

September 3, 2019

Mike Nickerson, CHMM  
Environmental/Safety Coordinator  
Central Bucks School District  
320 West Swamp Road  
Doylestown, PA 18901

**Re: Lead in Drinking Water Sample Collection and Reporting  
Re-Sampling of Central Bucks School Drinking Water Fixtures  
Bucks County, Pennsylvania**

Dear Mr. Nickerson:

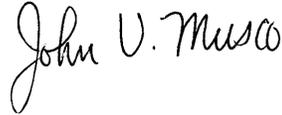
Langan Engineering and Environmental Services, Inc. (Langan) has prepared this summary to document the total lead analytical results to the drinking water re-sampling activities at specific schools. The results of the initial drinking water sampling activities documented that total lead was present in 16 of 1076 samples collected from drinking water fixtures at all schools at levels above the 15 micrograms per liter (ug/l) regulatory level. Also, select fixtures, where the initial results were between 10 – 15 ug/l were also re-sampled. In addition, several fixtures where the results were above the regulatory limit were decommissioned and removed from service. The re-sampling was conducted after the former fixtures were replaced with new fixtures. The table provided below summarizes the re-sampling location, number of samples and date of sampling.

<b>School Location</b>	<b>Number of Fixtures Re-Sampled</b>	<b>Date Sampled</b>
Kutz Elementary	2	8/16/2019
Cold Spring Elementary	1	8/16/2019
Groveland Elementary	1	8/16/2019
Buckingham Elementary	15	8/16/2019, 8/20/2019
Lenape Middle School	2	8/20/2019
Tohickon Middle School	1	8/20/2019
Unami Middle School	1	8/16/2019

The attached Appendices provide a summary of the initial results, the re-sampling results and the laboratory data packages.

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Sincerely,  
**Langan Engineering & Environmental Services, Inc.**



John V. Musco  
Associate

cc: R. Copenhaver, PG – Langan  
B. Lambing - Langan

List of Appendices  
Appendix A – Sampling Summary Table  
Appendix B – Lab Data Packages

## **APPENDIX A**

**APPENDIX A**  
**Summary of Water Testing Analytical Results - Re-Sampling Event**  
**Total Lead Analysis**

School Name	Sample name given by CBSD	Original Sample ID on Chain of Custody		Original Sample Date	Original Sample Result (ug/L)	Re-Sample ID	Resample date	Result
		Original Sample ID on Chain of Custody	Original Sample Date					
Lenape	Rm 205	L205	6/6/2019	6/6/2019	15.3	L205R	8/20/2019	1.8
Lenape	library office	L510B	6/6/2019	6/6/2019	24.9	L510BR	8/20/2019	64.6
Kutz	nurses office	KNO	6/6/2019	6/6/2019	16.2	KNOR	8/16/2019	1.4
Kutz	E4	KE4	6/6/2019	6/6/2019	25.7	KE4R	8/16/2019	5.9
Unami	kitchen 2-bowl sink by office window	U333A	6/7/2019	6/7/2019	37.4	U333AR	8/16/2019	1.2
Cold Spring	library work room	111	6/12/2019	6/12/2019	15.2	111R	8/16/2019	3.1
Buckingham	Rm 3	B3	6/12/2019	6/12/2019	449.0	B3RB	8/16/2019	143
Buckingham	Rm 4	B4A	6/12/2019	6/12/2019	12.7	B4AR	8/16/2019	10.3
Buckingham	Rm 5	B5	6/12/2019	6/12/2019	12.6	B5R	8/16/2019	60.9
Buckingham	Rm 8	B8B	6/12/2019	6/12/2019	14.9	B8BR	8/16/2019	9.1
Buckingham	library	B23A	6/12/2019	6/12/2019	31.8	B23AR	8/16/2019	35.5
Buckingham	Rm 51	B51	6/12/2019	6/12/2019	34.6	B51R	8/16/2019	20.5
Buckingham	Rm 52	B52	6/12/2019	6/12/2019	18.4	B52R	8/16/2019	22.3
Buckingham	Rm 53	B53	6/12/2019	6/12/2019	13.7	B53R	8/16/2019	36.7
Buckingham	Rm 54	B54	6/12/2019	6/12/2019	14.9	B54R	8/16/2019	30.1
Buckingham	Rm 55	B55	6/12/2019	6/12/2019	14.7	B55R	8/16/2019	35.7
Buckingham	faculty room	B57	6/12/2019	6/12/2019	31.7	B57R	8/16/2019	4.4
Buckingham	Kitchen 2-bowl under window	B58	6/12/2019	6/12/2019	13.4	B58R	8/20/2019	16.1
Buckingham	nurses office	B2A	6/12/2019	6/12/2019	52.1	B2AR	8/16/2019	4.9
Buckingham	nurses office	B2B	6/12/2019	6/12/2019	14.6	B2BR	8/16/2019	15.3
Buckingham	Outdoor faucet	N/A	N/A	N/A	N/A	BOWF	8/20/2019	42.1
Groveland	Nurses treatment	V118B			19.4	V118BR	8/16/2019	12.5
Tohickon	nurses office	TNB			17.6	TNBR	8/20/2019	1.8

Result above 15 ug/l  
N/A No Sample Collected

## **APPENDIX B**

**KUTZ**

August 28, 2019

Randy Copenhaver  
Langan Engineering  
2700 Kelly Road, Suite 200  
Warrington, PA 18976

RE: Project: CENTRAL BUCKS S.D. (KUTZ)  
Pace Project No.: 70101867

Dear Randy Copenhaver:

Enclosed are the analytical results for sample(s) received by the laboratory on August 17, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



John D. Stanton  
john.stanton@pacelabs.com  
(631)694-3040  
Project Manager

Enclosures

cc: Bill Lambing, Langan Engineering



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

## CERTIFICATIONS

Project: CENTRAL BUCKS S.D. (KUTZ)

Pace Project No.: 70101867

---

### Long Island Certification IDs

575 Broad Hollow Rd, Melville, NY 11747

New York Certification #: 10478 Primary Accrediting Body

New Jersey Certification #: NY158

Pennsylvania Certification #: 68-00350

Connecticut Certification #: PH-0435

Maryland Certification #: 208

Rhode Island Certification #: LAO00340

Massachusetts Certification #: M-NY026

New Hampshire Certification #: 2987

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## REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: CENTRAL BUCKS S.D. (KUTZ)

Pace Project No.: 70101867

Sample: <b>KNOR</b>		Lab ID: <b>70101867001</b>	Collected: 08/16/19 09:29	Received: 08/17/19 10:30	Matrix: Drinking Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

**200.8 MET ICPMS Drinking Water** Analytical Method: EPA 200.8

Lead	<b>1.4</b>	ug/L	1.0	1		08/22/19 13:04	7439-92-1	
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Sample: <b>KE4R</b>		Lab ID: <b>70101867003</b>	Collected: 08/16/19 09:32	Received: 08/17/19 10:30	Matrix: Drinking Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

**200.8 MET ICPMS Drinking Water** Analytical Method: EPA 200.8

Lead	<b>5.9</b>	ug/L	1.0	1		08/22/19 13:05	7439-92-1	
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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: CENTRAL BUCKS S.D. (KUTZ)  
Pace Project No.: 70101867

QC Batch: 126856 Analysis Method: EPA 200.8  
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET No Prep Drinking Water  
Associated Lab Samples: 70101867001, 70101867003

METHOD BLANK: 605654 Matrix: Water  
Associated Lab Samples: 70101867001, 70101867003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Lead	ug/L	<1.0	1.0	08/22/19 12:40	

