### **CHAM** HILL

#### **BIOASSAY REPORT**

1800 & REMEDIAL REOPOND 1

#### ACUTE AND CHRONIC TOXICITY TESTS Conducted March 21 through 28, 1995

Prepared for
Onalaska Landfill
Groundwater Treatment Facility
Onalaska, Wisconsin

Prepared by

CH2M HILL
Bioassay Laboratory
15779 West Ryerson Road
New Berlin, Wisconsin 53151

Lab I.D. No. 636 April 1995

ACT636.DOC



May 2, 1995

GLE65672.RA.11

Mr. Larry Lester Wisconsin DNR 101 South Webster Madison, WI 53707-7921

Dear Mr. Lester:

Subject:

Onalaska Municipal Landfill Long Term Remedial Action

WA 79-5HL5; Contract No. 68-W8-0400

Enclosed is one copy of the bioassay test report for the most recent quarterly whole effluent toxicity testing for the Onalaska Municipal Landfill groundwater treatment facility. Results of the test indicate the effluent passed acute and chronic toxicity tests for samples collected in March of this year. The next test period is scheduled for sometime in June.

MERG & REMEDIAL RESPONSE SECTION

BUR OF SOLID & HAZRD WASTE

If you have questions on this matter please contact me or Jim Fisher at 414-272-2426.

Sincerely,

CH2M HILL

Steve Keith, P.E.

Site Manager

MKE10015D11.WP5

**Enclosure** 

cc:

Kevin Adler/WAM/U.S. EPA Region 5

David Hantz/WDNR/Madison

Charlie Cameron/WDNR/LaCrosse (w/out attachments)

Stephen Nathan/PO/U.S. EPA Region 5 (w/out attachments)

Brigitte Manzke/CO/U.S. EPA Region 5 (w/out attachments)

Alpheus Sloan III/PM/Milwaukee (w/out attachments)

Ike Johnson/APM-OPNS/Milwaukee (w/out attachments)

John Fleissner/QAM/Milwaukee (w/out attachments)

Cherie Wilson/AA/Milwaukee

#### **Summary**

CH2M HILL conducted acute and chronic toxicity tests on effluent samples provided by the Onalaska Landfill Groundwater Treatment Facility (LGTF), Onalaska, Wisconsin. The bioassays were conducted from March 21 through 28, 1995, as part of compliance biomonitoring for the State of Wisconsin. *Ceriodaphnia dubia*, *Daphnia magna*, and fathead minnows were used as the test organisms. The following is a summary of the test results:

#### **Acute Toxicity**

Test Media	Ceriodaphnia dubia	Daphnia magna	Fathead Minnow
Black River Control 100% Effluent	Pass Pass	Pass Pass	Pass Pass
Laboratory Control	Pass	Pass	Pass

#### **Chronic Toxicity**

Test Media	Ceriodaphnia dubia		Fathe	ad Minnow
	Mean % Survival	Mean No. of Offspring	Mean % Survival	Mean Growth (mg)
Black River Control	100	31.1	74.5*	0.506
3.7% Effluent (IWC)	100	30.5	67.5	0.416
5% Effluent	100	32.1	78.8	0.563
10% Effluent	100	34.4	80.8	0.566
20% Effluent	90	28.3	80	0.558
40% Effluent	90	28.2	90	0.603
80% Effluent	90	26.7	90	0.613
IC <sub>25</sub>		>80%		> 80%
Laboratory Control	100	31.7	86.7	0.720
3.7% IWC (diluted with laboratory water)	100	33.5	87	0.661

<sup>\*</sup> Indicates data did not meet acceptability criteria for use as a control.

For NPDES compliance purposes, the test results show that:

- The effluent samples were not acutely toxic to *Ceriodaphnia dubia*, *Daphnia magna*, or fathead minnows at 100 percent concentrations using the 50 percent lethality criteria.
- Black River water data did not meet the acceptable survival criterion of 80% for use as a control in the fathead minnow test. However, the greater survival of organisms in the higher effluent concentrations indicates that the effluent was not toxic. This was also substantiated by non-toxic results from the 37 percent IWC (diluted with laboratory water).
- The effluent samples were not chronically toxic to either *Ceriodaphnia dubia* or fathead minnows at the 3.7 percent IWC. The concentration of effluent that was estimated to be chronically toxic to both test organisms, based on the IC<sub>25</sub> analysis, was greater than 80 percent.
- Black River water met test acceptability criteria in all acute tests and *Ceriodaphnia* chronic test.
- Laboratory water data met test acceptability criteria in all acute and chronic bioassays.

#### Introduction

This report presents the results of the laboratory acute and chronic toxicity tests conducted by CH2M HILL on effluent samples provided by the Onalaska LGTF, Onalaska, Wisconsin. The bioassays used *Ceriodaphnia dubia*, *Daphnia magna*, and fathead minnows as the test organisms and were performed from March 21 through 28, 1995, as part of compliance biomonitoring for the State of Wisconsin.

#### Methods

All laboratory methods, including organism culture, sample handling, test procedures, and data analyses, were in accordance with the recommendations of the U.S. Environmental Protection Agency (EPA) [1, 2, 3, 4], the CH2M HILL Milwaukee Bioassay Laboratory's Standard Operating Procedures, and the Wisconsin Department of Natural Resources (DNR) biomonitoring requirements.

#### Sample Collection and Handling

Photocopies of the chain-of-custody forms are included in Appendix B. Three 24-hour composite effluent samples and one receiving water grab sample were used as follows:

Description	Sample No.	Date Collected	Date Tested
Black River	636.01	3/19	3/21-28
Stripping Tower Effluent	636.02	3/19-20	3/21-23
Stripping Tower Effluent	636.03	3/21-22	3/23-25
Stripping Tower Effluent	636.04	3/23-24	3/25-28

All samples were collected by Onalaska LGTF personnel and shipped or delivered on ice to the CH2M HILL Milwaukee Bioassay Laboratory. Upon arrival, samples were logged in and physicochemical characterizations were conducted. Samples not immediately prepared for testing were refrigerated (4°C) for later use.

#### **Test Organisms**

All test organisms were cultured at the CH2M HILL Milwaukee Bioassay Laboratory.

#### **Test Procedures**

#### Bioassays

Bioassay test conditions are summarized in Tables 1 through 5.

#### Table 1

#### Summary of Test Conditions for the Ceriodaphnia Acute Bioassay

#### Conducted for the Onalaska LGTF

#### Onalaska, Wisconsin March 21 through 23, 1995

1.	Test organism	Ceriodaphnia dubia (Crustacea: Cladocera).
2.	Test type	Static renewal.
3.	Age of test organisms	Less than 24 hours.
4.	Test chamber size	30 mL
5.	Test solution volume	25 mL
6.	Renewal of test solutions	Daily.
7.	Replicate chambers per treatment	4
8.	Test organisms per chamber	5
9.	Primary control/dilution water	Receiving water: Black River.
10.	Internal control water	Laboratory culture medium.
11.	Effluent concentrations	6.25, 12.5, 25, 50, and 100%
12.	Temperature	$20 \pm 1$ °C
13.	Feeding regime	None.
14.	Aeration	None.
15.	Test duration	48 hours.
16.	Sampling scheme	One 24-hour composite effluent sample. Maximum holding time of 48 hours between completion of collection and initia test use. One receiving water grab sample collected within 48 hours of test initiation. Laboratory water used was collected daily.
17.	Effects measured	Survival.
18.	Test acceptability	90% or greater mean survival in the laboratory or receiving water control.

## Table 2 Summary of Test Conditions for the Daphnia Acute Bioassay Conducted for the Onalaska LGTF Onalaska, Wisconsin March 21 through 23, 1995

Test organism Daphnia magna (Crustacea: Cladocera). Test type 2. Static renewal. Age of test organisms Less than 24 hours. Test chamber size  $30 \, mL$ 4. Test solution volume 25 mL Renewal of test solutions Daily. 7. Replicate chambers per treatment 4 8. 5 Test organisms per chamber 9. Primary control/dilution water Receiving water: Black River. 10. Internal control water Laboratory culture medium. Effluent concentrations 6.25, 12.5, 25, 50, and 100%  $20 \pm 1$ °C 12. Temperature 13. Feeding regime None. 14. Aeration None. 15. Test duration 48 hours. 16. Sampling scheme One 24-hour composite effluent sample. Maximum holding time of 48 hours between completion of collection and initial test use. One receiving water grab sample collected within 48 hours of test initiation. Laboratory water used was collected daily. 17. Effects measured Survival. 18. Test acceptability 90% or greater mean survival in the laboratory or receiving water

control.

# Table 3 Summary of Test Conditions for the Fathead Minnow Acute Bioassay Conducted for the Onalaska LGTF Onalaska, Wisconsin March 21 through 25, 1995

1.	Test organism	Pimephales promelas (Osteichthyes: Cyprinidae).
2.	Test type	Static renewal.
3.	Age of test organisms	26 days old.
4.	Test chamber size	500 mL
5.	Test solution volume	400 mL
6.	Renewal of test solutions	Daily.
7.	Number of replicate chambers per treatment	2
8.	Number of test organisms per chamber	10
9.	Primary control/dilution water	Receiving water: Black River.
10.	Internal control water	Laboratory culture medium.
11.	Effluent concentrations	6.25, 12.5, 25, 50, and 100%
12.	Temperature	20 ± 1°C
13.	Feeding regime	None.
14.	Aeration	None, unless DO concentration falls below 40% saturation (then, continuous at rate not exceeding 100 bubbles/minute).
15.	Test duration	96 hours.
16.	Loading rate	Less than 0.65 g/L.
17.	Sampling scheme	Two separate 24-hour composite effluent samples, each used for a 48-hour exposure. Maximum holding time of 48 hours between completion of collection and initial test use for each sample. One grab sample of receiving water collected within 48 hours of test initiation. Laboratory water used was collected daily.
18.	Effects measured	Survival.
19.	Test acceptability	90% or greater mean survival in the laboratory or receiving water control.

# Table 4 Summary of Test Conditions for the Ceriodaphnia Chronic Bioassay Conducted for the Onalaska LGTF Onalaska, Wisconsin March 21 through 28, 1995

1.	Test organism	Ceriodaphnia dubia (Crustacea: Cladocera).
2.	Test type	Static renewal.
3.	Age of test organisms	Less than 24 hours, all released within an 8-hour period (same generation from even-aged parents).
4.	Test chamber size	30 mL
5.	Test solution volume	15 mL
6.	Renewal of test solutions	Daily.
7.	Number of replicate chambers per treatment	10
8.	Number of test organisms per chamber	1
9.	Primary control/dilution water	Receiving water: Black River.
10.	Secondary control water	Laboratory culture medium.
11.	Effluent concentrations	3.7, 5, 10, 20, 40%, and 80%; additional 3.7% using laboratory water for dilution.
12.	Temperature	25 ± 1°C
13.	Feeding regime	0.1 mL each of YCT culture food and algae per test chamber daily.
14.	Aeration	None.
15.	Test duration	7 days.
16.	Sampling scheme	Three 24-hour composite effluent samples, each used for a minimum of 48 consecutive exposure hours. Maximum holding time of 48 hours between completion of collection and initial test use of each sample. One grab sample of receiving water collected within 48 hours of test initiation. Laboratory water used was collected as one batch.
17.	Effects measured	Survival and reproduction.

Laboratory or receiving water control with 80% or greater mean survival, an average of 15 or more young per surviving female,

and at least 60% producing three broods.

18. Test acceptability

## Table 5 Summary of Test Conditions for the Fathead Minnow Chronic Bioassay Conducted for the Onalaska LGTF Onalaska, Wisconsin

#### March 21 through 28, 1995

		8 ,
1.	Test organism	Pimephales promelas (Osteichthyes: Cyprinidae).
2.	Test type	Static renewal.
3.	Age of test organisms	Larval, less than 24 hours.
4.	Test chamber size	500 mL
5.	Test solution volume	300 mL
6.	Renewal of test solutions	Daily.
7.	Replicate chambers per treatment	4
8.	Number of test organisms per chamber	10
9.	Primary control/dilution water	Receiving water: Black River.
10.	Secondary control water	Laboratory culture medium.
11.	Effluent concentrations	3.7, 5, 10, 20, 40%, and 80%; additional 3.7% using laboratory water for dilution.
12.	Temperature	25 ± 1°C
13.	Feeding regime	0.15 mL brine shrimp nauplii (less than 24 hours old) twice daily.
14.	Aeration	None, unless DO concentration falls below 40% saturation (then, continuous at rate not exceeding 100 bubbles/min).
15.	Cleaning	Siphon daily, immediately before test solution renewal.
16.	Test duration	7 days.
17.	Sampling scheme	Three 24-hour composite effluent samples, each used for a minimum of 48 consecutive exposure hours. Maximum holding time of 48 hours between completion of collection and initial test use of each sample. One grab sample of receiving water collected within 48 hours of test initiation. Laboratory water used was collected daily.
18.	Effects measured	Survival and growth (biomass).
19.	Test acceptability	Laboratory or receiving water control with 80% or greater mean survival, and surviving fish with at least 0.25 mg average dry

weight.

