AMERICAN ENGINEERING TESTING, INC.

CONSULTANTS
· ENVIRONMENTAL
· GEOTECHNICAL
· MATERIALS
· FORENSICS

April 3, 2019

Macalester College
1600 Grand Avenue
St. Paul, MN, 55105-1899

Attn: Ms. Jill Wirth
Environmental Health and Safety Manager

RE: Lead in Potable Water Testing Report
Laura Jeffrey Academy and
Highland Park Montessori School
1550 Summit Ave., St Paul, MN 55105-2243
AET Project No. 03-20089

Dear Ms. Wirth:

American Engineering Testing, Inc. (AET) has completed the Lead in Potable Water Testing at Laura Jeffrey Academy and Highland Park Montessori School. Results from the testing are presented in the attached report. Our services were conducted on December 22, 2016 and performed according to AET's Proposal No. 03-20089.

We appreciate your business and the opportunity to have been of service to you. If you have any questions regarding the information in this report please call Gail Cederberg, VP of Environmental Services, at 651-659-1332.

Sincerely,

Todd Lewis
Senior Environmental Scientist
Direct: (651) 603-6629
Email: tlewis@amengtest.com

AMERICAN ENGINEERING TESTING, INC.

CONSULTANTS
· ENVIRONMENTAL
· GEOTECHNICAL
· MATERIALS
· FORENSICS

Lead in Potable Water Testing Report

Laura Jeffrey Academy and Highland Park Montessori School

1550 Summit Ave.
St Paul, MN

AET Project No. 03-20089

Date:

April 3, 2019

Prepared for:

Macalester College
1600 Grand Avenue
St. Paul, MN, 55105-1899

www.amengtest.com

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APPENDICES

EXECUTIVE SUMMARY

American Engineering Testing (AET) was authorized by Ms. Jill Wirth, Director of Environmental Health and Safety at Macalester College (Client), to test the lead content in drinking water sources at Laura Jeffrey Academy (LJA) and Highland Park Montessori School (HPMS) located at 550 Summit Avenue in St. Paul, Minnesota (Site). Services were performed according to AET's Acknowledgment and Agreement of Services No. 03-20089, dated June 1, 2018.

Mr. Todd Lewis, a Licensed Minnesota Lead Risk Assessor, sampled potable water and other water sources for lead at Laura Jeffrey Academy and Highland Park Montessori School. In addition to testing the required water sources used for drinking and cooking, samples were also collected from selected faucets in bathrooms and classrooms used for handwashing, cleaning and uses other than drinking and cooking. The sampling was conducted to determine if the water sources contained lead over 15 parts per billion (ppb), the limit for lead in drinking water.

The water test result from the SE kitchen faucet, Room 236, at Laura Jeffrey Academy was 229 ppb. Test results from the other 15 water sources were below 15 ppb. All three kitchen faucets in Room 236 were retested on August 14, August 30, September 12, October 5, and December 4, 2018. AET collected water samples from the SE, SW and North kitchen faucets each time the plumber from Metropolitan Mechanical Contractors, Inc. (MMC) replaced or removed items from the system. Final sampling was conducted on February 19, 2019 after the aerators from the three new faucets were cleaned. After the aerators were cleaned the water results for lead at the three sinks were less than 15 ppb.

The results from all the tested sources, including the three sinks, were less than 15 ppb for lead. Although no further actions are required, the MDH recommends maintaining low lead levels in the water system by cleaning faucet aerators on a quarterly basis, using certified lead-free materials when performing plumbing work, and retesting drinking and cooking water sources every five years.

Since not all water sources in the buildings were tested, this report presents the results from the sources tested by AET. The lead content from untested water sources is not known and the results from this assessment cannot be applied to the untested water sources.

1.0 INTRODUCTION

American Engineering Testing (AET) was authorized by Ms. Jill Wirth, Director of Environmental Health and Safety for Macalester College (Client), to conduct lead in drinking water testing at Laura Jeffrey Academy (LJA) and Highland Park Montessori School located at 550 Summit Avenue in St. Paul, Minnesota (Site). Services were performed according to AET's Acknowledgement and Agreement of Services No. 03-20089, dated June 1, 2018. Change orders were issued for additional testing of the LJA kitchen faucets.

Mr. Todd Lewis, Minnesota Licensed Lead Risk Assessor, sampled potable water and other water sources for lead at Laura Jeffrey Academy and Highland Park Montessori School. The purpose for testing lead in drinking water and other selected sources was to meet the Minnesota Statutes, Section 121A.335 Lead in School Drinking Water to minimize lead exposure to students and staff from drinking and cooking water sources. The objective for the testing was to identify water sources above the 15 ppm regulatory limit, minimize lead exposure and recommend methods for reducing lead exposure from water sources.

1.1 BACKGROUND

On April 2018, the Minnesota Department of Education and Minnesota Department of Health (MDH) issued a technical guidance entitled "Reducing Lead in Drinking Water – A Technical Guidance and Model Plan for Minnesota Public Schools" for reducing lead in drinking water in Minnesota public schools. The objective for the technical guidance is to reduce the health hazards caused by lead exposure in children from drinking water sources in public schools. The document assists public and charter schools to adopt the model plan or assist schools in developing a plan to meet the requirements referenced in the Minnesota Statutes, Section 121A.335. The information in the document provides facility managers the necessary tools for testing and documenting activities to reduce the hazards of lead exposure to students and staff at public schools. This guidance document is provided in Appendix E and the online document can be found at: *https://www.health.state.mn.us/communities/environment/water/docs/pbschoolguide.pdf*.

1.2 SCOPE OF SERVICES

AET's project scope of work includes the following items:

- Collect 16 first-draw potable water from water sources for lead content after at least 6 hours from the last usage. Only first draw samples are collected from each source.
- Prepare sample/site diagrams.
- Submit samples to an accredited laboratory for lead analysis.
- Provide the laboratory report with a brief interpretation of the results.

- Collect water samples from sources after performing lead reduction activities until results below 15 ppb are obtained.
- Submit a written letter report to include sample locations, test results, conclusions and recommendations.

1.3 REGULATORY REQUIREMENTS

Reducing Lead in Drinking Water – A Technical Guidance and Model Plan for Minnesota Public Schools recommends lead in school drinking and cooking water not exceed 15 parts per billion (ppb) or 15 micrograms per liter (µg/L). If the measured lead content is below the maximum allowable limit, no further action is needed. Sources which exceed the 15 ppb allowable limit are flushed daily to remove the lead or the sources of water are removed from service.

1.4 SAMPLING AND ANALYTICAL METHODOLOGIES

Figures showing locations of the water samples for lead analysis are provided in Appendix A. Sampling methodologies and the laboratory analytical method is provided in the MDH document "Reducing Lead in Drinking Water - A Technical Guidance and Model Plan for Minnesota Public Schools" found in Appendix E.

2.0 SAMPLE RESULTS

Table 1 summarizes the results from the initial July 6, 2018 water sampling for lead. The laboratory analytical reports with chains of custody are provided in Appendix B. The lead Risk Assessor License and Training Certificate for Mr. Lewis are found in Appendix C. The laboratory accreditation and lead risk assessor certification are found in Appendix D.

The lead results from the July 6, 2018 sampling event are summarized in Table 1. One sample returned a result greater than 15 ppb. The results from for the SE kitchen faucet (Room 236) at LJA was 229 ppb. Results from the other 15 tested water sources were below 15 ppb. Macalester College initiated lead reduction activities with the assistance of Metropolitan Mechanical Contractors, Inc. (MMC) by removing or replacing items from the water service lines.

All three kitchen faucets (SE, SW and North kitchen faucets) in Room 236 were retested on August 14, August 30, September 12, October 5, and December 4, 2018. A second draw sample was also collected from the SE kitchen faucet during each sampling event.

Table 2 summarizes the results of the five additional rounds of sampling the three kitchen faucets. MMC removed the ball valves from the water system prior to retesting the three LJA kitchen faucets on August 14, 2018. Results for lead were all greater than 15 ppb. MMC then replaced

the three kitchen faucets with low lead fixtures. The August 30, 2018 sampling results were 26.6 ppb (SE), 14.4 ppb (SW) and 9.5 ppb (North). MMC removed additional components from the water system and the September 12, 2018 results were 38.9 ppb (SE), 20.6 ppb (SW), and 7.7 ppb (North). The result from the second draw from the SE faucet was 18.1 ppb. MMC then removed suspected lead components where the water main enters the building. October 5, 2018 test results from the three faucets were 36.8 ppm (SE), 29.0 ppm (SW), and 6.3 ppm (North). The second draw sample result from the SE faucet was 14.8 ppm. MMC then removed the last section of the original copper pipe located under the three sinks. Testing on December 4, 2018, yielded results of 44.4 ppm (SE), 21.2 ppm (SW) and 2.8 ppm (North). The result for the second draw sample from the SE faucet was 18.6 ppm.

Before the February 2019 sampling event, MMC removed the aerators from the new kitchen faucets; trapped debris was observed on the aerator screens. The aerator screens were cleaned and replaced. The results from the February 19, 2019 sampling were 9.3 ppm (SE), 1.1 ppm (SW), and 0.66 ppm (North). The second draw sample result from the SE faucet was 5.0 ppm. All results for lead from the February 19, 2019 sampling event were less than 15 ppb.

3.0 CONCLUSIONS

The conclusions are based on information obtained from the Client and the interpretation of the sample results.

- Tested water sources are below 15 ppb and below the action level.

4.0 RECOMMENDATIONS

The recommendations provided in this report are limited to available information and the interpretation of the sample results.

- No additional testing is recommended.

The following activities are suggested to maintain low lead levels in the water system:

- Clean faucet aerators on a quarterly basis
- Use certified lead free materials when performing plumbing work.
- Retest drinking and cooking water sources every five years.

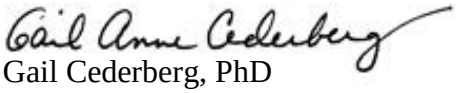
5.0 STANDARD OF CARE

The Standard of Care for all professional services performed or furnished by AET are at the level and care used ordinarily exercised by members of the profession practicing under similar conditions at the same time, locality, and cost constraints. The results, findings, conclusions, and recommendations expressed in this report are based on conditions observed during the testing. The information contained in this report is relevant to the date on which this service was performed. AET provides no warranty, expressed or implied, in connection with the services.

Prepared by:

Todd Lewis
Senior Environmental Scientist
Phone: (651) 603-6629
Email: tlewis@amengtest.com

Reviewed by:



Gail Cederberg, PhD
Vice President, Environmental Services
Phone: (651) 659-1332
Email: gcederberg@amengtest.com

Tables

TABLE 1
SUMMARY OF INITIAL LEAD IN DRINKING WATER TEST RESULTS
Sampling Date: July 6, 2018
Laura Jeffrey Academy and Highland Park Montessori School
AET PROJECT NO 03-20089

Sample No.	Lab Sample ID	School	Sample Location	Result (ppb)
1	10438523001	LJA	Drinking Fountain, 2nd Floor Hallway	0.73
2	**10438523002**	LJA	**Sink in Kitchen, Room 236** (1R SE Kitchen Faucet)	**229**
3	10438523003	LJA	Sink in Room 239	3.9
4	10438523004	LJA	2nd Floor Men's Bathroom, Room 226	4.2
5	10438523005	LJA	2nd Floor Women's Bathroom, Room 238	4.5
6	10438523006	LJA	3rd Floor Drinking Fountain, Hallway	1.6
7	10438523007	LJA	3rd Floor Women's Bathroom, Room 313	9.0
8	10438523008	LJA	1st Floor Drinking Fountain, Hallway	6.6
9	10438523009	LJA	1st Floor Men's Bathroom, Room 143	5.7
10	10438523010	LJA	1st Floor Women's Bathroom, Room 127	11.5
11	10438523011	HPMS	1st Floor Bathroom, Room 101	2.3
12	10438523012	HPMS	2nd Floor Drinking Fountain, Room 202	0.65
13	10438523013	HPMS	2nd floor Bathroom, Room 206	2.4
14	10438523014	HPMS	2nd floor Adult Bathroom, Room 205	4.5
15	10438523015	HPMS	1st Floor Drinking Fountain, Room 107	2.6
16	10438523016	HPMS	1st Floor Adult Bathroom, Room 101	4.6

LJA – Laura Jeffrey Academy
HPMS – Highland Park Montessori School

Bolded Sample –The result was above 15 ppb limit. Refer to the report for corrective actions and final test results

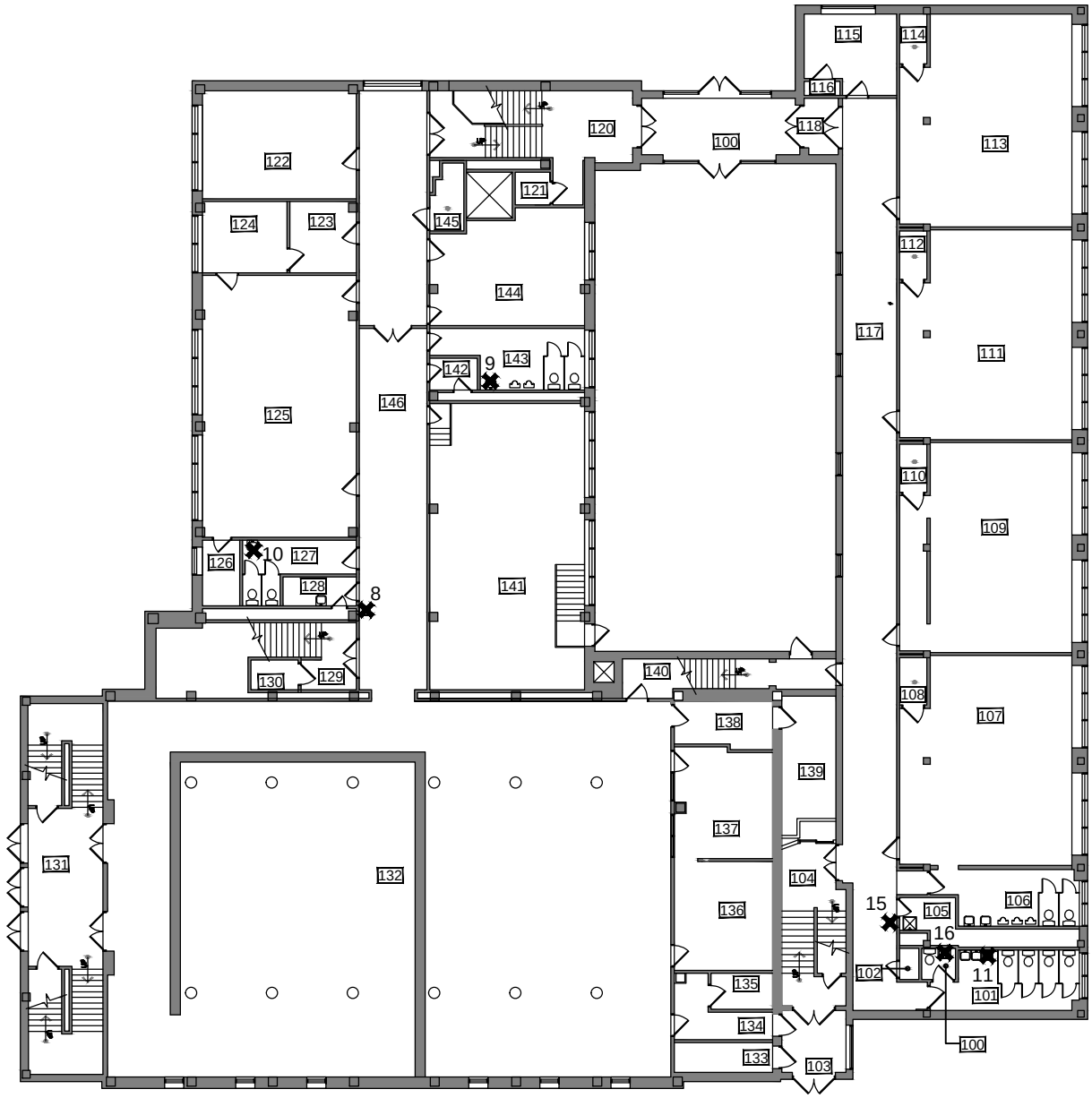
TABLE 2
SUMMARY OF KITCHEN FAUCET WATER TEST RESULTS
Laura Jeffrey Academy and Highland Park Montessori School
AET PROJECT NO 03-20089

Sample Location (Kitchen Sinks on Floor 2)	Date Sampled	Result (ppb)	Comments
1R SE Kitchen Faucet	8/14/208	**58.5**	MMC removed the ball valves prior to testing. This is also the sink that was first sampled on July 6, 2018.
	8/30/2018	**26.6**	MMC replaced faucet with low-lead fixture
	9/12/2018	**38.9**	MMC removed more components
		18.1	Second Draw from Faucet
	10/5/2018	**36.8**	MMC removed components where the water main enters the building
		14.8	Second Draw from Faucet
	12/4/2018	**44.4**	MMC removed original copper pipe under sink
		18.6	Second Draw from Faucet
	2/19/2019	9.3	MMC cleaned the faucet aerators
		5.0	Second Draw from Faucet
2R SW Kitchen Faucet	8/14/2019	**53.2**	MMC removed the ball valves prior to testing
	8/30/2018	14.4	MMC replaced faucet with low-lead fixture
	9/12/2018	**20.6**	MMC removed more components
	10/5/2018	**29.0**	MMC removed components where the water main enters the building
	12/4/2018	**21.2**	MMC removed original copper pipe under sink
	2/19/2019	1.1	MMC cleaned the faucet aerators
3R N Kitchen Faucet	8/14/2019	**108.**	MMC removed the ball valves prior to testing
	8/30/2018	9.5	MMC replaced faucet with low-lead fixture
	9/12/2018	7.7	MMC removed more components
	10/5/2018	6.3	MMC removed components where the water main enters the building
	12/4/2018	2.8	MMC removed original copper pipe under sink
	2/19/2019	0.66	MMC cleaned the faucet aerators

Bolded Result: The result was above 15 ppb EPA drinking water limit.

Appendix A

Sample Location Figures



Legend

✖ Water Sample Location

AMERICAN ENGINEERING TESTING, INC.

N

0 25

APPROXIMATE SCALE IN FEET

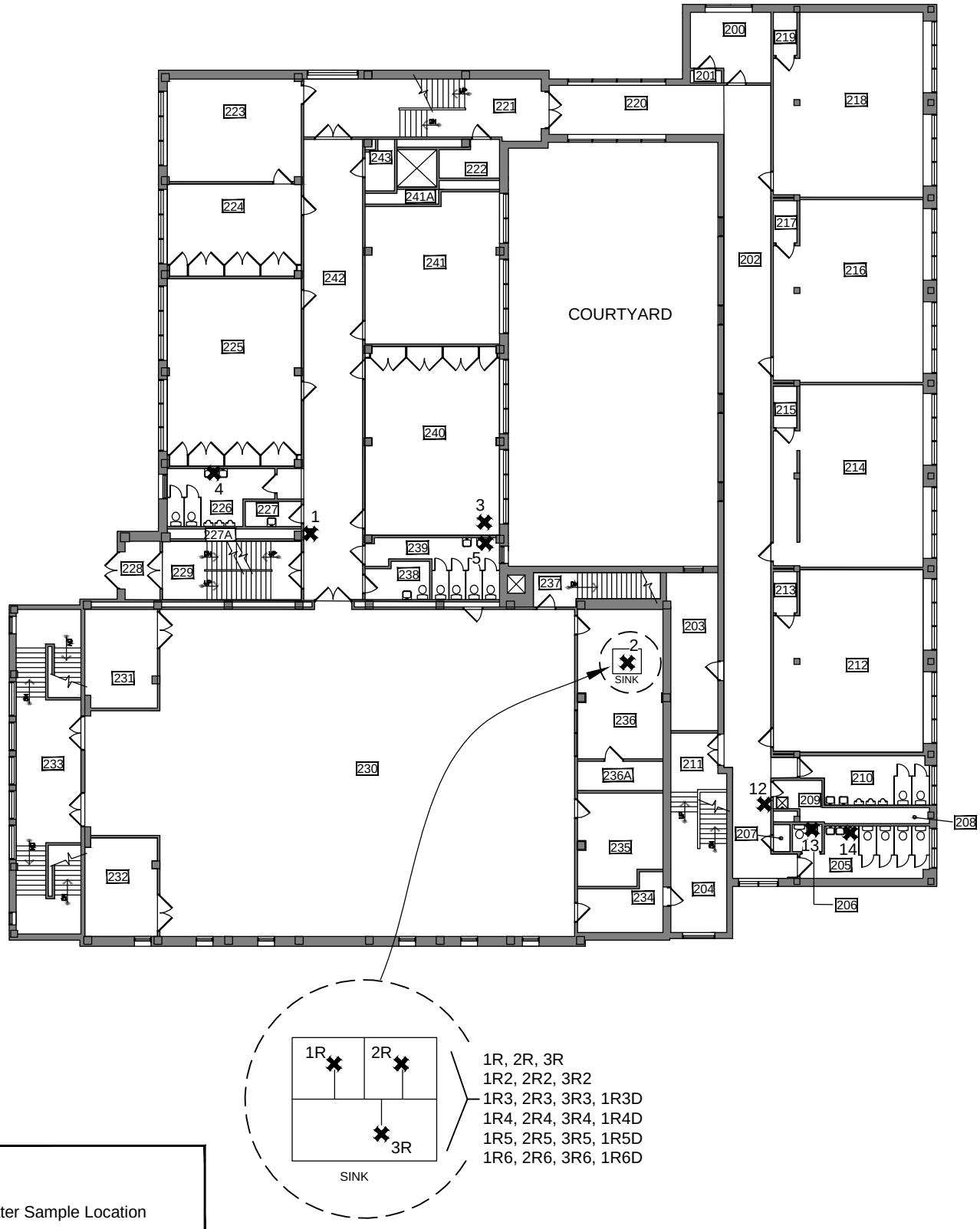
Figure 1

Floor 01 - Lead in Potable Water Testing

Laura Jeffrey Academy and
Highland Park Montessori School
1550 Summit Avenue
St. Paul, Minnesota

Date: 12/19/2018 AET Project No. 03-20089

File: LJ_HM_PotableWater_F.dwg PO 17938-633



AMERICAN ENGINEERING TESTING, INC.

