

1005 BOSTON POST ROAD
MADISON, CT 06443



Phone 203-245-0568
Fax 203-318-0830
Connecticut Certification PH-0535
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December 11, 2019

Town of Old Lyme WPCA
Attn: Richard Prendergast
Town Hall
82 Lyme Street
Old Lyme, Ct 06371

RE: Monitoring Well Test Results

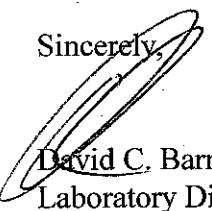
Dear Mr Prendergast,

Enclosed is the report of test results for samples collected on November 19, 2019.

Advise us on any 2020 sampling months.

Please contact me should you have any questions.

Sincerely,


David C. Barris
Laboratory Director

Enclosure

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MADISON, CT 06443



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CONSULTING LABORATORIES, INC.

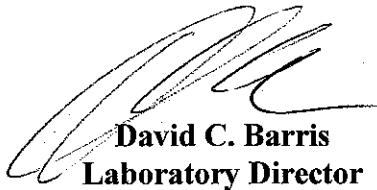
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REPORT OF TESTS

REPORT PREPARED FOR:

**Town of Old Lyme WPCA
83 Lyme Street
Old Lyme, CT 06371**

REPORT PREPARED BY:



**David C. Barris
Laboratory Director**

**ENVIRONMENTAL CONSULTING LABORATORIES, INC.
1005 Boston Post Road
Madison, CT 06443**

REPORT DATE: December 11, 2019

TABLE OF CONTENTS

	<u>Page Number</u>
I. Introduction	1
II. Sample and Site Identification	1
III. Sampling Methodology	1

Appendices:

- Appendix A - Chain of Custody**
- Appendix B - Site Map**
- Appendix C - Sampling Log Records**
- Appendix D- Sampling SOP**

INTRODUCTION

ENVIRONMENTAL CONSULTING LABORATORIES, INC., is a State of Connecticut certified public health laboratory. Dedicated to servicing our clients, we offer comprehensive, cost-effective environmental consulting and testing services. Analytical capabilities include testing of industrial effluents, groundwater, hazardous wastes, sewage, sludge, sediment, soils. All sampling and analytical procedures are in accordance with Federal and State regulations.

Environmental Consulting Laboratories, Inc., maintains strict quality control and assurance procedures to ensure data that can be used with confidence. Strict adherence to EPA approved methods, blanks, standards, spikes, and duplicate sample analyses are routine lab practice. In addition, Environmental Consulting Laboratories, Inc., participates in EPA and Connecticut proficiency performance evaluations.

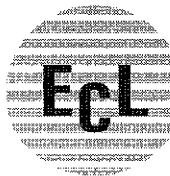
SAMPLE & SITE IDENTIFICATION

Ground water samples were collected by Environmental Consulting Laboratories, Inc., on November 19, 2019. Monitoring wells are identified as HN-1-98, HN-2-98, HN-3-98, HN-4N, HN-5N, HN-6, HN-7, HN-8, HN-9, HN-10 and HN-11. See Site Map in Appendix B

SAMPLING METHODOLOGY

Groundwater samples were taken in accordance with Town of Old Lyme Groundwater Monitoring Standard Operating Procedures. See document in Appendix D.

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Report of Analysis

Name: Old Lyme Town Hall
 c/o WPCA
 52 Lyme Street
 Old Lyme, CT 06371
 Attn: Richard Prendergast
Sample Date: 11/19/2019
Receipt Date: 11/19/2019
Report Date: 12/11/2019
Sample Site: HN-1-98

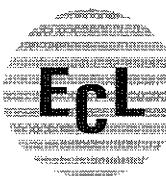
Sample ID#: 128974
Sample Type: Groundwater
Sample Source: Monitoring Wells
Sampler: ECL - MB

Parameter	Sample Result	Units	Method	MDL	Analysis Date	Analyst
Biological						
Coliform, E. Coli	<10	MPN/100mL	Colilert-18	10	11/19/2019	JB
Coliform, Total	<10	MPN/100mL	Colilert-18	10	11/19/2019	JB
Enterococcus Bacteria	<10	MPN/100mL	Enterolert	10	11/19/2019	JB
Fecal Coliform Bacteria	10	MPN/100mL	Colilert-18	10	11/19/2019	JB
Fecal Strep Bacteria	<10	col/100ml	SM9230	10	11/19/2019	JB
Chemical						
Ammonia as N	0.13	mg/L	ASTM D6919-03	0.05	12/3/2019	KC
Chloride	15.7	mg/L	EPA300.0	0.5	11/19/2019	JB
Nitrate as N	6.06	mg/L	EPA300.0	0.1	11/19/2019	JB
Nitrite as N	ND	mg/L	EPA300.0	0.01	11/19/2019	JB
Phosphorous -Total as P	0.07	mg/L	EPA 200.7	0.04	11/26/2019	JB
TKN as N	0.62	mg/L	4500NorgC	0.5	12/10/2019	KC
Total Nitrogen as N	6.68	mg/L	CALC	1	12/11/2019	KC
Physical						
Conductivity	144	umhos/cm	SM2510B	1	11/19/2019	JB
PH	5.30	pH	EPA 150.2	1	11/19/2019	MB
Turbidity	10	NTU	180.1	0.05	11/19/2019	JB

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Report of Analysis

Name: Old Lyme Town Hall
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52 Lyme Street
Old Lyme, CT 06371
Attn: Richard Prendergast
Sample Date: 11/19/2019
Receipt Date: 11/19/2019
Report Date: 12/11/2019
Sample Site: HN-2-98

Sample ID#: 128975
Sample Type: Groundwater
Sample Source: Monitoring Wells
Sampler: ECL - MB