LABORATORY CONTROL SAMPLE: 605655

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Lead	ug/L	50	52.1	104	85-115	

MATRIX SPIKE SAMPLE: 605658

Parameter	Units	70101863001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Lead	ug/L	143	4	147	99	70-130	M1

MATRIX SPIKE SAMPLE: 605660

Parameter	Units	70101863019 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Lead	ug/L	30.1	4	34.0	97	70-130	M1

SAMPLE DUPLICATE: 605657

Parameter	Units	70101863001 Result	Dup Result	RPD	Qualifiers
Lead	ug/L	143	145	1	

SAMPLE DUPLICATE: 605659

Parameter	Units	70101863019 Result	Dup Result	RPD	Qualifiers
Lead	ug/L	30.1	29.9	1	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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## QUALIFIERS

Project: CENTRAL BUCKS S.D. (KUTZ)

Pace Project No.: 70101867

---

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### ANALYTE QUALIFIERS

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CENTRAL BUCKS S.D. (KUTZ)

Pace Project No.: 70101867

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Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
70101867001	KNOR	EPA 200.8	126856		
70101867003	KE4R	EPA 200.8	126856		

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Sample Condition

WO#: 70101867

PM: JDS Due Date: 08/26/19
CLIENT: LAN-PA

Client Name:

Langan

Courier: [X] Fed Ex [ ] UPS [ ] USPS [ ] Client [ ] Commercial [ ] Pace [ ] Other

Tracking #: 760 0760 2340

Custody Seal on Cooler/Box Present: [ ] Yes [X] No Seals intact: [ ] Yes [ ] No

Temperature Blank Present: [ ] Yes [X] No

Packing Material: [X] Bubble Wrap [ ] Bubble Bags [ ] Ziploc [ ] None [ ] Other

Type of Ice: Wet Blue [X] None

Thermometer Used: FH091

Correction Factor: +0.2

[ ] Samples on ice, cooling process has begun

Cooler Temperature (°C): 23.8

Cooler Temperature Corrected (°C): 24.0

Date/Time 5035A kits placed in freezer

Temp should be above freezing to 6.0°C

USDA Regulated Soil ( [ ] N/A, water sample)

Date and Initials of person examining contents: JAS 8/27/19

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX, or VA (check map)? [ ] YES [ ] NO

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? [ ] Yes [ ] No

If Yes to either question, fill out a Regulated Soil Checklist (F-LI-C-010) and include with SCUR/COC paperwork.

Table with 16 rows and 3 columns: Question, Yes/No/N/A, and Comments. Includes fields for Chain of Custody, Sample Labels, Preservation, and Trip Blank information.

Client Notification/ Resolution:

Field Data Required? Y / N

Person Contacted:

Date/Time:

Comments/ Resolution:

**COLD SPRING**

August 28, 2019

Randy Copenhaver  
Langan Engineering  
2700 Kelly Road, Suite 200  
Warrington, PA 18976

RE: Project: CENTRAL BUCKS (COLD SPRING)  
Pace Project No.: 70101865

Dear Randy Copenhaver:

Enclosed are the analytical results for sample(s) received by the laboratory on August 17, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



John D. Stanton  
john.stanton@pacelabs.com  
(631)694-3040  
Project Manager

Enclosures

cc: Bill Lambing, Langan Engineering



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Project: CENTRAL BUCKS (COLD SPRING)

Pace Project No.: 70101865

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Massachusetts Certification #: M-NY026

New Hampshire Certification #: 2987

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## ANALYTICAL RESULTS

Project: CENTRAL BUCKS (COLD SPRING)

Pace Project No.: 70101865

Sample: 111R	Lab ID: 70101865001	Collected: 08/16/19 09:02	Received: 08/17/19 10:30	Matrix: Drinking Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.8 MET ICPMS Drinking Water</b>		Analytical Method: EPA 200.8						
Lead	<b>3.1</b>	ug/L	1.0	1		08/22/19 13:03	7439-92-1	

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### QUALITY CONTROL DATA

Project: CENTRAL BUCKS (COLD SPRING)  
Pace Project No.: 70101865

QC Batch: 126856 Analysis Method: EPA 200.8  
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET No Prep Drinking Water  
Associated Lab Samples: 70101865001

METHOD BLANK: 605654 Matrix: Water  
Associated Lab Samples: 70101865001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Lead	ug/L	<1.0	1.0	08/22/19 12:40	

LABORATORY CONTROL SAMPLE: 605655

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Lead	ug/L	50	52.1	104	85-115	

MATRIX SPIKE SAMPLE: 605658

Parameter	Units	70101863001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Lead	ug/L	143	4	147	99	70-130	M1

MATRIX SPIKE SAMPLE: 605660

Parameter	Units	70101863019 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Lead	ug/L	30.1	4	34.0	97	70-130	M1

SAMPLE DUPLICATE: 605657

Parameter	Units	70101863001 Result	Dup Result	RPD	Qualifiers
Lead	ug/L	143	145	1	

SAMPLE DUPLICATE: 605659

Parameter	Units	70101863019 Result	Dup Result	RPD	Qualifiers
Lead	ug/L	30.1	29.9	1	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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## QUALIFIERS

Project: CENTRAL BUCKS (COLD SPRING)

Pace Project No.: 70101865

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### DEFINITIONS

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J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### ANALYTE QUALIFIERS

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CENTRAL BUCKS (COLD SPRING)  
Pace Project No.: 70101865

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<b>Lab ID</b>	<b>Sample ID</b>	<b>QC Batch Method</b>	<b>QC Batch</b>	<b>Analytical Method</b>	<b>Analytical Batch</b>
70101865001	111R	EPA 200.8	126856		

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### REPORT OF LABORATORY ANALYSIS

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WO#: 70101865



# CHAIN-OF-CUSTODY / Analytical Request

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields

<b>Section A</b>		<b>Section B</b>		<b>Section C</b>	
<b>Required Client Information:</b>		<b>Required Project Information:</b>		<b>Invoice Information:</b>	
Company: Langan Engineering	Report To: Randy Copenhaver	Company Name: Langan Engineering	Attention: Randy Copenhaver	Company Name: Langan Engineering	Address: 2700 Kelly Road, Suite 200
Address: 2700 Kelly Road, Suite 200	Copy To: Bill Lambing - blambing@langan.com	Address: 2700 Kelly Road, Suite 200	Address: See Langan-Pace MSA	Address: 2700 Kelly Road, Suite 200	State / Location: PA
Marrington, PA 18976					
Email: rcopenhaver@langan.com	Purchase Order #: 200130401-400-001	Pace Project Manager: john.stanton@pacelabs.com	Pace Quote: See Langan-Pace MSA	Pace Project Manager: john.stanton@pacelabs.com	Regulatory Agency: PA
Phone: 215-491-6500	Project Name: Central Bucks School District (Cold Spring)	Pace Profile #: 7983			
Requested Due Date: RUSH	Project #: 200130401				

ITEM #	MATRIX	CODE	COLLECTED		SAMPLE TYPE (G=GRAB C=COMP)	MATRIX CODE (see valid codes to left)	# OF CONTAINERS	Preservatives							Analyses Test Y/N	Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)
			START DATE	END DATE				H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other			
1	DW	DW	8/16/2019 902	8/16/2019 902	G	DW	1	X									
2	DW	DW	8/16/2019 903	8/16/2019 903	G	DW	1	X									
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	
11																	
12																	