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APPROXIMATE SCALE IN FEET

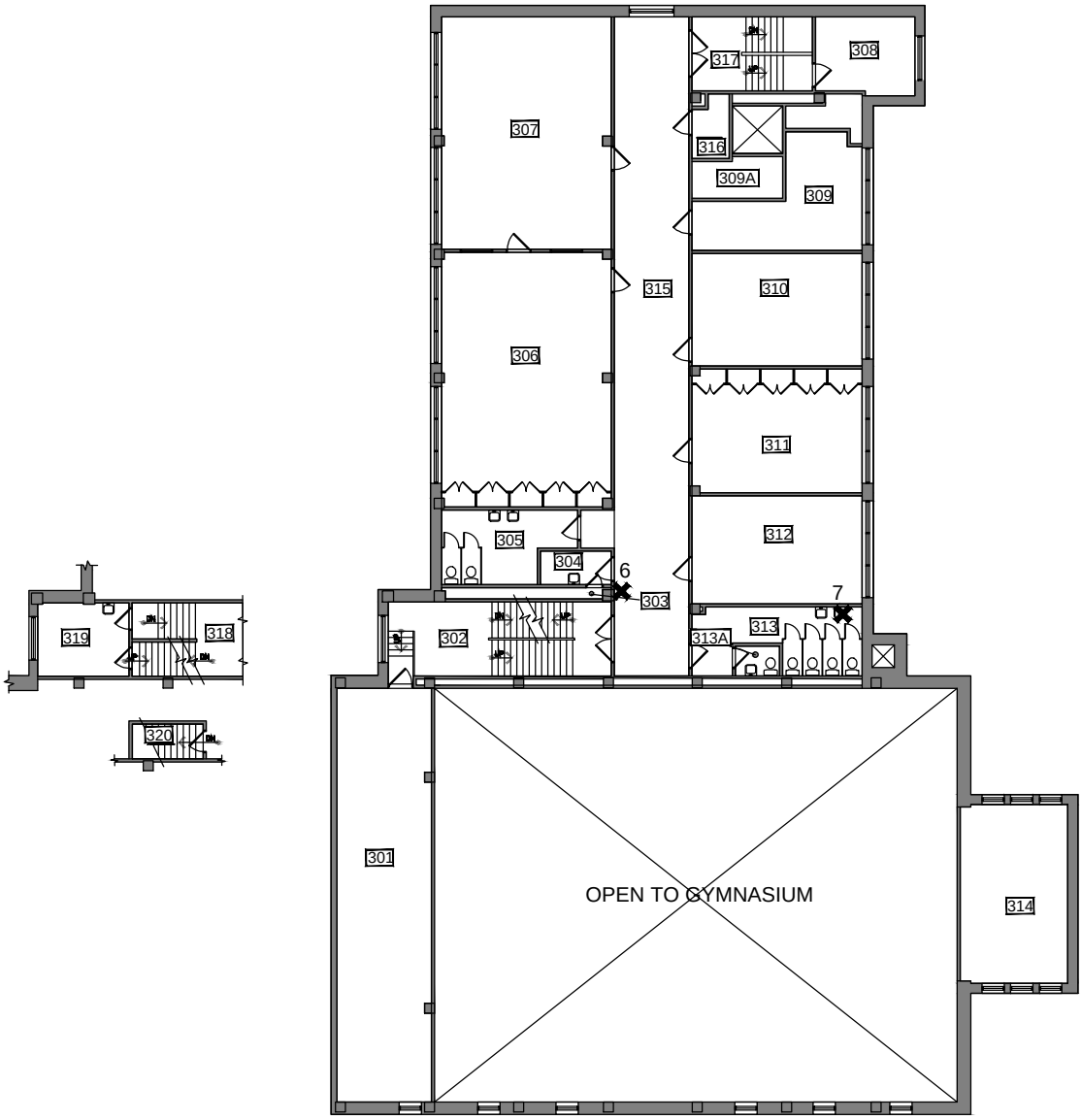
Figure 2

Floor 02 - Lead in Potable Water Testing

Laura Jeffrey Academy and
Highland Park Montessori School
1550 Summit Avenue
St. Paul, Minnesota

Date: 2/19/2019 AET Project No. 03-20089

File: LJ_HM_PotableWater_F.dwg PO 17938-633



Legend

✖ Water Sample Location

AMERICAN ENGINEERING TESTING, INC.

N

0 25

APPROXIMATE SCALE IN FEET

Figure 3

Floor 03 - Lead in Potable Water Testing

Laura Jeffrey Academy and
Highland Park Montessori School
1550 Summit Avenue
St. Paul, Minnesota

Date: 12/19/2018 AET Project No. 03-20089

File: LJ_HM_PotableWater_F.dwg PO 17938-633

Appendix B

Analytical Laboratory Reports and Chains of Custody

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

July 13, 2018

Todd Lewis
American Engineering Testing
550 Cleveland Ave. N.
Saint Paul, MN 55114

RE: Project: 03-20089 Laura, Jeffery & High
Pace Project No.: 10438523

REVIEWED
By Todd Lewis at 1:37 pm, Aug 03, 2018

Dear Todd Lewis:
Enclosed are the analytical results for sample(s) received by the laboratory on July 06, 2018. 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,

Tina Soltani
tina.soltani@pacelabs.com
(612)607-6384
Project Manager

Enclosures

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: 03-20089 Laura, Jeffery & High
Pace Project No.: 10438523

Minnesota Certification IDs

1700 Elm Street SE, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Minnesota Dept of Ag Certifcation #: via MN 027-053-137
Minnesota Petrofund Certification #: 1240
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970
Wyoming UST Certification #: 2926.01 via A2LA

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: 03-20089 Laura, Jeffery & High
Pace Project No.: 10438523

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10438523001	**DrinkingFountain 2nd FloorHall**	Water	07/06/18 00:00	07/06/18 11:51
10438523002	**Sink in Kitchen RM 235**	Water	07/06/18 00:00	07/06/18 11:51
10438523003	**Sink in Room 239**	Water	07/06/18 00:00	07/06/18 11:51
10438523004	**2nd Floor Mens Bathroom RM226**	Water	07/06/18 00:00	07/06/18 11:51
10438523005	**2ndFloor Womens Bathroom RM238**	Water	07/06/18 00:00	07/06/18 11:51
10438523006	**3rdFloor DrinkingFountain Hall**	Water	07/06/18 00:00	07/06/18 11:51
10438523007	**3rdFloor Womens Bathroom RM313**	Water	07/06/18 00:00	07/06/18 11:51
10438523008	**1stFloor DrinkingFountain Hall**	Water	07/06/18 00:00	07/06/18 11:51
10438523009	**1st Floor Mens Bathroom RM143**	Water	07/06/18 00:00	07/06/18 11:51
10438523010	**1st Floor WomensBathroom RM127**	Water	07/06/18 00:00	07/06/18 11:51
10438523011	**1st Floor Bathroom RM101**	Water	07/06/18 00:00	07/06/18 11:51
10438523012	**2ndFloorDrinkingFountain RM202**	Water	07/06/18 00:00	07/06/18 11:51
10438523013	**2nd Floor Bathroom RM206**	Water	07/06/18 00:00	07/06/18 11:51
10438523014	**2nd Floor Adult Bathroom RM205**	Water	07/06/18 00:00	07/06/18 11:51
10438523015	**1stFloorDrinkingFountain RM117**	Water	07/06/18 00:00	07/06/18 11:51
10438523016	**1st Floor Adult Bathroom RM101**	Water	07/06/18 00:00	07/06/18 11:51

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: 03-20089 Laura, Jeffery & High
Pace Project No.: 10438523

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10438523001	**DrinkingFountain 2nd FloorHall**	EPA 200.8	WBS	1	PASI-M
10438523002	**Sink in Kitchen RM 235**	EPA 200.8	WBS	1	PASI-M
10438523003	**Sink in Room 239**	EPA 200.8	WBS	1	PASI-M
10438523004	**2nd Floor Mens Bathroom RM226**	EPA 200.8	WBS	1	PASI-M
10438523005	**2ndFloor Womens Bathroom RM238**	EPA 200.8	WBS	1	PASI-M
10438523006	**3rdFloor DrinkingFountain Hall**	EPA 200.8	WBS	1	PASI-M
10438523007	**3rdFloor Womens Bathroom RM313**	EPA 200.8	WBS	1	PASI-M
10438523008	**1stFloor DrinkingFountain Hall**	EPA 200.8	WBS	1	PASI-M
10438523009	**1st Floor Mens Bathroom RM143**	EPA 200.8	WBS	1	PASI-M
10438523010	**1st Floor WomensBathroom RM127**	EPA 200.8	WBS	1	PASI-M
10438523011	**1st Floor Bathroom RM101**	EPA 200.8	WBS	1	PASI-M
10438523012	**2ndFloorDrinkingFountain RM202**	EPA 200.8	WBS	1	PASI-M
10438523013	**2nd Floor Bathroom RM206**	EPA 200.8	WBS	1	PASI-M
10438523014	**2nd Floor Adult Bathroom RM205**	EPA 200.8	WBS	1	PASI-M
10438523015	**1stFloorDrinkingFountain RM117**	EPA 200.8	WBS	1	PASI-M
10438523016	**1st Floor Adult Bathroom RM101**	EPA 200.8	WBS	1	PASI-M

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 03-20089 Laura, Jeffery & High
Pace Project No.: 10438523

Sample: DrinkingFountain 2nd FloorHall **Lab ID: 10438523001** Collected: 07/06/18 00:00 Received: 07/06/18 11:51 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, DW	Analytical Method: EPA 200.8							
Lead	**0.73**	ug/L	0.10	1		07/13/18 15:35	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 03-20089 Laura, Jeffery & High
Pace Project No.: 10438523

Sample: Sink in Kitchen RM 235 **Lab ID: 10438523002** Collected: 07/06/18 00:00 Received: 07/06/18 11:51 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, DW	Analytical Method: EPA 200.8							
Lead	**229**	ug/L	0.50	5		07/13/18 16:28	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 03-20089 Laura, Jeffery & High
Pace Project No.: 10438523

Sample: Sink in Room 239 **Lab ID: 10438523003** Collected: 07/06/18 00:00 Received: 07/06/18 11:51 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, DW	Analytical Method: EPA 200.8							
Lead	**3.9**	ug/L	0.10	1		07/13/18 15:45	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 03-20089 Laura, Jeffery & High
Pace Project No.: 10438523

Sample: 2nd Floor Mens Bathroom RM226 **Lab ID: 10438523004** Collected: 07/06/18 00:00 Received: 07/06/18 11:51 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, DW	Analytical Method: EPA 200.8							
Lead	**4.2**	ug/L	0.10	1		07/13/18 15:46	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 03-20089 Laura, Jeffery & High
Pace Project No.: 10438523

Sample: 2ndFloor Womens Bathroom RM238 **Lab ID: 10438523005** Collected: 07/06/18 00:00 Received: 07/06/18 11:51 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, DW	Analytical Method: EPA 200.8							
Lead	**4.5**	ug/L	0.10	1		07/13/18 15:48	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 03-20089 Laura, Jeffery & High
Pace Project No.: 10438523

Sample: 3rdFloor DrinkingFountain Hall **Lab ID: 10438523006** Collected: 07/06/18 00:00 Received: 07/06/18 11:51 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, DW	Analytical Method: EPA 200.8							
Lead	**1.6**	ug/L	0.10	1		07/13/18 15:56	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 03-20089 Laura, Jeffery & High
Pace Project No.: 10438523

Sample: 3rdFloor Womens Bathroom RM313 **Lab ID: 10438523007** Collected: 07/06/18 00:00 Received: 07/06/18 11:51 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, DW	Analytical Method: EPA 200.8							
Lead	**9.0**	ug/L	0.10	1		07/13/18 15:58	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 03-20089 Laura, Jeffery & High
Pace Project No.: 10438523

Sample: 1stFloor DrinkingFountain Hall **Lab ID: 10438523008** Collected: 07/06/18 00:00 Received: 07/06/18 11:51 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, DW	Analytical Method: EPA 200.8							
Lead	**6.6**	ug/L	0.10	1		07/13/18 16:00	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 03-20089 Laura, Jeffery & High
Pace Project No.: 10438523

Sample: 1st Floor Mens Bathroom RM143 **Lab ID: 10438523009** Collected: 07/06/18 00:00 Received: 07/06/18 11:51 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, DW	Analytical Method: EPA 200.8							
Lead	**5.7**	ug/L	0.10	1		07/13/18 16:02	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 03-20089 Laura, Jeffery & High
Pace Project No.: 10438523

Sample: 1st Floor WomensBathroom RM127 **Lab ID: 10438523010** Collected: 07/06/18 00:00 Received: 07/06/18 11:51 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, DW	Analytical Method: EPA 200.8							
Lead	**11.5**	ug/L	0.10	1		07/13/18 16:03	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 03-20089 Laura, Jeffery & High
Pace Project No.: 10438523

Sample: 1st Floor Bathroom RM101 **Lab ID: 10438523011** Collected: 07/06/18 00:00 Received: 07/06/18 11:51 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, DW	Analytical Method: EPA 200.8							
Lead	**2.3**	ug/L	0.10	1		07/13/18 16:05	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 03-20089 Laura, Jeffery & High
Pace Project No.: 10438523

Sample: 2ndFloorDrinkingFountain RM202 **Lab ID: 10438523012** Collected: 07/06/18 00:00 Received: 07/06/18 11:51 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, DW	Analytical Method: EPA 200.8							
Lead	**0.65**	ug/L	0.10	1		07/13/18 16:09	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 03-20089 Laura, Jeffery & High
Pace Project No.: 10438523

Sample: 2nd Floor Bathroom RM206 **Lab ID: 10438523013** Collected: 07/06/18 00:00 Received: 07/06/18 11:51 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, DW	Analytical Method: EPA 200.8							
Lead	**2.4**	ug/L	0.10	1		07/13/18 16:10	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 03-20089 Laura, Jeffery & High
Pace Project No.: 10438523

Sample: 2nd Floor Adult Bathroom RM205 **Lab ID: 10438523014** Collected: 07/06/18 00:00 Received: 07/06/18 11:51 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, DW	Analytical Method: EPA 200.8							
Lead	**4.5**	ug/L	0.10	1		07/13/18 16:12	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 03-20089 Laura, Jeffery & High
Pace Project No.: 10438523

Sample: 1stFloorDrinkingFountain RM117 **Lab ID: 10438523015** Collected: 07/06/18 00:00 Received: 07/06/18 11:51 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, DW	Analytical Method: EPA 200.8							
Lead	**2.6**	ug/L	0.10	1		07/13/18 16:23	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 03-20089 Laura, Jeffery & High
Pace Project No.: 10438523

Sample: 1st Floor Adult Bathroom RM101 **Lab ID: 10438523016** Collected: 07/06/18 00:00 Received: 07/06/18 11:51 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, DW	Analytical Method: EPA 200.8							
Lead	**4.6**	ug/L	0.10	1		07/13/18 16:25	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 03-20089 Laura, Jeffery & High
Pace Project No.: 10438523

QC Batch: 550012 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: ICPMS Metals, Drinking Water
Associated Lab Samples: 10438523001, 10438523002, 10438523003, 10438523004, 10438523005, 10438523006, 10438523007, 10438523008, 10438523009, 10438523010, 10438523011, 10438523012, 10438523013, 10438523014, 10438523015, 10438523016

METHOD BLANK: 2988830 Matrix: Water
Associated Lab Samples: 10438523001, 10438523002, 10438523003, 10438523004, 10438523005, 10438523006, 10438523007, 10438523008, 10438523009, 10438523010, 10438523011, 10438523012, 10438523013, 10438523014, 10438523015, 10438523016

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Lead	ug/L	ND	0.10	07/13/18 15:33	

LABORATORY CONTROL SAMPLE: 2988831

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Lead	ug/L	100	99.2	99	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2990292 2990293

Parameter	Units	10438523001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	ug/L	0.73	100	100	95.7	99.7	95	99	70-130	4	20	

MATRIX SPIKE SAMPLE: 2990294

Parameter	Units	10438523011 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Lead	ug/L	2.3	100	100	98	70-130	

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

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: 03-20089 Laura, Jeffery & High
Pace Project No.: 10438523

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.

LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 03-20089 Laura, Jeffery & High
Pace Project No.: 10438523

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10438523001	**DrinkingFountain 2nd FloorHall**	EPA 200.8	550012		
10438523002	**Sink in Kitchen RM 235**	EPA 200.8	550012		
10438523003	**Sink in Room 239**	EPA 200.8	550012		
10438523004	**2nd Floor Mens Bathroom RM226**	EPA 200.8	550012		
10438523005	**2ndFloor Womens Bathroom RM238**	EPA 200.8	550012		
10438523006	**3rdFloor DrinkingFountain Hall**	EPA 200.8	550012		
10438523007	**3rdFloor Womens Bathroom RM313**	EPA 200.8	550012		
10438523008	**1stFloor DrinkingFountain Hall**	EPA 200.8	550012		
10438523009	**1st Floor Mens Bathroom RM143**	EPA 200.8	550012		
10438523010	**1st Floor WomensBathroom RM127**	EPA 200.8	550012		
10438523011	**1st Floor Bathroom RM101**	EPA 200.8	550012		
10438523012	**2ndFloorDrinkingFountain RM202**	EPA 200.8	550012		
10438523013	**2nd Floor Bathroom RM206**	EPA 200.8	550012		
10438523014	**2nd Floor Adult Bathroom RM205**	EPA 200.8	550012		
10438523015	**1stFloorDrinkingFountain RM117**	EPA 200.8	550012		
10438523016	**1st Floor Adult Bathroom RM101**	EPA 200.8	550012		

AMERICAN ENGINEERING TESTING, INC.

☑ St. Paul Office
550 Cleveland Ave. N
St. Paul, MN 55114
651.659-9001
651-659-1379 (fax)

☐ OTHER _____

ADDRESS: _____

PHONE: _____

WO# : 10438523

10438523

AET Project No. 03-20089

PAGE 1 OF 4

AET PROJECT NUMBER 03-20089

PROJECT NAME/LOCATION Laura Jeffery & Highland Park

AET PROJECT MANAGER Todd Lewis

AET PURCHASE ORDER NO Todd Lewis

SEND REPORT TO Todd Lewis

SAMPLED BY (PRINT) _____

SAMPLER SIGNATURE _____

REQUESTED TURNAROUND TIME: ☒ NORMAL ☐ RUSH

DATE NEEDED BY: _____

ITEM #	SAMPLE DESCRIPTION	DATE	TIME	SAMPLE TYPE	NO. OF CONTAINERS	PRESERVATIVES: UNPRESERVED	MeOH	HCL	H_2SO_4	HNO_3		FIELD FILTERED Y/N	ANALYSIS: LEAD In Water	REMARKS
1	Drinking fountain 2nd Floor Hallway	7-6-18		~~Raw~~ water										001
2	Sink in kitchen Rm 235													002
3	Sink in Room ~~235~~ 239													003
4	2nd Floor men's Bathroom Rm 226													004

NOTE:
First Draw
TLewis@amengTest.com
Cell: 612-616-9235

ITEM NUMBER	RELINQUISHED BY/AFFILIATION	ACCEPTED BY/AFFILIATION	DATE	TIME
	Todd Lewis/AET T-6-18	Tracy Pace	7/6/18	11:51

T=23.9

AMERICAN ENGINEERING TESTING, INC.