Parameter	Sample Result	Units	Method	MDL	Analysis Date	Analyst
Biological						
Coliform, E. Coli	<10	MPN/100mL	Colilert-18	10	11/19/2019	JB
Coliform, Total	3076	MPN/100mL	Colilert-18	10	11/19/2019	JB
Enterococcus Bacteria	<10	MPN/100mL	Enterolert	10	11/19/2019	JB
Fecal Coliform Bacteria	<10	MPN/100mL	Colilert-18	10	11/19/2019	JB
Fecal Strep Bacteria	<10	col/100ml	SM9230	10	11/19/2019	JB
Chemical						
Ammonia as N	0.07	mg/L	ASTM D6919-03	0.05	12/3/2019	KC
Chloride	25.6	mg/L	EPA300.0	0.5	11/19/2019	JB
Nitrate as N	4.17	mg/L	EPA300.0	0.1	11/19/2019	JB
Nitrite as N	ND	mg/L	EPA300.0	0.01	11/19/2019	JB
Phosphorous -Total as P	0.15	mg/L	EPA 200.7	0.04	11/26/2019	JB
TKN as N	0.62	mg/L	4500NorgC	0.5	12/10/2019	KC
Total Nitrogen as N	4.79	mg/L	CALC	1	12/11/2019	KC
Physical						
Conductivity	160	umhos/cm	SM2510B	1	11/19/2019	JB
pH	6.00	pH	EPA 150.2	1	11/19/2019	MB
Turbidity	45	NTU	180.1	0.05	11/19/2019	JB


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Name: Old Lyme Town Hall
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Old Lyme, CT 06371
Attn: Richard Prendergast

Sample ID#: 128976
Sample Type: Groundwater
Sample Source: Monitoring Wells
Sampler: ECL - MB

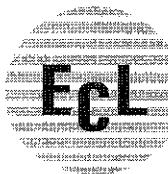
Sample Date: 11/19/2019
Receipt Date: 11/19/2019
Report Date: 12/11/2019
Sample Site: HN-3-98

Parameter	Sample Result	Units	Method	MDL	Analysis Date	Analyst
Biological						
Coliform, E. Coli	41	MPN/100mL	Colilert-18	10	11/19/2019	JB
Coliform, Total	1793	MPN/100mL	Colilert-18	10	11/19/2019	JB
Enterococcus Bacteria	41	MPN/100mL	Enterolert	10	11/19/2019	JB
Fecal Coliform Bacteria	52	MPN/100mL	Colilert-18	10	11/19/2019	JB
Fecal Strep Bacteria	110	col/100ml	SM9230	10	11/19/2019	JB
Chemical						
Ammonia as N	ND	mg/L	ASTM D6919-03	0.05	12/3/2019	KC
Chloride	20.0	mg/L	EPA300.0	0.5	11/19/2019	JB
Nitrate as N	3.11	mg/L	EPA300.0	0.1	11/19/2019	JB
Nitrite as N	ND	mg/L	EPA300.0	0.01	11/19/2019	JB
Phosphorous -Total as P	0.53	mg/L	EPA 200.7	0.04	11/26/2019	JB
TKN as N	2.24	mg/L	4500NorgC	0.5	12/10/2019	KC
Total Nitrogen as N	5.35	mg/L	CALC	1	12/11/2019	KC
Physical						
Conductivity	161	umhos/cm	SM2510B	1	11/19/2019	JB
PH	6.10	pH	EPA 150.2	1	11/19/2019	MB
Turbidity	90	NTU	180.1	0.05	11/19/2019	JB


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Name: Old Lyme Town Hall
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52 Lyme Street
Old Lyme, CT 06371
Attn: Richard Prendergast
Sample Date: 11/19/2019
Receipt Date: 11/19/2019
Report Date: 12/11/2019
Sample Site: HN-4N

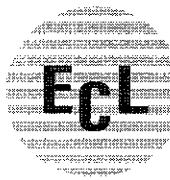
Sample ID#: 128977
Sample Type: Groundwater
Sample Source: Monitoring Wells
Sampler: ECL - MB

Parameter	Sample Result	Units	Method	MDL	Analysis Date	Analyst
Biological						
Coliform, E. Coli	<10	MPN/100mL	Colilert-18	10	11/19/2019	JB
Coliform, Total	<10	MPN/100mL	Colilert-18	10	11/19/2019	JB
Enterococcus Bacteria	<10	MPN/100mL	Enterolert	10	11/19/2019	JB
Fecal Coliform Bacteria	<10	MPN/100mL	Colilert-18	10	11/19/2019	JB
Fecal Strep Bacteria	<10	col/100ml	SM9230	10	11/19/2019	JB
Chemical						
Ammonia as N	ND	mg/L	ASTM D6919-03	0.05	12/3/2019	KC
Chloride	32.2	mg/L	EPA300.0	0.5	11/19/2019	JB
Nitrate as N	3.39	mg/L	EPA300.0	0.1	11/19/2019	JB
Nitrite as N	ND	mg/L	EPA300.0	0.01	11/19/2019	JB
Phosphorous -Total as P	0.85	mg/L	EPA 200.7	0.04	11/26/2019	JB
TKN as N	0.89	mg/L	4500NorgC	0.5	12/10/2019	KC
Total Nitrogen as N	4.28	mg/L	CALC	1	12/11/2019	KC
Physical						
Conductivity	160	umhos/cm	SM2510B	1	11/19/2019	JB
PH	5.50	pH	EPA 150.2	1	11/19/2019	MB
Turbidity	360	NTU		180.1	0.05	11/19/2019

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52 Lyme Street
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Attn: Richard Prendergast
Sample Date: 11/19/2019
Receipt Date: 11/19/2019
Report Date: 12/11/2019
Sample Site: HN-5N

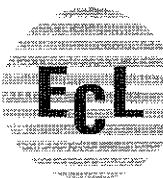
Sample ID#: 128978
Sample Type: Groundwater
Sample Source: Monitoring Wells
Sampler: ECL - MB

Parameter	Sample Result	Units	Method	MDL	Analysis Date	Analyst
Biological						
Coliform, E. Coli	<10	MPN/100mL	Colilert-18	10	11/19/2019	JB
Coliform, Total	30	MPN/100mL	Colilert-18	10	11/19/2019	JB
Enterococcus Bacteria	<10	MPN/100mL	Enterolert	10	11/19/2019	JB
Fecal Coliform Bacteria	10	MPN/100mL	Colilert-18	10	11/19/2019	JB
Fecal Strep Bacteria	<10	col/100ml	SM9230	10	11/19/2019	JB
Chemical						
Ammonia as N	7.14	mg/L	ASTM D6919-03	0.05	12/3/2019	KC
Chloride	33.5	mg/L	EPA300.0	0.5	11/19/2019	JB
Nitrate as N	0.63	mg/L	EPA300.0	0.1	11/19/2019	JB
Nitrite as N	ND	mg/L	EPA300.0	0.01	11/19/2019	JB
Phosphorous -Total as P	1.15	mg/L	EPA 200.7	0.04	11/26/2019	JB
TKN as N	7.35	mg/L	4500NorgC	0.5	12/10/2019	KC
Total Nitrogen as N	7.98	mg/L	CALC	1	12/11/2019	KC
Physical						
Conductivity	351	umhos/cm	SM2510B	1	11/19/2019	JB
PH	6.40	pH	EPA 150.2	1	11/19/2019	MB
Turbidity	340	NTU	180.1	0.05	11/19/2019	JB


