NYC Environmental Protection

Vincent Sapienza, P.E.
Commissioner

Paul V. Rush, P.E.
Deputy Commissioner
Bureau of Water Supply
prush@dep.nyc.gov

59-17 Junction Blvd.
Flushing, NY 11373
T: (845) 340-7800
F: (845) 334-7175

November 13, 2018

Li Huang, P.E.
New York City Department of Health and Mental Hygiene
Environmental Sciences & Engineering
42-09 28th Street, 14th Floor CN# 56
Long Island City, NY 11101

Patrick Palmer
New York State Department of Health
Bureau of Water Supply Protection, NYC Watershed Section
Empire State Plaza, Corning Tower, Room 1198
Albany, NY 12237

Katie Lynch
United States Environmental Protection Agency
Clean Water Division - New York City Water Supply Protection Program
290 Broadway, 24th Floor
New York, New York 10007-1866

RE: Monthly Water Quality Report for October 2018

Dear Ms. Huang, Mr. Palmer and Ms. Lynch:

Enclosed, please find the New York City Water Quality report for the month of **October 2018**. There was no well pumpage to distribution in the Groundwater System this month. Croton water fed into distribution from October 1 through October 14, 2018, and from October 17 through October 31, 2018. In addition to the following list of compliance reports, a disc of electronic files containing compliance and non-compliance data for this month is enclosed with this report.

- Raw Water Fecal Coliform Report
- Raw Water Turbidity Report
- Distribution Microbiological Compliance Reports
  - Summary
  - Positive Samples
  - Resamples
- Chlorine Residual Reports
  - Entry Point Online
  - Entry Point Daily Minimum
  - Heterotrophic Plate Count
  - Monthly Summary
- Distribution Turbidity Reports
  - Distribution Turbidity Report
  - Source Water > 1.49 NTU Table

- Color Entry Point Report
- Fluoride Reports
  - Fluoride Entry Point Report
  - Distribution Fluoride Report
- Quarterly Disinfection By-products Report

The reports are summarized as follows:

FAD REQUIREMENTS

1. *Raw Water Fecal Coliform Concentrations* (Section 141.71(a)(1)):
Requirements met. The Delaware Aqueduct effluent from Kensico Reservoir exhibited fecal coliform concentrations in water prior to disinfection at levels less than or equal to 20 CFU/100 mL in at least 90% of the samples collected in the six-month period from May 1, 2018 to October 31, 2018. The six month running percentage of samples collected with fecal coliform concentrations >20 CFU/100 mL was 2.17% for the Catskill/Delaware System for this time period.

2. *Raw Water Turbidity* (Section 141.71(a)(2)):
Requirements met. The raw water leaving Kensico Reservoir via the Delaware Aqueduct in compliance samples collected at DEL18DT, just prior to disinfection, exhibited turbidity levels less than or equal to 5 NTU on an ongoing basis during the month. Turbidity values did not exceed 1.2 NTU on the Catskill/Delaware System for the month.

3. *Entry Point Chlorine Residual* (Section 141.71(b)(1)(iii) and 141.72(a)(3)):
Requirements met. As required, continuous monitoring for free chlorine residual was maintained at the distribution entry points throughout the month and at no time did the concentration fall below 0.2 mg/L for more than four hours. The minimum daily free chlorine residual value for entry point readings for the Catskill/Delaware System from sites 1S03 (Tunnel 1) was 0.54 mg/L, 1S03A (Tunnel 2) was 0.76 mg/L, and 1S03B (Tunnel 3) was 0.45 mg/L for the Catskill/Delaware System.

The Croton Filtration Plant was online and feeding the Croton Low Service entry point from October 1 to October 14 at 6:40 AM and from October 17 at 7:55 AM to October 31, 2018. The Croton High Service entry point was online from October 1 at 10:35 AM to October 14 at 4:57 AM. When High Service Pumps are off, distribution Tunnel 3 water intermittently back feeds through the High Service tunnel to the Low Service entry point to meet the distribution demands. The minimum daily free chlorine residual value for Croton entry point readings from sites 1SCL1 (Low Service) and 1SCH3 (High Service) were 0.55 mg/L and 0.08 mg/L (original value of 0.32 mg/L with correction factor of -0.24 mg/L applied due to online instrument being out of tolerance when compared to grab sample), respectively. The minimum free chlorine residual of 0.08 mg/L at 1SCH3 occurred on October 1, 2018 from 10:38 PM to 10:44 PM, dropping below the required concentration of 0.2 mg/L only from 10:31 PM to 10:46 PM. Since the online instrument was found to be out of tolerance after Croton activated the High Service entry point, grab samples were collected and analyzed periodically by Croton Operators until the online instrument was adjusted on October 2, 2018. The difference between the grab sample and online

instrument readings was used as a correction factor to obtain a more realistic free chlorine concentration. The cause of high fluctuation in free chlorine residual on October 1 and 2 was attributed to valve positions and hydraulic imbalances on the sodium hypochlorite rapid mix feed lines. Valves were adjusted and the treated water sodium hypochlorite system was turned on in order to address this issue.

4. *Distribution System Disinfection Residuals* (Section 141.71(b)(1)(iv) and 141.72(a)(4)):
Requirements met. All free chlorine residuals measured at compliance sites within the distribution system during the month were greater than or equal to 0.02 mg/L except for one samples that equaled 0.0 mg/L.

A total of 1381 distribution samples were tested for free chlorine residual this month. For all distribution sites free chlorine residual ranged from 0.00 mg/L to 1.29 mg/L and averaged 0.57 mg/L for the month.

5. *Trihalomethane Monitoring / HAA5 Monitoring* (Section 141.71(b)(6)):
Requirements met. The results for the third quarter of 2018 were included in the report dated September 10, 2018 (For the August 2018 reporting period).

6. Total Coliform Monitoring (Section 141.71(b)(5)):
Requirements met. The results of monthly coliform monitoring performed in the distribution system are enclosed. A total of 841 compliance samples were tested for total coliform during this period. HPC were all ≤500 CFU/mL, equivalent to a measurable free chlorine residual. Zero percent of the samples had an undetectable free chlorine residual or HPC >500 CFU/mL. This meets the requirements that a free chlorine residual be maintained at representative points in the distribution system, and that no more than 5% of the free chlorine residual samples be undetectable in any two months. During the month, there were three (3) samples that tested positive for total coliform, and all samples were negative for *E. coli* during the month.