☑ St. Paul Office
550 Cleveland Ave. N.
St. Paul, MN 55114
651-659-9001
651-659-1379 (fax)

☐ OTHER _____

ADDRESS: _____

PHONE: _____

№ 22316

PAGE 2 OF _____

AET PROJECT NUMBER 03-20089

PROJECT NAME/LOCATION Lauva Jeffery - Highland Park

AET PROJECT MANAGER Todd Lewis

SEND REPORT TO _____

SAMPLED BY (PRINT) _____

SAMPLER SIGNATURE _____

REQUESTED TURNAROUND TIME: ☑ NORMAL ☐ RUSH

DATE NEEDED BY: _____

ITEM#	SAMPLE DESCRIPTION	DATE	TIME	SAMPLE TYPE	NO. OF CONTAINERS	PRESERVATIVES: UNPRESERVED	MeOH	HCL	H_2SO_4	HNO_3		FIELD FILTERED Y/N	ANALYSIS: LEAD in WATER	REMARKS
5	2nd floor Women's Bathroom Room 238													005
6	3rd floor Drinking Fountain in Hallway													006
7	3rd floor Women's Bathroom Room 313													007
8	First Floor Drinking Fountain in Hallway													008
9	First floor Men's Bathroom Room 143													009
10	First Floor Women's Bathroom - Room 127													010

NOTE:

ITEM NUMBER	RELINQUISHED BY/AFFILIATION	ACCEPTED BY/AFFILIATION	DATE	TIME
		Tammy Pace	7/6/18	11:51

T=23.9

AMERICAN ENGINEERING TESTING, INC.

☐ St. Paul Office
550 Cleveland Ave. N
St. Paul, MN 55114
651,659-9001
651-659-1379 (fax)

☐ OTHER _____

ADDRESS: _____

PHONE: _____

№ 23060

PAGE 3 OF _____

AET PROJECT NUMBER 03-20089

PROJECT NAME/LOCATION Laura Jeffery - Highland Park

AET PROJECT MANAGER Todd Lewis

AET PURCHASE ORDER NO _____

SEND REPORTTO _____

SAMPLED BY (PRINT) _____

SAMPLER SIGNATURE _____

REQUESTED TURNAROUND TIME: ☐ NORMAL ☐ RUSH

DATE NEEDED BY: _____

ITEM #	SAMPLE DESCRIPTION	DATE	TIME	SAMPLE TYPE	NO. OF CONTAINERS	PRESERVATIVES: UNPRESERVED	MeOH	HCL	H_2SO_4	HNO_3	FIELD FILTERED Y/N	ANALYSIS: LEAD in water	REMARKS
11	First Floor Bathroom Rm 101												011
~~12~~	~~Second Floor Bathroom~~												
12	Second Floor Drinking Fountain Room 202												012
13	Second Floor Bathroom Room 206												013

NOTE:

ITEM NUMBER	RELINQUISHED BY/AFFILIATION	ACCEPTED BY/AFFILIATION	DATE	TIME
		Jenny Pace	7/6/18	4:51

T = 23.9

AMERICAN ENGINEERING TESTING, INC.

☐ St. Paul Office
550 Cleveland Ave. N
St. Paul, MN 55114
651,659-9001
651-659-1379 (fax)

☐ OTHER _____

No 23059

ADDRESS: _____

PHONE: _____

PAGE 4 OF ____

AET PROJECT NUMBER 03-20089

PROJECT NAME/LOCATION Laura Jeffery

AET PROJECT MANAGER Todd Lewis

AET PURCHASE ORDER NO _____

SEND REPORT TO _____

SAMPLED BY (PRINT) _____

SAMPLER SIGNATURE _____

REQUESTED TURNAROUND TIME: ☑ NORMAL ☐ RUSH

DATE NEEDED BY: _____

ITEM #	SAMPLE DESCRIPTION	DATE	TIME	SAMPLE TYPE	NO. OF CONTAINERS	PRESERVATIVES: UNPRESERVED	MeOH	HCL	H_2SO_4	HNO_3	FIELD FILTERED Y/N	ANALYSIS: LEAD in WATER	REMARKS
14	Second Floor												014
Second Floor	Adult Bathroom												
	Room 205												
15	First Floor												015
	Drinking Fountain												
	Room 117												
16	First Floor												016
	Adult Bathroom												
	Room 101												

NOTE:

ITEM NUMBER	RELINQUISHED BY/AFFILIATION	ACCEPTED BY/AFFILIATION	DATE	TIME
		Tony Pace	7/6/18	11:51

T=23.9

AET Project No. 03-20089

Pace Analytical	Document Name: **Sample Condition Upon Receipt Form**	Document Revised: 02May2018 Page 1 of 2
	Document No.: **F-MN-L-213-rev.23**	Issuing Authority: Pace Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: AET

Project #: **WO#: 10438523**

PM: TS1 **Due Date: 07/13/18**

CLIENT: AET

Courier: ☐Fed Ex ☐UPS ☐USPS ☒Client ☐Commercial ☐Pace ☐SpeeDee ☐Other:_____

Tracking Number: _____

Custody Seal on Cooler/Box Present? ☐Yes ☒No **Seals Intact?** ☐Yes ☒No

Optional: Proj. Due Date: Proj. Name:

Packing Material: ☒Bubble Wrap ☐Bubble Bags ☐None ☐Other:_____ **Temp Blank?** ☒Yes ☐No

Thermometer Used: ☒G87A9170600254 ☐G87A9155100842 **Type of Ice:** ☐Wet ☐Blue ☒None ☐Dry ☐Melted

Cooler Temp Read (°C): 23.7 **Cooler Temp Corrected (°C):** 23.9 **Biological Tissue Frozen?** ☐Yes ☐No ☒N/A

Temp should be above freezing to 6°C **Correction Factor:** +0.2 **Date and Initials of Person Examining Contents:** AS 7/6/18

USDA Regulated Soil (☒N/A, water sample)

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 maps)? ☐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-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present?	☒Yes	☐No		1.
Chain of Custody Filled Out?	☒Yes	☐No		2.
Chain of Custody Relinquished?	☒Yes	☐No		3.
Sampler Name and/or Signature on COC?	☒Yes	☐No	☐N/A	4.
Samples Arrived within Hold Time?	☒Yes	☐No		5.
Short Hold Time Analysis (<72 hr)?	☐Yes	☒No		6.
Rush Turn Around Time Requested?	☐Yes	☒No		7.
Sufficient Volume?	☒Yes	☐No		8.
Correct Containers Used?	☒Yes	☐No		9.
-Pace Containers Used?	☒Yes	☐No		
Containers Intact?	☒Yes	☐No		10.
Filtered Volume Received for Dissolved Tests?	☐Yes	☐No	☒N/A	11. Note if sediment is visible in the dissolved container
Is sufficient information available to reconcile the samples to the COC? Matrix: WT	☒Yes	☐No		12. No time on coc and sample No date on sample 7/6/18
All containers needing acid/base preservation have been checked?	☒Yes	☐No	☐N/A	13. ☒HNO_3 ☐H_2SO_4 ☐NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>12 Cyanide)	☐Yes	☒No	☐N/A	Sample # 1-16
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☐Yes	☐No	☒N/A	Initial when completed: AS Lot # of added preservative: 1117/20
Headspace in VOA Vials (>6mm)?	☐Yes	☐No	☒N/A	14.
Trip Blank Present?	☐Yes	☐No	☒N/A	15.
Trip Blank Custody Seals Present?	☐Yes	☐No	☒N/A	
Pace Trip Blank Lot # (if purchased):				

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐Yes ☐No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: Tina Sloan **Date:** 7/9/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Pace Analytical	Document Name: **Sample Condition Upon Receipt Form**	Document Revised: 02May2018 Page 2 of 2
	Document No.: **F-MN-L-213-rev.23**	Issuing Authority: Pace Minnesota Quality Office

SCUR Exceptions: **Workorder #:**

Issue	Sample ID	Container Type/#

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preservative	pH Upon Receipt	Date Preservation Adjusted	Time Preservation Adjusted	Amount of Additional Preservative Added	Lot # of Preservative Added	pH After Adjustment	Initials
sample 1-16	HNO^3	6.0	7/6/18	1440	2ML	111720	1.0	AS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

August 16, 2018

Todd Lewis
American Engineering Testing
550 Cleveland Ave. N.
Saint Paul, MN 55114

RE: Project: 03-20089 Lead In Drinking Wtr.
Pace Project No.: 10443297

REVIEWED
By Todd Lewis at 1:14 pm, Aug 16, 2018

Dear Todd Lewis:
Enclosed are the analytical results for sample(s) received by the laboratory on August 14, 2018. 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,

Tina Soltani
tina.soltani@pacelabs.com
(612)607-6384
Project Manager

Enclosures

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: 03-20089 Lead In Drinking Wtr.
Pace Project No.: 10443297

Minnesota Certification IDs

1700 Elm Street SE, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Minnesota Dept of Ag Certifcation #: via MN 027-053-137
Minnesota Petrofund Certification #: 1240
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: 03-20089 Lead In Drinking Wtr.
Pace Project No.: 10443297

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10443297001	**1R SE Kitchen Faucet**	Water	08/14/18 09:45	08/14/18 10:10
10443297002	**2R SW Kitchen Faucet**	Water	08/14/18 09:45	08/14/18 10:10
10443297003	**3R N. Kitchen Faucet**	Water	08/14/18 09:45	08/14/18 10:10

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(612)607-1700

SAMPLE ANALYTE COUNT

Project: 03-20089 Lead In Drinking Wtr.
Pace Project No.: 10443297

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10443297001	**1R SE Kitchen Faucet**	EPA 200.8	TT3	1	PASI-M
10443297002	**2R SW Kitchen Faucet**	EPA 200.8	TT3	1	PASI-M
10443297003	**3R N. Kitchen Faucet**	EPA 200.8	TT3	1	PASI-M

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Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 03-20089 Lead In Drinking Wtr.
Pace Project No.: 10443297

Sample: 1R SE Kitchen Faucet **Lab ID: 10443297001** Collected: 08/14/18 09:45 Received: 08/14/18 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, DW	Analytical Method: EPA 200.8							
Lead	**58.5**	ug/L	0.10	1		08/16/18 09:06	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 03-20089 Lead In Drinking Wtr.
Pace Project No.: 10443297

Sample: 2R SW Kitchen Faucet **Lab ID: 10443297002** Collected: 08/14/18 09:45 Received: 08/14/18 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, DW	Analytical Method: EPA 200.8							
Lead	**53.2**	ug/L	0.10	1		08/16/18 09:15	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 03-20089 Lead In Drinking Wtr.
Pace Project No.: 10443297

Sample: 3R N. Kitchen Faucet **Lab ID: 10443297003** Collected: 08/14/18 09:45 Received: 08/14/18 10:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, DW	Analytical Method: EPA 200.8							
Lead	**108**	ug/L	0.10	1		08/16/18 09:17	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 03-20089 Lead In Drinking Wtr.
Pace Project No.: 10443297

QC Batch: 556787 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: ICPMS Metals, Drinking Water
Associated Lab Samples: 10443297001, 10443297002, 10443297003

METHOD BLANK: 3023285 Matrix: Water
Associated Lab Samples: 10443297001, 10443297002, 10443297003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Lead	ug/L	ND	0.10	08/16/18 09:02	

LABORATORY CONTROL SAMPLE: 3023286

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Lead	ug/L	100	103	103	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3025220 3025221

Parameter	Units	10443297001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	ug/L	58.5	100	100	157	157	98	99	70-130	0	20	

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

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: 03-20089 Lead In Drinking Wtr.
Pace Project No.: 10443297

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.

LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

WORKORDER QUALIFIERS

WO: 10443297

[1] Samples were received outside of the recommended temperature range of 0-6 degrees Celsius. The samples were received from the field on ice.

Pace Analytical Services, LLC
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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 03-20089 Lead In Drinking Wtr.
Pace Project No.: 10443297

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10443297001	**1R SE Kitchen Faucet**	EPA 200.8	556787		
10443297002	**2R SW Kitchen Faucet**	EPA 200.8	556787		
10443297003	**3R N. Kitchen Faucet**	EPA 200.8	556787		

AMERICAN ENGINEERING TESTING, INC.

☒ St. Paul Office
550 Cleveland Ave. N
St. Paul, MN 55114
651,659-9001
651-659-1379 (fax)

☐ OTHER _____

ADDRESS: _____

PHONE: _____

WO# : 10443297

10443297

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PAGE 1 OF 1

AET PROJECT NUMBER 03-20089

PROJECT NAME/LOCATION Lead in drinking water

AET PROJECT MANAGER Todd Lewis

AET PURCHASE ORDER NO 178660-691

SEND REPORT TO Todd Lewis

SAMPLED BY (PRINT) _____

SAMPLER SIGNATURE _____

REQUESTED TURNAROUND TIME: ☐ NORMAL ☒ RUSH

DATE NEEDED BY: Thursday

ITEM #	SAMPLE DESCRIPTION	DATE	TIME	SAMPLE TYPE	NO. OF CONTAINERS	PRESERVATIVES: UNPRESERVED	MeOH	HCL	H_2SO_4	HNO_3	FIELD FILTERED Y/N	ANALYSIS: Lead in drinking water Epa 200.8	REMARKS
1R	SE Kitchen faucet	8/14/18	9:45	Potable Water								X	001
2R	SW Kitchen Faucet											X	002
3R	N. Kitchen faucet											X	003

NOTE: Pb in drinking water

ITEM NUMBER	RELINQUISHED BY/AFFILIATION	ACCEPTED BY/AFFILIATION	DATE	TIME
10	Todd Lewis/AET/8/14/18	PACE	8-14-18	10:10

T=26.8°C

Pace Analytical	Document Name: **Sample Condition Upon Receipt Form**	Document Revised: 02May2018 Page 1 of 2
	Document No.: **F-MN-L-213-rev.23**	Issuing Authority: Pace Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: American Engineering Testing

Project #: **WO#: 10443297**

PM: TS1 **Due Date: 08/20/18**

CLIENT: AET

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☒ Client ☐ Commercial ☐ Pace ☐ SpeeDee ☐ Other:

Tracking Number:

Custody Seal on Cooler/Box Present? ☐ Yes ☒ No **Seals Intact?** ☐ Yes ☒ No

Optional: Proj. Due Date: Proj. Name:

Packing Material: ☒ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other: **Temp Blank?** ☒ Yes ☐ No

Thermometer Used: ☒ G87A9170600254 ☐ G87A9155100842 **Type of Ice:** ☐ Wet ☐ Blue ☒ None ☐ Dry ☐ Melted

Cooler Temp Read (°C): 27.0 **Cooler Temp Corrected (°C):** 26.8 **Biological Tissue Frozen?** ☐ Yes ☐ No ☒ N/A

Temp should be above freezing to 6°C **Correction Factor:** -0.2 **Date and Initials of Person Examining Contents:** HF 8/14/18

USDA Regulated Soil (☒ N/A, water sample)

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 maps)? ☐ 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-MN-Q-338) and include with SCUR/COC paperwork.

		COMMENTS:
Chain of Custody Present?	☒ Yes ☐ No	1.
Chain of Custody Filled Out?	☒ Yes ☐ No	2.
Chain of Custody Relinquished?	☒ Yes ☐ No	3.
Sampler Name and/or Signature on COC?	☒ Yes ☐ No ☐ N/A	4.
Samples Arrived within Hold Time?	☒ Yes ☐ No	5.
Short Hold Time Analysis (<72 hr)?	☐ Yes ☒ No	6.
Rush Turn Around Time Requested?	☒ Yes ☐ No	7.
Sufficient Volume?	☒ Yes ☐ No	8.
Correct Containers Used? -Pace Containers Used?	☒ Yes ☐ No ☒ Yes ☐ No	9.
Containers Intact?	☒ Yes ☐ No	10.
Filtered Volume Received for Dissolved Tests?	☐ Yes ☐ No ☒ N/A	11. Note if sediment is visible in the dissolved container
Is sufficient information available to reconcile the samples to the COC? Matrix: WT	☒ Yes ☐ No	12. No Time On Samples or Date
All containers needing acid/base preservation have been checked? All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>12 Cyanide) Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☒ Yes ☐ No ☐ N/A ☐ Yes ☒ No ☐ N/A ☐ Yes ☐ No ☒ N/A	13. ☒ HNO_3 ☐ H_2SO_4 ☐ NaOH Positive for Res. Chlorine? Y N Sample # 1-3 & 5 Initial when completed: HF Lot # of added preservative: 117120
Headspace in VOA Vials (>6mm)?	☐ Yes ☐ No ☒ N/A	14.
Trip Blank Present? Trip Blank Custody Seals Present? Pace Trip Blank Lot # (if purchased):	☐ Yes ☐ No ☒ N/A ☐ Yes ☐ No ☒ N/A	15.

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: Date/Time:

Comments/Resolution:

Project Manager Review: Jina Stasi **Date:** 8/14/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Pace Analytical	Document Name: **Sample Condition Upon Receipt Form**	Document Revised: 02May2018 Page 2 of 2
	Document No.: **F-MN-L-213-rev.23**	Issuing Authority: Pace Minnesota Quality Office

SCUR Exceptions: **Workorder #:** 10443297

Issue	Sample ID	Container Type/#

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preservative	pH Upon Receipt	Date Preservation Adjusted	Time Preservation Adjusted	Amount of Additional Preservative Added	Lot # of Preservative Added	pH After Adjustment	Initials
1R	HNO_3	6.0	8/14/18	1130	1mL	1117120	2.0	HE
2R	"	6.0	"	"	"	"	2.0	HE
3R	"	6.0	"	"	"	"	2.0	HE

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

September 04, 2018

Todd Lewis
American Engineering Testing
550 Cleveland Ave. N.
Saint Paul, MN 55114

REVIEWED
By Todd Lewis at 2:28 pm, Sep 04, 2018

RE: Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10445651

Dear Todd Lewis:
Enclosed are the analytical results for sample(s) received by the laboratory on August 30, 2018. 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,

Tina Soltani
tina.soltani@pacelabs.com
(612)607-6384
Project Manager

Enclosures

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10445651

Minnesota Certification IDs

1700 Elm Street SE, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Minnesota Dept of Ag Certifcation #: via MN 027-053-137
Minnesota Petrofund Certification #: 1240
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01

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Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10445651

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10445651001	**1R2 SE Kitchen Faucet**	Water	08/30/18 08:00	08/30/18 11:53
10445651002	**2R2 SW Kitchen Faucet**	Water	08/30/18 08:00	08/30/18 11:53
10445651003	**3R2 N Kitchen Faucet**	Water	08/30/18 08:00	08/30/18 11:53

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(612)607-1700

SAMPLE ANALYTE COUNT

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10445651

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10445651001	**1R2 SE Kitchen Faucet**	EPA 200.8	WBS	1	PASI-M
10445651002	**2R2 SW Kitchen Faucet**	EPA 200.8	WBS	1	PASI-M
10445651003	**3R2 N Kitchen Faucet**	EPA 200.8	WBS	1	PASI-M

Pace Analytical Services, LLC
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Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10445651

Sample: 1R2 SE Kitchen Faucet **Lab ID: 10445651001** Collected: 08/30/18 08:00 Received: 08/30/18 11:53 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, DW	Analytical Method: EPA 200.8							
Lead	**26.6**	ug/L	0.10	1		09/04/18 12:29	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10445651

Sample: 2R2 SW Kitchen Faucet **Lab ID: 10445651002** Collected: 08/30/18 08:00 Received: 08/30/18 11:53 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, DW	Analytical Method: EPA 200.8							
Lead	**14.4**	ug/L	0.10	1		09/04/18 12:36	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10445651

Sample: 3R2 N Kitchen Faucet **Lab ID: 10445651003** Collected: 08/30/18 08:00 Received: 08/30/18 11:53 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, DW	Analytical Method: EPA 200.8							
Lead	**9.5**	ug/L	0.10	1		09/04/18 12:37	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10445651

QC Batch: 560138 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: ICPMS Metals, Drinking Water
Associated Lab Samples: 10445651001, 10445651002, 10445651003

METHOD BLANK: 3040957 Matrix: Water
Associated Lab Samples: 10445651001, 10445651002, 10445651003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Lead	ug/L	ND	0.10	09/04/18 12:27	

LABORATORY CONTROL SAMPLE: 3040958

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Lead	ug/L	100	97.0	97	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3040959 3040960

Parameter	Units	10445651001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	ug/L	26.6	100	100	116	117	89	90	70-130	1	20	

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

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10445651

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.

LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10445651

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10445651001	**1R2 SE Kitchen Faucet**	EPA 200.8	560138		
10445651002	**2R2 SW Kitchen Faucet**	EPA 200.8	560138		
10445651003	**3R2 N Kitchen Faucet**	EPA 200.8	560138		

AMERICAN ENGINEERING TESTING, INC.

☑ St. Paul Office
550 Cleveland Ave. N
St. Paul, MN 55114
651,659-9001
651-659-1379 (fax)

☐ OTHER _____

ADDRESS: _____

PHONE: _____

WO# : 10445651

10445651

AET Project No. 03-20089

PAGE 1 OF 1

AET PROJECT NUMBER 03-20089

PROJECT NAME/LOCATION Laura Jeffery Academy

AET PROJECT MANAGER Todd Lewis

AET PURCHASE ORDER NO 17860-691

SEND REPORT TO Todd Lewis

SAMPLED BY (PRINT) _____

SAMPLER SIGNATURE _____

REQUESTED TURNAROUND TIME: ☐ NORMAL ☑ RUSH

DATE NEEDED BY: Tuesday (9-4-18)

ITEM #	SAMPLE DESCRIPTION	DATE	TIME	SAMPLE TYPE	NO. OF CONTAINERS	PRESERVATIVES: UNPRESERVED	MeOH	HCL	H_2SO_4	HNO_3		FIELD FILTERED Y/N	ANALYSIS: Lead in Drinking Water 200.8	REMARKS
1R2	SE Kitchen faucet	8/30/18		Water									X	001
2R2	SW Kitchen faucet												X	002
3R2	N. Kitchen faucet												X	003

NOTE:

ITEM NUMBER	RELINQUISHED BY/AFFILIATION	ACCEPTED BY/AFFILIATION	DATE	TIME
	Todd Lewis/AET 8-30-18 11:53	Matt Pea	8/30/18	1153
				T=25.2

Pace Analytical	Document Name: Sample Condition Upon Receipt Form	Document Revised: 02May2018 Page 1 of 2
	Document No.: F-MN-L-213-rev.23	Issuing Authority: Pace Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: American Engineering Testing

Project #: WO#: 10445651

PM: TS1 Due Date: 09/07/18

CLIENT: AET

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☑ Client ☐ Commercial ☐ Pace ☐ SpeeDee ☐ Other:

Tracking Number:

Custody Seal on Cooler/Box Present? ☐ Yes ☑ No **Seals Intact?** ☐ Yes ☑ No

Optional: Proj. Due Date: Proj. Name:

Packing Material: ☑ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other: **Temp Blank?** ☑ Yes ☐ No

Thermometer Used: ☑ G87A9170600254 ☐ G87A9155100842 **Type of Ice:** ☐ Wet ☐ Blue ☑ None ☐ Dry ☐ Melted

Cooler Temp Read (°C): ~~25.2~~ JJ 8/30/18 **Cooler Temp Corrected (°C):** 25.2 **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Temp should be above freezing to 6°C **Correction Factor:** -0.2 **Date and Initials of Person Examining Contents:** JJ 8/30/18

USDA Regulated Soil (☑ N/A, water sample)

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 maps)? ☐ 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-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present?	☑ Yes	☐ No		1.
Chain of Custody Filled Out?	☑ Yes	☐ No		2.
Chain of Custody Relinquished?	☑ Yes	☐ No		3.
Sampler Name and/or Signature on COC?	☑ Yes	☐ No	☐ N/A	4.
Samples Arrived within Hold Time?	☑ Yes	☐ No		5.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☑ No		6.
Rush Turn Around Time Requested?	☑ Yes	☐ No		7.
Sufficient Volume?	☑ Yes	☐ No		8.
Correct Containers Used?	☑ Yes	☐ No		9.
-Pace Containers Used?	☑ Yes	☐ No		
Containers Intact?	☑ Yes	☐ No		10.
Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☑ N/A	11. Note if sediment is visible in the dissolved container
Is sufficient information available to reconcile the samples to the COC? Matrix: WT	☑ Yes	☐ No		12. No time on COC, containers say 0800.
All containers needing acid/base preservation have been checked?	☑ Yes	☐ No	☐ N/A	13. ☑ HNO_3 ☐ H_2SO_4 ☐ NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>12 Cyanide)	☐ Yes	☑ No	☐ N/A	Sample # 1-3 1/1
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☐ Yes	☐ No	☑ N/A	Initial when completed: JJ Lot # of added preservative: 1117120
Headspace in VOA Vials (>6mm)?	☐ Yes	☐ No	☑ N/A	14.
Trip Blank Present?	☐ Yes	☐ No	☑ N/A	15.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☑ N/A	
Pace Trip Blank Lot # (if purchased):				

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: Date/Time:

Comments/Resolution:

Project Manager Review: Tina Sclari **Date:** 8/31/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Pace Analytical	Document Name: **Sample Condition Upon Receipt Form**	Document Revised: 02May2018 Page 2 of 2
	Document No.: **F-MN-L-213-rev.23**	Issuing Authority: Pace Minnesota Quality Office

SCUR Exceptions:

Workorder #:

Issue	Sample ID	Container Type/#

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preservative	pH Upon Receipt	Date Preservation Adjusted	Time Preservation Adjusted	Amount of Additional Preservative Added	Lot # of Preservative Added	pH After Adjustment	Initials
1R2	HNO_3	+6.0	8/30/18	13:59	2mL	1117120	2.0	JJ
2R2	HNO_3	+6.0	8/30/18	14:10	2mL	1117120	2.0	JJ
3R2	HNO_3	+6.0	8/30/18	14:10	2mL	1117120	2.0	JJ

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

September 14, 2018

Todd Lewis
American Engineering Testing
550 Cleveland Ave. N.
Saint Paul, MN 55114

REVIEWED
By Todd Lewis at 2:36 pm, Sep 14, 2018

RE: Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10447118

Dear Todd Lewis:
Enclosed are the analytical results for sample(s) received by the laboratory on September 12, 2018. 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,

Tina Soltani
tina.soltani@pacelabs.com
(612)607-6384
Project Manager

Enclosures

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10447118

Minnesota Certification IDs

1700 Elm Street SE, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Minnesota Dept of Ag Certifcation #: via MN 027-053-137
Minnesota Petrofund Certification #: 1240
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10447118

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10447118001	**1R3 SE Kitchen Faucet**	Water	09/12/18 08:15	09/12/18 08:28
10447118002	**2R3 SW Kitchen Faucet**	Water	09/12/18 08:15	09/12/18 08:28
10447118003	**3R3 North Kitchen Faucet**	Water	09/12/18 08:15	09/12/18 08:28
10447118004	**1R3D SE Kitchen Faucet 2nd Dra**	Water	09/12/18 08:15	09/12/18 08:28

Pace Analytical Services, LLC
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Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10447118

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10447118001	**1R3 SE Kitchen Faucet**	EPA 200.8	PW1	1	PASI-M
10447118002	**2R3 SW Kitchen Faucet**	EPA 200.8	PW1	1	PASI-M
10447118003	**3R3 North Kitchen Faucet**	EPA 200.8	PW1	1	PASI-M
10447118004	**1R3D SE Kitchen Faucet 2nd Dra**	EPA 200.8	PW1	1	PASI-M

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10447118

Sample: 1R3 SE Kitchen Faucet **Lab ID: 10447118001** Collected: 09/12/18 08:15 Received: 09/12/18 08:28 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, DW	Analytical Method: EPA 200.8							
Lead	**38.9**	ug/L	0.10	1		09/14/18 12:41	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10447118

Sample: 2R3 SW Kitchen Faucet **Lab ID: 10447118002** Collected: 09/12/18 08:15 Received: 09/12/18 08:28 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, DW	Analytical Method: EPA 200.8							
Lead	**20.6**	ug/L	0.10	1		09/14/18 12:48	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10447118

Sample: 3R3 North Kitchen Faucet **Lab ID: 10447118003** Collected: 09/12/18 08:15 Received: 09/12/18 08:28 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, DW	Analytical Method: EPA 200.8							
Lead	**7.7**	ug/L	0.10	1		09/14/18 12:49	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10447118

Sample: 1R3D SE Kitchen Faucet 2nd Dra **Lab ID: 10447118004** Collected: 09/12/18 08:15 Received: 09/12/18 08:28 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, DW	Analytical Method: EPA 200.8							
Lead	**18.1**	ug/L	0.10	1		09/14/18 12:51	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10447118

QC Batch: 562668 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: ICPMS Metals, Drinking Water
Associated Lab Samples: 10447118001, 10447118002, 10447118003, 10447118004

METHOD BLANK: 3054023 Matrix: Water
Associated Lab Samples: 10447118001, 10447118002, 10447118003, 10447118004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Lead	ug/L	ND	0.10	09/14/18 12:38	

LABORATORY CONTROL SAMPLE: 3054024

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Lead	ug/L	100	92.7	93	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3055058 3055059

Parameter	Units	10447118001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	ug/L	38.9	100	100	131	129	92	90	70-130	1	20	

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

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10447118

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.

LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10447118

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10447118001	**1R3 SE Kitchen Faucet**	EPA 200.8	562668		
10447118002	**2R3 SW Kitchen Faucet**	EPA 200.8	562668		
10447118003	**3R3 North Kitchen Faucet**	EPA 200.8	562668		
10447118004	**1R3D SE Kitchen Faucet 2nd Dra**	EPA 200.8	562668		

AMERICAN ENGINEERING TESTING, INC.

St. Paul Office
550 Cleveland Ave. N
St. Paul, MN 55114
651,659-9001
651-659-1379 (fax)

☐ OTHER

WO# : 10447118

№ 23094

ADDRES

10447118

PHONE:

PAGE 1 OF 1

AET PROJECT NUMBER 03-20089

PROJECT NAME/LOCATION Laura Jeffery Academy

AET PROJECT MANAGER Todd Lewis

AET PURCHASE ORDER NO 17860-691

SEND REPORT TO Todd Lewis

SAMPLED BY (PRINT)

SAMPLER SIGNATURE

REQUESTED TURNAROUND TIME: ☐ NORMAL ☑ RUSH

DATE NEEDED BY: Sept 14, 2018

ITEM #	SAMPLE DESCRIPTION	DATE	TIME	SAMPLE TYPE	NO. OF CONTAINERS	PRESERVATIVES: UNPRESERVED	MeOH	HCL	H_2SO_4	HNO_3	FIELD FILTERED Y/N	ANALYSIS: Lead in Drinking Water 200.8	REMARKS
1R3	SE. Kitchen Faucet	9/12/18	8:15	Water								C	001
2R3	SW Kitchen Faucet											C	002
3R3	North Kitchen Faucet											C	003
~~4R3~~													
1R3D	SE Kitchen Faucet 2nd Draw											C	004

NOTE:

ITEM NUMBER	RELINQUISHED BY/AFFILIATION	ACCEPTED BY/AFFILIATION	DATE	TIME
	Todd Lewis/AET 9-12-18/8:28	UPAKE	9-12-18	828

21.8°C

Pace Analytical	Document Name: **Sample Condition Upon Receipt Form**	Document Revised: 02May2018 Page 1 of 2
	Document No.: **F-MN-L-213-rev.23**	Issuing Authority: Pace Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: AET

Project #: **WO#: 10447118**

PM: TS1 **Due Date: 09/14/18**

CLIENT: AET

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☒ Client ☐ Commercial ☐ Pace ☐ SpeeDee ☐ Other:

Tracking Number:

Custody Seal on Cooler/Box Present? ☐ Yes ☒ No **Seals Intact?** ☐ Yes ☒ No

Optional: Proj. Due Date: Proj. Name:

Packing Material: ☒ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other: **Temp Blank?** ☒ Yes ☐ No

Thermometer Used: ☒ G87A9170600254 ☐ G87A9155100842

Type of Ice: ☐ Wet ☐ Blue ☒ None ☐ Dry ☐ Melted

Cooler Temp Read (°C): 22.0 **Cooler Temp Corrected (°C):** 21.8

Biological Tissue Frozen? ☐ Yes ☐ No ☒ N/A

Temp should be above freezing to 6°C **Correction Factor:** -0.2 **Date and Initials of Person Examining Contents:** 9/12/18 JD

USDA Regulated Soil (☒ N/A, water sample)

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 maps)? ☐ 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-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present?	☒ Yes	☐ No		1.
Chain of Custody Filled Out?	☒ Yes	☐ No		2.
Chain of Custody Relinquished?	☒ Yes	☐ No		3.
Sampler Name and/or Signature on COC?	☒ Yes	☐ No	☐ N/A	4.
Samples Arrived within Hold Time?	☒ Yes	☐ No		5.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☒ No		6.
Rush Turn Around Time Requested?	☒ Yes	☐ No		7.
Sufficient Volume?	☒ Yes	☐ No		8.
Correct Containers Used?	☒ Yes	☐ No		9.
-Pace Containers Used?	☒ Yes	☐ No		
Containers Intact?	☒ Yes	☐ No		10.
Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☒ N/A	11. Note if sediment is visible in the dissolved container
Is sufficient information available to reconcile the samples to the COC? Matrix: WT	☒ Yes	☐ No		12. No time or date on Samples
All containers needing acid/base preservation have been checked?	☒ Yes	☐ No	☐ N/A	13. ☒ HNO_3 ☐ H_2SO_4 ☐ NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>12 Cyanide)	☐ Yes	☒ No	☐ N/A	Sample # 1-41/1
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☐ Yes	☐ No	☒ N/A	Initial when completed: JD Lot # of added preservative: 111720
Headspace in VOA Vials (>6mm)?	☐ Yes	☐ No	☒ N/A	14.
Trip Blank Present?	☐ Yes	☐ No	☒ N/A	15.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☒ N/A	
Pace Trip Blank Lot # (if purchased): N/A				

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: Date/Time:

Comments/Resolution:

Project Manager Review: Jna Schaaf **Date:** 9/12/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Pace Analytical	Document Name: **Sample Condition Upon Receipt Form**	Document Revised: 02May2018 Page 2 of 2
	Document No.: **F-MN-L-213-rev.23**	Issuing Authority: Pace Minnesota Quality Office

SCUR Exceptions: **Workorder #:**

Issue	Sample ID	Container Type/#

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preservative	pH Upon Receipt	Date Preservation Adjusted	Time Preservation Adjusted	Amount of Additional Preservative Added	Lot # of Preservative Added	pH After Adjustment	Initials
1R3	HNO_3	6+	9/12/19	950	2mL	111720	2	JD
2R3	"	6	"	"	"	"	"	JA
3R3	"	"	"	"	"	"	"	JD
1R3D	"	"	"	"	"	"	"	JD

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

October 11, 2018

Todd Lewis
American Engineering Testing
550 Cleveland Ave. N.
Saint Paul, MN 55114

RE: Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10450432

REVIEWED
By Todd Lewis at 3:51 pm, Oct 11, 2018

Dear Todd Lewis:
Enclosed are the analytical results for sample(s) received by the laboratory on October 05, 2018. 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,

Tina Soltani
tina.soltani@pacelabs.com
(612)607-6384
Project Manager

Enclosures

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10450432

Minnesota Certification IDs

1700 Elm Street SE, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Minnesota Dept of Ag Certifcation #: via MN 027-053-137
Minnesota Petrofund Certification #: 1240
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10450432

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10450432001	**1R4 SE Kitchen Faucet**	Water	10/05/18 08:15	10/05/18 09:40
10450432002	**2R4 SW Kitchen Faucet**	Water	10/05/18 08:15	10/05/18 09:40
10450432003	**3R4 N Kitchen Faucet**	Water	10/05/18 08:15	10/05/18 09:40
10450432004	**1R4D SE Kitchen Faucet 2nd Dra**	Water	10/05/18 08:15	10/05/18 09:40

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10450432

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10450432001	**1R4 SE Kitchen Faucet**	EPA 200.8	PW1	1	PASI-M
10450432002	**2R4 SW Kitchen Faucet**	EPA 200.8	PW1	1	PASI-M
10450432003	**3R4 N Kitchen Faucet**	EPA 200.8	PW1	1	PASI-M
10450432004	**1R4D SE Kitchen Faucet 2nd Dra**	EPA 200.8	PW1	1	PASI-M

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10450432

Sample: 1R4 SE Kitchen Faucet **Lab ID: 10450432001** Collected: 10/05/18 08:15 Received: 10/05/18 09:40 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Lead	**36.8**	ug/L	0.10	1	10/09/18 13:10	10/11/18 11:10	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10450432

Sample: 2R4 SW Kitchen Faucet **Lab ID: 10450432002** Collected: 10/05/18 08:15 Received: 10/05/18 09:40 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, DW	Analytical Method: EPA 200.8							
Lead	**29.0**	ug/L	0.10	1		10/09/18 12:34	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10450432

Sample: 3R4 N Kitchen Faucet **Lab ID: 10450432003** Collected: 10/05/18 08:15 Received: 10/05/18 09:40 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, DW	Analytical Method: EPA 200.8							
Lead	**6.3**	ug/L	0.10	1		10/09/18 12:36	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10450432

Sample: 1R4D SE Kitchen Faucet 2nd Dra **Lab ID: 10450432004** Collected: 10/05/18 08:15 Received: 10/05/18 09:40 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, DW	Analytical Method: EPA 200.8							
Lead	**14.8**	ug/L	0.10	1		10/09/18 12:38	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10450432

QC Batch: 567752 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: ICPMS Metals, Drinking Water
Associated Lab Samples: 10450432002, 10450432003, 10450432004

METHOD BLANK: 3081460 Matrix: Water
Associated Lab Samples: 10450432002, 10450432003, 10450432004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Lead	ug/L	ND	0.10	10/09/18 14:50	

LABORATORY CONTROL SAMPLE: 3081461

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Lead	ug/L	100	98.9	99	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3082750 3082751

Parameter	Units	10450367061 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	ug/L	4.1	100	100	104	102	100	97	70-130	3	20	

MATRIX SPIKE SAMPLE: 3082752

Parameter	Units	10450395025 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Lead	ug/L	1.6	100	96.0	94	70-130	

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

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10450432

QC Batch: 568001 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 10450432001

METHOD BLANK: 3082461 Matrix: Water
Associated Lab Samples: 10450432001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Lead	ug/L	ND	0.10	10/10/18 11:05	

LABORATORY CONTROL SAMPLE: 3082462

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Lead	ug/L	100	109	109	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3082463 3082464

Parameter	Units	10450432001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	ug/L	36.8	100	100	140	135	103	99	70-130	3	20	

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

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10450432

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.

LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10450432

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10450432002	**2R4 SW Kitchen Faucet**	EPA 200.8	567752		
10450432003	**3R4 N Kitchen Faucet**	EPA 200.8	567752		
10450432004	**1R4D SE Kitchen Faucet 2nd Dra**	EPA 200.8	567752		
10450432001	**1R4 SE Kitchen Faucet**	EPA 200.8	568001	EPA 200.8	568310

AMERICAN ENGINEERING TESTING, INC.

