Effective and Economical
Environmental Solutions

Lead in Drinking Water Screening
Lincoln Elementary School
216 Lincoln Avenue
Orange, NJ 07050

Karl Environmental Group Project #: 16-0672

December 16, 2016

Prepared for:
Mr. Adekunle James
Business Administrator
Orange Board of Education
451 Lincoln Avenue
Orange, NJ 07050

Prepared by:
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Mohnton, PA 19540
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December 16, 2016

Mr. Adekunle James
Business Administrator
Orange Board of Education
451 Lincoln Avenue
Orange, NJ 07050

Re: Lead in Drinking Water Screening
Lincoln Elementary School: 216 Lincoln Avenue, Orange, NJ 07050
Karl Environmental Group Project #: 16-0672

Dear Mr. James:

Thank you for selecting Karl Environmental Group ("Karl") for this project. This report details the methods and findings of the lead in drinking water screening performed for the Orange Board of Education at the Lincoln Elementary School (the "Facility"), located at 216 Lincoln Avenue in Orange, New Jersey on June 21, 2016.

1.0 PROJECT BACKGROUND

Karl was contacted by the Orange Board of Education (the "Client") to conduct a lead in drinking water screening to determine the lead content of drinking water from drinking water sources throughout the Facilities. The purpose of the screening was to determine if any sampled drinking water sources exhibit lead levels exceeding the recommended Action Level of fifteen (15) parts per billion (ppb). The Action Level is the concentration of contaminant at which remediatory action is warranted. Potable water collection points can include any water source from which an occupant may drink or from which the water may be used for cooking, including water fountains/bubblers, kitchen faucets, Nurse's Office faucets, and the Faculty/Staff lounge. Additionally, the Facility's water service and main lines are sampled at or near the main building connection to aid in the interpretation of results.

2.0 LEAD IN DRINKING WATER

Lead is a toxic substance that can be harmful to human health. As compared to adults, children are more susceptible to the detrimental health effects of lead, as their nervous systems are not yet fully developed. Exposure to lead can occur in a variety of ways including through food, soil, deteriorating lead-based paint, and drinking water. Lead can leach into drinking water from plumbing materials such as pipes and solder, as well as brass plumbing fixtures. Sampling was conducted prior to the adoption of N.J.A.C. 6A:26: Educational Facilities requiring the sampling of drinking water for lead in public schools. As such, Karl following the guidance provided by the Environmental Protection Agency (EPA) titled "3Ts for Reducing Lead in Drinking Water in Schools: Revised Technical Guidance" (October 2006) which provides recommendations for sampling strategy, methodology, and interpretation for schools that are supplied by municipal water.

3.0 DRINKING WATER SAMPLING METHODOLOGY

Karl collected drinking water samples from water outlets throughout the Facility. Sampling strategy was planned in general accordance with the guidance provided by the EPA in the "3Ts for Reducing Lead in Drinking Water in Schools: Revised Technical Guidance."

At each collection point, Karl filled a 250 milliliter (mL) wide-mouth high density polyethylene (HDPE) sample collection bottle from the selected water source. Samples were collected after the water in each building had not been used for at least 8 hours, but not more than 18 hours, and prior to the building's daily opening. The initial sample at each collection point represents the first draw sample. The first draw sample is representative of the water from the end point of the water source (i.e. the bubbler or tap).

The samples were recorded under proper chain of custody and couriered directly to Suburban Testing Labs (Suburban), a New Jersey certified laboratory (NJ Lab ID #PA081) located in Reading, Pennsylvania for analysis by EPA method 200.8.

Karl collected the following number of water samples:

- One (1) Service Line Sample
- One (1) Main Line Sample
- Seven (7) First Draw Samples

Sampling locations are indicated on the floor plan in Attachment A.

4.0 DRINKING WATER ANALYSIS RESULTS

The analytical lead in drinking water results for each first draw sample are listed in Table 1, below:

Table 1: Analytical Lead Results for First Draw Water Samples Collected from Lincoln Elementary School

Sample I.D.	Location	Type of Collection Point	Lead Concentration (mg/L)	Lead Concentration (ppb)	Above Action Level?
O-LIN-01-S	Boiler Room (Service Line)	HC	0.001	1	No
O-LIN-01-M	Boiler Room (Main Line)	HC	0.001	1	No
O-LIN-01-A	Opposite Boiler Room (L)	MWF	<0.001	<1	No
O-LIN-02-A	Opposite Boiler Room (R)	MWF	<0.001	<1	No
O-LIN-03-A	Nurse's Office Exam Room	KF	0.008	8	No
O-LIN-04-A	Faculty Room	KF	<0.001	<1	No
O-LIN-05-A	D Wing, Next to D104 (Right)	MWF	<0.001	<1	No
O-LIN-06-A	2nd Floor, Opposite Library	MWF	<0.001	<1	No
O-LIN-07-A	3rd Floor, Opposite B306 (Left)	MWF	<0.001	<1	No

PWF = Porcelain Water Fountain **KF = Kitchen Faucet** **BD = Bottle Water Dispenser**
MWF = Metal Water Fountain **MS = Metal Sink** **SS = Slop Sink**
HC = Hose Connection **PS = Porcelain Sink**

Laboratory analytical results were compared to the New Jersey Department of Environmental Protection (NJDEP) Drinking Water Quality Standard of 15 ppb for lead. This value coincides with the EPA's Action Level of 15 ppb.

Analysis of lead in the first draw drinking water samples indicated that at the time of the screening event, none of the first draw samples collected exhibited a lead level above the Action Level of 15 ppb.

Analytical laboratory results and chains of custody are available in Attachment B.

5.0 MUNICIPAL WATER QUALITY

Public water systems are required by law to monitor for contaminants. Results of this monitoring are provided to the public as annual consumer confidence reports. Orange, New Jersey is serviced by SUEZ/Orange Water Department (SUEZ). Karl obtained the most recently released consumer confidence report (2016) from SUEZ and reviewed the results of water quality testing as it relates to lead in drinking water. According to the 2016 consumer confidence report, the most common source of lead in public water systems is the corrosion of household plumbing.

SUEZ reported no exceedances of the Action Level of 15 ppb for lead in their 2016 consumer confidence report. Additionally, 90% of the water samples collected exhibited lead levels of 2.7 ppb or lower. Based on the reported statistics, SEUZ was in compliance with regards to lead contamination in water.

All service line and main line samples collected during this sampling event indicate that the service line, main line, and/or municipal water are not likely to be significant sources of the lead contamination within the Facility, The EPA guidiance implies that “very low lead levels” are less than five (5) ppb.

The consumer confidence report is included in Attachment C.

