CHRONIC AQUATIC TOXICITY TEST REPORT

Barnhardt Manufacturing Company
Colrain, MA

Ceriodaphnia dubia Survival and Reproduction Test – EPA 1002.0

EPA 821-R-02-013, "Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms", Fourth Edition

Test Start Date: 4/3/17

Test Period: April 2017

Report Prepared by:

New England Bioassay
A division of GZA GeoEnvironmental
77 Batson Drive
Manchester CT, 06042

NEB Project Number: 05.0044654.00

Report Date: April 26, 2017

Report Submitted to:

Barnhardt Manufacturing Company
247 Main Road
Colrain, MA 01340

Sample ID: Effluent composite

Please contact the Lab Manager, Kim Wills, at **(860) 858-3153** or kimberly.wills@gza.com if you have any questions concerning these results.

NEW ENGLAND BIOASSAY, A DIVISION OF GZA EPA TEST SUMMARY SHEET

Facility Name: Barnhardt Manufacturing Company Test Start Date: 4/3/17
NPDES Permit Number: MA0003697 Outfall Number: 001

Test Type	Test Species	Sample Type	Sample Method
_ Acute	_ Fathead Minnow	_ Prechlorinated	_ Grab
X Chronic	X Ceriodaphnia Dubia	_ Dechlorinated	X Composite
_ Modified (Chronic reporting LC50 values)	Daphnia Pulex	X Unchlorinated	_ Flow-thru
	_ Mysid Shrimp	_ Chlorinated	_ Other
_ 24-Hour Screening	_ Sheepshead		
	_ Menidia		
	_ Sea Urchin	TRC conc. <0.001 mg/l.	
	_ Selenastrum		
	_ Other		

Dilution Water

X Receiving water collected at a point immediately upstream of or away from the discharge; (Receiving water name and sampling location: North River -see COC)

_ Alternate Surface Water of known quality and a hardness to generally reflect the characteristics of the receiving water; (Surface water name:)

_ Synthetic water prepared using either Millipore Mill-Q or equivalent deionized water and reagent grade chemicals; or deionized water combined with mineral water;

_ Artificial sea salts mixed with deionized water;

_ Other

Effluent Sampling Date (s): 4/2-3/17 4/4-5/17 4/6-7/17

Effluent Concentrations Tested (in%): 0% 6.25% 5.0% 12.5% 25% 50% 100%
* (Permit Limit Concentration): 5.0% (C-NOEC)

Was effluent salinity adjusted? No If yes, to what value? N/A ppt

Reference Toxicant test date: 4/3/17 Reference Toxicant Test Acceptable: Yes X No _

Age and Age Range of Test Organisms < 24 hours Source of Organisms NEB Lab

TEST RESULTS &PERMIT LIMITS

Test Acceptability Criteria

A. Synthetic Water Control
Mean Control Survival: 100% Mean Control Reproduction: 39.7 young/female

B. Receiving Water Control
Mean Control Survival: 100% Mean Control Reproduction: 37.3 young/female

C. Lab Culture Control Yes_ No X
Mean Control Survival: N/A Mean Control Reproduction: N/A

D. Thiosulfate Control Yes_ No X
Mean Control Survival: N/A Mean Control Reproduction: N/A

Test Variability

Test PMSD (growth) N/A	Upper and Lower PMSD bound N/A	low__	in-bounds__	high__
Test PMSD (reprod.) 14.4%	Upper and Lower PMSD bound 13-47%	low__	in-bounds X	high__

Permit Limits & Test Results

	Limits		Results
LC50	100%	LC50	>100%
		Upper Value	±∞
		Lower Value	100%
		Data Analysis Method Used	Graphical
A-NOEC	N/A	A-NOEC	100%
C-NOEC	5.0%	C-NOEC	5.0%
		LOEC	6.25%
IC25	N/A	IC25	10.1%
IC50	N/A	IC50	15.8%

PMSD Comparison Discussion (Test Variability/Sensitivity)

Reproduction

_ 1. PMSD exceeds upper bounds. Test results are highly variable and may not be sensitive enough to determine the presence of toxicity at the permit limit concentration (PLC).

_ 1a. Test results indicate the discharge is not toxic at the PLC. Test is not sufficiently sensitive and must be repeated within 30 days of the initial test completion date using fresh samples.

_ 1b. Test results indicate the discharge is toxic at the PLC. Test results are considered acceptable and the test does not have to be repeated.

X 2. The PMSD falls within the upper (47%) and lower (13%) bounds. Results are reportable.

_ 3. PMSD falls below the lower bound test variability criterion. The test is very sensitive. The relative percent difference (RPD) between the control and each treatment was calculated and compared to the lower PMSD boundary.

_ 3a. The RPD values for each concentration fall below the lower bound. The differences observed in this test are considered statistically insignificant.

_ 3b. The RPDs for the following concentrations are above the lower bound_____. The results at these concentrations are considered statistically significantly lower than controls.

Concentration-Response Evaluation

The concentration-response relationship observed in this data set corresponds to the following item number in Chapter Four of "Method Guidance and Recommendations for Whole Effluent Toxicity (WET) Testing (40 CFR Part 136)", EPA 821-B-00-004, July 2000:

Survival	Reprod.	
X	X	1. Ideal concentration-response relationship
_	_	2. All or nothing response
_	_	3. Stimulatory response at low concentrations and detrimental effects at higher concentrations
_	_	4. Stimulation at low concentrations but no significant effect at higher concentrations
_	_	5. Interrupted concentration-response: significant effects bracketed by non-significant effects
_	_	6. Interrupted concentration-response: non-significant effects bracketed by significant effects
_	_	7. Significant effects only at highest concentration
_		8. Significant effects at all test concentrations but flat concentration-response curve
_	_	9. Significant effects at all test concentrations with a sloped concentration-response curve
_	_	10. Inverse concentration-response relationship

The concentration-response relationship was reviewed according to the above guidance document and the following determination was made:

Survival	Reprod.	
X	X	1. Results are reliable and reportable.
_	_	2. Results are anomalous. An explanation is provided in the body of the report.
_	_	3. Results are inconclusive. A retest with fresh samples is required. An explanation is provided in the body of the report.

Whole Effluent Toxicity Testing Report Conclusions and Notes

Client Name/Project: Barnhardt Manufacturing Company Test Date: 4/3/17

Sample ID: Effluent composite

Your results were as follows:

☒ Passed all whole effluent toxicity permit limits

☐ Failed the following permit limit(s): ☐ LC50 ☐ C-NOEC
Please proceed according to the instructions in your permit.

☐ Original Test Invalid – **Valid retest performed. Both test and retest results are attached.**

☐ A retest using fresh samples must be performed within 30 days of the initial test completion date ( ) due to the test condition described below. See next page for further explanation.
☐ Test Invalid due to: ☐ Diluent toxicity ☐ Synthetic control toxicity
☐ Test not sufficiently sensitive. PMSD exceeds upper bound.
☐ Results are inconclusive due to an unusual concentration-response relationship.

☐ Available information is insufficient to determine whether this test passed or failed. Please compare results to your permit limits. Please submit a current copy of your permit to the GZA Lab so that we can determine the status of future tests results and help ensure your compliance with permit requirements.

☐ Additional testing for metals was required on the second and third effluent samples due to the following:
☐ Renewal sample(s) were of sufficient potency to cause lethality to 50% or more of the test organisms as follows: Effluent #: ☐ 2 ☐ 3 Concentration: ☐ 6.25% ☐ 12.5% ☐ 25% ☐ 50% ☐ 100% ☐ ____%
☐ The test failed to meet its permit limit for: ☐ LC50 ☐ C-NOEC

Diluent Toxicity:

☐ Testing ☐will be or ☐has been performed according to the Case 1 Protocols outlined in the attached copy of EPA-New England's species-specific, self-implementing policy for alternate dilution water.

☐ Retesting ☐will be or ☐has been performed according to the Case 1 Protocols outlined in the attached copy of EPA-New England's species-specific, self-implementing policy for alternate dilution water.

☐ This is your _____ case of dilution water toxicity. Please proceed according to the Case 2 Protocols outlined in the attached copy of EPA-New England's species-specific, self-implementing policy for alternate dilution water. The alternate dilution water you select for future tests for this species should be described as follows: "synthetic laboratory water made up according to EPA's toxicity test protocols, by adding specified amounts of salts into deionized water in order to match the hardness of our receiving water." Writing this letter should help you to avoid retests in the future.

Sampling Requirements:
A minimum of 3 samples were collected. ☒ Yes. ☐ No. See explanation on next page.

Samples were first used within 36 hours of collection. ☒ Yes. ☐ No. See explanation on next page.

Dechlorination Procedures: Chlorine was measured using 4500 CL-G DPD Colorimetric Method.
☒ Dechlorination was not required.

☐ Sample was dechlorinated to _____ mg/L by adding sodium thiosulfate to the sample prior to test initiation. A dechlorinated control of diluent water spiked with sodium thiosulfate equal in proportion to the amount added to the effluent sample was included in the test series.

☐ Chlorine elevated due to interference. Chlorine was mg/L after interference check.

☐ Total Residual Chlorine was re-measured following aeration, and was found to be mg/L.

WHOLE EFFLUENT TOXICITY TEST REPORT CERTIFICATION (Permittee)

I certify under penalty of law that this document and all ATTACHMENTS were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on _____ _____
[Date] [Authorized Signature]

_____
[Print or Type Name and Title]

_____
[Print or Type the Permittee's Name]

_____
[Print or Type the NPDES Permit No.]

Since the WET test and report check is complicated, the New England Bioassay, a division of GZA GeoEnvironmental, Inc. Aquatic Toxicity Laboratory has certified the validity of the WET test data in the section below. Please note that this does not relieve the permittee from its responsibility to sign and certify the report under 40 C.F.R. § 122.41(k).

WHOLE EFFLUENT TOXICITY TEST REPORT CERTIFICATION (Bioassay Laboratory)

I certify under penalty of law that this document and all ATTACHMENTS were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on 4/27/17 _____
[Date] [Authorized Signature]

Kim Wills, Laboratory Manager
[Print or Type Name and Title]

New England Bioassay
[Print or Type Name of Bioassay Laboratory]

24. Telephone Contacts
If you have questions, please contact Joy Hilton, Water Technical Unit, at (617) 918-1877 or David McDonald, Ecosystem Assessment Unit, at (617) 918-8609.