☒ St. Paul Office
550 Cleveland Ave. N
St. Paul, MN 55114
651,659-9001
651-659-1379 (fax)

☐ OTHER _____

ADDRESS: _____

PHONE: _____

WO# : 10450432

10450432

PAGE ____ OF ____

AET Project No. 03-20089

AET PROJECT NUMBER 03-20089

PROJECT NAME/LOCATION Laura Jeffery Academy

AET PROJECT MANAGER Todd Lewis

AET PURCHASE ORDER NO 17860-691

SEND REPORT TO Todd Lewis

SAMPLED BY (PRINT) Todd Lewis

SAMPLER SIGNATURE

REQUESTED TURNAROUND TIME: ☒ NORMAL ☐ RUSH

DATE NEEDED BY: 1 Week TAT

ITEM #	SAMPLE DESCRIPTION	DATE	TIME	SAMPLE TYPE	NO. OF CONTAINERS	PRESERVATIVES: UNPRESERVED	MeOH	HCL	H_2SO_4	HNO_3	FIELD FILTERED Y/N	ANALYSIS: Lead in Drinking Water method 200.8	REMARKS
1R4	SE. Kitchen faucet	10/5/18	8:15	Water								X	001
2R4	SW. Kitchen Faucet											X	002
3R4	N. Kitchen faucet											X	003
1R4D	SE. Kitchen faucet 2nd Draw											X	004

NOTE:

ITEM NUMBER	RELINQUISHED BY/AFFILIATION	ACCEPTED BY/AFFILIATION	DATE	TIME
	Todd Lewis / AET 9:40	Bad - PALE	10/5/18	9:40

T= 22.0

Pace Analytical	Document Name: **Sample Condition Upon Receipt Form**	Document Revised: 02May2018 Page 1 of 2
	Document No.: **F-MN-L-213-rev.23**	Issuing Authority: Pace Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: American Engineering Testing Inc.

Project #: **WO#: 10450432**

PM: TS1 **Due Date: 10/12/18**

CLIENT: AET

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☑ Client ☐ Commercial ☐ Pace ☐ SpeeDee ☐ Other:

Tracking Number:

Custody Seal on Cooler/Box Present? ☐ Yes ☑ No **Seals Intact?** ☐ Yes ☑ No

Optional: Proj. Due Date: Proj. Name:

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other: **Temp Blank?** ☑ Yes ☐ No

Thermometer Used: ☑ G87A9170600254 ☐ G87A9155100842 **Type of Ice:** ☐ Wet ☐ Blue ☑ None ☐ Dry ☐ Melted

Cooler Temp Read (°C): 22.2 **Cooler Temp Corrected (°C):** 22.0 **Biological Tissue Frozen?** ☐ Yes ☐ No ☑ N/A

Temp should be above freezing to 6°C **Correction Factor:** -0.2 **Date and Initials of Person Examining Contents:** 10/04/18 CS

USDA Regulated Soil (☑ N/A, water sample)

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 maps)? ☐ 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-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present?	☑ Yes	☐ No		1.
Chain of Custody Filled Out?	☑ Yes	☐ No		2.
Chain of Custody Relinquished?	☑ Yes	☐ No		3.
Sampler Name and/or Signature on COC?	☑ Yes	☐ No	☐ N/A	4.
Samples Arrived within Hold Time?	☑ Yes	☐ No		5.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☑ No		6.
Rush Turn Around Time Requested?	☐ Yes	☑ No		7.
Sufficient Volume?	☑ Yes	☐ No		8.
Correct Containers Used?	☑ Yes	☐ No		9.
-Pace Containers Used?	☑ Yes	☐ No		
Containers Intact?	☑ Yes	☐ No		10.
Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☑ N/A	11. Note if sediment is visible in the dissolved container
Is sufficient information available to reconcile the samples to the COC? Matrix: WT	☑ Yes	☐ No		12.
All containers needing acid/base preservation have been checked?	☑ Yes	☐ No	☐ N/A	13. ☑ HNO_3 ☐ H_2SO_4 ☐ NaOH Positive for Res. Chlorine? Y N
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>12 Cyanide)	☐ Yes	☑ No	☐ N/A	Sample # 1-4 : 1/1
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☐ Yes	☐ No	☑ N/A	Initial when completed: CS Lot # of added preservative: 111804
Headspace in VOA Vials (>6mm)?	☐ Yes	☐ No	☑ N/A	14.
Trip Blank Present?	☐ Yes	☐ No	☑ N/A	15.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☑ N/A	
Pace Trip Blank Lot # (if purchased): NA				

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐ Yes ☐ No

Person Contacted: Date/Time:

Comments/Resolution:

Project Manager Review: Tina Sottaie **Date:** 10/5/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Labled by CS

Pace Analytical	Document Name: **Sample Condition Upon Receipt Form**	Document Revised: 02May2018 Page 2 of 2
	Document No.: **F-MN-L-213-rev.23**	Issuing Authority: Pace Minnesota Quality Office

SCUR Exceptions: **Workorder #:**

Issue	Sample ID	Container Type/#

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preservative	pH Upon Receipt	Date Preservation Adjusted	Time Preservation Adjusted	Amount of Additional Preservative Added	Lot # of Preservative Added	pH After Adjustment	Initials
1R4	HNO_3	>2	10/05/18	9:52	2mL	1118040	1.0	CS
2R4	"	"	"	"	"	"	"	CS
3R4	"	"	"	"	"	"	"	CS
1R4D	"	"	"	"	"	"	"	CS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

December 11, 2018

Todd Lewis
American Engineering Testing
550 Cleveland Ave. N.
Saint Paul, MN 55114

RE: Project: 03-20089 Laura Jefferey Academ
Pace Project No.: 10457363

REVIEWED
By Todd Lewis at 2:55 pm, Dec 13, 2018

Dear Todd Lewis:
Enclosed are the analytical results for sample(s) received by the laboratory on December 04, 2018. 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,

Tina Soltani
tina.soltani@pacelabs.com
(612)607-6384
Project Manager

Enclosures

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: 03-20089 Laura Jefferey Academ
Pace Project No.: 10457363

Minnesota Certification IDs

1700 Elm Street SE, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Minnesota Dept of Ag Certifcation #: via MN 027-053-137
Minnesota Petrofund Certification #: 1240
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: 03-20089 Laura Jefferey Academ
Pace Project No.: 10457363

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10457363001	**IR5 S.E. Kitchen Faucet**	Drinking Water	12/04/18 00:00	12/04/18 08:45
10457363002	**2R5 S.W. Kitchen Faucet**	Drinking Water	12/04/18 00:00	12/04/18 08:45
10457363003	**3R5 N. Kitchen Faucet**	Drinking Water	12/04/18 00:00	12/04/18 08:45
10457363004	**1R5D S.E. Kitch. Faucet-2nd Dr**	Drinking Water	12/04/18 00:00	12/04/18 08:45

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: 03-20089 Laura Jefferey Academ
Pace Project No.: 10457363

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10457363001	**IR5 S.E. Kitchen Faucet**	EPA 200.8	BWB	1	PASI-M
10457363002	**2R5 S.W. Kitchen Faucet**	EPA 200.8	BWB	1	PASI-M
10457363003	**3R5 N. Kitchen Faucet**	EPA 200.8	BWB	1	PASI-M
10457363004	**1R5D S.E. Kitch. Faucet-2nd Dr**	EPA 200.8	BWB	1	PASI-M

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 03-20089 Laura Jefferey Academ
Pace Project No.: 10457363

Sample: IR5 S.E. Kitchen Faucet **Lab ID: 10457363001** Collected: 12/04/18 00:00 Received: 12/04/18 08:45 Matrix: Drinking Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, DW	Analytical Method: EPA 200.8							
Lead	**44.4**	ug/L	0.10	1		12/10/18 15:13	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 03-20089 Laura Jefferey Academ
Pace Project No.: 10457363

Sample: 2R5 S.W. Kitchen Faucet **Lab ID: 10457363002** Collected: 12/04/18 00:00 Received: 12/04/18 08:45 Matrix: Drinking Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, DW	Analytical Method: EPA 200.8							
Lead	**21.2**	ug/L	0.10	1		12/10/18 15:24	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 03-20089 Laura Jefferey Academ
Pace Project No.: 10457363

Sample: 3R5 N. Kitchen Faucet **Lab ID: 10457363003** Collected: 12/04/18 00:00 Received: 12/04/18 08:45 Matrix: Drinking Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, DW	Analytical Method: EPA 200.8							
Lead	**2.8**	ug/L	0.10	1		12/10/18 15:26	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 03-20089 Laura Jefferey Academ
Pace Project No.: 10457363

Sample: 1R5D S.E. Kitch. Faucet-2nd Dr **Lab ID: 10457363004** Collected: 12/04/18 00:00 Received: 12/04/18 08:45 Matrix: Drinking Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, DW	Analytical Method: EPA 200.8							
Lead	**18.6**	ug/L	0.10	1		12/10/18 15:29	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 03-20089 Laura Jefferey Academ
Pace Project No.: 10457363

QC Batch: 578950 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: ICPMS Metals, Drinking Water
Associated Lab Samples: 10457363001, 10457363002, 10457363003, 10457363004

METHOD BLANK: 3140367 Matrix: Water
Associated Lab Samples: 10457363001, 10457363002, 10457363003, 10457363004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Lead	ug/L	ND	0.10	12/10/18 15:04	

LABORATORY CONTROL SAMPLE: 3140368

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Lead	ug/L	100	102	102	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3145713 3145714

Parameter	Units	10457363001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	ug/L	44.4	100	100	143	146	98	102	70-130	3	20	

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

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: 03-20089 Laura Jefferey Academ
Pace Project No.: 10457363

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.

LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

WORKORDER QUALIFIERS

WO: 10457363

[1] This data is not intended for compliance use.

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 03-20089 Laura Jefferey Academ
Pace Project No.: 10457363

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10457363001	**IR5 S.E. Kitchen Faucet**	EPA 200.8	578950		
10457363002	**2R5 S.W. Kitchen Faucet**	EPA 200.8	578950		
10457363003	**3R5 N. Kitchen Faucet**	EPA 200.8	578950		
10457363004	**1R5D S.E. Kitch. Faucet-2nd Dr**	EPA 200.8	578950		

AMERICAN ENGINEERING TESTING, INC.

St. Paul Office
550 Cleveland Ave. N
St. Paul, MN 55114
651,659-9001
651-659-1379 (fax)

☐ OTHER _____

ADDRESS: _____

PHONE: _____

WO# : 10457363

10457363

AET Project No. 03-20089

PAGE 1 OF ____

AET PROJECT NUMBER 03-20089

PROJECT NAME/LOCATION Laura Jeffery Academy

AET PROJECT MANAGER Todd Lewis

AET PURCHASE ORDER NO 17860-691

SEND REPORT TO Todd Lewis

Todd Lewis
SAMPLED BY (PRINT)

SAMPLER SIGNATURE

REQUESTED TURNAROUND TIME: ☒ NORMAL ☐ RUSH

DATE NEEDED BY: _____

ITEM #	SAMPLE DESCRIPTION	DATE	TIME	SAMPLE TYPE	NO. OF CONTAINERS	PRESERVATIVES: UNPRESERVED	MeOH	HCL	H_2SO_4	HNO_3	FIELD FILTERED Y/N	ANALYSIS: LEAD in Drinking Water Method 200.8	REMARKS
1R5	SE. Kitchen faucet	12/4/18		Water								X	001
2R5	SW Kitchen faucet											X	002
3R5	N. Kitchen faucet											X	003
1R5D	SE. Kitchen faucet - 2nd Draw											X	004

NOTE:

ITEM NUMBER	RELINQUISHED BY/AFFILIATION	ACCEPTED BY/AFFILIATION	DATE	TIME
	Todd Lewis/AET 8:45	[signature] ACE	12-4-18	845

22.9°C

Pace Analytical	Document Name: **Sample Condition Upon Receipt Form**	Document Revised: 31Oct2018 Page 1 of 2
	Document No.: **F-MN-L-213-rev.24**	Issuing Authority: Pace Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: American Engineering Testing **Project #:** **WO#: 10457363**

PM: TS1 Due Date: 12/11/18

CLIENT: AET

Courier: ☐Fed Ex ☐UPS ☐USPS ☒Client ☐Commercial ☐Pace ☐SpeeDee ☐Other:

Tracking Number:

Custody Seal on Cooler/Box Present? ☐Yes ☒No **Seals Intact?** ☐Yes ☒No **Optional:** Proj. Due Date: Proj. Name:

Packing Material: ☒Bubble Wrap ☐Bubble Bags ☐None ☐Other: **Temp Blank?** ☒Yes ☐No

Thermometer Used: ☐G87A9170600254 ☒G87A9155100842 **Type of Ice:** ☐Wet ☐Blue ☒None ☐Dry ☐Melted

Cooler Temp Read (°C): 23.2 **Cooler Temp Corrected (°C):** 22.9 **Biological Tissue Frozen?** ☐Yes ☐No ☒N/A

Temp should be above freezing to 6°C **Correction Factor:** -0.3 **Date and Initials of Person Examining Contents:** JJ 12/4/18

USDA Regulated Soil (☒N/A, water sample)

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 maps)? ☐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-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present?	☒Yes	☐No		1.
Chain of Custody Filled Out?	☒Yes	☐No		2.
Chain of Custody Relinquished?	☒Yes	☐No		3.
Sampler Name and/or Signature on COC?	☒Yes	☐No	☐N/A	4.
Samples Arrived within Hold Time?	☒Yes	☐No		5.
Short Hold Time Analysis (<72 hr)?	☐Yes	☒No		6.
Rush Turn Around Time Requested?	☐Yes	☒No		7.
Sufficient Volume?	☒Yes	☐No		8.
Correct Containers Used? -Pace Containers Used?	☒Yes ☒Yes	☐No ☐No		9.
Containers Intact?	☒Yes	☐No		10.
Filtered Volume Received for Dissolved Tests?	☐Yes	☐No	☒N/A	11. Note if sediment is visible in the dissolved container
Is sufficient information available to reconcile the samples to the COC? Matrix: WT	☒Yes	☐No		12.
All containers needing acid/base preservation have been checked? All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>12 Cyanide)	☒Yes	☐No	☐N/A	13. ☒HNO_3 ☐H_2SO_4 ☐NaOH Positive for Res. Chlorine? Y N Sample # F-41/1
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☐Yes	☐No	☒N/A	Initial when completed: JJ Lot # of added preservative: 1118050
Headspace in VOA Vials (>6mm)?	☐Yes	☐No	☒N/A	14.
Trip Blank Present?	☐Yes	☐No	☒N/A	15.
Trip Blank Custody Seals Present?	☐Yes	☐No	☒N/A	
Pace Trip Blank Lot # (if purchased): NA				

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐Yes ☐No

Person Contacted: Date/Time:

Comments/Resolution:

Project Manager Review: Jina Soltani **Date:** 12/4/18

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by: JJ

Pace Analytical	Document Name: **Sample Condition Upon Receipt Form**	Document Revised: 02May2018 Page 2 of 2
	Document No.: **F-MN-L-213-rev.23**	Issuing Authority: Pace Minnesota Quality Office

SCUR Exceptions: **Workorder #:**

Issue	Sample ID	Container Type/#

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preservative	pH Upon Receipt	Date Preservation Adjusted	Time Preservation Adjusted	Amount of Additional Preservative Added	Lot # of Preservative Added	pH After Adjustment	Initials
JJ 12/4/18 ~~1R5~~ 1R5	HNO_3	6.0	12/4/18	9:45	2mL	1118050	2.0	JJ
2R5	"	"	"	9:48	"	"	2.0	JJ
3R5	"	"	"	9:50	"	"	2.0	JJ
1R5D	"	"	"	9:51	"	"	2.0	JJ

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

February 22, 2019

Todd Lewis
American Engineering Testing
550 Cleveland Ave. N.
Saint Paul, MN 55114

REVIEWED
By Todd Lewis at 5:24 pm, Feb 22, 2019

RE: Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10464512

Dear Todd Lewis:
Enclosed are the analytical results for sample(s) received by the laboratory on February 19, 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,

Tina Soltani
tina.soltani@pacelabs.com
(612)607-6384
Project Manager

Enclosures

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

CERTIFICATIONS

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10464512

Minnesota Certification IDs

1700 Elm Street SE, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Minnesota Dept of Ag Certifcation #: via MN 027-053-137
Minnesota Petrofund Certification #: 1240
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

SAMPLE SUMMARY

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10464512

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10464512001	**1R6 SE Kitchen faucet**	Water	02/19/19 00:00	02/19/19 09:04
10464512002	**2R6 S.W Kitchen faucet**	Water	02/19/19 00:00	02/19/19 09:04
10464512003	**3R6 N. Kitchen faucet**	Water	02/19/19 00:00	02/19/19 09:04
10464512004	**1R6D SE. Kitchen faucet**	Water	02/19/19 00:00	02/19/19 09:04

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Minneapolis, MN 55414
(612)607-1700

SAMPLE ANALYTE COUNT

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10464512

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10464512001	**1R6 SE Kitchen faucet**	EPA 200.8	PW1	1	PASI-M
10464512002	**2R6 S.W Kitchen faucet**	EPA 200.8	PW1	1	PASI-M
10464512003	**3R6 N. Kitchen faucet**	EPA 200.8	PW1	1	PASI-M
10464512004	**1R6D SE. Kitchen faucet**	EPA 200.8	PW1	1	PASI-M

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Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10464512

Sample: 1R6 SE Kitchen faucet **Lab ID: 10464512001** Collected: 02/19/19 00:00 Received: 02/19/19 09:04 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, DW	Analytical Method: EPA 200.8							
Lead	**9.3**	ug/L	0.10	1		02/22/19 11:08	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10464512

Sample: 2R6 S.W Kitchen faucet **Lab ID: 10464512002** Collected: 02/19/19 00:00 Received: 02/19/19 09:04 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, DW	Analytical Method: EPA 200.8							
Lead	**1.1**	ug/L	0.10	1		02/22/19 11:10	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10464512

Sample: 3R6 N. Kitchen faucet **Lab ID: 10464512003** Collected: 02/19/19 00:00 Received: 02/19/19 09:04 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, DW	Analytical Method: EPA 200.8							
Lead	**0.66**	ug/L	0.10	1		02/22/19 11:12	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

ANALYTICAL RESULTS

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10464512

Sample: 1R6D SE. Kitchen faucet **Lab ID: 10464512004** Collected: 02/19/19 00:00 Received: 02/19/19 09:04 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, DW	Analytical Method: EPA 200.8							
Lead	**5.0**	ug/L	0.10	1		02/22/19 11:14	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10464512

QC Batch: 590597 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: ICPMS Metals, Drinking Water
Associated Lab Samples: 10464512001, 10464512002, 10464512003, 10464512004

METHOD BLANK: 3194105 Matrix: Water
Associated Lab Samples: 10464512001, 10464512002, 10464512003, 10464512004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Lead	ug/L	ND	0.10	02/22/19 10:48	

LABORATORY CONTROL SAMPLE: 3194106

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Lead	ug/L	100	104	104	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3196103 3196104

Parameter	Units	75103404001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	ug/L	ND	100	100	103	103	103	102	70-130	1	20	

MATRIX SPIKE SAMPLE: 3196105

Parameter	Units	75103546003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Lead	ug/L	ND	100	99.2	99	70-130	

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

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALIFIERS

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10464512

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.

LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 03-20089 Laura Jeffery Academy
Pace Project No.: 10464512

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10464512001	**1R6 SE Kitchen faucet**	EPA 200.8	590597		
10464512002	**2R6 S.W Kitchen faucet**	EPA 200.8	590597		
10464512003	**3R6 N. Kitchen faucet**	EPA 200.8	590597		
10464512004	**1R6D SE. Kitchen faucet**	EPA 200.8	590597		

AMERICAN ENGINEERING TESTING, INC.