6.0 CONCLUSIONS & RECOMMENDATIONS

Karl collected first draw samples from drinking water sources throughout the Lincoln Elementary School in Orange, New Jersey. First draw sample results indicated that none of the samples collected exhibited lead levels above the EPA Action Level of 15 ppb. Based on the findings of the lead in water screening and observations made during sample collection, Karl offers the following recommendations at this time:

- Replace any known or discovered lead piping with with lead-free piping.

- Continue to monitor lead in drinking water levels as part of a regular sampling and maintenance plan. It is recommended that this include sampling any remaining untested drinking water outlets in the Facilities. Additional parameters may also be considered for analysis, such as: Antimony, Asbestos, Cadmium, Copper, Mercury, Nickel, Silver, Zinc, and biologicals.

- Where in use, regularly clean aerators to prevent the build-up of debris behind the screen which may contribute to elevated lead levels.

- Use only cold water for food and beverage preparation. Hot water is more likely to contribute to the corrosion of plumbing materials and thefore contain a greater level of contaminants from the plumbing system.

- Check piping for ground wiring for electricity. Such wiring may cause premature corrosion of the affected piping and lead to contamination of the water contained within.

7.0 LIMITATIONS

The purpose of the sampling event outlined within this report was to provide a general screening of potable water sources for potential lead contamination. No other heavy metals or additional contaminants were sampled for or analyzed. Lead concentrations can change as water continues to move through the water system. Each sample was a grab sample and represents lead concentrations only at the specific time of collection and may vary based on the water usage in the facility. Interpretation of these results is only valid if the facility is serviced by a municipal water supplier or water utility. This screening event focused upon the water outlets most likely to be used for consumption and did not attempt to sample all water outlets in each building. As such, Karl strongly recommends that the District continue to sample the remaining water sources at each building as part of a continuing sampling and maintenance plan. In the event that Karl Environmental Group could not access a building's water main connection, the nearest downstream water source was used to represent the service line and main line samples (a protocol recommended by the EPA).

This lead screening event was conducted prior to the adoption of amendments to N.J.A.C. 6A:26, Educational Facilities, which requires testing for lead in the drinking water of public school districts, and therefore does not, comply with the State regulations.

8.0 CLOSING

Thank you for using Karl to assist you with this project. Please do not hesitate to call if you have any questions relating to this report or for any other environmental health and safety concerns.

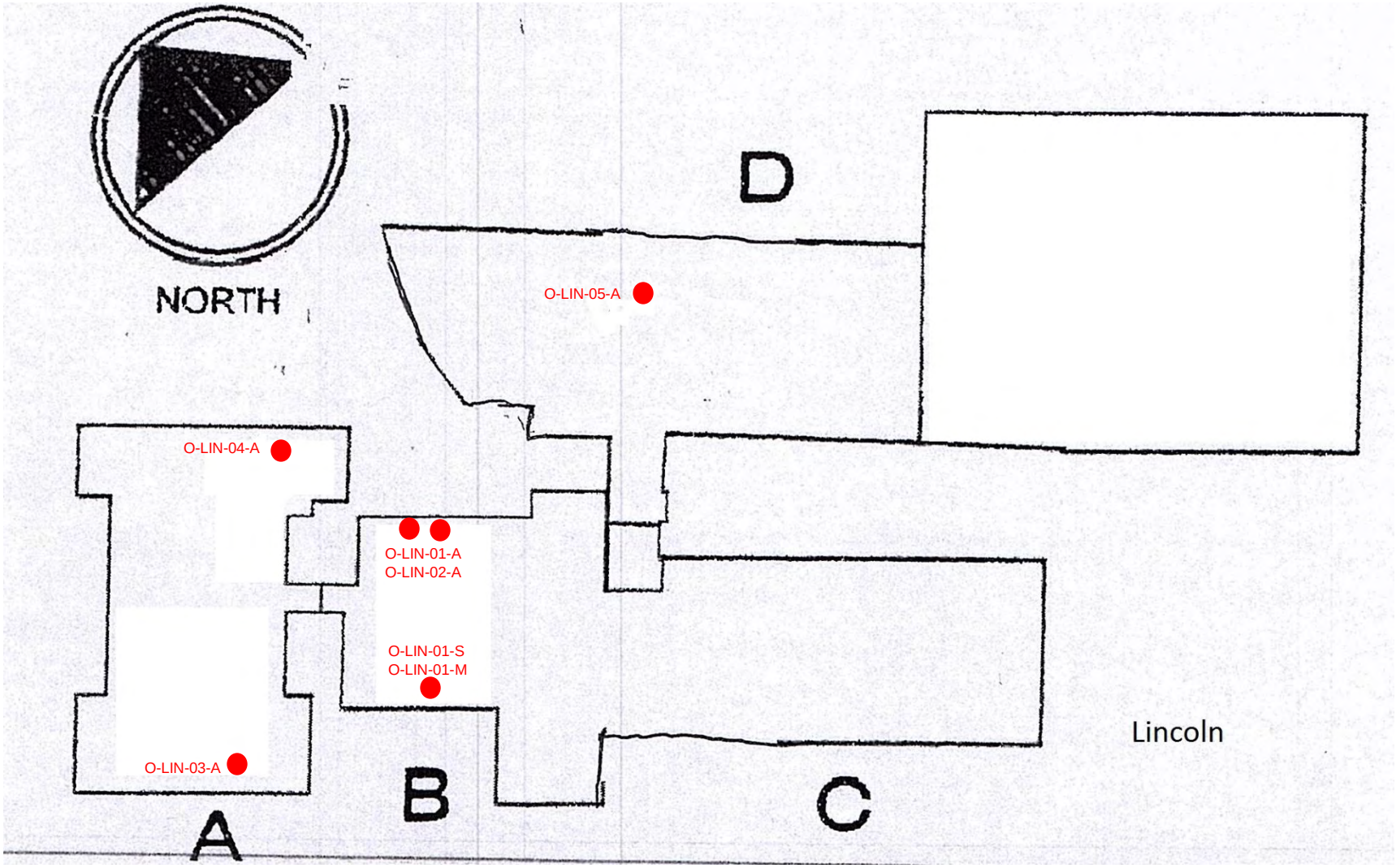
Respectfully submitted,
Karl Environmental Group

Kelly L. Mays
Consultant

Attachments:
A-Sampling Map
B-Laboratory Analytical Results
C-Consumer Confidence Reports

Attachment A

Sampling Map



Main Floor **Lincoln Elementary School** **216 Lincoln Avenue** **Orange, NJ 07050**	**FIGURE 1:** **Approximate Collection Point Locations** **June 21, 2016**	**Collection Point**	**Karl Environmental Group** **20 Lauck Road** **Mohnton, PA 19540**

Attachment B

Laboratory Analytical Results

SUBURBAN TESTING LABS

Results Report

Order ID: 6064131

Karl Environmental Group
20 Lauck Road
Mohnton, PA 19540

Project: Copper & Lead

Attn: Kelly Mays

Regulatory ID:

