

**2018 WATER QUALITY MONITORING  
BLUE MARSH RESERVOIR  
LEESPORT, PENNSYLVANIA**



**U.S. Army Corps of Engineers  
Philadelphia District  
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**2018 Water Quality Monitoring  
Blue Marsh Reservoir  
Leesport, Pennsylvania**

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## **1.0 INTRODUCTION**

### **1.1 PURPOSE OF THE MONITORING PROGRAM**

The U.S. Army Corps of Engineers (USACE) manages Blue Marsh Reservoir located in east-central Pennsylvania on the Tulpehocken Creek, which is within the Delaware River Basin. Blue Marsh Reservoir provides flood control and a dependable water supply to downstream communities west of Reading, PA. Additionally, the reservoir provides important habitat for fish, waterfowl, and other wildlife, and recreational opportunities through fishing, boating, and swimming. Due to the broad range of uses and demands that Blue Marsh Reservoir serves, the USACE monitors water quality, and other aspects related to ecological health, primarily to ensure public health safety. Results from water quality monitoring are compared to state and federal water quality standards and used to diagnose other problems that commonly affect reservoir health such as low dissolved oxygen, nutrient enrichment and toxic loadings. This report summarizes the results of water quality monitoring at Blue Marsh Reservoir in 2018.

### **1.2 DESCRIPTION OF BLUE MARSH RESERVOIR**

Blue Marsh Reservoir was designed to provide flood control, a water supply, and enhanced water quality to downstream communities along Tulpehocken Creek. Located about six miles northwest of Reading, Pennsylvania near Route 183, the reservoir dams a drainage area of 175 square miles. The dam, completed in 1979, can impound up to 42.3 billion gallons of water. The primary surface water inputs into Blue Marsh Reservoir other than Tulpehocken Creek include Wolf, Northkill, and Little Northkill Creeks from the northwest; Spring Creek from the west; and Licking Creek from the northeast. The reservoir is approximately 6 miles long and is 52 feet deep immediately above the dam near Lower Heidelberg during normal summer pool.

### **1.3 ELEMENTS OF THE STUDY**

The USACE, Philadelphia District, has been monitoring the water quality of Blue Marsh Reservoir since 1979. Over this time, the yearly monitoring designs have evolved to address new concerns such as health of public drinking water and contamination of reservoir bottom sediments. The 2018 monitoring program follows that in most recent years and includes the following major elements:

- Monthly water quality and bacteria monitoring of reservoir and upstream sources to evaluate compliance with Pennsylvania state water quality standards and to evaluate the health of the reservoir ecosystem starting on 26 June and ending on 04 September 2018;
- Monthly profile samples for temperature, dissolved oxygen, chlorophyll, pH, turbidity, and conductivity at all stations in the reservoir and watershed; and
- Twice weekly coliform bacteria monitoring at three beach stations - to ensure public health and safety at the Blue Marsh Reservoir swimming beach area.

## 2.0 METHODS

### 2.1 PHYSICAL STRATIFICATION MONITORING

Physical stratification monitoring of the water column was conducted monthly at Blue Marsh Reservoir from June to September 2018 (Table 2-1). Stratification parameters included temperature, dissolved oxygen (DO), pH, Chlorophyll a, turbidity, and conductivity. Monitoring was conducted at nine fixed stations located throughout the reservoir watershed (Fig. 2-1). Six stations were located within the reservoir body (BM-2, BM-6, BM-7, BM-8, BM-9, and BM-10) for which water quality was measured from surface to bottom at 5-ft depth intervals. Three stations (BM-1S, BM-5S, and BM-11S) were monitored for surface water quality only. All water quality parameters were measured with a calibrated YSI 6600 V2-4 water quality meter. For this report, all of the stratification monitoring results, when applicable, were summarized and compared to water quality standards enacted by the Pennsylvania Department of Environmental Protection (PADEP – Chapter 93 Water Quality Standards).

### 2.2 WATER COLUMN CHEMISTRY MONITORING

Water column chemistry monitoring was conducted five times at Blue Marsh Reservoir during the 2018 sampling season (Table 2-1). Water samples were collected at nine fixed stations in the reservoir watershed (Fig. 2-1). Surface water samples were collected at stations downstream of the reservoir (BM-1S), and upstream of the reservoir on Tulpehocken Creek (BM-5S) and Northkill Creek (BM-11S). Surface, middle, and bottom water samples were collected at the six stations within the reservoir (BM-2, BM-6, BM-7, BM-8, BM-9, and BM-10). Surface water samples were collected by opening sample containers approximately one foot below the surface of the water. Middle and bottom water samples were collected with a Van Dorn design horizontal water bottle sampler.

Water samples from all depths were analyzed for ammonia, nitrite, nitrate, total Kjeldahl nitrogen (TKN), total phosphorus, ortho-phosphate, soluble phosphorus, total dissolved solids (TDS), total suspended solids (TSS), biochemical oxygen demand (BOD), alkalinity, and total organic carbon. Table 2-2 summarizes the laboratory methods detection limits, state water quality standards, and sample holding times for each water quality parameter monitored.

### 2.3 TROPHIC STATE DETERMINATION

The trophic state of Blue Marsh Reservoir was determined by methods outlined by Carlson (1977) and EPA (1983). In general, these methods calculated trophic state indices (TSIs) independently for measures of total phosphorus, chlorophyll a, and secchi disk depth. Surface water measures of total phosphorus and chlorophyll a from chemistry monitoring were averaged in the calculation of monthly TSIs (Table 2-1). Secchi disk depth was measured at station BM-6.

<b>Table 2-1. Water quality monitoring schedule of Blue Marsh Reservoir during 2018. Monitoring was conducted at 9 fixed stations located throughout the reservoir watershed.</b>					
<b>Date of Sample Collection</b>	<b>Physical Stratification Monitoring (all stations)</b>	<b>Water Column Chemistry Monitoring (all stations)</b>	<b>Trophic State Assessment (BM-6)</b>	<b>(1) Coliform Bacteria Monitoring (all stations)</b>	<b>Drinking Water Monitoring (2)</b>
05 June	X (BM-1 and BM-6 only)				
26 June	X	X	X	X	
10 July	X	X	X	X	
30 July	X	X	X	X	
16 August	X	X	X	X	
04 September	X	X	X	X	
(1) Surface water bacteria samples only (2) Drinking water samples are collected quarterly by personnel at each reservoir. This data is not included.					

## 2.4 RESERVOIR COLIFORM BACTERIA MONITORING

Monitoring for coliform bacteria contaminants within the watershed was conducted monthly at Blue Marsh Reservoir. Water samples were analyzed for total and fecal coliforms. Surface water samples were tested at all stations. Table 2-3 presents the test methods, detection limits, PADEP water quality standards, and sample holding times for the bacteria parameters monitored at Blue Marsh Reservoir in 2018. The bacteria analytical method was based on a membrane filtration technique. All of the samples were analyzed within their respective maximum allowable hold times.



**Table 2-2.** Water quality test methods, detection limits, state regulatory criteria, and sample holding times for water quality parameters monitored at Blue Marsh Reservoir in 2018

Parameter	(2) Method	Limit of Quantification LOQ	PADEP Surface Water Quality Criteria	Allowable Hold Times (Days)
Total Alkalinity	SM20 2320 B-11	5.0 mg/L	Min. 20 mg/L CaCO <sub>3</sub>	14
Biochemical Oxygen Demand (BOD)	SM5210 B-11	3.4 mg/L	None	2
Total Phosphorus	EPA 365.3	0.05 mg/L	None	28
Diss./Ortho-Phosphate	NA	NA	None	28
Soluble Phosphorus	EPA 365.3	0.05 mg/L	None	28
Total Organic Carbon (TOC)	SM5310 B-11	1.0 mg/L	None	28
Total Inorganic Carbon (TIC) *	NA	NA	None	28
Total Carbon (TOC + TIC) *	NA	NA	None	28
(1) Chlorophyll a	YSI Probe	----	None	In Situ
Total Kjeldahl Nitrogen	EPA 351.2/ LACHAT	0.15 mg/L	None	28
Ammonia	SM4500 H-11LACHAT	0.20 mg/L	Temp. and pH dependent	28
Nitrate	EPA 353.2/ SM4500NO2B	0.10 mg/L	Maximum 10 mg/L (nitrate + nitrite)	28
Nitrite	SM4500NO2 B-11	0.01 mg/L		28
Total Dissolved Solids	SM2540 C-11	10.0 mg/L	Maximum 750 mg/L	7
Total Suspended Solids	SM2540 D-11	4.0 mg/L	None	7

(1) Chlorophyll a samples were recorded using a YSI 6600 with a chlorophyll sensor.

(2) Laboratory Methods Reference:

**EPA-** "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

**SM-** "Standard Methods for the Examination of Water and Wastewater", 22<sup>nd</sup> Edition, 2012.

**SW846-** "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods", 3<sup>rd</sup>. Edition, November 1986 and updates.

\* Total Inorganic Carbon and Total Carbon were not sampled for in 2018



**Figure 2-1.** Blue Marsh Reservoir and the location of the 9 fixed stations monitored for water quality during 2018

<b>Table 2-3.</b> Water quality test methods, detection limits, PADEP standards, and sample holding times for bacteria parameters monitored at Blue Marsh Reservoir in 2018.		
<b>Parameter</b>	<b>Total Coliform</b>	<b>Fecal Coliform</b>
Test method	SM 9223 B-06	SM 9222 D-06
Limit of Quantification	10 clns/100-mls	10 clns/100-mls
PADEP standard	None	Geometric mean < 200 clns/100-mls or a single sample reading of < 1000 clns/100-mls
Maximum allowable holding time	30 hours	30 hours
Achieved holding time	< 30 hours	< 30 hours

The PADEP monthly coliform bacteria standard is defined as a maximum geometric mean of 200 colonies/100-ml based on 5 consecutive samples collected on different days. In addition, a single sample standard of 1000 colonies/100-ml can also be used. These standards are most applicable at bathing beaches. The Philadelphia District maintains a bathing beach at Blue Marsh Reservoir and conducts separate bacteria sampling of that area. Given our logistical limitations (all monthly reservoir sampling conducted on one day) and the fact that water contact recreation is permitted within the reservoir, the reservoir coliform data collected by the Corps is compared to the single sample standard as a method of collecting and evaluating background coliform data on the main body of the reservoir. Although our sampling design does not fully meet PADEP guidelines for bathing beach monitoring, we feel that this interpretation of the coliform data meets the intent of the PADEP water quality standard for evaluating Blue Marsh Reservoir bacteria levels within the main reservoir body.

## 2.5 SWIMMING BEACH MONITORING

Additional coliform bacteria monitoring was conducted twice weekly near the public swimming beach at the Dry Brooks day use area (Table 2-4). Three stations (SB-1, SB-2, and SB-3) were monitored in the swimming beach area for total coliform and *Escherichia coli* (Figure 2-2). The coliform bacteria samples were collected and analyzed by the same methods used for monthly coliform bacteria sampling. The bacteria monitoring for Blue Marsh Swimming Beach followed a 4-step program of conditional monitoring. Each step or “condition” of monitoring responded to incremental increases of coliform contamination, and therefore reflected the risk to public health at the swimming beach area.

Table 2-4. Sampling dates for coliform bacteria monitoring at the Blue Marsh Reservoir swimming beach during 2018			
<b>Week 1</b>	12 May	<b>Week 10</b>	09 and 12 July
<b>Week 2</b>	14 and 17 May	<b>Week 11</b>	16 and 19 July
<b>Week 3</b>	21, 22 and 24 May	<b>Week 12</b>	23 and 26 July
<b>Week 4</b>	29 and 31 May	<b>Week 13</b>	30 , 31 July and 02 August
<b>Week 5</b>	05 and 07 June	<b>Week 14</b>	06, 08 and 09 August
<b>Week 6</b>	11 and 14 June	<b>Week 15</b>	13, 14, 15, 16 and 17 August
<b>Week 7</b>	18 and 21 June	<b>Week 16</b>	20 and 22 August
<b>Week 8</b>	25 and 28 June	<b>Week 17</b>	27 and 30 August
<b>Week 9</b>	02 and 05 July		

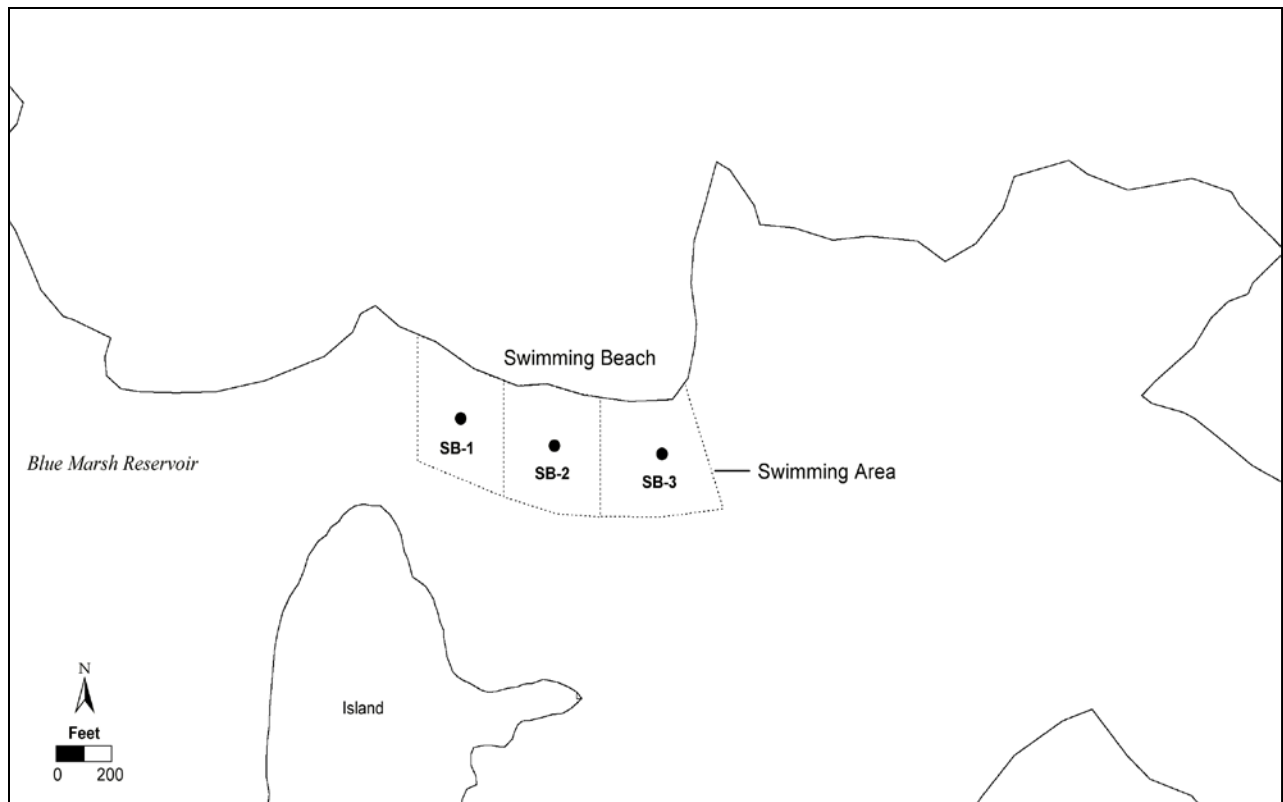


Figure 2-2. Swimming beach bacteriological monitoring stations at Blue Marsh Reservoir in 2018

## 3.0 RESULTS AND DISCUSSION

### 3.1 STRATIFICATION MONITORING

The following sections summarize the results of water quality monitoring for physical and chemical parameters: temperature, dissolved oxygen, and pH. Seasonal and spatial patterns of surface water quality measured throughout the reservoir watershed, and seasonal and depth related patterns of the stratified water column based on measures from the deepest portion of the reservoir (station BM-6 or the “Tower”) are described. It is appropriate to focus discussion on tributary source waters influencing reservoir water quality and lake stratification at station BM-6 as water quality problems related to depth are generally most severe in deep water habitats. Corps personnel collected the physical/chemical water quality data discussed herein over the monitoring period from June through September 2018, the most biologically productive time of the year for the reservoir. All of the parameters were measured with a calibrated YSI 6600 V2-4 water quality probe and are presented in Appendix A.