☒ St. Paul Office
550 Cleveland Ave. N
St. Paul, MN 55114
651,659-9001
651-659-1379 (fax)

☐ OTHER _____

ADDRESS _____

PHONE: _____

WO# : 10464512

10464512

№ 23523

PAGE ____ OF ____

AET PROJECT NUMBER 03-20089

PROJECT NAME/LOCATION Laura Jeffery Academy

AET PROJECT MANAGER Todd Lewis

AET PURCHASE ORDER NO 17860-691

SEND REPORT TO Todd Lewis

SAMPLED BY (PRINT) _____

SAMPLER SIGNATURE _____

REQUESTED TURNAROUND TIME: ☒ NORMAL ☐ RUSH

DATE NEEDED BY: _____

ITEM #	SAMPLE DESCRIPTION	DATE	TIME	SAMPLE TYPE	NO. OF CONTAINERS	PRESERVATIVES: UNPRESERVED	PRESERVATIVES: MeOH	PRESERVATIVES: HCL	PRESERVATIVES: H_2SO_4	PRESERVATIVES: HNO_3	FIELD FILTERED Y/N	ANALYSIS: Lead in Drinking Water Method 200.8	REMARKS
1R6	SE Kitchen faucet	2/19/19		Water								X	001
2R6	S.W Kitchen faucet											X	002
3R6	N. Kitchen faucet											X	003
1R6D	SE. Kitchen faucet											X	004

NOTE:

ITEM NUMBER	RELINQUISHED BY/AFFILIATION	ACCEPTED BY/AFFILIATION	DATE	TIME
	Todd Lewis/AET/9:03	[illegible]	2/19/19	0904

Temp: 13.7°C

Pace Analytical	Document Name: **Sample Condition Upon Receipt Form**	Document Revised: 06Feb2019 Page 1 of 1
	Document No.: **F-MN-L-213-rev.25**	Issuing Authority: Pace Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: American Engineering Testing **Project #:** **WO#: 10464512**

PM: TS1 **Due Date: 02/26/19**

CLIENT: AET

Courier: ☐Fed Ex ☐UPS ☐USPS ☑Client ☐Pace ☐SpeeDee ☐Commercial **See Exception** ☐

Tracking Number: _____

Custody Seal on Cooler/Box Present? ☐Yes ☑No **Seals Intact?** ☐Yes ☑No **Biological Tissue Frozen?** ☐Yes ☐No ☑N/A

Packing Material: ☑Bubble Wrap ☐Bubble Bags ☐None ☐Other:_____ **Temp Blank?** ☑Yes ☐No

Thermometer: FE 2/19/19 ☐G87A9155100842 ☑G87A9170600254 **Type of Ice:** ☐Wet ☐Blue ☑None ☐Dry ☐Melted

Note: Each West Virginia Sample must have temp taken (no temp blanks)

Temp should be above freezing to 6°C	**Cooler Temp Read w/temp blank:** 13.6 °C	**Average Corrected Temp (no temp blank only):** °C **See Exceptions** ☐
Correction Factor: +0.1	**Cooler Temp Corrected w/temp blank:** 13.7 °C	

USDA Regulated Soil: (☑N/A, water sample/Other:_____)
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 maps)? ☐Yes ☐No

Date/Initials of Person Examining Contents: JE 2/19/19
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-MN-Q-338) and include with SCUR/COC paperwork.

				COMMENTS:
Chain of Custody Present and Filled Out?	☑Yes	☐No		1.
Chain of Custody Relinquished?	☑Yes	☐No		2.
Sampler Name and/or Signature on COC?	☑Yes	☐No	☐N/A	3.
Samples Arrived within Hold Time?	☑Yes	☐No		4.
Short Hold Time Analysis (<72 hr)?	☐Yes	☑No		5. ☐Fecal Coliform ☐HPC ☐Total Coliform/E coli ☐BOD/cBOD ☐Hex Chrome ☐Turbidity ☐Nitrate ☐Nitrite ☐Orthophos ☐Other_____
Rush Turn Around Time Requested?	☐Yes	☑No		6.
Sufficient Volume?	☑Yes	☐No		7.
Correct Containers Used?	☑Yes	☐No		8.
-Pace Containers Used?	☑Yes	☐No		
Containers Intact?	☑Yes	☐No		9.
Field Filtered Volume Received for Dissolved Tests?	☐Yes	☐No	☑N/A	10. Is sediment visible in the dissolved container? ☐Yes ☐No
Is sufficient information available to reconcile the samples to the COC?	☑Yes	☐No		11. **If no, write ID/ Date/Time on Container Below:** no date/time on containers (all samples) or on COC for samples 2-4 **See Exception** ☐
Matrix: ☑Water ☐Soil ☐Oil ☐Other_____				
All containers needing acid/base preservation have been checked?	☑Yes	☐No	☐N/A	12. Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>12 Cyanide)	☐Yes	☑No	☐N/A	☐NaOH ☑HNO_3 ☐H_2SO_4 ☐Zinc Acetate 1-4: 1/1
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☐Yes	☐No	☑N/A	Positive for Res. ☐Yes Chlorine? ☐No **See Exception** ☑
Headspace in VOA Vials (greater than 6mm)?	☐Yes	☐No	☑N/A	13. **See Exception** ☐
Trip Blank Present?	☐Yes	☐No	☑N/A	14.
Trip Blank Custody Seals Present?	☐Yes	☐No	☑N/A	Pace Trip Blank Lot # (if purchased): N/A

CLIENT NOTIFICATION/RESOLUTION **Field Data Required?** ☐Yes ☐No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: Jina Soltani **Date:** 2/20/19

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by: FE

Pace Analytical	Document Name: SCUR Exception Form – Coolers Above 6°C	Document Revised: 04Feb2019 Page 1 of 1
	Document No.: F-MN-C-298-Rev.01	Issuing Authority: Pace Minnesota Quality Office

During sample triage, this form is to be placed in each cooler that arrives above 6.0 degrees Celsius

SCUR Exceptions: **Workorder #:**

Out of Temp Sample IDs	Container Type	# of Containers

PM Notified? ☐Yes ☑No

If yes, indicate who was contacted/date/time. T= 13.7°C

If no, indicate reason why. Same day, Metals, No ice

Multiple Cooler Project? ☐Yes ☑No
If you answered yes, fill out information to the left.

No Temp Blank		
Read Temp	Corrected Temp	Average Temp

Other Issues

Issue Type: Sample ID	Container Type	# of Containers

Tracking Number	

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preserv.	pH Upon Receipt	Date Adjusted	Time Adjusted	Amount Added (mL)	Lot # Added	pH After	In Compliance after addition?	Initials
1R6	HNO_3	6-0	2/19/19	16:30	2-0	1118545	2-0	☑Yes ☐No	FE
2R6	"	"	"	"	"	"	"	☑Yes ☐No	"
3R6	"	"	"	"	"	"	"	☑Yes ☐No	"
1R6D	"	"	"	"	"	"	"	☑Yes ☐No	"

Appendix C

Lead Risk Assessor Certification

Certificate No: 5LM05211801PbRAR *Issue Date: May 21, 2018*

This diploma is awarded to

Todd H. Lewis

4617 Del Dr New Hope MN 55428

for successfully completing and passing the examination for the

LEAD (Pb) RISK ASSESSOR REFRESHER TRAINING COURSE

This training course is Approved by the State of Minnesota under Minnesota Rules, parts 4761.2000 to 4761.2700 and meets the requirements of 40 CFR 745.225, and Title X of the Toxic Substances Control Act (TSCA) conducted by

Lake States Environmental, Ltd.

in

White Bear Lake, MN on May 21, 2018

Examination Date: May 21, 2018

Lake States Environmental, Ltd
P. O. Box 645, Rice Lake, WI 54868
(800) 254-9811

Bob Rogalla - Training Course Manager

Appendix D

Laboratory Accreditation

AIHA Laboratory Accreditation Programs, LLC

acknowledges that

Pace Analytical Services, LLC - IH Lab Minneapolis

1800 Elm St. SE - Suite 1830, Minneapolis, MN 55414

Laboratory ID: 101103

along with all premises from which key activities are performed, as listed above, has fulfilled the requirements of the AIHA Laboratory Accreditation Programs (AIHA-LAP), LLC accreditation to the ISO/IEC 17025:2005 international standard, *General Requirements for the Competence of Testing and Calibration Laboratories* in the following:

LABORATORY ACCREDITATION PROGRAMS

✓	**INDUSTRIAL HYGIENE**	Accreditation Expires: April 01, 2019
✓	**ENVIRONMENTAL LEAD**	Accreditation Expires: April 01, 2019
☐	**ENVIRONMENTAL MICROBIOLOGY**	Accreditation Expires:
☐	**FOOD**	Accreditation Expires:
☐	**UNIQUE SCOPES**	Accreditation Expires:

Specific Field(s) of Testing (FoT)/Method(s) within each Accreditation Program for which the above named laboratory maintains accreditation is outlined on the attached **Scope of Accreditation**. Continued accreditation is contingent upon successful on-going compliance with ISO/IEC 17025:2005 and AIHA-LAP, LLC requirements. This certificate is not valid without the attached **Scope of Accreditation**. Please review the AIHA-LAP, LLC website (www.aihaaccreditedlabs.org) for the most current Scope.

William Walsh, CIH
Chairperson, Analytical Accreditation Board

Cheryl O. Morton
Managing Director, AIHA Laboratory Accreditation Programs, LLC

Revision 15: 03/30/2016

Date Issued: 03/31/2017

AIHA Laboratory Accreditation Programs, LLC
SCOPE OF ACCREDITATION

Pace Analytical Services, LLC - IH Lab Minneapolis
1800 Elm St. SE - Suite 1830, Minneapolis, MN 55414

Laboratory ID: **101103**
Issue Date: 03/31/2017

The laboratory is approved for those specific field(s) of testing/methods listed in the table below. Clients are urged to verify the laboratory's current accreditation status for the particular field(s) of testing/Methods, since these can change due to proficiency status, suspension and/or withdrawal of accreditation.

Industrial Hygiene Laboratory Accreditation Program (IHLAP)

Initial Accreditation Date: 02/01/1987

IHLAP Scope Category	Field of Testing (FoT) (FoTs cover all relevant IH matrices)	Technology sub-type/ Detector	Published Reference Method/Title of In-house Method	Method Description or Analyte (*for internal methods only*)
Chromatography Core	Gas Chromatography	GC/FID	NIOSH 1500	
			NIOSH 1501	
			OSHA 07	
	GC/MS		3M Guidance	SOP IHVOCS2
			AT Labs Guidance	SOP IHVOCS2
			NIOSH 1500	
			NIOSH 1501	
			OSHA 07	
			SKC Guidance	SOP IHVOCS2
	Gas Chromatography (Diffusive Samplers)		3M 3500 Guidance	SOP IHVOCS1 SOP IHVOCS2
			3M 3551 Guidance	SOP IHETOPO
			AT Labs Guidance	SOP IHVOCS1 SOP IHVOCS2 SOP IHETOPO
			NIOSH 1500	
			NIOSH 1501	
			OSHA 07	
			SKC Guidance	SOP IHVOCS1 SOP IHVOCS2 SOP IHETOPO

AIHA Laboratory Accreditation Programs, LLC

IHLAP Scope Category	Field of Testing (FoT) (FoTs cover all relevant IH matrices)	Technology sub-type/ Detector	Published Reference Method/Title of In-house Method	Method Description or Analyte (*for internal methods only*)
Chromatography Core	Ion Chromatography (IC)		NIOSH 7903	
			OSHA ID-215	
	Liquid Chromatography	HPLC/UV	NIOSH 2016	
			NIOSH 2018	
Spectrometry Core	Atomic Absorption	CVAA	EPA 7471B	
			NIOSH 6009	
			OSHA ID-140	
			OSHA ID-140 (Modified)	
			OSHA ID-145	
	Inductively-Coupled Plasma	ICP/AES	EPA SW-846 6010C	
			NIOSH 7303	
	UV/VIS (Colorimetric)		3M 3721	SOP IHFORMALDEHYDE
			NIOSH 6014	
Asbestos/Fiber Microscopy Core	Phase Contrast Microscopy (PCM)		NIOSH 7400	
Miscellaneous Core	Gravimetric		NIOSH 0500	
			NIOSH 0600	

A complete listing of currently accredited Industrial Hygiene laboratories is available on the AIHA-LAP, LLC website at: http://www.aihaaccreditedlabs.org

AIHA Laboratory Accreditation Programs, LLC
SCOPE OF ACCREDITATION

Pace Analytical Services, LLC - IH Lab Minneapolis
1800 Elm St. SE - Suite 1830, Minneapolis, MN 55414

Laboratory ID: **101103**
Issue Date: 03/31/2017

The laboratory is approved for those specific field(s) of testing/methods listed in the table below. Clients are urged to verify the laboratory's current accreditation status for the particular field(s) of testing/Methods, since these can change due to proficiency status, suspension and/or withdrawal of accreditation.

The EPA recognizes the AIHA-LAP, LLC ELLAP program as meeting the requirements of the National Lead Laboratory Accreditation Program (NLLAP) established under Title X of the Residential Lead-Based Paint Hazard Reduction Act of 1992 and includes paint, soil and dust wipe analysis. Air and composited wipes analyses are not included as part of the NLLAP.

Environmental Lead Laboratory Accreditation Program (ELLAP)

Initial Accreditation Date: 02/01/1999

Field of Testing (FoT)	Technology sub-type/ Detector	Method	Method Description (*for internal methods only*)
Paint		EPA SW-846 3050B	
		EPA SW-846 6010C	
Soil		EPA SW-846 3050B	
		EPA SW-846 6010C	
Settled Dust by Wipe		EPA SW-846 3050B	
		EPA SW-846 6010C	
		Ghost Wipe Dig.	
Airborne Dust		NIOSH 7303	

A complete listing of currently accredited Environmental Lead laboratories is available on the AIHA-LAP, LLC website at: http://www.aihaaccreditedlabs.org

Appendix E

Reducing Lead in Drinking Water –

A Technical Guidance and Model Plan for Minnesota Public Schools, Minnesota Department of Health

AET Project No. 03-20089

Reducing Lead in Drinking Water

A TECHNICAL GUIDANCE AND MODEL PLAN FOR MINNESOTA'S PUBLIC SCHOOLS

MINNESOTA

DEPARTMENT OF EDUCATION

DEPARTMENT OF HEALTH

April 2018

Minnesota Department of Education
Division of School Finance – Long-Term Facilities Maintenance
1500 Highway 36 West
Roseville, Minnesota 55113
651-582-8779
mde.funding@state.mn.us
Minnesota Department of Education (http://www.education.state.mn.us)

Minnesota Department of Health
Environmental Health Division – Drinking Water Protection
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651-201-4700
health.drinkingwater@state.mn.us
www.health.state.mn.us

Upon request, this material will be made available in an alternative format. Printed on recycled paper.

Foreword

Reducing potential lead risks in school drinking water

We are pleased to present this guidance and model plan, *Reducing Lead in Drinking Water: A Technical Guidance and Model Plan for Minnesota's Public Schools*. This plan reflects the commitment of public health, education, and legislative leaders, as well as those directly responsible for operating school drinking water systems, to reduce the chance that children are exposed to the health hazards of lead through school drinking water. It provides information on both required steps (testing, reporting) and flexible guidance that schools can consider to meet their individual needs. Reducing lead exposure is a high priority for all of us.

When children take in even small amounts of lead, there can be detrimental health effects. The longer children are exposed to lead, or the higher the dose, the greater the impact. While current science has not found a safe level of lead exposure, lead is still present in many areas of our environment, making it very difficult and costly to reach a point of zero exposure. That is why it is so important for those of us who are concerned for the health and safety of our children to do what we can to reduce lead exposures for children.

While the greatest risks, by far, for children to be exposed to lead are typically in their own homes from a source such as lead paint, under certain conditions children can be exposed to lead through school drinking water. This manual builds on existing guidance that schools have used since 1989. It is designed to help schools develop and implement plans to test for lead in drinking water and communicate results to parents and the public – fulfilling the requirements of a new state law passed in 2017. Further, the manual describes steps schools may take to reduce lead in drinking water.

We recognize the challenges school managers will face in executing lead testing, communicating results, and taking action to reduce lead in drinking water. Many schools have already taken steps to reduce lead in drinking water and we are learning from their experience. If all schools take appropriate actions and continue to follow best practices, potential exposures across the State can be greatly limited and children protected from the life-long negative impacts of lead exposure. Staff in both of our agencies are available to provide assistance to help school staff to address these challenges.

We look forward to working with all schools in Minnesota to create a more lead-free future for our children.

Brenda Casselius
Commissioner of Education

Jan Malcolm
Commissioner of Health

Contents

Introduction

Purpose of this Technical Guidance and Model Plan

This technical guidance is designed to assist Minnesota's school districts and charter schools in minimizing the exposure of students and staff to lead in drinking water. It also contains the model plan for lead testing of school drinking water as required under Minnesota Statutes, section 121A.335. The specific text of the statute can be found at:

- Lead in School Drinking Water (https://revisor.mn.gov/statutes/?id=121A.335)

Minnesota Statutes, section 121A.335 requires schools to either adopt the model plan outlined in this document or develop and adopt an alternative plan that accurately and efficiently tests for the presence of lead in water in public school buildings serving students. The statute further directs that this technical guidance be based on "standards established by the United States Environmental Protection Agency (EPA)" and current Minnesota Department of Health (MDH) guidance. In addition to describing required aspects (planning, testing, reporting), the manual also presents flexible guidance that schools can consider to meet their individual needs most efficiently.

The Minnesota Department of Education (MDE) and MDH intend that school administrators consult this technical guidance and model plan when testing for lead in their drinking water and implement activities as needed to reduce exposure to lead. The school district is responsible for adopting and retaining the model plan/alternative plan and test results records, as well as making those results available to parents and the public.

Who is Required to Use this Technical Guidance and Model Plan?

This technical guidance and model plan are intended for use by all school districts and charter schools subject to requirements of Minnesota Statutes, section 121A.335.

School administrators, school boards and others in positions of governance should review this guidance. Beyond the model plan for lead testing, this technical guidance includes recommendations to reduce lead levels at taps used for drinking water and food preparation. The instructions for testing and suggested lead hazard reduction options are designed for school health, safety, and maintenance personnel, as well as consultants working with educational agencies.

If your school is served by a Community Public Water System (CPWS), i.e. municipality, you should contact your CPWS to learn more about lead in your water supply before testing your facility. It's important to develop a working relationship with your CPWS, including having a coordinated communications plan.

While this technical guidance and model plan pertains specifically to school districts and charter schools subject to Minnesota Statutes, 121A.335, other facilities serving infants, preschoolers, and children are encouraged to use this technical guidance and model plan to identify and reduce lead in drinking water.

Health Information

Why Worry About Lead in Schools?

Lead is a toxic material known to be harmful to human health if ingested or inhaled. Recent research has shown that exposure to lead is associated with adverse mental, physical, and behavioral effects on children. The current scientific consensus is that there is no safe level of lead exposure. For more background see:

- Centers for Disease Control and Prevention (https://www.cdc.gov/nceh/lead/).

Therefore, any measureable blood lead level can have negative health effects. While water is just one potential source of exposure to lead in the environment, reducing lead in school drinking water can decrease an individual's overall exposure to lead.

Health Risks of Lead

While we have known that lead is toxic for many centuries, there has historically been a level of exposure presumed to be "safe." Over the years, the safe level has been reduced based on new research, but it was always there. However, in 2012, the Centers for Disease Control and Prevention dramatically changed the way lead toxicity is assessed. Instead of setting a safe level, the new approach acknowledges the fact that there is no currently known safe level of lead exposure and recommends a primary prevention approach (i.e., preventing a problem before it occurs) to reducing risk. This concept of "no safe level" is similar to the way we assess risks from carcinogens.

Health risks from carcinogens are managed by setting an acceptable risk probability (not zero) that balances the need to reduce exposure with the practicality of avoiding chemicals that are widely distributed in our environment. The new approach for lead hazard reduction is similar in that it balances the need to reduce exposure (i.e., primary prevention) while recognizing that lead is still present in many areas of our environment.

Children

Children are more susceptible to lead exposure because their bodies absorb metals at higher rates than the average adult. Children younger than six years old are most at risk due to their rapid rate of growth and ongoing brain development. Exposure to lead can cause damage to the brain, nervous system, red blood cells, and kidneys. Lead also has the potential to cause lower IQs, hearing impairments, reduced attention span, hyperactivity, developmental delays, and poor classroom performance.

The damage from lead exposure in children is permanent. Fortunately, the impacts of lead exposure can be minimized with good nutrition, a stimulating education, and a supportive environment.

Adults

High blood lead levels in adults have been linked to increased blood pressure, poor muscle coordination, nerve damage, decreased fertility, and hearing and vision impairment. Pregnant

women and their fetuses are especially vulnerable to lead exposure since lead can significantly harm the fetus, causing lower birth weight and slowing normal mental and physical developments. For more information on the health impacts of lead on children and adults, please see the Minnesota Department of Health lead page:

- Lead (http://www.health.state.mn.us/topics/lead/index.html)

Common Sources of Lead

There are a number of pathways of exposure to lead in the environment. While this guidance focuses on lead in drinking water at schools, it is important to reduce exposure from all potential sources of lead. These include:

- Lead-based paint in older homes (i.e., built before 1978). This is the most common source for childhood lead poisoning;
- Lead-contaminated dust and soil;
- Imported spices, cosmetics, and medications contaminated with lead;
- Pottery or ceramics with lead glazes;
- Exposure through lead dust from a household member who has a job or hobby that involves lead, such as construction or shooting firearms;
- Swallowing items that contain lead, such as fishing sinkers; and
- Corrosion of plumbing materials including brass, solder and pipes.