Sample Number: 6064131-01 Site: O-LIN-01-S Sample ID:
Collector: DT Collect Date: 06/21/2016 3:49 am Sample Type: Grab

Department / Test / Parameter	Result	Units	Method	R.L.	DF	Prep Date	By	Analysis Date	By
Metals									
Lead	0.001	mg/L	EPA 200.8	0.001	1	07/14/16	RPV	07/20/16 20:53	RPV

Sample Number: 6064131-02 Site: O-LIN-01-M Sample ID:
Collector: DT Collect Date: 06/21/2016 3:53 am Sample Type: Grab

Department / Test / Parameter	Result	Units	Method	R.L.	DF	Prep Date	By	Analysis Date	By
Metals									
Lead	0.001	mg/L	EPA 200.8	0.001	1	07/14/16	RPV	07/20/16 21:03	RPV

Sample Number: 6064131-03 Site: O-LIN-01-A Sample ID:
Collector: KM Collect Date: 06/21/2016 3:54 am Sample Type: Grab

Department / Test / Parameter	Result	Units	Method	R.L.	DF	Prep Date	By	Analysis Date	By
Metals									
Lead	< 0.001	mg/L	EPA 200.8	0.001	1	07/14/16	RPV	07/20/16 21:05	RPV

Sample Number: 6064131-04 Site: O-LIN-02-A Sample ID:
Collector: KM Collect Date: 06/21/2016 3:55 am Sample Type: Grab

Department / Test / Parameter	Result	Units	Method	R.L.	DF	Prep Date	By	Analysis Date	By
Metals									
Lead	< 0.001	mg/L	EPA 200.8	0.001	1	07/14/16	RPV	07/20/16 21:07	RPV

Sample Number: 6064131-05 Site: O-LIN-03-A Sample ID:
Collector: KM Collect Date: 06/21/2016 3:59 am Sample Type: Grab

Department / Test / Parameter	Result	Units	Method	R.L.	DF	Prep Date	By	Analysis Date	By
Metals									
Lead	0.008	mg/L	EPA 200.8	0.001	1	07/14/16	RPV	07/20/16 21:09	RPV

Report Generated On: 07/21/2016 4:28 pm 6064131
STL_Results Revision #1.6 Effective: 07/09/2014

SUBURBAN TESTING LABS

Sample Number: 6064131-06 Site: O-LIN-04-A Sample ID:
Collector: KM Collect Date: 06/21/2016 4:03 am Sample Type: Grab

Department / Test / Parameter	Result	Units	Method	R.L.	DF	Prep Date	By	Analysis Date	By
Metals									
Lead	< 0.001	mg/L	EPA 200.8	0.001	1	07/14/16	RPV	07/20/16 21:11	RPV

Sample Number: 6064131-07 Site: O-LIN-05-A Sample ID:
Collector: DT Collect Date: 06/21/2016 4:08 am Sample Type: Grab

Department / Test / Parameter	Result	Units	Method	R.L.	DF	Prep Date	By	Analysis Date	By
Metals									
Lead	< 0.001	mg/L	EPA 200.8	0.001	1	07/14/16	RPV	07/20/16 21:13	RPV

Sample Number: 6064131-08 Site: O-LIN-06-A Sample ID:
Collector: DT Collect Date: 06/21/2016 4:11 am Sample Type: Grab

Department / Test / Parameter	Result	Units	Method	R.L.	DF	Prep Date	By	Analysis Date	By
Metals									
Lead	< 0.001	mg/L	EPA 200.8	0.001	1	07/14/16	RPV	07/20/16 21:15	RPV

Sample Number: 6064131-09 Site: O-LIN-07-A Sample ID:
Collector: DT Collect Date: 06/21/2016 4:13 am Sample Type: Grab

Department / Test / Parameter	Result	Units	Method	R.L.	DF	Prep Date	By	Analysis Date	By
Metals									
Lead	< 0.001	mg/L	EPA 200.8	0.001	1	07/14/16	RPV	07/20/16 21:17	RPV

Data Qualifiers:

All results meet the requirements of STL's TNI (NELAC) Accredited Quality System unless otherwise noted. If your results contain any data qualifiers or comments, you should evaluate useability relative to your needs.

If collectors initials include "STL", samples have been collected in accordance with STL SOP SL0015.

All results reported on an As Received (Wet Weight) basis unless otherwise noted.

This laboratory report may not be reproduced, except in full, without the written approval of STL.

Results are considered Preliminary unless report is signed by authorized representative of STL.

Reviewed and Released By:
Carol Schrenkel
QA Manager

Report Generated On: 07/21/2016 4:28 pm 6064131
STL_Results Revision #1.6 Effective: 07/09/2014

SUBURBAN TESTING LABS

6064131
Sarah Tyrrell

TAT (Check One): ☒ Standard ☐ 24hr ☐ 48hr ☐ 72hr ☐ Other ____
(Additional charges may apply for rush TAT. If not specified, standard TAT will apply)

Order ID: ____

Client Name: Karl Environmental Group
Address: 20 Lauck Road
Mohnton, PA 19540
Phone: 610-856-7700
Fax: 610-856-5040
Contact Name: Kelly Mays
Email: kmays@karlenv.com

Project Name: Orange Board of Education Lead in Water Screening
Address: Lincoln Elementary School
216 Lincoln Avenue, Orange, NJ
Payment / P.O. Info: 16-0672

Comments:

SWTL Sample Number	Sample Description / Site ID:	Date Sampled	Time Sampled	Samplers Initials	Test(s) Requested:	Bottle Quantity	See Codes Below: Matrix	Sample Type	Bottle Type	Preservative	Comments / Field Data:
	O-LIN-01-S	6/21	0349	DT	LEAD	1	PW	G	P	NA	SERVICE
	O-LIN-01-M		0353	DT	LEAD ** All samples preserved w/ HNO_3 until pH <2 DAD 6/21/16	1	PW	G	P	NA	MAIN
	O-LIN-01-A		0354	KM	LEAD	1	PW	G	P	NA	FIRST DRAW
	O-LIN-02-A		0355	KM	LEAD	1	PW	G	P	NA	FIRST DRAW
	O-LIN-03-A		0359	KM	LEAD	1	PW	G	P	NA	FIRST DRAW
	O-LIN-04-A		0403	KM	LEAD	1	PW	G	P	NA	FIRST DRAW
	O-LIN-05-A		0408	DT	LEAD	1	PW	G	P	NA	FIRST DRAW
	O-LIN-06-A	↓	0411	DT	LEAD	1	PW	G	P	NA	FIRST DRAW

Relinquished By: Kelly Mays / D. Townsend	Date: 06/21/16 Time: 0630		
Received By: Kelly Mays	Date: 06/21/16 Time: 0630	Temp °C: ____ Acceptable: Y / N	
Relinquished By: Kelly Mays	Date: 06/21/16 Time: 1015	Temp °C: ____ Acceptable: Y / N	
Received in Lab By: (9)	Date: 06-21-16 Time: 10:15	Temp °C: 24.1 Acceptable: (Y) / N	