#### 3.1.1 Temperature

Temperature is the primary influencing factor on water density, affects the solubility of many chemical compounds, and can therefore influence the effect of pollutants on aquatic life. Increased temperatures elevate the metabolic oxygen demand, in conjunction with reduced oxygen solubility, and can impact many species. Vertical stratification patterns naturally occurring in lakes affect the distribution of dissolved and suspended compounds.

Surface water temperature seasonal patterns upstream of the reservoir at stations BM-5S and BM-11S closely resembled each other throughout the sampling season (Fig. 3-1). Maximum surface water temperatures at station BM-5S was 18.23°C in August and 20.57°C at station BM-11S in early July. The maximum surface water temperature downstream of the reservoir at station BM-1S was 21.16°C in August with a minimum of 18.65°C in late June. Downstream temperatures are influenced through selective withdrawals at the Blue Marsh Dam. Annually the Corps performs selective withdrawal releases in an attempt to maintain temperatures downstream in the Tulpehocken Creek of less than 20°C in support of the trout fishery. The ability to meet this objective is dependent on meteorological conditions and other physical and operational limitations. The temperature objective was exceeded in 2018 from July through September.

Blue Marsh Reservoir was stratified with respect to temperature during 2018. The stratification pattern was most apparent at station BM-6 or the “Tower” station located in the deepest part of the reservoir (Fig. 3-2). The onset of temperature stratification was evident in June sampling with temperatures from surface (22.02°C) to bottom (13.34°C) differing by 8.68°C. The deeper and cooler temperature (<20°C) water was available for selective withdrawal to attempt to meet downstream temperature objectives until late July and into August. Stratification peaked in August and a noticeable shift to deeper warmer water temperatures was evident

throughout the summer. An erosion of the epilimnion was seen in September as the lake began the process of de-stratifying.

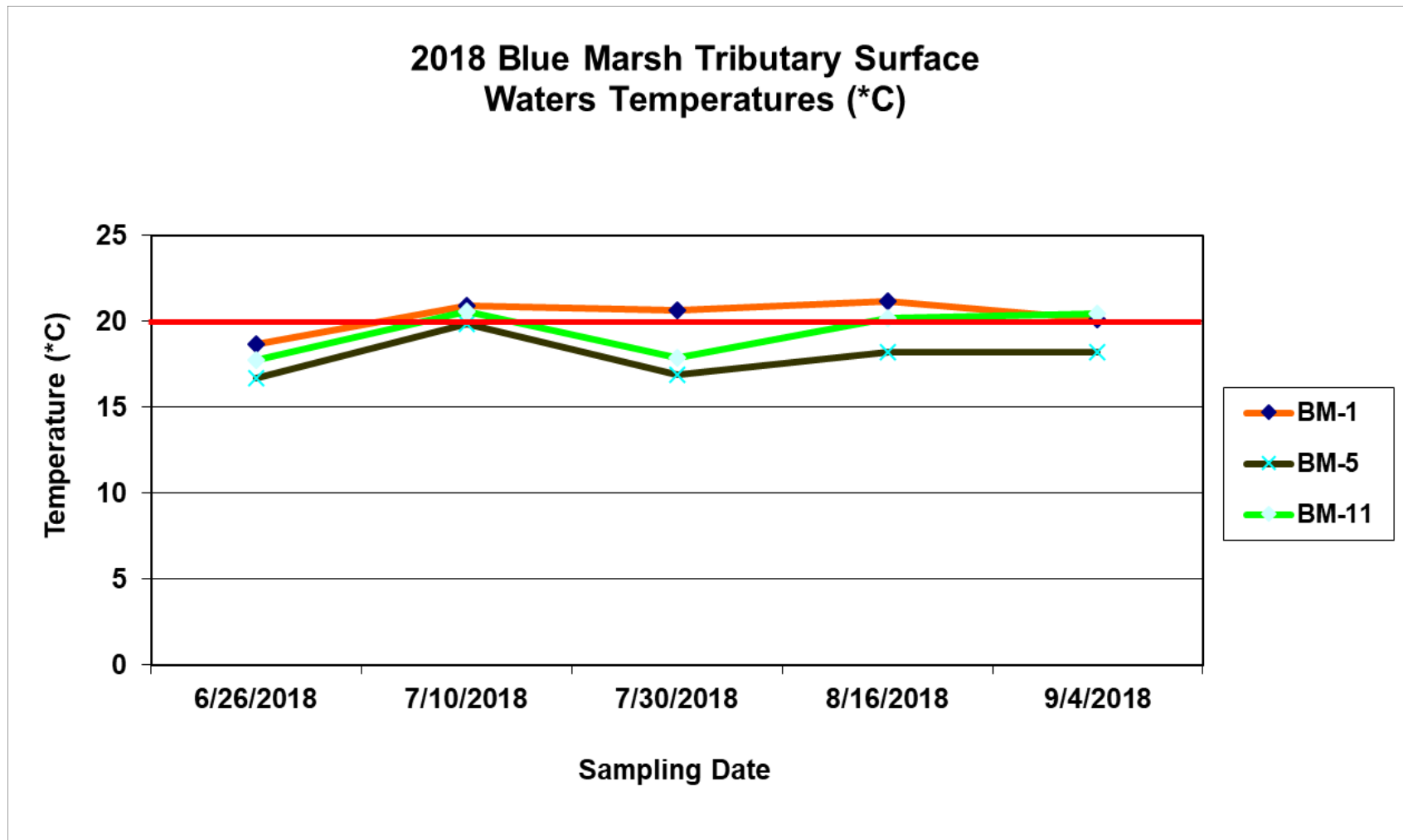
### 3.1.2 Dissolved Oxygen

Dissolved oxygen (DO) is the measure of the amount of DO in water. Typically, DO concentrations in surface waters are less than 10 mg/L. Dissolved Oxygen concentrations are subject to diurnal and seasonal fluctuations that can be influenced, in part, by temperature, river discharge, and photosynthetic activity. Dissolved Oxygen is essential to the respiratory metabolism of most aquatic organisms. It affects the availability and solubility of nutrients and subsequently the productivity of aquatic ecosystems. Low levels of oxygen can facilitate the release of nutrients from bottom sediments.

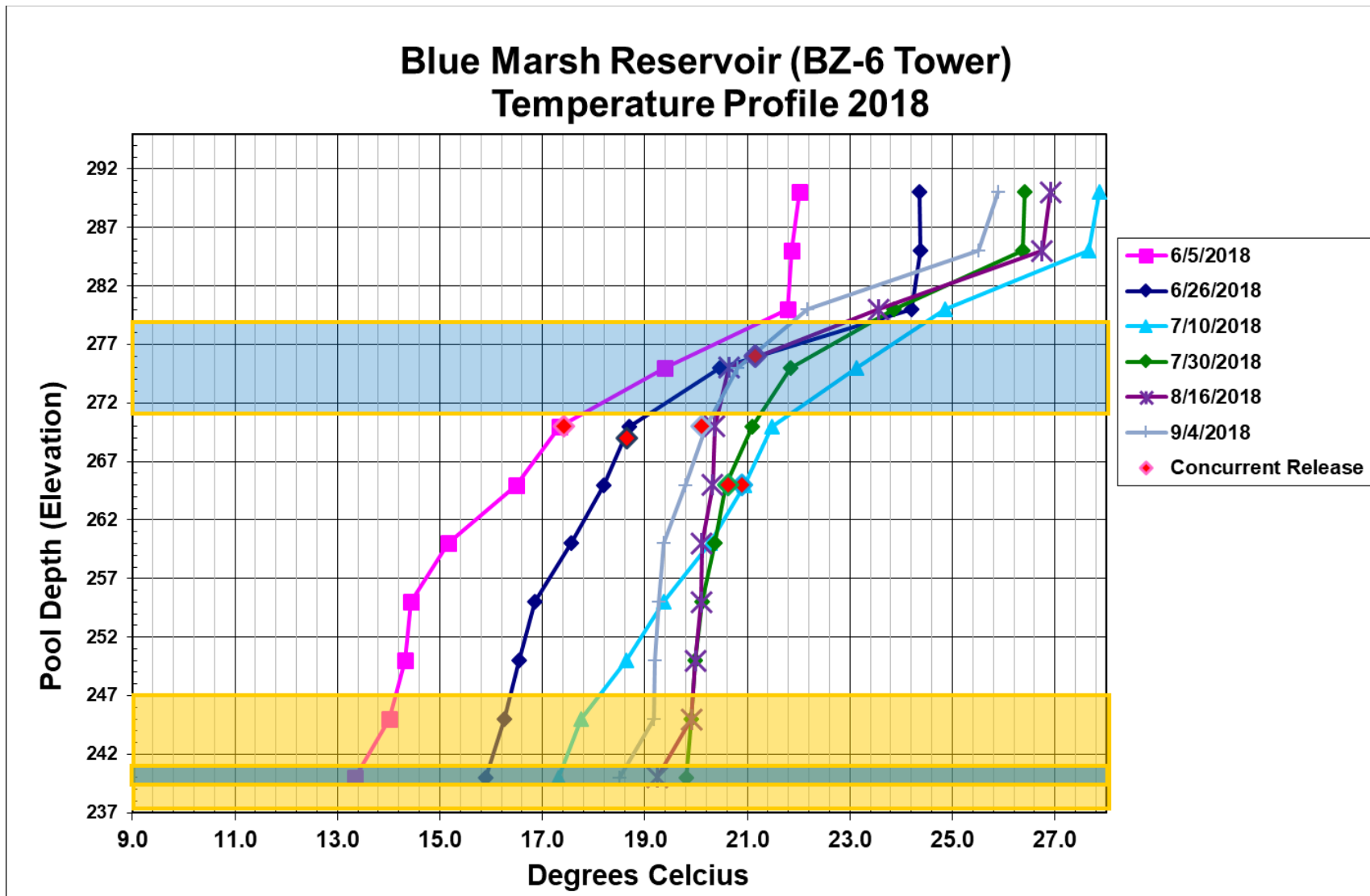
Surface waters upstream of the reservoir at tributary stations BM-5S and BM-11S had similar seasonal DO patterns throughout the sampling season (Fig. 3-3). The maximum DO concentration of 9.26 mg/L was recorded in August at station BM-11S with a minimum recorded value of 8.92 mg/L in September at Station BM-5S. The maximum surface water DO concentration downstream of the dam at station BM-1S was 9.22 mg/L recorded in September with a minimum of 8.16 mg/L recorded in early July.

Seasonal stratification and chemical and biological processes at Blue Marsh Reservoir dramatically influenced the distribution of DO in the water column during 2018 (Fig. 3-4). Stratification was apparent from early June through September at station BM-6, as DO concentrations decreased with depth. Historically, the lower oxygen levels deeper in the lake progressively move up the water column to within approximately 15-feet of the surface in mid- to late August. In most years the surface waters remain oxygenated as a result of surface algal productivity and water surface wind mixing. In 2018, the DO pattern in the deeper water column was as pronounced as previous years. In early July sampling, only the top 0-10 feet of the reservoir was oxygenated at Station BM-6. The low DO conditions can be detrimental to water quality and aquatic life. Dissolved oxygen concentrations in the upper water column of Blue Marsh Reservoir were in compliance with PADEP water quality standards during the 2018 sampling season with exception of the early July sampling event. The Pennsylvania water quality standard for DO is a minimum concentration of 5 mg/L within the epilimnion of stratified lakes.

The health of aquatic ecosystems can be impaired by low DO concentrations in the water column. Hypoxia, or conditions of DO concentrations less than 2 mg/L, is generally accepted as the threshold at which the most severe effects on biota occur. In all months sampled during 2018, except late July, the lower water column of Blue Marsh was affected by hypoxia (Fig. 3-4). Hypoxic water occupied most of the water column in late July. Hypoxia in the lower water column is a symptom of eutrophication. Nutrients in the water column feed explosive algal growth at the surface photic zone. Dead and decaying algae sink to lower levels of the water column and during the process of decay; oxygen is removed from the water.



**Figure 3-1.** Tributary and downstream surface water temperatures (°C) measured at Blue Marsh Reservoir in 2018. Station BM-1S is located downstream of the reservoir. See Appendix A for summary of plotted values. The cold-water species preference temperature of 20°C is shown as a red line reference.



**Figure 3-2.** Temperature stratification and release portal elevations at station BM-6 of Blue Marsh Reservoir in 2018. See Appendix A for summary of plotted values.

