New England Bioassay
A Division of GZA

GEOTECHNICAL
ENVIRONMENTAL
ECOLOGY
WATER
CONSTRUCTION MANAGEMENT

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NEW ENGLAND BIOASSAY A DIVISION OF GZA
CHRONIC AQUATIC TOXICITY TEST REPORT

Permitee: Barnhardt Manufacturing Co. NPDES # MA0003697
Report submitted to: 247 Main Road
Colrain, MA 01340
Sample ID: Effluent
Test Month/Year: July 2019
NEB Proj # 05.0044654.00

Test Type / Method: *Ceriodaphnia dubia* Modified Chronic Static-Renewal Freshwater Test Method 1002.0; EPA 821-R-02-013

Effluent Sample Dates: #1 7/7-8/19 #2 7/9-10/19 #3 7/11-12/19

Test Start Date: 7/8/19

Results Summary

Your results were as follows:

Fail - Please proceed according to the instructions in your permit

Acute Test Results

Species	LC50	A-NOEC	Permit Limit	Pass / Fail
Ceriodaphnia dubia	>100%	100%	≥ 100%	Pass

Chronic Test Results

Species	C-NOEC	C-LOEC	IC25	Permit Limit	Pass/Fail
Ceriodaphnia dubia	< 5%	5%	3.35%	≥ 5.0%	Fail

Data Qualifiers affecting this test:

Certifications & Approvals: NH ELAP (2071), NJ DEP (CT405)

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Test Report Certification

Permittee name: Barnhardt Manufacturing Co. Permit number: MA0003697

Client sample ID: Effluent Test Start Date: 7/8/19

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 directly responsible for gathering 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

MA0003697
Print or Type the NPDES Permit Number

Whole Effluent Toxicity Test Report Certification (Bioassay Laboratory)

The results reported relate only to the samples submitted as received

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 directly responsible for gathering 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: 8/5/19
(Date)

Kimberly Wills
Laboratory Manager
New England Bioassay a division of GZA

General Test Conditions

Permittee name: Barnhardt Manufacturing Co. Permit number: MA0003697

Client sample ID: Effluent Test Start Date: 7/8/19

Sample Collection Information

Effluent #1 Dates/Times: 7/7-8/19 @ 0700-0700 Receiving Water #1 Date/Time: 7/8/19 @ 0630

Effluent #2 Dates/Times: 7/9-10/19 @ 0700-0700 Receiving Water #2 Date/Time: 7/10/19 @ 0630

Effluent #3 Dates/Times: 7/11-12/19 @ 0700-0700 Receiving Water #3 Date/Time: 7/12/19 @ 0630

Were a minimum of three samples collected? Yes ☑ No ☐ *(see note below)

Were samples used within the first 36 hours of collection? Yes ☑ No ☐ * (see note below)

* sample collection note:

Test Conditions

Permittee's Receiving Water: North River

- Dilution water: Receiving water collected at a point immediately upstream of or away from the discharge
- Control water: Connecticut River adjusted to moderate hardness (hardness 80 - 100 mg/L CaCO3)

Effluent concentrations tested: 0%, 5.0%, 6.25%, 12.5%, 25%, 50%, 100%

Was effluent salinity adjusted? No ☑ Yes ☐ with Instant Ocean sea salts to _____ ppt

Dechlorination procedures: Chlorine is measured using 4500 CL-G DPD Colorimetric Method

- Dechlorination was not required

TRC results and further information about aeration of samples can be found attached in "sample receipt chemistry"

Reference Toxicant Data

Ceriodaphnia dubia

Date: 7/1/19

Toxicant: Sodium chloride

Dilution Water: NEB CTRMH

Organism Source: NEB

Reproduction IC25: 1.05 g/L

Results within range Yes ☑ No ☐

Ceriodaphnia dubia Test Results

Permittee name: Barnhardt Manufacturing Co. Permit number: MA0003697

Client sample ID: Effluent Test Dates: 7/8/19 - 7/14/19

Test Acceptability Criteria

Lab Control Survival:	90	%	Mean Lab Control Reproduction:	31.4	young per female
Diluent Control Survival:	100	%	Mean Diluent Control Reproduction:	32.7	young per female
Thiosulfate Control Survival:	N/A	%	Mean Thiosulfate Control Reproductior	N/A	young per female

Presence of an asterisk (*) indicates EPA criteria was not met, see explanation in the "Results Discussion" section at the bottom of the following page.

Test Results

		Permit Limit	Test Result	Pass/Fail Status
Acute Data	48 hr LC50	≥ 100%	>100%	Pass
	48 hr NOEC		100%	
	TUa			
Chronic Data	Chronic LC50		49.1%	
	Survival C-NOEC		50%	
	Survival C-LOEC		100%	
	Reproduction C-NOEC		< 5%	
	Reproduction C-LOEC		5%	
	Reproduction IC25		3.35%	
	Reproduction IC50		10%	
	Reportable C-NOEC	≥ 5.0%	< 5%	Fail
	Reportable C-LOEC		5%	
	MATC		< 5%	
	TUc			

Presence of an asterisk (*) indicates qualified data, see explanation in the "Results Discussion" section at the bottom of the following page.

Test Variability

Reproduction PMSD: 23.5% Upper & Lower EPA bounds: 13 - 47% ☐ Low ☑ Within bounds ☐ High

☐ 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)

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

☐ 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 bound.

- ☐ The RPD values for all concentrations fall below the lower bound. Any differences observed in this test are considered statistically insignificant.
- ☐ Some of the concentrations that were flagged as statistically significant have RPD values that fall below the lower bound. Any differences observed in these concentrations will not be considered statistically significantly decreased from the control.
- ☐ No statistically significant reductions were observed in this test.

Ceriodaphnia dubia Test Results

Permittee name: Barnhardt Manufacturing Co. Permit number: MA0003697

Client sample ID: Effluent Test Dates: 7/8/19 - 7/14/19

Concentration - Response Evaluation

Survival: #7 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: #7 Significant effects only at highest concentration.

Reproduction: #9 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: #9 Significant effects at all test concentrations with a sloped concentration-response curve.

The concentration - response relationship was reviewed and the following determination was made:

Survival	Reproduction	
X	X	Results are reliable and reportable
		Results are anomalous (see explanation below)
		Results are inconclusive - retest (see explanation below)

Results Discussion (if applicable):

TEST METHODS

Ceriodaphnia dubia

Test type:	Modified Chronic Static Renewal Freshwater Test
Test Reference Manual:	EPA-821-R-02-013 "Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to Freshwater Organisms"
Test Method:	*Ceriodaphnia dubia* Survival and Reproduction Test - EPA 1002.0
Temperature:	25 °C ± 1°C (Temperatures should not deviate by more than 3°C during the test) (required)
Light Quality:	Ambient Laboratory Illumination (recommended)
Light Intensity:	10-20 µE/m2/s, or 50-100 ft-c (recommended)
Photoperiod:	16 hours light, 8 hours dark (recommended)
Test chamber size:	30 mL (recommended minimum)
Test solution volume:	15 mL (recommended minimum)
Renewal of Test Solutions:	Daily (required)
Age of Test Organisms:	Less than 24 hours; and all released within a 8-h period (required)
Number of Neonates Per Test Chamber:	1 Assigned using blocking by known parentage (required)
Number of Replicate Test Chambers Per Treatment:	10 (required minimum)
Number of Neonates Per Test Concentration:	10 (required minimum)
Feeding Regime:	Fed 0.1 mL each of YCT and algal suspension per exposure chamber daily. (recommended)
Cleaning:	Use new plastic cups daily (recommended)
Aeration:	None (recommended)
Test Duration:	Until 60% or more of control females have three broods (maximum test duration 8 days) (required)
Endpoints:	Survival and reproduction (required)
Test Acceptability:	80% or greater survival of all control organisms and an average of 15 or more young per surviving female in the control solutions. 60% of surviving control females must produce three broods. (required)
Sampling Requirements:	Minimum of three samples with a maximum holding time of 36 hours before first use. (required)
Sample volume required:	1 L/Day (recommended)

CERIODAPHNIA DUBIA
DATASHEETS & STATISTICAL ANALYSIS

NEW ENGLAND BIOASSAY TOXICITY DATA FORM
CHRONIC COVER SHEET

CLIENT:	Barnhardt Manufacturing Co.	*C.dubia* TEST ID #	19-893
ADDRESS:	247 Main Road	CHAIN OF CUSTODY #	C39-2521/22
	Colrain, MA 01340	NEB PROJECT #	05.0044654.00
PERMITTEE:	Barnhardt Manufacturing Co.	SAMPLE ID:	Effluent
PERMIT NUMBER:	MA0003697		
DILUTION WATER:	North River		

INVERTEBRATES

TEST SET-UP TECHNICIAN:	CH
TEST SPECIES:	*Ceriodaphnia dubia*
NEB LOT #	Cd19 (140 S)
AGE:	< 24 hours
TEST SOLUTION VOLUME (mls):	15
ORGANISMS PER TEST CHAMBER:	1
ORGANISMS PER CONCENTRATION:	10

LABORATORY CONTROL WATER (CTRMH)

Lot Number	Hardness mg/L $CaCO_3$	Alkalinity mg/L $CaCO_3$
CTR19(MH004	90	70

	DATE	TIME
TEST START:	7/8/19	1548
TEST END:	7/14/19	1445

COMMENTS: _____

REVIEWED BY: _____ DATE: 8/5/19

NEW ENGLAND BIOASSAY - CHRONIC TOXICITY TEST BROOD DATA SHEET

FACILITY NAME & ADDRESS:	Barnhardt, 247 Main Rd, Colrain MA 01340				
NEB PROJECT NUMBER:	05.0044654.00	NEB TEST NUMBER:	19-893	COC #	C39-2521/22
TEST ORGANISM:	*Ceriodaphnia dubia*	AGE:	<24 hours	Lot #	Cd19 (140 S)
START DATE:	7/8/19	TIME: 1548	END DATE: 7/14/19	TIME:	1445

Effluent Concentration	Cup #	A3	A4	A5	A6	A8	A9	A10	A11	A12	A13	Total Live Young	# Live Adults	Analyst-Transfer	Analyst-Counts
		Culture Lot#				Cd19 (140 S)									
	Day Number	Replicate													
		A	B	C	D	E	F	G	H	I	J				
NEB Lab Control	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10	CH	
	1	✓/x	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	9	CH	
	2	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	9	KO	
	3	X	6	✓	6	7	7	✓	6	6	✓	38	9	CW	CW
	4	X	14	5	11	16	13	4	15	11	5	94	9	CH	CH
	5	X	✓	12	✓	✓	✓	11	✓	✓	9	32	9	CH	CH
	6	X	20	18	16	16	20	✓	24	22	14	150	9	CW	CW
	7														
	totals	0	40	35	33	39	40	15	45	39	28	314	9		MC
North River Diluent		A	B	C	D	E	F	G	H	I	J				
	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	3	5	6	4	✓	5	4	4	✓	5	✓	33	10		
	4	10	14	5	13	10	12	13	8	9	6	100	10		
	5	✓	✓	✓	✓	✓	✓	✓	15	✓	10	25	10		
	6	18	18	8	22	18	21	20	17	15	12	169	10		
	7														
	totals	33	38	17	35	33	37	37	40	29	28	327	10		
5.0%		A	B	C	D	E	F	G	H	I	J				
	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	2	✓	✓	✓	✓	✓	✓	✓/x	✓	✓	✓	0	9		
	3	✓	4	5	5	✓/x	✓	X	✓	✓	✓	14	8		
	4	6	10	✓	11	X	12	X	4	5	7	55	8		
	5	✓	✓	✓	✓	X	✓	X	9	✓	8	17	8		
	6	14	20	16	3	X	18	X	✓/x	5	✓	76	7		
	7														
	totals	20	34	21	19	0	30	0	13	10	15	162	7		

Notes: Adults producing no neonates were determined to be non-reproducing females at test termination.