Sample Conditions
- Submitted with COC? (Y) / N
- Number of containers match number on COC? (Y) / N
- All containers in tact? (Y) / N
- Tests within holding times (Y) / N
- 40 mL VOA vials free of headspace? Y / N

Matrix Key
NPW = Non-Potable Water
Solid = Raw Sludge, Dewatered sludge, soil, etc. (reported as mg/kg)
PW = Potable Water (not for SDWA compliance)
SDWA = Safe Drinking Water Act Potable Sample

Sample Type Key
G = Grab
8HC = 8 Hr. Composite
24HC = 24 Hr. Composite

SDWA Sample Types
D=Distribution
E=Entry Point
R=Raw
C=Check
S=Special
M=Maximum Residence

Bottle Type Key
P = Plastic
G = Glass
O = Other

Preservative Key
N = Sodium Thiosulfate
A = Ascorbic Acid
H = HNO_3
C = HCl
S = H_2SO_4
OH = NaOH
O = Other
NA = None Required

Reporting Options
☐ SDWA Reporting
PWSID: ____
☐ Fax
☒ Email dtownsend@karlenv.com
☐ Other ____
☐ Return a copy of this form with Report

Signing this form indicates your agreement with SWTL's Standard Terms and Conditions unless otherwise specified in writing. SLF059 Rev. 1.4 Effective November 12, 2014
Shaded areas are for SWTL use only.

SUBURBAN TESTING LABS

6064131
Sarah Tyrrell

TAT(Check One): ☒Standard ☐24hr ☐48hr ☐72hr ☐Other____
(Additional charges may apply for rush TAT. If not specified, standard TAT will apply)

Order ID:_____

Client Name: Karl Environmental Group
Address: 20 Lauck Road
Mohnton, PA 19540
Contact Name: DARREN TOWNSEND
Phone: 610-856-7700
Fax: 610-856-5040
Email: DTOWNSEND@KARLENV.COM

Project Name: Orange Board of Education Lead in Water Screening
Address: Lincoln Elementary School
216 Lincoln Avenue, Orange, NJ
Payment / P.O. Info: 16-0672

Comments:

SWTL Sample Number	Sample Description / Site ID:	Date Sampled	Time Sampled	Samplers Initials	Test(s) Requested:	Bottle Quantity	See Codes Below: Matrix	Sample Type	Bottle Type	Preservative	Comments / Field Data:
	O-LIN-07-A	6/21	0413	DT	LEAD	1	PW	G	P	NA	FIRST DRAW
					LEAD ** All samples	1	PW	G	P		
					LEAD preserved w/ HNO_3	1	PW	G	P		
					LEAD until pH <2	1	PW	G	P		
					LEAD	1	PW	G	P		
					LEAD DAW 6/21/16	1	PW	G	P		
					LEAD	1	PW	G	P		
					LEAD	1	PW	G	P		

Relinquished By: Kelly Mayo / D. Townsend	Date: 06/21/16 Time: 0630		
Received By: Kelly Mayo	Date: 06/21/16 Time: 0630	Temp °C: ____ Acceptable: Y / N	
Relinquished By: Kelly Mayo	Date: 06/21/16 Time: 1015	Temp °C: ____ Acceptable: Y / N	
Received in Lab By: Kate L (9)	Date: 06-21-16 Time: 10:15	Temp °C: 24.1 Acceptable: (Y) / N	

Sample Conditions
- Submitted with COC? (Y) / N
- Number of containers match number on COC? (Y) / N
- All containers in tact? (Y) / N
- Tests within holding times (Y) / N
- 40 mL VOA vials free of headspace? Y / N

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SDWA = Safe Drinking Water Act Potable Sample

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Bottle Type Key
P = Plastic
G = Glass
O = Other

Preservative Key
N = Sodium Thiosulfate
A = Ascorbic Acid
H = HNO_3
C = HCl
S = H_2SO_4
OH = NaOH
O = Other
NA = None Required

Reporting Options
☐SDWA Reporting
PWSID: _____
☐Fax
☒Email dtownsend@karlenv.com
☐Other_____
☐Return a copy of this form with Report

Signing this form indicates your agreement with SWTL's Standard Terms and Conditions unless otherwise specified in writing. SLF059 Rev. 1.4 Effective November 12, 2014
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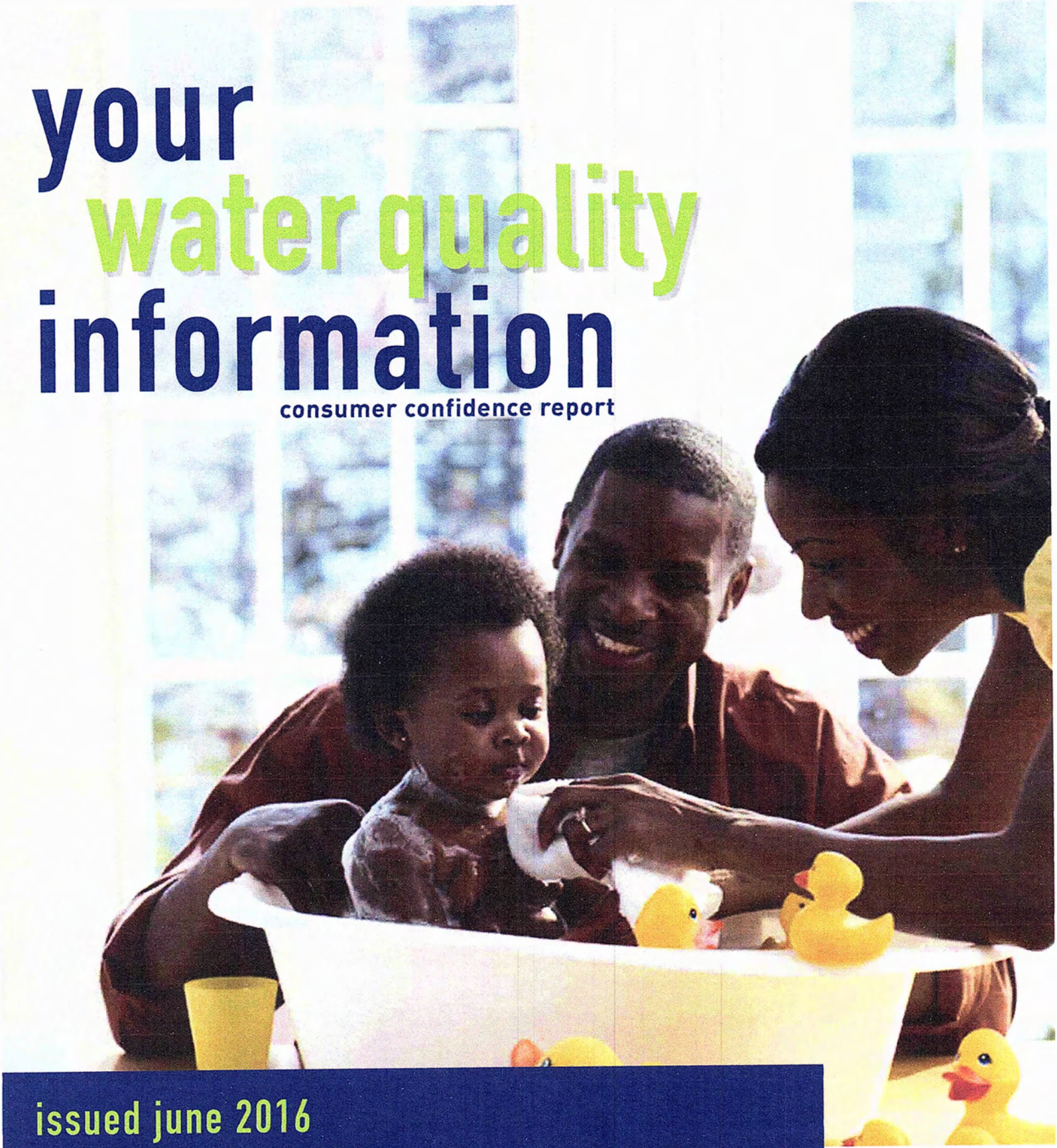
Attachment C