- A sample collected on 10/03/2018 from Site 11250 (sample station in front of 925 North Side of East Tremont Avenue, and first sampling station east of Daly Avenue, 20 inch main) was positive for total coliform. Repeat sampling on 10/05/2018 was coliform negative at all locations.
- A sample collected on 10/08/2018 from Site 31550 (sample station south side West 18th Street (opposite 329), and second sampling station east of 9th Avenue, 12 inch main) was positive for total coliform. Repeat sampling on 10/10/2018 was coliform negative at all locations.
- A sample collected on 10/20/2018 from Site 43050 (sample station south side Park Lane South, and first sampling station west of 102nd Street, 20 inch main) was positive for total coliform. Repeat sampling on 10/22/2018 was coliform negative at all locations.

OTHER WATER QUALITY MONITORING

7. Microbiological Monitoring:
Coliform monitoring at distribution sites near first service connections, in response to source water having a turbidity >1.49 NTU, was not required this month, but all samples were negative for total coliform.

The analyses of 540 distribution Operational samples resulted in three (3) samples testing positive for total coliform. No *E. coli* were detected.

The analyses of 251 Pre-Finished samples resulted in eight (8) samples testing positive for total coliform. One (1) sample tested positive for *E. coli*.

The analyses of 620 Autosampler Pre-finished samples resulted in fourteen (14) samples testing positive for total coliform. One (1) sample tested positive for *E. coli*.

8. *Distribution Turbidity Monitoring:*
For distribution sites turbidity ranged from <0.10 to 2.40 NTU and averaged 0.60 NTU for the month. This meets the MCL of 5 NTU for the monthly average of all distribution samples.

9. *Color Monitoring:*
The MCL of 15 units for color was met at each Catskill/Delaware and Croton entry point for the month. Daily analyses of entry point samples (133 samples in total), produced monthly average color values of six (6) units for site 1S03 (Tunnel 1), seven (7) units for sites 1S03A (Tunnel 2) and 1S03B (Tunnel 3), and four (4) units for sites 1SCL1 (Croton Low Service) and 1SCH3 (Croton High Service).

10. *Volatile Organic/TTHM/HAA5 Monitoring:*
Monthly Results: Twenty-one (21) distribution site samples were collected for volatile organic contaminant (VOC) analysis and six (6) entry point samples. All VOC samples from distribution sites and entry points were below detection. Twenty-one (21) TTHM distribution samples were collected ranging from 30 µg/L to 64 µg/L. Six (6) TTHM entry point samples were collected ranging from 28 µg/L to 59 µg/L. Twenty-one (21) HAA5 distribution samples were collected ranging from 35 µg/L to 53 µg/L. Four (4) HAA5 entry point samples were collected ranging from 36 µg/L to 44 µg/L.

11. *Semivolatile and Other Organic Chemicals/parameters:*
Monitoring for Method 551, determination of chlorination disinfection byproducts, chlorinated solvents, and halogenated pesticides/herbicides was conducted on October 1, 2018 at six (6) entry points including the Croton Low Service and High Service (1SCL1 and 1SCH3), and at one distribution sampling site (50250). All sites were below detection for 1,2 dibromoethane, 1,2-dibromo-3-chloropropane, and chloropicrin, while haloacetonitriles, halogenated ketones, and chloral hydrate were detected in the ranges normally seen.

Monitoring for Method 505 organohalide pesticides was conducted at two Catskill/Delaware entry points (1S03A, and 1S03B), and at the Croton Low Service and High Service entry points (1SCL1 and 1SCH3). All results were below detection.

12. ***Fluoride Monitoring:***
Daily analyses of entry point samples (178 samples in total), produced monthly average fluoride levels of 0.73 mg/L for sites 1S03 (Tunnel 1), 1S03A (Tunnel 2), 1S03B (Tunnel 3), and 1SCH3 (Croton High Service); and 0.75 mg/L for site 1SCL1 (Croton Low Service). The fluoride levels at the entry points did not exceed the MCL of 2.2 mg/L at any time during the month.

13. ***Unregulated Contaminant Monitoring Rule:***
Sampling results for bi-monthly cyanotoxins monitoring at the four (4) entry points conducted on September 12 and 26, 2018, corresponding to sampling event seven and eight under UCMR4, were below detection. This concludes DEP's cyanotoxin monitoring under UCMR4. Contract laboratory reports of available data are included as pdf files on the disc of electronic files enclosed with this report.

14. ***Other Monitoring:***
Sampling for Taste and Odor (T&O) compounds, Geosmin, 2-Methylisoborneol (MIB), 2,4,6-Trichloroanisole (TCA), 2-isobutyl-3-methoxy pyrazine (IBMP), and 2-isopropyl-3-methoxy pyrazine (IPMP), was conducted in October on 65 Croton water samples from New Croton Reservoir, Jerome Park Reservoir, and the Low Service entry point. Results for Geosmin ranged from ND to 4.5 ng/L, MIB ranged from ND to 6.8 ng/L and TCA, IBMP, and IPMP were all below detection. Contract laboratory reports of available data are included as pdf files on the disc of electronic files enclosed with this report.

Please feel free to contact me at (845) 340-7701 if you would like to discuss any of this information in greater detail.

Sincerely,

Antonio Trund for SS

Steven C. Schindler
Director, Water Quality

Enclosure
cc:

Mr. James Flaherty, Inspector General for NYCDEP
Mr. Kenneth Kosinski, NYSDEC
Mr. David Kvinge, Westchester County Water Agency (by email only)
Mr. Huan Li, NYCDOHMH
Mr. Trevor McProud, NYCDOHMH
Mr. Andy Tse, NYSDOH (by email only)
Mr. Steven Zahn, NYSDEC – Region 2

bcc:
Electronic file:

V. Sapienza, P.E., Commissioner
K. Alderisio
A. Bader
D. Borchert
K. Cipriano
K. Czarnogorski/file
S. Freud
C. Glaser
L. Janus, Ph.D.
K. Kane
L. Lu, Ph.D.
R. Levine
W. Melendez, P.E.
L. Occhiuto
A. Reaves
S. Riviere
D. Robinson
P. Rush, P.E.
S. Schindler (hard copy)
D. Warne/S. McCormack
M. Warne
V. Xu+