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Name: Old Lyme Town Hall
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52 Lyme Street
Old Lyme, CT 06371
Attn: Richard Prendergast
Sample Date: 11/19/2019
Receipt Date: 11/19/2019
Report Date: 12/11/2019
Sample Site: HN-6

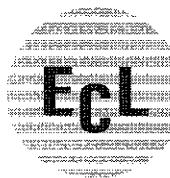
Sample ID#: 128979
Sample Type: Groundwater
Sample Source: Monitoring Wells
Sampler: ECL - MB

Parameter	Sample Result	Units	Method	MDL	Analysis Date	Analyst
Biological						
Coliform, E. Coli	<10	MPN/100mL	Colilert-18	10	11/19/2019	JB
Coliform, Total	20	MPN/100mL	Colilert-18	10	11/19/2019	JB
Enterococcus Bacteria	<10	MPN/100mL	Enterolert	10	11/19/2019	JB
Fecal Coliform Bacteria	<10	MPN/100mL	Colilert-18	10	11/19/2019	JB
Fecal Strep Bacteria	<10	col/100ml	SM9230	10	11/19/2019	JB
Chemical						
Ammonia as N	<0.05	mg/L	ASTM D6919-03	0.05	12/3/2019	KC
Chloride	42.4	mg/L	EPA300.0	0.5	11/19/2019	JB
Nitrate as N	2.04	mg/L	EPA300.0	0.1	11/19/2019	JB
Nitrite as N	ND	mg/L	EPA300.0	0.01	11/19/2019	JB
Phosphorous -Total as P	0.16	mg/L	EPA 200.7	0.04	11/26/2019	JB
TKN as N	1.48	mg/L	4500NorgC	0.5	12/10/2019	KC
Total Nitrogen as N	3.52	mg/L	CALC	1	12/11/2019	KC
Physical						
Conductivity	225	umhos/cm	SM2510B	1	11/19/2019	JB
PH	5.80	pH	EPA 150.2	1	11/19/2019	MB
Turbidity	24	NTU	180.1	0.05	11/19/2019	JB

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Report of Analysis

Name: Old Lyme Town Hall
c/o WPCA
52 Lyme Street
Old Lyme, CT 06371
Attn: Richard Prendergast
Sample Date: 11/19/2019
Receipt Date: 11/19/2019
Report Date: 12/11/2019
Sample Site: HN-7

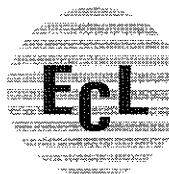
Sample ID#: 128980
Sample Type: Groundwater
Sample Source: Monitoring Wells
Sampler: ECL - MB

Parameter	Sample Result	Units	Method	MDL	Analysis Date	Analyst
Biological						
Coliform, E. Coli	<10	MPN/100mL	Colilert-18	10	11/19/2019	JB
Coliform, Total	<10	MPN/100mL	Colilert-18	10	11/19/2019	JB
Enterococcus Bacteria	<10	MPN/100mL	Enterolert	10	11/19/2019	JB
Fecal Coliform Bacteria	<10	MPN/100mL	Colilert-18	10	11/19/2019	JB
Fecal Strep Bacteria	<10	col/100ml	SM9230	10	11/19/2019	JB
Chemical						
Ammonia as N	ND	mg/L	ASTM D6919-03	0.05	12/3/2019	KC
Chloride	83.1	mg/L	EPA300.0	0.5	11/19/2019	JB
Nitrate as N	1.12	mg/L	EPA300.0	0.1	11/19/2019	JB
Nitrite as N	ND	mg/L	EPA300.0	0.01	11/19/2019	JB
Phosphorous -Total as P	1.22	mg/L	EPA 200.7	0.04	11/26/2019	JB
TKN as N	0.68	mg/L	4500NorgC	0.5	12/10/2019	KC
Total Nitrogen as N	1.80	mg/L	CALC	1	12/11/2019	KC
Physical						
Conductivity	321	umhos/cm	SM2510B	1	11/19/2019	JB
pH	5.40	pH	EPA 150.2	1	11/19/2019	MB
Turbidity	650	NTU	180.1	0.05	11/19/2019	JB

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c/o WPCA
52 Lyme Street
Old Lyme, CT 06371
Attn: Richard Prendergast
Sample Date: 11/19/2019
Receipt Date: 11/19/2019
Report Date: 12/11/2019
Sample Site: HN-8

Sample ID#: 128981
Sample Type: Groundwater
Sample Source: Monitoring Wells
Sampler: ECL - MB

Parameter	Sample Result	Units	Method	MDL	Analysis Date	Analyst
Biological						
Coliform, E. Coli	<10	MPN/100mL	Colilert-18	10	11/19/2019	JB
Coliform, Total	98	MPN/100mL	Colilert-18	10	11/19/2019	JB
Enterococcus Bacteria	176	MPN/100mL	Enterolert	10	11/19/2019	JB
Fecal Coliform Bacteria	31	MPN/100mL	Colilert-18	10	11/19/2019	JB
Fecal Strep Bacteria	<10	col/100ml	SM9230	10	11/19/2019	JB
Chemical						
Ammonia as N	ND	mg/L	ASTM D6919-03	0.05	12/3/2019	KC
Chloride	26.2	mg/L	EPA300.0	0.5	11/19/2019	JB
Nitrate as N	1.90	mg/L	EPA300.0	0.1	11/19/2019	JB
Nitrite as N	ND	mg/L	EPA300.0	0.01	11/19/2019	JB
Phosphorous -Total as P	1.26	mg/L	EPA 200.7	0.04	11/26/2019	JB
TKN as N	4.87	mg/L	4500NorgC	0.5	12/10/2019	KC
Total Nitrogen as N	6.77	mg/L	CALC	1	12/11/2019	KC
Physical						
Conductivity	136	umhos/cm	SM2510B	1	11/19/2019	JB
PH	6.10	pH	EPA 150.2	1	11/19/2019	MB
Turbidity	800	NTU	180.1	0.05	11/19/2019	JB