NEW ENGLAND BIOASSAY - CHRONIC TOXICITY TEST BROOD DATA SHEET

FACILITY NAME & ADDRESS:	Barnhardt, 247 Main Rd, Colrain MA 01340		
NEB PROJECT NUMBER:	05.0044654.00	ORGANISM: *Ceriodaphnia dubia*	START DATE: 7/8/19

Effluent Concentration	Day Number	Replicate A	B	C	D	E	F	G	H	I	J	Total Live Young	# Live Adults		
6.25%	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	3	4	6	3	5	7	7	4	✓	2	✓	38	10		
	4	8	7	6	10	11	8	1	6	4	5	66	10		
	5	✓	✓	✓	✓	✓	✓	✓	5	✓	8	13	10		
	6	16	20	13	16	15	14	12	9	14	2	131	10		
	7														
	totals	28	33	22	31	33	29	17	20	20	15	248	10		
12.5%		A	B	C	D	E	F	G	H	I	J				
	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	2	✓	✓	✓	✓	✓	✓	✓	✓/x	✓	✓	0	9		
	3	✓	6	4	✓	✓	2	4	X	5	1	22	9		
	4	4	✓	9	3	✓	5	3	X	7	✓	31	9		
	5	✓	15	✓	✓	✓	✓	✓	X	✓	✓	15	9		
	6	14	✓	13	8	4	✓	8	X	12	9	68	9		
	7														
	totals	18	21	26	11	4	7	15	0	24	10	136	9		
25%		A	B	C	D	E	F	G	H	I	J				
	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	2	✓	✓	✓	✓	✓	✓	✓	✓/x	✓/x	✓	0	8		
	3	✓	5	✓	7	2	✓	✓	X	X	✓	14	8		
	4	✓	✓	✓	✓	✓	1	1	X	X	✓	2	8		
	5	✓	✓	✓	✓	✓	✓	✓	X	X	✓	0	8		
	6	2	✓	✓	✓	✓	4	✓	X	X	✓	6	8		
	7														
	totals	2	5	0	7	2	5	1	0	0	0	22	8		
50%		A	B	C	D	E	F	G	H	I	J				
	0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	0	10		
	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓/x	0	9		
	2	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	0	9		
	3	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	0	9		
	4	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	0	9		
	5	✓	✓	✓	✓	✓/x	✓	✓	✓	✓/x	X	0	7		
	6	✓	✓	✓	✓	X	✓	✓/x	✓	X	X	0	6		
	7														
	totals	0	0	0	0	0	0	0	0	0	0	0	6		

NEW ENGLAND BIOASSAY - CHRONIC TOXICITY TEST BROOD DATA SHEET

FACILITY NAME & ADDRESS:	Barnhardt, 247 Main Rd, Colrain MA 01340		
NEB PROJECT NUMBER: 05.0044654.00	ORGANISM: *Ceriodaphnia dubia*	START DATE:	7/8/19

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

NEB'S DATA SHEET FOR ROUTINE CHEMICAL AND PHYSICAL DETERMINATIONS

FACILITY NAME & ADDRESS:	Barnhardt, 247 Main Rd, Colrain MA 01340							
NEB PROJECT NUMBER:	05.0044654.00			TEST ORGANISM			*Ceriodaphnia dubia*	
DILUTION WATER SOURCE:	North River			START DATE:			7/8/19 TIME:	1548
ANALYST	CH	BA	KO	BA	BA	BA		
NEB Lab Control	1	2	3	4	5	6	7	Remarks
Temp °C Initial	25.7	24.6	25.3	25.6	25.5	25.7		
D.O. mg/L Initial	8.0	8.6	8.2	8.0	7.9	8.0		
pH s.u. Initial	7.8	7.9	7.8	7.7	7.9	7.5		
Conductivity µS Initial	337	354	335	336	353	344		
Temp °C Final	24.6	24.5	25.3	25.8	25.2	26.0		
D.O. mg/L Final	8.1	8.1	8.0	7.8	8.0	7.9		
pH s.u. Final	7.8	7.8	7.8	8.0	8.0	7.8		
Conductivity µS Final	348	342	349	353	352	360		
North River Diluent	1	2	3	4	5	6	7	Remarks
Temp °C Initial	25.3	24.6	25.0	26.0	25.7	26.7		
D.O. mg/L Initial	8.6	8.7	8.3	8.6	8.3	8.7		
pH s.u. Initial	7.5	7.8	7.7	7.5	7.4	7.5		
Conductivity µS Initial	119	122	130	128	162	159		
Temp °C Final	24.8	24.5	25.3	26.0	25.0	26.0		
D.O. mg/L Final	8.1	8.0	7.9	7.9	7.8	7.8		
pH s.u. Final	7.8	7.8	7.9	8.0	8.0	7.6		
Conductivity µS Final	130	127	140	137	168	170		
5.0%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	25.3	24.6	24.9	26.2	25.7	26.8		
D.O. mg/L Initial	8.6	8.6	8.5	8.5	8.2	8.5		
pH s.u. Initial	7.7	7.8	7.8	7.9	7.6	7.7		
Conductivity µS Initial	227	217	253	240	281	279		
Temp °C Final	24.4	24.5	25.3	26.1	24.9	26.0		
D.O. mg/L Final	8.1	7.9	7.8	7.9	7.9	7.8		
pH s.u. Final	8.0	7.9	8.0	8.1	8.2	7.8		
Conductivity µS Final	240	220	262	248	290	288		
6.25%		2	3	4	5	6	7	Remarks
Temp °C Initial	25.3	24.5	24.8	26.2	25.7	26.8		
D.O. mg/L Initial	8.6	8.6	8.5	8.4	8.2	8.5		
pH s.u. Initial	7.9	8.1	8.0	8.2	7.9	7.9		
Conductivity µS Initial	250	249	284	276	343	317		
Temp °C Final	24.2	24.3	25.3	26.1	24.8	26.0		
D.O. mg/L Final	8.2	8.0	7.8	7.9	8.0	7.7		
pH s.u. Final	8.1	8.0	8.0	8.2	8.4	7.9		
Conductivity µS Final	261	254	295	285	356	326		

NEB'S DATA SHEET FOR ROUTINE CHEMICAL AND PHYSICAL DETERMINATIONS

FACILITY NAME & ADDRESS:	Barnhardt, 247 Main Rd, Colrain MA 01340							
NEB PROJECT NUMBER:	05.0044654.00			TEST ORGANISM		*Ceriodaphnia dubia*		
DILUTION WATER SOURCE:	North River			START DATE:		7/8/19	TIME:	1548

12.5%	1	2	3	4	5	6	7	Remarks
Temp °C Initial	25.2	24.5	24.9	26.2	25.7	26.7		
D.O. mg/L Initial	8.5	8.7	8.5	8.4	8.2	8.5		
pH s.u. Initial	8.4	8.5	8.3	8.5	8.1	8.3		
Conductivity µS Initial	386	381	411	426	495	472		
Temp °C Final	24.3	24.3	25.3	26.4	24.9	26.0		
D.O. mg/L Final	8.1	8.0	7.8	7.8	8.0	7.7		
pH s.u. Final	8.4	8.3	8.2	8.4	8.6	8.3		
Conductivity µS Final	398	391	436	440	516	489		
25%	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**Remarks**
Temp °C Initial	25.2	24.4	24.8	26.3	25.7	26.6		
D.O. mg/L Initial	8.4	8.6	8.4	8.4	8.1	8.4		
pH s.u. Initial	8.7	8.9	8.7	8.8	8.5	8.6		
Conductivity µS Initial	653	708	732	735	856	814		
Temp °C Final	24.2	24.4	25.3	26.2	24.9	26.0		
D.O. mg/L Final	8.2	7.9	7.8	7.8	7.9	7.7		
pH s.u. Final	8.7	8.7	8.6	8.8	8.8	8.6		
Conductivity µS Final	665	716	750	754	884	838		
50%	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**Remarks**
Temp °C Initial	25.2	24.5	24.9	26.2	25.7	26.3		
D.O. mg/L Initial	8.2	8.6	8.4	8.4	7.9	8.4		
pH s.u. Initial	8.9	9.0	8.8	8.9	8.7	8.7		
Conductivity µS Initial	1,241	1,244	1,352	1,378	1,489	1,461		
Temp °C Final	24.3	24.2	25.3	26.2	24.9	26.0		
D.O. mg/L Final	8.2	8.0	7.7	7.8	8.0	7.8		
pH s.u. Final	8.9	9.0	9.0	9.0	9.1	8.9		
Conductivity µS Final	1,268	1,251	1,402	1,408	1,588	1,533		
100%	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**Remarks**
Temp °C Initial	25.1	24.6	24.8	26.4	25.7	25.7		
D.O. mg/L Initial	7.7	8.5	7.8	8.2	7.4	8.2		
pH s.u. Initial	8.9	9.0	8.9	8.9	8.7	8.7		
Conductivity µS Initial	2,316	2,336	2,559	2,588	2,766	2,744		
Temp °C Final	24.3	24.3	25.3	26.3	25.0			
D.O. mg/L Final	8.1	8.0	7.7	7.8	7.9			
pH s.u. Final	9.1	9.2	9.1	9.2	9.2			
Conductivity µS Final	2,357	2,358	2,610	2,644	2,862			

Table of Random Permutations of 16 **C.dubia Test ID#** 19-893

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
												rep							
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
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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
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
						conc													
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

Ceriodaphnia dubia Culture Chart Lot # Cd19 (140 5) A

Brood mother source: RMH 137 A-11 Source's brood size: 19 (Qty.)