TABLE OF CONTENTS FOR CD FILES

October 2018 Monthly Water Quality Report

Microbiological Reports:	
Summary of Coliform Compliance Samples	*(NYC_Micro_Summary_Compliance_201810.xls)*
Coliform Positive Compliance Samples	*(NYC_Micro_Compliance_Positives_201810.xls)*
Coliform Resample for Positive Compliance Samples	*(NYC_Micro_Compliance_Resamples_201810.xls)*
Summary of Coliform Operational Samples	*(NYC_Micro_Operational_201810.pdf)* *(NYC_Micro_Summary_Operational_201810.xls)*
Coliform Positive Operational Samples	*(NYC_Micro_Operational_201810.pdf)* *(NYC_Micro_Operational_Positives_201810.xls)*
Coliform Resample for Positive Distribution Operational Samples	*(NYC_Micro_Operational_201810.pdf)* *(NYC_Micro_Operational_Resamples_201810.xls)*
Distribution Coliform Monitoring when Source Water Turbidity exceeds 1.49 NTU	*(NYC_EP_Coliform_For_Source_Turb_GT_149_201810.snp)*
All Microbiological Results	*(NYC_Monthly_Alldata_201810.xls\Micro)*
Free Chlorine Residual (FCR) Reports:	
Entry Point FCR On-Line Monitoring Results	*(Entry_Shaft_Cl2_Onln_201810_Fig.pdf)* *(Croton_Entry_Point_Cl2_Onln_201810_Fig.pdf)*
Daily Minimum FCR at Entry Points	*(Entry_Shaft_Cl2_201810_Tbl.pdf)* *(Croton_Entry_Point_Cl2_201810_Tbl.pdf)*
FCR and Heterotrophic Plate Count (HPC) Compliance Samples	*(NYC_Micro_Summary_FCR_&_HPC_Compliance_201810.xls)*
FCR and HPC of Operational Samples	*(NYC_Micro_Summary_FCR_&_HPC_Operational_201810.xls)* *(NYC_Micro_Operational_201810.pdf)*
Summary of FCR of Distribution Samples (Monthly)	*(NYC_FCR_Monthly_Summary_201810.xls)*
FCR of all Distribution Sites	*(NYC_FCR_Monthly_Alldata_201810.xls)*
Turbidity Reports:	
Summary of Turbidity of Distribution Samples	*(NYC_Turbidity_Monthly_Summary_201810.xls)*
Turbidity of all Distribution Sites	*(NYC_Turbidity_Monthly_Alldata_201810.xls)*
Color Reports:	
Color for Entry Point Samples	*(Entry_Point_Color_Monthly_201810.xls)*
Fluoridation Reports:	
Summary of Fluoride Levels of Distribution Samples	*(NYC_Fluoride_Monthly_Summary_201810.xls)*
Fluoride Daily Entry Point Report for Surface Water Systems	*(Entry_Point_Fluoride_Monthly_201810.xls)*
Fluoride of all Distribution Sites	*(NYC_Fluoride_ Monthly_Alldata_201810.xls)*
Volatile Organic Contaminant (VOC) and Disinfection By-products (DBP) Reports:	
Total Trihalomethanes (TTHM) & VOC Monthly Report	*(NYC_TTHM_&_VOC_Rpt_201810.xls)*
Summary of EPA Method 505 Quarterly Report	*(NYC_505_Qrtrly_Rpt_2018Q4.xls)*
Summary of EPA Method 551 Quarterly Report	*(NYC_551_Qrtrly_Rpt_2018Q4.xls)*
Haloacetic Acids (HAA5) Monthly Report	*(NYC_HAA5_Monthly_Rpt_201810.xls)*
Unregulated Contaminant Monitoring Rule 4 (UCMR4) Report	*(761932_UCMR4_EP_20180912.pdf, 764645_UCMR4_EP_20180926.pdf)*
Taste & Odor Sampling Reports from EEA Lab	*(767705_T&O_Sample_20181011.pdf, 768885_T&O_Sample_20181017.pdf, 769545_T&O_Sample_20181023.pdf, 771046_T&O_Sample_20181024.pdf, 770426_T&O_Sample_20181026.pdf, 770729_T&O_Sample_20181029.pdf, 771208_T&O_Sample_20181031.pdf)*
Summary of EPA Organic Method Reports	*(NYC_VOC_505_551_HAA5_Rpt_201810.pdf)*
Inorganic (IOC), Specified Organic (SOC), Metals Monitoring:	
All parameters for October 2018	*(NYC_Monthly_Alldata_201810.xls)*

RAW WATER FECAL COLIFORM CONCENTRATIONS

(FAD Requirement)

NYCDEP Division of Watershed Water Quality Operations

Catskill/Delaware System Raw Water Fecal Coliform Compliance Report

Hawthorne Laboratory, ELAP Lab ID No. 10771
15 Skyline Drive, Hawthorne, NY 10532

Deputy Chief: David Robinson
914-345-4973

Catskill/Delaware Public Water System at Shaft 18 (DEL18DT) - Raw Water — **Period: 08/16 To: 10/18**

Date	Number of Fecal Coliform Samples Examined per Month	Number of Fecal Coliform Samples with >20 colonies per 100 mL	Percent of Monthly Fecal Coliform Samples with >20 colonies per 100 mL	Percent of Monthly Fecal Coliform Samples with >20 colonies per 100 mL for Previous Six Months
8-16	30	0	0.00	0.00
9-16	30	0	0.00	0.00
10-16	31	0	0.00	0.00
11-16	30	0	0.00	0.00
12-16	31	0	0.00	0.00
1-17	31	0	0.00	0.00
2-17	28	0	0.00	0.00
3-17	31	0	0.00	0.00
4-17	30	0	0.00	0.00
5-17	31	0	0.00	0.00
6-17	30	0	0.00	0.00
7-17	31	0	0.00	0.00
8-17	31	0	0.00	0.00
9-17	30	0	0.00	0.00
10-17	31	0	0.00	0.00
11-17	30	0	0.00	0.00
12-17	31	0	0.00	0.00
1-18	31	0	0.00	0.00
2-18	28	1	3.57	0.55
3-18	31	0	0.00	0.55
4-18	30	0	0.00	0.55
5-18	31	0	0.00	0.55
6-18	30	0	0.00	0.55
7-18	31	0	0.00	0.55
8-18	31	0	0.00	0.00
9-18	30	2	6.67	1.09
10-18	31	2	6.45	2.17

DW Robinson 11/2/18

Reported by: David Robinson, Deputy Chief, Hawthorne Water Quality Operations 11/2/2018

RAW WATER TURBIDITY
(FAD Requirement)

NYCDEP Division of Watershed Water Quality Operations

Water Systems Operation Report - Catskill/Delaware System

Hawthorne Laboratory, ELAP Lab ID No. 10771
15 Skyline Drive, Hawthorne, NY 10532

Deputy Chief: David Robinson
914-345-4973

Catskill/Delaware Public Water System at Shaft 18 (DEL18DT) - Raw Water — **Period: October, 2018**