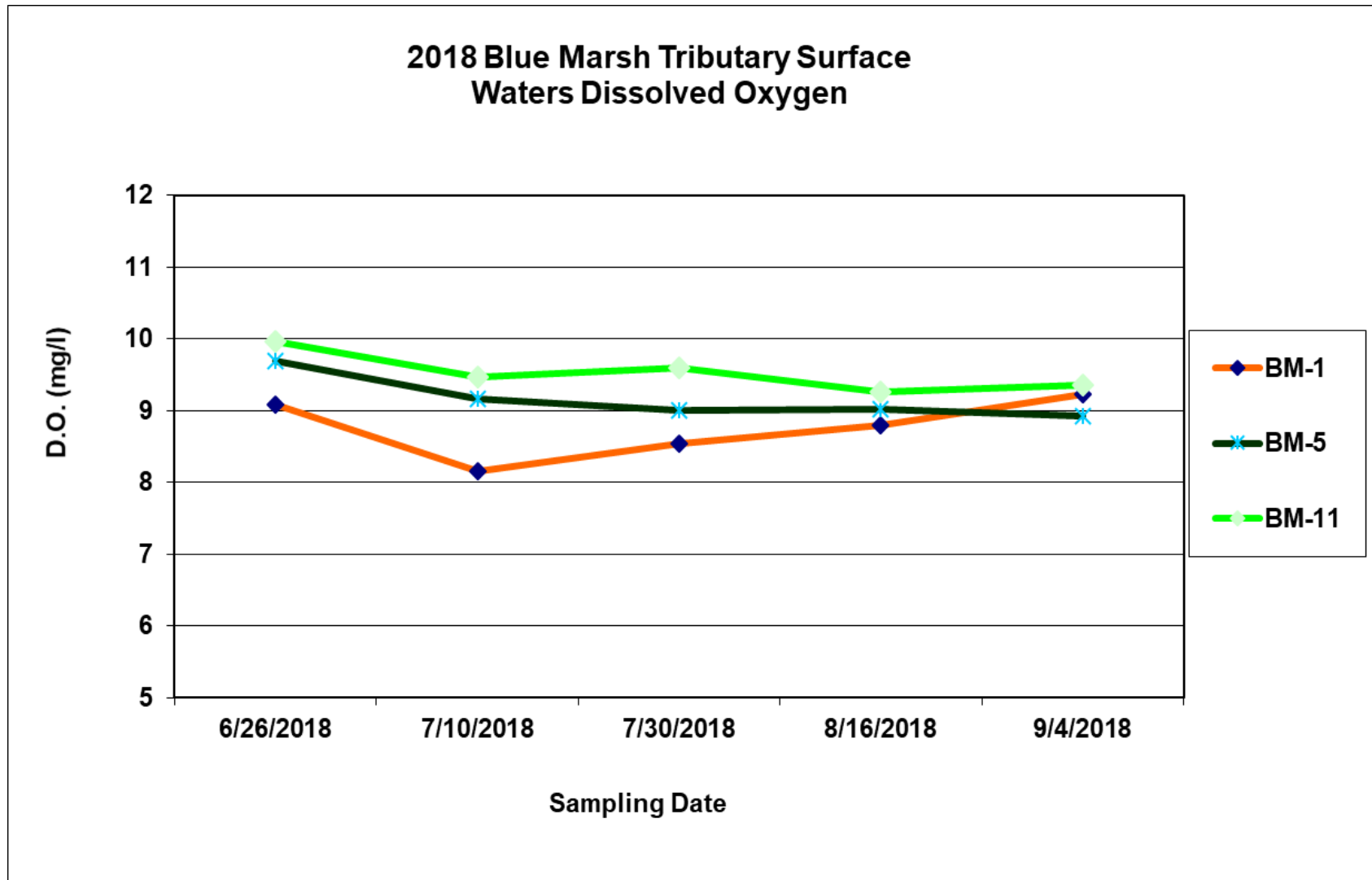


### 3.1.3 pH

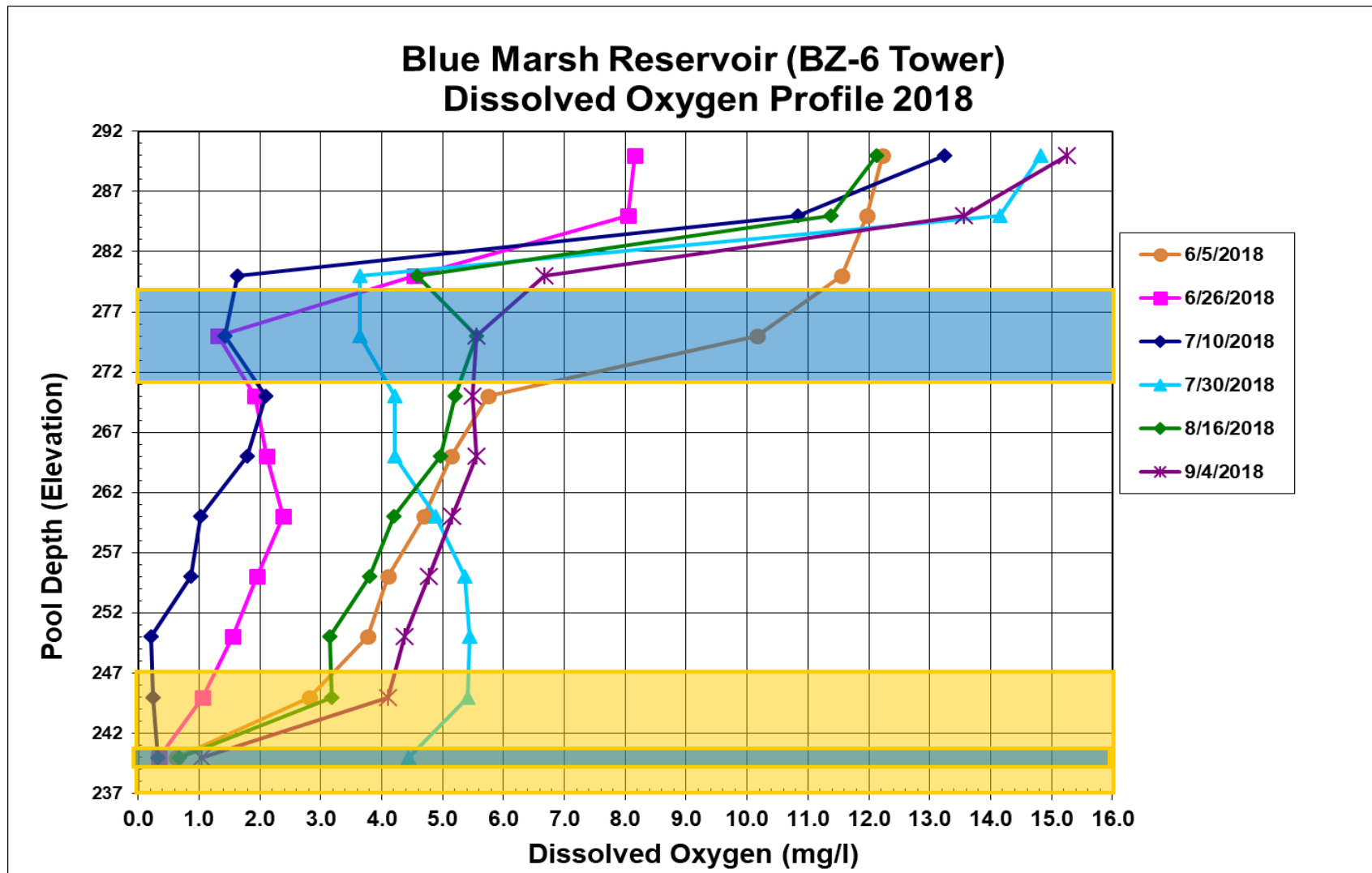
The hydrogen –ion concentration in water is measured as pH. The pH scale is 0-14. A pH below 7 is considered acidic and a pH above 7 is basic. High pH values tend to facilitate solubilization of ammonia, salts, and heavy metals. Low pH levels tend to increase carbonic acid and carbon dioxide concentrations. Lethal effects of pH on aquatic life typically occur below pH 4.5 and above pH 9.5.

Measures of pH in the surface waters at Blue Marsh Reservoirs upstream and downstream sampling stations followed a similar pattern during 2018 (Fig. 3-5). In the months sampled, no pH measures violated the PADEP water quality standard maximum and minimum pH level of 9.0 and 6.0, respectively. For the entire monitoring period and at all surface water stream stations, pH ranged from 7.40 to 8.00.

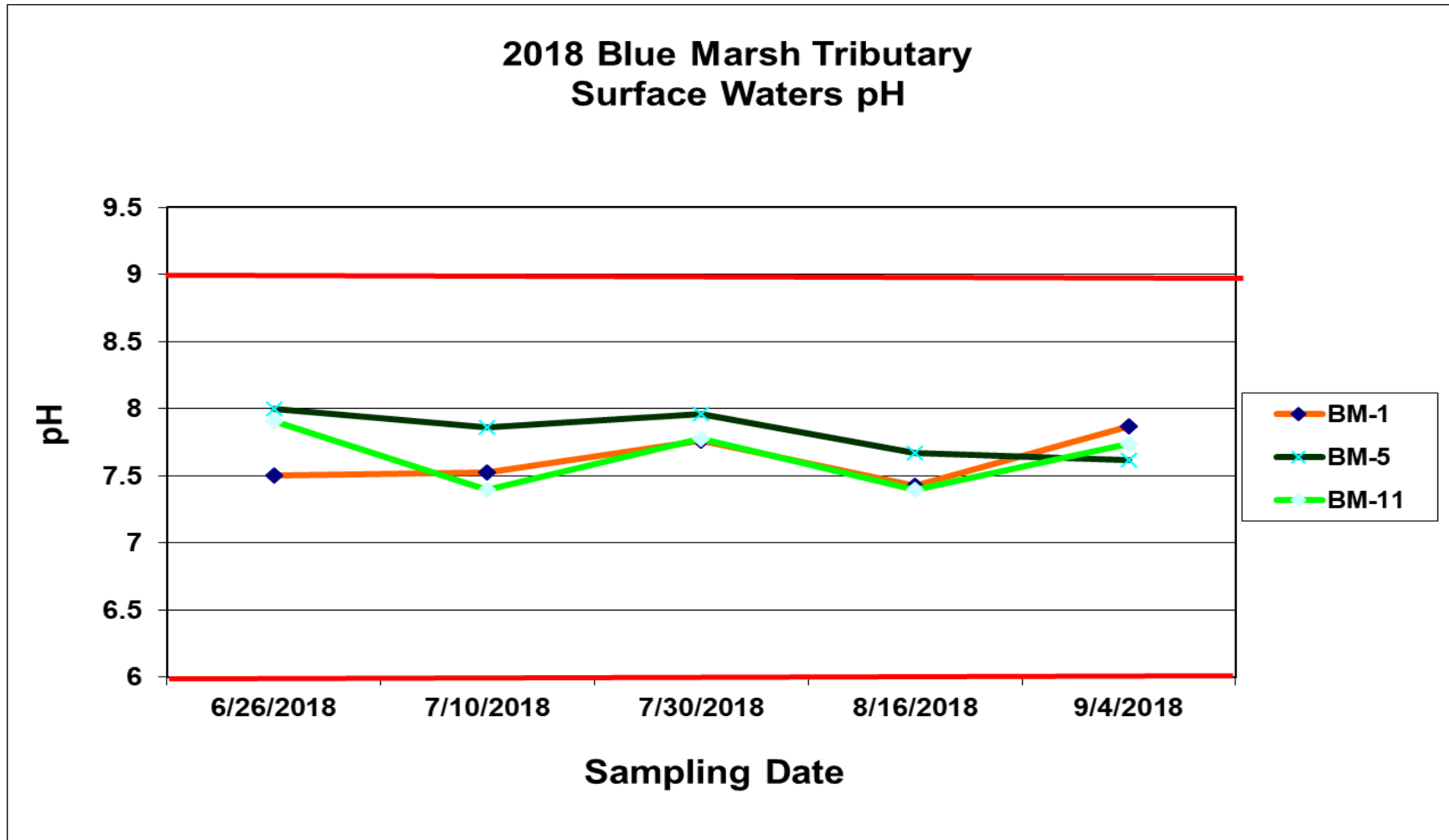
The pH profile in the water column of Blue Marsh Reservoir was consistent with a stratified lake during 2018 (Fig. 3-6). Throughout the monitoring period the upper 0-10 feet of the water column had consistently higher pH measures than the deeper waters. During the sampling season, pH at the surface to a depth of 10 feet ranged between 7.60 and 9.63. In contrast, measures of pH in the lower water column (>10 feet deep) were consistently lower during the monitoring period and ranged between 6.97 and 7.70. The higher pH in surface waters (euphotic zone) of the reservoir is a result of excessive algal blooms. As a function of increased productivity during photosynthesis, algae remove CO<sub>2</sub> from the water column. Dissolved CO<sub>2</sub> is slightly acidic; its reduction in the water column manifests an increase in pH. In 2018, this increased surface water productivity resulted in water samples at Blue Marsh Reservoir station BM-6 being slightly higher in pH than deeper waters.



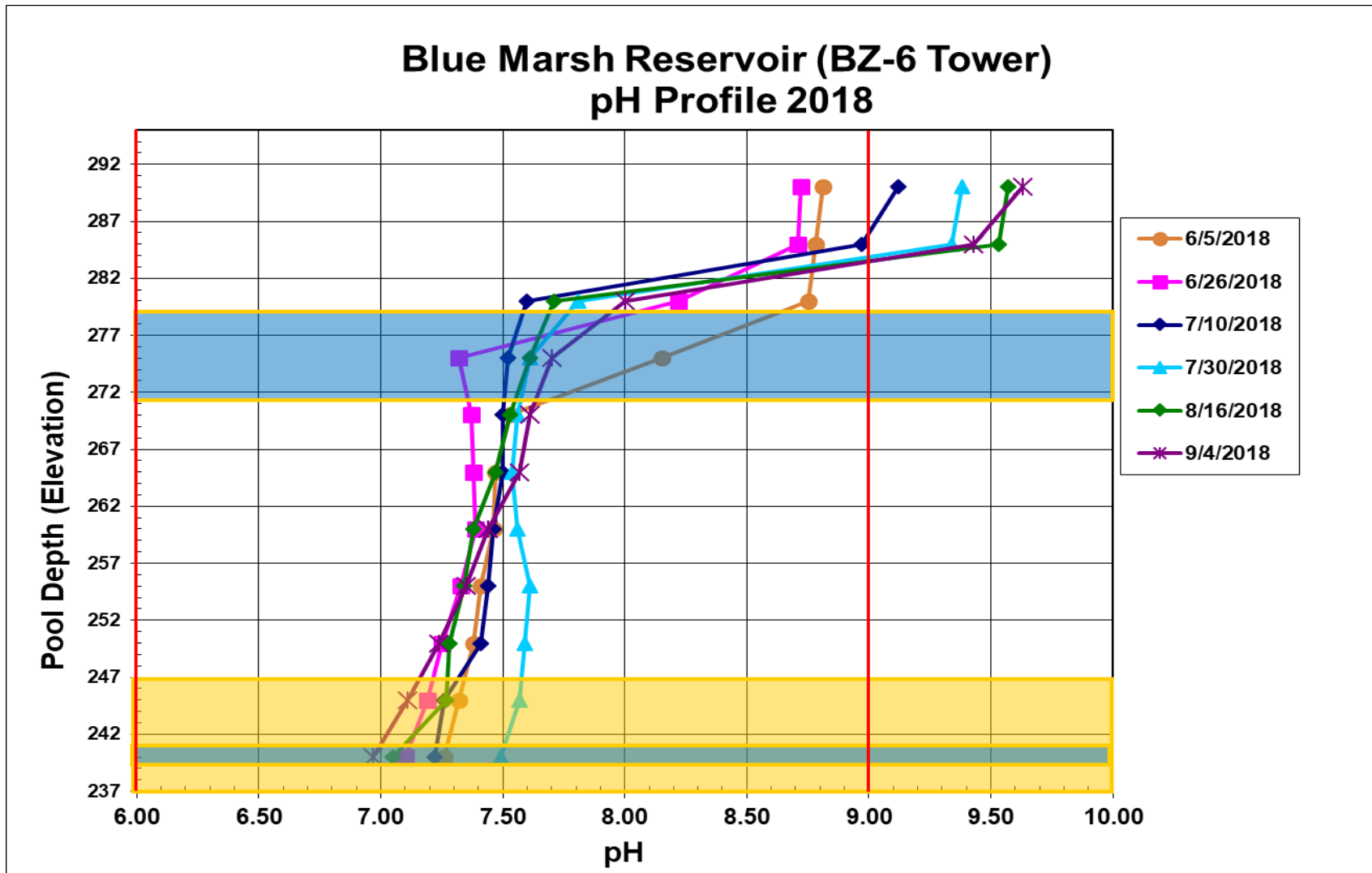
**Figure 3-3.** Tributary and outflow surface water dissolved oxygen concentrations measured at Blue Marsh Reservoir in 2018. (The PADEP water quality standard for DO is a minimum concentration of 5 mg/L.) See Appendix A for summary of plotted values.



**Figure 3-4.** Release portal elevations and dissolved oxygen stratification at station BM-6 of Blue Marsh Reservoir in 2018. (PADEP water quality standard for DO is a minimum concentration of 5 mg/L.) See Appendix A for summary of plotted values.



**Figure 3-5.** Tributary and outflow surface water pH measured at Blue Marsh Reservoir in 2018. (The PADEP water quality standard for pH is a range from 6 to 9.) See Appendix A for summary of plotted values.



**Figure 3-6.** Release portal elevations and stratification of pH at station BM-6 of Blue Marsh Reservoir in 2018. (The PADEP water quality standard for pH is a range from 6 to 9.) See Appendix A for summary of plotted values.

### 3.2 WATER COLUMN CHEMISTRY MONITORING

The following sections describe temporal, spatial, and depth patterns for the water quality parameters measured in surface, middle, and bottom waters of Blue Marsh Reservoir during 2018 (Table 3-2).

#### 3.2.1 Ammonia

Total Ammonia (NH<sub>3</sub>) is a measure of the most reduced inorganic form of nitrogen in water and includes dissolved ammonia and the ammonium ion. Ammonia is a small component of the nitrogen cycle but as an essential plant nutrient, it contributes to the trophic status of a water body. Excess ammonia contributes to eutrophication of water bodies. This can result in excessive algal growths and impacts on recreation and drinking water supplies. In high concentrations, ammonia is toxic to aquatic life.

EPA guidance for ambient water quality criteria for ammonia in freshwater are dependent on temperature and pH (EPA, 2013). Table 3.1 shows the acute and chronic criteria that are expected to protect freshwater aquatic life. The EPA (2013) also provides tables with the temperature and pH-dependent values of the acute criterion magnitude and the temperature and pH-dependent values of the chronic criterion magnitude. These tables provide an expected ammonia criteria over a wide range of pH and temperature values and can be utilized to evaluate field collected samples.

Ammonia concentrations were low in Blue Marsh Reservoir during 2018 (Table 3-2). Concentrations measured for 21 samples did exceed the laboratory minimum reporting limit of 0.20 mg/L. These samples were collected primarily at bottom water sampling locations within the reservoir body. The maximum single recorded sample of 0.86 mg/L was collected from station BM-6B on 26 June. Concentrations of ammonia measured at Blue Marsh Reservoir were in compliance with the PADEP and EPA water quality standards during 2018.