Therefore, while water is not typically the most prominent source of lead exposure for an individual, reducing lead in drinking water can help in lowering an individual's overall exposure.

How Does Lead Get Into Drinking Water?

Lead found in drinking water comes primarily from materials and components associated with the water distribution system and plumbing. While public water distribution systems may have lead components, the highest concentrations of lead are typically found nearest to the tap. Lead may be present in various materials in a building's plumbing system such as lead solder, brass fixtures, valves, and lead pipes. Corrosion of these materials allows lead to dissolve into the water passing through the plumbing system. The amount of corrosion depends on the type of plumbing materials, water quality characteristics, electrical currents, and how water is used. The longer water remains in contact with lead materials, the greater the chance lead can get into the water.

Why is Lead a Special Concern for Schools?

Children are more vulnerable to lead

Children typically have higher intake rates for environmental materials (such as soil, dust, food, water, air, paint) than adults. They are more likely to play in the dirt and put their hands and other objects in their mouths. Children tend to absorb a higher fraction of ingested lead than adults, which can slow the normal physical and mental development of their growing bodies. In addition, the physical and behavioral health effects from lead exposure can impact student success and school function. While the most vulnerable age for lead exposure is for children

less than six years old, the brains of school-age children are still developing and can be significantly impacted by lead exposure.

Plumbing materials and water use patterns at schools

Lead levels in the water within the plumbing system of schools can vary greatly from tap to tap. Plumbing materials and usage patterns influence the amount of lead in drinking water due to the variety of materials in the system (e.g., lead or copper pipes, lead solder, and brass fixtures). The amount of time the water is in contact with various materials in the plumbing system may have a significant effect on the concentrations found as well. The "on-again, off-again" water use patterns of most schools can contribute to elevated lead levels in drinking water. Water that remains stagnant in plumbing overnight, over a weekend, or during a vacation has longer contact with plumbing materials and therefore may contain higher levels of lead.

What Can Be Done to Reduce Lead Levels in Drinking Water?

This section is relevant to any tap used for drinking water or food preparation. These are best practices in reducing lead concentrations and can be used at home, school, or at work.

When evaluating the best approach for protecting against lead exposure in schools, it is important to balance a number of factors:

- Current research has not identified a safe level of exposure to lead;
- Lead is still present in many areas of the environment, making it very difficult to eliminate all exposure;
- The risks of developing irreparable damage from lead in water increase with higher concentrations of lead and longer exposure times;
- School buildings across the state are very different, being old/new, big/small, busy/limited, targeted/multi-purpose, which impacts the likelihood of lead exposure; and
- Local school districts have the best understanding of their buildings and how they are used; they can work with parents, students, teachers, and administrators to come up with the best approach for their specific situation.

An effective response to lead in water must consider all of the factors listed above. Both MDE and MDH are readily available for technical assistance and consultation, but the local school district is in the best position to understand and implement an effective strategy for their specific situation.

Use only cold water for drinking and food preparation

Use only cold water for drinking, preparing food, and making baby formula. Hot water releases more lead from pipes than cold water. The water may be warmed before use in formula.

Let it run before use

Running water at a tap, prior to using it for drinking or food preparation, will typically help reduce lead levels in the water. This works by removing the water that has been in the longest contact with the plumbing materials, thus removing the water with the highest concentration of lead. Let the water run for 30-60 seconds before using it for drinking or cooking if the water

has not been turned on in over six hours. The only way to know if lead has been reduced after letting it run is to check with a test.

Other routine maintenance

Like any appliance, water systems require routine maintenance to function properly. Steps to help reduce the presence of lead in your water include:

- Clean faucet aerators on a quarterly basis - more often if debris buildup is observed - as lead-containing materials may accumulate in aerator screens;
- Use only certified lead free materials when performing plumbing work.
    - Lead Free Certification Marks (http://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100GRDZ.txt) ; and
- Follow the manufacturer's recommendations for water softener settings to ensure an appropriate level of hardness. The hardness of the incoming water may have to be determined by asking your water supplier or having a sample analyzed.

Test the water for lead

The only way to determine how much lead may be present in drinking water is to have the water tested. Each tap or fixture providing water for drinking or food preparation should be tested at least every five years. Some form of lead hazard reduction should implemented for taps where lead is found. Detailed instructions on testing water for lead and recommended lead hazard reduction options can be found later in this document.

Regulations and Guidance

Due to lead's health effects and the special circumstances that make lead a concern in schools, a number of legal requirements and guidance materials exist that are applicable to reducing lead in school drinking water.

Table 1 displays the rules, regulations and guidance applicable to schools. They represent a range of laws, rules (enforceable) and guidance (not enforceable) developed over the past 30 years. Much has been learned over that time regarding lead health impacts, requiring an ongoing evolution in the way we address lead hazards. Each rule, regulation or guidance is explained in detail in the sections following the table.

Table 1: Regulations and Guidance Governing Lead in Schools Drinking Water

Type	State Statutory Requirement	Federal Laws and Rules			State Guidance	Federal Guidance (EPA)
Name	Minnesota Statute 121A.335	Lead and Copper Rule (SDWA)	Lead Contamination Control Act	Reduction of Lead in Drinking Water Act (SDWA)	Reducing Lead in Drinking Water	3Ts (Training, Testing and Telling)
Effective Date	2018	1991/2007	1988	2014	1989/2014	1994/2006
Applicability	All public and charter schools in Minnesota	Directly applies to schools served by their own water source (e.g., well) and serving 25 or more people	All schools	All schools	All schools	All schools

Minnesota State Statute 121A.335

The document you are reading was developed in response to Minnesota State Statute 121A.335. It requires public and charter schools to have a plan for efficiently and accurately testing for lead in drinking water using the model plan developed by MDE and MDH or by adopting an alternative plan. The law applies in addition to any other current testing requirements. The full Statute is found at:

- Lead in School Drinking Water (https://revisor.mn.gov/statutes/?id=121A.335)

Under the statute, **by July 1, 2018 school districts must:**

- Adopt the model plan from this document or develop and adopt an alternative plan to accurately and efficiently test for lead in school buildings serving students from prekindergarten to grade 12;

- Create a schedule for testing that includes all school district buildings and charter schools serving students where there is a source of water that may be consumed by students (used in cooking or directly by drinking). Each tap must be tested at least once every five years. Testing must have begun by July 1, 2018 and complete testing of all buildings serving students must be done within five years; and
- Make the results of testing available to the public to review and notify the parents and guardians of the availability of the information.

The Safe Drinking Water Act, Lead and Copper Rule

The Lead and Copper Rule (LCR) of the federal Safe Drinking Water Act (SDWA) was first passed in 1991, was updated in 2007, and applies to the public water system (PWS) supplying drinking water to a school building. Compliance with the LCR is based on the 90th percentile concentration value from samples collected at different points in the PWS. Compliance is a statistical calculation used to determine when a PWS must explore options to reduce lead in the water in the whole system. The LCR does not apply to individual taps.

Testing under the LCR is conducted based on a tier system, with the highest priority being individual residences. Therefore, a school served by a community water supply will not be tested under the LCR. However, if a school has a private well and has 25 or more staff and students, they are classified as a PWS and must test for lead under the LCR. More information on the LCR is at:

- Lead and Copper Rule (http://water.epa.gov/lawsregs/rulesregs/sdwa/lcr/index.cfm)

The Lead Contamination Control Act

The Lead Contamination and Control Act (LCCA) - Public Law 100-572 was passed in 1988 and applies to all schools. The intent of the LCCA is to identify and reduce lead in drinking water at schools and relies on voluntary compliance by individual schools and school districts. In particular, it focuses on certain models of water coolers in existence at the time of the law's enactment, while also addressing lead risk reduction generally. Although compliance with the LCCA is voluntary, schools are encouraged to review its recommendations and consider implementation where appropriate.

More information on the LCCA is at:

- Lead in Drinking Water in Schools Historical Documents (https://www.epa.gov/dwreginfo/lead-drinking-water-schools-historical-documents)

The Safe Drinking Water Act, Reduction of Lead in Drinking Water Act

The Reduction of Lead in Drinking Water Act (Public Law 111-380 amending Section 1417 of the Safe Drinking Water Act) became effective in January 2014. This law applies to all schools. The most common source of lead in drinking water is the corrosion of pipes and plumbing fixtures. In an effort to reduce this contamination source, the EPA amended the SDWA to mandate that

all pipes, solders, fittings, and fixtures be "lead free." The Act revised the definition of lead free to lower the allowable amount of lead to a weighted average of 0.25% percent of the wetted surfaces of plumbing products and established a statutory method for calculating lead content; it retains a 0.20% lead limit for solder and flux. The law also created exemptions from the lead free requirements for plumbing products used exclusively for non-potable services as well as for other specified products. All plumbing fittings and fixtures must meet the NSF/ANSI Standard 61, Annex G.

More information on identifying lead free certification marks is at:

- EPA How to Identify Lead-Free Certification Marks for Drinking Water System and Plumbing Materials (http://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100GRDZ.txt)

MDH Guidance

In 1989, MDH developed its first guidance document addressing lead in school drinking water based on the information in the 1988 EPA Lead Contamination Control Act. The latest revision in 2014 was based on new information in the 2014 EPA Reduction of Lead in Drinking Water Act. The 2014 version is superseded by this 2018 guidance.

3Ts (Training, Testing and Telling)

In 1994 the EPA developed the Lead in Drinking Water in Schools and Nonresidential Buildings guidance to assist schools in reducing the lead concentrations in their drinking water. In 2005, it was updated to become technical guidance titled "3Ts for Reducing Lead in Drinking Water in Schools and Child Care Facilities." The 3Ts were designed to aid schools with the following:

- Establishing partnerships;
- Determining current water quality;
- Identifying potential problem areas;
- Developing a monitoring plan;
- Collecting and submitting water samples;
- Implementing corrective actions if lead is detected in any sample result; and
- Communicating and conducting public outreach.

The 3Ts guidance may be found at:

- 3Ts for Reducing Lead in Drinking Water in Schools and Child Care Facilities (https://www.epa.gov/dwreginfo/3ts-reducing-lead-drinking-water-schools-and-child-care-facilities)

Guidance Values of Lead

Lead is still present in many areas of our environment, including materials that were commonly used in plumbing systems. To help in understanding the risks posed by environmental lead, a variety of guidance values have been developed at different times by different organizations. Some of the values are relatively recent, others much older; some are health based, while

others are for statistical assessment of a water system. Table 2 summarizes guidance values frequently identified with public health protection.

Table 2: Lead in Drinking Water: by the Numbers

Guidance Value: ppb (parts per billion)	Description
0 ppb	EPA has set a maximum contaminate level goal (MCLG) of zero for lead in water. *Note: analytical tests can only measure down to their detection limits; it is not possible to actually measure down to 0 ppb.*
1 ppb	The American Academy of Pediatrics recommends this level be used as a standard for school drinking water taps. *Note: The minimum repeatable detection limits achieved by laboratories today are typically between 0.5 and 2.0 ppb.*
5 ppb	Illinois, Michigan and Washington DC use this value as a trigger for schools to implement lead hazard reduction or provide notification. Health Canada has proposed this value as their new Maximum Allowable Concentration. See Health Canada (https://www.canada.ca/en/health-canada/programs/consultation-lead-drinking-water/document.html#a1) Is the International Bottled Water Association (IBWA) Bottled Water Code of Practice finished water quality product standard.
15 ppb	Public water systems sample for lead following the EPA Lead and Copper Rule. No more than 10 percent of a water system's samples are allowed to be above this level. However, this is not a health-based value. It is applied as a statistical calculation to determine when a public water system must explore corrosion control treatment options to reduce lead in the water based on the laboratory detection limit available at the time of the rule making. This action level has not been updated since 1991. Several states have adopted this value in their school guidance in order to match the Lead and Copper Rule value.
20 ppb	This is the trigger value used in EPA's Lead in Drinking Water in Schools and Nonresidential Buildings (1994), now the 3Ts (2005). This value has not been updated since the publication of these documents and is not a health-based value.

Model Plan for Lead Testing

This section presents the model plan as required by Minnesota Statute 121A.335. If schools adopt the model plan, all steps should be implemented. If there are questions regarding the model plan, contact MDE at 651-582-8779 or MDH at 651-201-4700 for further information.

Required Components of a Model Plan

The model plan includes three required steps:

Step 1. Sampling Program Development
Step 2. Conduct First Draw Tap Monitoring
Step 3. Communicate Results

All schools must complete these steps or formulate a plan that addresses the core concepts of a sampling plan, testing, and communicating results. An alternative plan must accurately and efficiently test for the presence of lead in water in school buildings serving pre-kindergarten students and students in kindergarten through grade 12.

Recommendations for interpreting results and possible hazard reduction steps, which must be tailored to meet specific local needs and conditions, are presented later in this document. The recommendations are presented as guidance and are not a required part of Minnesota Statute 121A.335

MDE Support for Lead Reduction Activities

MDE administers the Long-Term Facilities Maintenance Revenue program under Minnesota Statutes, section 123B.595. This program may be utilized to reimburse costs associated with lead testing and remediation. Funding does not cover staff time used to perform daily flushing or water use utility cost associated with flushing procedures. Memorandums from MDE, program guidance documents, spreadsheets and forms used to obtain approval to receive revenue are available at this link:

- Long-Term Facilities Maintenance (http://education.state.mn.us/MDE/dse/schfin/fac/ltfm/)

Step 1- Sampling Program Development:

A program to assess and sample for lead in drinking water must incorporate, at a minimum, the following actions:

- **Inventory drinking water taps used for consumption (i.e., drinking water and food preparation):**
    - A drinking water faucet or tap is the point of access for people to obtain water for drinking or food preparation. A faucet/tap can be a fixture, faucet, drinking fountain or water cooler. Drinking water taps typically do not include bathroom taps, hose bibbs, laboratory faucets/sinks or custodial closet sinks; these should be clearly marked not for drinking.

  - Taps used for human consumption should only be cold water taps.
  - Hot water taps should never be used to obtain water for drinking water or food preparation.
- **Check all drinking fountains to ensure EPA has not identified them as having a lead lined tank under the LCCA.** This list can be found at: Lead in Drinking Water Coolers (http://tinyurl.com/kr8kppf) ;
  - If a drinking fountain within the school is found on this list, it should be removed from use immediately.
- **Determine a schedule for sampling:**
  - All taps used for drinking water or food preparation must be tested at a minimum of once every five years.
  - If budget or resources do not allow all taps to be tested in the first year, it is suggested that taps be prioritized, with all high priority taps tested the first year, medium priority the second, and low priority the third. The fourth year should be used as a "make up" year, if needed.
  - Recommended priority levels are:
    - High priority: taps used by children under the age of six years of age or pregnant women (e.g., drinking fountains, nurse's office sinks, classrooms used for early childhood education and kitchen sinks);
    - Medium priority: other taps regularly used to obtain water for drinking or cooking (e.g., Family and Consumer Science sinks, classroom sinks, and teacher's lounges); and
    - Low priority: other taps that could reasonably be used to obtain water for drinking but are not typically used for that purpose
- **Determine logistics for sampling:**
  - Water testing should be done consistent with the established schedule. Prior to testing it must be determined if school staff or a contractor will conduct the testing.
  - If the school will be doing the testing itself, it will need to contact a laboratory or purchase field testing equipment.
  - Schools will also need to decide if they will use field analyzers or laboratories to analyze results. Either method is acceptable with appropriate quality control and experience.
- **Analysis by an Accredited Laboratory:**
  - Laboratory analysis typically involves a school district or consultant contracting with an accredited lab to obtain sample bottles. The laboratory will send instructions for sampling, sample bottles, and a chain-of-custody form to document time and date collected, collector name, and sample location.
  - Limitations:
    - Analytical costs. These vary from lab to lab. Currently, typical per sample costs for lead and copper analysis may range from $20 - $50, depending on a variety of factors;
    - May take longer to get results than using a field analyzer; and
    - Typically requires shipping.

- Benefits
  - District and/or consultant will not need to maintain instrument calibration records;
  - Uses a Chain-of-Custody to ensure integrity of sample analysis process;
  - Analysis done by third-party may provide more independent review/transparency;
  - Accredited labs use EPA approved methods and have met industry standards for analysis; and
  - Analysts are certified and trained.

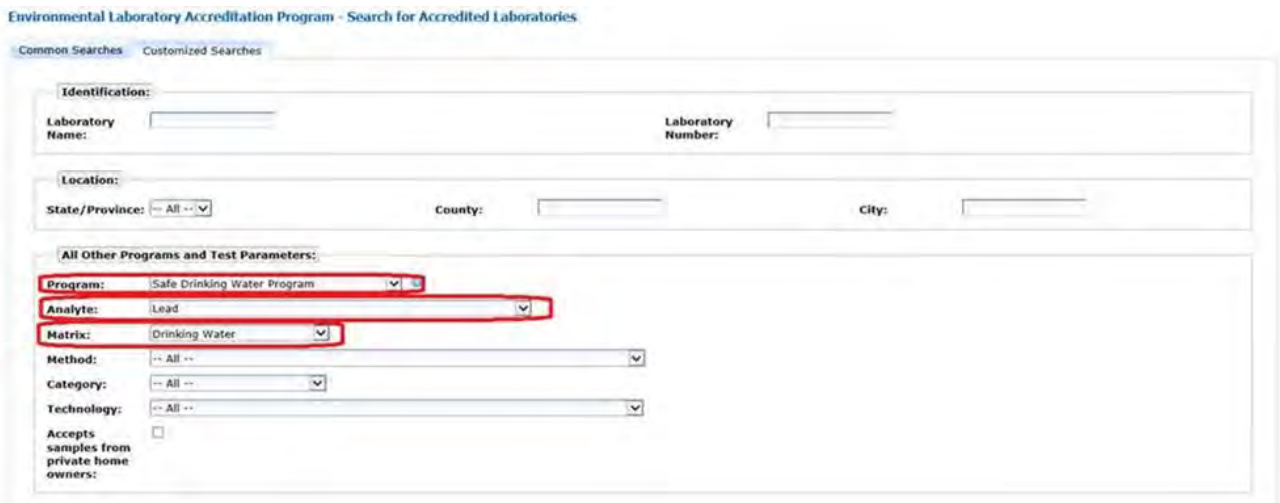
A listing of accredited laboratories may be found at:

- Accredited Laboratories (http://www.health.state.mn.us/labsearch)

Figure 1 presents a screen shot from the MDH website on search terms for finding an accredited lab using a customized search.

Program = Safe Drinking Water Program
Analyte = Lead
Matrix = Drinking Water

Figure 1: Screenshot of Customized Searches from MDH website



- **Analysis Using Field Analyzers:**
  A Field Analyzer can be a great tool for quickly and efficiently testing for lead in drinking water. If you or your consultant uses a field analyzer, it is important that you understand its limitations and proper use.
  - Limitations:
    - Some analyzers may not measure all forms of lead in drinking water. It is important that the instrument you use measures *total* lead (particulate and dissolved). If the instrument does not measure all types of lead in drinking water, your result could be biased low;

        - Staff using an instrument need to ensure that the instrument is properly calibrated and maintained according to manufacturer's specifications, and that records of calibration and maintenance are kept;
        - Instruments may require chemicals which will need to be stored and that can expire;
        - Field instruments may not have limits of detection that are as low as an accredited laboratory. Be sure that the method you use can identify concentrations as low as 1 ppb; and
        - Some instruments may have interferences with other contaminants and, therefore, under or overestimate the lead level. This may require that additional tests for iron, manganese, hardness, alkalinity or other contaminants be done prior to use to ensure that the instrument will be operated as designed.
    - Benefits:
        - Get results faster;
        - Useful when doing large numbers of samples or investigative sampling where many samples might be taken from one tap;
        - Can be done on-site (no shipping needed); and
        - Can be more cost efficient depending on frequency of use.

Step 2- Conduct First Draw Tap Monitoring:

Once the plan from Step 1 is set, water sampling must be conducted according to the established schedule and priority. Water from taps used for drinking or food preparation must be tested for lead using "first draw" samples. First draw means that the samples are collected before the fixture is used or flushed during the day. Use only cold water for collecting lead samples. It is necessary to consider the order in which tap samples are collected to avoid the potential of accidentally flushing a tap. Always start at taps closest to where the water enters the building.