Date	Turbidity (NTU) 12 AM	4 AM	8 AM	12 PM	4 PM	8 PM	Total Coliform (Colonies per 100 mL)	Fecal Coliform (Colonies per 100 mL)
10/1/18	0.60	0.60	0.60	0.70	0.75	0.70	E200	E3
10/2/18	0.60	0.65	0.60	0.65	0.70	0.70	E160	E5
10/3/18	0.65	0.65	0.65	0.85	0.95	1.0	E250	E15
10/4/18	0.80	0.75	0.90	1.0	0.95	0.80	E260	32
10/5/18	0.80	0.75	0.75	0.65	0.65	0.70	E160	38
10/6/18	0.80	0.75	0.75	0.70	0.65	0.70	E60	E10
10/7/18	0.65	0.75	0.75	0.60	0.65	0.65	E60	<1
10/8/18	0.65	0.65	0.65	0.80	0.75	0.70	E40	>=E6
10/9/18	0.75	0.70	0.75	0.65	0.65	0.60	E80	E5
10/10/18	0.60	0.65	0.60	0.75	0.70	0.65	E80	E13
10/11/18	0.70	0.70	0.65	0.65	0.65	0.80	E100	E9
10/12/18	0.80	0.75	0.70	0.75	0.70	0.65	E80	E4
10/13/18	0.65	0.75	0.70	0.65	0.75	0.75	E60	E6
10/14/18	0.65	0.75	0.75	0.75	0.70	0.65	E40	E6
10/15/18	0.75	0.70	0.70	0.75	0.80	0.70	E20	E6
10/16/18	0.80	0.80	0.75	0.70	0.70	0.70	E50	E3
10/17/18	0.75	0.70	0.65	0.60	0.65	0.65	E40	E2
10/18/18	0.65	0.65	0.70	0.60	0.65	0.65	E40	E2
10/19/18	0.65	0.65	0.65	0.60	0.65	0.60	E60	E2
10/20/18	0.65	0.65	0.60	0.80	0.70	0.70	E10	E3
10/21/18	0.70	0.75	0.85	0.65	0.70	0.70	E140	E2
10/22/18	0.70	0.65	0.55	0.65	0.70	0.65	E10	E2
10/23/18	0.60	0.60	0.65	0.65	0.70	0.60	E30	<1
10/24/18	0.70	0.65	0.70	0.65	0.70	0.65	E30	E2
10/25/18	0.65	0.60	0.55	0.60	0.60	0.65	E10	E2
10/26/18	0.65	0.65	0.65	0.60	1.1	1.2	E10	E1
10/27/18	0.75	0.70	0.80	0.80	0.75	0.75	E100	E3
10/28/18	0.90	0.80	0.80	0.75	0.70	0.70	E20	E2
10/29/18	0.65	0.70	0.75	0.80	0.85	0.80	E30	E1
10/30/18	0.80	0.75	0.85	0.65	0.70	0.65	E30	E1
10/31/18	0.70	0.70	0.60	0.60	0.65	0.70	<10	<1

.: Aqueduct Shutdown, CONF: Confluent Growth (+ indicates positive coliform growth), LE: Lab Error, FE: Field Error,
E: estimated count based on non-ideal plate, >=: plate count may be biased low based on heavy growth, >: observed count replaced with dilution based value

1. Does a raw water turbidity M & R violation exist? ___ Yes _X_ No
2. Does the turbidity reading exceed 5 NTU at any time? ___ Yes X No
   If yes, check for MCL violation, and notify state by the end of the next business day.
3. Minimum number of microbiological samples required per week: __5__
4. A daily microbiological sample is required every day the raw water turbidity exceeds 1 NTU.

Additional Comments:

D.W. Robinson 11/2/18

Reported by: David Robinson, Deputy Chief, Hawthorne Water Quality Operations 11/2/2018

All results that fall within the scope of the NELAP program meet that program's requirements unless stated in the qualifiers addendum printed at the end of this report.

Report Printed on 11/02/201812:05 pm

NYCDEP Division of Watershed Water Quality Operations

Water Systems Operation Report - Qualifiers and Methods Addendum

Hawthorne Laboratory, ELAP Lab ID No. 10771
15 Skyline Drive, Hawthorne, NY 10532

Deputy Chief: David Robinson
914-345-4973

Data Qualifiers and Additional Notes

Period: October, 2018

Date/Time	Site	Analytes Affected	Qualifier
10/21/18 09:55	DEL18DT	Total Coliform	QC blank contamination
10/29/18 09:34	DEL18DT	Fecal Coliform, Total Coliform	No middle control run with analysis.

Analytical Methods

Coliform, Fecal	-	SM 9222D (2006)
Coliform, Total	-	SM 9222B (2006)
Turbidity	-	SM 2130B (01)

ENTRY POINT CHLORINE RESIDUAL
(FAD Requirement)

New York City Department of Environmental Protection
Bureau of Water Supply

Daily Minimum Chlorine Readings Recorded at Tunnel Entry Shafts for Catskill/Delaware System

Tunnel No.1 (Catskill) at Shaft 3			Tunnel No.2 (Delaware) at Shaft 3A			Tunnel No.3 (Cat/Del) at Shaft 3B		
Date	MinCl_1DL	Remark 1	Date	MinCl_2DL	Remark 2	Date	MinCl_3DL	Remark 3
10/01/18	0.62		10/01/18	0.89		10/01/18	0.62	
10/02/18	0.58		10/02/18	0.84		10/02/18	0.57	
10/03/18	0.58		10/03/18	0.83		10/03/18	0.45	
10/04/18	0.64		10/04/18	0.92		10/04/18	0.56	
10/05/18	0.56		10/05/18	0.90		10/05/18	0.63	
10/06/18	0.64		10/06/18	0.91		10/06/18	0.64	
10/07/18	0.65		10/07/18	0.93		10/07/18	0.65	
10/08/18	0.61		10/08/18	0.97		10/08/18	0.69	
10/09/18	0.66		10/09/18	0.92		10/09/18	0.67	
10/10/18	0.63		10/10/18	0.90		10/10/18	0.66	
10/11/18	0.63		10/11/18	0.97		10/11/18	0.63	
10/12/18	0.58		10/12/18	0.93		10/12/18	0.57	
10/13/18	0.61	Data logger daily minimum value is obtained from the minimum value of all the valid every one minute values collected in one day.	10/13/18	0.92	Data logger daily minimum value is obtained from the minimum value of all the valid every one minute values collected in one day.	10/13/18	0.66	Data logger daily minimum value is obtained from the minimum value of all the valid every one minute values collected in one day.
10/14/18	0.63		10/14/18	0.87		10/14/18	0.62	
10/15/18	0.59		10/15/18	0.90		10/15/18	0.64	
10/16/18	0.63		10/16/18	0.94		10/16/18	0.63	
10/17/18	0.57		10/17/18	0.76		10/17/18	0.62	
10/18/18	0.65		10/18/18	0.94		10/18/18	0.62	
10/19/18	0.63		10/19/18	0.96		10/19/18	0.66	
10/20/18	0.66		10/20/18	0.92		10/20/18	0.65	
10/21/18	0.63		10/21/18	0.79		10/21/18	0.62	
10/22/18	0.62		10/22/18	0.95		10/22/18	0.62	
10/23/18	0.54		10/23/18	0.94		10/23/18	0.64	
10/24/18	0.62		10/24/18	0.93		10/24/18	0.63	
10/25/18	0.57		10/25/18	0.90		10/25/18	0.63	
10/26/18	0.64		10/26/18	0.93		10/26/18	0.67	
10/27/18	0.61		10/27/18	0.90		10/27/18	0.64	
10/28/18	0.63		10/28/18	0.92		10/28/18	0.63	
10/29/18	0.57		10/29/18	0.91		10/29/18	0.64	
10/30/18	0.64		10/30/18	0.96		10/30/18	0.63	
10/31/18	0.63		10/31/18	0.95		10/31/18	0.70	

Legend: MinCl_1DL: Shaft 3's minimum chlorine level measured at the shaft and recorded at the location via data logger, in ppm.
MinCl_2DL: Shaft 3A's minimum chlorine level measured at the shaft and recorded at the location via data logger, in ppm.
MinCl_3DL: Shaft 3B's minimum chlorine level measured at the shaft and recorded at the location via data logger, in ppm.