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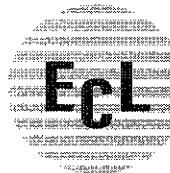
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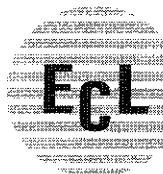
Name:	Old Lyme Town Hall c/o WPCA 52 Lyme Street Old Lyme, CT 06371 Attn: Richard Prendergast	Sample ID#:	128982
Sample Date:	11/19/2019	Sample Type:	Groundwater
Receipt Date:	11/19/2019	Sample Source:	Monitoring Wells
Report Date:	12/11/2019	Sampler:	ECL - MB
Sample Site:	HN-9		

Parameter	Sample Result	Units	Method	MDL	Analysis Date	Analyst
Biological						
Coliform, E. Coli	<10	MPN/100mL	Colilert-18	10	11/19/2019	JB
Coliform, Total	<10	MPN/100mL	Colilert-18	10	11/19/2019	JB
Enterococcus Bacteria	<10	MPN/100mL	Enterolert	10	11/19/2019	JB
Fecal Coliform Bacteria	<10	MPN/100mL	Colilert-18	10	11/19/2019	JB
Fecal Strep Bacteria	<10	col/100ml	SM9230	10	11/19/2019	JB
Chemical						
Ammonia as N	0.83	mg/L	ASTM D6919-03	0.05	12/3/2019	KC
Chloride	3495	mg/L	EPA300.0	0.5	11/19/2019	JB
Nitrate as N	0.39	mg/L	EPA300.0	0.1	11/19/2019	JB
Nitrite as N	ND	mg/L	EPA300.0	0.01	11/19/2019	JB
Phosphorous -Total as P	0.65	mg/L	EPA 200.7	0.04	11/26/2019	JB
TKN as N	2.72	mg/L	4500NorgC	0.5	12/10/2019	KC
Total Nitrogen as N	3.11	mg/L	CALC	1	12/11/2019	KC
Physical						
Conductivity	5730	umhos/cm	SM2510B	1	11/19/2019	JB
PH	6.40	pH	EPA 150.2	1	11/19/2019	MB
Turbidity	310	NTU	180.1	0.05	11/19/2019	JB

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c/o WPCA
52 Lyme Street
Old Lyme, CT 06371
Attn: Richard Prendergast
Sample Date: 11/19/2019
Receipt Date: 11/19/2019
Report Date: 12/11/2019
Sample Site: HN-10

Sample ID#: 128983
Sample Type: Groundwater
Sample Source: Monitoring Wells
Sampler: ECL - MB

Parameter	Sample Result	Units	Method	MDL	Analysis Date	Analyst
Biological						
Coliform, E. Coli	<10	MPN/100mL	Colilert-18	10	11/19/2019	JB
Coliform, Total	<10	MPN/100mL	Colilert-18	10	11/19/2019	JB
Enterococcus Bacteria	20	MPN/100mL	Enterolert	10	11/19/2019	JB
Fecal Coliform Bacteria	<10	MPN/100mL	Colilert-18	10	11/19/2019	JB
Fecal Strep Bacteria	80	col/100ml	SM9230	10	11/19/2019	JB
Chemical						
Ammonia as N	1.29	mg/L	ASTM D6919-03	0.05	12/3/2019	KC
Chloride	1515	mg/L	EPA300.0	0.5	11/19/2019	JB
Nitrate as N	0.42	mg/L	EPA300.0	0.1	11/19/2019	JB
Nitrite as N	ND	mg/L	EPA300.0	0.01	11/19/2019	JB
Phosphorous -Total as P	0.36	mg/L	EPA 200.7	0.04	11/26/2019	JB
TKN as N	2.83	mg/L	4500NorgC	0.5	12/10/2019	KC
Total Nitrogen as N	3.25	mg/L	CALC	1	12/11/2019	KC
Physical						
Conductivity	2470	umhos/cm	SM2510B	1	11/19/2019	JB
PH	5.80	pH	EPA 150.2	1	11/19/2019	MB
Turbidity	130	NTU	180.1	0.05	11/19/2019	JB

DAVID BARRIS - LABORATORY DIRECTOR

ND = Not Detected

1005 BOSTON POST ROAD
MADISON, CT 06443
Phone 203-245-0568
FAX 203-318-0830
Connecticut Certification PH-0535
www.eclinconline.com



**ENVIRONMENTAL
CONSULTING LABORATORIES, INC.**

Report of Analysis

Name: Old Lyme Town Hall
c/o WPCA
52 Lyme Street
Old Lyme, CT 06371
Attn: Richard Prendergast
Sample Date: 11/19/2019
Receipt Date: 11/19/2019
Report Date: 12/11/2019
Sample Site: HN-11

Sample ID#: 128984
Sample Type: Groundwater
Sample Source: Monitoring Wells
Sampler: ECL - MB