Barnhardt 7.8.19

Tech	AH	AH	KF	SoP	MC		AH	KF								
Date	7.1	7.2	7.3	7.4	7.6		7.7	7.8								
Day acc.	0	1	2	3	4	5	6	7		8	9	10	11	12	13	14
Cup # 1	N	N	N	3	5		Y	Y	1							
2	N	N	N	4	7		Y	Y	2							
3	N	N	N	3	6		Y	T1 Y 18	3							
4	N	N	N	4	7		Y	T2 Y 19	4							
5	N	N	N	5	8		Y	T3 Y 21	5							
6	N	N	N	4	9		Y	T4 Y 20	6							
7	N	N	N	5	8		Y	Y	7							
8	N	N	N	3	7		Y	T5 Y 16	8							
9	N	N	N	4	10		Y	T6 Y 18	9							
10	N	N	N	4	8		Y	T7 Y 19	10							
11	N	N	N	3	7		Y	T8 Y 16	11							
12	N	N	N	3	8		Y	T9 Y 23	12							
13	N	N	N	4	9		Y	T10 Y 16	13							

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
0044654	T	Y	7.7.19/1900 → 7.7.19/2120	7.8.19/1245
	T			
	T			
	T			
	T			
	T			

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

Analysis ID:	06-5090-9977	**Endpoint:**	2d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	17 Jul-19 16:34	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1

Batch ID:	14-3266-9569	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**			
Start Date:	08 Jul-19 15:48	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Laboratory Water		
Ending Date:	14 Jul-19 14:45	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable		
Test Length:	5d 23h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture	**Age:**	<24

Sample ID:	16-3872-5035	**Code:**	61ACF5AB	**Project:**	
Sample Date:	08 Jul-19 07:00	**Material:**	WWTF Effluent	**Source:**	Barnhardt (BBA Fiberweb)
Receipt Date:	08 Jul-19 11:25	**CAS (PC):**		**Station:**	
Sample Age:	9h	**Client:**	Barnhardt		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X)	Linear	1411848	200	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
LC50	>100	n/a	n/a	<1	n/a	n/a

2d Survival Rate Summary

			Calculated Variate(A/B)								Isotonic Variate	
Conc-%	**Code**	**Count**	**Mean**	**Min**	**Max**	**Std Dev**	**CV%**	**%Effect**	**A/B**		**Mean**	**%Effect**
0	D	10	1.0000	1.0000	1.0000	0.0000	0.00%	0.0%	10/10		1	0.0%
5		10	0.9000	0.0000	1.0000	0.3162	35.14%	10.0%	9/10		0.95	5.0%
6.25		10	1.0000	1.0000	1.0000	0.0000	0.00%	0.0%	10/10		0.95	5.0%
12.5		10	0.9000	0.0000	1.0000	0.3162	35.14%	10.0%	9/10		0.9	10.0%
25		10	0.8000	0.0000	1.0000	0.4216	52.70%	20.0%	8/10		0.85	15.0%
50		10	0.9000	0.0000	1.0000	0.3162	35.14%	10.0%	9/10		0.85	15.0%
100		10	0.7000	0.0000	1.0000	0.4830	69.01%	30.0%	7/10		0.7	30.0%

2d Survival Rate Detail

Conc-%	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	0.0000	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	0.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
100		0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	1.0000

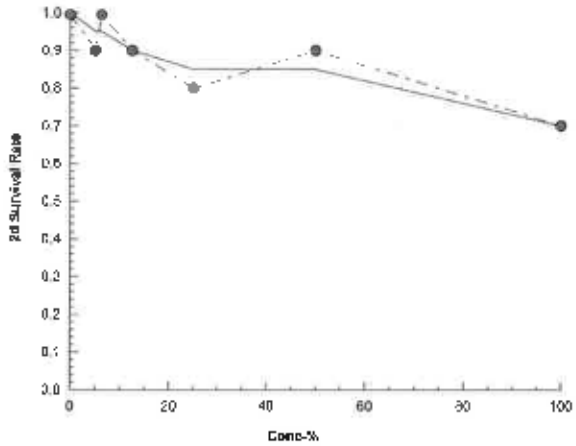
2d Survival Rate Binomials

Conc-%	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	0/1	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	0/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	0/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	0/1
100		0/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	0/1	1/1

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

Analysis ID:	06-5090-9977	**Endpoint:**	2d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	17 Jul-19 16:34	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1

Graphics



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

Analysis ID:	20-2561-9763	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	17 Jul-19 16:35	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1
Batch ID:	14-3266-9569	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**	
Start Date:	08 Jul-19 15:48	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Laboratory Water
Ending Date:	14 Jul-19 14:45	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable
Test Length:	5d 23h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture **Age:** <24
Sample ID:	16-3872-5035	**Code:**	61ACF5AB	**Project:**	
Sample Date:	08 Jul-19 07:00	**Material:**	WWTF Effluent	**Source:**	Barnhardt (BBA Fiberweb)
Receipt Date:	08 Jul-19 11:25	**CAS (PC):**		**Station:**	
Sample Age:	9h	**Client:**	Barnhardt		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Linear	Linear	223828	200	Yes	Two-Point Interpolation

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits Lower	Upper	Overlap	Decision
Control Resp	32.7	15	>>	Yes	Passes Criteria

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC25	3.35	2.543	6.7	29.85	14.92	39.33
IC50	10.01	6.522	14.07	9.991	7.106	15.33

Reproduction Summary

			Calculated Variate						Isotonic Variate	
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	Mean	%Effect
0	D	10	32.7	17	40	6.717	20.54%	0.0%	32.7	0.0%
5		10	16.2	0	34	11.19	69.09%	50.46%	20.5	37.31%
6.25		10	24.8	15	33	6.763	27.27%	24.16%	20.5	37.31%
12.5		10	13.6	0	26	8.682	63.84%	58.41%	13.6	58.41%
25		10	2.2	0	7	2.573	117.00%	93.27%	2.2	93.27%
50		10	0	0	0	0		100.0%	0	100.0%

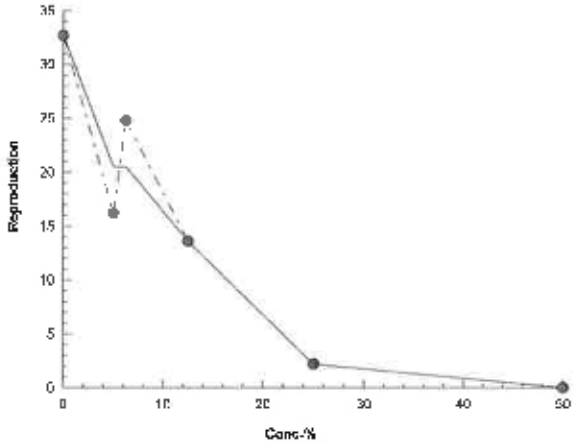
Reproduction Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	33	38	17	35	33	37	37	40	29	28
5		20	34	21	19	0	30	0	13	10	15
6.25		28	33	22	31	33	29	17	20	20	15
12.5		18	21	26	11	4	7	15	0	24	10
25		2	5	0	7	2	5	1	0	0	0
50		0	0	0	0	0	0	0	0	0	0

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

Analysis ID:	20-2561-9763	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	17 Jul-19 16:35	**Analysis:**	Linear Interpolation (ICPIN)	**Status Level:**	1

Graphics



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

Analysis ID:	10-4061-3015	**Endpoint:**	6d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	17 Jul-19 16:34	**Analysis:**	Trimmed Spearman-Kärber	**Status Level:**	1

Batch ID:	14-3266-9569	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**			
Start Date:	08 Jul-19 15:48	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Laboratory Water		
Ending Date:	14 Jul-19 14:45	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable		
Test Length:	5d 23h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture	**Age:**	<24

Sample ID:	16-3872-5035	**Code:**	61ACF5AB	**Project:**	
Sample Date:	08 Jul-19 07:00	**Material:**	WWTF Effluent	**Source:**	Barnhardt (BBA Fiberweb)
Receipt Date:	08 Jul-19 11:25	**CAS (PC):**		**Station:**	
Sample Age:	9h	**Client:**	Barnhardt		

Trimmed Spearman-Kärber Estimates

Threshold Option	Threshold	Trim	Mu	Sigma	LC50	95% LCL	95% UCL
Control Threshold	0	13.33%	1.691	0.08384	49.13	33.39	72.29

6d Survival Rate Summary

			Calculated Variate(A/B)							Isotonic Variate	
Conc-%	Code	Count	Mean	Min	Max	Std Dev	CV%	%Effect	A/B	Mean	%Effect
0	D	10	1.0000	1.0000	1.0000	0.0000	0.00%	0.0%	10/10	1	0.0%
5		10	0.7000	0.0000	1.0000	0.4830	69.01%	30.0%	7/10	0.8667	13.33%
6.25		10	1.0000	1.0000	1.0000	0.0000	0.00%	0.0%	10/10	0.8667	13.33%
12.5		10	0.9000	0.0000	1.0000	0.3162	35.14%	10.0%	9/10	0.8667	13.33%
25		10	0.8000	0.0000	1.0000	0.4216	52.70%	20.0%	8/10	0.8	20.0%
50		10	0.6000	0.0000	1.0000	0.5164	86.07%	40.0%	6/10	0.6	40.0%
100		10	0.0000	0.0000	0.0000	0.0000		100.0%	0/10	0	100.0%

6d Survival Rate Detail

Conc-%	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	0.0000	1.0000	0.0000	0.0000	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	0.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	0.0000
100		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

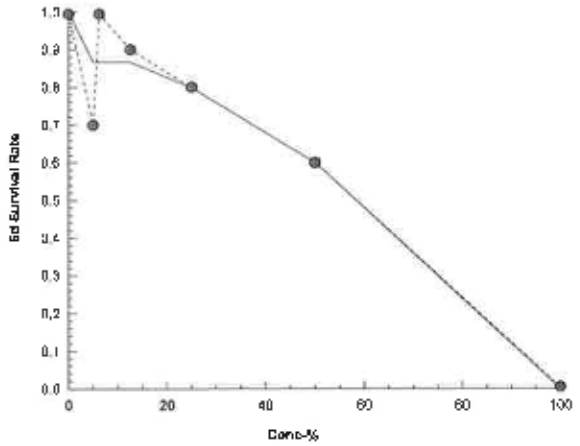
6d Survival Rate Binomials

Conc-%	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	0/1	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	0/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	0/1	1/1
50		1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	0/1
100		0/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	0/1	1/1

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

Analysis ID:	10-4061-3015	**Endpoint:**	6d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	17 Jul-19 16:34	**Analysis:**	Trimmed Spearman-Kärber	**Status Level:**	1

Graphics



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

Analysis ID:	06-9398-0685	**Endpoint:**	6d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	17 Jul-19 16:34	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Batch ID:	14-3266-9569	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**			
Start Date:	08 Jul-19 15:48	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Laboratory Water		
Ending Date:	14 Jul-19 14:45	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable		
Test Length:	5d 23h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture	**Age:**	<24