New York City Department of Environmental Protection
Bureau of Water Supply

Daily Minimum Chlorine Readings Recorded at Croton Distribution Entry Points

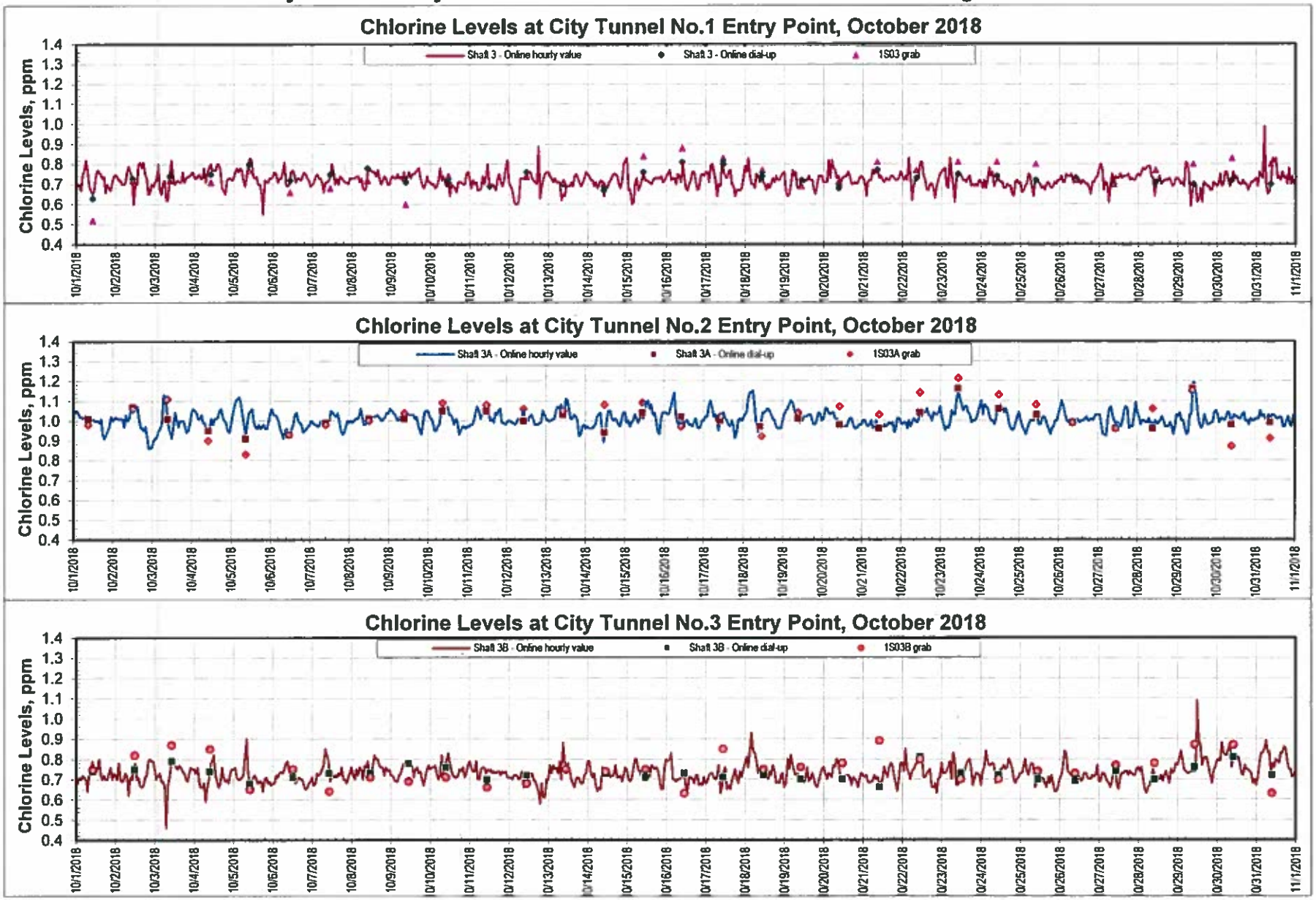
Low Service			High Service		
Date	MinCl_1SCL1	Remark 1	Date	MinCl_1SCH3	Remark 2
10/01/18	0.55		10/01/18	0.08	Croton water began feeding entry point at 11:35 EDT on 10/1/2018. The minimum on-line reading of 0.32 ppm at 23:40 EDT occurred while the meter was out-of-tolerance. Based on grab samples a correction factor of 0.24 was applied to report a minimum value of 0.08 ppm.
10/02/18	0.77		10/02/18	0.21	
10/03/18	0.80		10/03/18	0.55	
10/04/18	0.79		10/04/18	0.58	
10/05/18	0.84		10/05/18	0.56	
10/06/18	0.94		10/06/18	0.66	
10/07/18	0.89		10/07/18	0.69	
10/08/18	0.93		10/08/18	0.67	
10/09/18	0.86		10/09/18	0.70	
10/10/18	0.82		10/10/18	0.46	
10/11/18	0.65		10/11/18	0.47	
10/12/18	0.98		10/12/18	0.67	
10/13/18	0.99		10/13/18	0.37	
10/14/18	0.71	Croton water stopped entering low service entry point at 7:40 EDT on 10/14/2018	10/14/18	0.43	Croton water stopped entering entry point at 5:57 EDT on 10/14/2018.
10/15/18		No Croton water to LS	10/15/18		No Croton water to HS
10/16/18			10/16/18		
10/17/18	1.00	Croton water reached low service entry point at 8:55 EDT on 10/17/2018	10/17/18		
10/18/18	0.76		10/18/18		
10/19/18	0.88		10/19/18		
10/20/18	0.90		10/20/18		
10/21/18	0.82		10/21/18		
10/22/18	0.89		10/22/18		
10/23/18	0.88		10/23/18		
10/24/18	0.90		10/24/18		
10/25/18	0.74		10/25/18		
10/26/18	1.04		10/26/18		
10/27/18	1.04		10/27/18		
10/28/18	1.01		10/28/18		
10/29/18	0.69		10/29/18		
10/30/18	0.94		10/30/18		
10/31/18	0.93		10/31/18		

Legend: MinCl_1SCL1: 1SCL1's minimum chlorine level measured and recorded at the location via data logger, in ppm.
MinCl_1SCH3: 1SCH3's minimum chlorine level measured and recorded at the location via data logger, in ppm.