#### Physicochemical Monitoring

Total alkalinity, hardness, and total ammonia were measured initially on each new sample. Total residual chlorine was measured initially on each effluent sample. Total alkalinity and hardness were measured once in the laboratory control media.

Dissolved oxygen (DO), pH, and conductivity were measured initially and daily thereafter in all test treatment renewals. DO and pH were measured in one test chamber or composite of each 24-hour-old test solution.

Bioassay incubator temperature was electronically monitored hourly by thermocouple and data logger, and a 24-hour summary of mean values was recorded.

#### **Data Analysis**

Pass/fail criteria were applied to acute toxicity data. A modified EPA mathematical analysis was used to estimate an  $IC_{25}$  (the concentration that is inhibited 25 percent from the control data) on chronic toxicity data. The  $IC_{25}$  value generated is the linear interpolation estimate.

Toxicity was defined according to the following DNR criteria:

#### Acute Toxicity

• Less than 50 percent survival of test organisms in 100 percent effluent at test termination (48 hours for *Ceriodaphnia dubia* and *Daphnia magna*, and 96 hours for fathead minnow).

#### Chronic Toxicity

• IC<sub>25</sub> value for *Ceriodaphnia dubia* reproduction or fathead minnow biomass less than the 3.7 percent instream wastewater concentration (IWC) after a nominal 7-day exposure.

#### **Quality Assurance**

Part of the quality assurance and quality control (QA/QC) program at the CH2M HILL Milwaukee Bioassay Laboratory includes the performance of organisms concurrently tested in laboratory media. Tables 1 through 5 present the test acceptability criteria for laboratory control data. The results of the laboratory control tests are listed in Tables 6 and 7.

In addition, other QA/QC procedures include performing monthly reference toxicant tests using reagent-grade sodium chloride. The results of reference toxicant tests conducted during the past 12 months on the appropriate test organisms are summarized in Appendix C.

#### **Results**

Photocopies of the laboratory data and computer printouts of the statistical analyses are found in Appendix A. There were no excursions from the protocols and all test conditions were within the limits required by the EPA and the DNR. The test results are summarized below.

#### **Acute Bioassays**

Table 6 presents the acute bioassay results. No acute toxicity was demonstrated to *Ceriodaphnia dubia*, *Daphnia magna*, or fathead minnows in the 100 percent effluent concentration. Black River and laboratory control data were acceptable in all tests.

## Table 6 Summary of Results of Acute Bioassays Conducted for the Onalaska LGTF Onalaska, Wisconsin March 21 through 25, 1995

	Mean Percent Survival			
Test Media	Ceriodaphnia dubia	Daphnia magna	Fathead Minnow	
Black River Control	100	100	100	
6.25% Effluent	100	100	100	
12.5% Effluent	100	100	100	
25% Effluent	100	100	100	
50% Effluent	100	100	100	
100% Effluent	100	100	100	
Laboratory Control	100	100	100	

#### **Chronic Bioassays**

Table 7 presents the chronic bioassay results. No chronic toxicity was indicated to *Ceriodaphnia dubia* at the 3.7 percent IWC using the IC<sub>25</sub> criteria. The IC<sub>25</sub> value for reproduction was greater than 80 percent.

Black River water data did not meet the test acceptability criterion of 80% for use as a control in the fathead minnow test. However, the greater survival of organisms as effluent concentrations increase indicates that the effluent was not toxic. In addition, the 37 percent IWC diluted with laboratory water demonstrated no toxicity.

Black River water data were acceptable in the *Ceriodaphnia* bioassay, and laboratory control water data were acceptable in both bioassays.

Table 7
Summary of Results of Chronic Bioassays
Conducted for the Onalaska LGTF
Onalaska, Wisconsin
March 21 through 28, 1995

Test Media	Ceriodaphnia dubia		Fathead Minnow	
	Mean % Survival	Mean No. of Offspring	Mean % Survival	Mean Growth (mg)
Black River Control	100	31.1	74.5*	0.506
3.7% Effluent (IWC)	100	30.5	67.5	0.416
5% Effluent	100	32.1	78.8	0.563
10% Effluent	100	34.4	80.8	0.566
20% Effluent	90	28.3	80	0.558
40% Effluent	90	28.2	90	0.603
80% Effluent	90	26.7	90	0.613
IC <sub>25</sub>		>80%		> 80%
Laboratory Control	100	31.7	86.7	0.720
3.7% IWC (diluted with laboratory water)	100	33.5	87	0.661

<sup>\*</sup> Indicates data did not meet acceptability criteria for use as a control.

#### **Physicochemical Data**

All physicochemical parameters measured satisfied the bioassay requirements (see Appendix A).

#### **Conclusions**

The results of the laboratory bioassays conducted on effluent samples collected by the Onalaska LGTF on March 20, 22, and 24, 1995, show:

- The effluent samples were not acutely toxic to *Ceriodaphnia dubia*, *Daphnia magna*, or fathead minnows at 100 percent concentrations using the 50 percent lethality criteria.
- Black River water data did not meet the acceptable survival criterion of 80% for use as a control in the fathead minnow test. However, the greater survival of organisms in the higher effluent concentrations indicates that the effluent was not toxic. This was also substantiated by non-toxic results from the 37 percent IWC (diluted with laboratory water).
- The effluent samples were not chronically toxic to either *Ceriodaphnia dubia* or fathead minnows at the 3.7 percent IWC. The concentration of effluent that was estimated to be chronically toxic to both test organisms, based on the IC<sub>25</sub> analysis, was greater than 80 percent.
- Black River water met test acceptability criteria in all acute tests and Ceriodaphnia chronic test.
- Laboratory water data met test acceptability criteria in all acute and chronic bioassays.

#### References

- Weber, C. I. (ed.). 1993. Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms (Fourth Edition). EPA/600/4-90/027F.
   U.S. EPA, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio. 293 p.
- 2. Denny, J. S. 1987. Guidelines for the Culture of Fathead Minnows, Pimephales promelas, for Use in Toxicity Tests. EPA/600/3-87/001. U.S. EPA, Environmental Research Laboratory, Duluth, Minnesota. 42 p.
- 3. Weber, C. I., et al. 1989. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (Second Edition). EPA/600/4-89/001. U.S. EPA, Environmental Monitoring Systems Laboratory, Cincinnati, Ohio. 249 p.
- 4. Weber, C. I., et al. 1989. Supplement to Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms
  Revision 1). EPA/600/4-89/001a. U.S. EPA, Environmental Monitoring Systems
  Laboratory, Cincinnati, Ohio. 42 p.

APPENDIX A
LABORATORY DATA SHEETS
AND STATISTICAL ANALYSES

#### CH2M HILL MILWAUKEE BIOASSAY LABORATORY

CLIENT: Onalaska Gandfill
TEST DATE: 3-20-95
To the best of our knowledge, the laboratory data reported is true and accurate.
Report and Data:
Reviewed by:
Mary Witmann Date: 4-20-95
Approved by:
James Stark Date: 4-20-95

#### 48-HOUR ACUTE TEST INITIAL CHEMICAL DATA\*

(1-7 TREATMENTS)

PROJECT No.: <u>A5E 142.32</u> CLIENT: <u>O</u>	relaska Landfill
TEST ORGANISM: <u>Ceriodaphnia</u> dubia	LAB MEDIA /No .: Culture media 1636. APL
SAMPLE No.(s): 636.01,02 SAMPLE DESCRIPTION: Effluent	CONTROLIDILUENT: Black RIVEY
SAMPLE DESCRIPTION: Effluent	
TEST START DATE: 3-21-95 TIME: 1400	TEST END DATE: 3-23-95 TIME: /500
ANALYSTICS: J. Trammp/	CODE:

#### INITIAL CHEMICAL MEASUREMENT

TREAT. NO	TEST SOLN	PARAMETER	EXPOSURE F	PERIOD (HR) 24	COMMENTS
1	Lab	DØ pH ©OND	8.9 8.3 · 21	8.0	
2	13/ac/s RIVEr	DØ pH COND	8.9 8.1 1.14	8.7 7.9 .14	
3	6.25%	DO pH 2 GOND	8.5 7.8.	8.6 7.8 .15	
4	12.5%	DO pH COND	8.8 7.7 ./6	8.7 7.9 .19	e
5	25 %	DO pH ©OND	8.7 7.8	8.8 8./ .20	•
6	50%	DO pH COND	8.7 8.0 .24	8.9 8.2 . 25	
7	100%	DO pH COND	8.9 8.3 .34	8.8	
	DATE SAMPLE No. DETERMINED	) BY	3-21 .02 JT	3-22 .02	

\*DO as mg/L COND as mmho

Form BLAT04

Revised 11/92

#### 48-HOUR ACUTE TEST FINAL CHEMICAL DATA\*

(1-7 TREATMENTS)

PROJECT No.: <u>ASE 142.32</u> CLIENT: <u>O</u>	nalaska Landfill
TEST ORGANISM: Ccriodaphnia dubia	LAB MEDIA/No.: Culture media/636.ADL
SAMPLE No.(s): 636,01,.02	CONTROLIDILUENT: Black RIVER
SAMPLE DESCRIPTION: <u>Effluen</u> T	
TEST START DATE: 3-21-95 TIME: 1400	TEST END DATE: 3-23-95 TIME: 1500
ANALYST(s): J. Tiginmel	CODE:

#### FINAL MEASUREMENT

	,			-			
TREAT. NO.	TEST SOLN	PARAMETER	EXPOSURE F	PERIOD (HRS) 48	Des	COMMENTS	
1	Lab	DO pH	8. <i>3</i>	8.S 8.3			
2	Black	D© pH	8. Z	8.S			
3	6.25 1/.	DO pH	8.0	8.0 8.0			
4	12.5%	00 рң	8.7 8.0	8.5 8.0	٤		
5	25%	DO Hq	8.7 8.0	8.5 8.2			
6	50%	DO Hq	8.8	8.5 8. <b>3</b>			i
7	100%	DO pH	8.8 8.4	8.5 8.5			
	DATE DETERMINED	) BÝ	3-22	3-23			• • • • • • • • • • • • • • • • • • • •

\*DO as mg/L COND as mmho

Yun.

Form BLATOS

#### 48-HOUR ACUTE BIOASSAY SURVIVAL DATA

(4 Reps. 1-7 Treatments)

PROJECT No.: <u>ASE 142.32</u> CLIENT: <u>One</u> TEST ORGANISM: <u>Ceriodaphnia</u> dub	125Ka Land (1/1)
SAMPLE DESCRIPTION: Effluen E	
SAMPLE No.(s): 636,01,02	
LAB MEDIA/No .: Culture media/636.	ADLCONTROLIDILUENT: Black RIVER
TEST START DATE: 3-21-95 TIME: 1400	TEST END DATE: 3-23-95 TIME: 1500
ANALYST(s): J. Trammel	CODE:

1 (ab B 0 0 0 0   100% B 0   100% B 0 0   100% B 0   100%	TREAT: NO.	TEST SOLN	REP	FATAI PER EXI PERIOI 24		TOTAL FATAL	MEAN SURV.	GOMMENTS
3 6.25% B 0 0 0 0 100%  A 0 0 0 0 0 100%  A 0 0 0 0 0 100%  A 0 0 0 0 0 100%	1	Lab	B C	0	0	0	100%	
3 6.25% B 0 0 0 0 100%  A 0 0 0 0 100%  A 0 0 0 0 100%  B 0 0 0 0 100%  A 0 0 0 0 100%  A 0 0 0 0 100%  B 0 0 0 0 100%  A 0 0 0 0 0 100%  A 0 0 0 0 0 100%	2	13lack 12lver	B C	0	0	0	100%	
4 /2.5% B 0 0 0 100%  5 25% B 0 0 0 100%  6 50% B 0 0 0 0 100%  6 50% C 0 0 0 0 100%  A 0 0 0 0 0 100%	3	6.25%	B C	0	0	0	100%	
5 25% B 0 0 0 100%  6 50% B 0 0 0 0 100%  A 0 0 0 0 100%  B 0 0 0 0 100%  A 0 0 0 0 0 100%	4	12.5%	B	0	00	0	100%	
6 50% B 0 6 0 100% B 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	5	25 %	B 6	0	0	0	100%	
7	Y	50%	B C	0	6	0	100%	
00/, 00/,		100%	B C	0	0	0	100%	