Sample ID:	16-3872-5035	**Code:**	61ACF5AB	**Project:**	
Sample Date:	08 Jul-19 07:00	**Material:**	WWTF Effluent	**Source:**	Barnhardt (BBA Fiberweb)
Receipt Date:	08 Jul-19 11:25	**CAS (PC):**		**Station:**	
Sample Age:	9h	**Client:**	Barnhardt		

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU
Untransformed	C > T	50	>50	n/a	2

Fisher Exact/Bonferroni-Holm Test

Control vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Dilution Water	5	0.1053	Exact	0.4211	Non-Significant Effect
	6.25	1.0000	Exact	1.0000	Non-Significant Effect
	12.5	0.5000	Exact	1.0000	Non-Significant Effect
	25	0.2368	Exact	0.7105	Non-Significant Effect
	50	0.0433	Exact	0.2167	Non-Significant Effect

Data Summary

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	D	10	0	10	1	0	0.0%
5		7	3	10	0.7	0.3	30.0%
6.25		10	0	10	1	0	0.0%
12.5		9	1	10	0.9	0.1	10.0%
25		8	2	10	0.8	0.2	20.0%
50		6	4	10	0.6	0.4	40.0%

6d Survival Rate Detail

Conc-%	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	0.0000	1.0000	0.0000	0.0000	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	0.0000	1.0000
25		1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	1.0000
50		1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	0.0000	1.0000	0.0000	0.0000

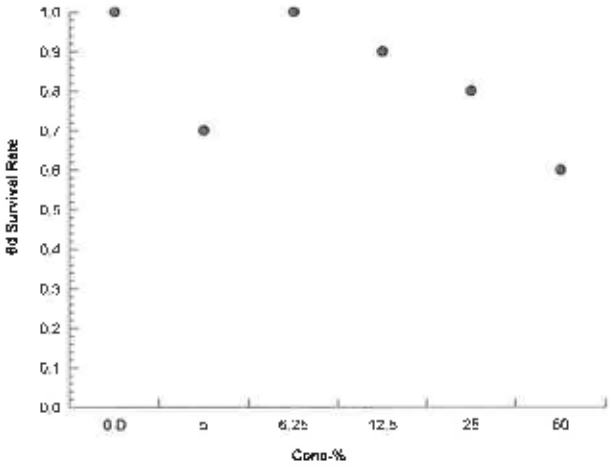
6d Survival Rate Binomials

Conc-%	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	0/1	1/1	0/1	0/1	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	0/1	1/1
25		1/1	1/1	1/1	1/1	1/1	1/1	1/1	0/1	0/1	1/1
50		1/1	1/1	1/1	1/1	0/1	1/1	0/1	1/1	0/1	0/1

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

Analysis ID:	06-9398-0685	**Endpoint:**	6d Survival Rate	**CETIS Version:**	CETISv1.9.4
Analyzed:	17 Jul-19 16:34	**Analysis:**	STP 2xK Contingency Tables	**Status Level:**	1

Graphics



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

Analysis ID:	18-1164-4225	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	17 Jul-19 16:34	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Batch ID:	14-3266-9569	**Test Type:**	Reproduction-Survival (7d)	**Analyst:**			
Start Date:	08 Jul-19 15:48	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Laboratory Water		
Ending Date:	14 Jul-19 14:45	**Species:**	Ceriodaphnia dubia	**Brine:**	Not Applicable		
Test Length:	5d 23h	**Taxon:**	Branchiopoda	**Source:**	In-House Culture	**Age:**	<24

Sample ID:	16-3872-5035	**Code:**	61ACF5AB	**Project:**	
Sample Date:	08 Jul-19 07:00	**Material:**	WWTF Effluent	**Source:**	Barnhardt (BBA Fiberweb)
Receipt Date:	08 Jul-19 11:25	**CAS (PC):**		**Station:**	
Sample Age:	9h	**Client:**	Barnhardt		

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C > T	<5	5	n/a	>20	23.47%

Steel Many-One Rank Sum Test

Control vs	Control II	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water	5*	66	76	0	18	Asymp	0.0058	Significant Effect
	6.25*	73.5	76	4	18	Asymp	0.0292	Significant Effect
	12.5*	59	76	0	18	Asymp	9.7E-04	Significant Effect
	25*	55	76	0	18	Asymp	3.1E-04	Significant Effect

Test Acceptability Criteria

Attribute	Test Stat	TAC Limits Lower	Upper	Overlap	Decision
Control Resp	32.7	15	>>	Yes	Passes Criteria

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	5345.2	1336.3	4	22.41	<1.0E-37	Significant Effect
Error	2683.3	59.6289	45			
Total	8028.5		49			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	15.21	13.28	0.0043	Unequal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9794	0.9367	0.5261	Normal Distribution

Reproduction Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	10	32.7	27.89	37.51	34	17	40	2.124	20.54%	0.00%
5		10	16.2	8.193	24.21	17	0	34	3.54	69.09%	50.46%
6.25		10	24.8	19.96	29.64	25	15	33	2.139	27.27%	24.16%
12.5		10	13.6	7.389	19.81	13	0	26	2.746	63.84%	58.41%
25		10	2.2	0.3591	4.041	1.5	0	7	0.8138	116.97%	93.27%
50		10	0	0	0	0	0	0	0		100.00%

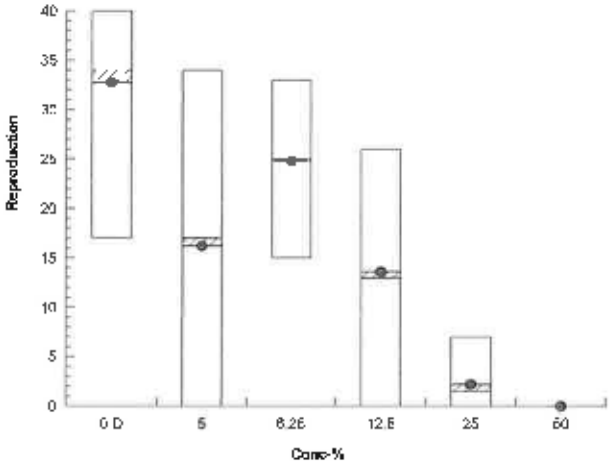
Reproduction Detail

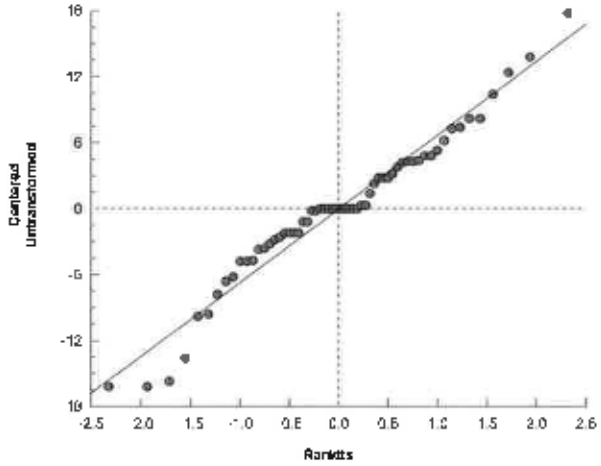
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	D	33	38	17	35	33	37	37	40	29	28
5		20	34	21	19	0	30	0	13	10	15
6.25		28	33	22	31	33	29	17	20	20	15
12.5		18	21	26	11	4	7	15	0	24	10
25		2	5	0	7	2	5	1	0	0	0
50		0	0	0	0	0	0	0	0	0	0

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

Analysis ID:	18-1164-4225	**Endpoint:**	Reproduction	**CETIS Version:**	CETISv1.9.4
Analyzed:	17 Jul-19 16:34	**Analysis:**	Nonparametric-Control vs Treatments	**Status Level:**	1

Graphics





CHEMICAL ANALYSIS

Please note the subcontract laboratory has its own QAQC and data review processes, and therefore New England Bioassay does not review the analytical results we receive.

PHOENIX
Environmental Laboratories, Inc.

Friday, July 12, 2019

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

Project ID: BARNHARDT MFG
SDG ID: GCD51803
Sample ID#s: CD51803 - CD51805

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 are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Sincerely yours,

Phyllis Shiller
Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #M-CT007
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
UT Lab Registration #CT00007
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

Sample Id Cross Reference

July 12, 2019

SDG I.D.: GCD51803

Project ID: BARNHARDT MFG

Client Id	Lab Id	Matrix
EFFLUENT #1 C39-2521	CD51803	WASTE WATER
NORTH RIVER #1 C39-2522	CD51804	WATER
EFF GRAB #1	CD51805	WASTE WATER

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

July 12, 2019

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:		07/08/19	7:00
Location Code:	NEB	Received by:	B	07/08/19	15:26
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	22512				

Laboratory Data

SDG ID: GCD51803
Phoenix ID: CD51803

Project ID: BARNHARDT MFG
Client ID: EFFLUENT #1 C39-2521

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Aluminum	0.080	0.010	mg/L	1	07/10/19	CPP	E200.7
Cadmium	0.0002	0.0001	mg/L	1	07/10/19	RS	SM3113B
Copper	0.0222	0.0010	mg/L	1	07/10/19	CPP	E200.7
Hardness (CaCO3)	52.9	0.1	mg/L	1	07/10/19		E200.7
Nickel	0.003	0.001	mg/L	1	07/10/19	CPP	E200.7
Lead	< 0.0003	0.0003	mg/L	1	07/10/19	RS	SM3113B
Zinc	0.036	0.002	mg/L	1	07/10/19	CPP	E200.7
Alkalinity-CaCO3	1160	5.00	mg/L	1	07/09/19	rwr/kdb	SM2320B-11
Conductivity	2270	5.00	umhos/cm	1	07/09/19	rwr/kdb	SM2510B-11
Ammonia as Nitrogen	0.18	0.10	mg/L	2	07/10/19	KDB	E350.1
Tot. Diss. Solids	1600	20	mg/L	2	07/09/19	BMD/BJA	SM2540C-11
Tot. Org. Carbon	53.9	2.5	mg/L	5	07/11/19	RWR	SM5310B-11
Total Solids	1500	40	mg/L	4	07/09/19	BMD/BJA	SM2540B-11
Total Metals Digestion	Completed				07/09/19	AG	

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

Comments:

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
July 12, 2019
Reviewed and Released by: Rashmi Makol, Project Manager

Ver 1

PHOENIX

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

Analysis Report

July 12, 2019

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:		07/08/19	6:30
Location Code:	NEB	Received by:	B	07/08/19	15:26
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	22512				