Consumer Confidence Report

your water quality information

consumer confidence report



issued june 2016

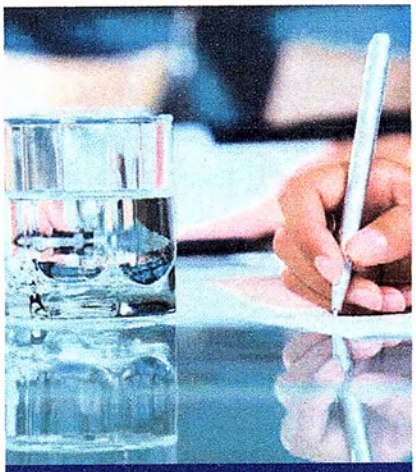
SUEZ | Orange Water Department

PWSID # 0717001

This report contains important information about your drinking water.
Este informe contiene información muy importante sobre su agua potable.
Tradúzcalo ó hable con alguien que lo entienda bien.

suez

our commitment to you



"We take great pride in our ability to provide you with drinking water that meets or surpasses all state and federal standards."

Dear Customer,

SUEZ is the contract operator hired by the City of Orange Township to operate and maintain the City's water system. Through this partnership, the City retains ownership of all the water facilities and sets the rates. SUEZ, as contract operator, provides the day to day management of the water system. These organizations work together to provide you with water that meets—and often surpasses—all the health and safety standards set by the United States Environmental Protection Agency (EPA) and the New Jersey Department of Environmental Protection (NJDEP).

We regularly test water samples to be sure that your water meets these safety standards. All the test results are on file with the NJDEP, the agency that monitors and regulates drinking water quality in our state. The EPA and NJDEP also requires water suppliers to provide a Consumer Confidence Report (CCR) to customers on an annual basis. This CCR contains important information about your drinking water. Please read it carefully and feel free to call us at 866.893.0546 if you have any questions about your water or your water service. You can also call the EPA Safe Drinking Water Hotline at 800.426.4791 with water-related questions. If you have specific questions about your water as it relates to your personal health, we suggest that you contact your health care provider.

Sincerely,

Steve Houst
Project Manager

who we are

SUEZ provides water and wastewater services to over 7 million people in the United States. In addition to owning and operating regulated utilities, SUEZ operates municipal systems through public-private partnerships and contract agreements. Three of the nation's largest water and wastewater contracts are operated by SUEZ.

about your water supply

The City of Orange Township uses an average of about 3.1 million gallons of water each day. The primary source of water is groundwater from five wells in the South Mountain Reservation, along with two city wells located at Gist Place* and Orange Park*. On a few occasions during the year, these sources had to be supplemented by purchasing a blend of surface water and groundwater from the neighboring New Jersey American Water Company.

*Note: The Gist Place well was shut down in July of 2015 and the Orange Park well did not operate in 2015.

about the treatment process

The City of Orange Township's water supply is treated at three locations. Well water from four wells located in the South Mountain Reservation is treated and pumped at the Chestnut Street Pumping Station. Water from the Gist Place and Orange Park wells in the City are treated in a treatment facility adjacent to each of those wells. Treatment at both Gist Place and Orange Park includes packed tower aeration to remove volatile organic compounds from the water to below required concentrations. Orange Park also has an arsenic filter.

All treatment facilities use an orthopolyphosphate inhibitor for corrosion control to reduce the possibility of lead and copper dissolving from household plumbing after it is distributed to our customers. In addition, chlorine is added to the water at each treatment facility to disinfect the water and to protect the distribution system from microbial contamination as the water travels throughout the system. Caustic soda is used at the Chestnut Street Pump Station for pH control.

use water wisely

We encourage our customers to use water wisely. A little effort and common sense can make a big difference. By installing more efficient water fixtures and repairing leaks, families can reduce indoor water use by up to 25 percent and help save money on water and energy bills. The more you conserve, the more you save! For more information, please visit: www.epa.gov/watersense.

health notes

2015 test results show that the Orange Water Department exceeded the recommended upper limit for sodium. The highest running annual average at the Chestnut Street Pump Station was 109 ppm with a range of results of 64 ppm to 128 ppm.

The one sample collected in 2016 showed that the Orange Water Department exceeded the recommended upper limit for sodium. The result was 101 ppm.

For healthy individuals, the sodium intake from water is not important because a much greater intake of sodium takes place from salt in the diet. However, sodium levels above the recommended upper limit may be a concern to individuals on a sodium restricted diet.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA Safe Drinking Water Hotline at 800.426.4791.

lead and your drinking water

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. The City of Orange Township is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 second to 2 minutes before using water for drinking and cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water hotline or at http:www.epa.gov/safewater/lead.

Frequently asked questions about lead in drinking water can be found here:
https://www.mysuezwater.com/sites/default/files/SUEZ_8.5x11_Lead_FAQ.pdf

waiver information

The Safe Drinking Water Act (SDWA) regulations allow monitoring waivers to reduce or eliminate the monitoring requirements for asbestos, volatile organic chemicals (VOCs), lead and copper, and synthetic organic chemicals (SOCs). Our system received monitoring waivers for SOCs because this system was determined not to be vulnerable to this type of contamination.

city notes

The Orange City Council meets on the first and third Tuesdays of each month at 7:00 p.m. at Orange City Hall. Residents are welcome to attend and participate in these meetings, and may inquire about any water system issues of interest. For meeting information, contact the City Clerk at 973.266.4025. You may also visit the City of Orange web site at www.ci.orange.nj.us to obtain information on City Council meetings and other local events, contact information for local officials, etc. The City's web site also provides a link for sending email inquiries to the City.

tap water or bottled water?