NEW ENGLAND BIOASSAY TOXICITY DATA FORM
CHRONIC COVER SHEET

CLIENT: Barnhardt
ADDRESS: 247 Main Road
Colrain, MA 01340
SAMPLE TYPE: Barnhardt Industrial Effluent
DILUTION WATER: North River

C.dubia TEST ID # 17-460
COC # C37-1736/37
PROJECT # 05.0044654.00

INVERTEBRATES

TEST SET UP (TECU INIT)	CW
TEST SPECIES	*Ceriodaphnia dubia*
NEB LOT#	Cd17(RMH 056)
AGE	< 24 hours
TEST SOLUTION VOLUME (mls)	15
NO. ORGANISMS PER TEST CHAMBER	1
NO. ORGANISMS PER CONCENTRATION	10

Laboratory Control Water (CTRMH)

Batch Number	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$
CTR17-MH003	92	60

	DATE	TIME
TEST START:	4/3/17	1311
TEST END:	4/9/17	1300

Results of *Ceriodaphnia dubia* Chronic Test

		95% Confidence Limits
48 Hour LC50	>100%	100%±∞
7 Day LC50	100%	N/A
Survival NOEC	100%	
Survival LOEC	>100%	
Reproduction NOEC	5.0%	
Reproduction LOEC	6.25%	
Reproduction IC_{25}	10.1%	

NOEC: NO OBSERVABLE EFFECT CONCENTRATIO LOEC: LOWEST OBSERVABLE EFFECT CONCENTRATION

Comments:

REVIEWD BY: DATE: 4/27/17

NEW ENGLAND BIOASSAY - CHRONIC TOXICITY TEST BROOD DATA SHEET

FACILITY NAME & ADDRESS:	Barnhardt, 247 Main Road, Colrain, MA 01340				
NEB PROJECT NUMBER:	05.0044654.00	NEB TEST NUMBER:	17-460	COC #	C37-1736/37
TEST ORGANISM:	*Ceriodaphnia dubia*	AGE:	<24 hours	Lot #	Cd17(RMH 056)
START DATE: 4/3/17	TIME: 1311	END DATE:	4/9/17	TIME:	1300

Effluent Concentration	Cup # / Day Number	A3	A5	A6	A11	A12	A13	B3	B4	B5	B13	Total Live Young	# Live Adults	Analyst-Transfer	Analyst-Counts
		Culture Lot#				Cd17(RMH 056)									
		Replicate													
		A	B	C	D	E	F	G	H	I	J				
NEB Lab Synthetic Control	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10	CW	
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10	CB	
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10	KO	
	3	6	6	5	5	6	5	7	5	6	6	57	10	KO	KO
	4	✓	✓	✓	14	13	✓	✓	14	15	16	72	10	CW	CW
	5	10	17	12	✓	✓	14	15	✓	✓	✓	68	10	CW	CW
	6	17	21	20	22	18	22	18	21	21	20	200	10	CW	CW
	7														
	totals	33	44	37	41	37	41	40	40	42	42	397	10		MG
North River Diluent		A	B	C	D	E	F	G	H	I	J				
	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	3	4	6	3	7	8	7	6	4	6	5	56	10		
	4	14	✓	12	12	10	✓	✓	12	12	13	85	10		
	5	✓	14	✓	✓	✓	10	14	✓	✓	✓	38	10		
	6	21	17	19	22	22	18	19	19	19	18	194	10		
	7														
	totals	39	37	34	41	40	35	39	35	37	36	373	10		
5.0%		A	B	C	D	E	F	G	H	I	J				
	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	3	7	6	4	5	5	6	✓	6	6	6	51	10		
	4	✓	✓	13	12	10	✓	8	10	13	12	78	10		
	5	14	10	✓	✓	✓	13	14	✓	✓	✓	51	10		
	6	19	22	18	21	19	21	16	17	19	16	188	10		
	7														
	totals	40	38	35	38	34	40	38	33	38	34	368	10		

Notes: _____

NEW ENGLAND BIOASSAY - CHRONIC TOXICITY TEST BROOD DATA SHEET

FACILITY NAME & ADDRESS:	Barnhardt, 247 Main Road, Colrain, MA 01340		
NEB PROJECT NUMBER:	05.0044654.00	ORGANISM: *Ceriodaphnia dubia*	START DATE: 4/3/17

Effluent Concentration	Day Number	Replicate A	B	C	D	E	F	G	H	I	J	Total Live Young	# Live Adults	Analyst-Transfer	Analyst-Counts
6.25%	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	3	2	4	4	9	4	4	8	7	4	5	51	10		
	4	✓	✓	10	14	13	✓	✓	10	10	8	65	10		
	5	10	13	✓	✓	✓	12	12	✓	✓	✓	47	10		
	6	17	5	15	20	18	20	15	17	14	18	159	10		
	7														
	totals	29	22	29	43	35	36	35	34	28	31	322	10		
12.5%		A	B	C	D	E	F	G	H	I	J				
	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	3	4	✓	4	6	1	4	5	4	2	6	36	10		
	4	11	1	7	✓	9	✓	12	8	8	12	68	10		
	5	✓	✓	✓	16	✓	8	✓	✓	✓	✓	24	10		
	6	15	9	18	15	13	✓	13	12	12	18	125	10		
	7														
	totals	30	10	29	37	23	12	30	24	22	36	253	10		
25%		A	B	C	D	E	F	G	H	I	J				
	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	7														
	totals	0	0	0	0	0	0	0	0	0	0	0	10		
50%		A	B	C	D	E	F	G	H	I	J				
	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	3	✓	✓	✓	✓/x	✓	✓	✓	✓	✓	✓	0	9		
	4	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	0	9		
	5	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	0	9		
	6	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	0	9		
	7														
	totals	0	0	0	0	0	0	0	0	0	0	0	9		

NEW ENGLAND BIOASSAY - CHRONIC TOXICITY TEST BROOD DATA SHEET

FACILITY NAME & ADDRESS:	Barnhardt, 247 Main Road, Colrain, MA 01340		
NEB PROJECT NUMBER:	05.0044654.00	ORGANISM: *Ceriodaphnia dubia*	START DATE: 4/3/17

Effluent Concentration	Day Number	Replicate A	B	C	D	E	F	G	H	I	J	Total Live Young	# Live Adults	Analyst-Transfer	Analyst-Counts
100%	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		10		
	2	✓	✓	✓	✓	✓	✓	✓/x	✓	✓	✓	0	9		
	3	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	0	9		
	4	✓	✓	✓	✓	✓/x	✓	X	✓/x	✓/x	✓	0	6		
	5	✓	✓	✓	✓	X	✓	X	X	X	✓	0	6		
	6	✓	✓	✓	✓	X	✓	X	X	X	✓/x	0	5		
	7												5		
	totals	0	0	0	0	0	0	0	0	0	0	0	5		

Ceriodaphnia 7-d Survival and Reproduction Test — **New England Bioassay**

Analysis ID:	21-0948-0652	**Endpoint:**	2d Survival Rate	**CETIS Version:**	CETISv1.9.2
Analyzed:	12 Apr-17 11:14	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Batch ID:	02-9904-6974	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	
Start Date:	03 Apr-17 13:11	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Receiving Water
Ending Date:	09 Apr-17 13:00	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d	**Source:**	In-House Culture	**Age:**	<24h

Sample ID:	06-7753-1284	**Code:**	28624E94	**Client:**	Barnhardt
Sample Date:	03 Apr-17 07:00	**Material:**	WWTF Effluent	**Project:**	
Receipt Date:	03 Apr-17 09:55	**Source:**	Barnhardt (BBA Fiberweb)		
Sample Age:	6h	**Station:**			

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X)	Linear	1602754	200	Yes	Two-Point Interpolation

Point Estimates

Level		95% LCL	95% UCL
LC50	>100	n/a	n/a

2d Survival Rate Summary

			Calculated Variate(A/B)								
Group	**Code**	**Count**	**Mean**	**Min**	**Max**	**Std Err**	**Std Dev**	**CV%**	**%Effect**	**A**	**B**
0	D	10	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10
5		10	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10
6.25		10	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10
12.5		10	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10
25		10	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10
50		10	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10
100		10	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10

2d Survival Rate Detail

Group	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

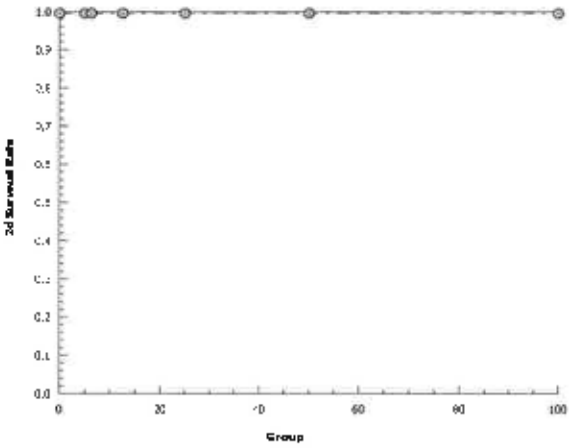
2d Survival Rate Binomials

Group	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1

Ceriodaphnia 7-d Survival and Reproduction Test — **New England Bioassay**

Analysis ID:	21-0948-0652	**Endpoint:**	2d Survival Rate	**CETIS Version:**	CETISv1.9.2
Analyzed:	12 Apr-17 11:14	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Graphics



Ceriodaphnia 7-d Survival and Reproduction Test — **New England Bioassay**

Analysis ID:	02-5241-7485	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.2
Analyzed:	12 Apr-17 11:16	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Batch ID:	02-9904-6974	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	
Start Date:	03 Apr-17 13:11	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Receiving Water
Ending Date:	09 Apr-17 13:00	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d	**Source:**	In-House Culture	**Age:**	<24h

Sample ID:	06-7753-1284	**Code:**	28624E94	**Client:**	Barnhardt
Sample Date:	03 Apr-17 07:00	**Material:**	WWTF Effluent	**Project:**	
Receipt Date:	03 Apr-17 09:55	**Source:**	Barnhardt (BBA Fiberweb)		
Sample Age:	6h	**Station:**			

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	717660	200	Yes	Two-Point Interpolation

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits Lower	Upper	Overlap	Decision
Control Resp	37.3	15	>>	Yes	Passes Criteria

Point Estimates

Level		95% LCL	95% UCL
IC25	10.08	7.562	13.45
IC50	15.79	13.22	17.3

Reproduction Summary

			Calculated Variate						
Group	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	10	37.3	34	41	0.7461	2.359	6.33%	0.0%
5		10	36.8	33	40	0.8138	2.573	6.99%	1.34%
6.25		10	32.2	22	43	1.806	5.712	17.74%	13.67%
12.5		10	25.3	10	37	2.864	9.056	35.79%	32.17%
25		10	0	0	0	0	0		100.0%
50		10	0	0	0	0	0		100.0%
100		10	0	0	0	0	0		100.0%