<b>Table 3.1 Environmental Protection Agency Ammonia Freshwater Criteria 2013</b>	
2013 Final Aquatic Life Criteria for Ammonia (Magnitude, Frequency, and Duration) (mg TAN/L) pH 7.0, T=20°C	
Acute (1-hour average)	17
Chronic (30-day rolling average)	1.9*
*Not to exceed 2.5 times the CCC as a 4-day average within the 30-days, i.e. 4.8 mg TAN/L at pH 7 and 20°C, more than once in three years on average. Criteria frequency: Not to be exceeded more than once in three years on average.	

Station	Date	ALK	BOD5	DISS-P	NH3	NO2	NO3	PO4	TDS	TKN	TOC	TP	TSS
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
BM-01S	6/26/2018	127	<3.4	<0.05	0.20	0.03	5.2	NS	150	0.52	2.8	<0.05	3.8
	7/10/2018	137	6.3	<0.05	0.20	0.08	4.5	NS	168	0.73	2.5	<0.05	5.5
	7/30/2018	117	5.2	0.07	0.62	0.09	4.6	NS	178	0.73	3.4	0.10	9.5
	8/16/2018	115	3.7	<0.05	0.16	0.05	4.1	NS	188	0.50	3.1	<0.05	9.1
	9/4/2018	118	<3.4	0.09	0.16	0.06	4.0	NS	210	0.61	13.6	0.06	9.1
	Mean	122.8	4.4	.06	.27	.06	4.48		178.8	.62	5.08	.06	7.4
	Stdev	8.21	1.16	.02	.18	.02	.43		20.02	.10	4.27	.02	2.31
	Max	137	6.3	.09	.62	.09	5.2		210	.73	13.6	.10	9.5
	Min	115	3.4	.05	.16	.03	4		150	.50	2.5	.05	3.8
	No. of Det	5	3	2	5	5	5		5	5	5	2	5
BM-02S	6/26/2018	105	<3.4	0.12	<0.20	0.02	4.0	NS	145	0.73	3.4	<0.05	4.6
	7/10/2018	77	5.5	<0.05	<0.20	0.03	3.4	NS	53.3	1.6	3.9	<0.05	12.0
	7/30/2018	62.6	5.5	<0.05	0.83	0.05	3.6	NS	135	1.6	3.5	0.06	15.8
	8/16/2018	174	<3.4	<0.05	<0.20	0.02	2.1	NS	100	0.62	4.6	0.03	14.4
	9/4/2018	72.3	6.8	0.06	<0.20	0.03	2.5	NS	115	27.3	8.3	0.07	58
	Mean	98.18	4.92	.07	.33	.03	2.92		109.66	6.37	4.74	.05	20.96
	Stdev	40.45	1.33	.03	.25	.01	.69		32.22	10.47	1.83	.01	18.92
	Max	174	6.8	.12	.83	.05	4		145	27.3	8.3	.07	58
	Min	62.6	3.4	.05	.20	.02	2.1		53.3	.62	3.4	.03	4.6
	No. of Det	5	3	2	1	5	5		5	5	5	3	5

Station	Date	ALK	BOD5	DISS-P	NH3	NO2	NO3	PO4	TDS	TKN	TOC	TP	TSS
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
BM-02M	6/26/2018	128	<3.4	<0.05	<0.20	0.02	5.7	NS	245	0.43	2.4	<0.05	4.9
	7/10/2018	106	4.7	<0.05	<0.20	0.03	4.7	NS	150	0.68	3.2	0.05	6.5
	7/30/2018	119	<3.4	0.06	0.25	0.04	4.9	NS	173	0.69	2.2	0.18	12.8
	8/16/2018	109	<3.4	<0.05	0.11	0.04	4.0	NS	164	0.85	3.3	<0.05	7.7
	9/4/2018	114	<3.4	0.12	0.17	0.04	3.9	NS	193	0.42	13.2	0.09	18.2
	Mean	115.2	3.66	.07	.19	.03	4.64		185	.61	4.86	.08	10.02
	Stdev	7.78	.52	.03	.05	.01	.66		33.09	.17	4.19	.05	4.87
	Max	128	4.7	.12	.25	.04	5.7		245	.85	13.2	.18	18.2
	Min	106	3.4	.05	.11	.02	3.9		150	.42	2.2	.05	4.9
	No. of Det	5	1	2	3	5	5		5	5	5	3	5
BM-02B	6/26/2018	126	<3.4	.15	0.25	0.07	4.5	NS	5.0	0.58	2.4	<0.05	6.0
	7/10/2018	160	6.7	<0.05	0.32	0.14	4.7	NS	133	0.45	2.4	<0.05	5.9
	7/30/2018	131	<3.4	<0.05	0.29	0.03	5.7	NS	197	0.74	1.9	0.09	25.1
	8/16/2018	109	<3.4	<0.05	0.29	0.04	4.7	NS	174	0.66	2.9	<0.04	20.2
	9/4/2018	126	<3.4	.11	0.16	0.03	4.7	NS	233	0.47	12.2	0.16	13.3
	Mean	130.4	4.06	.08	.26	.06	4.86		148.4	.58	4.36	.08	14.1
	Stdev	16.57	1.32	.04	.06	.04	.43		78.71	.11	3.93	.04	7.64
	Max	160	6.7	.15	.32	.14	5.7		233	.74	12.2	.16	25.1
	Min	109	3.4	.05	.16	.03	4.5		5	.45	1.9	.04	5.9
	No. of Det	5	1	2	5	5	5		5	5	5	2	5



Table 3-2 continued. Summary of surface, middle, and bottom water quality monitoring data for Blue Marsh Reservoir in 2018

Station	Date	ALK	BOD5	DISS-P	NH3	NO2	NO3	PO4	TDS	TKN	TOC	TP	TSS
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
BM-05S	6/26/2018	187	<3.4	0.05	<0.20	0.01	8.8	NS	155	0.32	1.1	0.06	10.6
	7/10/2018	231	3.5	<0.05	<0.20	0.02	8.8	NS	195	0.27	1.8	0.09	9.4
	7/30/2018	201	<3.4	<0.05	0.20	0.02	8.8	NS	305	0.29	1.0	0.05	18.6
	8/16/2018	217	<3.4	<0.05	<0.20	0.01	7.9	NS	304	<0.15	1.2	<0.05	16.4
	9/4/2018	199	<3.4	0.07	<0.20	0.03	7.1	NS	314	0.34	4.3	0.10	19
	Mean	207	3.42	.05	.20	.02	8.28		254.6	.27	1.88	.07	14.8
	Stdev	15.34	.04	.01	0	.01	.69		66.30	.07	1.24	.02	4.04
	Max	231	3.5	.07	.20	.03	8.8		314	.34	4.3	.10	19
	Min	18.7	3.4	.05	.20	.01	7.1		155	.15	1	.05	9.4
	No. of Det	5	1	2	1	5	5		5	4	5	4	5
BM-06S	6/26/2018	98.3	<3.4	<0.05	<0.20	0.03	4.0	NS	100	0.70	2.6	<0.05	3.8
	7/10/2018	43.7	6.4	<0.05	<0.20	0.04	3.6	NS	30	0.72	3.6	0.05	11.6
	7/30/2018	72.5	<3.4	<0.05	<0.20	0.06	2.7	NS	154	1.3	NS	<0.05	16.7
	8/16/2018	69.9	<3.4	0.04	<0.20	0.02	2.2	NS	144	0.61	3.7	0.05	9.8
	9/4/2018	69.7	<3.4	<0.05	<0.20	0.03	2.3	NS	75	0.35	6.7	<0.05	12.3
	Mean	70.82	4	.05	.20	.04	2.96		100.6	.74	4.15	.05	10.84
	Stdev	17.29	1.2	0	0	.01	.72		45.55	.31	1.53	0	4.19
	Max	98.3	6.4	.05	.20	.06	4		154	1.3	6.7	.05	16.7
	Min	43.7	3.4	.04	.20	.02	2.2		30	.35	2.6	.05	3.8
	No. of Det	5	1	1	0	5	5		5	5	4	2	5

Station	Date	ALK	BOD5	DISS-P	NH3	NO2	NO3	PO4	TDS	TKN	TOC	TP	TSS
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
BM-06M	6/26/2018	124	<3.4	<0.05	<0.20	0.03	5.9	NS	100	0.64	1.9	<0.05	2.4
	7/10/2018	129	4.8	<0.05	<0.20	0.04	4.8	NS	170	0.59	3.5	0.07	6.2
	7/30/2018	122	4.4	0.07	<0.20	0.06	4.7	NS	198	0.63	NS	0.10	8.7
	8/16/2018	115	<3.4	<0.05	0.14	0.02	4.1	NS	142	0.53	3.3	0.03	10.3
	9/4/2018	121	<3.4	0.06	0.18	0.07	4.4	NS	182	0.46	9.1	0.06	10.3
	Mean	122.2	3.88	.06	.18	.04	4.78		158.4	.57	4.45	.06	7.58
	Stdev	4.53	.60	.01	.02	.02	.61		34.47	.07	2.75	.02	2.99
	Max	129	4.8	.07	.20	.07	.59		198	.64	9.1	.10	10.3
	Min	115	3.4	.05	.14	.02	4.1		100	.46	1.9	.03	2.4
	No. of Det	5	2	2	3	5	5		5	5	4	4	5
BM-06B	6/26/2018	106	<3.4	0.10	0.86	0.05	4.6	NS	210	0.80	2.3	0.10	29.3
	7/10/2018	160	6.2	<0.05	<0.20	0.12	5.2	NS	183	0.57	1.8	<0.05	<4.0
	7/30/2018	141	<3.4	<0.05	0.20	0.04	5.8	NS	216	0.69	1.7	0.19	12.7
	8/16/2018	269	4.6	<0.05	0.34	0.10	4.8	NS	180	0.58	2.1	0.03	10.8
	9/4/2018	35.9	<3.4	0.07	0.21	0.08	4.4	NS	193	0.49	9.7	0.05	11.3
	Mean	142.38	4.2	.06	.36	.08	4.96		196.4	.63	3.52	.08	13.62
	Stdev	76.17	1.10	.02	.25	.03	.50		14.35	.11	3.10	.06	8.4
	Max	269	6.2	.10	.86	.12	5.8		216	.80	9.7	.19	29.3
	Min	35.9	3.4	.05	.20	.04	4.4		180	.49	1.7	.03	4.0
	No. of Det	5	2	2	4	5	5		5	5	5	4	4

Station	Date	ALK	BOD5	DISS-P	NH3	NO2	NO3	PO4	TDS	TKN	TOC	TP	TSS
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
BM-07S	6/26/2018	84.8	<3.4	<0.05	<0.20	0.02	4.3	NS	197	0.57	2.2	<0.05	5.5
	7/10/2018	72.8	7.5	<0.05	<0.20	0.04	3.5	NS	90	0.68	3.7	<0.05	15
	7/30/2018	74	7.2	<0.05	<0.20	0.05	3.0	NS	172	2.00	3.8	0.06	13.4
	8/16/2018	187	<3.4	<0.05	<0.20	0.04	2.3	NS	110	0.43	3.9	<0.05	12.6
	9/4/2018	77.4	<3.4	<0.05	0.25	0.03	2.3	NS	70	1.80	6.6	<0.05	20.4
	Mean	99.2	4.98	.05	.21	.04	3.08		127.8	1.10	4.04	.05	13.38
	Stdev	44.10	1.94	0	.02	.01	.76		48.64	.66	1.42	.00	4.79
	Max	187	7.5	.05	.25	.05	4.3		197	2	6.6	.06	20.4
	Min	72.8	3.4	.05	.20	.02	2.3		70	.43	2.2	.05	5.5
No. of Det	5	2	0	1	5	5		5	5	5	1	5	
BM-07M	6/26/2018	125	<3.4	<0.05	0.20	0.04	5.5	NS	56.7	0.53	1.5	<0.05	4.0
	7/10/2018	91.5	4.5	<0.05	<0.20	0.04	3.9	NS	110	0.78	3.8	<0.05	5.8
	7/30/2018	98.3	<3.4	<0.05	<0.20	0.03	4.2	NS	190	0.66	2.6	0.08	7.1
	8/16/2018	94.7	<3.4	<0.05	0.10	0.02	3.6	NS	102	0.50	3.2	<0.05	7.7
	9/4/2018	116	7.6	1.3	1.7	0.03	3.7	NS	100	1.20	8.1	1.60	450
	Mean	105.1	4.46	.30	.48	.03	4.18		111.74	.73	3.84	.37	94.92
	Stdev	13.07	1.63	.50	.61	.01	.69		43.34	.25	2.26	.62	177.54
	Max	125	7.6	1.3	1.7	.04	5.5		190	1.2	8.1	1.6	450
	Min	91.5	3.4	.05	.10	.02	3.6		56.7	.50	1.5	.05	4
No. of Det	5	2	1	3	5	5		5	5	5	2	5	

Table 3-2 continued. Summary of surface, middle, and bottom water quality monitoring data for Blue Marsh Reservoir in 2018													
Station	Date	ALK	BOD5	DISS-P	NH3	NO2	NO3	PO4	TDS	TKN	TOC	TP	TSS
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
BM-07B	6/26/2018	157	<3.4	<0.05	0.25	0.04	6.0	NS	258	0.55	1.8	<0.05	9.4
	7/10/2018	108	5.3	<0.05	<0.20	0.03	5.6	NS	163	0.64	2.2	<0.05	9.4
	7/30/2018	104	<3.4	<0.05	0.57	0.03	4.6	NS	188	0.65	NS	0.06	10.3
	8/16/2018	122	<3.4	<0.05	0.14	0.02	5.4	NS	138	0.54	2.7	<0.05	34.9
	9/4/2018	129	10.1	0.20	0.78	0.05	4.0	NS	100	0.48	7.3	0.24	233
	Mean	124	5.12	.08	.39	.03	5.12		169.4	.57	3.5	.09	59.4
	Stdev	18.84	2.60	.06	.25	.01	.72		52.99	.06	2.22	.08	87.35
	Max	157	10.1	.20	.78	.05	6.0		258	.65	7.3	.24	233
	Min	104	3.4	.05	.14	.02	4.0		100	.48	1.8	.05	9.4
	No. of Det	5	2	1	4	5	5		5	5	4	2	5
BM-08S	6/26/2018	81.1	<3.4	<0.05	<0.20	0.02	4.3	NS	203	0.63	2.2	<0.05	3.0
	7/10/2018	72.8	6.5	<0.05	<0.20	0.03	3.7	NS	107	0.67	4.7	<0.05	11.4
	7/30/2018	75.6	5.9	<0.05	<0.20	0.03	2.7	NS	158	1.90	3.3	<0.05	20.0
	8/16/2018	77.6	<3.4	<0.05	<0.20	0.03	2.3	NS	52.5	0.61	4.4	<0.05	25.7
	9/4/2018	68.6	<3.4	0.03	<0.20	0.02	2.1	NS	117	0.41	5.0	0.04	20.3
	Mean	75.14	4.52	.05	.20	.03	3.02		127.5	.84	3.92	.05	16.08
	Stdev	4.24	1.38	.01	0	0	.84		50.57	.54	1.03	0	7.98
	Max	81.1	6.5	.05	.20	.03	4.3		203	1.9	5	.05	25.7
	Min	68.60	3.4	.03	.20	.02	2.1		52.5	.41	2.2	.04	3
	No. of Det	5	2	1	0	5	5		5	5	5	1	5