The sources of drinking water (for both tap and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals, and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or human activity. Contaminants that may be present in source water include:

- Microbial contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- Inorganic contaminants, such as salts and metals, which can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining or farming.
- Pesticides and herbicides, which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.
- Organic chemical contaminants, including synthetic and volatile organic chemicals, which are byproducts of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems.
- Radioactive contaminants, which can be naturally-occurring or be the result of oil and gas production and mining activities.

In order to ensure that the water is safe to drink, the EPA prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration regulations establish limits for contaminants in bottled water which must provide the same protection for public health. So, what's the bottom line? If bottled and tap water meet the federal standards, they are both safe to drink. However, your tap water is substantially less expensive than bottled water.

source water assessment program

The New Jersey Department of Environmental Protection (NJDEP) has completed and issued the Source Water Assessment Report and Summary for this public water system, which is available at http://www.state.nj.us/dep/swap or by contacting the NJDEP, Bureau of Safe Drinking Water at 609.292.5550. The table below illustrates the susceptibility rating for each individual source for each of the contaminant categories in the Orange Water system. For susceptibility ratings of purchased water, refer to the specific water system's source water assessment report. NJDEP considered all surface water highly susceptible to pathogens. For the purpose of Source Water Assessment Program, radionuclides are more of a concern for ground water than surface water.

If a system is rated highly susceptible for a contaminant category, it does not mean a customer is or will be consuming contaminated drinking water. The rating reflects the potential for contamination of source water, not the existence of contamination. Public water systems are required to monitor for regulated contaminants and to install treatment if any contaminants are detected at frequencies and concentrations above allowable levels. As a result of the assessments, NJDEP may customize (change existing) monitoring schedules based on the susceptibility ratings. If you have questions regarding the source water assessment report or summary please contact the Bureau of Safe Drinking Water at watersupply@dep.state.nj.us or 609.292.5550.

susceptibility rating for Orange Water Department O&M by SUEZ

EPTDS ID	Source ID	Source Name	Pathogens Rating	Nutrients Rating	Pesticides Rating	VOCs Rating	Inorganics Rating	Radionuclides Rating	Radon Rating	DBPs Rating
01	002	Well #2	M	H	L	L	M	M	H	M
01	003	Well #3	M	M	L	L	M	M	H	M
01	004	Well #4	M	H	L	L	M	M	H	M
01	005	Well #5	M	H	L	L	M	M	H	M
01	006	Well #6	M	M	L	L	M	M	H	M
02	009	Orange Park	L	M	L	H	H	H	H	M
03	011	Gist Place	M	M	L	H	H	H	H	M

definitions

Pathogens: Disease-causing organisms such as bacteria and viruses. Common sources are animal and human fecal wastes.

Nutrients: Compounds, minerals and elements that aid growth, that are both naturally occurring and man-made. Examples include nitrogen and phosphorus.

Volatile Organic Compounds (VOCs): Man-made chemicals used as solvents, degreasers, and gasoline components. Examples include benzene, methyl tertiary butyl ether (MTBE), and vinyl chloride.

Pesticides: Man-made chemicals used to control pests, weeds and fungus. Common sources include land application and manufacturing centers of pesticides. Examples include herbicides such as atrazine, and insecticides such as chlordane.

Inorganics: Mineral-based compounds that are both naturally occurring and man-made. Examples include arsenic, asbestos, copper, lead, and nitrate.

Radionuclides: Radioactive substances that are both naturally occurring and man-made. Examples include radium and uranium.

Radon: Colorless, odorless, cancer-causing gas that occurs naturally in the environment. For more information go to http://www.nj.gov/dep/rpp/radon/index.htm or call 800.648.0394.

Disinfection Byproduct Precursors (DBPs): A common source is naturally occurring organic matter in surface water. Disinfection byproducts are formed when the disinfectants (usually chlorine) used to kill pathogens reacts with dissolved organic material (for example leaves) present in surface water.

L, M, H: Low, Medium, High, susceptibility.

important information

Please pass this information along to those who speak Spanish, Portuguese, Korean, Gujarti or Arabic:

- Este informe contiene información muy importante sobre su agua potable. Tradúzcalo ó hable con alguien que lo entienda bien.
- Este reporte contem informáções importantes sobre a sua água de beber. Traduza-o ou fale com alguém que o compreenda.
- 이 보고서는 귀하가 마시는 식수에 대한 중요한 정보가 포함되어 있습니다. 번역을 하시든지 아니면 이 보고서를 잘 이해하시는 분과 의논 하시기를 바랍니다.
- આ અહેવાલ માં તમારા પીવાના પાણી વિશે મહત્વ ની માહિતી આપવા મા આવી છે. એનો અનુવાદ કરો અથવા જેને સમજણ પડતી હોય તેની સાથે વાત કરો
- للمعلومات في هذا التقرير تحتوى على معلومات مهمة عن مياة الشرب التى تشربها. من فضلك اذا لم تفهم هذة المعلومات اطلب من يترجمها لك.

drinking water quality

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons, such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infections by cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline at 800.426.4791.

The water quality table shows how the quality of your drinking water in 2015 compared to the standards set by the USEPA and the NJDEP. When standards differed, the more stringent standard was used for the MCL. Results are from 2015 unless noted otherwise.

primary standards - directly related to the safety of drinking water.

Inorganic Chemicals	MCLG	MCL	Highest Result*	Range of Results*	Violation	Likely Source
Arsenic ppb (2014)	0	5	2.9	ND - 2.9	No	Erosion of natural deposits; runoff from orchards; runoff from glass and electronics production wastes
Barium ppm (2014)	2	2	0.23	0.13 - 0.23	No	Erosion of natural deposits; discharge of drilling wastes; discharge from metal refineries
Fluoride ppm (2014)	4	4	0.05	ND - 0.05	No	Erosion of natural deposits; water additive which promotes strong teeth; discharge from fertilizer and aluminum factories
Nitrate as nitrogen ppm	10	10	3.66	0.65 - 3.66	No	Runoff from fertilizer usage; leaching from septic tanks, sewage; erosion of natural deposits
Selenium ppb (2014)	50	50	4.6	ND - 4.6	No	Discharge from petroleum and metal refineries; erosion of natural deposits; discharge from mines

Informational statement regarding arsenic: While your drinking water meets EPA's standard for arsenic, it does contain low levels of arsenic. EPA's standard balances the current understanding of arsenic's possible health effects against the costs of removing arsenic from drinking water. EPA continues to research the health effects of low levels of arsenic, which is a mineral known to cause cancer in humans at high concentrations and is linked to other health effects such as skin damage and circulatory problems. The "Average Result" and "Highest Result" for Arsenic are based on the Running Annual Average (RAA), due to multiple samples collected during 2014.