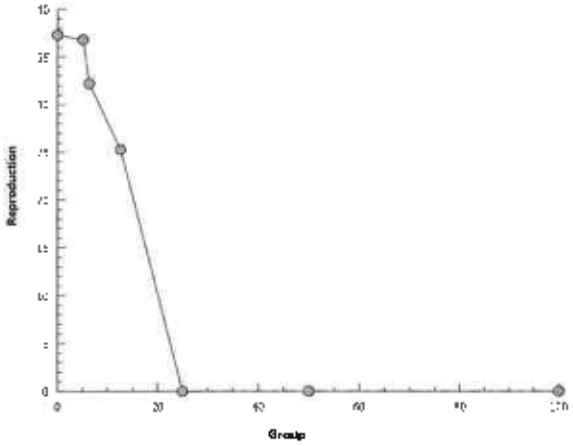
Reproduction Detail

Group	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	39	37	34	41	40	35	39	35	37	36
5		40	38	35	38	34	40	38	33	38	34
6.25		29	22	29	43	35	36	35	34	28	31
12.5		30	10	29	37	23	12	30	24	22	36
25		0	0	0	0	0	0	0	0	0	0
50		0	0	0	0	0	0	0	0	0	0
100		0	0	0	0	0	0	0	0	0	0

Ceriodaphnia 7-d Survival and Reproduction Test — **New England Bioassay**

Analysis ID:	02-5241-7485	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.2
Analyzed:	12 Apr-17 11:16	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Graphics



CETIS Analytical Report

Report Date:	12 Apr-17 11:16 (p 1 of 2)
Test Code:	17-460 ; 12-2919-1268

Ceriodaphnia 7-d Survival and Reproduction Test — **New England Bioassay**

Analysis ID:	07-5048-9960	**Endpoint:**	6d Survival Rate	**CETIS Version:**	CETISv1.9.2
Analyzed:	12 Apr-17 11:15	**Analysis:**	Trimmed Spearman-Kärber	**Official Results:**	Yes

Batch ID:	02-9904-6974	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	
Start Date:	03 Apr-17 13:11	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Receiving Water
Ending Date:	09 Apr-17 13:00	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d	**Source:**	In-House Culture	**Age:**	<24h

Sample ID:	06-7753-1284	**Code:**	28624E94	**Client:**	Barnhardt
Sample Date:	03 Apr-17 07:00	**Material:**	WWTF Effluent	**Project:**	
Receipt Date:	03 Apr-17 09:55	**Source:**	Barnhardt (BBA Fiberweb)		
Sample Age:	6h	**Station:**			

Trimmed Spearman-Kärber Estimates

Threshold Option	Threshold	Trim	Mu	Sigma	LC50	95% LCL	95% UCL
Control Threshold	0	50.00%	2	0	100	N/A	N/A

6d Survival Rate Summary

			Calculated Variate(A/B)								
Group	**Code**	**Count**	**Mean**	**Min**	**Max**	**Std Err**	**Std Dev**	**CV%**	**%Effect**	**A**	**B**
0	D	10	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10
5		10	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10
6.25		10	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10
12.5		10	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10
25		10	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	10	10
50		10	0.9000	0.0000	1.0000	0.1000	0.3162	35.14%	10.0%	9	10
100		10	0.5000	0.0000	1.0000	0.1667	0.5270	105.40%	50.0%	5	10

6d Survival Rate Detail

Group	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000

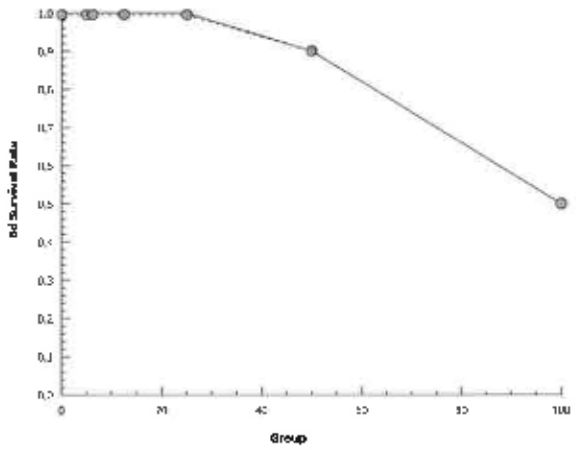
6d Survival Rate Binomials

Group	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	1/1

Ceriodaphnia 7-d Survival and Reproduction Test — **New England Bioassay**

Analysis ID:	07-5048-9960	**Endpoint:**	6d Survival Rate	**CETIS Version:**	CETISv1.9.2
Analyzed:	12 Apr-17 11:15	**Analysis:**	Trimmed Spearman-Kärber	**Official Results:**	Yes

Graphics



Ceriodaphnia 7-d Survival and Reproduction Test — **New England Bioassay**

Analysis ID:	16-0068-2030	**Endpoint:**	6d Survival Rate	**CETIS Version:**	CETISv1.9.2
Analyzed:	12 Apr-17 11:15	**Analysis:**	STP 2xK Contingency Tables	**Official Results:**	Yes

Batch ID:	02-9904-6974	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	
Start Date:	03 Apr-17 13:11	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Receiving Water
Ending Date:	09 Apr-17 13:00	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d	**Source:**	In-House Culture	**Age:**	<24h

Sample ID:	06-7753-1284	**Code:**	28624E94	**Client:**	Barnhardt
Sample Date:	03 Apr-17 07:00	**Material:**	WWTF Effluent	**Project:**	
Receipt Date:	03 Apr-17 09:55	**Source:**	Barnhardt (BBA Fiberweb)		
Sample Age:	6h	**Station:**			

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU
Untransformed	C > T	100	> 100	n/a	

Fisher Exact/Bonferroni-Holm Test

Control vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Dilution Water	5	1.0000	Exact	1.0000	Non-Significant Effect
	6.25	1.0000	Exact	1.0000	Non-Significant Effect
	12.5	1.0000	Exact	1.0000	Non-Significant Effect
	25	1.0000	Exact	1.0000	Non-Significant Effect
	50	0.5000	Exact	1.0000	Non-Significant Effect
	100	0.0163	Exact	0.0975	Non-Significant Effect

Data Summary

Group	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	D	10	0	10	1	0	0.0%
5		10	0	10	1	0	0.0%
6.25		10	0	10	1	0	0.0%
12.5		10	0	10	1	0	0.0%
25		10	0	10	1	0	0.0%
50		9	1	10	0.9	0.1	10.0%
100		5	5	10	0.5	0.5	50.0%

6d Survival Rate Detail

Group	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
50		1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	0.0000	0.0000	0.0000	0.0000

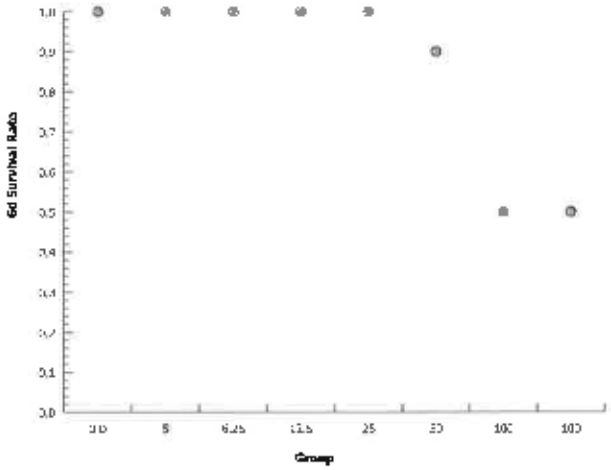
6d Survival Rate Binomials

Group	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
6.25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
12.5		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
50		1/1	1/1	1/1	0/1	1/1	1/1	1/1	1/1	1/1	1/1
100		1/1	1/1	1/1	1/1	0/1	1/1	0/1	0/1	0/1	0/1

Ceriodaphnia 7-d Survival and Reproduction Test — **New England Bioassay**

Analysis ID:	16-0068-2030	**Endpoint:**	6d Survival Rate	**CETIS Version:**	CETISv1.9.2
Analyzed:	12 Apr-17 11:15	**Analysis:**	STP 2xK Contingency Tables	**Official Results:**	Yes

Graphics



CETIS Analytical Report

Report Date: 12 Apr-17 11:16 (p 1 of 2)
Test Code: 17-460 | 12-2919-1268

Ceriodaphnia 7-d Survival and Reproduction Test — **New England Bioassay**

Analysis ID:	04-2962-1632	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.2
Analyzed:	12 Apr-17 11:15	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Batch ID:	02-9904-6974	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	
Start Date:	03 Apr-17 13:11	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Receiving Water
Ending Date:	09 Apr-17 13:00	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Duration:	6d	**Source:**	In-House Culture	**Age:**	<24h

Sample ID:	06-7753-1284	**Code:**	28624E94	**Client:**	Barnhardt
Sample Date:	03 Apr-17 07:00	**Material:**	WWTF Effluent	**Project:**	
Receipt Date:	03 Apr-17 09:55	**Source:**	Barnhardt (BBA Fiberweb)		
Sample Age:	6h	**Station:**			

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	5	6.25	5.59		14.40%

Steel Many-One Rank Sum Test

Control vs	Group	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water	5	99	77	3	18	Asymp	0.5623	Non-Significant Effect
	6.25*	73	77	3	18	Asymp	0.0209	Significant Effect
	12.5*	63.5	77	2	18	Asymp	0.0024	Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits Lower	Upper	Overlap	Decision
Control Resp	37.3	15	>>	Yes	Passes Criteria
PMSD	0.144	0.13	0.47	Yes	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	928.2	309.4	3	9.759	7.5E-05	Significant Effect
Error	1141.4	31.7056	36			
Total	2069.6		39			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	20.02	11.34	1.7E-04	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9253	0.9236	0.0114	Normal Distribution

Reproduction Summary

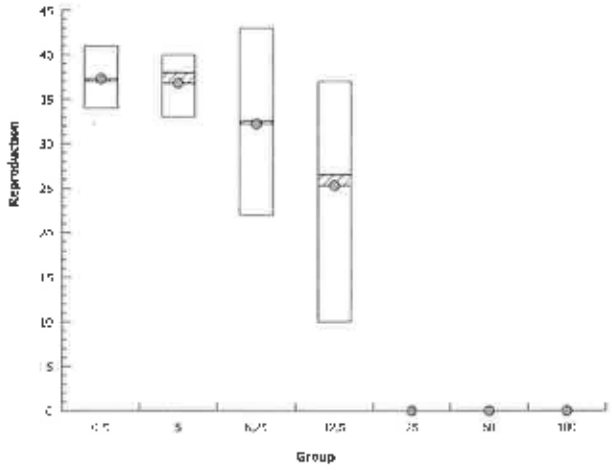
Group	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	10	37.3	35.61	38.99	37	34	41	0.7461	6.33%	0.00%
5		10	36.8	34.96	38.64	38	33	40	0.8138	6.99%	1.34%
6.25		10	32.2	28.11	36.29	32.5	22	43	1.806	17.74%	13.67%
12.5		10	25.3	18.82	31.78	26.5	10	37	2.864	35.79%	32.17%
25		10	0	0	0	0	0	0	0		100.00%
50		10	0	0	0	0	0	0	0		100.00%
100		10	0	0	0	0	0	0	0		100.00%

