
A		ND	ND	①3.0 ②		88	84	132	120	108					
B															
A															
B															
A															
B															
A															
B															
A															
B	50%														
A															
B	100%					172	168	132	134	120					
Date		8/27	8/28	8/29			8/27	8/28	8/29	8/30					
Init		AN	AN	AN			AN	AN	AN	AN					

N-A
KA 8/30

Notes:

① 112

① 2.2 ml $Na_2S_2O_3$ added
= 3.9 mg/l Cl_2 AN

② changed blue again
added additional
3.0 ml $Na_2S_2O_3$
= 5.2 ml total added
= 9.22 mg/l Cl_2
AN

APPENDIX

96 HOUR BIOASSAY
AQUA SURVEY, INC

GENERAL INFORMATION

Job #: 96-312 Test volume: 500 ml

Client: Kin Bue Land Fill Dilution water: Receiving ___ Culture ___ Alternative ✓

Organism: M. bahia Test temperature: 20.0±2.0°C

Testing location: Mobile laboratory _____ Flemington laboratory _____ Satellite laboratory _____

Test type: Flow Through _____ Static Daily Renewal ✓ Static Non Renewal _____

Test start date: 8/30/96 Time: 4:30 p.m. Technician: RL
(Test starts when organisms are introduced)

Test end date: 8/30/96 Time: 4:30 pm Technician: YT

ACCLIMATION INFORMATION (laboratory or field acclimation only)

Exchange type: Drip ____ Meter. pump ____ Exchange rate (mL/min) _____

Start date: _____ Time: _____ Chamber volume: _____

End date: _____ Time: _____ Feeding: Day 0_____ Day 1_____ Day 2 _____ Day 3 _____

Remarks: _____ Mortality: Day 0_____ Day 1_____ Day 2 _____ Day 3 _____

Temperature range: _____ (field use only) Temperature: Day 0_____ Day 1_____ Day 2 _____ Day 3 _____ (lab use only)

DILUTER INFORMATION

Set up date: _____ Water used: _____ Diluter number: _____ Technician: _____

Cycles during pretest: _____ Elapsed pretest time: _____

Total cycles: _____ Elapsed time: _____

DESCRIPTION OF SAMPLES (use only for in-lab samples)

Effluent
Odor: _____ Color: _____ Other: _____

Diluent
Odor: _____ Color: _____ Other: _____

AERATION PROCEDURE

Aeration required _____ Aeration not required ✓

Description of problem: DO levels below 50% saturation _____ DO levels dropping rapidly _____

Cycles increased Date: _____ Time: _____ Technician: _____

Dilution aeration begun Date: _____ Time: _____ Technician: _____

Test aeration begun Date: _____ Time: _____ Technician: _____

AQUA SURVEY, INC.

CULTURE LAB DISTRIBUTION FORM

DATE: 8/26/96

TEST JOB#: 96-312 CLIENT: Kim Buck

TEST LOCATION: IN-LAB [X] FIELD [ ]

TEST SPECIES: M. bahia

TOTAL NUMBER ORGANISMS TRANSFERRED: 150+

AQUA SURVEY, INC. CULTURE LAB INVESTIGATORS: CD

A. ORGANISMS

1. ASI CULTURE/HOLDING UNIT: 39 l tank
2. RECEIVING LOG #: VOID
3. CULTURE LOG #: 96-0518
4. AGE/SIZE INFORMATION: 1-5 days HD 8/23/96

B. HOLDING [ ] CULTURE [X] WATER PARAMETERS

1. TEMPERATURE: 19.5°C
2. SALINITY: 29.0 ppt
3. WATER SOURCE: Manasquan

C. TRANSFER CUSTODY & TRANSFER

1. LIVESTOCK RELINQUISHMENT DATE: 8/26/96
   TIME: 1600 hrs
   BY: CD

2. LIVESTOCK RECEIVING DATE: 8/26/96
   TIME: 1630 hrs
   BY: RZ

3. CULTURE SUPERVISOR OR SENIOR TECH. INITIALS: CD

REMARKS:

AQUA SURVEY, INC.

Culture Lab Acclimation Form

Acclimatization

[ ] No acclimatization required
[X] Temperature acclimatization
[X] Water acclimatization

Job #: 96-312, 313 Test Species: M. bahia

Acclimatization Initial Parameters

Temperature: 23.5°C Salinity: 25.0ppt Type of Water: Forty Fathoms

Acclimatization Target Parameters

Temperature: 20±2ppt Salinity: 30±2ppt Type of Water: Manasquan

Acclimatization Chamber Volume (liters): 76 l tank

Acclimatization Location: Culture Annex Room

Acclimatization Water Type: Manasquan

Acclimatization Water Temperature: 21.0°C

Acclimatization Commencement-Date/Time: 8/23/96 / 1130 hrs

Change Over Rate (Approximately mL/Minute): 10-20 ml/min

Acclimatization Conclusion - Date/Time: 8/25/96 / 0800 hrs

Technician Initials/Commencement: CD

Technician Initials/Conclusion: CD

Supervisor Initials: CD

Remarks:

AQUA SURVEY, INC.
CULTURE LABORATORY

15 DAY - GENERAL SPECIES STATUS LOG

SPECIES: M. bahia DATES: 8/23/96 →

RECEIVING [ ] CULTURE [X] LOG #: VOID INITIAL STOCK @: 700+

TEST JOB #: 96-312, 313 CLIENT: SCS A+B KMB FOOD TYPE: Artemia

		Temp/DO	NH_3/NO_2	pH	Sal/~~Hard~~	Alkalinity	Mortality	Remarks/Initials
8/23	Day 1	23.5°C/6.8	0/0	7.2	25.0ppt	72	Ø	Acclimation started fed Artemia CD
8/24	Day 2	20.5°C/8.1	0/0	7.6	27.5ppt	92	Ø	Acclimation con't fed Artemia MLP
8/25	Day 3	19.5°C/8.0	0/0	7.7	29.0ppt	96	Ø	Acclimation completed fed Artemia MLP
8/26	Day 4	19.5°C/7.5	0/0	7.8	29.0ppt	108	Ø	KMB organisms to test fed Artemia CD
	Day 5							
	Day 6							
	Day 7							
	Day 8							
	Day 9							
	Day 10							
	Day 11							
	Day 12							
	Day 13							
	Day 14							
	Day 15							