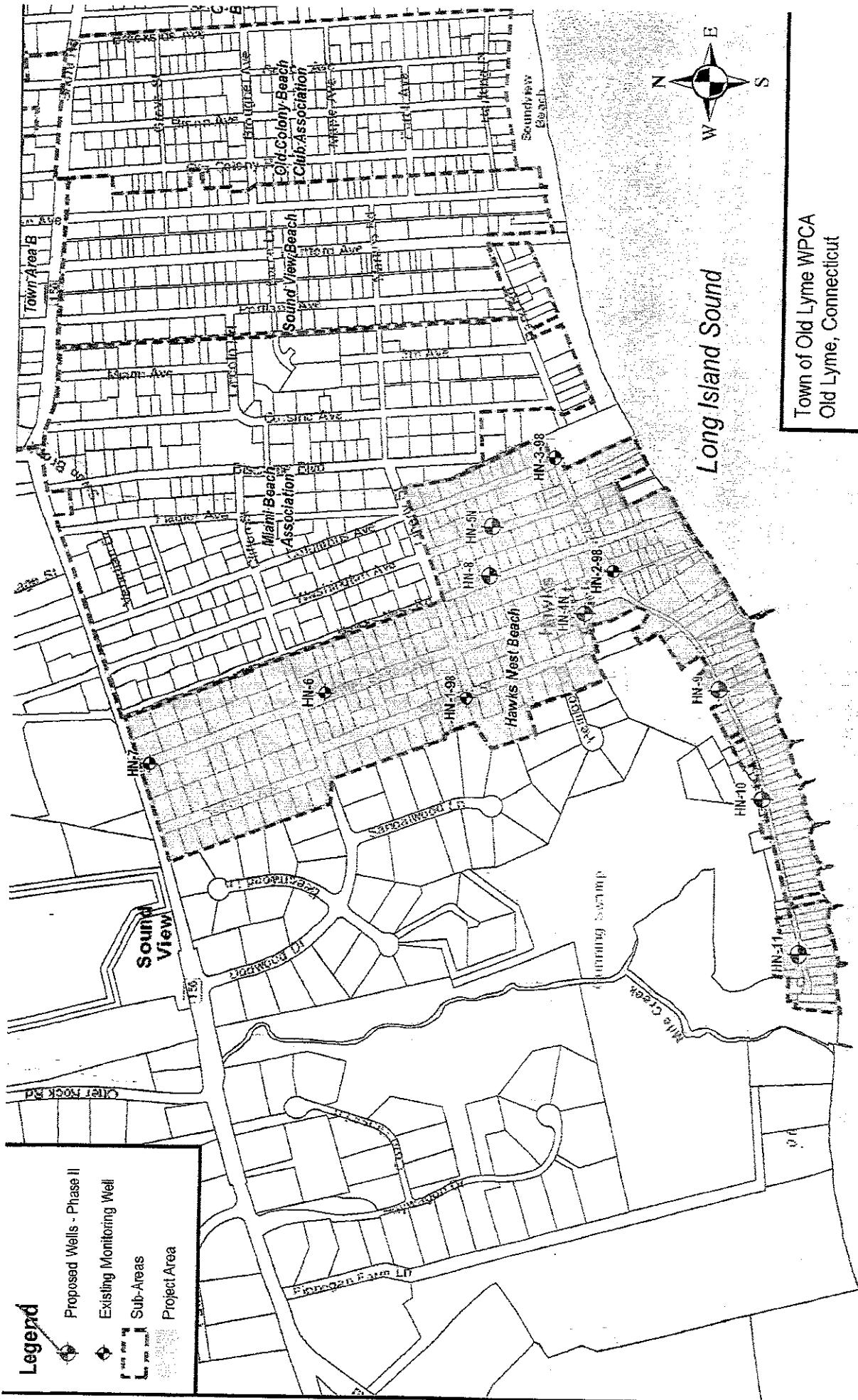
Parameter	Sample Result	Units	Method	MDL	Analysis Date	Analyst
Biological						
Coliform, E. Coli	<10	MPN/100mL	Colilert-18	10	11/19/2019	JB
Coliform, Total	20	MPN/100mL	Colilert-18	10	11/19/2019	JB
Enterococcus Bacteria	<10	MPN/100mL	Enterolert	10	11/19/2019	JB
Fecal Coliform Bacteria	10	MPN/100mL	Colilert-18	10	11/19/2019	JB
Fecal Strep Bacteria	<10	col/100ml	SM9230	10	11/19/2019	JB
Chemical						
Ammonia as N	1.65	mg/L	ASTM D6919-03	0.05	12/3/2019	KC
Chloride	8233	mg/L	EPA300.0	0.5	11/19/2019	JB
Nitrate as N	0.55	mg/L	EPA300.0	0.1	11/19/2019	JB
Nitrite as N	ND	mg/L	EPA300.0	0.01	11/19/2019	JB
Phosphorous -Total as P	0.87	mg/L	EPA 200.7	0.04	11/26/2019	JB
TKN as N	5.14	mg/L	4500NorgC	0.5	12/10/2019	KC
Total Nitrogen as N	5.69	mg/L	CALC	1	12/11/2019	KC
Physical						
Conductivity	10750	umhos/cm	SM2510B	1	11/19/2019	JB
PH	6.40	pH	EPA 150.2	1	11/19/2019	MB
Turbidity	220	NTU	180.1	0.05	11/19/2019	JB

DAVID BARRIS - LABORATORY DIRECTOR

ND = Not Detected

APPENDIX A

APPENDIX B



Proposed Areas for Additional Groundwater Monitoring

Figure 1

SCALE: 1 in = 600 ft	DRAWN BY: ACB
DATE: May 2018	JOB NO.: 228617
DOC: Figure1_Proposed_update05-25-18.mxd	

Notes:

1. Groundwater monitoring well locations are approximated based on Monitoring Well Location Plan, Prepared for Old Lyme WPCA, by J. Robert Pfanner & Associates, P.C., dated May 23, 2017.
2. Proposed locations for the new wells are subject to change based on a review of site conditions and input from stakeholders.



APPENDIX C

GROUND WATER SAMPLE LOG

1. Sample Location: OL

2. Well Number: HN-1-98

3. Sampled By: mB-jm

4. Date: 11-19-19

5. Time: 11:25 AM

6. Weather:

Cloudy	<u>Cold</u>	Snow
<u>Sunny</u>	Warm	Rain
Hot	Windy	

7. Sample Method: **Bailer (Disposable)**

8. Depth to bottom of well from measuring point: 20.10 Feet

9. Depth to Water: 11.40 Feet

10. #8 - #9= LWC: 8.70 Feet (**Length of water column**)

11. Diameter of inner casings: 2" 4" 6"

12. Volume of water in well:

$$2" \text{ Diameter well} = 0.163 \times \text{LWC} = \underline{1.42} \text{ Gallons}$$

$$4" \text{ Diameter Well} = 0.633 \times \text{LWC} = \underline{\quad} \text{ Gallons}$$

$$6" \text{ Diameter Well} = 1.467 \times \text{LWC} = \underline{\quad} \text{ Gallons}$$

13. Purge Volume: $3 \times \#12 = \underline{4.25}$ Gallons to purge

**TOWN OF OLD LYME
WATER QUALITY MEASUREMENTS FORM**

Location (Site/Facility Name) - Old Lyme
Well Number <u>H/N-1-97</u> Date <u>11-19-19</u>