Laboratory Data

SDG ID: GCD51803
Phoenix ID: CD51804

Project ID: BARNHARDT MFG
Client ID: NORTH RIVER #1 C39-2522

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Aluminum	0.029	0.020	mg/L	1	07/10/19	EK	SW6010D/E200.7
Cadmium	< 0.0001	0.0001	mg/L	1	07/09/19	RS	SM3113B/SW7010-10
Copper	< 0.0020	0.0020	mg/L	1	07/10/19	EK	SW6010D/E200.7
Hardness (CaCO3)	34.2	0.1	mg/L	1	07/10/19		E200.7
Nickel	0.001	0.001	mg/L	1	07/10/19	EK	SW6010D/E200.7
Lead	< 0.0003	0.0003	mg/L	1	07/09/19	RS	SM3113B/SW7010
Zinc	< 0.004	0.004	mg/L	1	07/10/19	EK	SW6010D/E200.7
Alkalinity-CaCO3	40.1	5.00	mg/L	1	07/09/19	nw/kdb	SM2320B-11
Conductivity	118	5.00	umhos/cm	1	07/09/19	nw/kdb	SM2510B-11
Ammonia as Nitrogen	< 0.05	0.05	mg/L	1	07/10/19	KDB	E350.1
pH	7.33	1.00	pH Units	1	07/09/19 05:53	nw/kdb	SM4500-H B-11
Tot. Org. Carbon	1.77	0.50	mg/L	1	07/11/19	RWR	SM5310B-11
Total Metals Digestion	Completed				07/09/19	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 you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
July 12, 2019
Reviewed and Released by: Rashmi Makol, 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

July 12, 2019

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:		07/08/19	7:00
Location Code:	NEB	Received by:	B	07/08/19	15:26
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	22512				

Laboratory Data

SDG ID: GCD51803
Phoenix ID: CD51805

Project ID: BARNHARDT MFG
Client ID: EFF GRAB #1

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Chlorine Residual	< 0.02	0.02	mg/L	1	07/08/19 19:48	O	SM4500CLG-97
pH	8.98	1.00	pH Units	1	07/09/19 05:55	rw/kdb	SM4500-H B-11

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 you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
July 12, 2019
Reviewed and Released by: Rashmi Makol, 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

July 12, 2019

QA/QC Data

SDG I.D.: GCD51803

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 486642 (mg/L), QC Sample No: CD51784 (CD51804)														
Cadmium - Water	BRL	0.0001	<0.0001	<0.0001	NC	114			139			75 - 125	20	m
QA/QC Batch 486807 (mg/L), QC Sample No: CD51812 (CD51803)														
Cadmium - Water	BRL	0.0001	<0.0001	<0.0001	NC	108			111			75 - 125	20	
QA/QC Batch 486642 (mg/L), QC Sample No: CD51784 (CD51804)														
Lead (Furnace) - Water	BRL	0.001	<0.0003	<0.001	NC	108			90.5			75 - 125	30	
QA/QC Batch 486807 (mg/L), QC Sample No: CD51812 (CD51803)														
Lead (Furnace) - Water	BRL	0.001	<0.0003	<0.001	NC	101			107			75 - 125	30	
QA/QC Batch 486838 (mg/L), QC Sample No: CD51793 (CD51803)														
ICP Metals - Aqueous														
Aluminum	BRL	0.010	0.024	0.022	NC	99.6	99.3	0.3	112			75 - 125	20	
Copper	BRL	0.0025	0.0014	<0.0025	NC	100	99.7	0.3	111			75 - 125	20	
Nickel	BRL	0.0005	0.003	0.0026	NC	98.2	101	2.8	104			75 - 125	20	
Zinc	BRL	0.0020	0.029	0.0287	1.00	96.2	100	3.9	105			75 - 125	20	
QA/QC Batch 486810 (mg/L), QC Sample No: CD51863 (CD51804)														
ICP Metals - Aqueous														
Aluminum	BRL	0.020	0.055	0.051	NC	98.1	102	3.9	103			75 - 125	20	
Copper	BRL	0.005	0.007	0.007	NC	102	104	1.9	107			75 - 125	20	
Nickel	BRL	0.001	0.005	0.005	0	96.3	102	5.7	97.4			75 - 125	20	
Zinc	BRL	0.004	0.005	0.005	NC	98.2	104	5.7	101			75 - 125	20	

m = This parameter is outside laboratory MS/MSD specified recovery limits.

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

July 12, 2019

QA/QC Data

SDG I.D.: GCD51803

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 486725 (mg/L), QC Sample No: CD51787 (CD51803)													
Tot. Diss. Solids	BRL	10	480	490	2.10	98.0						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 486738 (mg/L), QC Sample No: CD51789 (CD51803, CD51804)													
Alkalinity-CaCO3	BRL	5.00	58	60	NC	103						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 486732 (pH), QC Sample No: CD51789 (CD51804, CD51805)													
pH			7.42	7.48	0.80	98.8						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 486765 (mg/L), QC Sample No: CD51796 (CD51803)													
Total Solids	BRL	10	260	270	3.80	96.0						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 486748 (umhos/cm), QC Sample No: CD51799 (CD51803, CD51804)													
Conductivity	BRL	5.00	806	806	0	99.0						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 487263 (mg/L), QC Sample No: CD52285 (CD51803, CD51804)													
Total Organic Carbon	BRL	1.0	1.9	1.9	NC	105			101			85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 486842 (mg/L), QC Sample No: CD51796 (CD51803, CD51804)													
Ammonia as Nitrogen	BRL	0.05	<0.10	<0.10	NC	101			95.5			90 - 110	20
QA/QC Batch 486686 (mg/L), QC Sample No: CD51549 (CD51805)													
Chlorine Residual	BRL	0.02	<0.02	<0.02	NC	99.6							

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
July 12, 2019

Friday, July 12, 2019
Criteria: None
State: MA

Sample Criteria Exceedances Report

GCD51603 - 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 exceedance report. It is provided as an additional tool to identify requested criteria exceedances. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedance 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

July 12, 2019

SDG I.D.: GCD51803

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

PHOENIX Environmental Laboratories, Inc.

CHAIN OF CUSTODY RECORD

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

Cooler: Yes ☑ No ☐
Coolant: IPK ☐ ICE ☐ No ☐
Temp: 2.6 °C Pg of

Data Delivery/Contact Options:
☐ Fax:
☐ Phone:
☒ Email: Kimberly.wills@92a.com

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

Project: Baynhardt Mfg (MA)
Report to: Kim Wills
Invoice to: Kim Wills
QUOTE #

Project P.O.: 22512

This section MUST be completed with Bottle Quantities.

Client Sample - Information - Identification

Sampler's Signature _____ Date: _____

Matrix Code:
DW=Drinking Water GW=Ground Water SW=Surface Water WW=Waste Water
RW=Raw Water SE=Sediment SL=Sludge S=Soil SD=Solid W=Wipe OIL=Oil
B=Bulk L=Liquid X = _____(Other)

Analysis Request

PHOENIX USE ONLY SAMPLE #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	Hardness, alkalinity	Specific conductance	Total solids	Total dissolved solids	Ammonia	Total organic carbon	Cd (AA), Pb (AA), Cu, Zn	Ni, Al	Total residual chlorine	pH	GL Amber 6 oz. w/H3PO4	Soil VOA Vials [ ] methanol [ ] H2O	GL Soil container ( ) oz	GL Soil container ( ) oz	40 ml VOA Vial [ ] As is [ ] HCl	GL Amber 1000ml [ ] As is [ ] H2SO4	PL As is [ ] 250ml [ ] 500ml [ ] 1000ml	PL H2SO4 [ ] 250ml [ ] 500ml	PL HNO3 250ml	PL NaOH 250ml	Bacteria Bottle w/thio	Bacteria Bottle as is
S18103	Effluent #1 C39-2521	WW	7/7/19	0700-0700	X	X	X	X	X	X	X	X									1	1	1			
S18104	North River #1 C39-2522	D	7/8/19	0630	X	X			X	X	X			X							1	1	1			
S18105	Eff grab #1	WW	7/8/19	0700									X	X							1					

Relinquished by:	Accepted by:	Date:	Time:
[signature]	[signature]	7-8-19	1415
[signature]	[signature]	7-8-19	1526

Comments, Special Requirements or Regulations:

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

RI
☐ Direct Exposure (Residential)
☑ GW
☐ Other

CT
☐ RCP Cert
☐ GW Protection
☐ SW Protection
☐ GA Mobility
☐ GB Mobility
☐ Residential DEC
☐ I/C DEC
☐ Other

MA
☐ MCP Certification
☐ GW-1
☐ GW-2
☐ GW-3
☐ S-1 GW-1 ☐ S-1 GW-2 ☐ S-1 GW-3
☐ S-2 GW-1 ☐ S-2 GW-2 ☐ S-2 GW-3
☐ S-3 GW-1 ☐ S-3 GW-2 ☐ S-3 GW-3
☐ MWRA eSMART ☐ Other

State where samples were collected: MA

Data Format
☐ Excel
☐ PDF
☐ GIS/Key
☐ EQuIS
☐ Other

Data Package
☐ Tier II Checklist
☐ Full Data Package*
☐ Phoenix Std Report
☐ Other
* SURCHARGE APPLIES

PHOENIX
Environmental Laboratories, Inc.

Tuesday, July 16, 2019

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

Project ID: BARNHARDT MFG
SDG ID: GCD53828
Sample ID#s: CD53828 - CD53830

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 are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Sincerely yours,

Phyllis Shiller
Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #M-CT007
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
UT Lab Registration #CT00007
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

Sample Id Cross Reference

July 16, 2019

SDG I.D.: GCD53828

Project ID: BARNHARDT MFG

Client Id	Lab Id	Matrix
EFFLUENT 2 C39-2587	CD53828	WASTE WATER
NORTH RIVER C39-2588	CD53829	WATER
EFFLUENT 2 C39-2587	CD53830	WASTE WATER

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

July 16, 2019

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:		07/10/19	7:00
Location Code:	NEB	Received by:	B	07/10/19	16:52
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	22512				

Laboratory Data

SDG ID: GCD53828
Phoenix ID: CD53828

Project ID: BARNHARDT MFG
Client ID: EFFLUENT 2 C39-2587

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Aluminum	0.074	0.010	mg/L	1	07/13/19	CPP	E200.7
Cadmium	0.0003	0.0001	mg/L	1	07/12/19	RS	SM3113B
Copper	0.0236	0.0010	mg/L	1	07/13/19	CPP	E200.7
Hardness (CaCO3)	80.9	0.1	mg/L	1	07/13/19		E200.7
Nickel	0.004	0.001	mg/L	1	07/13/19	CPP	E200.7
Lead	< 0.0003	0.0003	mg/L	1	07/12/19	RS	SM3113B
Zinc	0.040	0.002	mg/L	1	07/13/19	CPP	E200.7
Alkalinity-CaCO3	1300	5.00	mg/L	1	07/11/19	RWR/KDB	SM2320B-11
Conductivity	2530	5.00	umhos/cm	1	07/11/19	RWR/KDB	SM2510B-11
Ammonia as Nitrogen	0.24	0.05	mg/L	1	07/12/19	KDB	E350.1
Tot. Diss. Solids	*700	50	mg/L	5	07/12/19	BMD/JD	SM2540C-11
Tot. Org. Carbon	88.6	2.5	mg/L	5	07/12/19	RWR	SM5310B-11
Total Solids	1700	50	mg/L	5	07/12/19	BMD/BJA	SM2540B-11
Total Metals Digestion	Completed				07/12/19	AG	