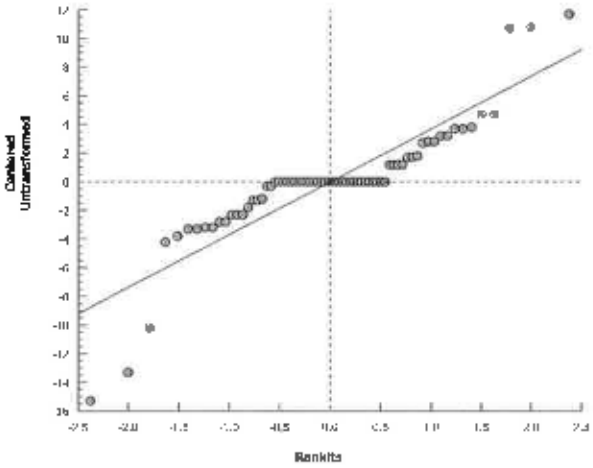
Reproduction Detail

Group	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	39	37	34	41	40	35	39	35	37	36
5		40	38	35	38	34	40	38	33	38	34
6.25		29	22	29	43	35	36	35	34	28	31
12.5		30	10	29	37	23	12	30	24	22	36
25		0	0	0	0	0	0	0	0	0	0
50		0	0	0	0	0	0	0	0	0	0
100		0	0	0	0	0	0	0	0	0	0

Analysis ID:	04-2962-1632	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.2
Analyzed:	12 Apr-17 11:15	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

Graphics





NEB'S DATA SHEET FOR ROUTINE CHEMICAL AND PHYSICAL DETERMINATIONS

FACILITY NAME & ADDRESS:	Barnhardt, 247 Main Road, Colrain, MA 01340							
NEB PROJECT NUMBER:	05.0044654.00			TEST ORGANISM			*Ceriodaphnia dubia*	
DILUTION WATER SOURCE:	North River			START DATE:			4/3/17 TIME:	1311
ANALYST	CW	CB	PD	KO	CW	KO		
NEB Lab Synthetic Control	1	2	3	4	5	6	7	Remarks
Temp °C Initial	25.2	24.8	24.5	24.4	25.1	25.1		
D.O. mg/l. Initial	8.3	8.2	8.0	8.4	7.6	8.0		
pH s.u. Initial	8.0	7.6	7.4	7.5	7.7	7.7		
Conductivity µS Initial	404	388	383	393	404	389		
Temp °C Final	24.6	24.5	24.1	24.0	24.4	24.5		
D.O. mg/l. Final	8.7	7.6	8.5	8.3	8.4	8.8		
pH s.u. Final	8.2	8.5	8.1	8.3	8.4	8.3		
Conductivity µS Final	437	424	426	425	435	426		
North River Diluent	1	2	3	4	5	6	7	Remarks
Temp °C Initial	25.2	25.8	25.8	24.6	25.7	24.2		
D.O. mg/L Initial	10.0	8.9	9.1	7.8	9.4	8.5		
pH s.u. Initial	7.4	7.5	7.1	7.6	7.5	7.9		
Conductivity µS Initial	92	89	70	71	68	62		
Temp °C Final	24.6	24.7	24.3	24.0	24.4	24.5		
D.O. mg/L Final	8.7	7.7	8.4	8.3	8.4	8.7		
pH s.u. Final	8.1	8.5	8.1	8.5	8.5	8.5		
Conductivity µS Final	122	127	103	104	98	93		
5.0%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	25.9	26.0	25.6	24.4	25.6	24.1		
D.O. mg/l. Initial	10.0	8.9	9.3	7.8	9.3	9.1		
pH s.u. Initial	7.5	7.5	7.2	7.6	7.4	7.9		
Conductivity µS Initial	209	210	173	178	193	196		
Temp °C Final	24.4	24.9	24.4	24.0	24.1	24.5		
D.O. mg/l. Final	8.7	7.6	8.4	8.4	8.4	8.6		
pH s.u. Final	8.2	8.5	8.1	8.4	8.4	8.4		
Conductivity µS Final	247	246	218	220	237	269		
6.25%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	25.9	26.0	25.9	24.4	25.7	24.2		
D.O. mg/L Initial	9.9	8.9	9.5	7.8	9.3	9.2		
pH s.u. Initial	7.6	7.6	7.4	7.9	7.5	7.8		
Conductivity µS Initial	262	266	245	252	240	249		
Temp °C Final	24.5	24.9	24.5	24.0	24.1	24.5		
D.O. mg/L Final	8.8	7.7	8.5	8.4	8.4	8.8		
pH s.u. Final	8.4	8.7	8.3	8.5	8.5	8.6		
Conductivity µS Final	302	299	285	287	286	297		

NEB'S DATA SHEET FOR ROUTINE CHEMICAL AND PHYSICAL DETERMINATIONS

FACILITY NAME & ADDRESS:	Barnhardt, 247 Main Road, Colrain, MA 01340							
NEB PROJECT NUMBER:	05.0044654.00			TEST ORGANISM			*Ceriodaphnia dubia*	
DILUTION WATER SOURCE:	North River			START DATE:			4/3/17 TIME:	1311
12.5%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	25.9	26.0	25.9	24.4	25.8	24.3		
D.O. mg/L Initial	9.9	8.8	9.4	7.9	9.2	9.2		
pH s.u. Initial	7.9	7.9	7.8	8.1	7.8	8.1		
Conductivity µS Initial	412	421	380	389	399	399		
Temp °C Final	24.6	25.0	24.5	24.0	24.0	24.5		
D.O. mg/L Final	8.9	7.8	8.6	8.4	8.6	8.9		
pH s.u. Final	8.6	8.8	8.5	8.7	8.7	8.7		
Conductivity µS Final	468	520	436	453	457	444		
25%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	26.0	26.0	25.8	24.3	25.8	24.5		
D.O. mg/L Initial	9.8	8.7	9.3	7.8	9.0	9.1		
pH s.u. Initial	8.2	8.2	8.2	8.4	8.3	8.4		
Conductivity µS Initial	740	758	696	748	731	729		
Temp °C Final	24.6	25.1	24.4	24.0	24.1	24.4		
D.O. mg/L Final	8.9	8.0	8.7	8.4	8.5	9.0		
pH s.u. Final	8.8	9.0	8.7	8.9	8.9	8.9		
Conductivity µS Final	831	956	767	857	825	783		
50%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	26.0	26.0	25.6	24.3	26.0	24.8		
D.O. mg/L Initial	9.3	8.6	9.0	7.8	8.7	8.8		
pH s.u. Initial	8.4	8.4	8.4	8.5	8.4	8.6		
Conductivity µS Initial	1,402	1,398	1,390	1,377	1,408	1,426		
Temp °C Final	24.7	25.0	24.5	24.0	24.0	24.4		
D.O. mg/L Final	8.8	8.1	8.7	8.5	8.6	8.9		
pH s.u. Final	9.0	9.1	9.0	9.1	9.1	9.0		
Conductivity µS Final	1,506	1,474	1,458	1,512	1,497	1,508		
100%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	26.0	25.9	25.2	24.4	26.0	25.8		
D.O. mg/L Initial	8.6	8.3	8.4	7.8	7.8	8.6		
pH s.u Initial	8.4	8.5	8.5	8.6	8.5	8.6		
Conductivity µS Initial	2,635	2,675	2,669	2,645	2,701	2,740		
Temp °C Final	24.7	25.2	24.6	24.0	24.0	24.4		
D.O. mg/L Final	8.6	8.0	8.6	8.5	8.6	8.9		
pH s.u. Final	9.1	9.2	9.1	9.2	9.2	9.1		
Conductivity µS Final	2,839	2,760	2,762	2,665	2,824	2,942		

Table of Random Permutations of 16 **C.dubia Test ID#** **17-460**

7	12	15	15	1	2	7	16	10	2	14	15	7	13	13	10	6	1	8	10
13	3	8	16	7	10	11	10	13	5	11	7	13	16	7	7	5	13	2	14
3	1	4	5	14	13	3	14	9	13	13	2	9	15	6	2	8	4	5	8
11	8	16	14	15	6	2	6	2	16	8	5	12	3	9	13	4	3	10	4
14	9	1	6	3	9	14	13	8	6	5	8	14	7	3	15	13	11	4	7
2	16	10	13	5	5	13	2	11	7	3	12	5	14	12	16	2	2	9	15
4	6	13	7	2	15	1	9	1	4	7	10	6	9	11	9	7	6	16	11
6	14	6	10	4	14	4	15	3	3	4	16	2	6	5	1	12	10	6	9
10	15	2	1	13	12	16	3	4	8	10	1	15	5	14	12	14	12	3	2
12	10	7	12	9	11	9	8	12	14	15	4	11	8	16	8	9	14	14	1
15	7	5	2	10	7	8	12	6	15	6	13	16	12	15	4	11	8	12	6
16	2	11	8	8	8	15	5	16	1	1	9	8	1	8	14	16	5	13	5
9	13	14	3	6	4	10	11	5	12	9	3	10	4	4	3	10	9	1	3
8	11	9	4	11	3	12	7	7	10	12	14	3	10	1	6	15	16	15	12
1	5	12	11	16	16	5	4	14	9	16	11	1	2	10	5	1	15	7	13
5	4	3	9	12	1	6	1	15	11	2	6	4	11	2	11	3	7	11	16
11	8	16	5	5	13	1	13	2	16	14	12	9	8	7	5	13	3	13	3
2	2	8	8	14	16	4	3	8	11	10	14	15	1	2	11	4	5	15	9
6	13	2	13	6	5	9	15	11	10	12	6	16	15	16	9	10	12	16	15
14	12	4	16	16	11	14	10	5	12	3	3	12	14	15	13	6	4	1	16
8	6	3	9	4	10	6	4	16	2	2	9	8	16	4	6	5	15	7	8
9	15	12	10	3	2	12	6	1	15	4	13	7	7	9	12	14	8	8	11
3	10	11	12	13	12	5	11	7	8	9	5	14	11	10	1	3	13	3	5
16	1	13	14	8	14	15	5	3	7	11	15	6	12	5	7	11	1	14	4
1	14	14	2	9	15	16	14	6	14	7	8	3	13	11	8	7	7	12	7
4	4	6	4	12	3	11	8	15	9	8	1	13	6	3	3	15	9	9	12
15	5	1	11	10	6	3	7	10	5	5	11	10	10	12	15	16	14	5	2
5	3	5	6	7	7	13	2	14	3	16	4	5	5	13	4	9	16	2	6
12	7	15	15	15	9	8	12	12	13	15	10	1	4	6	16	2	6	11	1
10	11	10	3	2	4	2	1	4	6	6	7	11	9	14	10	8	11	4	13
7	9	7	7	11	1	7	16	13	1	13	2	4	2	1	2	12	2	10	14
13	16	9	1	1	8	10	9	9	4	1	16	2	3	8	14	1	10	6	10
				rep	conc														
1	6	7	4	8	6	5	2	8	15	4	6	6	1	4	5	7	13	2	10
9	15	11	3	11	15	9	10	1	3	8	2	15	7	9	8	16	1	14	3
10	16	4	5	12	9	16	11	7	1	7	16	11	8	3	3	12	2	3	4
4	14	1	9	5	5	4	13	6	8	15	5	12	5	7	16	5	11	8	1
7	3	13	14	15	2	1	14	16	5	14	9	2	16	1	12	6	14	4	13
16	11	2	1	14	16	6	9	3	4	16	14	3	15	11	11	3	9	12	5
3	10	16	16	13	7	13	1	11	14	9	10	16	2	10	2	10	7	10	16
11	13	9	13	4	13	8	3	5	13	10	12	5	12	5	14	13	16	5	6
15	2	3	12	9	12	2	4	13	10	3	13	14	4	2	1	14	8	6	12
14	1	14	6	10	1	3	12	4	2	2	4	13	3	16	9	9	3	7	14
13	12	5	11	3	11	15	8	2	7	11	7	8	14	6	4	4	4	15	11
12	5	10	7	2	14	7	15	14	16	13	1	9	10	12	10	11	10	9	8
8	9	8	10	6	4	11	7	10	11	6	8	4	9	8	15	8	6	11	9
2	7	6	2	1	8	10	6	15	12	1	11	7	11	13	6	1	15	13	15
6	4	15	8	16	10	14	16	9	6	12	3	10	6	14	7	2	12	16	7
5	8	12	15	7	3	12	5	12	9	5	15	1	13	15	13	15	5	1	2
13	4	10	4	16	13	16	13	5	3	6	14	1	16	8	7	2	3	3	12
5	14	4	6	8	2	15	1	13	14	16	4	15	4	3	12	12	1	4	7
2	2	2	15	14	16	9	12	16	6	10	15	14	9	10	1	14	8	8	16
7	12	15	8	12	3	5	14	7	12	5	13	16	1	7	5	11	2	9	3
6	9	7	14	9	14	10	11	15	11	12	1	12	12	14	16	3	11	11	8
14	5	16	7	10	8	11	8	14	13	7	11	6	3	11	4	4	6	6	9
15	11	8	9	7	12	8	7	1	15	9	3	3	7	13	11	10	4	5	1
11	6	6	1	4	1	3	16	12	5	4	9	13	13	6	8	15	9	1	14
4	10	3	16	2	11	7	9	6	9	1	8	4	11	5	2	16	10	12	4
1	8	1	13	1	15	4	4	11	4	2	16	5	8	1	9	5	12	16	6
9	7	14	2	6	4	14	10	9	8	15	10	7	10	9	10	6	14	10	11
12	1	9	10	15	5	2	15	10	2	14	2	8	2	4	13	8	5	15	5
3	3	12	11	5	9	6	6	3	10	13	12	9	6	2	15	7	15	7	13
10	15	11	5	13	7	12	5	2	7	11	5	10	15	12	3	1	13	13	10
8	13	13	3	3	10	13	2	4	1	8	6	11	14	15	6	9	16	2	2
16	16	5	12	11	6	1	3	8	16	3	7	2	5	16	14	13	7	14	15