Station	Date	ALK	BOD5	DISS-P	NH3	NO2	NO3	PO4	TDS	TKN	TOC	TP	TSS
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
BM-08M	6/26/2018	98.3	<3.4	<0.05	<0.20	0.02	3.7	NS	127	0.62	1.7	<0.05	19.3
	7/10/2018	116	3.6	<0.05	0.25	0.04	3.5	NS	200	0.68	2.6	<0.05	8.3
	7/30/2018	82.8	<3.4	<0.05	<0.20	0.03	3.2	NS	150	0.83	4.8	<0.05	19.8
	8/16/2018	80.2	5.7	<0.05	<0.20	0.03	2.5	NS	150	0.48	4.0	<0.05	16.5
	9/4/2018	73.9	<3.4	0.03	<0.20	0.02	2.4	NS	96.7	0.30	5.1	0.04	13.8
	Mean	90.24	3.9	.05	.21	.03	3.06		144.74	.58	3.64	.05	15.54
	Stdev	15.18	.90	.01	.02	.01	.52		33.86	.18	1.30	0	4.21
	Max	116	5.7	.05	.25	.04	3.7		200	.83	5.1	.05	19.8
	Min	73.9	3.4	.03	.20	.02	2.4		96.7	.30	1.7	.04	8.3
No. of Det	5	2	1	1	5	5		5	5	5	1	5	
BM-08B	6/26/2018	115	<3.4	<0.05	0.22	0.02	4.0	NS	140	0.59	1.9	<0.05	46.5
	7/10/2018	110	4.6	<0.05	0.27	0.04	3.3	NS	157	0.66	2.1	<0.05	23.4
	7/30/2018	101	<3.4	<0.05	<0.20	0.02	3.8	NS	156	1.3	3.0	<0.05	17
	8/16/2018	91.1	7.0	<0.05	0.17	0.02	3.3	NS	190	0.45	3.7	0.09	34
	9/4/2018	89.7	<3.4	<0.05	<0.20	0.02	3.1	NS	147	0.32	6.4	0.03	9.4
	Mean	101.36	4.36	.05	.21	.02	3.5		158	.66	3.42	.05	26.06
	Stdev	10.02	1.40	0	.01	.01	.34		17.17	.34	1.62	.02	13.02
	Max	115	7	.05	.04	.04	4		190	1.3	6.4	.09	46.5
	Min	89.7	3.4	.05	.02	.02	3.1		140	.32	1.9	.03	9.4
No. of Det	5	2	0	3	5	5		5	5	5	2	5	

Station	Date	ALK	BOD5	DISS-P	NH3	NO2	NO3	PO4	TDS	TKN	TOC	TP	TSS
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
BM-09S	6/26/2018	85.3	<3.4	<0.05	<0.20	0.02	4.4	NS	82.5	0.67	2.3	<0.05	3.9
	7/10/2018	114	6.8	<0.05	<0.20	0.04	3.6	NS	137	0.95	3.2	<0.05	12
	7/30/2018	74	6.2	<0.05	0.30	0.04	2.6	NS	142	2.3	3.7	0.21	20.8
	8/16/2018	80.2	4.3	<0.05	<0.20	0.04	2.4	NS	140	0.51	4.4	<0.05	15.8
	9/4/2018	74.4	<3.4	0.03	<0.20	0.03	2.2	NS	100	0.41	6.6	0.03	15.2
	Mean	85.58	4.82	.05	.22	.03	3.04		120.3	.97	4.04	.08	13.54
	Stdev	14.80	1.42	.01	.04	.01	.83		24.41	.69	1.45	.07	5.58
	Max	114	6.8	.05	.30	.04	4.4		142	2.3	6.6	.21	20.8
	Min	74	3.4	.03	.20	.02	2.2		82.5	.41	2.3	.03	3.9
	No. of Det	5	3	1	1	5	5		5	5	5	2	5
BM-09M	6/26/2018	136	<3.4	<0.05	<0.20	0.03	6.2	NS	246	0.74	2.0	<0.05	6.4
	7/10/2018	187	5.0	<0.05	<0.20	0.03	4.0	NS	86.7	0.58	2.9	<0.05	8.3
	7/30/2018	148	<3.4	<0.05	<0.20	0.02	6.1	NS	236	0.69	2.1	0.10	35.3
	8/16/2018	69.9	4.5	<0.05	<0.20	0.02	3.1	NS	144	0.44	5.5	<0.05	8.9
	9/4/2018	123	<3.4	0.05	0.72	0.03	4.0	NS	153	0.38	7.7	0.07	53.4
	Mean	132.78	3.94	.05	.30	.03	4.68		173.14	.57	4.04	.06	22.46
	Stdev	38.03	.68	0	.21	0	1.24		59.98	.14	2.22	.02	18.79
	Max	187	5.0	.05	.72	.03	6.2		246	.74	7.7	.10	53.4
	Min	69.9	3.4	.05	.20	.02	3.1		86.7	.38	2.0	.05	6.4
	No. of Det	5	2	1	1	5	5		5	5	5	2	5

Table 3-2 continued. Summary of surface, middle, and bottom water quality monitoring data for Blue Marsh Reservoir in 2018													
Station	Date	ALK	BOD5	DISS-P	NH3	NO2	NO3	PO4	TDS	TKN	TOC	TP	TSS
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
BM-09B	6/26/2018	144	<3.4	<0.05	0.25	0.03	5.4	NS	223	0.99	2.9	<0.05	25.5
	7/10/2018	297	3.9	<0.05	<0.20	0.03	6.1	NS	143	0.51	1.7	<0.05	147
	7/30/2018	154	<3.4	<0.05	<0.20	0.02	6.5	NS	220	0.57	1.3	0.06	18.9
	8/16/2018	123	<3.4	0.04	0.14	0.02	5.6	NS	190	0.56	2.6	0.05	121
	9/4/2018	156	<3.4	0.10	0.10	0.03	5.8	NS	180	0.34	8.4	0.12	39.6
	Mean	174.8	3.5	.06	.18	.03	5.88		191.2	.59	3.38	.07	70.4
	Stdev	62.21	.20	.02	.05	0	.39		29.29	.21	2.58	.03	53
	Max	297	3.9	.10	.25	.03	6.5		223	.99	8.4	.12	147
	Min	123	3.4	.04	.10	.02	5.4		143	.34	1.3	.05	18.9
	No. of Det	5	1	2	3	5	5		5	5	5	3	5
BM-10S	6/26/2018	94.1	<3.4	<0.05	<0.20	0.02	4.6	NS	33.3	0.80	2.8	<0.05	6.5
	7/10/2018	146	7.1	<0.05	<0.20	0.04	3.6	NS	120	0.50	3.2	<0.05	11.3
	7/30/2018	171	5.3	<0.05	<0.20	0.04	2.5	NS	144	3.0	3.7	<0.05	38.8
	8/16/2018	79.7	6.8	<0.05	<0.20	0.02	2.6	NS	144	0.46	4.6	<0.05	17.4
	9/4/2018	68.6	<3.4	0.07	<0.20	0.03	2.0	NS	80	0.39	6.4	0.06	22
	Mean	111.88	5.2	.05	.20	.03	3.06		104.26	1.03	4.14	.05	19.2
	Stdev	39.71	1.59	.01	0	.01	.93		42.50	.99	1.28	0	11.13
	Max	171	7.1	.07	.20	.04	4.6		144	3.0	6.4	.06	38.8
	Min	68.6	3.4	.05	.20	.02	2.0		33.3	.39	2.8	.05	11.13
	No. of Det	5	3	1	0	5	5		5	5	5	1	5

Table 3-2 continued. Summary of surface, middle, and bottom water quality monitoring data for Blue Marsh Reservoir in 2018													
Station	Date	ALK	BOD5	DISS-P	NH3	NO2	NO3	PO4	TDS	TKN	TOC	TP	TSS
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
BM-10M	6/26/2018	133	<3.4	<0.05	<0.20	0.01	6.3	NS	227	0.79	2.2	<0.05	17.6
	7/10/2018	166	6.5	<0.05	<0.20	0.02	4.2	NS	103	0.53	2.8	<0.05	12.3
	7/30/2018	109	<3.4	<0.05	<0.20	0.03	4.5	NS	170	2.1	2.2	0.15	395
	8/16/2018	76.1	5.8	<0.05	<0.20	0.02	2.9	NS	136	0.48	3.9	<0.05	15.3
	9/4/2018	177	<3.4	0.04	<0.20	0.03	3.7	NS	143	0.31	6.1	0.05	12.3
	Mean	132.22	4.5	.05	.20	.02	4.32		155.8	.84	3.44	.07	90.5
	Stdev	39.97	1.37	0	0	.01	1.13		41.51	.65	1.47	.04	152.26
	Max	177	6.5	.05	.20	.03	6.3		227	2.1	6.1	.15	395
	Min	76.1	3.4	.04	.20	.01	2.9		103	.31	2.2	.05	12.3
	No. of Det	5	2	1	0	5	5		5	5	5	2	5
BM-10B	6/26/2018	154	<3.4	<0.05	0.21	0.02	6.4	NS	96	1.3	2.1	<0.05	92.5
	7/10/2018	148	7.8	<0.05	<0.20	0.01	6.3	NS	167	0.39	1.4	0.37	395
	7/30/2018	156	5.2	<0.05	<0.20	0.02	7.3	NS	266	0.82	1.2	0.10	55
	8/16/2018	140	<3.4	0.03	0.11	0.01	6.4	NS	240	0.33	2.7	0.04	48
	9/4/2018	167	<3.4	0.25	<0.20	0.04	5.9	NS	197	0.29	5.6	0.23	21.7
	Mean	153	4.64	.09	.18	.02	6.46		193.2	.63	2.60	.16	122.44
	Stdev	8.94	1.73	.08	.04	.01	.46		59.39	.39	1.59	.13	138.15
	Max	167	7.8	.25	.21	.04	7.30		266	1.3	5.60	.37	395
	Min	140	3.4	.03	.11	.01	5.90		96	.29	1.20	.04	21.7
	No. of Det	5	2	2	2	5	5		5	5	5	4	5



Station	Date	ALK	BOD5	DISS-P	NH3	NO2	NO3	PO4	TDS	TKN	TOC	TP	TSS
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
BM-11S	6/26/2018	67.1	<3.4	<0.05	<0.20	<0.01	4.4	NS	57.5	0.40	2.0	<0.05	9.9
	7/10/2018	45.8	3.7	<0.05	<0.20	0.01	5.3	NS	33.3	0.24	1.5	<0.05	7.1
	7/30/2018	38.8	<3.4	<0.05	<0.20	0	4.8	NS	97.8	0.26	1.6	0.05	5.9
	8/16/2018	34.2	<3.4	<0.05	<0.20	0	4.2	NS	124	0.32	2.8	0.03	14.6
	9/4/2018	44.3	<3.4	<0.05	<0.20	0	4.0	NS	83	0.17	3.6	0.03	4.2
	Mean	46.04	3.46	.05	.20	0	4.54		79.12	.28	2.3	.04	8.34
	Stdev	11.31	.12	0	0	0	.46		31.45	.08	.79	.01	3.64
	Max	67.1	3.7	.05	.20	.01	5.3		124	.40	3.6	.05	14.6
	Min	34.2	3.4	.05	.20	0	4		33.3	.17	1.5	.03	4.2
	No. of Det	5	1	0	0	1	5		5	5	5	3	5

< Laboratory analysis result was less than the limit of quantification or limit of detection.

NS- Not Sampled

### 3.2.2 Nitrite and Nitrate

Nitrite (NO<sub>2</sub>) is a measure of a form of nitrogen that occurs as an intermediate in the nitrogen cycle. It is unstable and can rapidly be oxidized to nitrate or reduced to nitrogen gas. Nitrite is a source of nutrients for plants and can be toxic to aquatic life in relatively low concentrations. Nitrite concentrations were low at Blue Marsh Reservoir during 2018 (Table 3-1). Concentrations ranged from less than the reporting limit of 0.01 mg/L to 0.14 mg/L during the sampling season.

Nitrate (NO<sub>3</sub>) is the measure of the most oxidized and stable form of nitrogen. It is the principal form of combined nitrogen in natural waters. Nitrate is the primary form of nitrogen used by plants as a nutrient to stimulate plant growth. Nitrate concentrations maintained similar seasonal patterns across all stations in Blue Marsh Reservoir in 2018. Consistently higher concentrations were measured at upstream tributary station BM-5S (Table 3-1). Elevated nitrate concentrations at this station are likely attributed to agriculture in the upstream watershed. Concentrations at all sampling locations and depths ranged from 2.0 to 8.8 mg/L. Seasonal mean concentrations at surface tributary stations BM-5S (8.28 mg/L) maintained the highest concentrations of all stations and dates sampled.

Concentrations of nitrate and nitrite measured at Blue Marsh Reservoir were in compliance with PADEP water quality standards during 2018. The state water quality standard for nitrogen from nitrite and nitrate sources is a summed concentration of not more than 10 mg/L. Summed concentrations at all stations were less than the State standard. The highest nitrogen summed concentration of 9.0 mg/L occurred in the surface waters at station BM-5S in July.

### 3.2.3 Total Kjeldahl Nitrogen

Total Kjeldahl nitrogen (TKN) is a measure of organic nitrogen that is inclusive of ammonia. Organic nitrogen is not immediately available for biological activity and is therefore not available for plant growth until decomposition to inorganic form occurs. In general, TKN remained low but variable throughout the water column of Blue Marsh Reservoir in 2018 (Table 3-1). Concentrations measured at all stations and depths, except one, in the reservoir and tributaries ranged from less than the laboratory reporting limit of 0.15 mg/L to 3.0 mg/L. A single elevated sampling result (27.3 mg/L) was collected from the surface waters of the reservoir on 04 September at station BM-2S. This sample result was not consistent with the concentrations of other forms of nitrogen found in the sample. It was also not consistent with other samples taken at the reservoir on that date and may be the result of sampling or laboratory error.

### 3.2.4 Total Phosphorus

Total phosphorus (TP) is a measure of both organic and inorganic forms of phosphorus. It is an essential plant nutrient and is often the most limiting nutrient to plant growth in freshwater systems. Inputs of phosphorus are the prime contributing factors to eutrophication in most

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freshwater systems. Phosphorus bound to bottom sediments in lakes can be released when oxygen levels are depleted in bottom waters. This phosphorus then becomes available for plant growth.

EPA guidance for nutrient criteria in lakes and reservoirs suggests a maximum concentration for total phosphorus of 0.01-mg/L (EPA 2000). Lakes and reservoirs exceeding this concentration are more likely to experience algal bloom problems during the growing season. In 2018, the laboratory sample analysis method used to measure total phosphorus only allowed a minimum reporting limit of 0.05 mg/L. As a result of the detection limit being greater than sample results often seen at Blue Marsh Reservoir, results at some stations and dates were recorded as <0.05 mg/L (Table 3-2). All sample results are shown as exceeding the EPA 0.01 mg/L suggested concentration, however, results presented as less than the laboratory reporting limit do not accurately reflect total phosphorus concentrations in Blue Marsh Reservoir and its tributaries.

Total phosphorus in the watershed and lake body of Blue Marsh Reservoir was frequently measured at concentrations well above the EPA criteria during 2018 (Table 3-1). Bottom and mid-depth waters within the lake and upstream tributary station BM-5S routinely had elevated concentrations. This may be a direct result of nutrient enrichment from the watershed and phosphorus release from bottom sediments during anoxic conditions experienced at Blue Marsh Reservoir annually. The single sample values for all stations and depths ranged from 0.37 mg/L to <0.05 mg/L. Agriculture and other land use found in the watershed contribute to the historic and currently measured elevated total phosphorus levels in Blue Marsh reservoir.

### 3.2.5 Total Dissolved Phosphorus

Total dissolved phosphorus (DISS P) in the water column of Blue Marsh Reservoir was consistently low during 2018. The single sample values for all stations and depths ranged from 1.3 mg/L to <0.05 mg/L with the majority of samples collected less than the minimum reporting limit (Table 3-1). The maximum value recorded during the sampling season of 1.30 mg/L was collected at the reservoir mid-depth station BM-7M on 04 September.

### 3.2.6 Dissolved Phosphate

Orthophosphate (PO<sub>4</sub>) is a measure of the inorganic oxidized form of soluble phosphorus. This form of phosphorus is the most readily available for uptake during photosynthesis. In freshwater environments, dissolved phosphate is usually a limiting nutrient and is readily taken up by freshwater plants and algae. In 2018, dissolved phosphate concentrations were not measured in samples collected at Blue Marsh Reservoir.