GROUND WATER SAMPLE LOG

1. Sample Location: OL

2. Well Number: HN-2-98

3. Sampled By: mb-jm

4. Date: 11-19-19

5. Time: 9:50 AM

6. Weather:

Cloudy	<u>Cold</u>	Snow
<u>Sunny</u>	Warm	Rain
Hot	Windy	

7. Sample Method: **Bailer (Disposable)**

8. Depth to bottom of well from measuring point: 15.60 Feet

9. Depth to Water: 7.2 Feet

10. #8 - #9 = LWC: 8.40 Feet (**Length of water column**)

11. Diameter of inner casings: 2" 4" 6"

12. Volume of water in well:

$$2" \text{ Diameter well} = 0.163 \times \text{LWC} = \underline{1.37} \text{ Gallons}$$

$$4" \text{ Diameter Well} = 0.633 \times \text{LWC} = \underline{\quad\quad\quad} \text{ Gallons}$$

$$6" \text{ Diameter Well} = 1.467 \times \text{LWC} = \underline{\quad\quad\quad} \text{ Gallons}$$

13. Purge Volume: $3 \times \#12 = \underline{48.11}$ Gallons to purge

Town of Old Lyme
FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) - Old Lyme
 Well Number HW-2-18 Date 11-19-19

Clock Time	Depth To Water	pH	Temperature	Comments
24 HR	7.20	6.0	14.5 $^{\circ}$ C	meter

GROUND WATER SAMPLE LOG

1. Sample Location: OL
2. Well Number: HN-3-98
3. Sampled By: mb-jm
4. Date: 11-19-19
5. Time: 10:20 AM
6. Weather:

Cloudy	<u>Cold</u>	Snow
<u>Sunny</u>	Warm	Rain
Hot	Windy	
7. Sample Method: **Bailer (Disposable)**
8. Depth to bottom of well from measuring point: 13.0 Feet
9. Depth to Water: 5.70 Feet
10. #8 - #9 = LWC: 7.30 Feet (**Length of water column**)
11. Diameter of inner casings: 2" 4" 6"
12. Volume of water in well:
$$2" \text{ Diameter well} = 0.163 \times \text{LWC} = \underline{1.19} \text{ Gallons}$$
$$4" \text{ Diameter Well} = 0.633 \times \text{LWC} = \underline{\quad} \text{ Gallons}$$
$$6" \text{ Diameter Well} = 1.467 \times \text{LWC} = \underline{\quad} \text{ Gallons}$$
13. Purge Volume: $3 \times \#12 = \underline{3.57}$ Gallons to purge

Town of Old Lyme

FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) - Old Lyme
Well Number HV-3-98 **Date** 11-19-19

Clock Time 24 HR	Depth To Water	pH	Temperature	Comments
10:24 AM	5.70	6.01	15.6 ° C	meter

GROUND WATER SAMPLE LOG

1. Sample Location: OL

2. Well Number: HN-4N

3. Sampled By: mb-jm

4. Date: 11-19-19

5. Time: 11:45AM

6. Weather:

Cloudy	<input checked="" type="checkbox"/>	Cold	Snow
<input checked="" type="checkbox"/>	Sunny	Warm	Rain
Hot		Windy	

7. Sample Method: **Bailer (Disposable)**

8. Depth to bottom of well from measuring point: 16.30 Feet

9. Depth to Water: 9.80 Feet

10. #8 - #9 = LWC: 6.50 Feet (**Length of water column**)

11. Diameter of inner casings: 2" 4" 6"

12. Volume of water in well:

$$2" \text{ Diameter well} = 0.163 \times \text{LWC} = \underline{1.06} \text{ Gallons}$$

$$4" \text{ Diameter Well} = 0.633 \times \text{LWC} = \underline{\quad} \text{ Gallons}$$

$$6" \text{ Diameter Well} = 1.467 \times \text{LWC} = \underline{\quad} \text{ Gallons}$$

13. Purge Volume: $3 \times \#12 = \underline{3.18}$ Gallons to purge

Town of Old Lyme

FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) - Old Lyme
Well Number HV-44 **Date** 11-19-19

GROUND WATER SAMPLE LOG

1. Sample Location: OL

2. Well Number: HV-5N

3. Sampled By: mb-jm

4. Date: 11-19-19

5. Time: 10:40 AM

6. Weather:

Cloudy	<input checked="" type="checkbox"/>	Cold	<input checked="" type="checkbox"/>	Snow
<input checked="" type="checkbox"/>	Sunny	Warm	<input checked="" type="checkbox"/>	Rain
Hot		Windy		

7. Sample Method: Bailer (Disposable)

8. Depth to bottom of well from measuring point: 12.90 Feet

9. Depth to Water: 5.30 Feet

10. #8 - #9= LWC: 7.60 Feet (Length of water column)

11. Diameter of inner casings: 2" 4" 6"

12. Volume of water in well:

2" Diameter well = $0.163 \times \text{LWC} = 1.24$ Gallons

4" Diameter Well = $0.633 \times \text{LWC} =$ _____ Gallons

6" Diameter Well = $1.467 \times \text{LWC} =$ _____ Gallons

13. Purge Volume: $3 \times \#12 = 3.72$ Gallons to purge

Town of Old Lyme

FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) - Old Lyme
Well Number 11N-5N Date 11-19-19

Location (Site/Facility Name) - Old Lyme
 Well Number HV-5W Date 11-19-19

Clock	Time	Depth To Water	pH	Temperature	Comments
24 HR					
10:45AM		5.30	6.40	14.5°C	—

GROUND WATER SAMPLE LOG

1. Sample Location: OL

2. Well Number: HN-6

3. Sampled By: mb jm

4. Date: 11-19-19

5. Time: 12:00pm

6. Weather:

Cloudy	<u>Cold</u>	Snow
<u>Sunny</u>	Warm	Rain
Hot	Windy	

7. Sample Method: **Bailer (Disposable)**

8. Depth to bottom of well from measuring point: 13.0 Feet

9. Depth to Water: 10.50 Feet

10. #8 - #9= LWC: 2.50 Feet (**Length of water column**)