Project ID: BARNHARDT MFG
Client ID: **EFFLUENT 2 C39-2587**

Phoenix I.D.: CD53828

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 you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
July 16, 2019
Reviewed and Released by: Rashmi Makol, 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

July 16, 2019

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:		07/10/19	6:30
Location Code:	NEB	Received by:	B	07/10/19	16:52
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	22512				

Laboratory Data

SDG ID: GCD53828
Phoenix ID: CD53829

Project ID: BARNHARDT MFG
Client ID: NORTH RIVER C39-2588

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Aluminum	0.027	0.020	mg/L	1	07/15/19	CPP	SW6010D/E200.7
Cadmium	< 0.0001	0.0001	mg/L	1	07/12/19	RS	SM3113B/SW7010-10
Copper	< 0.0020	0.0020	mg/L	1	07/15/19	CPP	SW6010D/E200.7
Hardness (CaCO3)	36.5	0.1	mg/L	1	07/15/19		E200.7
Nickel	< 0.001	0.001	mg/L	1	07/15/19	CPP	SW6010D/E200.7
Lead	< 0.0003	0.0003	mg/L	1	07/12/19	RS	SM3113B/SW7010
Zinc	< 0.004	0.004	mg/L	1	07/15/19	CPP	SW6010D/E200.7
Alkalinity-CaCO3	43.7	5.00	mg/L	1	07/11/19	RWR/KDB	SM2320B-11
Conductivity	125	5.00	umhos/cm	1	07/11/19	RWR/KDB	SM2510B-11
Ammonia as Nitrogen	< 0.05	0.05	mg/L	1	07/12/19	KDB	E350.1
pH	7.39	1.00	pH Units	1	07/11/19 04:30	RWR/KDB	SM4500-H B-11
Tot. Org. Carbon	1.97	0.50	mg/L	1	07/12/19	RWR	SM5310B-11
Total Metals Digestion	Completed				07/13/19	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 you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
July 16, 2019
Reviewed and Released by: Rashmi Makol, 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

July 16, 2019

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:		07/10/19	7:00
Location Code:	NEB	Received by:	B	07/10/19	16:52
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	22512				

Laboratory Data

SDG ID: GCD53828
Phoenix ID: CD53830

Project ID: BARNHARDT MFG
Client ID: EFFLUENT 2 C39-2587

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Chlorine Residual	< 0.02	0.02	mg/L	1	07/10/19 19:36	D	SM4500CLG-97
pH	8.88	1.00	pH Units	1	07/11/19 04:32	RWR/KDB	SM4500-H B-11

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 you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.203. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
July 16, 2019
Reviewed and Released by: Rashmi Makol, 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

July 16, 2019

QA/QC Data

SDG I.D.: GCD53828

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 487248 (mg/L), QC Sample No: CD53822 (CD53828, CD53829)													
Cadmium - Water	BRL	0.0001	<0.0001	<0.0001	NC	110			114			75 - 125	20
QA/QC Batch 487248 (mg/L), QC Sample No: CD53822 (CD53828, CD53829)													
Lead (Furnace) - Water	BRL	0.001	<0.0003	<0.001	NC	108			115			75 - 125	30
QA/QC Batch 487570 (mg/L), QC Sample No: CD53823 (CD53829)													
ICP Metals - Aqueous													
Aluminum	BRL	0.020	0.042	0.042	NC	98.4	98.7	0.3	98.4			75 - 125	20
Copper	BRL	0.005	<0.0020	<0.005	NC	103	103	0.0	103			75 - 125	20
Nickel	BRL	0.001	<0.001	0.001	NC	105	107	1.9	101			75 - 125	20
Zinc	BRL	0.004	<0.004	<0.004	NC	106	107	0.9	102			75 - 125	20
QA/QC Batch 487462 (mg/L), QC Sample No: CD53825 (CD53828)													
ICP Metals - Aqueous													
Aluminum	BRL	0.010	0.018	0.021	NC	106	102	3.8	107			75 - 125	20
Copper	BRL	0.0025	0.0070	0.0070	NC	106	101	4.8	105			75 - 125	20
Nickel	BRL	0.0005	0.001	0.0012	NC	104	98.6	5.3	98.0			75 - 125	20
Zinc	BRL	0.0020	0.036	0.0344	4.50	103	98.3	4.7	99.2			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

July 16, 2019

QA/QC Data

SDG I.D.: GCD53828

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 487473 (mg/L), QC Sample No: CD51591 (CD53828, CD53829)													
Total Organic Carbon	BRL	1.0	2.2	2.1	NC	100			100			85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 487169 (mg/L), QC Sample No: CD53690 (CD53828, CD53829)													
Alkalinity-CaCO3	BRL	5.00	307	309	0.50	101						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 487181 (umhos/cm), QC Sample No: CD53690 (CD53828, CD53829)													
Conductivity	BRL	5.00	596	589	1.20	98.0						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 487161 (pH), QC Sample No: CD53690 (CD53829, CD53830)													
pH			7.52	7.57	0.70	98.7						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 487355 (mg/L), QC Sample No: CD53714 (CD53828)													
Tot. Diss. Solids	BRL	10	43	39	NC	98.0						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 487406 (mg/L), QC Sample No: CD53825 (CD53828)													
Total Solids	BRL	10	250	250	0	97.0						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 487246 (mg/L), QC Sample No: CD53822 (CD53828, CD53829)													
Ammonia as Nitrogen	BRL	0.05	8.44	8.12	3.90	100			106			90 - 110	20
QA/QC Batch 487097 (mg/L), QC Sample No: CD53255 (CD53830)													
Chlorine Residual	BRL	0.02	<0.02	<0.02	NC	114							

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

Phyllis Shiller, Laboratory Director
July 16, 2019

Tuesday, July 16, 2019
Criteria: None
State: WA

Sample Criteria Exceedances Report

GCD53828 - 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 exceedance 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

July 16, 2019 SDG I.D.: GCD53828

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

Chronic Sample Set #2

Cooler: Yes ☒ No ☐
Coolant: IPK ☒ ICE ☐ No ☐
Temp 2.6 °C Pg of

CHAIN OF CUSTODY RECORD

PHOENIX Environmental Laboratories, Inc.

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

Data Delivery/Contact Options:
☐ Fax:
☐ Phone:
☒ Email: Kimberly.wills@gza.com

Customer: NEB - a div. of GZA
Address: 77 Batson Drive
Manchester, CT 06042

Project: Bayhardt Mfg (MA)
Report to: Kim Wills
Invoice to: Kim Wills
QUOTE #

Project P.O.: 22512

This section MUST be completed with Bottle Quantities.

Client Sample - Information - Identification

Sampler's Signature _____ Date: _____

Matrix Code:
DW=Drinking Water GW=Ground Water SW=Surface Water WW=Waste Water
RW=Raw Water SE=Sediment SL=Sludge S=Soil SD=Solid W=Wipe OIL=Oil
B=Bulk L=Liquid X = _____(Other)

Analysis Request

PHOENIX USE ONLY SAMPLE #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	Hardness, alkalinity	Specific conductance	Total solids	Total dissolved solids	Ammonia	Total organic carbon	Cd (AA), Pb (AA), Cu, Zn	Ni, Al	Total residual chlorine	pH	GL Amber 8 oz. w/H3PO4	Soil VOA Vials [ ] methanol [ ] H2O	GL Soil container ( ) oz	GL Soil container ( ) oz	40 ml VOA Vial [ ] As is [ ] HCl	GL Amber 1000ml [ ] As is [ ] H2SO4	PL As is [✓] 250ml [✓] 500ml [ ] 1000ml	PL H2SO4 [✓] 250ml [ ] 500ml	PL HNO3 250ml	PL NaOH 250ml	Bacteria Bottle w/thio	Bacteria Bottle as is
53828	Effluent - 2 (331-2587)	WW	7/9-7/10/19	0700-0700	X	X	X	X	X	X	X	X									1	1	1			
53829	North River - 2 (331-2588)	O	7/10/19	06:30	X	X			X	X	X	X		X							1	1	1			
53830	Eff grab - 2	WW	7/10/19	0700									X	X							1					

Relinquished by:	Accepted by:	Date:	Time:
[signature]	[signature]	7-10-19	1625
[signature]	[signature]	7-10-19	1052

Comments, Special Requirements or Regulations:
Cd - 0.0005 mg/L Pb - 0.0005 mg/L
Cu - 0.003 mg/L Zn - 0.005 mg/L
Ni - 0.005 mg/L Al - 0.02 mg/L

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

RI
[ ] Direct Exposure (Residential)
☐ GW
☐ Other

CT
☐ RCP Cert
☐ GW Protection
☐ SW Protection
☐ GA Mobility
☐ GB Mobility
☐ Residential DEC
☐ I/C DEC
☐ Other

MA
☐ MCP Certification
☐ GW-1
☐ GW-2
☐ GW-3
☐ S-1 GW 1 ☐ S-1 GW-2 ☐ S-1 GW-3
☐ S-2 GW-1 ☐ S-2 GW-2 ☐ S-2 GW-3
☐ S-3 GW-1 ☐ S-3 GW-2 ☐ S-3 GW-3
☐ MWRA eSMART ☐ Other

Data Format
☐ Excel
☐ PDF
☐ GIS/Key
☐ EQuIS
☐ Other

Data Package
☐ Tier I Checklist
☐ Full Data Package*
☐ Phoenix Std Report
☐ Other
* SURCHARGE APPLIES

State where samples were collected: MA

PHOENIX
Environmental Laboratories, Inc.

Friday, July 19, 2019

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

Project ID: BARNHARDT MFG
SDG ID: GCD56250
Sample ID#s: CD56250 - CD56252

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.