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
YELLOW HIGHLIGHT TO BE SAMPLED	Bill Lambing	8/16/2019	1700	Randy Copenhaver	8/17/2019	10:30	Sealed, Cooled, Intact
* HOLD UNTIL NOTIFIED							

SAMPLER NAME AND SIGNATURE		Received on	Ice	Custody	Sealed	Cooled	Intact
PRINT Name of SAMPLER:		TEMP in C	(Y/N)	(Y/N)	(Y/N)	(Y/N)	(Y/N)
SIGNATURE of SAMPLER:							
DATE Signed:							



# Sample Condition Upon Receipt

**WO#: 70101865**  
 PM: JDS Due Date: 08/26/19  
 CLIENT: LAN-PA

Client Name:

Langan

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace  Other

Tracking #: 760 0760 2340

Custody Seal on Cooler/Box Present:  Yes  No      Seals intact:  Yes  No

Temperature Blank Present:  Yes  No

Packing Material:  Bubble Wrap  Bubble Bags  Ziploc  None  Other

Type of Ice: Wet Blue None

Thermometer Used: FH091

Correction Factor: +0.2

Samples on ice, cooling process has begun

Cooler Temperature (°C): 23.8

Cooler Temperature Corrected (°C): 24.0

Date/Time 5035A kits placed in freezer

Temp should be above freezing to 6.0°C

USDA Regulated Soil ( N/A, water sample)

Date and Initials of person examining contents: JAS 8/27/19

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX, or VA (check map)?  YES  NO

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

If Yes to either question, fill out a Regulated Soil Checklist (F-LI-C-010) and include with SCUR/COC paperwork.

			COMMENTS:	
Chain of Custody Present:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	1.	
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	2.	
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	3.	
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No		5.
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No		6.
Rush Turn Around Time Requested:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No		7.
Sufficient Volume: (Triple volume provided for MS/MSD)	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No		8.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No		9.
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No		
Containers Intact:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No		10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No		12.
-Includes date/time/ID/Analysis Matrix <u>SLW</u> OIL				
All containers needing preservation have been checked	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH <input type="checkbox"/> HCl
pH paper Lot # <u>HCX03163</u>				Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl, NaOH>9 Sulfide, NaOH>12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water). Per Method, VOA pH is checked after analysis	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> N/A	Initial when completed:      Lot # of added preservative:      Date/Time preservative added
Samples checked for dechlorination: KI starch test strips Lot #	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	14. Positive for Res. Chlorine? Y N
Residual chlorine strips Lot #				
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	15.
Trip Blank Present:	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	16.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if applicable):				

Client Notification/ Resolution:

Field Data Required? Y / N

Person Contacted:

Date/Time:

Comments/ Resolution:

**GROVELAND**



August 28, 2019

Randy Copenhaver  
Langan Engineering  
2700 Kelly Road, Suite 200  
Warrington, PA 18976

RE: Project: CENTRAL BUCKS S.D. (GROVELAND)  
Pace Project No.: 70101864

Dear Randy Copenhaver:

Enclosed are the analytical results for sample(s) received by the laboratory on August 17, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



John D. Stanton  
john.stanton@pacelabs.com  
(631)694-3040  
Project Manager

Enclosures

cc: Bill Lambing, Langan Engineering



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

## CERTIFICATIONS

Project: CENTRAL BUCKS S.D. (GROVELAND)

Pace Project No.: 70101864

---

### Long Island Certification IDs

575 Broad Hollow Rd, Melville, NY 11747

New York Certification #: 10478 Primary Accrediting Body

New Jersey Certification #: NY158

Pennsylvania Certification #: 68-00350

Connecticut Certification #: PH-0435

Maryland Certification #: 208

Rhode Island Certification #: LAO00340

Massachusetts Certification #: M-NY026

New Hampshire Certification #: 2987

---

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: CENTRAL BUCKS S.D. (GROVELAND)

Pace Project No.: 70101864

Sample: V118BR	Lab ID: 70101864001	Collected: 08/16/19 09:14	Received: 08/17/19 10:30	Matrix: Drinking Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.8 MET ICPMS Drinking Water</b>		Analytical Method: EPA 200.8						
Lead	<b>12.5</b>	ug/L	1.0	1		08/22/19 13:02	7439-92-1	

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: CENTRAL BUCKS S.D. (GROVELAND)  
Pace Project No.: 70101864

QC Batch: 126856 Analysis Method: EPA 200.8  
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET No Prep Drinking Water  
Associated Lab Samples: 70101864001

METHOD BLANK: 605654 Matrix: Water  
Associated Lab Samples: 70101864001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Lead	ug/L	<1.0	1.0	08/22/19 12:40	

LABORATORY CONTROL SAMPLE: 605655

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Lead	ug/L	50	52.1	104	85-115	

MATRIX SPIKE SAMPLE: 605658

Parameter	Units	70101863001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Lead	ug/L	143	4	147	99	70-130	M1

MATRIX SPIKE SAMPLE: 605660

Parameter	Units	70101863019 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Lead	ug/L	30.1	4	34.0	97	70-130	M1

SAMPLE DUPLICATE: 605657

Parameter	Units	70101863001 Result	Dup Result	RPD	Qualifiers
Lead	ug/L	143	145	1	

SAMPLE DUPLICATE: 605659

Parameter	Units	70101863019 Result	Dup Result	RPD	Qualifiers
Lead	ug/L	30.1	29.9	1	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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without the written consent of Pace Analytical Services, LLC.

## QUALIFIERS

Project: CENTRAL BUCKS S.D. (GROVELAND)

Pace Project No.: 70101864

---

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### ANALYTE QUALIFIERS

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

## REPORT OF LABORATORY ANALYSIS

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without the written consent of Pace Analytical Services, LLC.

### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CENTRAL BUCKS S.D. (GROVELAND)

Pace Project No.: 70101864

---

<b>Lab ID</b>	<b>Sample ID</b>	<b>QC Batch Method</b>	<b>QC Batch</b>	<b>Analytical Method</b>	<b>Analytical Batch</b>
70101864001	V118BR	EPA 200.8	126856		

---

### REPORT OF LABORATORY ANALYSIS

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Sample Condition

WO#: 70101864

PM: JDS Due Date: 08/26/19

CLIENT: LAN-PA

Client Name:

Langan

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace  Other

Tracking #: 760 0760 2340

Custody Seal on Cooler/Box Present:  Yes  No Seals intact:  Yes  No

Temperature Blank Present:  Yes  No

Packing Material:  Bubble Wrap  Bubble Bags  Ziploc  None  Other

Type of Ice: Wet Blue  None

Thermometer Used: FH091

Correction Factor: +0.2

Samples on ice, cooling process has begun

Cooler Temperature (°C): 23.08

Cooler Temperature Corrected (°C): 24.0

Date/Time 5035A kits placed in freezer

Temp should be above freezing to 6.0°C

USDA Regulated Soil ( N/A, water sample)

Date and Initials of person examining contents: JAS 8/27/19

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX, or VA (check map)?  YES  NO

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

If Yes to either question, fill out a Regulated Soil Checklist (F-LI-C-010) and include with SCUR/COC paperwork.