Note: Croton water fed to High Service time period was determined by specific conductance greater than 150 uS/cm.

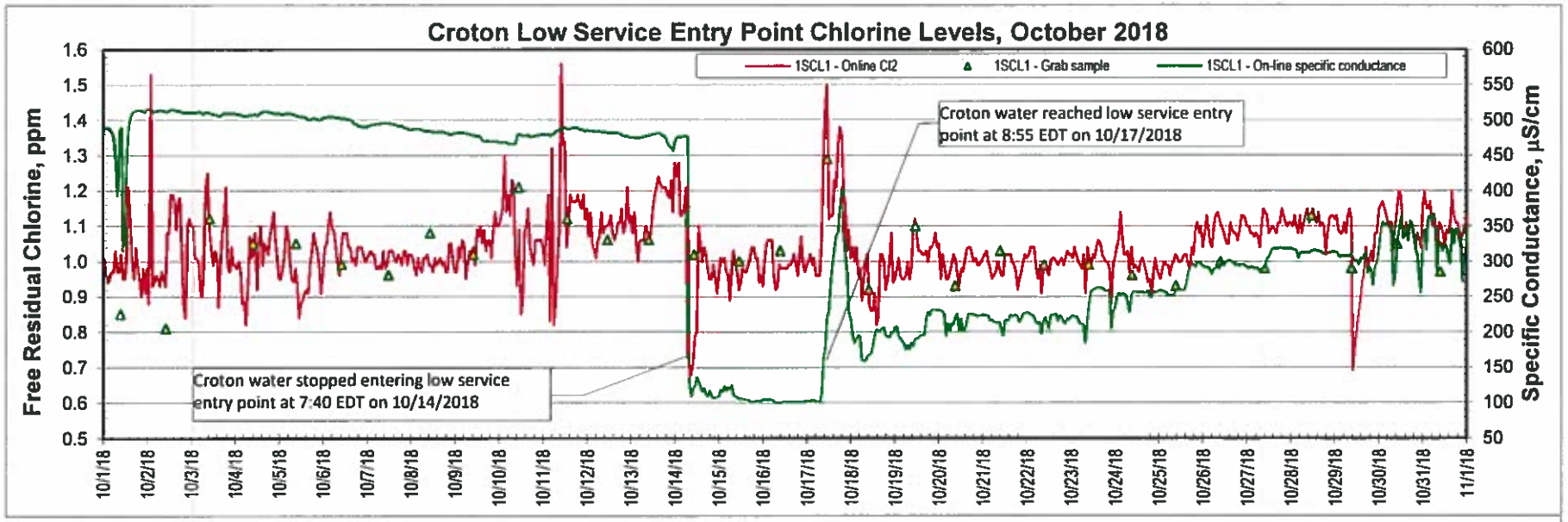
New York City Department of Environmental Protection
Bureau of Water Supply

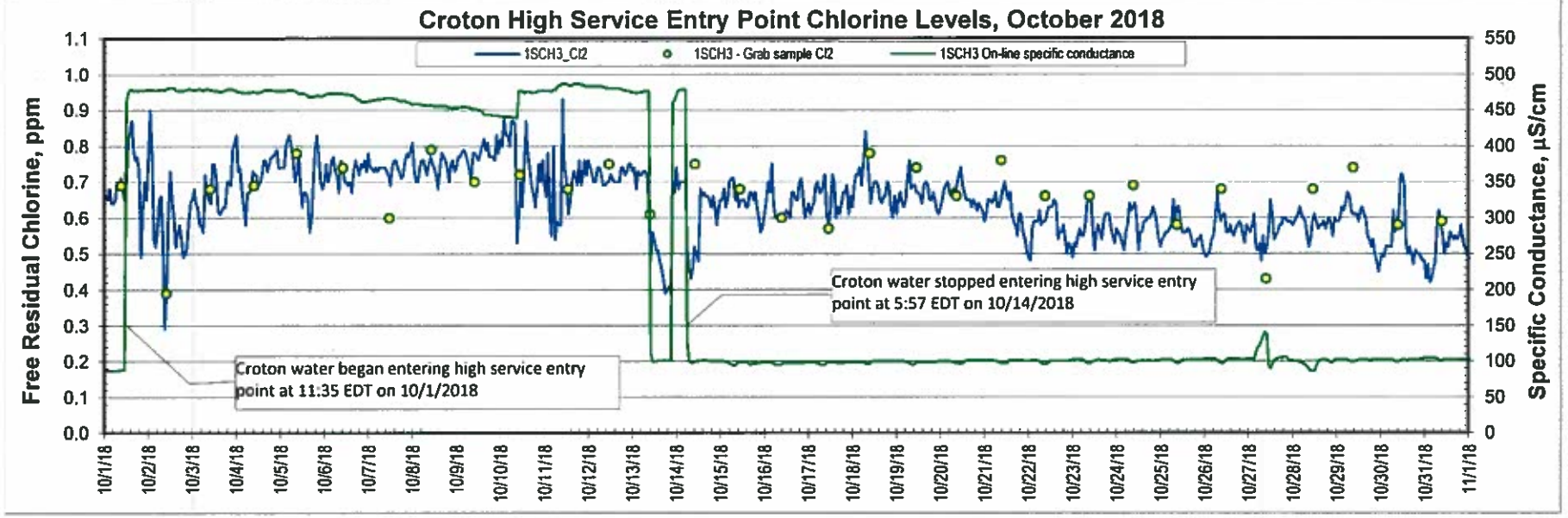
City Tunnel Entry Point Residual Chlorine Continuous Monitoring Results



Note: Continuous monitoring of free chlorine residual (FCR) at distribution entry points was maintained. FCR was maintained above 0.2 ppm at all times.
Since 3/11/18, all online readings, grab and online dial-up readings were recorded in Eastern Daylight Saving Time.

New York City Department of Environmental Protection
Bureau of Water Supply
Croton Distribution Entry Point Residual Chlorine Continuous Monitoring Results





Note: Continuous monitoring of free chlorine residual (FCR) at distribution entry points was maintained. FCR was maintained above 0.2 ppm at all times except for 15 minutes on 10/1/2018.