11. Diameter of inner casings: 2" 4" 6"

12. Volume of water in well:

2" Diameter well = $0.163 \times \text{LWC} =$ 0.41 Gallons

4" Diameter Well = $0.633 \times \text{LWC} =$ _____ Gallons

6" Diameter Well = $1.467 \times \text{LWC} =$ _____ Gallons

13. Purge Volume: $3 \times \#12 =$ 1.22 Gallons to purge

TOWN OF OLD LYME
FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) - Old Lyme
Well Number H-N-6 Date 11-19-19

Location (Site/Facility Name) - Old Lyme	
Well Number	HW-6
Date	11-19-19
Clock	Depth To
Time	Water
24 HR	pH
12:00pm	10.50
	5.8
	15.8 ^o C
	meter

GROUND WATER SAMPLE LOG

1. Sample Location: OL

2. Well Number: HN-7

3. Sampled By: mb-jm

4. Date: 11-19-19

5. Time: 12:30pm

6. Weather:

<u>Cloudy</u>	<u>Cold</u>	Snow
<u>Sunny</u>	Warm	Rain
Hot	Windy	

7. Sample Method: **Bailer (Disposable)**

8. Depth to bottom of well from measuring point: 16.80 Feet

9. Depth to Water: 9.50 Feet

10. #8 - #9= LWC: 7.30 Feet (**Length of water column**)

11. Diameter of inner casings: 2" 4" 6"

12. Volume of water in well:

2" Diameter well = $0.163 \times \text{LWC} =$ 1.19 Gallons

4" Diameter Well = $0.633 \times \text{LWC} =$ _____ Gallons

6" Diameter Well = $1.467 \times \text{LWC} =$ _____ Gallons

13. Purge Volume: $3 \times \#12 =$ 3.57 Gallons to purge

Town of Old Lyme

FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) - Old Lyme
Well Number HV-7 **Date** 11-19-19

Location (Site/Facility Name) - Old Lyme
 Well Number HN-7 Date 11-19-19

GROUND WATER SAMPLE LOG

1. Sample Location: OL
2. Well Number: HW-8
3. Sampled By: mb jm
4. Date: 11-19-19
5. Time: 11:05 AM
6. Weather:

Cloudy	<u>Cold</u>	Snow
<u>Sunny</u>	Warm	Rain
Hot	Windy	
7. Sample Method: **Bailer (Disposable)**
8. Depth to bottom of well from measuring point: 11.90 Feet
9. Depth to Water: 6.40 Feet
10. #8 - #9 = LWC: 5.50 Feet (Length of water column)
11. Diameter of inner casings: (2") 4" 6"
12. Volume of water in well:
2") Diameter well = $0.163 \times \text{LWC} =$, 89 Gallons
4" Diameter Well = $0.633 \times \text{LWC} =$ _____ Gallons
6" Diameter Well = $1.467 \times \text{LWC} =$ _____ Gallons
13. Purge Volume: $3 \times \#12 =$ 3.70 Gallons to purge

Town of Old Lyme

FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) - Old Lyme

Well Number HV-8 Date 11-19-19

Location (Site/Facility Name) - Old Lyme
 Well Number HW-8 Date 11-19-19

GROUND WATER SAMPLE LOG

1. Sample Location: OL

2. Well Number: HN-9

3. Sampled By: mb-jm

4. Date: 11-19-19

5. Time: 9:30 AM

6. Weather:

Cloudy	<u>Cold</u>	Snow
<u>Sunny</u>	Warm	Rain
Hot	Windy	

7. Sample Method: **Bailer (Disposable)**

8. Depth to bottom of well from measuring point: 11.40 Feet

9. Depth to Water: 3.10 Feet

10. #8 - #9= LWC: 8.30 Feet (**Length of water column**)

11. Diameter of inner casings: 2" 4" 6"

12. Volume of water in well:

$$2" \text{ Diameter well} = 0.163 \times \text{LWC} = \underline{1.35} \text{ Gallons}$$

$$4" \text{ Diameter Well} = 0.633 \times \text{LWC} = \underline{\quad} \text{ Gallons}$$

$$6" \text{ Diameter Well} = 1.467 \times \text{LWC} = \underline{\quad} \text{ Gallons}$$

13. Purge Volume: $3 \times \#12 = \underline{48 \text{ } 1 \text{ --}}$ Gallons to purge

Town of Old Lyme

FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) - Old Lyme
Well Number HW-9 Date 11-19-19

GROUND WATER SAMPLE LOG

1. Sample Location: OL

2. Well Number: HN-10

3. Sampled By: mb-jm

4. Date: 11-19-19

5. Time: 9:10 AM

6. Weather:

Cloudy	<u>Cold</u>	Snow
<u>Sunny</u>	Warm	Rain
Hot	Windy	

7. Sample Method: **Bailer (Disposable)**

8. Depth to bottom of well from measuring point: 11.50 Feet

9. Depth to Water: 3.50 Feet

10. #8 - #9 = LWC: 8.0 Feet (Length of water column)

11. Diameter of inner casings: 2" 4" 6"

12. Volume of water in well:

2" Diameter well = $0.163 \times \text{LWC} =$ 1.30 Gallons

4" Diameter Well = $0.633 \times \text{LWC} =$ _____ Gallons

6" Diameter Well = $1.467 \times \text{LWC} =$ _____ Gallons

13. Purge Volume: $3 \times \#12 =$ 3.91 Gallons to purge

Town of Old Lyme

FIELD WATER QUALITY MEASUREMENTS FORM

Location (Site/Facility Name) - Old Lyme
Well Number HV-10 **Date** 11-19-19

Well Number	Location (Site/County Name)	Date
HN-10	—	11-19-19

GROUND WATER SAMPLE LOG

1. Sample Location: OL

2. Well Number: HN-11

3. Sampled By: mb-jm

4. Date: 11-19-19

5. Time: 8:50 AM

6. Weather:

Cloudy	<u>Cold</u>	Snow
<u>Sunny</u>	Warm	Rain
Hot	Windy	

7. Sample Method: **Bailer (Disposable)**

8. Depth to bottom of well from measuring point: 11.40 Feet

9. Depth to Water: 3.90 Feet

10. #8 - #9 = LWC: 7.50 Feet (**Length of water column**)