			COMMENTS:
Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		3.
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		5.
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		6.
Rush Turn Around Time Requested:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		7.
Sufficient Volume: (Triple volume provided for MS/MSD)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		8.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		9.
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		11. Note if sediment is visible in the dissolved container.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		12.
-Includes date/time/ID/Analysis Matrix S W OIL			
All containers needing preservation have been checked	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH <input type="checkbox"/> HCl
pH paper Lot # HCX03163			Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl, NaOH>9 Sulfide, NaOH>12 Cyanide)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		
Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water). Per Method, VOA pH is checked after analysis			Initial when completed: Lot # of added preservative: Date/Time preservative added
Samples checked for dechlorination: KI starch test strips Lot #	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		14. Positive for Res. Chlorine? Y N
Residual chlorine strips Lot #			
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		15.
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		16.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		
Pace Trip Blank Lot # (if applicable):			

Client Notification/ Resolution:

Field Data Required? Y / N

Person Contacted:

Date/Time:

Comments/ Resolution:



**BUCKINGHAM**

August 28, 2019

Randy Copenhaver  
Langan Engineering  
2700 Kelly Road, Suite 200  
Warrington, PA 18976

RE: Project: CENTRAL BUCKS S.D.(BUCKINGHAM)  
Pace Project No.: 70101863

Dear Randy Copenhaver:

Enclosed are the analytical results for sample(s) received by the laboratory on August 17, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



John D. Stanton  
john.stanton@pacelabs.com  
(631)694-3040  
Project Manager

Enclosures

cc: Bill Lambing, Langan Engineering



## REPORT OF LABORATORY ANALYSIS

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without the written consent of Pace Analytical Services, LLC.

## CERTIFICATIONS

Project: CENTRAL BUCKS S.D.(BUCKINGHAM)

Pace Project No.: 70101863

---

### Long Island Certification IDs

575 Broad Hollow Rd, Melville, NY 11747

New York Certification #: 10478 Primary Accrediting Body

New Jersey Certification #: NY158

Pennsylvania Certification #: 68-00350

Connecticut Certification #: PH-0435

Maryland Certification #: 208

Rhode Island Certification #: LAO00340

Massachusetts Certification #: M-NY026

New Hampshire Certification #: 2987

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## REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: CENTRAL BUCKS S.D.(BUCKINGHAM)

Pace Project No.: 70101863

Sample: B3RB		Lab ID: 70101863001	Collected: 08/16/19 08:17	Received: 08/17/19 10:30	Matrix: Drinking Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.8 MET ICPMS Drinking Water</b>		Analytical Method: EPA 200.8						
Lead	<b>143</b>	ug/L	1.0	1		08/22/19 12:41	7439-92-1	M1
Sample: B4AR		Lab ID: 70101863004	Collected: 08/16/19 08:21	Received: 08/17/19 10:30	Matrix: Drinking Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.8 MET ICPMS Drinking Water</b>		Analytical Method: EPA 200.8						
Lead	<b>10.3</b>	ug/L	1.0	1		08/22/19 12:45	7439-92-1	
Sample: B5R		Lab ID: 70101863007	Collected: 08/16/19 08:27	Received: 08/17/19 10:30	Matrix: Drinking Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.8 MET ICPMS Drinking Water</b>		Analytical Method: EPA 200.8						
Lead	<b>60.9</b>	ug/L	1.0	1		08/22/19 12:46	7439-92-1	
Sample: B8BR		Lab ID: 70101863009	Collected: 08/16/19 08:30	Received: 08/17/19 10:30	Matrix: Drinking Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.8 MET ICPMS Drinking Water</b>		Analytical Method: EPA 200.8						
Lead	<b>9.1</b>	ug/L	1.0	1		08/22/19 12:47	7439-92-1	
Sample: B23AR		Lab ID: 70101863011	Collected: 08/16/19 08:32	Received: 08/17/19 10:30	Matrix: Drinking Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.8 MET ICPMS Drinking Water</b>		Analytical Method: EPA 200.8						
Lead	<b>35.5</b>	ug/L	1.0	1		08/22/19 12:48	7439-92-1	
Sample: B51R		Lab ID: 70101863013	Collected: 08/16/19 08:36	Received: 08/17/19 10:30	Matrix: Drinking Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.8 MET ICPMS Drinking Water</b>		Analytical Method: EPA 200.8						
Lead	<b>20.5</b>	ug/L	1.0	1		08/22/19 12:50	7439-92-1	

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: CENTRAL BUCKS S.D.(BUCKINGHAM)

Pace Project No.: 70101863

Sample: B52R	Lab ID: 70101863015	Collected: 08/16/19 08:34	Received: 08/17/19 10:30	Matrix: Drinking Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.8 MET ICPMS Drinking Water</b>	Analytical Method: EPA 200.8							
Lead	<b>22.3</b>	ug/L	1.0	1		08/22/19 12:51	7439-92-1	
<b>Sample: B53R</b>	<b>Lab ID: 70101863017</b>	Collected: 08/16/19 08:40	Received: 08/17/19 10:30	Matrix: Drinking Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.8 MET ICPMS Drinking Water</b>	Analytical Method: EPA 200.8							
Lead	<b>36.7</b>	ug/L	1.0	1		08/22/19 12:52	7439-92-1	
<b>Sample: B54R</b>	<b>Lab ID: 70101863019</b>	Collected: 08/16/19 08:38	Received: 08/17/19 10:30	Matrix: Drinking Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.8 MET ICPMS Drinking Water</b>	Analytical Method: EPA 200.8							
Lead	<b>30.1</b>	ug/L	1.0	1		08/22/19 12:53	7439-92-1	M1
<b>Sample: B55R</b>	<b>Lab ID: 70101863021</b>	Collected: 08/16/19 08:42	Received: 08/17/19 10:30	Matrix: Drinking Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.8 MET ICPMS Drinking Water</b>	Analytical Method: EPA 200.8							
Lead	<b>35.7</b>	ug/L	1.0	1		08/22/19 12:56	7439-92-1	
<b>Sample: B57R</b>	<b>Lab ID: 70101863023</b>	Collected: 08/16/19 08:43	Received: 08/17/19 10:30	Matrix: Drinking Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.8 MET ICPMS Drinking Water</b>	Analytical Method: EPA 200.8							
Lead	<b>4.4</b>	ug/L	1.0	1		08/22/19 12:57	7439-92-1	
<b>Sample: B2AR</b>	<b>Lab ID: 70101863024</b>	Collected: 08/16/19 08:45	Received: 08/17/19 10:30	Matrix: Drinking Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.8 MET ICPMS Drinking Water</b>	Analytical Method: EPA 200.8							
Lead	<b>4.9</b>	ug/L	1.0	1		08/22/19 12:58	7439-92-1	

### REPORT OF LABORATORY ANALYSIS

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without the written consent of Pace Analytical Services, LLC.