Form BLAT10

DETERMINED BY

#### 48-HOUR ACUTE TEST INITIAL CHEMICAL DATA\*

(1-7 TREATMENTS)

PROJECT No.: <u>ASE 142.32</u> CLIENT: <u>O.</u>	
TEST ORGANISM: Daphnia magna	LAB MEDIA /No.: Culture media/636, ADI
SAMPLE No.(s): 636.01,.02	CONTROLIDILUENT: 13/eck RIVEY
SAMPLE DESCRIPTION: Effluent	
TEST START DATE: 3-21-95 TIME: 1345	TEST END DATE: 3-23-95 TIME: 1345
ANALYST(s): J. Tramme/	CODE:

#### INITIAL CHEMICAL MEASUREMENT

TREAT. NO.	TEST SOLN	PARAMETER	EXPOSURE F	ERIOD (HR) 24	COMMENTS	
1	Lab	DØ pH GØND	8. 9 8.3 ·21	8./ 8.6 .20		
2	Black River	DØ pH COND	8.9 8.1	8.7 7.9 .14		
3	6.25%	DO pH COND	8.5 7.8 .15	8.6 7.8 115		
4	12.5%	DO pH COND	8.8 7.7 .16	8.7 2.9	•	
5	25 %	DO pH COND	8.7 7.8 ,19	8.8 8./ .20		:
6	50%	DO pH COND	8.7 8.0	8.9 8.2 .25		
7	100%	DO pH COND	8.9 8.3 .34	8.8 8.4 .34		
	DATE SAMPLE No. DETERMINED	) BY	3-21 ,02 JT	3-22 ,02 JT		

\*DO as mg/L COND as mmho

Form BLAT04

Revised 11/92

#### 48-HOUR ACUTE TEST FINAL CHEMICAL DATA\*

(1-7 TREATMENTS)

PROJECT No.: <u>ASE 142.32</u> CLIENT: <u>O</u>	ralasta Landfill
TEST ORGANISM: Daphnia magna	LAB MEDIA/No.: Culture media/ADL
SAMPLE No.(s): 636,01,.02	CONTROLIDILUENT: Black RIVER
SAMPLE DESCRIPTION: Efficient	
TEST START DATE: 3-21-95 TIME: 1345	TEST END DATE: 3-23-95 TIME: 1345
ANALYST(s): J. Trainmel	CODE:

#### FINAL MEASUREMENT

TREAT.	TEST SOLN	PARAMETER	EXPOSURE I	PERIOD (HRS)			
.,,0,	5031		8.7	48 8.6	<u> </u>	COMMENTS	
<b>. 1</b>	Lab	DO pH	8.3	8.3			
2	Black River	DO -11	8.7	8.6			
<del> </del>		рН	8.8				
3	6.25%	DO pH	8.0	7.9			
4	12.5%	DO Hq	8.7 7.9	8.6	e		
	25%	DO	8.7	8.6			enner!
5		рH	7.9	8.2	{	•	
6	50%	DO pH	8.7	8.5 8.3.			;
7	100%	DO pH	8.7 8.5	8. <i>S</i>			
	DATE DETERMINED	· · · · · · · · · · · · · · · · · · ·	3-22	3-23			*

\*DO as mg/L COND as mmho

#### 48-HOUR ACUTE BIOASSAY SURVIVAL DATA

(4 Reps. 1-7 Treatments)

PROJECT No.: ASE 142.32 CLIENT: Ona	laska Landfill
TEST ORGANISM: Daphnia magny	AGE: 424H LOT No.: 409
SAMPLE DESCRIPTION: <u>Effluen</u> E	•
SAMPLE No.(s): 636.0/, .02	
LAB MEDIANO .: CULTURE MESICAPOL	CONTROLIDILUENT: 13/ack RIVER
TEST START DATE: 3-2/-95 TIME: 1345	TEST END DATE: 3-23-95 TIME: 1345
ANALYST(s): J. Tramme/	CODE:

TREAT, NO,	TEST SOLN	REP		ITIES POSURE D (Hrs) 48	TOTAL FATAL	MEAN SURV	GOMMENTS
1	Lab	A B C D	0000	0000	0 0 0	100%,	
2	Black River	A B C D	0000	0000	0 0 0	100%	
3	6.25%	A B C D	0 0 0 0	0000	0 000	100%	
4	12.5%	A B C D	0000	0 0 00	0000	100%	
5	25 %	A B C D	0000	0 0 0 0	0000	100%	
6	50%	A B C	0 0	0000	0 0 0	100%	
7	100%	A B C D	0 0 0	0000	0 0	100%	

 DATE
 3-28
 3-23

 DETERMINED BY
 ) 7
 57

Form BLAT10

#### 96-HOUR ACUTE TEST INITIAL CHEMICAL DATA\*

(1-7 TREATMENTS)

PROJECT No.: ASE 142.32 CLIENT: Ona /a	ska Landf	111	
TEST ORGANISM: Fatherd minnow	LAB MEDIA /No ·	CUITURE	media/636. AFI
SAMPLE No.(s): 636,01,02,03 CONTRO	DL/DILUENT:	Bla	CK RIVER
SAMPLE DESCRIPTION: <u>C+4/UCn t</u>	•		
TEST START DATE: 3-21-95 TIME: /300	TEST END DATE:	3-25-95	TIME: //30
ANALYST(s): J. Trammel	CODF:		

#### INITIAL CHEMICAL MEASUREMENT

TREAT.			ΕX		PERIOD (I	IRS)	
NO.	SOLN	PARAMETER	0	24	48	72	COMMENTS
1	Lab	DO pH COND	8.8 8.3 .20	8.6	7.9	8.7 8.0	
2	Black River	DO pH COND	8.9 8.1 .14	8.3 7.8	8.1 7.7	8.7 7.9	
3	6.25%.	DO pH COND	8.5 7.8 .15	8.5 7.7 .15	8.2 7.5	8.6 7.8 .15	
4	12.5%	DO pH COND	8.8 7.7 ·16	8.5 7.7 .17	8.4 7.5 .18	8.7 7.9 .19	
5	25 <i>7.</i>	DO pH COND	8.7 2.8 .19	8.5 2.8 .20	8, 6 7, 5 , 20	8.8 8.1 .20	
6	50%.	DO pH COND	8.7 8.0 . 24	8.5 2.8 .24	8.7 2.8 · 26	8.9 8.2 .25	
7	100%	DO pH COND	8. 9 8.3 .34	8.6 8.0 •36	8.9 8.2 .36	8.8 8.4 .34	
	DATE SAMPLE NO DETERMINE	******************************	3-21 -02 J1	3-22	3-23	3-24 .03	

\*DO as mg/L COND as mmho

#### 96-HOUR ACUTE TEST FINAL CHEMICAL DATA\*

(1-7 TREATMENTS)

PROJECT No.: ASE	142.32	CLIENT: Oha!	aska Car	nd (1/1	
TEST ORGANISM:	Fatherd	MIGROW	_ LAB MEDIA /No.:_	Culture	mod, a/636.AF
SAMPLE No.(s):6	36.01,02,	<i>03</i> CONTR	OL/DILUENT:	131ac	CK RIVE-
SAMPLE DESCRIPTIO	N: EFFIU	CAT			
TEST START DATE:	3-21-95 TIN	ME: /300	TEST END DATE:	3-25-95	TIME: _//30
ANALYST(s): J.	Tramme	/	CODE:		<b>,</b>

#### **FINAL MEASUREMENT**

TREAT.	TEST		EXPOSU	IRE PERIO	DD (HRS)		
NO.	SOLN	PARAMETER	24	48	72	96	COMMENTS
		DO	7.8	8.3	8.3	8.2	
1	Lab	рН	7.8	8.0	8.0	8.1	
	Black	DO	7.8	8.1	8.2	8.1	
2	River	рН	7.7	7.8	7.8	7.9	•
	1201	DO	7.8	3.0	8.2	8.1	
3	6.25%	рН	7.2	7.7	7.8	7.8	
	,	DO	7.8	8.0	8.2	8.1	
4	12.5%	рН	7.6	7.6	7.7	7.7.	
		DO	7.8	8.6	8.1	8.7	
5	25 %	ρН	7.8	7.8	7.8	7.8	
	50%	DO	7.8	8.0	8.1	7.9	
6	307,	ρН	2.8	7.9	7.9	8.0	•
	1 - 1	DO	7.8	8.6	8.1	8.0	
7	100%	рН	8.1	8.2	8.2	8.3	
	DATE		3-92	3-23	3-24	3-25	•
	DETERMINED	BY	$\perp \mathcal{J}'$	77	JT	<b>ン</b> プ	

<sup>\*</sup>DO as mg/L

#### 96-HOUR ACUTE BIOASSAY SURVIVAL DATA

(1 - 7 Treatments)

PROJECT No.: ASE 142.32 CLIENT: Ohalas	ka Landfill
TEST ORGANISM: Fathead minnow	AGE: 26 D LOT No.: 1680, 1682
SAMPLE DESCRIPTION: <u>Effluent</u>	
SAMPLE No.(s): 636,01,02,03	
SAMPLE No.(s): 636.01,02,03 LAB MEDIA/No.: Culture media/636.AFL	CONTROL/DILUENT: Black RIVER
TEST START DATE: 3-2/-95 TIME: 1300	TEST END DATE: 3-25-95 TIME: 1/30
ANALYST(s): J. Trammel	CODE:

TREAT. NO.	TEST SOLN	REP	24	FATALII PER EXPO PERIOD I	SURE	96	TOTAL FATALITIES	MEAN SURVIVAL
1	Lab	В	0	0	0	0	0	100%
2	13/act River	A B	0	0	0	0	0	100%
3	6.25%	A B	0	0	0	0	0	100%
4	12.5%	A B	0	0	0	0	0	100%
5	25 %	A B	0	0	0	0	0	100%
6	50%	A B	0	0	0	0	00	100%
7	100%	A B	0	0	0	0	0	100%
* - W * 3	DATE DETERMINED BY	/	3-22 TT	3-23	3-24	3-29 OT		

COMMENTS:

. 1292

#### CHRONIC TEST INITIAL CHEMICAL DATA:

PROJECT No.: ASE 142.32 CLIENT: Ona aska Landfill

TEST ORGANISM: Ceriodophnia dubia LAB MEDIA INO.: Cultum mud.:a (636. CCC

SAMPLE No.(s): 636.01, 02.03,04 CONTROLIDILUENT: Black River

TEST START DATE: 3-21-95 TIME: 1600 TEST END DATE: 3-28-95 TIME: 1700

ANALYST(s): M. Sharmy, J. Trammel, J. Stark CODE:

winwend was	CODE:
IEAT TEST VO SOLNI	ARAMETER 70 11 22 3 4 5 65 COMMENTS
i LAB	DO: 4.0 4.1 6.2 6.1 8.4 8.4 7.8  DH: 8.1 6.2 6.2 6.2 8.2 8.0  COND: 0.20 .21 0.20 0.23 ,22 0.22 ,20
Black River	DO G.3 BIX 8.2 G.A 8.1 8.1 7.9  DH 7.7 7.7 7.9 G.O G. 8.1 7.9  GOND 0.14 .15 0.15 0.16 .15 0.15 .15
3 3.7 /	DO: 4.0 8.1 8.1 8.2 8.2 8.0 PHE 7.6 7.4 7.8 7.9 8.0 8.0 7.9 COND 0.14 .15 0.15 0.15 .16 0.16 .16
<sup>4</sup> , 5 /,	7.4 8.6 7.9 8.0 8.2 8.2 8.0 pH 7.5 7.6 7.8 7.8 7.9 7.9 7.7 ©ONO 0.14 .15 0.66 0.75 ,15 0.16 .16
3 10%	©© 7.8 7.9 7.8 4.1 8.2 8.2 8.0 ©PH 7.5 7.5 7.8 7.8 7.9 7.9 7.9 7.7 ©OND 0.76 .16 0.76 0.76 .17 0.17 .76
6 Zo:/.	900 7.4 7.9 7.8 4.0 8.1 8.1 8.1 7.7 7.4 7.9 7.8 7.9 7.8 7.9 7.2 9000 0.17 1.17 0.64 0.18 1.20 0.20 1.19
9 40%	DO 7.7 7.9 7.9 6.0 8.6 8.1 8.1 DE 7.9 7.9 6.0 6.0 8.3 8.3 7.7 GONDI 0.22 .22 0.23 0.23 .23
GEIERNIVE SYNGRENGE DIVAE	3.21.95 3.22 3.23 3.24 3.25 3.26 3.27