### 3.2.7 Total Dissolved Solids

Total dissolved solids (TDS) are a measure of the amount of non-filterable dissolved material in the water. Dissolved salts such as sulfate, magnesium, chloride, and sodium

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contribute to elevated levels. Total dissolved solids (TDS) in the water column of Blue Marsh Reservoir at all stations and depths ranged from 314 mg/L to 5 mg/L in 2018 (Table 3-1). The state water quality standard for TDS is a maximum concentration of 500 mg/L. Total dissolved solids measured at Blue Marsh Reservoir in 2018 were in compliance with PADEP water quality standards.

### 3.2.8 Total Suspended Solids

Total suspended solids (TSS) are a measure of the amount of filterable particulate matter that is suspended within the water column. High concentrations increase the turbidity of the water and can hinder photosynthetic activity, result in damage to fish gills, and cause impairment to spawning habitat (smothering). Total suspended solids in the waters of Blue Marsh Reservoir were generally low during the 2018 sampling period (Table 3-1). Sample results at all stations and depths ranged from 450 mg/L to <4.0 mg/L (laboratory minimum reporting limit). The maximum and consistently higher TSS readings were taken in the bottom and middle water column samples at reservoir deep water sampling locations. Uncharacteristically high single sample readings from these water samples can be attributed to sample collection error. Bottom sediments can be re-suspended during the sample collection process and are sometimes inadvertently included in the sample. Nearly all the elevated sample results occurred at or near bottom water sampling stations and likely were associated with sediment disturbance. The Pennsylvania Department of Environmental Protection has not issued a water quality standard for TSS.

### 3.2.9 Biochemical Oxygen Demand

Five-day biochemical oxygen demand (BOD) is a measure of the oxygen-depleting burden imposed by organic material present in water. It measures the rate of oxygen uptake by organisms in the water sample over a period of time. It is an indicator of the quality of a water body and the degree of pollution by biodegradable organic matter can therefore be inferred. The five-day biochemical oxygen demand and commonly accepted water quality inferences are as follows:

- 1-2 mg/L is associated with very clean water and little biodegradable wastes;
- 3-5 mg/L is associated with moderately clean water with some biodegradable wastes;
- 6-9 mg/L is associated with fairly polluted water, many bacteria, and much biodegradable wastes;
- 10+ mg/L is associated with very polluted water and large amounts of biodegradable wastes.

Biochemical oxygen demand in the waters of Blue Marsh Reservoir ranged from <3.4 mg/L to 10.1 mg/L during the 2018 sampling period (Table 3-1) with many concentrations less than the laboratory reporting limit of 3.4 mg/L and also ranging widely between the maximum and minimum concentrations. In holistically analyzing the BOD results from 2018 and considering the rarity of elevated levels, it is inferred that upstream tributaries of the reservoir remained very clean with little biodegradable waste throughout the sampling season. It is also inferred that Blue

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Marsh Reservoir ranges from very clean with little biodegradable wastes in spring and early summer with a transition to moderately clean waters with some biodegradable wastes in summer and fall. The Pennsylvania Department of Environmental Protection (PADEP) does not issue a water quality standard for BOD.

### 3.2.10 Alkalinity

Alkalinity is a measure of the acid-neutralizing capacity of water. Waters that have high alkalinity values are considered undesirable because of excessive hardness and high concentrations of sodium salts. Water with low alkalinity has little capacity to buffer acidic inputs and is susceptible to acidification (low pH). The PADEP standard is a minimum concentration of 20-mg/L  $\text{CaCO}_3$  except where natural conditions are less.

Throughout the monitoring period in 2018, concentrations at all stations and depths for Blue Marsh Reservoir ranged from 34.2 mg/L  $\text{CaCO}_3$  to 297 mg/L  $\text{CaCO}_3$  (Table 3-1). Upstream tributary station BM-5S maintained the highest seasonal mean concentration of 207 mg/L  $\text{CaCO}_3$ . Whereas, upstream tributary station BM-11S maintained the lowest seasonal mean concentration of 46 mg/L  $\text{CaCO}_3$ . Concentrations of alkalinity measured at Blue Marsh Reservoir were in compliance with PADEP water quality standards for all samples collected during 2018.

### 3.2.11 Total Organic Carbon

Total organic carbon (TOC) is a measurement of the amount of dissolved and particulate carbon that is bound in organic compounds. TOC can be derived from decaying vegetation, bacterial growth, and metabolic activities of living organisms. The bulk of organic carbon in water is composed of humic substances and partly degraded animal and plant materials. Other sources of TOC can include agricultural chemicals such as herbicides and insecticides and also wastewater treatment plants. The amount of carbon in a freshwater stream is an indicator of the organic character of a water body. High organic content can increase the growth of microorganisms which contribute to the depletion of oxygen. Total organic carbon concentrations in the water column and tributaries of Blue Marsh Reservoir were low during 2018 (Table 3-1). Concentrations of TOC at all stations and depths ranged from 1.0 mg/L to 13.6 mg/L.

### 3.2.12 Chlorophyll a

Chlorophyll a is the measure of the plant chlorophyll "a" primary pigment which helps plants get energy from light. It is found in most plants, algae, and cyanobacteria. Chlorophyll a measures increase in relation to algal densities in a water body. Chlorophyll a is used as a measure of algal biomass. In 2018, the average concentration during the monitoring period for lake surface waters (<15 feet) at lake station BM-6 was 6.0 ug/L with the highest concentrations seen during the month of June (Appendix A). For all reservoir sampling stations, surface water concentrations of chlorophyll a increased in late July and into September. Upstream surface water stations BM-5S and BM-11S maintained lower concentrations throughout the sampling season. Algal productivity in tributary waters would be expected to be less than lake surface

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waters as a result of thermal warming, longer in lake water residence time, and increased nutrient concentrations and availability at lake stations.

### 3.3 TROPIC STATE DETERMINATION

Carlson's (1977) trophic state index (TSI) is a method of quantitatively expressing the magnitude of eutrophication for a lake. The trophic state analysis calculates separate indices for eutrophication based on measures of total phosphorus, chlorophyll a, and secchi disk depth. Index values for each parameter range on the same scale from 0 (least enriched) to 100 (most enriched). The resulting indices can also be compared to qualitative threshold values that correspond to levels of eutrophication: oligotrophic (TSI <40), mesotrophic (TSI >40), and eutrophic (TSI >50).

During 2018, TSI's calculated for measures of secchi disk depth classified Blue Marsh Reservoir as eutrophic in June (52.35), early July (62.34), late July (62.34), August (59.30) and September (60.74) (Fig. 3-7). TSI's calculated for measures of total phosphorus (Figure 3-7) classified Blue Marsh Reservoir as eutrophic in June (60.56), early July (60.56), late July (60.56), August (60.56) and September (60.56). TSI's calculated for measures of chlorophyll a classified Blue Marsh Reservoir as oligotrophic in June (30.60) and early July (34.58), and eutrophic in late July (53.73), August (52.40) and September (55.43).

Carlson (1977) warned against averaging TSI values estimated for different parameters, and instead suggested giving priority to chlorophyll a in the summer and to phosphorus in the spring, fall, and winter. The laboratory minimum detection limit for total phosphorus did not accurately reflect levels of total phosphorus in samples collected from Blue Marsh Reservoir in 2018 (see Section 3.2.4). With this in mind, the trophic state of the reservoir fluctuated between being mesotrophic and eutrophic at different points in time during the 2018 sampling season.

The EPA (1983) also provides criteria for defining the trophic conditions of lakes of the North Temperate Zone based on concentrations of total phosphorus, chlorophyll a, and secchi depth (Table 3-3). Utilizing the EPA classification, Blue Marsh Reservoir fluctuated between being mesotrophic and eutrophic at different points in time during the 2018 sampling season. Taking into account the general agreement between the EPA classifications with that of the Carlson TSI's, the trophic condition of Blue Marsh Reservoir was predominantly eutrophic in 2018.

Water Quality Variable	Oligo-trophic	Meso-trophic	Eutrophic	26 June	10 July	30 July	16 August	04 September
Total phos. (ppb)	<10	10-20	>20	50	50	50	50	50
Chlorophyll (ppb)	<4	4-10	>10	0.03	1.50	10.57	9.23	12.57
Secchi depth (m)	>4	2-4	<2	1.70	0.85	0.85	1.05	0.95

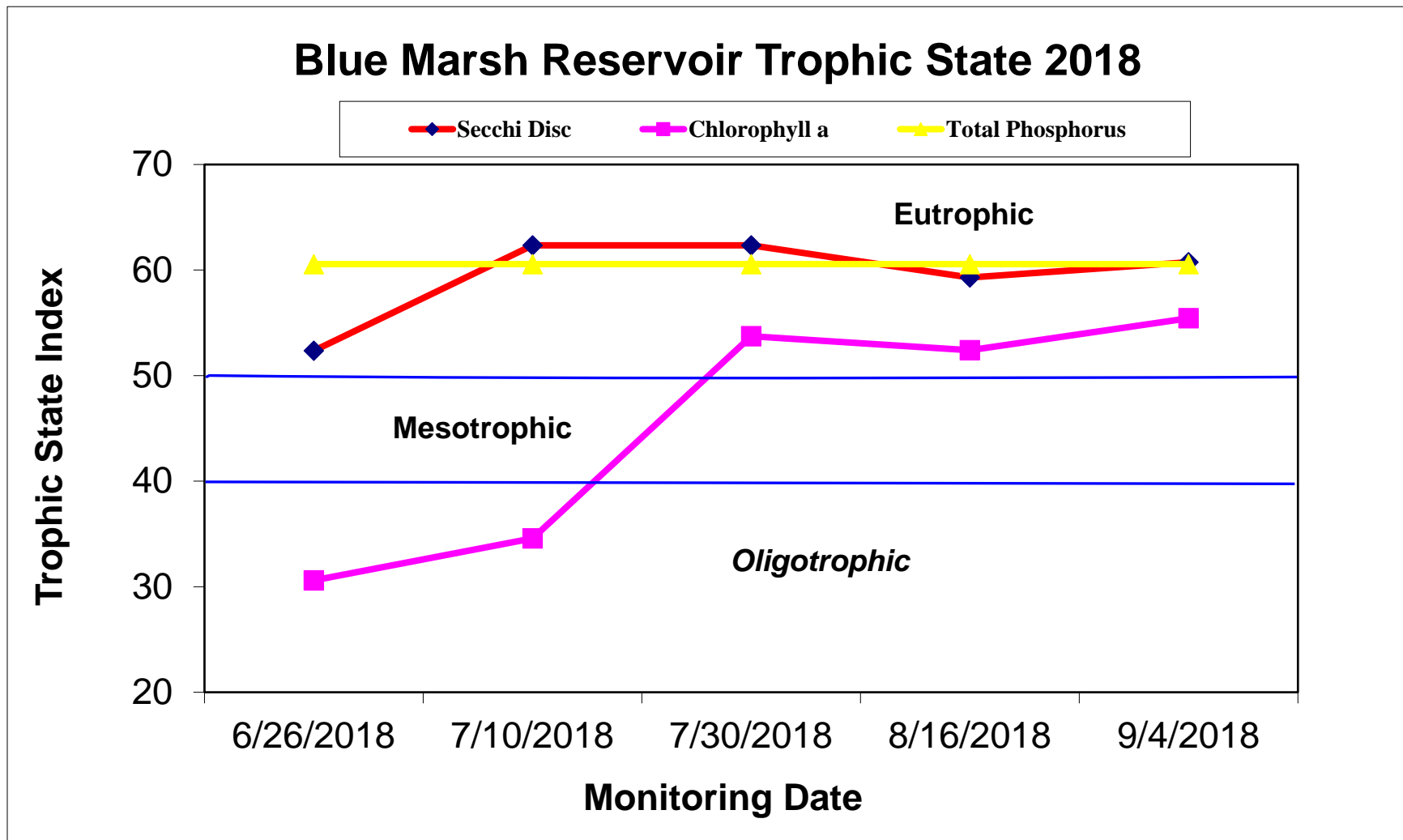
### 3.4 RESERVOIR COLIFORM BACTERIA MONITORING

Two forms of coliform bacteria contamination were monitored in the tributary and lake surface waters at Blue Marsh Reservoir during 2018 including total and fecal coliform (Table 3-4). Total coliform includes escherichia coli (E. coli) and related bacteria that are associated with fecal discharges. Fecal coliform bacteria are a subgroup of the total coliform and are normally associated with waste derived from human and other warm-blooded animals and indicate the presence of fecal contamination but not the associated risk.

Total coliform contamination of Blue Marsh Reservoir was low at all lake sampling stations during the 2018 monitoring period ranging in values from 0 colonies/100-ml to 80 colonies/100-ml. Elevated levels in all months sampled were seen at the upstream tributary stations (BM-5S and BM-11S) and in the downstream release waters (BM-1S). Total coliform values for these three stations ranged from 155 colonies/100-ml to 6000 colonies/100-ml. Bacteria in natural waters are common and their presence in the sample is not necessarily a human health concern. No State or federal standards exist for total coliform for water contact recreation.

With respect to PADEP water quality standards, fecal coliform bacteria has been replaced with an e-coli criteria. For purposes of the 2018 reservoir bacteria sampling, the previous fecal coliform criteria was used. The previous standard for fecal coliform bacteria during the swimming season (from 1 May to 30 September) is a geometric mean not greater than 200 colonies/100-ml. Given that our regular monitoring was completed on one day grab samples, single sample results were then compared to the Pennsylvania Department of Health single sample standard of <1000 colonies/100-ml.

Fecal coliform contamination of Blue Marsh Reservoir was low at all lake sampling stations during the 2018 monitoring period ranging in values from 0 colonies/100-ml to 136 colonies/100-ml. Elevated levels in all months sampled were seen at the upstream tributary stations (BM-5S and BM-11S) and in the downstream release waters (BM-1S). Fecal coliform values for these three stations ranged from 10 colonies/100-ml to 10,800 colonies/100-ml. The fecal coliform samples collected at Blue Marsh Reservoir did exceed the State single sample standard in 2018 on 4 occasions at the upstream tributary stations and on one occasion at the downstream release station. Elevated counts at stations BM-5S and BM-11S are likely attributed to agricultural activities in those upstream watersheds. Water contact recreation, such as water skiing, is permitted at Blue Marsh Reservoir. No long term elevated bacteria counts were recorded in the main reservoir body. The Corps recreational public swimming beach area is monitored and managed separately from the monthly routine lake water quality sampling (see Section 3.5).



**Figure 3-7.** Trophic state indices calculated from secchi disk depth and concentrations of total phosphorus and chlorophyll a at Blue Marsh Reservoir in 2018.



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**Table 3-4.** Bacteria counts (colonies/100 ml) at Blue Marsh Reservoir during 2018. Shaded values exceed the Pennsylvania Department of Health water quality standard for bathing beach of 1,000 fecal coliform colonies/100-ml. NS = Not Sampled in 2018

STATION	DATE	Total Coliform	Fecal Coliform (FC)	Escherichia coli
BM-1S	6/26/2018	155	10	NS
	7/10/2018	246	168	NS
	7/30/2018	340	300	NS
	8/16/2018	673	10,800	NS
	9/4/2018	590	360	NS
BM-2S	6/26/2018	4	0	NS
	7/10/2018	0	0	NS
	7/30/2018	60	14	NS
	8/16/2018	8	136	NS
	9/4/2018	67	20	NS
BM-5S	6/26/2018	4200	540	NS
	7/10/2018	500	4800	NS
	7/30/2018	4000	2900	NS
	8/16/2018	3600	4300	NS
	9/4/2018	4500	550	NS
BM-6S	6/26/2018	18	0	NS
	7/10/2018	0	2	NS
	7/30/2018	17	4	NS
	8/16/2018	0	29	NS
	9/4/2018	9	12	NS
BM-7S	6/26/2018	12	2	NS
	7/10/2018	0	22	NS
	7/30/2018	46	11	NS
	8/16/2018	8	88	NS
	9/4/2018	80	40	NS
BM-8S	6/26/2018	0	0	NS
	7/10/2018	7	0	NS
	7/30/2018	14	0	NS
	8/16/2018	0	0	NS
	9/4/2018	4	0	NS
BM-9S	6/26/2018	25	2	NS
	7/10/2018	2	0	NS
	7/30/2018	49	8	NS
	8/16/2018	4	46	NS
	9/4/2018	60	0	NS
BM-10S	6/26/2018	23	50	NS
	7/10/2018	2	10	NS
	7/30/2018	23	11	NS
	8/16/2018	31	54	NS
	9/4/2018	8	0	NS
BM-11S	6/26/2018	6000	520	NS
	7/10/2018	664	450	NS
	7/30/2018	2600	510	NS
	8/16/2018	4500	3100	NS
	9/4/2018	918	500	NS

### 3.5 WEEKLY SWIMMING BEACH BACTERIA MONITORING

Weekly coliform bacteria monitoring was conducted at the public swimming beach of the Dry Brooks Day Use Area of Blue Marsh Reservoir to gauge compliance with Pennsylvania Department of Health and United States Environmental Protection Agency bathing beach water quality standards to ensure public safety for this water contact recreation area.