*Highest result based upon the highest single sample. Range of Results represent the lowest and highest individual detection during the monitoring year.

Copper and Lead (2013 Data)	MCLG	AL	90th Percentile	Samples > AL	Violation	Likely Source
Copper ppm	1.3	1.3	0.498	0	No	Corrosion of household plumbing
Lead ppb	0	15	2.7	0	No	Corrosion of household plumbing system; erosion of natural deposits

Microbiologicals	MCLG	MCL	Highest Result	Range of Results	Violation	Likely Source
Total coliforms	0	1	1	0 - 1	No	Naturally present in the environment

Radionuclides (2014)	MCLG	MCL	Highest Result (RAA)	Range of Results*	Violation	Likely Source
Combined radium (226/228) pCi/L	0	5	1.21	1.21 - 1.21	No	Erosion of natural deposits
Uranium ppb	0	30	10.3	10.3 - 10.3	No	Erosion of natural deposits

RAA = Running Annual Average.
*The Range of Results represent the lowest and highest detection during the monitoring year.

Disinfection By-products - Stage 2	MCLG	MCL	Highest Result LRAA	Range of Results*	Violation	Likely Source
Total THMs ppb (THMs: bromoform, bromodichloromethane, chlorodibromomethane, chloroform)	NA	80	27.7	8.5 - 40.1	No	By-product of drinking water disinfection
HAA5 ppb (HAA5: dibromoacetic acid, dichloroacetic acid, monobromoacetic acid, monochloroacetic acid, trichloroacetic acid)	NA	60	12.3	3.8 - 20.5	No	By-product of drinking water disinfection

LRAA = A Locational Running Annual Average. DBP max levels are site specific.
*The Range of Results represent the lowest and highest individual detection during the monitoring year.

Disinfectant Residual	MRDLG	MRDL	Highest Result (RAA)*	Range of Results*	Violation	Likely Source
Chlorine ppm	4	4.0	0.93	0.08 - 1.68	No	Water additive used to control microbes

*Highest result is the highest running annual average (RAA) and the range of results represent the highest and lowest values from the individual samples.

secondary standards: related to the aesthetic quality of drinking water

Substance (2014)	NJ RUL*	Highest Result	Range of Results	Likely Source
Alkalinity ppm	NA	176	108 - 176	Natural Mineral
Calcium ppm	NA	106	77 - 106	Natural Mineral
Chloride ppm#	250	273	163 - 273	Natural Mineral, Road Salt
Color CU	10	5	0 - 5	Natural mineral and organic matter
Hardness (as $CaCO_3$) ppm#	250	410	279 - 410	Natural Mineral
Iron ppb	300	31	ND - 31	Erosion of natural deposits and oxidation of iron components
Manganese ppb#	50	72	ND - 72	Erosion of Natural Deposits
pH units	6.5 - 8.5	7.44	7.09 - 7.44	Natural Mineral, Treatment Process
Sodium ppm (2015)**	50	109	64 - 128	Natural Mineral, Road Salt
Sulfate ppm	250	121	17 - 121	Natural Mineral
Total dissolved solids ppm#	500	697	680 - 697	Natural Mineral

*New Jersey Recommended Upper Limit

#Note on exceedances: Secondary standards are non-mandatory guidelines to assist public water systems in managing their drinking water for aesthetic considerations, such as taste, color and odor. These contaminants are not considered to present a risk to human health. In accordance with the regulatory requirements, these compounds are sampled every three (3) years unless otherwise indicated.

**Sodium: Orange was above New Jersey's Recommended Upper Limit (RUL) for sodium. For healthy individuals, the sodium intake from water is not important because a much greater intake of sodium takes place from salt in the diet. However, sodium levels above the recommended upper limit may be a concern to individuals on a sodium restricted diet. Highest Result are based on the Running Annual Average (RAA), due to multiple samples collected for sodium during 2015.

unregulated substances – for which the epa requires monitoring

Unregulated contaminants are those for which the EPA has not established drinking water standards. The purpose of unregulated contaminant monitoring is to assist the EPA and DEP in determining the occurrence of unregulated contaminants in drinking water and whether regulation is warranted.

Unregulated Contaminants (2015)	MCLG	MCL	Highest Result	Range of Results	Violation	Likely Source
Chromium ppb	NA	100	0.73	ND - 0.73	NA	Prevalent natural element
Strontium ppb	NA	NA	4500	ND - 4500	NA	Naturally occurring element
Vanadium ppb	NA	NA	2	ND - 2	NA	Naturally occurring element
1,4-Dioxane ppb	NA	NA	0.16	ND - 0.16	NA	Used as a solvent, cleaning agent, chemical stabilizer, surface coating, adhesive agent, and an ingredient in chemical manufacture
Chlorate ppb	NA	NA	180	ND - 180	NA	Known byproduct of the drinking water disinfection process, forming when sodium hypochlorite or chlorine dioxide are used in the disinfection process
Chromium(VI) ppb	NA	NA	0.41	ND - 0.41	NA	Industries that process or use chromium, chromium compounds, or chromium processes
Perfluoro-octanoic acid (PFOA) ppb	NA	NA	0.044	ND - 0.044	NA	Perfluorinated compounds (PFCs) are man-made compounds used in the manufacture of stain, oil, and water resistant consumer products. They are also found in products such as firefighting foams, cleaners, cosmetics, paints, adhesives and insecticides.

Additional information about unregulated contaminants can be found at the following link, courtesy of American Water Works Association: http://www.drinktap.org/home/water-information/water-quality/ucmr3.aspx

definitions

Action Level (AL): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

CU: Color unit.

Maximum Contaminant Level (MCL): The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

Maximum Residual Disinfectant Level (MRDL): The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of disinfectant is necessary for control of microbial contaminants.

Maximum Residual Disinfectant Level Goal (MRDLG): The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectant to control microbial contamination.

NA: Not applicable.

ND: Not detected.

NTU: Nephelometric Turbidity Unit.

ppb Parts Per Billion: The equivalent of one second in 32 years.

ppm Parts Per Million: The equivalent of one second in 12 days.

pCi/L: Picocuries per liter. The equivalent of one second in 32 million years.

Primary Standards: Federal drinking water regulations for substances that are health-related. Water suppliers must meet all primary drinking water standards.

Secondary Standards: Federal drinking water measurements for substances that do not have an impact on health. These reflect aesthetic qualities such as taste, odor and appearance. Secondary standards are recommendations, not mandates.

TON: Threshold Odor Number.

Treatment Technique (TT): A required process intended to reduce the level of a contaminant in drinking water.