DISTRIBUTION SYSTEM DISINFECTION RESIDUAL
(FAD Requirement)

REPORT

NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER SUPPLY, DISTRIBUTION LAB (NYSDOH ELAP #10770; USEPA #NY01351)

Residual Chlorine (mg/L) Distribution Samples

October 2018

All Distribution Sites			
Samples	Min	Max	Average
1381	0.00	1.29	0.57

Hach DPD Method (analyte is not ELAP certified)

SAMPLE NUMBER	SAMPLE DATE	SAMPLE SITE	LOCATION TYPE	RESIDUAL CHLORINE	COMMENT
31477	10/17/18	1SCL1	Reg Stop	1.29	Max
30467	10/8/18	31550	Reg Stop	0.00	Min

A FCR is to be maintained at representative points in the distribution system and no more than 5% of the samples can be undetectable in any two months.

TOTAL COLIFORM MONITORING
(FAD Requirement)

REPORT

NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER SUPPLY, DISTRIBUTION LAB (NYSDOH ELAP #10770; USEPA #NY01351)

Results for Microbiological Quality
Free Chlorine Residual and Heterotrophic Plate Count
Compliance Samples

10/1/2018 to 10/31/2018

Location	Number of Sampling Points	Number of Samples Collected	Number of Samples Tested (Free Chlorine Residual)	Number of Samples Tested (Heterotrophic Plate Count)	Number of Samples with Free Chlorine Residual *		Range of Heterotrophic Plate Count (CFU/mL) for Free Chlorine Residual of 0.00 mg/L **	Number of Samples with Free Chlorine Residual of 0.00 mg/L and HPC > 500	Percent of Samples with Free Chlorine Residual of 0.00 mg/L and HPC > 500 ***
					< 0.20 mg/L	0.00 mg/L			
Bronx	46	141	141	101	3	0	--	0	0.0%
Brooklyn	70	201	201	144	5	0	--	0	0.0%
Manhattan	56	173	173	133	23	1	4	0	0.0%
Queens †	79	242	242	181	34	0	--	0	0.0%
Staten Island	28	84	84	63	13	0	--	0	0.0%
Ground Water Supply †	-	-	-	-	-	-	--	-	-
Total	279	841	841	622	78	1	4	0	0.0%

* Free chlorine residual is determined by Hach DPD Method (analyte is not ELAP certified).
** Heterotrophic plate count is determined by method SM 9215 B, PCA medium, 35°C, 48hrs. HPC result ≤ 500 CFU/mL is equivalent to a measurable FCR.
*** No more than 5 % of FCR samples shall be undetectable in any 2 consecutive months.

† There was no groundwater sample this month because no well was in operation to distribution.

Supervisor: Rupa Aggarwal Date: 11/08/18

Director: Kim Burke Date: 11/9/18

REPORT

NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER SUPPLY, DISTRIBUTION LAB (NYSDOH ELAP #10770; USEPA #NY01351)

Summary of Results for Microbiological Quality
Compliance Samples

10/1/2018 to 10/31/2018

Location	Number of Sampling Points	Number of Samples Collected	Number of Samples Tested	Number of Samples with Positive Coliform *	Number of Samples with Positive E. coli *	Percent of Samples with Positive Coliform **
Bronx	46	141	141	1	0	0.7%
Brooklyn	70	201	201	0	0	0.0%
Manhattan	56	173	173	1	0	0.6%
Queens ***	79	242	242	1	0	0.4%
Staten Island	28	84	84	0	0	0.0%
Ground Water Supply ***	-	-	-	-	-	-
Total	279	841	841	3	0	0.4%

* As determined by Colilert Quanti-Tray-18 Method (SM 9223 B).

** If more than 5.0 % of all monthly TCR compliance samples are positive for total coliform, a Level I Assessment must be conducted.

*** There was no groundwater sample this month because no well was in operation to distribution.

Supervisor: Rupa Nagpal Date: 11/08/18

Director: Ken Bisnath Date: 11/9/18

REPORT

NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER SUPPLY, DISTRIBUTION LAB (NYSDOH ELAP #10770; USEPA #NY01351)

Results for Microbiological Quality
Positive Compliance Samples
10/1/2018 to 10/31/2018

Date	Time	Site Number	Boro	Location	Coliform *	E. coli *	Chlorine Residual (mg/L) **	Remarks
10/3/2018	09:46	11250	Bronx	SS - IFO 925 N/S E Tremont Ave, 1st SS E/O Daly Ave, 20 inch	1.0	<1	0.72	To Be Resampled
10/8/2018	09:55	31550	Manhattan	SS - S/S W 18th St, 2nd SS E/O 9th Ave (opposite 329), 12"	9.9	<1	0.00	To Be Resampled
10/20/2018	07:40	43050	Queens	SS - S/S Park Lane South, 1st SS W/O 102nd St, 20"	2.0	<1	0.04	To Be Resampled

* As determined by Colilert Quanti-Tray-18 Method (SM 9223 B). Results expressed in "MPN/100 mL."

** As determined by Hach DPD Method (analyte is not ELAP certified).

Supervisor: Rupa Agarwal Date: 11/08/18

Director: Ken Bell Date: 11/9/18

REPORT

NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER SUPPLY, DISTRIBUTION LAB (NYSDOH ELAP #10770; USEPA #NY01351)

Results for Microbiological Quality
Resamples for Positive Compliance Samples

10/1/2018 to 10/31/2018

Date	Time	Site Number	Boro	Location	Coliform *	E. coli *	Chlorine Residual (mg/L) **	Remarks
10/5/2018	08:45	11250	Bronx	SS - N/S E Tremont Ave, btw Honeywell & Daly Aves	<1	<1	0.64	Upstream
10/5/2018	09:06	11250	Bronx	SS - IFO 925 N/S E Tremont Ave, 1st SS E/O Daly Ave, 20 inch	<1	<1	0.85	Original Location
10/5/2018	09:27	11250	Bronx	SS - N/S E Tremont Ave, 1st SS W/O Vyse Ave	<1	<1	0.83	Downstream
10/10/2018	08:31	31550	Manhattan	SS - S/S W 18th St, 1st SS E/O 9th Ave	<1	<1	0.06	Upstream
10/10/2018	08:48	31550	Manhattan	SS - S/S W 18th St, 2nd SS E/O 9th Ave (opposite 329), 12"	<1	<1	0.09	Original Location
10/10/2018	09:05	31550	Manhattan	SS - S/S W 18th St, 1st SS W/O 8th Ave	<1	<1	0.28	Downstream
10/22/2018	08:39	43050	Queens	SS - S/S Park Lane South, 1st SS E/O 101st St	<1	<1	0.02	Upstream
10/22/2018	09:02	43050	Queens	SS - S/S Park Lane South, 1st SS W/O 102nd St, 20"	<1	<1	0.05	Original Location
10/22/2018	09:20	43050	Queens	SS - S/S Park Lane South, 1st SS E/O 102nd St	<1	<1	0.04	Downstream

* As determined by Colilert Quanti-Tray-18 Method (SM 9223 B). Results expressed in "MPN/100 mL."
** As determined by Hach DPD Method (analyte is not ELAP certified).