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Sincerely yours,

Phyllis Shiller
Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #M-CT007
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
UT Lab Registration #CT00007
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

Sample Id Cross Reference

July 19, 2019

SDG I.D.: GCD56250

Project ID: BARNHARDT MFG

Client Id	Lab Id	Matrix
EFFLUENT-3 C39-2637	CD56250	WASTE WATER
RECEIVING WATER-3 C39-2638	CD56251	SURFACE WATER
EFFLUENT GRAB 3	CD56252	WASTE WATER

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

July 19, 2019

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:		07/12/19	7:00
Location Code:	NEB	Received by:	CP	07/12/19	16:30
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	22512				

Laboratory Data

SDG ID: GCD56250
Phoenix ID: CD56250

Project ID: BARNHARDT MFG
Client ID: EFFLUENT-3 C39-2637

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Aluminum	0.066	0.010	mg/L	1	07/16/19	EK	E200.7
Cadmium	0.0003	0.0001	mg/L	1	07/18/19	RS	SM3113B
Copper	0.0226	0.0010	mg/L	1	07/16/19	EK	E200.7
Hardness (CaCO3)	56.2	0.1	mg/L	1	07/16/19		E200.7
Nickel	0.003	0.001	mg/L	1	07/16/19	EK	E200.7
Lead	< 0.0003	0.0003	mg/L	1	07/17/19	RS	SM3113B
Zinc	0.043	0.002	mg/L	1	07/16/19	EK	E200.7
Alkalinity-CaCO3	1430	5.00	mg/L	1	07/13/19	RWR/KDB	SM2320B-11
Conductivity	2720	5.00	umhos/cm	1	07/13/19	RWR/KDB	SM2510B-11
Ammonia as Nitrogen	0.41	0.10	mg/L	2	07/16/19	KDB	E350.1
Tot. Diss. Solids	2100	100	mg/L	10	07/16/19	BMD/BJA	SM2540C-11
Tot. Org. Carbon	81.5	2.5	mg/L	5	07/16/19	RWR	SM5310B-11
Total Solids	2200	50	mg/L	5	07/16/19	BMD	SM2540B-11
Total Metals Digestion	Completed				07/15/19	AG	

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

Comments:

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
July 19, 2019
Reviewed and Released by: Helen Geoghegan, 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

July 19, 2019

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:	SURFACE WATER	Collected by:		07/12/19	6:30
Location Code:	NEB	Received by:	CP	07/12/19	16:30
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	22512				

Laboratory Data

SDG ID: GCD56250
Phoenix ID: CD56251

Project ID: BARNHARDT MFG
Client ID: RECEIVING WATER-3 C39-2638

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Aluminum	0.033	0.020	mg/L	1	07/17/19	TH	SW6010D
Cadmium	< 0.0001	0.0001	mg/L	1	07/16/19	RS	SM3113B/SW7010-10
Copper	< 0.0020	0.0020	mg/L	1	07/17/19	TH	SW6010D
Hardness (CaCO3)	37.9	0.1	mg/L	1	07/18/19		E200.7
Nickel	< 0.001	0.001	mg/L	1	07/17/19	TH	SW6010D
Lead	< 0.0003	0.0003	mg/L	1	07/15/19	RS	SM3113B/SW7010-10
Zinc	< 0.004	0.004	mg/L	1	07/17/19	TH	SW6010D
Alkalinity-CaCO3	58.4	5.00	mg/L	1	07/13/19	RWR/KDB	SM2320B-11
Conductivity	156	5.00	umhos/cm	1	07/13/19	RWR/KDB	SM2510B-11
Ammonia as Nitrogen	< 0.05	0.05	mg/L	1	07/16/19	KDB	E350.1
Tot. Org. Carbon	2.46	0.50	mg/L	1	07/16/19	RWR	SM5310B-11
Total Metals Digestion	Completed				07/16/19	AG/BF	

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

Comments:

If you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200.
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Phyllis Shiller, Laboratory Director
July 19, 2019
Reviewed and Released by: Helen Geoghegan, 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

July 19, 2019

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:		07/12/19	7:00
Location Code:	NEB	Received by:	CP	07/12/19	16:30
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	22512				

Laboratory Data

SDG ID: GCD56250
Phoenix ID: CD56252

Project ID: BARNHARDT MFG
Client ID: EFFLUENT GRAB 3

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference
Chlorine Residual	< 0.02	0.02	mg/L	1	07/12/19 18:59	O	SM4500CLG-97
pH	8.79	1.00	pH Units	1	07/13/19 02:50	RWR/KDB	SM4500-H B-11

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 you are the client above and have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext.200. The contents of this report cannot be discussed with anyone other than the client listed above without their written consent.

Phyllis Shiller, Laboratory Director
July 19, 2019
Reviewed and Released by: Helen Geoghegan, 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

July 19, 2019

QA/QC Data

SDG I.D.: GCD56250

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 487569 (mg/L), QC Sample No: CD56251 (CD56251)														
Cadmium - Water	BRL	0.0001	<0.0001	<0.0001	NC	96.6			94.2			75 - 125	20	
QA/QC Batch 487893 (mg/L), QC Sample No: CD56860 (CD56250)														
Cadmium - Water	BRL	0.0001	<0.0010	<0.0010	NC	101			70.2			75 - 125	20	m
QA/QC Batch 487248 (mg/L), QC Sample No: CD53822 (CD56251)														
Lead (Furnace) - Water	BRL	0.001	<0.0003	<0.001	NC	108			115			75 - 125	30	
QA/QC Batch 487893 (mg/L), QC Sample No: CD56860 (CD56250)														
Lead (Furnace) - Water	BRL	0.001	<0.025	<0.005	NC	93.9			NC			75 - 125	30	
QA/QC Batch 487698 (mg/L), QC Sample No: CD55966 (CD56250)														
ICP Metals - Aqueous														
Aluminum	BRL	0.010	0.156	0.159	1.90	103	97.3	5.7	109			75 - 125	20	
Copper	BRL	0.0025	0.019	0.0186	2.10	101	95.2	5.9	102			75 - 125	20	
Nickel	BRL	0.0005	0.153	0.147	4.00	99.2	93.6	5.8	89.7			75 - 125	20	
Zinc	BRL	0.0020	0.063	0.0608	3.60	97.3	93.4	4.1	96.6			75 - 125	20	
QA/QC Batch 487891 (mg/L), QC Sample No: CD56053 (CD56251)														
ICP Metals - Aqueous														
Aluminum	BRL	0.020	0.584	0.617	5.50	97.3	97.9	0.6	112			75 - 125	20	
Copper	BRL	0.005	0.068	0.067	1.50	102	103	1.0	100			75 - 125	20	
Nickel	BRL	0.001	0.005	0.006	18.2	97.4	105	7.5	104			75 - 125	20	
Zinc	BRL	0.004	0.239	0.237	0.80	97.9	105	7.0	105			75 - 125	20	

m = This parameter is outside laboratory MS/MSD specified recovery limits.

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Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

July 19, 2019

QA/QC Data

SDG I.D.: GCD56250

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 487548 (mg/L), QC Sample No: CD55810 (CD56250, CD56251)													
Alkalinity-CaCO3	BRL	5.00	65	64	NC	103						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 487543 (pH), QC Sample No: CD55810 (CD56252)													
pH			7.55	7.59	0.50	99.5						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 487556 (umhos/cm), QC Sample No: CD55898 (CD56250, CD56251)													
Conductivity	BRL	5.00	676	677	0.10	98.2						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 487862 (mg/L), QC Sample No: CD56436 (CD56250)													
Tot. Diss. Solids	BRL	10	98	88	10.8	99.0						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 487925 (mg/L), QC Sample No: CD57262 (CD56250, CD56251)													
Total Organic Carbon	BRL	1.0	3.8	3.9	NC	103			95.0			85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 487902 (mg/L), QC Sample No: CD57632 (CD56250)													
Total Solids	BRL	10	380	370	2.70	101						85 - 115	20
Comment:													
Additional: LCS acceptance range is 85-115% MS acceptance range 75-125%.													
QA/QC Batch 487707 (mg/L), QC Sample No: CD55917 (CD56250, CD56251)													
Ammonia as Nitrogen	BRL	0.05	<0.05	<0.05	NC	102			97.0			90 - 110	20
QA/QC Batch 487499 (mg/L), QC Sample No: CD55691 (CD56252)													
Chlorine Residual	BRL	0.02	<0.02	<0.02	NC	102							

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
July 19, 2019

Friday, July 19, 2019
Criteria: None
State: MA

Sample Criteria Exceedances Report

GCD56250 - 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 exceedance report. It is provided as an additional tool to identify requested criteria exceedances. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedance 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

July 19, 2019 SDG I.D.: GCD56250

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

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 2.4 Pg of

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 (NA)
Report to: Kim Wills
Invoice to: Kim Wills

Project P.O: 22512
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	Ammonia (0.1 mg/L)	pH (-)	Total Residual Chlorine (0.02 mg/L)	Hardness, alkalinity	Total Solids	Total dissolved solids	TOC	Cd(GA) Pb(GA), Cu, Zn, Ni	Specific conductance			glass amber 8 oz H3PO4	Soil VOA Vials [ ] methanol [ ] Sod Bisulfate	GL Soil container ( ) oz	PL As is 250 ml	PL As is ~~250ml~~ 500 ml	GL Amber 250ml [ ] As is [ ] H2SO4	PL As is 1000ml	PL H2SO4 [X] 250ml [ ] 1000ml	PL HNO3 [ ] ~~250~~ml [ ] 1000ml	PL NaOH 250ml	Bacteria Bottle
56250	Effluent-3 C39-2637	WW	7/11-12/19	0700-0700	X			X	X	X	X	X	X			1				1			1	1		
56251	Receiving Water-3 C39-2638	O	7/12/19	0630	X			X			X	X	X			1				1			1	1		
56252	Effluent Grab - 3	WW	7/12/19	0700		X	X												1							

Relinquished by:	Accepted by:	Date:	Time:
[signature]	[signature]	7-12-19	1600
[signature]	Krystal Hall	7-12-19	16:30

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

SAMPLE RECEIPT CHEMISTRY
&
CHAIN OF CUSTODY DOCUMENTS

NEW ENGLAND BIOASSAY - INITIAL CHEMISTRY DATA

PERMITTEE: Barnhardt Manufacturing Co.