NEW ENGLAND BIOASSAY
INITIAL CHEMISTRY DATA

CLIENT: Barnhardt
NEB JOB # 05.0044654.00
TEST ID # C.dubia 17-460

DATE RECEIVED	4/3/17		4/5/17		4/7/17	
SAMPLE TYPE:	EFF #1	RIVER #1	EFF #2	RIVER #2	EFF #3	RIVER #3
COC #	C37-1736	C37-1737	C37-1772	C37-1773	C37-1806	C37-1807
pH (SU)	8.3	7.3	8.5	7.3	8.5	6.8
Temperature (^{0}C)	6.8	3.4	6.9	5.3	9.2	4.8
Dissolved Oxygen (mg/L)	10.1	12.7	9.0	12.0	8.8	11.8
Conductivity (µmhos)	2,740	84	2,692	57	2,743	57
Salinity (ppt)	1	<1	1	< 1	1	<1
TRC - DPD (mg/L)	<0.001	0.005	<0.001	0.016	<0.001	0.011
TRC - Amperometric (mg/L)	N/A	N/A	N/A	N/A	N/A	N/A
Hardness (mg/L as $CaCO_3$)	68	22	68	16	66	14
Alkalinity (mg/l as $CaCO_3$)	1,310	20	1,315	10	1,370	10
Tech Initials	PD	PD	CW	CW	PD	PD

NOTE: NA = NOT APPLICABLE

Data Reviewed By: Date Reviewed: 4/27/17

Ceriodaphnia dubia **Culture Chart** **Lot #** C217(RMH 056) **A**

Brood mother source: RMH 050 A-14 Source's brood size: 21 (Qty.)

Barnhardt 4-3-17

Tech	AH	MG		SP	AH	AH	AH	AH		AH		MG	AH			
Date	3-23	3-24		3-26	3-27	3-28	3-29	3-30		3-31		4-2	4-3			
Day acc.	0	1	2	3	4	5	6	7		8	9	10	11	12	13	14
Cup # 1	N	N		N	5	9	Y	N	1	Y		Y	T1 T1 Y 21			
2	N	N		N	5	10	Y	N	2	Y		Y	T2 T2 Y 20			
3	N	N		N	6	10	Y	N	3	Y		Y	T1 T1 Y 23			
4	N	N		N	5	9	Y	N	4	Y		Y	T3 T3 Y 20			
5	N	N		N	4	10	N	Y	5	Y		Y	T2 T2 Y 21			
6	N	N		N	6	9	Y	N	6	Y		Y	T3 T3 Y 20			
7	N	N		N	5	10	Y	N	7	Y		Y	T4 T4 Y 20			
8	N	N		N	5	10	Y	N	8	Y		Y	T5 T5 Y 19			
9	N	N		N	4	8	Y	N	9	Y		Y	T6 T6 Y 21			
10	N	N		N	5	7	Y	N	10	Y		Y	T7 T7 Y 22			
11	N	N		N	5	9	Y	N	11	Y		Y	T4 T4 Y 20			
12	N	N		N	4	10	Y	N	12	Y		Y	T5 T5 Y 23			
13	N	N		N	5	10	N	Y	13	Y		Y	T6 T6 Y 21			

Y = neonates present, and *criterion has been met:* ≥ 20 neonates produced in total by 3rd brood. **N** = no neonates

2B = two broods present. **2Y** = two broods and criterion met: ≥ 20 neos. by 3rd brood. **X** = brood mother dead **ae** = aborted eggs

✓ or **P** = neonates present after renewal on previous day (see time in log) **A→** = acceptable for acute testing only

T# = neonates used in test, replicate number of test noted (and brood counted). **acc.** = *if acclimated*, H_2O type used w/ renewal this day.

Test organism collection:

Project #	Symbols (✓ / P)	Tray diagram used? (Y/N)	Time period, neonates released	Collection date / time
Nacl	T	Y	4-2-17/1330 → 4-2-17/1610	4-3-17/0950
0044725	T	Y	4-2-17/1330 → 4-2-17/1610	4-3-17/0950
0044654	T	Y	4-2-17/1610 → 4-3-17/0800	4-3-17/1240
0044087	T	Y	4-2-17/1610 → 4-3-17/0800	4-3-17/1240
	T			
	T			

Ceriodaphnia dubia **Culture Chart** **Lot #** CA17(RMH 056) **B**

Brood mother source: RMH 050 A-17 Source's brood size: 19 (Qty.) Barnhardt 4.3.17

Tech	AH	MG		SP	AH	AH	AH	AH		AH		MG	AH			
Date	3.23	3.24		3.26	3.27	3.28	3.29	3.30		3.31		4.2	4.3			
Day acc.	0	1	2	3	4	5	6	7		8	9	10	11	12	13	14
Cup # 1	N	N		N	5	10	Y	N	1	Y		Y	(18) T8 Y 22			
2	N	N		N	5	9	Y	N	2	Y		Y	(17) T9 Y 23			
3	N	N		N	6	8	Y	N	3	Y		Y	(17) T7 Y 21			
4	N	N		N	6	11	Y	N	4	Y		Y	(18) T8 Y 20			
5	N	N		N	6	9	Y	N	5	Y		Y	(19) T9 Y 22			
6	N	N		N	5	12	Y	N	6	Y		Y	(18) T8 Y 20			
7	N	N		N	4	11	Y	N	7	Y		Y	Y			
8	N	N		N	5	9	Y	N	8	Y		Y	Y			
9	N	N		N	4	9	Y	N	9	Y		Y	Y			
10	N	N		N	5	9	Y	N	10	Y		Y	Y			
11	N	N		N	5	10	Y	N	11	Y		Y	T10 Y 16			
12	N	N		N	4	10	Y	N	12	Y		Y	Y			
13	N	N		N	5	9	Y	N	13	Y		Y	T10 Y 17			

Y = neonates present, and *criterion has been met:* ≥ 20 neonates produced in total by 3rd brood. **N** = no neonates

2B = two broods present. **2Y** = two broods and criterion met: ≥ 20 neos. by 3rd brood. **X** = brood mother dead **ae** = aborted eggs

✓ or **P** = neonates present after renewal on previous day (see time in log). **A→** = acceptable for acute testing only

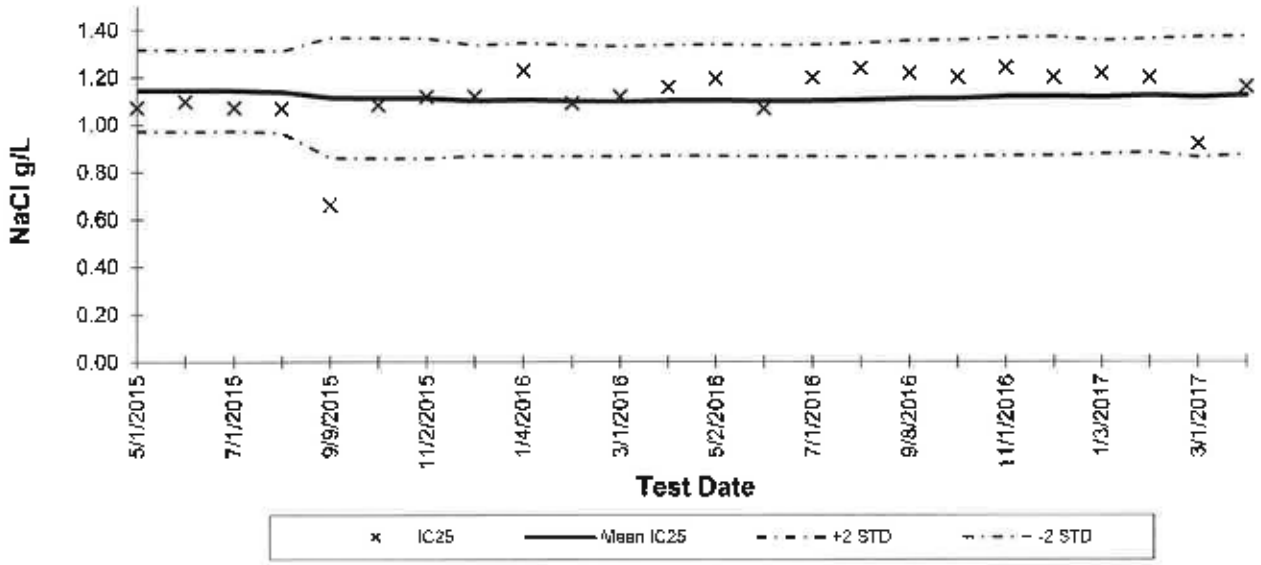
T# = neonates used in test, replicate number of test noted (and brood counted). **acc.** = *if acclimated*; H_2O type used *w/* renewal **this** day.