<sup>\*00 =</sup> DISSOLVEO OXYGEN (mg/L)

CONO = CONDUCTIVITY (mmho)

### CHRONIC TEST CHEMICAL DATA\* (1-4 TREATMENTS)

PROJECT No.: ASE 14732 CLIENT: Onglask	a Landfill
TEST ORGANISM: Cerio domaia debia	AB MEDIA/No.: Culture media/636.CCC
SAMPLE No.(s): 636.01.02.03.04	CONTROLIDILUENT: Black River
SAMPLE DESCRIPTION: Effluent	DIACIE NIME
TEST START DATE: 3-21-95 TIME: 1600	TEST END DATE: 3-28-95 TIME: 1700
ANALYST(s): M. Stanaway, J. Trammel,	15twk CODE:

#### INITIAL CHEMICAL MEASUREMENT

	EDEATE THAT													
TREAT.	TEST				EXP	<b>OSURE</b>	DAY							
NO.	SOLN	PARAMETER	0	1	2	3	4	5	6	COMMENTS				
		DO	7.7	7.9	8,0	7.9	8.3	8.1	8.1					
8	80%	pН	<b>ዓ.</b> ኦ	8.1	4.3	6.2	8.2	8.2	8.2					
		COND	0.3/	, 72	0.33	0,31	<b>.3</b> .3	0.33	,29					
	AS INC	DO	7.9	7.8	8.0	7.8	8.0	8.0	8.1					
9	3.7 %	pH	<b>4,0</b>	9.0	84		83	8.3	8.2					
1	3.77.	COND	65.0	,24	0.24		,23	6.22	,25					
	/	DO		1111										
3	_ /	pН												
		COND												
		DO												
4		pН												
		COND												
	DATE		3-2195	7-27	3-23	3-24	3-25	3-26	3-27					
<b>)</b>	SAMPLEN		,02	.02	.03	.03	.04							
ŧ	DETERMIN		MS	MS	ms	M5	57	.04	.04	<u>'</u>				
•					1	1-13	5/	95	<u>で)</u>					

#### FINAL CHEMICAL MEASUREMENT

	***************************************			. 0111214	HOAL	MILAG		ZIN I		
TREAT.					EXP	OSURE	DAY			
NO.	SOLN	PARAMETER	1	2	3	4	5	6	7	COMMENTS
8	801	DO	8.4	6.3	7.8	8.1	8.3	8.3	84	
	/.	рH	8.4	4.4	9.3	8.4	8.3	8.4	8.4	
9	LAB IUC	DO	8,3	8.4	74	8.1	8.3	8.3	8.4	
•	3.7%	pH	8.6	8.5	8,2	8,4	8.5	8.5	8.4	
3	\ /	DO								
		pН								
4		DO								
	1	pН								
	DATE	***************************************	3-2L	3-23	3-24	325	3-26	3-27	3-28	
	DETERMIN	NED BY	MS	MS	MS	07	37	5	37	
		*DO - Dissolve	40	/ "	00115		4		4	

\*DO = Dissolved Oxygen (mg/L) COND = Conductivity (mmho)

### CHRONIC TEST FINAL CHEMICAL DATA:

PROJECT NO.: ASE 142.32 CLIENT: Onalaska Landill

TEST ORGANISM: Ceriodophnia dubia LAB MEDIA /No.: Culture media / 636.CC /

SAMPLE No.(s): 636.01, 02, 03, 04 CONTROLIDILUENT: Black River

TEST START DATE: 3-21-95 TIME: /600 TEST END DATE: 3-28.95 TIME: /700

ANALYST(s): M. SANASAY, J. Tramme/ CODE:

TREAT.	TEST SOUN	PARA- METER	1	2	EXPOS	UREDAY	5	6	
1	LAB	DØ pH	8.6 8.4	8.7	4.5 4.2	8.2	8.4	8./	8.8
	Black River	DO pH	8,6 8,3	8.7	4.3 8.1	8.3	8.1	8.1 7.8	8.9
3	3.7%	DO pH	8.5 8.2	4,5	8.4	8.2	8.3 8.6	8.2	8.5
4	5%	DO pH	4,3 4,1	8.5	8.3 7.9	8.0	8.3	8.2	8.5
5	10%	DO pH	8.3 811	4,5 8.1	8.3 7.9	8.2	8.2	7.9	8.8
6	20%	DO pH	8.3	8.1 8.1	8,0	8.0	8.2	8.1	8.4
7	40%	D© pH	8,2	4.3 4.7	7.9 7.8	8.1	8.3	8.0	,8-3 · 8.3
ŧ	DATE DETERMINED B	Y DO = Dissolv	3-22 175	3-23 M5	3-24 M5	3-25 JT	3-26 Tr	3-27 3 T	3-28

\*DO = Dissolved Oxygen (mg/L) COND = Conductivity (mmho)

COMMENTS:

PROJE	ECT No.: <u>AS</u> DRGANISM:	E 14	2.32		_ CLIEI	NT:	Ona	laska	. La	ndfi	11		
						<u> </u>				AGE:	12	44	LOT No.: <u>614</u>
SAMPL	E DESCRIP	TION:_		5ffh	unt								
SAMPL	E No.(s):	636.	0/,,	02,	03,	.04							THE RESERVE OF THE PARTY OF THE
	EDIA/No.: C						CCC			_			DILUENT: Black RIVE
	START DATE										TEST	END D	DATE: 3-28-95 TIME: 1700
ANALY	'ST(s): <u>M.5</u>	TANA	)A1,_	). 7r	amn	20/			CODE	<b>=</b> :			PAGE
TREAT.						4			PLICATI				
NO.	SOLN		1		3	4	5	6	7	8	9	10	COMMENTS
		2	OK-								1		7
		3										<del>                                     </del>	
)	LAB	4	5	6	5	5	6	5	5	6	6	5	
Ĺ	,	5		0	0	10	9	8	0	8	9	0	
		65	80	8	8	0	0	1	15	0	0	9	
		7	15	17	19	16	19	18	19	17	16	14	
							•			•			SUMMARY
NO of V	OUNG		7 3	31	32	31	34	32	35	31	31	28	TOTAL MEAN 3/7401
	IROODS		32 3	3	3	3	37	3	3	3	3	3	30 3
ADULT	FATALITIES		Ō	0	0	O	0	Ŏ	0	0	٥	0	O % SURVIVAL /OO
	TEST								LICATE	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
NO.	SOLN	DAY	1	2	3	4	5	6	7	8	9	10	COMMENTS
	Blow	1 2	0K										_
_	Black River	3	<u> </u>										
2	Kwer	4	4	4	5	5	4	3	.5	4	4	4	-
		5	8	8	7	12	9	7	10	10	8	12	
		6	Q	0	0	0	0	0	0	0	0	0	
		7	/6	15	20	18	18	17	19	12	20	17	
													SUMMARY
NO. of Y	OHNG	I	28	27	32	35	31	27	34	32	32	33	TOTAL MEAN 3/./
NO. of B	***********			<i>.</i>	20	ر ر	J!	<u> </u>	<i>- ,</i>	7-	JA		
	ATALITIES		0	O	0	Ù	0	Ó	0	0	0	0	O % SURVIVAL 100
XPOSU	RE DAY		0	000000000000000000000000000000000000000	2		4		6	7			
DATE		*********	3.21		3.23			3-26		3-28			
DETERM	INED / FED BY		m5	MS	MS	MS	<i>J</i> 7	IT	51	JI			

PROJE	ROJECT NO.: ASE 142.32 CLIENT: Onalaska Landfill EST ORGANISM: Coriodaphaia dubia AGE: L24H LOT NO.: 614															
						٤				_ AGE:	12	244		LOT No.:	614	
SAMPL	LE DESCRIP	TION:_		Etth	unt								· · · · · · · · · · · · · · · · · · ·			
SAMPL	_E No.(s): EDIA/No.:_ <i>C</i>	651	<u>6.0/</u>	, .0;	2,.0	3,0	9			***				81 1 0		
LAB M	EDIA/No.:_C	u pru	re p	ug(ia	16.	<u> 36 , (</u>	<u> </u>							Black Ri		
	START DATE 'ST(s): <u>M.    </u>						7		COD	<b>-</b> .	IESI	END L	DATE:	18-95	TIME: 170	
		) C an	awa	9,0	//.4/								9488		PAGE_ <u> </u>	OF <b>5</b>
TREAT.	TEST SOLN	DAY	1	2	3			2EH HE	PLICAT	E 8	9	10		COMN	TENTS	
		<u>1</u> 2	0K		+							ļ	_			
-	3,	3	<u>G</u> —									<del> </del>				
3	3.7 %	4	4	5	4	4	5	5	5	4	3	4	1			
		- 5	10	10	9	8	9	6	フ	8	10	9				
		6	0	0	0	0	0	0	0	0	0	0				
		7	/8	18	16	15	17	17	16	12/	19	19		T-0-1-0-1-0-2000000000000000000000000000		
													the residence had been a particular to the	MEAN MEAN		
NO, of Y			32	33	29	27	31	28	28	33	32	32	305	30.5		
	ROODS															٦
TREAT.	FATALITIES TEST		0	0	0	0	DINIGED	C DC	PLICATE		0			% SURVIVAL	100	
NO.	SOLN	DAY	1	2	3	4	5	6	7	- 8	9	10		COMM	ENTS	
		1	OK	_												
		2	OK													
4	5%	3	OK	-		77										
/	_	4 5	4	10	5	9	4	2	2	4	3	0				
		6	0*	0	8	8	0		0	80	0	12	* ADULT	LOST PUL	RING TRA	NSFER. JT
		7	1	22	18	18	15	19	20	22	18	19				
•											, , ,			MARY		
NO. of Y	OUNG	•	<del>V,X</del> 1	21	2.5		<u> </u>			~	54			MEAN	÷9	
NO. of B			X	36	30	30	31	30	31	34	28	39	<del>301</del> 289	32.1	W)	
**************	ATALITIES			0	0	0	0	0	0	0	0	0	287	% SURVIVAL	100	
EXPOSU	RE DAY	1	0		2		4		6	7					•	
DATE		**********		3-22		3-24				-						
JETERMI	NED / FED 8Y		m5	M3	M5	M5	JT	<b>ゴ</b> ゲ	5/	7/						

PROJE	ROJECT NO.: ASE 14232 CLIENT: Onalaska Landfill EST ORGANISM: Cariodophnia dubia AGE: 2244 LOT No.: 614																	
TEST	ORGANISM:	Cario	dopho	ia .	dub:	a				_ AGE:	1 2	244		LOT No.:	614			
SAMP	LE DESCRIP	TION:	<u> </u>	<u>6784</u>	unt	1011	,											
SAMPI	LE No.(s): <i>&amp;</i> EDIA/No.:_ <i>C</i>	in Hr	Ne o	and sa	16	26 C	01	-			CON	TPOL/	THE HENT	Black R	1.11			
	START DATE													28-95		200		
	(ST(s): M,						7		_COD	E:					PAGE		5	
TREAT. TEST OFFSPRING PER REF									PLICAT	E								
NO.	SOLN	DAY	<u> </u>	2	3	4	5	6	7	8	9	10		COMI	∦ENTS			
		1			+===		<del> </del>		-	+								
		3	6K					<del> </del>	-			#==	-  					
5	10 %	4	4	5	5	5	6	4	5	6	6	5						
		5	10		10	10	9	9	0	10	10	9						
		6	0	0	0	0	-0	0	13	0	0	0						
		7	21	20	1/2	17	17	20	20	17	24	21			1			
													TOTAL	IMARY MEAN				
NO. of N	YOUNG		35	34	32	32	3 ユ	33	3 &	33	40	35	344	MEVIA				
******	BROODS															_		1
***************************************	FATALITIES		O	0	0	0	0	0	PLICATE	0	<u></u> 0	0	0	% SURVIVAL	/00			Soccooss
TREAT.	TEST SOLN	DAY	1	2	3	4	HING F	6 6	7LICA 11	= - 8	9	10		COMN	IENTS			
		1	oK-	***************										<u> </u>			261.300	2020000
		2																
6	20%	3	OK															
V	00/0	4	5	6	4	5	2	4	5	9	5	0						
		5 6	_7	10	12	9	9	9	10	//	10	O AD						
		7	79	19	18	19	16	14	13	18	15	70						
	I.		- /					/	1	,,,			SUM	MARY				
							-		· -				TOTAL	**************				
NO. of Y	OUNG ROODS		33	35	34	33	30	27	28	33	30	0	<u> 583                                   </u>	28.3				
	FATALITIES		Ð	0	0	0	0	0	0	0	06	Da 1	Ø1	% SURVIVAL	90	$\neg$		
Annual Control	REDAY					3							True	1 mary and the construction of the first of the land				—
DATE		******				3-24							, ,,,,,,					
DETERM	INED/FED BY		ms	M5	125	MS	エト	01	ンプ	7								