NEB JOB # 05.0044654.00

DATE RECEIVED	7/8/19		7/10/19		7/12/19	
SAMPLE TYPE:	EFF #1	RIVER #1	EFF #2	RIVER #2	EFF #3	RIVER #3
COC #	C39-2521	C39-2522	C39-2587	C39-2588	C39-2637	C39-2638
pH (SU)	8.9	7.5	8.8	7.4	8.6	7.3
Temperature (^{0}C)	9.7	13.2	2.7	6.9	6.5	4.2
Dissolved Oxygen (mg/L)	7.6	8.9	8.5	9.4	7.3	8.5
Conductivity (µmhos)	2,343	117	2,600	126	2,802	156
Salinity (ppt)	1	<1	1	<1	2	< 1
TRC - DPD (mg/L)	<0.001	0.017	<0.001	0.009	<0.001	0.022
TRC - Amperometric (mg/L)	N/A	N/A	N/A	N/A	N/A	N/A
Hardness (mg/L as $CaCO_3$)	50	40	58	42	62	38
Alkalinity (mg/l as $CaCO_3$)	1,155	35	1,285	40	1,430	50
Tech Initials	KO	KO	CH	CH	CW	CW

NOTE: NA = NOT APPLICABLE

Data Reviewed By: [signature] Date Reviewed: 8/5/19

NEW ENGLAND BIOASSAY - CHAIN-OF-CUSTODY

Sample Set #1

EFFLUENT

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

Sampling Method: X Composite
Sample ID: Effluent
Start Date: 7-7-19 Time: 7am
End Date: 7-8-19 Time: 7am

Sampling Method: X Grab (for pH and TRC only X)
Date Collected: 7-8-19
Time Collected: 7am

Sample Type:
____ Prechlorinated
____ Dechlorinated
____ Unchlorinated
____ Chlorinated

RECEIVING WATER

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

Sampling Method: X Grab
Sample ID: North River
Date Collected: 7-8-19
Time Collected: 6:30am

Effluent Sampling Location and Procedures: Composite before outfall

Receiving Water Sampling Location and Procedures: Above outfall

Requested Analysis: X Chronic and modified acute

Sample Shipment

Method of Shipment: NEB Courier

Relinquished By:	[signature]	Date: 7-8-19	Time: 0950
Received By:	[signature]	Date: 7-8-19	Time: 0950
Relinquished By:	[signature]	Date: 7-8-19	Time: 1125
Received By:	[signature]	Date: 7/8/19	Time: 1125

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: 9.7 °C
Temperature of Receiving Water Upon Receipt at Lab: 13.2 °C

Effluent COC# C39-2521
Receiving Water COC# C39-2522

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
Start Date: 7-9-19 Time: 7Am
End Date: 7-10-19 Time: 7Am

Sampling Method: X **Grab** (for pH and TRC only X)
Date Collected: 7-10-19
Time Collected: 7Am

Sample Type:
____ Prechlorinated
____ Dechlorinated
____ Unchlorinated
____ Chlorinated

RECEIVING WATER

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

Sampling Method: X Grab
Sample ID: North River
Date Collected: 7-10-19
Time Collected: 6:30Am

Effluent Sampling Location and Procedures: Composite before outfall

Receiving Water Sampling Location and Procedures: Above outfall

Requested Analysis: X Chronic and modified acute

Sample Shipment

Method of Shipment: NEB Courier

Relinquished By:	[signature]	Date: 7-10-19	Time: 1145
Received By:	[signature]	Date: 7/10/19	Time: 1145
Relinquished By:	[signature]	Date: 7/10/19	Time: 2:30
Received By:	[signature]	Date: 7/10/19	Time: 1430

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: 2.7 °C
Temperature of Receiving Water Upon Receipt at Lab: 6.9 °C

Effluent COC# C39-2587
Receiving Water COC# C39-2588

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

EFFLUENT Sample Set # 3

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

Sampling Method: X Composite
Sample ID: Effluent
Start Date: 7-11-19 Time: 7AM
End Date: 7-12-19 Time: 7AM

RECEIVING WATER

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

Sampling Method: X Grab
Sample ID: North River
Date Collected: 7-12-19
Time Collected: 6:30AM

Sampling Method: X Grab (for pH and TRC only X)
Date Collected: 7-12-19
Time Collected: 7AM

Received
ON ICE

Sample Type:
_____ Prechlorinated
_____ Dechlorinated
_____ Unchlorinated
_____ Chlorinated

Effluent Sampling Location and Procedures: Composite before outfall

Receiving Water Sampling Location and Procedures: Above outfall

Requested Analysis: X Chronic and modified acute

Sample Shipment

Method of Shipment: NEB Courier

Relinquished By:	[illegible]	Date:	7-12-19	Time:	0953
Received By:	[illegible]	Date:	7-12-19	Time:	0953
Relinquished By:	[illegible]	Date:	7-12-19	Time:	1135
Received By:	[illegible]	Date:	7/12/19	Time:	1135

Optional Information

Purchase Order # to reference on invoice: _____

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: 6.5 °C
Temperature of Receiving Water Upon Receipt at Lab: 4.2 °C

Effluent COC# C39-2637
Receiving Water COC# C39-2638

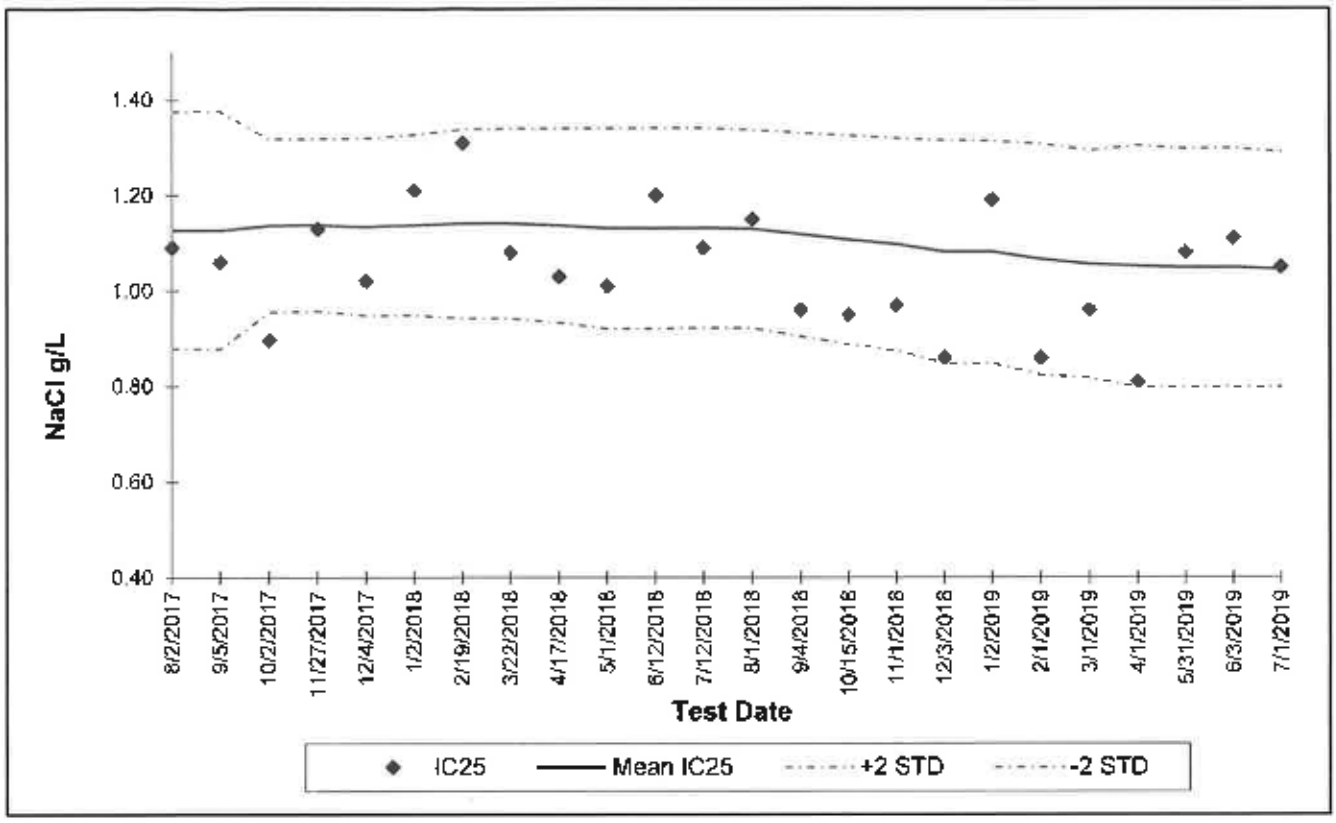
IF THIS COOLER IS MISPLACED OR THE LABEL IS LOST, PLEASE SHIP TO:
KIM WILLS, NEW ENGLAND BIOASSAY 77 BATSON DRIVE MANCHESTER, CT 06042

NEB Issued: 8/5/19

REFERENCE TOXICANT CHARTS

New England Bioassay

Reference Toxicant Data: Sodium chloride (NaCl) *Ceriodaphnia dubia* Chronic Reproduction IC_{25}



Test ID	Date	IC_{25}	Mean IC_{25}	STD	-2STD	+2STD	Avg. CV	Repro PMSD (%)	Avg. PMSD (%)
17-1146	8/2/2017	1.09	1.13	0.12	0.88	1.38	0.11	23.94	15.20
17-1317	9/5/2017	1.06	1.13	0.12	0.88	1.38	0.11	33.78	16.13
17-1516	10/2/2017	0.90	1.14	0.09	0.95	1.32	0.08	24.47	16.53
17-1787	11/27/2017	1.13	1.14	0.09	0.96	1.32	0.08	19.97	16.69
17-1846	12/4/2017	1.02	1.13	0.09	0.95	1.32	0.08	14.69	16.60
18-10	1/2/2018	1.21	1.14	0.09	0.95	1.33	0.08	10.81	16.36
18-271	2/19/2018	1.31	1.14	0.10	0.94	1.34	0.09	22.90	16.56
18-416	3/22/2018	1.08	1.14	0.10	0.94	1.34	0.09	17.59	16.88
18-553	4/17/2018	1.03	1.14	0.10	0.93	1.34	0.09	38.54	17.77
18-607	5/1/2018	1.01	1.13	0.10	0.92	1.34	0.09	24.65	18.25
18-816	6/12/2018	1.20	1.13	0.11	0.92	1.34	0.09	46.97	19.59
18-996	7/12/2018	1.09	1.13	0.10	0.92	1.34	0.09	11.41	19.70
18-1103	8/1/2018	1.15	1.13	0.10	0.92	1.34	0.09	17.23	19.67
18-1315	9/4/2018	0.96	1.12	0.11	0.91	1.33	0.10	22.12	20.09
18-1577	10/15/2018	0.95	1.11	0.11	0.89	1.33	0.10	24.32	20.64
18-1625	11/1/2018	0.97	1.10	0.11	0.88	1.32	0.10	31.57	21.34
18-1756	12/3/2018	0.86	1.08	0.12	0.85	1.32	0.11	15.77	21.00
19-8	1/2/2019	1.19	1.08	0.12	0.85	1.31	0.11	40.72	21.30
19-177	2/1/2019	0.86	1.07	0.12	0.82	1.31	0.11	18.71	21.63
19-265	3/1/2019	0.96	1.06	0.12	0.82	1.29	0.11	19.84	22.13
19-403	4/1/2019	0.81	1.05	0.13	0.80	1.30	0.12	10.09	21.85
19-674	5/31/2019	1.08	1.05	0.12	0.80	1.30	0.12	15.59	21.93
19-688	6/3/2019	1.11	1.05	0.12	0.80	1.30	0.12	15.24	22.23
19-926	7/1/2019	1.05	1.04	0.12	0.80	1.29	0.12	12.60	22.23

National 75th Percentile and 90th Percentile CV Averages for Ceriodaphnia Reproduction IC25 (EPA 833-R-00-003): 0.46 - 0.62
PMSD Upper and Lower Bounds for Ceriodaphnia Reproduction (EPA-821-R-02-013): 13% - 47%