Test organism collection:

Project #	Symbols (✓ / P)	Tray diagram used? (Y/N)	Time period, neonates released	Collection date / time
Nacl	T	Y	4.2.17/1330 → 4.2.17/1610	4.3.17/0950
00447255	T	Y	4.2.17/1330 → 4.2.17/1610	4.3.17/0950
00441654	T	Y	4.2.17/1610 → 4.3.17/0800	4.3.17/1240
00449087	T	Y	4.2.17/1610 → 4.3.17/0800	4.3.17/1240
	T			
	T			

New England Bioassay
Reference Toxicant Data: *Ceriodaphnia dubia* Chronic Reproduction IC25

Reference Toxicant: Sodium chloride
Test Dates: May 2015 - April 2017



Test ID	Date	IC_{25}	Mean IC_{25}	STD	-2STD	+2STD	CV	CV National 75th%	CV National 90th%
15-602	5/1/2015	1.07	1.14	0.09	0.97	1.32	0.08	0.45	0.62
15-750	6/1/2015	1.10	1.14	0.09	0.97	1.32	0.08	0.45	0.62
15-955	7/1/2015	1.07	1.14	0.09	0.97	1.32	0.07	0.45	0.62
15-1211	8/3/2015	1.07	1.14	0.09	0.97	1.31	0.08	0.45	0.62
15-1375	9/9/2015	0.66	1.11	0.13	0.86	1.37	0.11	0.45	0.62
15-1540	10/1/2015	1.08	1.11	0.13	0.86	1.37	0.11	0.45	0.62
15-1691	11/2/2015	1.12	1.11	0.13	0.86	1.36	0.11	0.45	0.62
15-1897	12/28/2015	1.12	1.10	0.12	0.87	1.33	0.11	0.45	0.62
16-37	1/4/2016	1.23	1.11	0.12	0.87	1.34	0.11	0.45	0.62
16-138	2/1/2016	1.09	1.10	0.12	0.87	1.34	0.11	0.45	0.62
16-307	3/1/2016	1.12	1.10	0.12	0.87	1.33	0.11	0.45	0.62
16-463	4/1/2016	1.16	1.10	0.12	0.87	1.34	0.11	0.45	0.62
16-596	5/2/2016	1.19	1.10	0.12	0.87	1.34	0.11	0.45	0.62
16-707	6/1/2016	1.07	1.10	0.12	0.87	1.34	0.11	0.45	0.62
16-880	7/1/2016	1.20	1.10	0.12	0.87	1.34	0.11	0.45	0.62
16-1212	8/24/2016	1.24	1.10	0.12	0.86	1.34	0.11	0.45	0.62
16-1258	9/8/2016	1.22	1.11	0.12	0.87	1.35	0.11	0.45	0.62
16-1553	10/24/2016	1.20	1.11	0.12	0.87	1.36	0.11	0.45	0.62
16-1592	11/1/2016	1.24	1.12	0.12	0.87	1.37	0.11	0.45	0.62
16-1734	12/1/2016	1.20	1.12	0.13	0.87	1.37	0.11	0.45	0.62
17-14	1/3/2017	1.22	1.12	0.12	0.88	1.36	0.11	0.45	0.62
17-151	2/1/2017	1.20	1.12	0.12	0.88	1.36	0.11	0.45	0.62
17-267	3/1/2017	0.92	1.12	0.13	0.86	1.37	0.11	0.45	0.62
17-460	4/3/2017	1.16	1.12	0.12	0.87	1.37	0.11	0.45	0.62

PHOENIX
Environmental Laboratories, Inc.

Friday, April 07, 2017

Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Project ID: BARNHARDT MFG
Sample ID#s: BX97850 - BX97852

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext. 200.

Sincerely yours,

Phyllis Shiller
Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #MA-CT-007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B

NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
VT Lab Registration #VT11301

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Telephone (860) 645-1102 Fax (860) 645-0823

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

April 07, 2017

FOR: Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	WASTE WATER	Collected by:		04/03/17	7:00
Location Code:	NEB	Received by:	SW	04/03/17	16:37
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	21953				

Laboratory Data

SDG ID: GBX97850
Phoenix ID: BX97850

Project ID: BARNHARDT MFG
Client ID: C37-1736 EFFLUENT-1

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Aluminum	0.047	0.005	mg/L	1	04/05/17	MA	E200.7
Calcium	16.9	0.005	mg/L	1	04/05/17	MA	E200.7
Cadmium	0.0003	0.0001	mg/L	1	04/05/17	RS	SM3113B
Chromium	0.004	0.001	mg/L	1	04/05/17	MA	E200.7
Copper	0.024	0.001	mg/L	1	04/05/17	MA	E200.7
Hardness (CaCO3)	78.1	0.1	mg/L	1	04/05/17		E200.7
Magnesium	8.71	0.005	mg/L	1	04/05/17	MA	E200.7
Nickel	0.003	0.001	mg/L	1	04/05/17	MA	E200.7
Lead	0.0028	0.0003	mg/L	1	04/05/17	RS	SM3113B
Zinc	0.056	0.001	mg/L	1	04/05/17	MA	E200.7
Alkalinity-CaCO3	1360	5.00	mg/L	1	04/04/17	BS/EG	SM2320B-97
Conductivity	2380	5.00	umhos/cm	1	04/04/17	BS/EG	SM2510B-97,-11
Ammonia as Nitrogen	0.30	0.05	mg/L	1	04/05/17	WHM	E350.1
Tot. Diss. Solids	1800	100	mg/L	10	04/04/17	KH	SM2540C-97,-11
Tot. Org. Carbon	70.3	2.5	mg/L	5	04/06/17	RWR	SM5310C/E415.1-00
Total Solids	1800	100	mg/L	10	04/04/17	KH	SM2540B-97,-11
Total Metals Digestion	Completed				04/04/17	AG	

Project ID: BARNHARDT MFG
Client ID: C37-1736 EFFLUENT-1

Phoenix I.D.: BX97850

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

TOC Analysis:
This sample was received with a pH>2. The EPA requires preservation at time of sampling to a pH of <2. A sample bias can not be ruled out.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
This report must not be reproduced except in full as defined by the attached chain of custody.

Phyllis Shiller, Laboratory Director
April 07, 2017
Reviewed and Released by: Deb Lawrie, Project Manager

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

April 07, 2017

FOR: Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	WASTE WATER	Collected by:		04/03/17	6:45
Location Code:	NEB	Received by:	SW	04/03/17	16:37
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	21953				

Laboratory Data

SDG ID: GBX97850
Phoenix ID: BX97851

Project ID: BARNHARDT MFG
Client ID: C37-1737 RECEIVING WATER-1

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Aluminum	0.113	0.005	mg/L	1	04/05/17	MA	E200.7
Cadmium	< 0.0001	0.0001	mg/L	1	04/05/17	RS	SM3113B
Copper	< 0.001	0.001	mg/L	1	04/05/17	MA	E200.7
Hardness (CaCO3)	21.7	0.1	mg/L	1	04/05/17		E200.7
Nickel	< 0.001	0.001	mg/L	1	04/05/17	MA	E200.7
Lead	< 0.0003	0.0003	mg/L	1	04/05/17	RS	SM3113B
Zinc	0.002	0.001	mg/L	1	04/05/17	MA	E200.7
Alkalinity-CaCO3	26.9	5.00	mg/L	1	04/04/17	BS/EG	SM2320B-97
Conductivity	82	5.00	umhos/cm	1	04/04/17	BS/EG	SM2510B-97,-11
Ammonia as Nitrogen	< 0.05	0.05	mg/L	1	04/05/17	WHM	E350.1
pH	7.37	1.00	pH Units	1	04/04/17 05:49	BS/EG	SM4500-H B-00
Tot. Org. Carbon	2.59	0.50	mg/L	1	04/06/17	RWR	SM5310C/E415.1-00
Total Metals Digestion	Completed				04/04/17	AG	

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
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Phyllis Shiller, Laboratory Director
April 07, 2017
Reviewed and Released by: Deb Lawrie, Project Manager

Ver 1

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

April 07, 2017

FOR: Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	WASTE WATER	Collected by:		04/03/17	7:15
Location Code:	NEB	Received by:	SW	04/03/17	16:37
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	21953				

Laboratory Data

SDG ID: GBX97850
Phoenix ID: BX97852

Project ID: BARNHARDT MFG
Client ID: EFFLUENT GRAB-1

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Chlorine Residual	< 0.02	0.02	mg/L	1	04/03/17 18:34	O	SM4500CLG-97
pH	8.69	1.00	pH Units	1	04/04/17 05:53	BS/EG	SM4500-H B-00

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

The regulatory hold time for Chlorine is immediately. This Chlorine was performed in the laboratory and may be considered outside of hold-time.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
This report must not be reproduced except in full as defined by the attached chain of custody.