## ANALYTICAL RESULTS

Project: CENTRAL BUCKS S.D.(BUCKINGHAM)

Pace Project No.: 70101863

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>Sample: B2BR</b>		<b>Lab ID: 70101863026</b>		Collected: 08/16/19 08:48	Received: 08/17/19 10:30	Matrix: Drinking Water		
<b>200.8 MET ICPMS Drinking Water</b>		Analytical Method: EPA 200.8						
Lead	<b>15.3</b>	ug/L	1.0	1		08/22/19 12:59	7439-92-1	

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: CENTRAL BUCKS S.D.(BUCKINGHAM)  
Pace Project No.: 70101863

QC Batch: 126856 Analysis Method: EPA 200.8  
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET No Prep Drinking Water  
Associated Lab Samples: 70101863001, 70101863004, 70101863007, 70101863009, 70101863011, 70101863013, 70101863015, 70101863017, 70101863019, 70101863021, 70101863023, 70101863024, 70101863026

METHOD BLANK: 605654 Matrix: Water  
Associated Lab Samples: 70101863001, 70101863004, 70101863007, 70101863009, 70101863011, 70101863013, 70101863015, 70101863017, 70101863019, 70101863021, 70101863023, 70101863024, 70101863026

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Lead	ug/L	<1.0	1.0	08/22/19 12:40	

LABORATORY CONTROL SAMPLE: 605655

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Lead	ug/L	50	52.1	104	85-115	

MATRIX SPIKE SAMPLE: 605658

Parameter	Units	70101863001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Lead	ug/L	143	4	147	99	70-130	M1

MATRIX SPIKE SAMPLE: 605660

Parameter	Units	70101863019 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Lead	ug/L	30.1	4	34.0	97	70-130	M1

SAMPLE DUPLICATE: 605657

Parameter	Units	70101863001 Result	Dup Result	RPD	Qualifiers
Lead	ug/L	143	145	1	

SAMPLE DUPLICATE: 605659

Parameter	Units	70101863019 Result	Dup Result	RPD	Qualifiers
Lead	ug/L	30.1	29.9	1	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: CENTRAL BUCKS S.D.(BUCKINGHAM)

Pace Project No.: 70101863

---

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### ANALYTE QUALIFIERS

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CENTRAL BUCKS S.D.(BUCKINGHAM)

Pace Project No.: 70101863

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
70101863001	B3RB	EPA 200.8	126856		
70101863004	B4AR	EPA 200.8	126856		
70101863007	B5R	EPA 200.8	126856		
70101863009	B8BR	EPA 200.8	126856		
70101863011	B23AR	EPA 200.8	126856		
70101863013	B51R	EPA 200.8	126856		
70101863015	B52R	EPA 200.8	126856		
70101863017	B53R	EPA 200.8	126856		
70101863019	B54R	EPA 200.8	126856		
70101863021	B55R	EPA 200.8	126856		
70101863023	B57R	EPA 200.8	126856		
70101863024	B2AR	EPA 200.8	126856		
70101863026	B2BR	EPA 200.8	126856		

### REPORT OF LABORATORY ANALYSIS

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# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

<b>Section A</b>		<b>Section B</b>		<b>Section C</b>	
<b>Required Client Information:</b>		<b>Required Project Information:</b>		<b>Invoice Information:</b>	
Company: Langan Engineering	Report To: Randy Copenhaver	Report To: Randy Copenhaver	Attention: Randy Copenhaver	Company Name: Langan Engineering	Regulatory Agency
Address: 2700 Kelly Road, Suite 200	Copy To: Bill Lambing - blambing@langan.com	Copy To: Bill Lambing - blambing@langan.com	Address: 2700 Kelly Road, Suite 200	Address: 2700 Kelly Road, Suite 200	State / Location
Warrington, PA 18976				See Langan-Pace MSA	PA
Email: <a href="mailto:rcopenhaver@langan.com">rcopenhaver@langan.com</a>	Purchase Order #: 200130401-400-001	Purchase Order #: 200130401-400-001	Pace Quote:	Pace Project Manager: john.stanton@paceabs.com,	
Phone: 215-491-6500   Fax: 2015-491-6501	Project Name: Central Bucks School District (Buckingham)	Project Name: Central Bucks School District (Buckingham)	Pace Profile #: 7983		
Requested Due Date: RUSH	Project #: 200130401	Project #: 200130401			

ITEM #	MATRIX	CODE	COLLECTED		SAMPLE TYPE (G=GRAB C=COMP)	MATRIX CODE (see valid codes to left)	# OF CONTAINERS	Preservatives						Analyses Test Y/N	2007 Metals (PB)	Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)
			START DATE	END DATE				Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3				
1	B2AR1	DW	8/16/2019 846	8/16/2019 846	DW	DW	1	X						X	* HOLD		025
2	B2BR	DW	8/16/2019 848	8/16/2019 848	DW	DW	1	X						X			026
3	B2BR1	DW	8/16/2019 849	8/16/2019 849	DW	DW	1	X						X	* HOLD		027
4																	
5																	
6																	
7																	
8																	
9																	
10																	
11																	
12																	

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
YELLOW HIGHLIGHT TO BE SAMPLED	Bill Lambing	8/16/2019	1	[Signature]	8/16/2019	23:54	NY
* HOLD UNTIL NOTIFIED							

TEMP in C	Received on	Ice (Y/N)	Custody Sealed (Y/N)	Cooler (Y/N)	Samples Intact (Y/N)

SAMPLER NAME AND SIGNATURE  
 PRINT Name of SAMPLER:  
 SIGNATURE of SAMPLER: [Signature]  
 DATE Signed:



Sample Condition Upo

WO#: 70101863
PM: JDS Due Date: 08/26/19
CLIENT: LAN-PA

Client Name: Langan

Courier: [X] Fed Ex [ ] UPS [ ] USPS [ ] Client [ ] Commercial [ ] Pace [ ] Other

Tracking #: 760 0760 2340

Custody Seal on Cooler/Box Present: [ ] Yes [X] No Seals intact: [ ] Yes [ ] No

Packing Material: [X] Bubble Wrap [ ] Bubble Bags [ ] Ziploc [ ] None [ ] Other

Thermometer Used: TH091

Correction Factor: +0.2

Cooler Temperature (°C): 23.8

Cooler Temperature Corrected (°C): 24.0

Temperature Blank Present: [ ] Yes [X] No

Type of Ice: Wet Blue [X] None

[ ] Samples on ice, cooling process has begun

Date/Time 5035A kits placed in freezer

Temp should be above freezing to 6.0°C

USDA Regulated Soil ( [ ] N/A, water sample)

Date and Initials of person examining contents: JAS 8/17/19

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX, or VA (check map)? [ ] YES [ ] NO

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? [ ] Yes [ ] No

If Yes to either question, fill out a Regulated Soil Checklist (F-LI-C-010) and include with SCUR/COC paperwork.

Table with 16 rows and 3 columns: Description, Yes/No/N/A checkboxes, and Comments. Includes fields for Chain of Custody, Containers Intact, pH paper Lot # (HCX03463), and Residual chlorine strips.

Client Notification/ Resolution:

Field Data Required? Y / N

Person Contacted:

Date/Time:

Comments/ Resolution:

**UNAMI**

August 28, 2019

Randy Copenhaver  
Langan Engineering  
2700 Kelly Road, Suite 200  
Warrington, PA 18976

RE: Project: CENTRAL BUCKS S.D. (UNAMI)  
Pace Project No.: 70101866

Dear Randy Copenhaver:

Enclosed are the analytical results for sample(s) received by the laboratory on August 17, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



John D. Stanton  
john.stanton@pacelabs.com  
(631)694-3040  
Project Manager

Enclosures

cc: Bill Lambing, Langan Engineering



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

## CERTIFICATIONS

Project: CENTRAL BUCKS S.D. (UNAMI)

Pace Project No.: 70101866

---

### Long Island Certification IDs

575 Broad Hollow Rd, Melville, NY 11747

New York Certification #: 10478 Primary Accrediting Body

New Jersey Certification #: NY158

Pennsylvania Certification #: 68-00350

Connecticut Certification #: PH-0435

Maryland Certification #: 208

Rhode Island Certification #: LAO00340

Massachusetts Certification #: M-NY026

New Hampshire Certification #: 2987

---

## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.