G = GRAVID E = EYED R = RELEASING YOUNG AD = ADULT DEAD YD = YOUNG DEAD

PROJECT No.: ASE 142.32 CLIENT: Onalaska Landfill TEST ORGANISM: Coriodophnia dubia AGE: L244 LOT No.: 614																
TEST ORGANISM: Cariodaphnia dubia AGE: L244 LOT No.: 614																
SAMPLE DESCRIPTION: Effhunt																
SAMPLE No.(s): 636.01,.02,.03,.04																
LAB MEDIANO: Culture media 1636.07 636.CCL CONTROL/DILUENT: Black RIVE																
TEST START DATE: 3-21-95 TIME: 1600 TEST END DATE: 4-28-95 TIME: 1700																
ANALYST(s): M. Scanaway, J. Trammel CODE: PAGE 4 OF 5																
TREAT.	TEST SOLN	nev	1	2	3	OFFS 4		PER RE			9	10	_	2011	ACNITO .	
1102	SOCIT	1	οK	contractors and annual	0		J	· · · · · · ·	· · · · · · · · · · · · · · · · · · ·	0	3	10		COMAN	MENTS	
		2	OK	AD	OK								1			
7	1129/	3	M	17	0/6		<b></b>			+	+		Ī			
(	40%	4	4	1 1	4	5	4	5	5	5	6	5	1			
		5	10		12	12	10	10	11	9	8	10				
		6	0		0	0	0	0	Ö	0	0	0	]			
		7	17		16	19	13	16	17	16	13	20				
						Ť							Problem Control of Control	IMARY		
NO. of Y	OHING:		31	<del>ن</del>	32	36	27	<u> </u>	33	30	27	3.5	292	MEAN		
NO: of B			121	<del>                                     </del>	13 E	ط د	UT	131	122	30	27	122	282	28.2		
	FATALITIES		0	1	0	0	0	0	0	0	0	0	1	% SURVIVAL	90	
800000000000000000000000000000000000000	TEST						خناه كالمحانية بالمانية ب	ER RE	And design to be a beauty							
NO.	SOLN	DAY	1	2	3	4	- 5	6	7	8	9	10		COMM	ENTS	
	40%	1 	oK													
		3	214										-			
4		4	5/2 0/3 5	0	4	5	5	4	4	5	4	3				
		5	0	8	15	10	5	12/AD		7	10	8				
		6	8	0	0	0	0	1	9	0	0	0				
		7	16	15	15	15	16		17	15	16	15				
														MARY		
NO. 6f Y	CUNC		20		Ι	7.0	2 -		<u> </u>		٦	27	TOTAL	MEAN		
NO. of B			29_	23	26	30	30	ط) ا	30	27	30	26	267	26.7		
	ATALITIES		0	0	0	0	00	1200	0	0	0	0	1	% SURVIVAL	90	
XPOSUI				1			4		6	7					10	
			3.2/	3.22	3-23		3-25			3-28						
ETERMI	NED / FED BY	M5	M5	M3	<b>プ</b>	OT	51	ケア								

G = GRAVID E = EYED R = RELEASING YOUNG AD = ADULT DEAD YD = YOUNG DEAD

PROJECT No.: ASE 142.3 Z CLIENT: Onalaska Landfill TEST ORGANISM: Cariodaphnia dubia AGE: L244 LOT No.: 614																	
TEST ORGANISM: Cariodophnia dubia AGE: LZ44 LOT No.: 6/4																	
SAMPLE DESCRIPTION: Effhant																	
SAMPLE No.(s): 636.01,.02,.03,.04																	
LAB MEDIA/No.: Culture midta / 636. CC C CONTROL/DILUENT: Black RIVE																	
TEST START DATE: 3-21-95 TIME: 1600 TEST END DATE: 3-28-95 TIME: 1700																	
ANALYST(s): M. Stanaway, J. Trammel CODE: PAGE 5 OF 5																	
TREAT.	TEST SOLN	DAY	1	2	3	OFFSI 4	PRING F	PER RE		E 8	9	10	_	COM	VENTS		
	Lab	1	OK											_			
	IWC	2	OK						<u> </u>	<u> </u>			<u>†</u>				
a	200	3								ļ			_				
9	3.7%	4	0	2	0	5	ح	6	6	6	<u>S</u>	5	_				
	3.7.	5		0	1.5	9	/3	0	0	0	0	0	_				
		6 7	12	23	1/8	19	13	12	12	(3	/-	OE	4				
l		4	α, ι	_~~	1 / 0	1.77	1/0	1 20	/ 0	130	17	1 46		MARY	3		
														MEAN			
NO. of Y			40	36	32	3.3	36	38	36	38	31	15	.335	33,5			
	ROODS															_	
	FATALITIES TEST		_0_	0		0	PRING P	0	0	0	0	0	0	% SURVIVAL	100		***************************************
	SOLN	DAY	1	2	3	∪rror 4	HING P		10A1E	8	9	10		COMN	RENTS		
		1	30000000						************		······································			<u> </u>		30000	
		2										<del></del>					nnonemahahan
1	<b>\</b>	3															
		4															
$\downarrow$	$\sim$ [	5															
		6															
		7															
														VARY			
NO ALV	OHING					I	I	T		T	I		TOTAL	MEAN			
NO::6fYOUNG NO::6fBROOPS																	
	ATALITIES					<del>-</del>								% SURVIVAL		]	
XPOSUI	RE DAY		0	1	2	3	4	5	6	7	<del>-</del>					·	
*****		3				3.24	3-25			3-28							
ETERM	INED / FED 8Y	ı	m5	M5	M5	M5	57	<b>プ</b> ア	コア	57							

G = GRAVID E = EYED R = RELEASING YOUNG AD = ADULT DEAD YD = YOUNG DEAD

## Inhibition Concentration Calculation (ICx)

CH2M Hill July 1991

Client: Onalaska Landfill

Project Number: ASE142.32 Test Solution: Effluent

Test Date: March 21, 1995 Test Organism: Ceriodaphnia dubia

Response Measured: Reproduction

	Smoothed
Mean	Mean
Response	Response
31.100	32.028
30.500	32.028
32.111	32.028
34.400	32.028
28.300	28.300
28.200	28.200
26.700	26.700
	31.100 30.500 32.111 34.400 28.300 28.200

IC25 (%) Toxic Units

Linear Interpolation Estimate> 80.00

# CHRONIC TEST INITIAL CHEMICAL DATA

PROJECT No.: ASE 142.32 CLIENT: Ona gska Landfill

TEST ORGANISM: Fathed minnor LAB MEDIA /No.: Cultum mudia //63bCF/

SAMPLE No.(s): 63bO/, 02, 03, 04 CONTROLIDILUENT: Black River

SAMPLE DESCRIPTION: EFF/unt

TEST START DATE: 3-21-95 TIME: 1/30 TEST END DATE: 3-28-95 TIME: 1/230

ANALYST(s): M. Glanaway, J. Trammel, J. Stark CODE:

TREAT,	TEST				- FXPY	SURE	55V2			
NO.	SOLVI	PARAMETER	0.4		22	37.	45	5.	-63	COMMENTS
1	LAB	DO: DH DH GOND	8,2 8,1 0.19	8.3 8.2 .19	8.2 8.2 0.21	8.2 0.21	8.1	8.1	8.3 8.3	
2.	Black River	DO pH GOND	%,3 7,7 8 <i>14</i>	8.2 7.7 .15	8-2 7.9 0.15	8.2 8.0 0.16	8.1 8.1 115	8·/ 8·/ 0·/5	8.3 8.0	
	3.7%	DO) PH COND	8.0 7,6 0,14	8.1 7.4 .15	8.1 7.8 0.15	8.2 7.9 0.15	8.2	8.2	8.2 7.9	·
Α,	5 /.	DØ; pH; cond	7.8 7.5 0.14	9.0 7.4 .15	7.9 7.8 0.16	8.6 7.8 0.15	8.2	8.2 27.9 0.16	8,2 7.9	
5	10%	DO pH: GOND	7.8 7.5 0.16	7.9	7.8 7.8 0.16	8.1 7.8 0.16	7.9 7.9	8.2 7.9 0.17	8.2 7.8	
6	20:1.	DO: _pH_ _COND	7.8 7.1 0.17	7.9	7.8 7.9 0.18	8.6 7.8 6.18	8.1 7.8	8.1	8.2 2.8 .2/	*
7.	40%	DO pft COND	7.7 7.9 6.22	7.9	7.9 8.0 0.23	8.0 8.0 0.23	8.0	8.1	8.2	
	DATE SAMPLENOS DECEMINE	)·BY:	3.21.9 02 M5	02 MS	3-23 .03 MS	3-24 103 1015	3-25 04 51	3-26	1	<del></del>

\*00 = DISSOLVED OXYGEN (mg/L)

COND = CONDUCTIVITY (mmho)

### **CHRONIC TEST** FINAL CHEMICAL DATA:

PROJECT No.: ASE 142.32 CLIENT: Onglaska Landfill TEST ORGANISM: Fotherd minnow

LAB MEDIA /No.: Culture mudic/636.CEC

SAMPLE NO.(s): 636.01,.02,.03.04

CONTROLIDILUENT: Black River

TEST START DATE: 3-21-95 TIME: //30 TEST END DATE: 3-28.95 TIME: /230

ANALYST(s): M. STANAWAY, J. Trammel CODE:

TREAT NO.	TEST SOLN	PARA-		I	EXPOS	UREDAY			
1		METER DO	1	2	3	4	5	6	
	LAB	Hq	7,6 4,1	8.7	8.4	8.1	7.4	7.4	7.0
2	Black River	DØ pH	7.2 7.9	8.1 7.9	8.3	7.5	7.4	2.4 8.0	7.7
್ವ -	3.7%	DO pH	7,3 7,8	7.9	8,0	7.5 7.8	7.3 7.7	7.4	7.1
4	5%	00 Hq	7.3 7.7	8.0 7.7	7.8	7.4 7.8	7. z 7. <i>7</i>	7.2	2.1
5	10 %	DO pH	7,2	7.9 7.7	7. 7 7. 8	7.3	7.2	7.2	7.6
- 6 - 7	20%	D© pH	7.2 7.7	7.8 7.7	7.4 7.8	7. <i>3</i> 7.8	7. Z 7.7	7. o 7. 7	6.8
	40%	DØ pH	7.7	7.6 7.8	7.6 7.9	7.3	7.1	6.1	.6.9
	DETERMINED BY	*DO = Dissolv	3-28.96 M5 ed Oxygen (m	MS	3-24 MS	3-25	3-26	3-27	3-28

\*DO = Dissolved Oxygen (mg/L) COND = Conductivity (mmho)

COMMENTS:

# CHRONIC TEST CHEMICAL DATA\* (1-4 TREATMENTS)

PROJECT No.: ASE 14232 CLIENT: Onalaska Landfill
TEST ORGANISM: Fothered minrow
SAMPLE No.(s): 636.01,.02,.03.04 CONTROLIDITIEST. 11.16
SAMPLE DESCRIPTION: Effluen +
TEST START DATE: 3-21-95 TIME: 1/30 TEST END DATE: 3-72.45 THE
ANALYST(s): M. Staneway, J. Trammel, J. Stark CODE:

### INITIAL CHEMICAL MEASUREMENT

***************************************	***************************************	***************************************			IVIICAL	. 1415		ricia i		
1	TEST				EXP	OSURE	DAY			
NO.	SOLN	PARAMETER	0	1	2	3	4	5	6	COMMENTS
8 8	30%	DO pH COND	7.7 8.2 0.31	7.9 8.1 ,32	8.0 8.3 0.33	7.9 8.2 0.31	8.1 8.2 .33	8.1	8.2	
	INC. 71/.	DO pH GOND	716 8.1 0,24	7.9 4.2 123	8.0 8.3 0.23	8.0 8.3 0.23	8.4 8.3	8.4 8.3 0.23	8.2 83	
3		DO pH COND					-			
4 /		DO pH COND								
DA	**************		3-21	<b>3-</b> 22	3-23	3-24	3-25		3-2)	
	SAMPLE No. DETERMINED BY			.02 MS	.03 TT	.03 TT	.04	95	.04 JT	

## FINAL CHEMICAL MEASUREMENT

TREAT	TEST					DSURE				
NO.	SOLN	PARAMETER	1	2	3	4	- 5	6	7	COMMENTS
8	80./	DO	7.0	7.5	7,6	7.2	7.6	6.8	6-8	
7	1. AO T	Нq	8,2	4p	8,1	8.1	7.7	7.8	7.9	
9	AB IUC.	DO	7.3	7.3	7,7	2./	6.9	6.7	6.8	
	3.11.	pН	8,>	4,0	8,1	8.1	8.0	7.9	29	
3 ,	\	DO								
4	<del>/</del>	pН								
7		DO pH								
î	DATE	рa	2-15	2.2	3 244	2 - 4	,			
144	DETERMIN	IED BY	m s	3-23 M5	3-24 ms	3-25 5T	-	3.27	3-28	
two		*DO = Dissolver	100000		WHD.		OT	97	51	

\*DO = Dissolved Oxygen (mg/L) COND = Conductivity (mmho)

Wan.