11. Diameter of inner casings: 2" 4" 6"

12. Volume of water in well:

$$2" \text{ Diameter well} = 0.163 \times \text{LWC} = \underline{1.02} \text{ Gallons}$$

$$4" \text{ Diameter Well} = 0.633 \times \text{LWC} = \underline{\quad} \text{ Gallons}$$

$$6" \text{ Diameter Well} = 1.467 \times \text{LWC} = \underline{\quad} \text{ Gallons}$$

13. Purge Volume: $3 \times \#12 = \underline{3.67}$ Gallons to purge

**TOWN OF OLD LYME
WATER CITY MEASUREMENTS FORM**

Location (Site/Facility Name) - Old Lyme
Well Number H-11 **Date** 11-19-94

Location (Site/Facility Name) - Old Lyme					
Well Number		Date			
Clock Time 24 HR	Depth To Water	pH	Temperature	Comments	
8:50 AM	3.90	6.4	14.8°C	—	

APPENDIX D

Town of Old Lyme Ground Water Monitoring

SAMPLING SOP Rev 4 - Environmental Consulting Lab

Groundwater Monitoring Wells

Bailer Purge Technique

Overview:

Stagnant water must be removed from the monitoring well in order to obtain an accurate sample of groundwater for laboratory analysis.

This SOP will address the bailing and sampling procedures to be taken.

Safety:

Prior to sampling, field personnel should conduct a preliminary assessment of the area to determine any safety hazards.

Placement of traffic cones, safety vests and truck hazard lights should be used.

Minimize monitoring well water contact with potential personal protective equipment i.e. safety glasses & nitrile gloves.

Procedure:

Prior to purging the well, observe for any physical problems with monitoring well, ie: lock present, well cap broken or missing, condition of casing, etc.

Measure groundwater to the nearest hundredth of inch record on field sheet with time of measurement. Calculate the volume of standing water to purge a minimum of three volumes using prior readings of depth to bottom, to avoid agitating fines that may have accumulated on the bottom of the well.

A separate new bailer will be used for each well to minimize the potential for cross contamination of sampling equipment.

Lower bailer into monitoring well in a manner as to create minimum water disturbance. Repeat this process until three well volumes have been purged.

Following purging of three well volumes, measure pH and Temperature of the groundwater and record on field worksheet.

Sample Collection:

1. Do not rinse or empty bottles. Several bottles contain a preservative that must remain in the bottle.
2. If there is an overflow while filling a sample bottle that contains preservatives, restart the procedure using a new sample bottle.
3. If one bottle is to be used for several different tests, be sure there are no conflicts with preservation requirements.

Field Logs:

Use the Ground Water Sample Log (attached) to record all field information. Include Well ID, Date and Time, Weather, readings, observations and calculations for purge volume

Complete the Chain of Custody form (attached). Include sample ID/location, date and time.

The following pages contain specific sampling instructions and procedures that are dependent on analyte type.

GROUP:
Inorganics

SUBGROUP:

Chloride,Nitrate,Nitrite

BOTTLE: 500-mL

Preservative: Chill to 4 degrees C.

Holding Time: 48 Hrs

Test Method: EPA 300.1 Ion Chromatography

PROCEDURE

1. Using waterproof ink, fill out and attach label. At a minimum, include the Well ID number, sampling point and date.
2. Remove the sampling container cap. Be careful not to touch the inside of the sampling container or cap with your fingers. When possible, hold the sampling container in one hand and the cap in the other or set the cap on a clean surface. Quickly position the sampling container under the water flow.
3. Fill to the shoulder of the container. Do not over fill.
4. Quickly remove the sampling container from the water flow.
5. Replace cap and tighten.
6. Completely fill out the chain of custody form.
7. Sample must be placed in coolers for laboratory submittal.

GROUP:
Bacteria

Total/ Fecal
Coliforms,
Enterococci, Fecal
Strep

BOTTLE: (4) 120 mL sterile plastic bottle

Preservative: Chill to 4 degrees C.

Holding Time: 8 Hrs.

Test Methods: Colilert-18, Enterolert, SM9230

PROCEDURE

1. Using waterproof ink, fill out and attach label. At a minimum, include the Well ID number, sampling point and date.
2. Remove the sampling container cap. Be careful not to touch the inside of the sampling container or cap with your fingers. When possible, hold the sampling container in one hand and the cap in the other or set the cap on a clean surface. Quickly position the sampling container under the water flow.
3. Fill to at least the 100 mL mark. Leave some air space.
4. Quickly remove the sampling container from the waterflow.
5. Replace cap and tighten.
6. Completely fill out the chain of custody form.
7. Sample must be placed in coolers for laboratory submittal.

GROUP:
Inorganic

SUBGROUP:

Phosphorus-Total

BOTTLE: One 125 ml

Preservative: PH<2 1:1 Nitric Acid

Test Method: EPA 200.7 ICP

PROCEDURE:

1. Using waterproof ink, fill out and attach label. At a minimum, include the Well ID number, sampling point and date.
2. Remove the sampling container cap. Be careful not to touch the inside of the sampling container or cap with your fingers. When possible, hold the sampling container in one hand and the cap in the other or set the cap on a clean surface. Quickly position the sampling container under the water flow.
3. Fill to the shoulder of the container. Do not over fill.
4. Quickly remove the sampling container from the water flow.
5. Bottle contains Nitric Acid Preservative.
6. Replace cap and tighten.
7. Completely fill out the chain of custody form.
8. Sample must be placed in coolers for laboratory submittal.

GROUP:

Inorganic

SUBGROUP:

Ammonia, TKN

BOTTLE: 125-mL

Preservative: PH <2 with 1:1 Sulfuric Acid

Holding time: 28 Days

Test Method: ASTM D6919-03, SM 4500-Norg C

PROCEDURE

1. Using waterproof ink, fill out and attach label. At a minimum, include the Well ID number, sampling point and date.
2. Remove the sampling container cap. Be careful not to touch the inside of the sampling container or cap with your fingers. When possible, hold the sampling container in one hand and the cap in the other or set the cap on a clean surface. Quickly position the sampling container under the water flow.
3. Fill to the shoulder of the container. Do not over fill.
4. Quickly remove the sampling container from the water flow.
5. Bottle contains Sulfuric Acid Preservative.
6. Replace cap and tighten.
7. Completely fill out the chain of custody form.
8. Sample must be placed in coolers for laboratory submittal