*Escherichia coli* is the most reliable indicator of fecal bacterial contamination of surface waters in the United States according to water quality standards set by the EPA (2000). The EPA recommendation for recreational water quality standards for *E. coli* is based on two criteria: a geometric mean of 126 organisms/ 100 ml (geometric mean of five samples collected over not more than a 30 consecutive day period) threshold and 235 organisms/ 100 ml (single water sample) threshold. Samples for *E. coli* analysis were collected twice weekly from 3 fixed beach area stations on each date in the regulated swimming area. During the 2018 recreation season, *E. coli* samples at the swimming beach area of Blue Marsh Reservoir exceeded the single sample criteria on 9 occasions and the geometric mean criteria on one occasion (Table 3-5). Elevated bacteria and reservoir pool levels resulted in beach closure during the recreation season. High bacterial readings appeared to correlate with precipitation and subsequent runoff from the watershed.

## Results and Discussion

**Table 3-5.** Maximum counts and 5-day e-coli running geometric means of the three swimming beach stations of Blue Marsh Reservoir in 2018. Shaded values indicate results were not in compliance with PA Dep. of Health water quality standards for E-coli levels at bathing beaches: maximum single count greater than 235 colonies/100-ml; 5-day geometric mean greater than 126 colonies/100-ml.

Week	Date	Single Maximum Count	Sampling Station 5-Day Geometric Means		
			sb1	sb2	sb3
Week 1	5/12/2108	18	-	-	-
Week 2	5/14/2018	9	-	-	-
	5/17/2018	360	-	-	-
Week 3	5/21/2018	70	-	-	-
	5/22/2018	12	19.96	30.20	23.95
	5/24/2018	10	13.95	27.16	15.07
Week 4	5/29/2018	110	17.52	31.58	24.86
	5/31/2018	10	8.96	17.02	9.54
Week 5	6/5/2018	33	9.01	13.38	8.69
	6/7/2018	13	8.20	13.59	8.31
Week 6	6/11/2018	550	19.18	30.30	19.96
	6/14/2018	73	20.52	40.55	14.60
Week 7	6/18/2018	37	24.97	52.68	16.17
	6/21/2018	10	19.66	42.28	16.17
Week 8	6/25/2018	76	33.89	42.28	20.14
	6/28/2018	260	28.67	36.40	19.01
Week 9	7/2/2018	12	18.58	25.37	14.53
	7/5/2018	150	26.47	33.56	28.30
Week 10	7/9/2018	58	32.53	33.56	40.22
	7/12/2018	7	20.19	20.09	28.11
Week 11	7/16/2018	84	12.98	9.75	24.13
	7/19/2018	7	11.30	8.76	24.89
Week 12	7/23/2018	32	6.90	5.79	18.53
	7/26/2018	980	13.60	15.37	32.61
Week 13	7/30/2018	460	12.16	33.04	96.76
	7/31/2018	11	8.81	36.17	49.69
	8/2/2018	44	13.67	45.48	71.77
Week 14	8/6/2018	1000	37.85	100.48	134.15
	8/8/2018	16	17.18	42.18	49.93
	8/9/2018	6	18.63	27.06	19.33
Week 15	8/13/2018	2400	55.00	58.52	73.59
	8/14/2018	690	98.93	106.54	127.62
	8/15/2018	270	82.99	72.90	87.40
	8/16/2018	7	47.67	65.45	78.15
	8/17/2018	3	33.31	59.10	73.78
Week 16	8/20/2018	7	14.24	19.43	22.26
	8/22/2018	17	7.97	8.93	9.90
Week 17	8/27/2018	7	3.84	4.69	5.53
	8/30/2018	81	6.68	7.65	4.82

## 4.0 REFERENCES

**American Public Health Association, American Water Works Association, and Water Pollution Control Federation, 1992, Standard Methods for the Examination of Water and Wastewater (18<sup>th</sup> Ed.): Washington, D.C., American Public Health Association.**

**Carlson, R.E. 1977, A trophic state index for lakes, Limnology and Oceanography 22:361-369.**

**McComas, Steve, 1993, Lake Smarts, the First Lake Maintenance Handbook, Terrene Institute.**

**Pennsylvania Code, Title 25, Environmental Resources, Chapter 93 Water Quality Standards, Department of Environmental Resources, Bureau of Water Quality Management, Division of Assessment and Standards, 2001, Harrisburg, Pennsylvania.**

**Pennsylvania Code, Title 25, Environmental Resources, Chapter 93 Water Quality Standards, Department of Environmental Resources, Bureau of Water Quality Management, Division of Assessment and Standards, 1984, Harrisburg, Pennsylvania.**

**U.S. Environmental Protection Agency, 1983, Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, March 1983 and subsequent revisions, Environmental Protection Agency Washington, DC.**

**U.S. Environmental Protection Agency, 1983, Technical Guidance Manual for Performing Waste Load Allocations. Book 4 Lakes and Impoundments. Chapter 2 Nutrient/Eutrophication Impacts. U.S. Environmental Protection Agency Washington, DC.**

**U.S. Environmental Protection Agency, 1986, Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods-SW846 (3<sup>rd</sup> Ed.), November 1986 and updates.**

**U.S. Environmental Protection Agency, 2000, Nutrient Criteria Technical Guidance Manual for Lakes and Reservoirs, EPA-822-B00-001, U.S. Environmental Protection Agency Washington, DC.**

**U.S. Environmental Protection Agency, 2013, Aquatic Life Ambient Water Quality Criteria for Ammonia – Freshwater, EPA 822-R-13-001, U.S. Environmental Protection Agency Washington, DC.**

# **APPENDIX A**

## **STRATIFICATION DATA TABLES**

## 2018 Blue Marsh Stratification/Profile

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
BM-1	6/5/2018	07:43:32	0.5	17.42	92.2	8.82	7.72	-57.9	136.4	5.6	4.1	0.278
	6/26/2018	13:22:09	0.5	18.65	97.3	9.08	7.5	-44.9	142.9	7.8	3.2	0.325
	7/10/2018	14:31:26	0.5	20.9	91.5	8.16	7.53	-47.1	123.1	10.7	4.5	0.358
	7/30/2018	12:41:47	0.5	20.63	95.2	8.54	7.76	-60.5	143.5	23.5	2.4	0.309
	8/16/2018	7:34:22	0.5	21.16	99.1	8.8	7.43	-41.3	183.3	37.4	2.3	0.303
	9/4/2018	11:41:54	0.5	20.11	101.7	9.22	7.87	-67	117.6	24.8	1.5	0.305
BM-2	6/26/2018	9:15:25	0.5	24.29	105.8	8.85	8.81	-124.2	93.3	7.9	3.1	0.290
		9:14:29	5.0	24.25	101.9	8.54	8.78	-122.5	93.5	7.7	2.5	0.291
		9:13:35	10.0	24.08	94	7.9	8.73	-119.2	93.9	12.6	2	0.290
		9:12:05	15.0	20.43	16.6	1.5	7.32	-34.5	117.9	4.4	2.7	0.357
		9:10:05	20.0	19.64	20.4	1.87	7.37	-37.2	110.5	4.2	2.3	0.370
		9:09:24	25.0	18.52	18.7	1.75	7.37	-37.2	107.9	6.8	1.8	0.377
		9:07:39	30.0	17.6	18.5	1.76	7.33	-34.8	98.6	8.80	2.9	0.355
		9:06:31	35.0	16.65	7.6	0.74	7.24	-29.3	90	10.1	3	0.330
		9:05:22	40.0	16.33	3.4	0.33	7.19	-26.7	71.4	16.7	3.7	0.328
BM-2	7/10/2018	12:17:19	0.5	29.34	208.8	15.96	9.38	-160.8	96.2	31.3	5.4	0.274
		12:16:52	5	28.39	203.3	15.79	9.38	-160.2	99.3	44.6	7.8	0.271
		12:15:29	10	25.24	37.5	3.08	7.67	-55.6	138.8	14.5	4.8	0.322
		12:13:45	15	23	24.4	2.09	7.5	-45.1	139.4	15.1	4.2	0.326
		12:12:31	20	21.53	33.4	2.95	7.47	-43.4	136.1	18.5	4.1	0.299
		12:11:34	25	20.71	29.3	2.63	7.48	-43.7	132.1	18.1	4.1	0.301
		12:11:16	30	20.23	24.1	2.18	7.44	-41.7	132.2	15.8	3.3	0.348
		12:10:05	35	19.43	11.5	1.06	7.35	-36.4	127.4	12.3	2.8	0.367
		12:09:01	40	18.62	3.9	0.37	7.31	-33.7	120.9	12.1	3.5	0.368
12:08:17	45	17.76	4.9	0.46	7.29	-32.5	117.8	14.8	3.4	0.370		
BM-2	7/30/2018	9:13:18	0.5	26.38	194.5	15.67	9.53	-168.8	113.5	26.2	15.7	0.253
		9:11:45	5	26.18	180	14.55	9.48	-165.1	121.5	32.3	13.3	0.253
		9:09:56	10	23.58	54.2	4.59	7.84	-65.9	162	12.3	6.3	0.287
		9:08:58	15	21.9	46.8	4.1	7.68	-56.1	165.8	17.9	2.7	0.294
		9:07:11	20	20.96	55.3	4.93	7.65	-54.3	165.8	17.7	2.4	0.281
		9:04:43	25	20.62	58.6	5.26	7.64	-53.7	166.1	25	2.4	0.289
		9:03:01	30	20.43	68.1	6.14	7.65	-53.7	169.3	33.7	0.9	0.312
		9:02:04	35	19.97	68.9	6.26	7.63	-53	171.2	41.60	0.7	0.338
		9:00:44	40	19.78	66	6.02	7.6	-51.2	171.8	48.00	0.6	0.346
8:59:02	45	19.71	62.7	5.73	7.59	-50.3	170.9	52.7	1.9	0.348		
BM-2	8/16/2018	10:11:47	0.5	26.91	166.9	13.31	9.62	-174.1	52	25.9	16.2	0.237
		10:10:52	5	26.23	137.3	11.09	9.43	-162.4	55.8	15.6	9.7	0.239
		10:09:30	10	22.05	46.4	4.05	7.66	-54.5	86	11.6	2.7	0.298
		10:08:10	15	21.19	60.7	5.39	7.54	-47.3	91.4	21.2	1.6	0.285
		10:07:21	20	20.61	62.1	5.57	7.46	-42.7	92.8	26.7	1.7	0.279
		10:06:35	25	20.37	63.9	5.77	7.39	-38.7	94.1	31.2	1.6	0.270
		10:05:44	30	20.01	62.1	5.64	7.31	-34	94.6	37.7	1.5	0.276
		10:04:36	35	19.92	63.9	5.82	7.25	-30.3	92.9	37.2	1	0.276
		10:03:16	40	19.59	55.9	5.12	7.22	-28.2	84.1	47.3	1.3	0.287
10:01:43	45	19.59	56.4	5.17	7.25	-30.5	68.3	46.9	1.7	0.287		

## 2018 Blue Marsh Stratification/Profile

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
BM-2	9/4/2018	8:33:15	0.5	25.84	177	14.4	9.52	-167.4	73.8	21.5	12.6	0.239
		8:32:22	5	25.62	160.7	13.12	9.48	-165.3	73.9	20.0	10.7	0.240
		8:31:10	10	22.04	72	6.28	7.82	-64.3	105.9	22.9	5.5	0.266
		8:30:21	15	20.84	62	5.54	7.6	-51	111.3	25.3	2.4	0.280
		8:29:21	20	20.33	60.4	5.45	7.51	-45.5	113.2	25.9	2.3	0.282
		8:27:39	25	20.05	65.7	5.97	7.36	-36.9	118.2	25.1	1.1	0.287
		8:26:29	30	19.71	63.4	5.79	7.3	-33.2	117.8	30.4	1.6	0.310
		8:24:34	35	19.37	66	6.07	7.33	-34.9	106.5	38.5	2.5	0.320
		8:22:31	40	19.08	66.3	6.14	7.43	-40.8	81.5	48.5	1.2	0.334
BM-4												
	Inactive Sampling Station											
BM-5	6/26/2018	12:41:21	0.5	16.69	99.8	9.69	8	-73.8	151.7	30.8	2.6	0.474
	7/10/2018	13:35:39	0.5	19.83	100.6	9.16	7.86	-66.5	131.8	17.7	2.5	0.51
	7/30/2018	12:02:52	0.5	16.92	93.1	9	7.96	-71.9	133	35.4	0	0.468
	8/16/2018	13:46:06	0.5	18.23	95.9	9.02	7.67	-55.1	147.4	29.3	0	0.466
	9/4/2018	11:03:57	0.5	18.22	94.8	8.92	7.62	-51.9	154.8	39	0	0.434
BM-6	6/5/2018	8:36:05	0	22.02	140	12.23	8.81	-123.2	123.1	4.2	7	0.288
		8:35:11	5	21.87	136.6	11.97	8.78	-121.4	124.9	5.5	9.4	0.288
		8:34:25	10	21.78	131.7	11.56	8.75	-119.6	127.6	6.1	8.2	0.288
		8:33:30	15	19.38	110.5	10.17	8.15	-83.6	143.8	4.1	6	0.323
		8:31:23	20	17.33	59.9	5.75	7.53	-46.4	155.2	3.3	6.8	0.301
		8:30:28	25	16.49	52.7	5.14	7.47	-43.1	156	3.2	6.9	0.286
		8:29:25	30	15.16	46.7	4.69	7.46	-42.2	156.3	2.5	7.1	0.265
		8:24:30	35	14.44	40.2	4.1	7.41	-39.2	154	4.1	7.6	0.253
		8:23:02	40	14.32	36.8	3.77	7.38	-37.4	154	5.2	7.5	0.253
		8:20:57	45	14.01	27.3	2.81	7.32	-34	153.9	10.7	6.7	0.250
8:18:59	50	13.34	6.1	0.63	7.26	-30.5	153.7	11.1	6.4	0.248		
BM-6 Secchi 1.70 M	6/26/2018	8:35:36	0.5	24.35	97.7	8.16	8.72	-118.6	118.3	7.7	0.5	0.291
		8:33:58	5	24.37	96.3	8.04	8.71	-118.1	117.6	8.2	0.1	0.292
		8:30:46	10	24.2	54.1	4.53	8.22	-88.9	119.4	6.4	1	0.291
		8:30:05	15	20.46	14.6	1.31	7.32	-34.4	135.3	3.6	0.3	0.342
		8:28:14	20	18.7	20.6	1.92	7.37	-37.2	129.8	3.6	1.1	0.338
		8:27:25	25	18.19	22.4	2.11	7.38	-37.8	126.8	5.6	0.8	0.342
		8:26:31	30	17.56	25	2.39	7.39	-38.4	123	4	0.6	0.332
		8:24:59	35	16.86	20.2	1.95	7.33	-34.6	117.2	6.1	0.2	0.300
		8:24:00	40	16.55	15.9	1.55	7.25	-30.2	114.2	5.2	0.5	0.291
		8:23:11	45	16.26	10.8	1.06	7.19	-26.4	110.5	8.2	1.1	0.297
		8:20:45	50	15.89	3.4	0.34	7.1	-21.6	109.2	27.9	3	0.306