Supplemental Source of Supply Data

In 2015, the City of Orange Township purchased water from neighboring New Jersey American Water Company to supplement its source of supply. This insert contains the water quality data from New Jersey American Water Company Short Hills System (PWS ID: NJ0712001). Additional information about this source of supply is available by visiting their company's website at www.amwater.com.

New Jersey American Water – Short Hills System – PWS ID# NJ0712001 – 2016 Water Quality Report
Table of Detected Contaminants - 2015
Regulated Substances

Contaminant	Unit	MCL	MCLG	Range Detected	Highest Detected Level	Compliance Achieved	Typical Source
Disinfectant By-Products – Stage 2 Data							
Total Trihalomethanes (TTHM)	ppb	80	NA	11.5 – 87.7	68 [1,2]	YES	By-product of drinking water disinfection
Five Haloacetic Acids (HAA5)	ppb	60	NA	5.0 – 36.4	29 [1]	YES	By-product of drinking water disinfection
Disinfectants							
Chlorine	ppm	MRDL = 4	MRDLG = 4	0.59 - 0.84	1.2 [3]	YES	Water additive used to control microbes
Inorganic Contaminants							
Arsenic	ppb	5	0	ND - 1	1	YES	Erosion of natural deposits
Barium	ppm	2	2	ND - 0.2	0.2	YES	Erosion of natural deposits
Chromium (total)	ppb	100	100	ND – 1.9	1.9	YES	Discharge from steel and pump mills; erosion of natural deposits
Nickel	ppb	NA	NA	ND – 16	16	NA	Erosion of natural deposits
Nitrate [4]	ppm	10	10	0.26 – 3.74	3.74	YES	Runoff from fertilizer use; Leaching from septic tanks, sewage; Erosion of natural deposits
Selenium	ppb	50	50	ND - 0.85	0.85	YES	Erosion of natural deposits
Treatment By-Products Precursor Removal							
Total Organic Carbon	ppm	TT	NA	1.40 - 3.47	3.47	YES	Naturally present in the environment
Radiological Contaminants							
Alpha emitters [5]	pCi/L	15	0	ND - 12.0	12.0	YES	Erosion of natural deposits
Combined Radium [5]	pCi/L	5	0	ND – 2.1	2.1	YES	Erosion of natural deposits

1 This level represents the highest locational running annual average calculated from the data collected.

2 Some people who drink water containing trihalomethanes in excess of the MCL over many years may experience problems with their liver, kidneys, or central nervous systems, and may have an increased risk of getting cancer.

3 Highest Detected Level is the maximum monthly average detected at the point of entry. Range indicates the average values detected in the distribution system.

4 Nitrate in drinking water at levels above 10 ppm is a health risk for infants of less than six months of age. High nitrate levels in drinking water can cause blue baby syndrome. Nitrate levels may raise quickly for short periods of time because of rainfall or agricultural activity. If you are caring for an infant, you should ask for advice from your health care provider.

5 The state of New Jersey allows us to monitor for some substances less than once per year because the concentrations of these substances do not change frequently. Some of our data, though representative, is more than one year old.

Unregulated Contaminant Monitoring Rule (UCMR)

New Jersey American Water participated in the Unregulated Contaminant Monitoring Rule. Unregulated contaminants are those for which the EPA has not established drinking water standards. The purpose of unregulated contaminant monitoring is to assist the EPA and DEP in determining the occurrence of unregulated contaminants in drinking water and whether regulation is warranted. Our results are available upon request. For testing conducted in the Short Hills system, we found the substances listed.

Unregulated Substances

Contaminant	Years Sampled	Units	Range Detected	Average
Chlorate [1]	2013, 2015	ppb	ND – 200	98
Chromium VI [2]	2013, 2015	ppb	ND – 1.71	0.40
Cobalt [3]	2013, 2015	ppb	ND – 2.3	0.1
Molybdenum [4]	2013, 2015	ppb	ND – 1.8	0.2
N-nitrosopyrrolidine (NPYR) [5]	2008, 2009	ppb	ND – 0.0023	0.0002
Perfluorooctanoic Acid (PFOA) [6]	2011, 2015	ppb	ND – 0.021	0.001
Strontium [7]	2013, 2015	ppb	76 – 689.8	240
Vanadium [8]	2013, 2015	ppb	ND – 22.4	2.5
1,4-dioxane [9]	2013, 2014, 2015	ppb	ND – 0.24	0.03

1 Use or Environmental Source for Chlorate: Agricultural defoliant or desiccant; disinfection byproduct; and used in production of chlorine dioxide

2 Use or Environmental Source for Chromium VI: Naturally-occurring element ; used in making steel and other alloys; chromium III or VI forms are used for chrome plating, dyes and pigments, leather tanning, and wood preservation

3 Use or Environmental Source for Cobalt: Naturally-occurring element found in the earth's crust and at low concentrations in seawater, and in some surface and ground water; cobaltous chloride was formerly used in medicine as a germicide

4 Use or Environmental Source for Molybdenum: Naturally-occurring element found in ores and present in plants, animals, and bacteria; commonly used form molybdenum trioxide used as a chemical reagent

5 Nitrosamines can form as intermediates and byproducts in chemical synthesis and manufacture of rubber, leather, and plastics; can form spontaneously by reaction of precursor amines with nitrosating agents (nitrate and related compounds), or by action of nitrate-reducing bacteria. Foods such as bacon and malt beverages can contain nitrosamines; there is also evidence that they form in the upper GI tract.

6 PFOA is a man-made chemical used in the manufacture of fluoropolymers. With non-stick and stain-resistant properties, fluoropolymers have wide application in common household products such as cookware, carpet and all-weather clothing. There is currently no regulatory limit established for PFOA in drinking water. However, in February 2007 the NJ Dept. of Environmental Protection (NJDEP) issued a preliminary guidance level of 0.04 ppb. In order to assist the NJDEP in assessing the occurrence of this substance in NJ, New Jersey American Water began to monitor for PFOA in some of its systems. We are sharing the results in this report because we want to educate our customers about the quality of their drinking water. This proactive approach reinforces our continuing commitment to protect public health and provide quality drinking water and reliable service. For more information on PFOA, contact NJDEP Bureau of Safe Drinking Water at (609) 292-5550.

7 Use or Environmental Source for Strontium: Naturally-occurring element; historically, commercial use of strontium has been in the faceplate glass of cathode-ray tube televisions to block x-ray emissions

8 Use or Environmental Source for Vanadium: Naturally-occurring elemental metal; used as vanadium pentoxide which is a chemical intermediate and a catalyst

9 Use or Environmental Source for 1,4-dioxane: Cyclic aliphatic ether; used as a solvent or solvent stabilizer in manufacture and processing of paper, cotton, textile products, automotive coolant, cosmetics and shampoos

Additional information about unregulated contaminants can be found at the following link, courtesy of American Water Works Association:
http://www.drinktap.org/home/water-information/water-quality/ucmr3.aspx