Supervisor: Rupa Agarwal Date: 11/08/18

Director: Ken Bisch Date: 11/9/18

MICROBIOLOGICAL MONITORING

REPORT

NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER SUPPLY, DISTRIBUTION LAB (NYSDOH ELAP #10770; USEPA #NY01351)

Coliform Monitoring Results at Sample Sites near the First Service Connection When Source Water Turbidity Exceeds 1.49 NTU

October 2018

Source water		Distribution site near first service connection			
Date Turb>1.49 NTU	System	Sample Date	Sample Site	Coliform *	E.coli *

No official four-hour turbidity readings from Cat-Del source water were greater than 1.5 NTU this month.

*** As determined by Colilert Quanti-Tray-18 Method (SM 9223B). Results expressed in "MPN /100mL."**

DISTRIBUTION TURBIDITY MONITORING

REPORT

NEW YORK CITY DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER SUPPLY, DISTRIBUTION LAB (NYSDOH ELAP #10770; USEPA #NY01351)

Turbidity (NTU) Distribution Samples

October 2018

All Distribution Sites			
Samples	Min	Max	Average
1381	<0.10	2.40	0.60

Analytical Method SM 2130 B

SAMPLE NUMBER	SAMPLE DATE	SAMPLE SITE	LOCATION TYPE	TURBIDITY	COMMENT
31572	10/18/18	42950	Reg Stop	2.40	Max
29662	10/1/18	33450	Reg Stop	<0.10	Min
29777	10/2/18	1SCH3	Reg Stop	<0.10	Min

The monthly average of all distribution samples is not to exceed 5 NTU.

COLOR MONITORING

REPORT

NYC DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER SUPPLY DISTRIBUTION LABORATORY (NYSDOH ELAP #10770; USEPA #NY01351)

Color (U) for Distribution Entry Points

October 2018

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Catskill/Delaware 1S03 (Tunnel 1)	7	7	6	6	6	6	7	7	7	7	7	6	6	8	6	6	6	6	6	6	7	6	6	6	6	6	6	6	7	6	7
Catskill/Delaware 1S03A (Tunnel 2)	6	10	6	6	7	7	7	7	7	7	7	7	7	8	6	6	6	6	6	7	7	6	7	7	6	6	6	7	7	7	7
Catskill/Delaware 1S03B (Tunnel 3)	6	9	6	7	7	7	7	7	7	7	7	7	6	6	7	6	6	6	6	7	7	6	6	6	7	6	7	7	7	6	7
Croton System 1SCL1 [a]	4	4	3	4	4	4	4	4	4	4	4	4	4	-	-	-	4	4	4	4	4	4	4	4	3	4	4	4	3	4	4
Croton System 1SCH3 [b]	-	4	3	4	4	4	4	4	4	4	4	4	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Analytical Method SM 2120 B. Apparent color.

The average of two consecutive samples from the same site is not to exceed the MCL of 15 color units.

[a] Croton System online as of 9/26/18 at 1SCL1. No Croton water to low service from 7:40 EDT 10/14/18 to 8:55 EDT 10/17/18.

[b] Croton water began feeding to high service from 11:35 EDT 10/1/18 to 5:57 EDT 10/14/18.

Entry Point	Samples	Minimum	Maximum	Average
Catskill/Delaware 1S03 (Tunnel 1)	31	6	8	6
Catskill/Delaware 1S03A (Tunnel 2)	31	6	10	7
Catskill/Delaware 1S03B (Tunnel 3)	31	6	9	7
Croton System 1SCL1 [a]	28	3	4	4
Croton System 1SCH3 [b]	12	3	4	4

Supervisor _____ **Date** 11/09/18

Director _____ **Date** 11/9/18

FLUORIDE MONITORING

REPORT

NYC DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER SUPPLY DISTRIBUTION LABORATORY (NYSDOH ELAP #10770; USEPA #NY01351)

Fluoride (mg/L) for Distribution Entry Points

October 2018

DAY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Catskill/Delaware 1S03 (Tunnel 1)	0.71	0.73	0.71	0.72	0.72	0.72	0.72	0.73	0.73	0.73	0.73	0.72	0.74	0.73	0.73	0.74	0.73	0.74	0.72	0.73	0.73	0.70	0.72	0.72	0.72	0.72	0.75	0.73	0.73	0.73	0.72
Catskill/Delaware 1S03A (Tunnel 2)	0.72	0.73	0.72	0.73	0.72	0.71	0.73	0.74	0.73	0.73	0.73	0.73	0.73	0.73	0.72	0.73	0.72	0.74	0.72	0.73	0.73	0.71	0.72	0.72	0.73	0.73	0.75	0.73	0.74	0.72	0.71
Catskill/Delaware 1S03B (Tunnel 3)	0.72	0.73	0.71	0.72	0.73	0.72	0.73	0.74	0.72	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.72	0.75	0.72	0.73	0.72	0.71	0.72	0.71	0.73	0.73	0.76	0.74	0.74	0.73	0.72
Croton System 1SCL1 [a]	0.73	0.73	0.71	0.73	0.72	0.70	0.71	0.73	0.72	0.73	0.73	0.72	0.70	-	-	-	0.77	0.76	0.73	0.77	0.79	0.77	0.81	0.76	0.81	0.77	0.79	0.77	0.77	0.77	0.74
Croton System 1SCH3 [b]	-	0.72	0.69	0.73	0.72	0.73	0.71	0.77	0.72	0.72	0.75	0.72	0.75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Analytical Method SM 4500 F'C (97)

The average of two consecutive samples from the same distribution entry point site is not to exceed the MCL of 2.2 ppm.

[a] Croton System online as of 9/26/18 at 1SCL1. No Croton water to low service from 7:40 EDT 10/14/18 to 8:55 EDT 10/17/18.

[b] Croton water began feeding to high service from 11:35 EDT 10/1/18 to 5:57 EDT 10/14/18.

Entry Point	Samples	Minimum	Maximum	Average
Catskill/Delaware 1S03 (Tunnel 1)	31	0.70	0.75	0.73
Catskill/Delaware 1S03A (Tunnel 2)	31	0.71	0.75	0.73
Catskill/Delaware 1S03B (Tunnel 3)	31	0.71	0.76	0.73
Croton System 1SCL1 [a]	28	0.70	0.81	0.75
Croton System 1SCH3 [b]	12	0.69	0.77	0.73

Supervisor _____ **Date** 11/09/18

Director _____ **Date** 11/9/18