# CHRONIC BIOASSAY SURVIVAL DATA

PROJEC	T NO.: ASE	- 142.3	2	CLIE	NT: _ C	nalas	ka Land	F: 11					
TEST OF	rganism: <u>F</u>	gthead m	innow			A(	3E: <u>_24</u> #	LOT No.:	1707				
SAMPLE	DESCRIPTIO	N:E	f/umt										
		01,02,											
		ture mis		b.CFC			ONTROUDILUE						
TEST ST	ART DATE:	-21-95 TI	ME:		- ,	TE	ST END DATE:	<u> 3-28-</u>		<u>:/230</u>			
		tanawa		Tramp					_ CODE:				
THEAT.	SOLUTION	( REP T	NUMBEH I 2 I	UH:HATALI 3		DAY 6 I	7 SURVIVORS	IOMBEH	HOIBVIVA	MEAN AL SURVIVAI		COMMENTS	· · · · · · · · · · · · · · · · · · ·
		A D		0	0		21 9	<u>                                   </u>				O.OIRINIETT IO	
1		BOO	<del></del>	5 1	0		5 9	1	90	FIR86.72	<u></u>		
	LAB	© 0	0	, 0	0	0 0	2 84.	<del>                                     </del>	89 88	987.8	Ja. NINE	FISH SE	T. 57
		D B	0	0	0	1 0		2	7877	.8			
	Black	A O	0 /	12	0		2 2	3	70		┥		
2	S1	88 <b>O</b>	0 0		0		0 9	1	90	7//61			
	River	O D	0 3	. 0	0		79.	2	7822	74.57			
		D O	0 4	2 2	0	0 0	7 6	4	60				
		A O	0 8		3	0 0		5	50		1		
3	3.7%	B 0	0 1	17	2	/ C		5	50	1700	,		
	J. 1 10		0 0	0		00		0	100	67.5%			
		D O	0 0	2	1	0 0		3	70				
		A O	ට <b>ට</b>	. 1	0	0 0	Ga.	3	6766	7.60	1		
4	5%	B	0 0	0	0	0 2	72.	2	2877	78.87			
	2 /0	© 0	1 0	0	0	0 0	9	/	7877.	78.61	•		
		D	0 2	0		0 0	8	a	80	7			
		A 0	0 1	0	0 1	0	9	1	90				
5	10%	B <b>D</b>	0 /	2		0	86.	3	7372	1000 F	b. ELEVEN	FISH SE	T. TT
	10/5	© 0	v Ö	0		0 0	10	0	100	80.0 /,			
		D 0	1 0	3	0 /	0 0	6	4	60	7 /	_		
		A O	0 1	1	0	00	8	2	85		JANE)		
6	20%	8 D	7 6	0		0 0		3	70	82.07	202		
	2010	© 0	0 /	12		2 C			90	00.0/	80%		
		D D	0 0	2		2 0	1 -	ス	80				
		A O	00	0		2 0	ga.	0	100				
7	40%	B 0	Q a	0		2 0		2_	80	90.0%			
	40/0	0 0	0 2	0	<u> </u>	2 0		2	80	10.0%			
		DS O	0 0	8	0 0	) 0	10	0	100				
	DATE		3.23 3-29		** **	-27 3-2	8						
<u>۔</u>	TERMINEDE	γ <u>π</u> 5	MS MS		ナトリン	1 57							
	FEEDING	AM V	./ 1	7	<b>V</b> 0	A 6 1	888						
m BLCTOS		PM V	./ /	+	V	- <del>  ,</del> /	7				2		
شنا			<del>/</del>								~	1416 0 0 1 1 /92	

# CHRONIC BIOASSAY SURVIVAL DATA

PROJ	ECT NO.: H	= 14	12.3	2		CLI	ENT: _	Ong	195 Ka	Land	-111			
TEST	ORGANISM: 1	-at hea	1 m	inno	رباه				AGE	<u>_24H</u>	LOT No.:	1707		
SAMPI	LE DESCRIPTION LE No.(s):	NC:	Eff	/un	<u>-+</u>									
SAMPI	LE No.(s): <b>6</b> .	3601,	.02,	.03	04									
LABM	EDIANO .: Ca	(trine	min.	ig/	6 Th.	CPC			CON	ITROUDILUE	NT: <u>B/q</u>	ck Riva	<u>.                                    </u>	
	START DATE:								TES	T END DATE:	3-28-5	<del>}5_</del> ПМЕ:	1230	
	'ST(s): M. S		way	/ J	. /r	3MM	0/				· · · · · · · · · · · · · · · · · · ·	_ CODE:		
NO.	J. TEST SOLUTIO							EH DY			NWRFH ****	<u> </u>	MEAN	
140:	3000110				7		0		7	ENCYNYAU3	FAILUTES	SURVIVAL 80	SUHVIVAL	COMMENTS
*		B.		18	10	0	0	0	0	8	<u> </u>		₹	
<b>~</b>	80%	- C		0	00	0	10	0			6	90	90.0%	1
		D		8	0	17	0	10	0	10		100	10.07	'
9888888888888	888888	Control without	-	1	+ + +	++-			l l	87 Va.	<u> </u>	90		a. ONE FISH LOST. UPON
9	LAB IWC	- All		0	+ =	10	0	0	0	<b>3</b> / <b>7</b>	2	78778	<b>}</b>	TERMINATION. (SEVEN
- ₹	3.7%			0	+->	0	0			8	2	80	87.0	
	3.7.70	D	3		+-	0	10	0	0	9	/	90	0710	
000000000000000000000000000000000000000	8888	100000000000000000000000000000000000000	-	0	0	+ o	10		0	16	0	100		
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	DETERMINED			75			ST	UT	51					
	FEEDING	S.DAY   S	. 7	******************************	7			V	38333.d SSSS					
Form BLCT06		· <del>}</del>	<del>\</del> \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	<del>/  </del>	<b>/</b>	V	$\frac{\checkmark}{\lor}$	$\dot{V}$	<del>y</del>					
rom BLC108	(90000000000000000000000000000000000000	1860/A	<u> </u>	—— <b>↓</b>		<u> </u>	V		У					Perled 11/92

# CHRONIC BIOASSAY GROWTH DATA

PROJECT No.: ASE 142.32 CLIENT: Onalaska Landfill TEST ORGANISM: Fathead minnow AGE: < 24 H LOT No.: 1707

SAMPLE DESCRIPTION: Effluent

SAMPLE No.(s): 636,01,.02,.03,.04

LAB MEDIANO.: Culture media /631.CFL CONTROL/DILUENT: Black RIVER

TEST START DATE: 3-21-95 TIME: 1130 TEST END DATE: 3-28-95 TIME: 1230

ANALYST(s): J. Trammel, M. Stanaway CODE:

TEST	TREAT	TARE	TARE+DRY	TOTAL	C:2 53//			
SOLN	REP	(mg)	WT (mg)			erence Test		5 Test
	1A	1089,27	1095,60	WT (mg)	No. Surv.	Organism Wt.	No. Exposed	
LAB	1B	1113.10	1120,78	6,33			10	0.633
440	1C	1112.81	1120.19	7.68			10	0.768
	10	1118,71	1124.62	5.91			9	0.820
	2A	1095,22	1100.29				9	0.657
Black	2B			5.07			10	0,507
River	2C	1094.64	1100.56	5.65			10	0.565
	2D	1099.86	1105.09	5,23			9	0.581
	3A	1097.82	1101.52	3.70			10	0.370
2754	3B	1091.66	1095.05	3.39			10	0.339
3.7%	3C	1089.54	1092.85	2.51			10	0.251
	3D	1089,64	1095.22	<i>5,5</i> 8			10	0.558
		1095.97	1101.12	5.15			10	0.515
5%	4A	1096.76	1100.98	4.22			9	0.469
	48	1097.20	1102.66	5,46			9	0.607
	4C	i i	1100.22	5.89			10	0.589
	4D		1102.69	5.87			10	0.587
	5A	1096.40	1102.81	6.41			10	0.641
10%	58	1101.96		5.87			11	0.534
	5C		1099.66	6.81			10	0.681
	5D	1094.02	1098.09	4.07			10	0.407
	6A	1092.62	1098,53	5.91			10	0.591
20%	6B	1091.25	1096.70	5,45			10	0.545
	6C	1088.11	1094.10	5.99			10	0,599
	6D	1099.94	1104.89	4,95			10	0.495
	7A	1091.07	1097.12	6,05			9	0.672
40%	7B	1101.20	1106.48	5.28			10	0.528
40%	7C	1091.55	1097.26				10	0.571
	7D	1099.67	1166.08	6.41			10	
								۱۲۵.۵
	СОММ				Mean 1 =		Mean 1 =	0.641

Mean 3 = Mean 3 = 0.416 Mean 4 = Mean 4 ≖ 0.563 Mean 5 = Mean 5 = 0.566 Mean 6 == Mean 6 = 0.558 Mean 7 == Mean 7 = 0.603

### CHRONIC RICASSAY GROWTH DATA

		CHION	IC BION22	AY GHO	WIHDA	IA		
PROJECT	No.: AS	E 142.37	CLIENT:O	nalacka				
TEST ORG	ANISM:	Fathead	MINNOW D	MATUSING	AGE: / 76	LIL LOTAL	. 1707	
SAMPLE D	$\mathbb{H}_{SCHIF}$	)   ( )   (	-/110nF				5.: <u>  110                                  </u>	
SAMPLE N	lo.(s): <i>6</i>	63601,	02,03,	.04	W-84			
LAB MEDIA	۷No.: <u>८</u>	culture	02,.03, media/6	31,CFL	CONTROL	DILUENT:		
1621214	REDALI	Ŀ: <u>_フ み</u> / ツ	O TIME: 🖊	130	TEST END	DATE: 3-28	3-95TIME.	1230
ANALYST(	s): <u>//</u> /	Scanaw	ay, J. Tra	mmel	CODE:			100
TEST	TREAT	TARE	TARE + DRY	TOTA	S			
SOLN	REP	(mg)		TOTAL	***	erence Test		Test
	8A	1094.40	WT (mg)	WT (mg)	No. Surv.	Organism Wt.		Organism Wt.
	<b>8</b> B	1		6.67			10	0.667
80%	8°C	1088.70		5.62			10	0.562
	8D	1090.19	1096.17	5.98			10	0.598
LAB IWL		1096.60	1102.85	6.25			10	0.625
LAGIM	<b>9</b> A	1093.66		5.57			9	0.619
3.7%	<b>4</b> B	1096.84	1102.95	6.11			10	0.611
	<b>9</b> C	1099.04	1105.48	6.44			10	0.644
	<b>9</b> D	1092.32	1100.03	7.71			10	0.771
	3A							
	3B							
	3C							
	3D							
	4A							
	48							
	4C							
	4D							
	5A							
	5B							
	5C							
	5D							
	6A							
	6B							
	6C					·		
	6D							
	7A							
	7B							
	7C							****
	7D							
	СОММІ	ENTS:			Mean 1 =		Mean 8 =	0,613
					Mean 2 ≖	·	Mean <b>?</b> ≖	0,661
					Mean 3 =		Mean 3 =	
					Mean 4 ≖		Mean 4 ≖	
					Mean 5 =		Mean.5≔	
					Mean 6 ≖		Mean 6 ≖	
	Eor- DI CY	\c_		1	Mean 7 ≖		Mean 7 ≖	

#### 

CH2M Hill July 1991

Client: Onalaska Landfill

Project Number: ASE142.32
Test Solution: Effluent

Test Date: March 21, 1995
Test Organism: Fathead Minnow
Response Measured: Growth (Biomass)