Phyllis Shiller, Laboratory Director
April 07, 2017
Reviewed and Released by: Deb Lawrie, Project Manager

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

April 07, 2017

QA/QC Data

SDG I.D.: GBX97850

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 381447 (mg/L), QC Sample No: BX97161 (BX97850, BX97851)													
Cadmium - Water	BRL	0.0001	<0.0001	<0.0001	NC	115			95.4			75 - 125	20
Lead (Furnace) - Water	BRL	0.001	<0.001	<0.001	NC	92.7			105			75 - 125	30
QA/QC Batch 381436 (mg/L), QC Sample No: BX98155 (BX97850, BX97851)													
ICP Metals - Aqueous													
Aluminum	BRL	0.005	0.467	0.493	5.40	103			95.1			75 - 125	20
Calcium	BRL	0.005	4.97	5.09	2.40	104			NC			75 - 125	20
Chromium	BRL	0.001	<0.001	<0.001	NC	103			101			75 - 125	20
Copper	BRL	0.003	0.010	0.010	NC	104			103			75 - 125	20
Magnesium	BRL	0.005	1.04	1.04	0	104			97.4			75 - 125	20
Nickel	BRL	0.001	0.005	0.005	0	103			101			75 - 125	20
Zinc	BRL	0.001	0.041	0.040	2.50	103			101			75 - 125	20

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

April 07, 2017

QA/QC Data

SDG I.D.: GBX97850

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits	
QA/QC Batch 381380 (mg/L), QC Sample No: BX97225 (BX97850)														
Total Solids	BRL	10	4700	4700	0	100						85 - 115	20	
Comment:														
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.														
QA/QC Batch 381377 (mg/L), QC Sample No: BX97265 (BX97850)														
Tot. Diss. Solids	BRL	10	280	270	3.60	95.0						85 - 115	20	
Comment:														
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.														
QA/QC Batch 381334 (mg/L), QC Sample No: BX97692 (BX97852)														
Chlorine Residual	BRL	0.02	<0.02	<0.02	NC	101								
QA/QC Batch 381390 (mg/L), QC Sample No: BX97693 (BX97850, BX97851)														
Alkalinity-CaCO3	BRL	5.00	29	28	NC	106						85 - 115	20	
Comment:														
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.														
QA/QC Batch 381385 (pH), QC Sample No: BX97693 (BX97851, BX97852)														
pH			7.62	7.62	0	98.6						85 - 115	20	
Comment:														
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.														
QA/QC Batch 381376 (mg/L), QC Sample No: BX97715 (BX97850, BX97851)														
Ammonia as Nitrogen	BRL	0.05	0.08	0.07	NC	86.9			93.2			90 - 110	20	I
Comment:														
The LCS recovery for Ammonia is below acceptance criteria. All other QC are within criteria. No bias is suspected.														
QA/QC Batch 381879 (mg/L), QC Sample No: BX99332 (BX97850, BX97851)														
Total Organic Carbon	BRL	1.0	<1.0	<1.0	NC	108			102			85 - 115	20	
Comment:														
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.														

I = This parameter is outside laboratory LCS/LCSD specified recovery limits.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria
Intf - Interference

Phyllis Shiller, Laboratory Director
April 07, 2017

Friday, April 07, 2017

Criteria: None

State: MA

Sample Criteria Exceedances Report

GBX97850 - NEB

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units

*** No Data to Display ***

Phoenix Laboratories does not assume responsibility for the data contained in this report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac
NY # 11301

Analysis Comments

April 07, 2017 SDG I.D.: GBX97850

The following analysis comments are made regarding exceptions to criteria not already noted in the Analysis Report or QA/QC Report: None.

WOIP

CHAIN OF CUSTODY RECORD

PHOENIX Environmental Laboratories, Inc.

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Email: service@phoenixlabs.com Fax (860) 645-0823
Client Services (860) 645-8726

Temp 4°C Pg of

Data Delivery (check one):
☐ Fax #:
☒ Email: kimberly.wills@gza.com
Format: ☐ Excel ☐ Pdf ☐ Gis Key

Customer: New England Bioassay
Address: 77 Batson Drive
Manchester, CT 06042

Project: Barnhardt Mfg (MA)
Report to: Kim Wills
Invoice to: Kim Wills

Project P.O: 21953
Phone #: 860-643-9560
Fax #: 860-646-7169

Client Sample - Information - Identification

Sampler's Signature _____ Date _____

Matrix Code:
DW=drinking water WW=wastewater S=soil/solid O=other
GW=groundwater SL=sludge A=air

Analysis Request

Phoenix Sample #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	Hardness (0.5 mg/L)	Alkalinity (2.0 mg/L)	Specific Conductance (--)	Total Solids (--)	Total Dissolved Solids (--)	Ammonia (0.1 mg/L)	Total Organic Carbon (0.5 mg/L)	Cd (AA), Pb (AA), Cu, Zn, Ni, Al	Total Residual Chlorine (0.02 mg/L)	pH (--)	Cr, Ca, Mg	Soil VOA Vials [ ] methanol [ ] Sod Bisulfate	GL Soil container ( ) oz	PL As Is 250 ml	PL 120ml As Is	GL Amber 120ml [ ] As Is [X] H2SO4	PL As Is [X] 500ml [ ] 1000ml	PL H2SO4 [X] 250ml [ ] 1000ml	PL HNO3 [X] 250ml [ ] 1000ml	PL NaOH 250ml	Bacteria Bottle
C37-1736	Effluent-1	WW	4/2-3/17	0700-0700	X	X	X	X	X	X	X	X			X					1	1	1	1		97850
C37-1737	Receiving Water-1	O	4/3/17	0645	X	X	X			X	X	X		X						1	1	1	1		97851
	Effluent grab-1	WW	4/3/17	0715									X	X				1							97852

Relinquished by:	Accepted by:	Date:	Time:
[signature]	[signature]	4-3-17	1650
[signature]	TFOLLIN	4-3-17	1637

Comments, Special Requirements or Regulations:

Please see detection limits (MLs) listed next to each parameter above. Metals MLs are listed below.

Cd - 0.0005 mg/L; Pb 0.0006 mg/L. Cu - 0.003 mg/L; Zn - 0.005 mg/L; Ni - 0.005 mg/L; Al - 0.02 mg/L

Please CC: Melanie.Cruff@gza.com and Robin.Faulk@gza.com on reports

Turnaround:
☐ 1 Day*
☐ 2 Days*
☐ 3 Days*
☒ Standard
☐ Other

* Surcharge Applies

Requirements for CT
☐ Res. Criteria
☐ GW Protection
☐ GA Mobility
☐ GB Mobility
☐ SW Protection
☐ Res. Vol.
☐ Ind. Vol.

Requirements for MA
☐ GW-1
☐ GW-2
☐ GW-3
☐ S-1
☐ S-2
☐ S-3
☐ MCP Certification
☐ Other

PHOENIX
Environmental Laboratories, Inc.

Wednesday, April 12, 2017

Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Project ID: BARNHARDT MFG
Sample ID#s: BX99362 - BX99363

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext. 200.

Sincerely yours,

Phyllis Shiller
Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #MA-CT-007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B

NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
VT Lab Registration #VT11301

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Telephone (860) 645-1102 Fax (860) 645-0823

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

April 12, 2017

FOR: Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	WASTE WATER	Collected by:		04/05/17	7:00
Location Code:	NEB	Received by:	SW	04/05/17	16:19
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	21953				

Laboratory Data

SDG ID: GBX99362
Phoenix ID: BX99362

Project ID: BARNHARDT MFG
Client ID: EFFLUENT-2 C37-1772

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Ammonia as Nitrogen	0.30	0.10	mg/L	2	04/12/17	WHM	E350.1

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
This report must not be reproduced except in full as defined by the attached chain of custody.

Phyllis Shiller, Laboratory Director
April 12, 2017
Reviewed and Released by: Deb Lawrie, Project Manager

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

April 12, 2017

FOR: Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	WASTE WATER	Collected by:		04/05/17	6:45
Location Code:	NEB	Received by:	SW	04/05/17	16:19
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	21953				

Laboratory Data

SDG ID: GBX99362
Phoenix ID: BX99363

Project ID: BARNHARDT MFG
Client ID: RECEIVING WATER-2 C37-1773

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Ammonia as Nitrogen	0.05	0.05	mg/L	1	04/12/17	WHM	E350.1

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
This report must not be reproduced except in full as defined by the attached chain of custody.

Phyllis Shiller

Phyllis Shiller, Laboratory Director
April 12, 2017
Reviewed and Released by: Deb Lawrie, Project Manager

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

April 12, 2017

QA/QC Data

SDG I.D.: GBX99362

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 382212 (mg/L), QC Sample No: BX99496 (BX99362, BX99363)													
Ammonia as Nitrogen	BRL	0.05	<0.05	<0.05	NC	94.7			103			90 - 110	20

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria
Intf - Interference

Phyllis Shiller, Laboratory Director
April 12, 2017

Wednesday, April 12, 2017

Criteria: None

State: CT

Sample Criteria Exceedances Report

GBX99362 - NEB

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units

*** No Data to Display ***

Phoenix Laboratories does not assume responsibility for the data contained in this report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.

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Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac
NY # 11301

Analysis Comments

April 12, 2017 SDG I.D.: GBX99362

The following analysis comments are made regarding exceptions to criteria not already noted in the Analysis Report or QA/QC Report: None.

4.4°w/c + IP

Pg of

PHOENIX Environmental Laboratories, Inc.

CHAIN OF CUSTODY RECORD

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Email: service@phoenixlabs.com Fax (860) 645-0823
Client Services (860) 645-8726

Temp ____ °C Ice/ Blue Ice/ No Coolant

Data Delivery (check one):
- [ ] Fax #:
- [x] Email: kimberly.wills@gza.com

Format: [ ] Excel [ ] Pdf [ ] Gis Key

Customer: New England Bioassay
Address: 77 Batson Drive
Manchester, CT 06042

Project: Barnhardt Mfg (MA)
Report to: Kim Wills
Invoice to: Kim Wills

Project P.O: 21953
Phone #: 860-643-9560
Fax #: 860-646-7169

Client Sample - Information - Identification

Phoenix Sample #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	Ammonia (0.1 mg/L)	Soil VOA Vials [ ] methanol [ ] Sod Bisulfate	GL Soil container ( ) oz	PL As is 500 ml	PL As is 120ml	GL Amber 250ml [ ] As is [ ] H2SO4	PL As is 1000ml	PL H2SO4 [X] 250ml [ ] 1000ml	PL HNO3 [ ] 250ml [ ] 1000ml	PL NaOH 250ml	Bacteria Bottle
993162	Effluent-2 C371772	WW	4/4/5/17	0700-0700	X							1			
993163	Receiving Water-2 C371773	O	4/5/17	0645	X							1			

Relinquished by:	Accepted by:	Date:	Time:
[signature]		4-5-17	1550
[signature]	CParadive	4-5-17	1619

Comments, Special Requirements or Regulations:

Please see detection limits (MLs) listed next to each parameter above

Please CC: Melanie.Cruff@gza.com and Robin.Faulk@gza.com on reports

Turnaround:
- [ ] 1 Day*
- [ ] 2 Days*
- [ ] 3 Days*
- [x] Standard
- [ ] Other

* Surcharge Applies

Requirements for CT
- [ ] Res. Criteria
- [ ] GW Protection
- [ ] GA Mobility
- [ ] GB Mobility
- [ ] SW Protection
- [ ] Res. Vol.
- [ ] Ind. Vol.

Requirements for MA
- [ ] GW-1
- [ ] GW 2
- [ ] GW-3
- [ ] S-1
- [ ] S-2
- [ ] S-3
- [ ] MCP Certification
- [ ] Other

PHOENIX
Environmental Laboratories, Inc.

Friday, April 14, 2017

Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Project ID: BARNHARDT MFG
Sample ID#s: BY00836 - BY00837

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory. This report is incomplete unless all pages indicated in the pagination at the bottom of the page are included.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext. 200.