Sample site preparation and sample collection must be performed consistent with the following conditions:

- Note that it may be necessary to collect samples over a number of days to ensure only first draw samples were collected;
- The day before sampling - normal usage of the sampling tap should occur;
- The night before sampling - secure the fixture from being used (e.g., hang a "Do Not Use" sign);
- Do not use sampling taps for a minimum of six hours. MDH recommends not exceeding 18 hours;
- Do not remove aerators or attachments;
- Collect the first draw sample using a 250 mL bottle. Be sure to start sampling at taps closest to where the water enters the building so that no accidental flushing occurs;
- Complete all scheduled sampling for that sampling period; and
- Have samples analyzed by sending to a laboratory or conduct analysis using field analyzers. Be sure to follow all instructions from the lab or field analyzer manufacturer.

Schools with active flushing programs or considering a flushing program may also want to collect a flushed sample in order to verify flushing effectiveness.

Step 3- Communicate Results:

Minnesota Statutes section 121A.335, subdivision 5 creates a reporting requirement for schools as follows - “A school district that has tested its buildings for the presence of lead shall make the results of the testing available to the public for review and must notify parents of the availability of the information.”

In addition to testing for lead and meeting the reporting requirements, a lead hazard reduction program should include a comprehensive communication plan. The purpose of a communication plan is to provide a process for school employees, students and parents to address questions, report results and provide ongoing, up-to-date information regarding sampling efforts.

School management should:

- Assign a designated person to be the contact;
- Notify affected individuals about the availability of the testing and results within a reasonable time. School employees, students, and parents should be informed and involved in the communication process. Results of initial and any follow-up testing should be easily accessible along with documentation of lead hazard reduction options. Posting the information on a website is preferred, but the information should also be available to those without easily accessible internet access. Examples of other information venues are: meetings, open houses, and public notices; and
- Identify and share specific activities pursued to correct any lead problems. Local health officials can assist in understanding potential health risks, technical assistance and communication strategies.

MDE and MDH have developed an Education and Communication Toolkit to aid schools in implementing this Model Plan.

The three steps presented above constitute the required portions of the Model Plan. Guidance provided in the remaining sections of this manual, which are highly recommended but not statutorily required, can be used by schools to help ensure that results from required sampling are appropriately reviewed, interpreted, and communicated. Information is also presented to help school districts assess and implement effective and reasonable lead hazard control measures.

Lead Hazard Reduction Options

Information gathered as part of the required three steps of the model plan can be used to formulate actions to address and mitigate lead exposure. The options presented here are not a required part of Minnesota Statutes, section 121A.335. Recommended lead hazard reduction options include:

Step 4. Interpret Sample Results
Step 5. Take Corrective Actions
Step 6. Reassess

Because individual school buildings vary tremendously across the state, it is imperative that final decisions on hazard reduction options are driven by local conditions and considerations. Actions that may be ideal in one district may not be appropriate for another district.

The recommendations in this section were compiled by MDE and MDH to assist school districts in choosing the best lead hazard reduction option to reduce exposure to lead in their schools. They should not be taken to be requirements, but may be implemented individually, in combination, or not at all, depending on the specific situation at an individual school. Because no two districts or buildings are exactly alike, best management practices will likely vary across the state.

Guidance on Interpreting Results and Recommended Lead Hazard Reduction Options

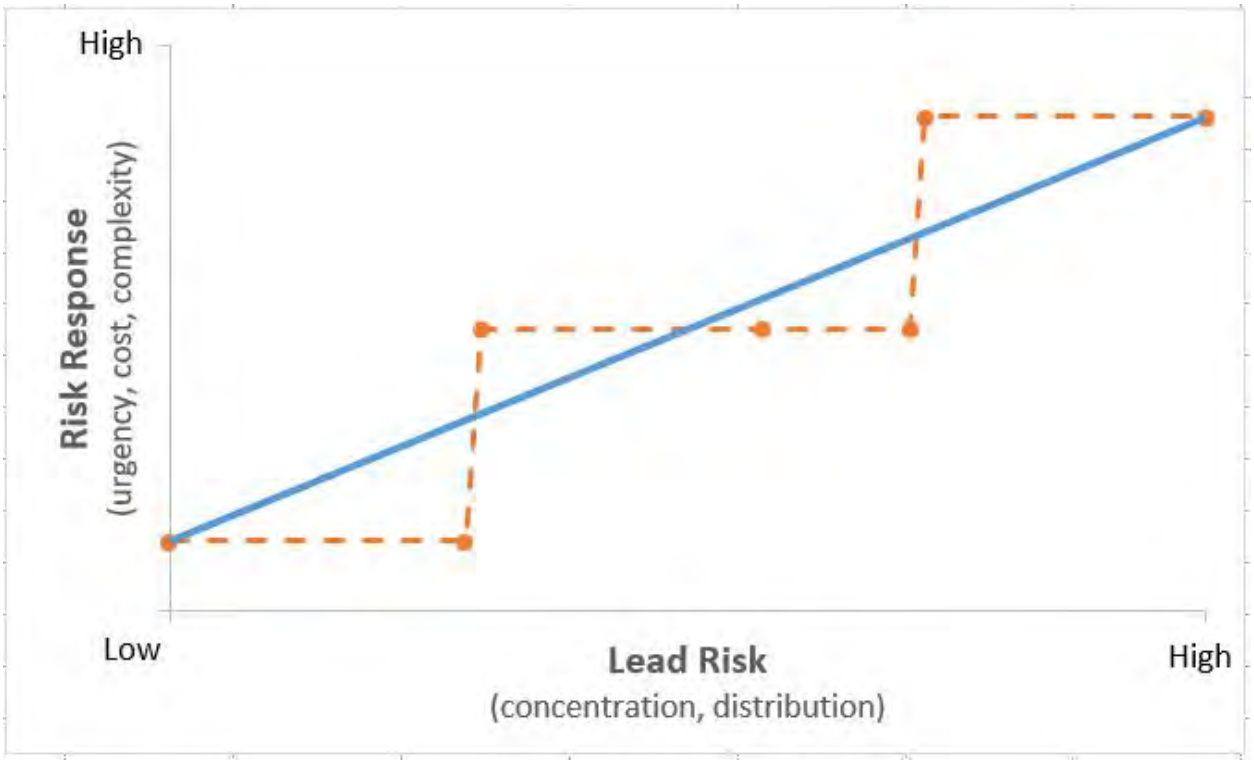
It is widely understood that there is no safe level of lead exposure from any environmental hazard, including water. When confirmed evidence of a lead hazard is identified, some response to manage the exposure (risk or harm) is necessary and appropriate. MDH encourages some level of response be taken for any plumbing fixtures identified as producing a detectable level of lead.

Districts should be prepared to communicate with parents about decisions made to address lead hazards. In their communication plan, schools should be prepared to speak to taking some action at every level. However, given that lead is still found in many environments and products, it is also important to recognize that attaining zero exposure to lead may not be reasonable, or even possible, under some circumstances.

In addition, it is critical to understand that health risks from lead do not abruptly change at varying concentration of lead. As lead concentrations, the duration of exposure, or the number of taps impacted (i.e., distribution) steadily increases, the risks posed to students steadily increase. Response options should consider vulnerability of those exposed, concentration of lead, duration of exposures, and current practices to reduce lead, among other things. The most accurate relationship between lead risk and appropriate responses follow a smooth path (i.e., solid line) as concentration increases (Figure 2). Therefore, a result of 19 ppb is not appreciably safer than a result of 21 ppb. The dashed line represents a standards-based approach (e.g. responses are similar up to a threshold, and then abruptly change). Both the risk

present and response options needed for lead exposure should be evaluated as a continuum and not be driven by specific numbers.

Figure 2: Relationship between Lead Risk and Risk Response



Mitigation strategies used will depend on the site-specific conditions of the school building such as building age, plumbing materials, water use pattern, incoming water quality, and population served. It may take a combination of options and multiple steps over a period of time to manage/remove lead in drinking water. Analytical results can be highly variable and a clear pattern should be identified before implementing any strategy. Schools may consider prioritizing strategies to prevent exposures to students and staff most at risk. The following discussion provides the most common hazard reduction options, but is not intended to be all-inclusive. EPA's 3Ts guidance document is also an excellent resource for strategies on finding lead sources and implementing mitigation.

Step 4- Interpret Sample Results:

Once a school receives its sample results, it should verify that all results are expressed in parts per billion (ppb). For water samples, this will sometimes be stated as micrograms per liter (µg/L), which is equivalent to ppb.

Table 3 presents possible lead hazard reduction options for various lead levels. The intention of presenting the information is to provide perspective on possible actions in response to increasing lead concentrations in water. The concentration ranges represent increasing levels of lead and should not be used as strict thresholds. More comprehensive actions may be necessary to address health threats from higher concentrations. As there is no safe level of

lead, it is important to incorporate lead hazard reduction options and communicate at all levels of lead in order to raise awareness and reduce exposure.

Table 3: Recommended Lead Hazard Reduction Options

Lead Level At The Tap	Lead Hazard Reduction Options
< 2 ppb or Non-Detected	• Lead was not detected. Tap may be used as normal; • Record result and test again in 5 years; and • Make all test results and lead education materials accessible to the community, such as on a website, or annual report, and available upon request.
2 ppb to 20 ppb*	The tap may be used for cooking and drinking water while steps are taken to reduce overall exposure. A higher number of taps with elevated results increases the urgency to implement hazard reduction. Options include: • Retest the sample tap and attempt to more accurately determine the source of the lead; consider monitoring tap more frequently until the source of lead is found and removed; • Consider the feasibility of flushing or other steps to minimize lead exposure, including limiting softened water supplies to hot water taps only, taking into account other actions that the school may already have in place; • Make all test results and lead education materials accessible to the community, such as on a website, or annual report, and available upon request.
> 20 ppb*	Action should be taken to reduce exposure. The specific action(s) taken will be dependent on individual school conditions. Options include: • Remove tap from service until problem is demonstrably corrected by replacement, a flushing program, filtration, or treatment; • Do *not* use tap for cooking or drinking water; • Retest the tap and attempt to determine the source of the lead; If the tap is not replaced, consider monitoring tap more frequently, such as annually, until the source of lead is found and removed; • Implement a flushing protocol or other lead hazard reduction option; sampling should be use to evaluate effectiveness; • Make all test results and lead education materials accessible to the community, such as on a website, or annual report, and available upon request; and • Provide targeted communication and education to individuals, parents, and staff members that routinely use that tap.

*established by EPA 3Ts guidance; if EPA amends, Table 3 will be adjusted to be consistent with new value

Step 5- Lead Hazard Reduction Options:

In addition to possible lead hazard reduction options outlined in Table 3, the options further described here are in priority order of long-term effectiveness in reducing lead hazards. Some lead hazard reduction option needs to be implemented when lead is detected.

If the school receives its water from a Community Public Water Supply (such as a municipal water supply) the school is encouraged to work with them to assess the source contribution of lead coming into the school and if the school has a lead service line. For schools on their own well, the only way to characterize lead contribution from the water source is to do a test of water coming into the building.

Option 1. Removal of Lead Sources

Engineering plans and specifications for the plumbing system are useful for identifying sources of lead and helpful in determining if sources of lead can be removed from service or replaced with lead free fixtures. Options for eliminating lead sources include:

- Remove tap/fixture from service. If the tap is seldom used, it may be disconnected or removed from the water supply line, but first verify the tap is not required for local building code compliance;
- Replace with lead free fixture/plumbing component in accordance with Reduction of Lead in Drinking Water Act;
    - If the existing tap is suspected to be the source of contamination, replace with a lead free tap;
    - Replace other sources of lead, including lead pipe, lead solder joints, and brass plumbing components with lead free materials; and
    - To minimize the introduction of lead into drinking water systems, go to EPA's website to identify lead free certification marks for drinking water systems and plumbing materials.
        - Lead Free Certification Marks (http://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100GRDZ.txt)

Option 2. Implement a Flushing Program

Flushing the drinking water taps (letting the water run for a set amount of time on a regular basis) can effectively reduce lead concentrations in drinking water. A flushing program works to reduce lead concentrations by clearing the taps of water that has been in contact with plumbing components that may contain lead. While flushing can work to reduce lead, it requires staff time, diligence, and commitment to ensure effectiveness. Essential to any flushing program is monitoring after flushing to verify effectiveness.

There are two primary types of flushing programs: Individual Tap Flushing and Main Pipe Flushing.

Individual Tap Flushing Program

- May be implemented if lead concentrations are found to be high at certain taps;
- Flush individual taps that have been tested and found to have high lead levels. This procedure is to be followed each day the school is in session;
- During periods of normal use:

    - Run each tap for 2 to 3 minutes in the morning before children arrive
    - Run each tap midday for two to three minutes if the tap has been unused and stagnant for the morning period
- Periodic testing may be done prior to and after the midday flushing to ensure the lead concentrations have remained low throughout the morning hours. If they have not, the flushing time should be increased or another option should be implemented;
- After weekends or breaks, run each tap for ten to fifteen minutes before children return to school then return to normal use; and
- Frequency and duration of flushing should be reasonably documented.

Main Pipe Flushing Program

- May be implemented if lead concentrations are found to be high throughout the entire school or confined to a certain area of the school. This procedure is to be followed each day the school is in session;
- Begin by flushing the tap furthest away from the water source for at least ten minutes;
- Next flush the tap the second furthest away and continue in this manner until all taps have been flushed;
- Flushed samples should be periodically collected and analyzed for lead to confirm the effectiveness of flushing programs;
- It is recommended that midday samples and end of the day samples be taken periodically to ensure the lead concentrations have remained low throughout the day. If they have not, another option should be implemented; and
- Review the results upon receipt and continue to optimize the procedure to reduce lead.

More on Flushing

Flushing is a best management practice used to reduce lead levels by controlling the age of the water. It can be an interim or long-term option. This guidance presents flushing procedures that MDH has found effective in reducing the lead level in drinking water. Site-specific conditions will determine how long a tap needs to be flushed and the number of times a day a tap needs flushing. The key to using flushing as a best management practice is monitoring that demonstrates the lead level has been reduced.

Note that schools implementing a flush program may wish to identify non-consumptive uses for the flushed water (watering, cleaning, etc.) in order to make use of this resource.

Option 3. Treatment

Point-of-Use (POU) Treatment Device

A POU water treatment device may be installed at taps where lead has been detected. It is strongly encouraged that the POU device is approved to meet NSF Standard 53, NSF Standard 58, or an equivalent standard. It is to be installed, operated, and maintained in accordance with the manufacturer's recommendations. **POU treatment systems may be subject to Department of Labor and Industry (DLI) or local administrative authority plan review and approval prior to installation. Contact DLI at (651) 284-5063 for more information.**

Point of Entry (POE) Chemical Treatment

Adjusting the water chemistry may reduce the amount of lead absorbed by the water. This may be done by adding a chemical to the water as it enters the building. Typical methods of chemical treatment include addition of a phosphate-based or silica-based corrosion inhibitor or an adjustment to the water's pH or hardness. **All chemical treatment systems are subject to MDH plan review and approval prior to installation**. In addition, a school that installs POE corrosion control treatment becomes a public water system and is required to meet the regulatory requirements of the SDWA. As a public water system, the school would be responsible for meeting all of the water quality standards of the SDWA, be subject to inspection of the water distribution system, and be required to have a certified water operator.

Contact the Minnesota Department of Health Drinking Water Protection Program at 651-201-4700 to determine if additional requirements will apply to your school prior to installing treatment.

Step 6- Reassess:

All taps affected by a lead hazard reduction option should be retested to ensure the control options worked. A first draw sample is to be taken using the procedure outlined in Step 2.

Interpreting Post Control Option Results

- If the analysis does not detect lead, no further action is required, as long as the control option remains in place. The next sample should be collected within five years;
- If the analysis shows lead remains present, continue twice daily flushing. A midday sample, as specified in Step 5, should be collected to determine if flushing is effective. Alternatively, a new control option can be implemented followed by retesting as specified in Step 2.

MN Statute 121A.335 specifies that each building be tested at least once every five years. MDH and MDE recommend that schools repeat monitoring once every five years if results are below two ppb. If results show persistent elevated lead levels, testing should continue until the lead source is found and hazard reduction options implemented. The overall goal is to have MDH, MDE, school districts, parents, and students all work together to ensure that available resources are best targeted to minimize exposure to lead in drinking water.

Glossary of Terms and Abbreviations

Aerator - An aerator is found at the tip of the faucet. Aerators are screwed onto the faucet head, creating a non-splashing stream and delivering a mixture of water and air

Corrosion - A dissolving and wearing-away of metal caused by a chemical reaction between water and plumbing materials in contact with the water

Detection Level (DL) - The lowest concentration of lead that can be analyzed with a certainty of precision. Results below this level are often expressed as “non-detected,” “nd,” or “<DL.” For the purposes of this document, 2 ppb is the maximum detection level recommended for lead analysis

Detected: An amount of lead above the detection level. A concentration of lead analyzed with a certainty of precision to be at or above the detected level

Drinking Water Faucet/Tap - Point of access for people to obtain water for drinking or food preparation. A faucet/tap can be a fixture, faucet, drinking fountain or water cooler. Drinking water taps typically **do not** include bathroom taps, hose bibs, laboratory faucets/sinks or custodial closet sinks when clearly marked

Field Analyzer - Instrument suitable for water quality analysis in the field and will provide results without the use of a laboratory

First Draw Sample - The first water drawn from a faucet/tap after the water has sat undisturbed in the plumbing system for at least six hours

Fittings - Plumbing components used to join sections of pipe or to join pipe to fixtures

Fixture - Exchangeable device connected for the distribution and use of water in a building. Examples: fountain, sinks, shower, tub, toilet, hydrant

Flush(ing) - Running the water at a faucet/tap or combination of faucets/taps to clear standing water from the plumbing system

Flush Sample - A water sample that has been collected following the flushing of a drinking water tap

Flux - A substance applied during soldering to facilitate the flow of solder. Flux used prior to 1986 contains lead and can itself be a source of lead contamination in water

LCCA – Lead Contamination Control Act, July 1989

LCR – Lead and Copper Rule, June 1991

Lead Free - Weighted average of not more than 0.25% in wetted surface material for pipe, pipe and plumbing fittings and fixtures and 0.2% for solder and flux. More information is available from the EPA website at the following link:

- Basic Information about Lead in Drinking Water (https://www.epa.gov/ground-water-and-drinking-water/basic-information-about-lead-drinking-water)

Limit of Detection (LOD) – The lowest quantity of a substance that can be distinguished from the absence of the substance due to the instrument's analytical process. It is usually lower than the detection level

MDE – Minnesota Department of Education

MDH – Minnesota Department of Health

Model Plan - The plan developed by the commissioners of health and education to accurately and efficiently test for the presence of lead in drinking water in public school buildings, as required under Minnesota Statutes 121A.335

Non-Detect: A lead result below the limit of detection, often expressed as "non-detected," "nd," or "<DL."

pH - A logarithmic measure of acidity and alkalinity between 0 (highly acidic) and 14 (highly basic); 7 is neutral

Parts per Billion (ppb) - A standard unit of measurement commonly used to describe the concentration of lead in drinking water. Also expressed as micrograms/liter (µg/L)

Point of Entry (POE) - A water treatment device installed to treat all water entering a single school, building, facility or home. Example: water softener

Point of Use (POU) - A water treatment device intended to treat water for direct consumption, typically at a single tap or a limited number of taps. Example: faucet mount cartridge filter

Primary Prevention - aims to prevent disease or injury before it ever occurs. It is done by preventing exposures to hazards that cause disease or injury, altering unhealthy or unsafe behaviors that can lead to disease or injury, and increasing resistance to disease or injury should exposure occur

Public Water System (PWS) - A system that has at least 15 service connections or regularly serves an average of 25 individuals daily at least 60 days out of the year

- **Community Public Water System (CPWS)** - A PWS which serves at least 15 service connections used by year round residents or regularly serves at least 25 year round residents. Examples: municipalities, manufactured mobile home parks

- **Nontransient Noncommunity (NTNC) Public Water System** - A PWS that is not a CPWS and that regularly serves at least 25 of the same persons over 6 months per year
    - Examples: schools, childcare centers, factories

Schools - Minnesota's public and charter schools serving students in pre-kindergarten through grade 12

SDWA – Federal Safe Drinking Water Act

Service Connection - The pipe that carries tap water from the public water main to a building

Solder - A metallic compound used to seal the joints between pipes. Until 1988, solder containing up to 50% lead was legally used in potable water plumbing. Lead free solders, which can contain up to 0.2% lead, often contain one or more of the following metals: antimony, tin, copper or silver

United States Environmental Protection Agency (EPA) - Federal agency with a mission to protect human health and the environment; oversees implementation of the SDWA