	Smoothed
Mean	Mean
Response	Response
0.506	0.546
0.416	0.546
0.563	0.546
0.566	0.546
0.557	0.546
0.603	0.546
0.613	0.546
	Response  0.506  0.416  0.563  0.566  0.557  0.603

IC25 (%) Toxic Units

Linear Interpolation Estimate> 80.00

Form BLSTO1

## **BIOASSAY SAMPLE RECEIPT CHARACTERIZATION**

CLIENT	Unalaska	Candfill					
DATE RECVD		IPTION	TEMP (C)	DO (mg/L)	рН	COND (mmho)	INITIALS
3-19-95	Black R		90	9.0	\$ 6.9	.11	<b>エ</b> ア
SIEVED _	DECHLORINATION		USE: IMM	EPIATE _	STO	RE (4 C) <u>V</u>	_
	S HOMOGENIZED	CONTAINER	TYPE (G/P) 👱		R		-
APPEARA	NCE : CLEAR <u></u>	CLOUDY So	OLIDS	COLOR_	TAN		
ALIQUOT	FOR: HARDNESS TS:	^_^^^^^^^^^	LKALINITY_				
COMMEN	15:	•	•				
DATE	SAMPI DESCR	LE NO. IPTION	TEMP	DO		COND	HUTIALE
	/ 36.	02.	(C)	(mg/L)			
3-21-95	Effluent	#/	50	11.2	8.2	.3/	3/
SIEVED _	✓ DECHLORINATI	<b>=</b>	USE: IMM	EDIATE_	/_ stor	RE (4 C)	
ALIQUOTS	S HOMOGENIZED .NCE : CLEAR/ FOR : HARDNESS	CONTAINER	TYPE (G/P) _	<u>/</u> 2_ ODO	R	/ • • • • • • • •	,
APPEARA	NCE : CLEAR	CLOUDY S	OLIDS	COLOR_	GOLP/	4ELLOV	
			LKALINITY_				
COMMEN.	15:						
DATE RECVD	SAMP	LE NO. IPTION	TEMP	DO	-11	COND	(AUTUAL C
		***************************************	(C)	(mg/L)	pН	<u> </u>	INITIALS
3/23-95	636.03 Efflum	+	40	<b>5</b> /1.1	872	,34	
	· · · · · · · · · · · · · · · · · · ·	····		· · · · · · · · · · · · · · · · · · ·	1,		1 -
ALIQUOTS	DECHLORINATI S HOMOGENIZED✓	CONTAINER	TYPE (G/P)	PODO	<u>Z</u> 510	(4 0)	
APPEARA	NCE : CLEAR 🗸	CLOUDY S	OLIDS	COLOR_	•		
ALIQUOT	FOR: HARDNESS_		ALKALINITY_				
COMMEN.							
DATE	SAMP		TEMP	DO		COND	
RECVD	•	RIPTION	(C)	(mg/L)	рН	(mmho)	INITIALS
3-25	636.04		40	16 a	8.4	2/	<b>ラ</b> ア
	Effluent			1	1	1 -	
SIEVED _	✓ DECHLORINAT S HOMOGENIZED	E	USE: IMM	IEDIATE _	V STO	RE (4 C) _	
ADDEADA	O NOR CLEAR V	CONTAINER	TYPE (G/P) _		)K		
ALIQUOT	NCE: CLEAR $\underline{\mathcal{J}}$ FOR: HARDNESS_	CLOOD1 5	OLIDS	COLOR_			
COMMEN	ITS:		ירויארוואוו ז				
							Revised 1/2

# SUPPLEMENTAL CHEMICAL DATA SUMMARY

PROJECT NO.	ASE	142.	32
TEST DATE _3	-21-	95	

CLIENT Onglaska Landfill SUMMARIZED BY J. Trannel, M. Colevan

LABORATORY CONTROL								
3.24	CONTROL I:D.							
	636. ADL	636. AFL	636.CCL	636.CFL				
TOTAL ALKALINITY mg/L CaCO3	98	100	94	92				
HARDNESS mg/L CaCO3	110	110	105	110				

SAMPLE DESCRIPTION		
DI al Bi		SAMPLE NO.
Black River	636.01	
TOTAL ALKALINITY mg/L CaCO3	36	
HARDNESS mg/L CaCO3	50	
TOTAL RESIDUAL CHLORINE mg/L	NA	
TOTAL AMMONIA mg/L	.72	

SAMPLE DESCRIPTION				
		SAMPLEN	10.	
Effluent	636.02	636.03	636.04	
TOTAL ALKALINITY mg/L CaCO3	196	212	214	
HARDNESS mg/L CaCO3	160	165	160	
TOTAL RESIDUAL CHLORINE mg/L	0	0	^	
TOTAL AMMONIA mg/L	1.7	2.9	3.8	

SAMPLE DESCRIPTION	
	SAMPLE NO.
TOTAL	
TOTAL ALKALINITY mg/L CaCO3	
HARDNESS mg/L CaCO3	
TOTAL RESIDUAL CHLORINE mg/L	
TOTAL AMMONIA mg/L	

NA = Not Analyzed

<sup>\* =</sup> Duplicate for QA

### **TEST TEMPERATURE SUMMARY**

PROJECT No.: ASE 142.32 CLIENT: Ohalas Ka	Landfill
---	----------

### **ACUTE TEST TEMPERATURE**

		DATE									
	3-21	3-22	3-23	3-24	3-25						
AVG	26,7	20.7	20.6	20.6	20.6						
MAX											
MIN											
SUM. BY:	JI	<i>ゴ</i> ア	丁厂	ンプ	<b></b>						

#### CHRONIC TEST TEMPERATURE

		DATE										
	3-21	3-22	3-23	3-24	3-25	3-26	3~2>	3-28				
AVG	25.3	25.2	25.2	25.2	25/5	25.3	25,3	24,9				
MAX							TOTAL ALL DESIGNATION	4				
MIN												
SUM. BY:	JT	JJ	ナ厂	ファ	<b>ゴ</b> ア	<b>ン</b> プ	77	57				

COMMENTS:		 	 

FORM BLST04

Revised 7/25/90

APPENDIX B
CHAIN-OF-CUSTODY FORMS

<b>CHM</b> HIL	L		CHAIN	OF CU	STODY RE	CORD F	OR NPDE	S COMPL	IANCE BION	MONITOR	RING			
Client Name				Client	Shipping Ac	ldress					NPDES N			
Sample Kit Tracking Information  No. of Cooler — of —  Total No. of Bottles —				☐ Fed	x	Ste		Stere Shipped b Stev	repared by/Date; Steve Feur 3/ hipped by/Date: Steve Feur 3/ Lery		Ship Samples to: CH2M HILL Bioassay Laboratory 15779 W. Ryerson Road New Berlin, WI 53151 Phone: (414) 784-0448 Fax: (414) 784-0353			-
Composite Sam	ple Inforr	nation				1	n of Sampli	-			Sample Container			
Flow Proportion Samples/Hour Total Hours Initiated: Date Ended: Date Chilled During C	rotal Hours Total Volume  nitiated: Date Time  Ended: Date Time					la Ki Lasler		rdfill ste		Plastic			Π <i>η</i>	
Sample Description River Nati	Date 3/19	Time 14:20	Sampl Comp	e Type Grab χ	No. of Containers	Volume 20 gcl	Alvo	Sampled	by (Signature)			Comments		For Lab Use Sample ID No.
											•			
Relinquished By	and Title	e (Signatu	re)		<u>I</u>		J.,		Date 3/19/9)	□ Intact		of Seal Upon F	Receipt b	y Lab
Received By: (S	ignature)	1	Date		Relinquish	ed By: (Sig	gnature)		Date Received By Lab: (Signature) Date 3/70					
			Time					1	ime	14gno	non	nell	T	rime 1808

C	4	A	4	III
_				

#### CHAIN OF CUSTODY RECORD FOR NPDES COMPLIANCE BIOMONITORING

Client Name Client Shipping Address							NPDES Number	
							Ship Samples to:	
Sample Kit Tracking Information	Method	of Shipme	nt (Check C	ne)	Prepared by/Date:		CH2M HILL Bioassay	Laboratory
7.					3-20-95		15779 W. Ryerson Ro	ad
No. of Cooler $\longrightarrow$ of $\longrightarrow$	- 🗗 Fed	X	☐ Pickup		Shipped by/Date:		New Berlin, WI 53151	
Total No. of Bottles	☐ UPS		Other	***************************************	3-20-95		Phone: (414) 784-044	8
			·				Fax: (414) 784-035	3
Composite Sample Information		<i>i</i> .		n of Samplir			Sample Container	
Flow Proportional, Time I	nterval 📕	.1	Efflu	ent f	rom Towar		Plastic Gloss New	Used 🗌
Samples/HourVolu	ıme/Sample	200 m	57	rippiv	o Towar		Refrigerant Used For Shipping	
Total Hours 24 Tota	ıl Volume	3 gal					Wet ice Blue ice Oth	er 🗆
		Pluss					Sample(s) Shipped Via	
Initiated: Date 3-/9-9 Tir	ne						UPS   Fed X D Other	
Initiated: Date $\frac{3-/9-9}{3-20-95}$ Tire Ended: Date	ne		,				Bioassays Required	
	No						Acute Chronic Other [	<u> </u>
	mple Type	No. of						For Lab Use
Description Date Time Cor	np Grab	Containers	Volume		Sampled by (Signature)		Comments	Sample ID No.
Processed weeks 3-22-55 /130 /		2	3 gal	S/one to	I / William L	Normal		636.02
					- V- Production - Company			
			!					
Relinquished By and Title (Signature)		1/2			Date 3-20-95	1	Condition of Seal Upon Receip	t by Lab
William L. C	~~~	1/19	and Of	Borater	Time 2:00 pm	The second second second second	☐ Other (Describe)	
Received By: (Signature)			ed By: (Sig	gnature)	Date	_ ^ _	By Lab: (Signature)	Date 3 21-79
Time					Time	Jon	i d'rammel	Time (

C	K	M	<i> </i>	//	11
			11.73		

### CHAIN OF CUSTODY RECORD FOR NPDES COMPLIANCE BIOMONITORING

Client Name				Client	Shipping Ad	Address				NPDES Number		
Sample Kit Trac No. of Cooler Total No. of Bot Composite Sam	tles	of —	<u>/</u> [		of Shipmer	`		Prepared by/Date:  3-22-93  Shipped by/Date:  3-23-85  Showe Kery		Ship Samples to: CH2M HILL Bioassay Laboratory 15779 W. Ryerson Road New Berlin, WI 53151 Phone: (414) 784-0448 Fax: (414) 784-0353 Sample Container		
Flow Proportional Time Interval Samples/Hour Yolume/Sample 3.5 gal					'	•	•	town	Plastic Glass New Refrigerant Used For Shipping			
Initiated: Date Ended: Date Chilled During C	<u>3</u> <u>3</u> -	-21-95		10130						Sample(s) Shipped VIa  UPS Fed X Other  Bioassays Required  Acute Chronic Other	*	
Sample Description	Date	Time	Sampl Comp	e Type Grab	No. of Containers	Volume		Sampled by (Signat	ure)	Comments	For Lab Use Sample ID No.	
Prox me wo leg	3-2025	10:300			.2	33-l	نيآلا	line L. word			636.03	
Relinquished By					Los by			Date 32.2.		Condition of Seal Upon Receip	t by Lab	
Received By: (S	ignature)			3/95	Relinquish			Date Time	1000 100 100 100 100 100 100 100 100 10	d By Lab: (Signature)	Date 3/23/95 Time 0930	