## ANALYTICAL RESULTS

Project: CENTRAL BUCKS S.D. (UNAMI)

Pace Project No.: 70101866

Sample: U333AR		Lab ID: 70101866001	Collected: 08/16/19 09:46	Received: 08/17/19 10:30	Matrix: Drinking Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.8 MET ICPMS Drinking Water</b>		Analytical Method: EPA 200.8						
Lead	<b>1.2</b>	ug/L	1.0	1		08/22/19 13:04	7439-92-1	

## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

### QUALITY CONTROL DATA

Project: CENTRAL BUCKS S.D. (UNAMI)

Pace Project No.: 70101866

QC Batch: 126856

Analysis Method: EPA 200.8

QC Batch Method: EPA 200.8

Analysis Description: 200.8 MET No Prep Drinking Water

Associated Lab Samples: 70101866001

METHOD BLANK: 605654

Matrix: Water

Associated Lab Samples: 70101866001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Lead	ug/L	<1.0	1.0	08/22/19 12:40	

LABORATORY CONTROL SAMPLE: 605655

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Lead	ug/L	50	52.1	104	85-115	

MATRIX SPIKE SAMPLE: 605658

Parameter	Units	70101863001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Lead	ug/L	143	4	147	99	70-130	M1

MATRIX SPIKE SAMPLE: 605660

Parameter	Units	70101863019 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Lead	ug/L	30.1	4	34.0	97	70-130	M1

SAMPLE DUPLICATE: 605657

Parameter	Units	70101863001 Result	Dup Result	RPD	Qualifiers
Lead	ug/L	143	145	1	

SAMPLE DUPLICATE: 605659

Parameter	Units	70101863019 Result	Dup Result	RPD	Qualifiers
Lead	ug/L	30.1	29.9	1	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

## QUALIFIERS

Project: CENTRAL BUCKS S.D. (UNAMI)

Pace Project No.: 70101866

---

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### ANALYTE QUALIFIERS

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CENTRAL BUCKS S.D. (UNAMI)

Pace Project No.: 70101866

---

<b>Lab ID</b>	<b>Sample ID</b>	<b>QC Batch Method</b>	<b>QC Batch</b>	<b>Analytical Method</b>	<b>Analytical Batch</b>
70101866001	U333AR	EPA 200.8	126856		

---

### REPORT OF LABORATORY ANALYSIS

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without the written consent of Pace Analytical Services, LLC.





Sample Condition Up

WO#: 70101866
PM: JDS Due Date: 08/26/19
CLIENT: LAN-PA

Client Name: Langan

Courier: [X] Fed Ex [ ] UPS [ ] USPS [ ] Client [ ] Commercial [ ] Pace [ ] Other
Tracking #: 760 0760 2340
Custody Seal on Cooler/Box Present: [ ] Yes [X] No Seals intact: [ ] Yes [ ] No
Packing Material: [X] Bubble Wrap [ ] Bubble Bags [ ] Ziploc [ ] None [ ] Other
Thermometer Used: FH091 Correction Factor: +0.2
Cooler Temperature (°C): 23.8 Cooler Temperature Corrected (°C): 24.0

Temperature Blank Present: [ ] Yes [X] No
Type of Ice: Wet Blue None
[ ] Samples on ice, cooling process has begun
Date/Time 5035A kits placed in freezer

Temp should be above freezing to 6.0°C
USDA Regulated Soil ( [ ] N/A, water sample)

Date and Initials of person examining contents: JAS 8/21/19

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX, or VA (check map)? [ ] YES [ ] NO

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? [ ] Yes [ ] No

If Yes to either question, fill out a Regulated Soil Checklist (F-LI-C-010) and include with SCUR/COC paperwork.

Table with 16 rows and 3 columns: Description, Yes/No/N/A checkboxes, and Comments. Includes items like Chain of Custody Present, Samples Arrived within Hold Time, Containers Intact, etc.

Client Notification/ Resolution:
Person Contacted:
Comments/ Resolution:
Field Data Required? Y / N
Date/Time:

**BUCKINGHAM**

August 28, 2019

Randy Copenhaver  
Langan Engineering  
2700 Kelly Road, Suite 200  
Warrington, PA 18976

RE: Project: Central Bucks (Buckingham)  
Pace Project No.: 70102148

Dear Randy Copenhaver:

Enclosed are the analytical results for sample(s) received by the laboratory on August 21, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



John D. Stanton  
john.stanton@pacelabs.com  
(631)694-3040  
Project Manager

Enclosures

cc: Bill Lambing, Langan Engineering



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.



## CERTIFICATIONS

Project: Central Bucks (Buckingham)

Pace Project No.: 70102148

---

### Long Island Certification IDs

575 Broad Hollow Rd, Melville, NY 11747

New York Certification #: 10478 Primary Accrediting Body

New Jersey Certification #: NY158

Pennsylvania Certification #: 68-00350

Connecticut Certification #: PH-0435

Maryland Certification #: 208

Rhode Island Certification #: LAO00340

Massachusetts Certification #: M-NY026

New Hampshire Certification #: 2987

---

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Central Bucks (Buckingham)

Pace Project No.: 70102148

<b>Sample: BOWF</b>		<b>Lab ID: 70102148001</b>	Collected: 08/20/19 07:59	Received: 08/21/19 10:20	Matrix: Drinking Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

**200.8 MET ICPMS Drinking Water** Analytical Method: EPA 200.8

Lead	<b>42.1</b>	ug/L	1.0	1		08/22/19 16:52	7439-92-1
------	-------------	------	-----	---	--	----------------	-----------

<b>Sample: B58R</b>		<b>Lab ID: 70102148003</b>	Collected: 08/20/19 08:00	Received: 08/21/19 10:20	Matrix: Drinking Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

**200.8 MET ICPMS Drinking Water** Analytical Method: EPA 200.8

Lead	<b>16.1</b>	ug/L	1.0	1		08/22/19 16:53	7439-92-1
------	-------------	------	-----	---	--	----------------	-----------

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Central Bucks (Buckingham)

Pace Project No.: 70102148

QC Batch: 127106	Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8	Analysis Description: 200.8 MET No Prep Drinking Water
Associated Lab Samples: 70102148001, 70102148003	

METHOD BLANK: 606959 Matrix: Water

Associated Lab Samples: 70102148001, 70102148003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Lead	ug/L	<1.0	1.0	08/22/19 16:33	

LABORATORY CONTROL SAMPLE: 606960

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Lead	ug/L	50	51.9	104	85-115	

MATRIX SPIKE SAMPLE: 606962

Parameter	Units	30319606005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Lead	ug/L	0.0049 mg/L	4	9.2	107	70-130	

MATRIX SPIKE SAMPLE: 606964

Parameter	Units	70101786007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Lead	ug/L	<1.0	4	4.8	110	70-130	

SAMPLE DUPLICATE: 606961

Parameter	Units	30319606005 Result	Dup Result	RPD	Qualifiers
Lead	ug/L	0.0049 mg/L	4.7	5	

SAMPLE DUPLICATE: 606963

Parameter	Units	70101786007 Result	Dup Result	RPD	Qualifiers
Lead	ug/L	<1.0	<1.0		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: Central Bucks (Buckingham)

Pace Project No.: 70102148

---

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Central Bucks (Buckingham)

Pace Project No.: 70102148

---

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
70102148001	BOWF	EPA 200.8	127106		
70102148003	B58R	EPA 200.8	127106		

### REPORT OF LABORATORY ANALYSIS

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WO#: 70102148



**CHAIN-OF-CUSTODY / Analytical Requi**  
The Chain-of-Custody is a LEGAL DOCUMENT. All relevant

**Section A**  
**Required Client Information:**  
 Company: Langan Engineering  
 Address: 2700 Kelly Road, Suite 200  
 Warrington, PA 18976  
 Email: [rcopenhaver@langan.com](mailto:rcopenhaver@langan.com)  
 Phone: 215-491-6500 Fax 2015-491-6501  
 Requested Due Date: RUSH