Sincerely yours,

Phyllis Shiller
Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #MA-CT-007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B

NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
VT Lab Registration #VT11301

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Telephone (860) 645-1102 Fax (860) 645-0823

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

April 14, 2017

FOR: Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	WASTE WATER	Collected by:		04/07/17	7:00
Location Code:	NEB	Received by:	B	04/07/17	14:49
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	21953				

Laboratory Data

SDG ID: GBY00836
Phoenix ID: BY00836

Project ID: BARNHARDT MFG
Client ID: EFFLUENT 3

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Ammonia as Nitrogen	0.38	0.25	mg/L	5	04/13/17	WHM	E350.1

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
This report must not be reproduced except in full as defined by the attached chain of custody.

Phyllis Shiller

Phyllis Shiller, Laboratory Director
April 14, 2017
Reviewed and Released by: Deb Lawrie, Project Manager

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

April 14, 2017

FOR: Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	WATER	Collected by:		04/07/17	6:45
Location Code:	NEB	Received by:	B	04/07/17	14:49
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	21953				

Laboratory Data

SDG ID: GBY00836
Phoenix ID: BY00837

Project ID: BARNHARDT MFG
Client ID: RECEIVING WATER 3

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Ammonia as Nitrogen	< 0.05	0.05	mg/L	1	04/13/17	WHM	E350.1

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
This report must not be reproduced except in full as defined by the attached chain of custody.

Phyllis Shiller, Laboratory Director
April 14, 2017
Reviewed and Released by: Deb Lawrie, Project Manager

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

April 14, 2017

QA/QC Data

SDG I.D.: GBY00836

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 382511 (mg/L), QC Sample No: BY00584 (BY00836, BY00837)													
Ammonia as Nitrogen	BRL	0.05	6.1	5.21	15.7	101			97.3			90 - 110	20

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria
Intf - Interference

Phyllis Shiller, Laboratory Director
April 14, 2017

Friday, April 14, 2017

Criteria: None

State: MA

Sample Criteria Exceedances Report

GBY00836 - NEB

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units

*** No Data to Display ***

Phoenix Laboratories does not assume responsibility for the data contained in this report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac
NY # 11301

Analysis Comments

April 14, 2017 SDG I.D.: GBY00836

The following analysis comments are made regarding exceptions to criteria not already noted in the Analysis Report or QA/QC Report: None.

413 00836 + 837

Pg of

PHOENIX Environmental Laboratories, Inc.

CHAIN OF CUSTODY RECORD

587 East Middle Turnpike P.O. Box 370, Manchester, CT 06040
Email: service@phoenixlabs.com Fax (860) 645-0823
Client Services (860) 645-8726

Temp ____ °C Ice/ Blue Ice/ No Coolant

Data Delivery (check one):
- [ ] Fax #:
- [x] Email: kimberly.wills@gza.com

Format: [ ] Excel [ ] Pdf [ ] Gis Key

Customer: New England Bioassay
Address: 77 Batson Drive
Manchester, CT 06042

Project: Bauhardt Mfg (MA)
Report to: Kim Wills
Invoice to: Kim Wills

Project P.O: 21953
Phone #: 860-643-9560
Fax #: 860-646-7169

Client Sample - Information - Identification

Phoenix Sample #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	Ammonia (0.1 mg/L)	Soil VOA Vials [ ]	methanol [ ]	Soil Bisulfate	GL Soil container ( ) oz	PL As is 500 ml	PL As is 120ml	GL Amber 250ml [ ]	PL As is 1000ml [ ]	As is [ ]	H2SO4	PL H2SO4 [X] 250ml	PL HNO3 [ ] 250ml	PL NaOH 250ml [ ]	1000ml	Bacteria Bottle
00836	Effluent-3	WW	4/7/17	0700-0800	x											1				
00837	Receiving Water-3	O	4/7/17	0645	x											1				

Relinquished by:	Accepted by:	Date:	Time:
Pat Hanel	[signature]	4-7-17	1315
[signature]	Melissa Pelc	4-7-17	1449

Comments, Special Requirements or Regulations:

Please see detection limits (MLs) listed next to each parameter above

Please CC: Melanie.Crull@gza.com and Robin.Faulk@gza.com on reports

Turnaround:
- [ ] 1 Day*
- [ ] 2 Days*
- [ ] 3 Days*
- [x] Standard
- [ ] Other

* Surcharge Applies

Requirements for CT
- [ ] Res. Criteria
- [ ] GW Protection
- [ ] GA Mobility
- [ ] GB Mobility
- [ ] SW Protection
- [ ] Res. Vol.
- [ ] Ind. Vol.

Requirements for MA
- [ ] GW 1
- [ ] GW-2
- [ ] GW-3
- [ ] S-1
- [ ] S-2
- [ ] S 3
- [ ] MCP Certification
- [ ] Other

NEW ENGLAND BIOASSAY - CHAIN-OF-CUSTODY

Sample Set #1

EFFLUENT

Sampler: Keith Gammell
Title: WWTP operator
Facility: Barnhardt Manufacturing

Sampling Method: X Composite
Sample ID: Effluent composite
Start Date: 4-2-17 Time: 7AM
End Date: 4-3-17 Time: 7AM

Sampling Method: X Grab (for pH and TRC only X)
Date Collected: 4-3-17
Time Collected: 7:15AM

Sample Type:
- ____ Prechlorinated
- ____ Dechlorinated
- X Unchlorinated
- ____ Chlorinated

RECEIVING WATER

Sampler: Keith Gammell
Title: WWTP operator
Facility: Barnhardt Manufacturing

Sampling Method: X Grab
Sample ID: North River
Date Collected: 4-3-17
Time Collected: 6:45AM

Effluent Sampling Location and Procedures: composite sample from effluent by flow

Receiving Water Sampling Location and Procedures: North river behind building 119

Requested Analysis: X Chronic and modified acute

Sample Shipment

Method of Shipment: NEB Courier

Relinquished By:	[illegible]	Date: 4-3-17	Time: 0830
Received By:	Chris Rand	Date: 4-3-17	Time: 0830
Relinquished By:	Chris Rand	Date: 4-3-17	Time: 0955
Received By:	Pat Jane	Date: 4-3-17	Time: 0955

Optional Information

Purchase Order # to reference on invoice: ____

Received
ON ICE

FOR NEB USE ONLY

*** Please return all ice packs NEB has provided to insure accurate temperature upon receipt to the NEB laboratory.**

Temperature of Effluent Upon Receipt at Lab: 6.8 °C
Temperature of Receiving Water Upon Receipt at Lab: 3.4 °C

Effluent COC# C37-1736
Receiving Water COC# C37-1737

IF THIS COOLER IS MISPLACED OR THE LABEL IS LOST, PLEASE SHIP TO:
KIM WILLS, NEW ENGLAND BIOASSAY 77 BATSON DRIVE MANCHESTER, CT 06042

NEW ENGLAND BIOASSAY - CHAIN-OF-CUSTODY

Sample Set # 2

EFFLUENT

Sampler: Keith Gammell
Title: WWTP operator
Facility: Barnhardt Manufacturing

Sampling Method: X **Composite**
Sample ID: Effluent composite
Start Date: 4-4-17 Time: 7AM
End Date: 4-5-17 Time: 7AM

RECEIVING WATER

Sampler: Keith Gammell
Title: WWTP operator
Facility: Barnhardt Manufacturing

Sampling Method: X Grab
Sample ID: North River
Date Collected: 4-5-17
Time Collected: 6:45AM

Sampling Method: x **Grab** (for pH and TRC only_____)
Date Collected: 4-5-17
Time Collected: 7:15

Sample Type:
____ Prechlorinated
____ Dechlorinated
x Unchlorinated
____ Chlorinated

Effluent Sampling Location and Procedures: Composite sample from effluent by flow

Receiving Water Sampling Location and Procedures: North river behind building 119

Requested Analysis: X Chronic and modified acute

Sample Shipment

Method of Shipment: NEB Courier

Relinquished By:	[signature]	Date: 4-5-17	Time: 0830
Received By:	Chris Rand	Date: 4-5-17	Time: 0830
Relinquished By:	Chris Rand	Date: 4-5-17	Time: 10:21
Received By:	[signature]	Date: 4/5/17	Time: 1021

Optional Information

Purchase Order # to reference on invoice:_____

Received
ON ICE

FOR NEB USE ONLY

*** Please return all ice packs NEB has provided to insure accurate temperature upon receipt to the NEB laboratory.**

Temperature of Effluent Upon Receipt at Lab: 6.9 °C
Temperature of Receiving Water Upon Receipt at Lab: 5.3 °C

Effluent COC# C37-1772
Receiving Water COC# C37-1773

IF THIS COOLER IS MISPLACED OR THE LABEL IS LOST, PLEASE SHIP TO:
KIM WILLS, NEW ENGLAND BIOASSAY 77 BATSON DRIVE MANCHESTER, CT 06042

NEW ENGLAND BIOASSAY - CHAIN-OF-CUSTODY

Sample Set #3

EFFLUENT

Sampler: Keith Gammell
Title: WWTP operator
Facility: Barnhardt Manufacturing

Sampling Method: X **Composite**
Sample ID: Effluent composite
Start Date: 4-6-17 Time: 7am
End Date: 4-7-17 Time: 7am

RECEIVING WATER

Sampler: Keith Gammell
Title: WWTP operator
Facility: Barnhardt Manufacturing

Sampling Method: X Grab
Sample ID: North River
Date Collected: 4-7-17
Time Collected: 6:45am

Sampling Method: x **Grab** (for pH and TRC only_____)
Date Collected: 4-7-17
Time Collected: 7:15 am

Sample Type:
_____ Prechlorinated
_____ Dechlorinated
x Unchlorinated
_____ Chlorinated

Effluent Sampling Location and Procedures: composite sample from effluent by flow

Receiving Water Sampling Location and Procedures: North river behind building 119

Requested Analysis: X Chronic and modified acute

Sample Shipment

Method of Shipment: NEB Courier

Relinquished By:	[illegible]	Date: 4-7-17	Time: 0830
Received By:	Chris Ram	Date: 4-7-17	Time: 0830
Relinquished By:	Chris Raul	Date: 4-7-17	Time: 1005
Received By:	Pat Jane	Date: 4-7-17	Time: 1005

Optional Information

Purchase Order # to reference on invoice:

Received
ON ICE

FOR NEB USE ONLY

*** Please return all ice packs NEB has provided to insure accurate temperature upon receipt to the NEB laboratory.**

Temperature of Effluent Upon Receipt at Lab: 9.2 °C
Temperature of Receiving Water Upon Receipt at Lab: 4.8 °C

Effluent COC# C37-1806
Receiving Water COC# C37-1807

IF THIS COOLER IS MISPLACED OR THE LABEL IS LOST, PLEASE SHIP TO:
KIM WILLS, NEW ENGLAND BIOASSAY 77 BATSON DRIVE MANCHESTER, CT 06042