<b>CHAM</b> HILL	<u>.</u>	(	CHAIN (	OF CUS	STODY RE	CORD FO	OR NPDES COM	IPLIANCE BIOM	ONITORII	ΝG			
Client Name		LA	WD-	Client S	Shipping Ad	ldress				NPDES Number			
ONAKA	15K/4	2 F/	///							Ship Samples to:			
Sample Kit Tracking Information Method of Shipment (Check One)							ne) Prepare	ed by/Date:		CH2M HILL		aboratory	
								7-24-97	li di	15779 W. Ry	-	<u>-</u>	
No. of Cooler of Fed X					☐ Pickup	Shippe	d by/Date:		New Berlin,				
Total No. of Bott													
										Fax: (414) 784-0353			
Composite Samp						Description	n of Sampling Site			Sample Containe	er		
Flow Proportions	al 🗌	, Ti	ime Inter	val 🖒					LF.	Plastic D Glas	s New	Used 🗌	
Flow Proportional Time Interval Samples/Hour Yolume/Sample Total Hours Total Volume 33									ļ.	Refrigerant Used	For Shipping		
Total Hours	,	34	Total Vo	lume	330l				<u>\</u>	Wet Ice Blue	e Ice 🗌 Other		
					V				9	Sample(s) Shippe	ed Vla		
Initiated: Date		7-23	Time	9170	يستسددم :				l	UPS 🗆 Fed X 🖟 Other 🗆			
Ended: Date	<u> </u>	7-23 7-24	Time	81300	سمسرب				E	Bioassays Required			
Chilled During C			Yes 🗗					Acute □ Chronic □ Other □					
Sample			·	е Туре	No. of							For Lab Use	
Description	Date	Time	Comp	Grab	Containers	Volume		led by (Signature)		X	ments	Sample ID No.	
Orocassulcate	3-44-	91.00 m	1			331	william	Lum		Ica about 9		636,04	
									ا ا	Bample was			
		<b> </b>			<del>                                     </del>				<del>/</del>	7:30 one			
										Contact intel			
	1,000												
Relinquished By	and Title	(Signatui	re)	1				Date 3-24-55		Condition of Seal	l Upon Receipt	by Lab	
wit	lian	1 L. C	المروس العار	g/				Time//:30 cm	☐ Intact 〔	☐ Other (Des	cribe)	······································	
Received By: (Signature) Date Relinquished B				ed By: (Sig	jnature)			By Lab: (Signatu		Date 3 -25-9			

Time

APPENDIX C
REFERENCE TOXICANT DATA

Table 1. Reference Toxicant Summary

Laboratory:

CH2M HILL - Milwaukee, WI

Test Type:

Acute

Organism:

Ceriodaphnia dubia

Age

< 24 Hours

# of Organisms / Conc.:

20

**Test Duration:** 

48 Hours

Toxicant:

Sodium Chloride

Response:

Mean % Survival

Calculation:

LC50

Reporting Period:

		Test	12 Mon	th Contro	Limits	1	
	Test	LC50	Mean	Mean	Mean	of	
Test No	<u>Date</u>	<u>(g/L)</u>	LC50	+2 S.D.	-2 S.D.	Control	Action if Out of Control
55	4/13/94	2.45	2.47	2.76	2.17	IN	
56	5/31/94	2.67	2.48	2.80	2.17	IN	
57	6/29/94	2.32	2.47	2.80	2.14	IN	
58	7/29/94	2.45	2.48	2.80	2.17	IN	
59	8/31/94	2.52	2.49	2.80	2.17	IN	
60	9/28/94	2.58	2.47	2.73	2.21	IN	
61	10/18/94	2.45	2.47	2.73	2.21	IN	
62	11/28/94	1.54	2.38	2.95	1.80	OUT	а
63	12/14/94	2.60	2.39	2.98	1.80	IN	
64	12/20/94	2.63	2.42	3.02	1.83	IN	
65	12/27/94	2.53	2.43	3.03	1.84	IN	
66	1/24/95	2.32	2.42	3.02	1.82	IN	
67	2/28/95	2.10	2.39	3.02	1.77	IN	
68	3/28/95	2.25	2.36	2.96	1.75	IN	

a = water batch had low hardness (<70 mg/L); Retest 12/14/94

### Table 2. Reference Toxicant Summary

Laboratory:

CH2M HILL - Milwaukee, WI

Test Type:

Acute

Organism

Daphnia magna

Age

< 24 Hours

# of Organisms / Conc.:

.. 20

**Test Duration:** 

48 Hours

Toxicant:

Sodium Chloride

Response:

Mean % Survival

Calculation:

LC50

Reporting Period:

		Test	12 Mon	th Contro	l Limits	In or Ou	t
	Test	LC50	Mean	Mean	Mean	of	
Test No	<u>Date</u>	(g/L)	LC50	+2 S.D.	<u>-2 S.D.</u>	Control	Action if Out of Control
53	4/13/94	4.90	4.76	5.31	4.21	IN	
54	5/31/94	4.99	4.82	5.28	4.35	IN	
55	6/29/94	4.90	4.87	5.18	4.56	IN	
56	7/29/94	4.90	4.87	5.18	4.56	IN	
57	8/31/94	4.65	4.89	5.06	4.73	OUT	a
58	9/28/94	4.51	4.86	5.14	4.58	OUT	a
59	10/18/94	4.64	4.84	5.14	4.53	IN	
60	11/28/94	3.83	4.75	5.40	4.10	OUT	b
61	12/20/94	4.90	4.74	5.41	4.06	IN	
62	12/27/94	4.90	4.74	5.41	4.06	IN	
63	1/24/95	5.34	4.77	5.53	4.01	IN	
64	2/28/95	3.74	4.66	5.63	3.69	IN	С
65	3/28/95	4.78	4.64	5.60	3.69	IN	

a = The LC50s of tests 57 and 58 were 5% and 7% different, respectively, from the mean LC50. As the variance has been too low (tight) due to many of the previous tests with identical results, no action was taken. This is due to an artifact of the statistical analysis.

b = Lab water hardness decreased below 70 mg/L; Retest when cultures back on-line.

c = New concentrations used.

### **Table 3. Reference Toxicant Summary**

Laboratory:

CH2M HILL - Milwaukee, WI

Test Type:

Acute

Organism

Pimephales promelas

Age

10 ± 2 Days

# of Organisms / Conc.:

20

**Test Duration:** 

96 Hours

Toxicant:

Sodium Chloride

Response:

Mean % Survival

Calculation:

LC50

Reporting Period:

		Test	12 Month Control Limits		In or Out		
	Test	LC50	Mean	Mean	Mean	of	
Test No	<u>Date</u>	(g/L)	LC50	<u>+2 S.D.</u>	-2 S.D.	Control	Action if Out of Control
53	4/18/94	8.31	6.95	8.94	4.95	IN	
54	5/16/94	9.53	7.23	9.56	4.90	IN	
55	6/13/94	6.49	7.26	9.54	4.98	IN	
56	7/11/94	5.47	7.17	9.64	4.69	IN	
57	8/8/94	5.41	7.07	9.72	4.42	IN	
58	9/12/94	5.81	6.91	9.60	4.22	IN	
59	10/10/94	5.79	6.85	9.61	4.09	IN	
60	11/7/94	5.76	6.61	9.16	4.06	IN	
61	12/8/94	5.98	6.63	9.16	4.09	IN	
62	1/9/95	5.28	6.58	9.19	3.98	IN	
63	2/6/95	5.28	6.39	8.96	3.81	IN	
64	3/6/95	5.81	6.28	8.82	3.74	IN	

### Table 4. Reference Toxicant Summary

Laboratory:

CH2M HILL - Milwaukee

Test Type:

Chronic

Organism:

Ceriodaphnia dubia

Age:

< 24 Hours

# of Organisms / Conc.: 10.00

**Test Duration:** 

7 days

Toxicant:

Sodium Chloride

Response:

Mean No. of Young per Adult

Calculation:

25% Inhibition Concentration (IC25)

Reporting Period:

						In or Out	
	Test	IC25	Mean	Mean	Mean	of	
Test No	<u>Date</u>	(g/L)	IC25	+2 S.D	<u>-2 S.D.</u>	Control	Action if Out of Control
52	4/5/94	1.06	0.99	1.36	0.61	IN	
53	5/4/94	1.27	1.01	1.42	0.60	IN	
54	5/31/94	1.05	1.01	1.42	0.60	IN	
55	6/18/94	1.12	1.04	1.42	0.66	IN	
56	7/8/94	1.08	1.05	1.42	0.67	IN	
57	8/4/94	1.09	1.05	1.43	0.67	IN	
58	9/16/94	0.95	1.01	1.32	0.70	IN	
59	10/22/94	0.84	0.99	1.30	0.68	IN	
60	11/28/94	0.84	0.97	1.29	0.65	IN	
61	12/29/94	0.96	0.99	1.29	0.69	IN	
62	1/13/95	0.70	0.96	1.30	0.63	IN	
63	2/10/95	1.18	1.00	1.32	0.68	IN	
64	3/3/95	0.93	1.01	1.32	0.69	IN	

Table 5. Reference Toxicant Summary

Laboratory:

CH2M HILL - Milwaukee

Test Type:

Chronic

Organism:

Ceriodaphnia dubia

Age:

< 24 Hours

# of Organisms / Conc.:

10

**Test Duration:** 

7 days

Toxicant:

Sodium Chloride

Response:

Mean 7- day % Survival and No. of Young per Adult

Calculation:

NOEC and LOEC

Reporting Period:

April 94- March 95

	-	Survival		Reprod	duction
	Test	NOEC	LOEC	NOEC	LOEC
Test No	<u>Date</u>	(g/L)	(g/L)	(g/L)	(g/L)
52	4/5/94	1.00	1.50	1.00	1.50
53	5/4/94	1.50	2.00	1.00	1.50
54	5/31/94	2.00	4.00	0.50	1.00
55	6/18/94	2.00	4.00	0.50	1.00
56	7/8/94	2.00	4.00	0.50	1.00
57	8/4/94	1.50	2.00	0.50	1.00
58	9/16/94	1.00	1.50	0.50	1.00
59	10/22/94	2.00	4.00	1.00	1.50
60	11/28/94	2.00	4.00	0.50	1.00
61	12/29/94	2.00	4.00	0.50	1.00
62	1/13/95	2.00	4.00	0.50	1.00
63	2/10/95	1.50	2.00	0.50	1.00
64	3/3/95	1.50	2.00	0.50	1.00

Test on 3/29/94 failed acceptability criterion for reproduction; Retest 4/5/94 Test on 5/4/94 for April test requirement

### Table 6. Reference Toxicant Summary

Laboratory:

CH2M HILL - Milwaukee

Test Type:

Chronic

Organism:

Pimephales promelas

Age:

< 24 Hours

# of Organisms / Conc.:

40

Test Duration:

7 days

Toxicant:

Sodium Chloride

Response:

Mean Growth (mg per number of organisms exposed)

Calculation:

25% Inhibition Concentration (IC25)

Reporting Period:

12 M	onth	Control	Limits	(IC25)	In or	Out

			0. 0 0	•			
	Test	IC25	Mean	Mean	Mean	of	
Test No	<u>Date</u>	(g/L)	IC25	+2 S.D.	-2 S.D.	Control	Action if Out of Control
49	4/12/94	0.40	0.54	0.72	0.36	IN	
50	5/16/94	0.59	0.54	0.72	0.36	IN	
51	6/30/94	0.90	0.57	0.85	0.30	OUT	New lab media used - MHRW as diluent.
52	7/25/94	0.54	0.56	0.84	0.29	IN	
53	8/31/94	0.48	0.55	0.83	0.28	IN	
54	9/28/94	0.61	0.55	0.83	0.28	IN	
55	10/18/94	0.60	0.56	0.84	0.28	IN	
56	11/15/94	0.57	0.56	0.84	0.28	IN	
57	12/9/94	0.50	0.55	0.83	0.27	IN	
58	1/9/95	0.56	0.57	0.81	0.33	IN	
59	2/17/95	0.19	0.55	0.87	0.22	OUT	Retest 3/2/95
60	3/2/95	0.49	0.54	0.86	0.21	IN	
61	3/10/95	0.43	0.54	0.86	0.22	IN	

Table 7. Reference Toxicant Summary

Laboratory:

CH2M HILL - Milwaukee

Test Type:

Chronic

Organism:

Pimephales promelas

Age:

< 24 Hours

# of Organisms / Conc.:

40

**Test Duration:** 

7 days

Toxicant:

Sodium Chloride

Response:

Mean % 7 day Survival and Growth (mg)

Calculation:

NOEC and LOEC

Reporting Period:

	-	Survival			Growth		···
	Test	NOEC	LOEC	;	NOEC	LOEC	*
<u>Test No</u>	<u>Date</u>	(g/L)	(g/L)		(g/L)	(g/L)	Comments and Action
49a	4/12/94	0.30	0.60		0.30	0.60	a. Different dilution series used
50	5/16/94	0.30	1.50		0.30	1.50	
51	6/30/94	1.50	3.00		0.30	1.50	
52	7/25/94	0.30	1.50		0.30	1.50	
53	8/31/94	0.30	1.50		0.30	1.50	
54	9/28/94	0.30	1.50		0.30	1.50	
55	10/18/94	0.30	1.50		0.30	1.50	
56	11/15/94	0.30	1.50		0.30	1.50	
57	12/9/94	0.30	1.50		0.30	1.50	
58	1/9/95	0.30	1.50		0.30	1.50	
59	2/17/95	0.30	1.50		0.30	1.50	
60	3/2/95	0.30	1.50		0.30	1.50	
61	3/10/95	0.30	1.50		0 30	1.50	