**Section B**  
**Report To:** Randy Copenhaver  
**Copy To:** Bill Lambing - blambing@langan.com  
**Purchase Order #:** 200130401-400-001  
**Project Name:** Central Bucks School District (Buckingham)  
**Project #:** 200130401

**Section C**  
**Invoice Information:**  
**Attention:** Randy Copenhaver  
**Company Name:** Langan Engineering  
**Address:** 2700 Kelly Road, Suite 200  
**Pace Quote:** See Langan-Pace MSA  
**Pace Project Manager:** john.stanton@pacelabs.com,  
**Pace Profile #:** 7983

**Regulatory Agency**  
**State / Location**  
 PA

ITEM #	MATRIX	MATRIX CODE (see valid codes to left)	COLLECTED		SAMPLE TYPE (G-GRAB C-COMP)	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	PRESERVATIVES							ANALYSES TEST Y/N	200.7 Metals (PB)	Residual Chlorine (Y/N)
			START DATE	END DATE				UNPRESERVED	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol			
1	BOWF	DW G	8/20/2019 759	8/20/2019 759	G	1		X									
2	BOWF1	DW G	8/20/2019 759	8/20/2019 759	G	1		X									
3	B58R	DW G	8/20/2019 800	8/20/2019 800	G	1		X									
4	B58R1	DW G	8/20/2019 801	8/20/2019 801	G	1		X									
5																	
6																	
7																	
8																	
9																	
10																	
11																	
12																	

**ADDITIONAL COMMENTS**  
 YELLOW HIGHLIGHT TO BE SAMPLED  
 \* HOLD UNTIL NOTIFIED

**RELINQUISHED BY / AFFILIATION**  
 Bill Lambing  
 MS/PACE

**DATE**  
 8/20/2019

**TIME**  
 1419

**ACCEPTED BY / AFFILIATION**  
 MS/PACE  
 Duane Gooch/Pace

**DATE**  
 8/20/2019

**TIME**  
 1419

**SAMPLE CONDITIONS**  
 Received on Ice (Y/N)  
 Custody Sealed (Y/N)  
 Cooler (Y/N)  
 Samples Intact (Y/N)

**TEMP in C**  
 25.3

**SAMPLER NAME AND SIGNATURE**  
 PRINT Name of SAMPLER: Bill Lambing  
 SIGNATURE of SAMPLER: [Signature]  
 DATE Signed: [Date]



### Sample Condition Upon Receipt

**WO#: 70102148**

PM: JDS Due Date: 08/28/19  
CLIENT: LAN-PA

Client Name: LAN-PA

Project

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace  Other

Tracking #: 7892 6120 8166  
Custody Seal on Cooler/Box Present:  Yes  No Seals intact:  Yes  No

Packing Material:  Bubble Wrap  Bubble Bags  Ziploc  None  Other

Thermometer Used: TH091 Correction Factor: +0.2

Cooler Temperature (°C): 25.3 Cooler Temperature Corrected (°C): 25.5

Temp should be above freezing to 6.0°C

USDA Regulated Soil ( N/A, water sample)

Date and Initials of person examining contents:

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX, or VA (check map)?  YES  NO

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

If Yes to either question, fill out a Regulated Soil Checklist (F-LI-C-010) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume: (Triple volume provided for MS/MSD)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.
-Includes date/time/ID/Analysis Matrix SL WT OIL		
All containers needing preservation have been checked	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH <input type="checkbox"/> HCl
pH paper Lot # <u>HC863463</u>		Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl, NaOH>9 Sulfide, NAOH>12 Cyanide)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water). Per Method, VOA pH is checked after analysis		Initial when completed: Lot # of added preservative: Date/Time preservative added
Samples checked for dechlorination:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
KI starch test strips Lot #		Positive for Res. Chlorine? Y N
Residual Chlorine strips Lot #		
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	16.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if applicable):		

Client Notification/ Resolution:

Field Data Required? Y / N

Person Contacted:

Date/Time:

Comments/ Resolution:

Client requested 200.7 Pb was logged for 200.8.

**LENAPE**



August 28, 2019

Randy Copenhaver  
Langan Engineering  
2700 Kelly Road, Suite 200  
Warrington, PA 18976

RE: Project: Central Bucks (Lenape)  
Pace Project No.: 70102153

Dear Randy Copenhaver:

Enclosed are the analytical results for sample(s) received by the laboratory on August 21, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



John D. Stanton  
john.stanton@pacelabs.com  
(631)694-3040  
Project Manager

Enclosures

cc: Bill Lambing, Langan Engineering



## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

## CERTIFICATIONS

Project: Central Bucks (Lenape)

Pace Project No.: 70102153

---

### Long Island Certification IDs

575 Broad Hollow Rd, Melville, NY 11747

New York Certification #: 10478 Primary Accrediting Body

New Jersey Certification #: NY158

Pennsylvania Certification #: 68-00350

Connecticut Certification #: PH-0435

Maryland Certification #: 208

Rhode Island Certification #: LAO00340

Massachusetts Certification #: M-NY026

New Hampshire Certification #: 2987

---

## REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
without the written consent of Pace Analytical Services, LLC.

## ANALYTICAL RESULTS

Project: Central Bucks (Lenape)

Pace Project No.: 70102153

Sample: L205R	Lab ID: 70102153001	Collected: 08/20/19 08:36	Received: 08/21/19 10:20	Matrix: Drinking Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

**200.8 MET ICPMS Drinking Water** Analytical Method: EPA 200.8

Lead	<b>1.8</b>	ug/L	1.0	1		08/22/19 16:54	7439-92-1
------	------------	------	-----	---	--	----------------	-----------

Sample: L510BR	Lab ID: 70102153003	Collected: 08/20/19 08:39	Received: 08/21/19 10:20	Matrix: Drinking Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual

**200.8 MET ICPMS Drinking Water** Analytical Method: EPA 200.8

Lead	<b>64.6</b>	ug/L	1.0	1		08/22/19 16:55	7439-92-1
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## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Central Bucks (Lenape)

Pace Project No.: 70102153

QC Batch: 127106	Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8	Analysis Description: 200.8 MET No Prep Drinking Water
Associated Lab Samples: 70102153001, 70102153003	

METHOD BLANK: 606959 Matrix: Water

Associated Lab Samples: 70102153001, 70102153003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Lead	ug/L	<1.0	1.0	08/22/19 16:33	

LABORATORY CONTROL SAMPLE: 606960

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Lead	ug/L	50	51.9	104	85-115	

MATRIX SPIKE SAMPLE: 606962

Parameter	Units	30319606005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Lead	ug/L	0.0049 mg/L	4	9.2	107	70-130	

MATRIX SPIKE SAMPLE: 606964

Parameter	Units	70101786007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Lead	ug/L	<1.0	4	4.8	110	70-130	

SAMPLE DUPLICATE: 606961

Parameter	Units	30319606005 Result	Dup Result	RPD	Qualifiers
Lead	ug/L	0.0049 mg/L	4.7	5	

SAMPLE DUPLICATE: 606963

Parameter	Units	70101786007 Result	Dup Result	RPD	Qualifiers
Lead	ug/L	<1.0	<1.0		

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: Central Bucks (Lenape)

Pace Project No.: 70102153

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### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Central Bucks (Lenape)

Pace Project No.: 70102153

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<b>Lab ID</b>	<b>Sample ID</b>	<b>QC Batch Method</b>	<b>QC Batch</b>	<b>Analytical Method</b>	<b>Analytical Batch</b>
70102153001	L205R	EPA 200.8	127106		
70102153003	L510BR	EPA 200.8	127106		

### REPORT OF LABORATORY ANALYSIS

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# Sample Condition Upon Receipt

Client Name:

LAN-PA

Project

**WO#: 70102153**

PM: JDS Due Date: 08/28/19

CLIENT: LAN-PA

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace  Other

Tracking #: 7892 6120 8166  
Custody Seal on Cooler/Box Present:  Yes  No      Seals intact:  Yes  No

Packing Material:  Bubble Wrap  Bubble Bags  Ziploc  None  Other

Thermometer Used: TH091

Correction Factor: +0.2

Samples on ice, cooling process has begun

Cooler Temperature (°C): 25.3      Cooler Temperature Corrected (°C): 25.5

Date/Time 5035A kits placed in freezer \_\_\_\_\_

Temp should be above freezing to 6.0°C

USDA Regulated Soil (  N/A, water sample)

Date and Initials of person examining contents: \_\_\_\_\_

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX, or VA (check map)?  YES  NO

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

If Yes to either question, fill out a Regulated Soil Checklist (F-LI-C-010) and include with SCUR/COC paperwork.

			COMMENTS:
Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.	
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.	
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	3.	
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.	
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.	
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.	
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.	
Sufficient Volume: (Triple volume provided for MS/MSD)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.	
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.	
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.	
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.	Note if sediment is visible in the dissolved container.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	12.	
-Includes date/time/ID/Analysis Matrix SL WT OIL			
All containers needing preservation have been checked	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13.	<input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH <input type="checkbox"/> HCl
pH paper Lot # <u>HC863463</u>			Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl, NaOH > 9 Sulfide, NaOH > 12 Cyanide)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		
Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water). Per Method, VOA pH is checked after analysis			
Samples checked for dechlorination:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.	
KI starch test strips Lot #			Positive for Res. Chlorine? Y N
Residual Chlorine strips Lot #			
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.	
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	16.	
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		
Pace Trip Blank Lot # (if applicable):			

Client Notification/ Resolution:

Field Data Required? Y / N

Person Contacted:

Date/Time:

Comments/ Resolution:

client requested 200.7 PB logged for 200.8.



**TOHICKON**

August 28, 2019

Randy Copenhaver  
Langan Engineering  
2700 Kelly Road, Suite 200  
Warrington, PA 18976

RE: Project: Central Bucks (Tohickon)  
Pace Project No.: 70102151

Dear Randy Copenhaver:

Enclosed are the analytical results for sample(s) received by the laboratory on August 21, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



John D. Stanton  
john.stanton@pacelabs.com  
(631)694-3040  
Project Manager

Enclosures

cc: Bill Lambing, Langan Engineering



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: Central Bucks (Tohickon)

Pace Project No.: 70102151

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### Long Island Certification IDs

575 Broad Hollow Rd, Melville, NY 11747

New York Certification #: 10478 Primary Accrediting Body

New Jersey Certification #: NY158

Pennsylvania Certification #: 68-00350

Connecticut Certification #: PH-0435

Maryland Certification #: 208

Rhode Island Certification #: LAO00340

Massachusetts Certification #: M-NY026

New Hampshire Certification #: 2987

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## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: Central Bucks (Tohickon)

Pace Project No.: 70102151

Sample: TNBR	Lab ID: 70102151001	Collected: 08/20/19 08:20	Received: 08/21/19 10:20	Matrix: Drinking Water				
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.8 MET ICPMS Drinking Water</b>		Analytical Method: EPA 200.8						
Lead	<b>1.8</b>	ug/L	1.0	1		08/22/19 16:54	7439-92-1	

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: Central Bucks (Tohickon)  
Pace Project No.: 70102151

QC Batch: 127106      Analysis Method: EPA 200.8  
QC Batch Method: EPA 200.8      Analysis Description: 200.8 MET No Prep Drinking Water  
Associated Lab Samples: 70102151001

METHOD BLANK: 606959      Matrix: Water  
Associated Lab Samples: 70102151001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Lead	ug/L	<1.0	1.0	08/22/19 16:33	

LABORATORY CONTROL SAMPLE: 606960

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Lead	ug/L	50	51.9	104	85-115	

MATRIX SPIKE SAMPLE: 606962

Parameter	Units	30319606005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Lead	ug/L	0.0049 mg/L	4	9.2	107	70-130	

MATRIX SPIKE SAMPLE: 606964

Parameter	Units	70101786007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Lead	ug/L	<1.0	4	4.8	110	70-130	

SAMPLE DUPLICATE: 606961

Parameter	Units	30319606005 Result	Dup Result	RPD	Qualifiers
Lead	ug/L	0.0049 mg/L	4.7	5	

SAMPLE DUPLICATE: 606963

Parameter	Units	70101786007 Result	Dup Result	RPD	Qualifiers
Lead	ug/L	<1.0	<1.0		

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## QUALIFIERS

Project: Central Bucks (Tohickon)

Pace Project No.: 70102151

---

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Central Bucks (Tohickon)

Pace Project No.: 70102151

---

<b>Lab ID</b>	<b>Sample ID</b>	<b>QC Batch Method</b>	<b>QC Batch</b>	<b>Analytical Method</b>	<b>Analytical Batch</b>
70102151001	TNBR	EPA 200.8	127106		

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### REPORT OF LABORATORY ANALYSIS

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# Sample Condition Upon Receipt

Client Name: LAN-PA

Project

WO#: **70102151**

PM: JDS Due Date: 08/28/19

CLIENT: LAN-PA

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace  Other

Tracking #: 7892 6120 8166  
Custody Seal on Cooler/Box Present:  Yes  No      Seals intact:  Yes  No

Packing Material:  Bubble Wrap  Bubble Bags  Ziploc  None  Other

Thermometer Used: TH091

Correction Factor: +0.2

Cooler Temperature (°C): 25.3      Cooler Temperature Corrected (°C): 25.5

Temp should be above freezing to 6.0°C

USDA Regulated Soil ( N/A, water sample)

Date and Initials of person examining contents:

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX, or VA (check map)?  YES  NO

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes  No

If Yes to either question, fill out a Regulated Soil Checklist (F-LI-C-010) and include with SCUR/COC paperwork.

			COMMENTS:
Chain of Custody Present:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	3.
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	5.
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	7.
Sufficient Volume: (Triple volume provided for MS/MSD)	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	8.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	9.
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	
Containers Intact:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11. Note if sediment is visible in the dissolved container.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	12.
-Includes date/time/ID/Analysis Matrix SL WT OIL			
All containers needing preservation have been checked	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> N/A	13. <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> NaOH <input type="checkbox"/> HCl
pH paper Lot # <u>HC863463</u>			Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl, NaOH > 9 Sulfide, NAOH > 12 Cyanide)	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Exceptions: VOA, Coliform, TOC/DOC, Oil and Grease, DRO/8015 (water). Per Method, VOA pH is checked after analysis			Initial when completed:      Lot # of added preservative:      Date/Time preservative added
Samples checked for dechlorination:	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14. Positive for Res. Chlorine? Y N
KI starch test strips Lot #			
Residual chlorine strips Lot #			
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Present:	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	16.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes	<input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if applicable):			

Client Notification/ Resolution:

Field Data Required? Y / N

Person Contacted:

Date/Time:

Comments/ Resolution:

Client requested 200.7 Pb was logged for 200.8