## 2018 Blue Marsh Stratification/Profile

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
BM-6 Secchi 0.85 M	7/10/2018	8:45:57	0.5	27.86	168.8	13.24	9.12	-144.6	107.2	31.7	3.4	0.275
		8:43:59	5	27.65	137.6	10.83	8.97	-135	111.8	29.1	1.1	0.278
		8:42:47	10	24.85	19.7	1.63	7.6	-51.9	136.9	10.2	0.1	0.339
		8:40:28	15	23.12	16.6	1.42	7.52	-46.4	138.1	12.8	1.4	0.346
		8:39:28	20	21.48	23.8	2.1	7.5	-45	138.2	11.9	1.7	0.337
		8:38:35	25	20.94	20.2	1.8	7.5	-45.2	137	7.9	1.4	0.352
		8:37:23	30	20.26	11.4	1.03	7.46	-42.8	136.4	6.8	2.8	0.367
		8:36:29	35	19.37	9.4	0.86	7.44	-41.6	135.7	7.5	2.4	0.378
		8:32:54	40	18.64	2.3	0.22	7.41	-39.4	129.5	8.2	2.5	0.378
		8:30:30	45	17.75	2.6	0.25	7.26	-30.9	133.6	11.6	3.7	0.373
		8:28:52	50	17.31	3.4	0.32	7.22	-28.1	142.4	13.5	3.5	0.372
BM-6 Secchi 0.85 M	7/30/2018	8:46:16	0.5	26.41	184.2	14.83	9.38	-159.3	112	25.9	13.1	0.257
		8:44:38	5	26.37	175.7	14.16	9.34	-156.8	116.8	27.8	11.1	0.257
		8:42:08	10	23.86	43.1	3.64	7.81	-64.2	155.3	13.3	7.5	0.302
		8:40:35	15	21.84	41.7	3.65	7.61	-51.6	160.3	11.1	3.3	0.300
		8:39:13	20	21.1	47.5	4.22	7.56	-48.9	161	12.8	2.8	0.286
		8:38:06	25	20.58	46.9	4.21	7.54	-47.5	161.1	18.8	2.2	0.273
		8:36:34	30	20.37	54.1	4.88	7.56	-48.9	160.5	21.8	2.1	0.303
		8:33:00	35	20.11	59.3	5.37	7.61	-51.8	157.5	24.8	1	0.329
		8:31:42	40	19.99	59.9	5.44	7.59	-50.3	157.5	31.2	1.5	0.334
		8:30:44	45	19.9	59.5	5.42	7.57	-49.4	157.1	30.3	0.4	0.341
		8:27:53	50	19.81	48.7	4.44	7.49	-44.4	171.7	38.6	1.6	0.343
BM-6 Secchi 1.05	8/16/2018	9:43:13	0.5	26.91	151.9	12.12	9.57	-171.2	69.7	17.10	12.6	0.238
		9:42:23	5	26.75	142.1	11.37	9.53	-168.7	71.6	18.10	10.1	0.237
		9:40:41	10	23.56	54.2	4.59	7.71	-58	110.3	16.70	5	0.279
		9:40:00	15	20.64	61.8	5.55	7.61	-51.8	108.5	27.50	2.1	0.282
		9:38:39	20	20.36	57.7	5.20	7.53	-46.6	108.9	30.10	1.3	0.285
		9:37:26	25	20.32	55.1	4.97	7.47	-43.3	108.2	30.50	0.7	0.292
		9:36:10	30	20.11	46.3	4.20	7.38	-38.1	108.1	28.60	1.2	0.315
		9:35:21	35	20.1	41.9	3.80	7.34	-35.5	106.7	27.50	1	0.331
		9:34:27	40	19.99	34.7	3.15	7.28	-32.3	104.2	20.10	0.2	0.358
		9:33:39	45	19.91	35.0	3.18	7.27	-31.7	100.1	25.70	0.4	0.361
		9:29:49	50	19.24	7.4	0.68	7.05	-18.7	56	23.10	1	0.358
BM-6 Secchi 0.95 M	9/4/2018	8:09:39	0.5	25.9	187.8	15.26	9.63	-174.3	74.3	26.1	16.8	0.231
		8:08:22	5	25.5	165.6	13.56	9.43	-162.2	77.9	25.7	13.9	0.236
		8:06:29	10	22.17	76.7	6.68	8	-74.9	100.3	17.9	7	0.265
		8:05:17	15.0	20.81	62.2	5.56	7.7	-57.2	104.3	23.9	2.9	0.277
		8:04:15	20.0	20.19	60.6	5.49	7.61	-51.9	105.9	23.5	1.7	0.289
		8:03:16	25.0	19.79	61	5.56	7.57	-49.2	105.8	22.6	1.3	0.298
		8:01:15	30.0	19.36	56.1	5.16	7.44	-41.5	105.5	26.3	1.6	0.318
		7:59:48	35.0	19.27	51.8	4.77	7.35	-36.3	102.4	25.10	0.7	0.323
		7:58:32	40.0	19.2	47.4	4.37	7.24	-29.9	99.8	27.3	0.7	0.328
		7:57:35	45.0	19.18	44.4	4.1	7.11	-21.9	100.4	27.7	0.9	0.328
		7:56:00	50.0	18.51	11.2	1.05	6.97	-13.4	88.4	25.5	0.3	0.356



## 2018 Blue Marsh Stratification/Profile

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
BM-7	6/26/2018	9:52:44	0.5	24.31	93.9	7.85	8.43	-101.3	101.1	7.2	2.3	0.308
		9:51:18	5.0	24.14	93.3	7.83	8.44	-101.8	99.9	9.2	3.8	0.308
		9:49:55	10.0	23.88	77.3	6.51	8.31	-94.3	100.2	10	2.9	0.307
		9:48:52	15.0	20.91	41	3.66	7.44	-41.7	115.4	5.9	2.8	0.364
		9:47:49	20.0	19.51	45	4.13	7.53	-46.6	112.1	10.50	2.9	0.386
		9:45:28	25.0	18.7	30.7	2.86	7.45	-41.9	103.6	17.4	2.4	0.387
		9:43:39	30.0	17.82	8.8	0.84	7.29	-32.7	98.5	63.7	4	0.377
BM-7	7/10/2018	11:37:40	0.5	28.28	193.3	15.05	9.28	-154.3	141.2	32.2	4.6	0.291
		11:36:43	5	27.35	182.8	14.47	9.23	-151.1	153.6	35.4	7.8	0.288
		11:35:18	10	24.45	80.1	6.68	7.84	-66	196.8	10.6	3.6	0.288
		11:33:51	15	22.97	42.3	3.63	7.45	-42.5	205.5	17.4	2.8	0.295
		11:32:12	20	21.77	45.2	3.96	7.44	-41.9	205.7	18.5	3.2	0.281
		11:30:57	25	20.99	58	5.17	7.49	-44.7	206.2	22.4	2.4	0.298
		11:29:52	30	20.2	59.1	5.35	7.52	-46.3	204.5	37.3	3	0.319
BM-7	7/30/2018	9:35:52	0.5	25.78	170.6	13.89	9.42	-161.3	115.4	39.9	16.6	0.262
		9:34:29	5	25.52	144.2	11.79	9.27	-152.5	122.6	35.7	10.8	0.263
		9:32:53	10	24.36	91.3	7.63	8.84	-126.2	135.4	15.8	6.4	0.268
		9:31:34	15	21.73	67.6	5.93	7.85	-65.9	156.2	16.5	2.3	0.281
		9:30:20	20	21.22	84.6	7.5	7.97	-73.2	155.1	20.5	3	0.313
		9:28:37	25	20.77	74.7	6.69	7.68	-56.1	164.7	30.4	1.4	0.313
		9:27:41	30	19.82	75.3	6.87	7.71	-57.3	165.2	65	2	0.367
BM-7	8/16/2018	10:45:22	0.5	26.54	160.2	12.86	9.47	-165.2	35.5	23.2	10.1	0.243
		10:44:20	5	26.03	141.7	11.48	9.38	-159	34.9	21.5	13.6	0.242
		10:42:50	10	22.68	69.3	5.98	7.85	-66	55.8	17.3	3.6	0.276
		10:42:03	15	21.31	73.1	6.48	7.69	-56.5	59.7	22.1	2.2	0.267
		10:41:04	20	20.58	68.6	6.16	7.47	-43.5	64.7	29.2	1.7	0.277
		10:40:00	25	19.42	74.1	6.81	7.42	-40.3	63.9	65.3	1	0.300
		10:38:24	28	19.4	73.6	6.77	7.41	-39.8	51.8	75.7	1.4	0.301
BM-7	9/4/2018	8:54:14	0.5	25.29	180.4	14.82	9.53	-167.7	84.3	55.10	12	0.234
		8:52:48	5	24.81	147.5	12.23	9.32	-155.2	89	36.80	11.7	0.235
		8:50:59	10	21.93	76.5	6.69	7.78	-61.9	122	22.20	5.9	0.255
		8:50:02	15	20.88	75.6	6.75	7.6	-51.1	127.4	25.30	3.4	0.269
		8:49:05	20	20.69	77.7	6.96	7.51	-45.6	131.2	24.60	3.6	0.273
		8:47:29	25	19.93	72	6.55	7.48	-43.6	127.9	41.30	2.2	0.316
		8:46:23	30	19.44	76.5	7.03	7.56	-48.3	121.5	57.20	1.4	0.353
BM-8	6/26/2018	11:22:54	0.5	25.29	141.5	11.63	8.96	-133.7	133.1	9.7	2.7	0.292
		11:22:12	5.0	24.58	141.2	11.75	9.01	-136.4	137.2	15.6	3.3	0.289
		11:20:42	10.0	22.88	101	8.67	8.16	-85	160.6	8.10	3	0.315
		11:19:45	15.0	20.78	106.1	9.49	8.15	-83.5	164.2	19.6	2.6	0.304
		11:18:18	20.0	19.46	68.5	6.29	7.58	-49.7	173.3	28.9	0.8	0.326
BM-8	7/10/2018	10:57:30	0.5	28.27	216.3	16.84	9.32	-157	90.8	22.7	4.8	0.289
		10:56:20	5	27.28	190.6	15.1	9.2	-148.9	98.3	29.7	7.5	0.285
		10:55:13	10	24.7	120.9	10.04	8.54	-108.2	112.1	20.1	3.2	0.300
		10:52:50	15	22.61	65	5.61	7.75	-60.2	119.2	17.3	2.1	0.313
		10:51:41	20	21.68	47.8	4.2	7.49	-44.4	122.2	41.3	2.3	0.325
		10:49:59	22	21.41	40.2	3.55	7.43	-41.3	110.4	39.3	1	0.32

## 2018 Blue Marsh Stratification/Profile

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
BM-8	7/30/2018	11:16:04	0.5	26.37	224.3	18.07	9.77	-182.8	56.9	39.9	16.9	0.256
		11:14:40	5	25.9	141.6	11.5	9.31	-155	63.7	25.1	7.6	0.255
		11:12:53	10	23.46	153.9	13.08	9.19	-146.7	65.5	28.4	6.9	0.268
		11:11:18	15	21.89	82	7.18	7.9	-69.4	85.4	22.3	3.4	0.281
		11:09:16	20	21.28	88.5	7.84	7.93	-71	69	22.6	2.1	0.289
BM-8	8/16/2018	12:33:34	0.5	27.02	219	17.44	9.62	-174.5	100.2	47.1	16.6	0.247
		12:32:03	5	25.58	144.1	11.77	9.33	-156.1	115	30.2	12	0.245
		12:31:07	10	22.35	96.4	8.37	8.06	-78.6	148.5	17.7	4.5	0.261
		12:30:07	15	21.09	81.8	7.28	7.58	-50.1	158.4	17.8	2.5	0.263
		12:28:49	20	20.07	86.4	7.84	7.5	-45.2	156.9	41.8	2	0.300
BM-8	9/4/2018	10:16:22	0.5	26.52	255.5	20.53	9.86	-188.4	95.5	29.7	17.1	0.236
		10:14:27	5	24.17	151.1	12.67	9.07	-139.6	125.8	22.8	10.9	0.225
		10:13:29	10	21.98	133.5	11.67	8.55	-107.9	143.1	20.8	6.7	0.253
		10:12:14	15	20.96	101.6	9.06	7.93	-70.9	150.2	21.2	5.3	0.248
		10:11:08	20	20.3	94.6	8.54	7.82	-63.9	146.6	21.6	3.6	0.275
BM-9	6/26/2018	10:25:24	0.5	24.73	123.6	10.26	8.76	-121.5	120.5	8.7	2.3	0.297
		10:23:46	5	24.34	103.3	8.63	8.53	-107.3	131.7	14.1	2.9	0.308
		10:22:19	10	22.52	76.4	6.61	7.77	-61.6	148.5	11.3	2.7	0.314
		10:20:54	15	20.79	37.4	3.35	7.42	-40.3	156.3	5.4	2.7	0.390
		10:19:11	20	19.88	73.8	6.72	7.75	-59.6	150.8	18	2.9	0.386
		10:18:12	25	19.41	70.2	6.45	7.73	-58.7	150.1	32	2.7	0.377
		10:16:26	30	18.11	48.1	4.54	7.49	-44.5	152.5	55.8	3.1	0.363
10:15:52	32	17.86	46.1	4.37	7.48	-43.4	151.1	57.3	3.6	0.351		
BM-9	7/10/2018	10:25:57	0.5	27.58	182.8	14.4	9.24	-151.3	115.2	36.2	6.2	0.293
		10:25:03	5	27.07	147.6	11.73	9.07	-140.9	125.2	34.2	7.4	0.292
		10:24:17	10	25.44	83.8	6.86	7.83	-65.6	148.3	12.9	3.1	0.292
		10:22:51	15	22.84	52.3	4.5	7.56	-48.8	151.5	16.6	2.5	0.286
		10:21:55	20	21.68	75.9	6.67	7.77	-61.1	146.7	21.4	3	0.299
		10:21:03	25	21.14	80.8	7.18	7.86	-66.8	144.1	47.9	3.1	0.328
		10:18:53	30	20.19	58.7	5.32	7.58	-49.7	145.1	64.2	3	0.342
10:17:25	32	19.96	51.4	4.67	7.49	-44.4	142.9	99.1	3.8	0.341		
BM-9	7/30/2018	10:02:42	0.5	25.97	202.6	16.44	9.68	-177.6	111.3	51.4	18.2	0.253
		10:01:37	5	25.64	162	13.22	9.41	-160.9	121.7	28.9	12.1	0.260
		9:59:44	10	23.51	93	7.9	8.34	-95.6	149	12.2	5.1	0.295
		9:58:26	15	22.24	84.5	7.35	8.05	-78.1	153.8	17.2	3.1	0.293
		9:56:38	20	21.46	106.2	9.37	8.32	-94.1	148.8	25.6	3	0.344
		9:53:14	25	19.59	81.8	7.49	7.79	-62.1	164.3	57.8	1.9	0.382
9:51:57	30	19.39	79.3	7.29	7.76	-60.6	162.9	84	0.6	0.381		

## 2018 Blue Marsh Stratification/Profile

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
BM-9	8/16/2018	11:15:59	0.5	26.22	167.1	13.49	9.47	-164.5	79.3	23.2	15.2	0.244
		11:14:58	5	25.6	132.4	10.82	9.28	-153.2	85.3	16.6	9	0.244
		11:12:22	10	22.75	84.6	7.29	8.03	-77	107.4	20.8	2.8	0.255
		11:11:31	15	21.18	89.6	7.95	7.89	-68.2	114.1	26.4	1.2	0.307
		11:10:02	20	19.85	81.7	7.45	7.6	-50.8	124.5	36.7	0.8	0.304
		11:08:25	25	19.36	80.1	7.37	7.53	-46.8	125.2	77.7	1.7	0.316
		11:06:52	30	19.36	80	7.36	7.52	-46.4	122.7	90.3	1.3	0.316
BM-9	9/4/2018	9:20:19	0.5	26.02	199.4	16.16	9.69	-177.7	99.4	33	13.5	0.233
		9:19:32	5	24.87	139.2	11.52	9.28	-152.8	109.2	24.1	8.7	0.235
		9:18:17	10	22.03	90.3	7.89	8.14	-83.2	133.9	22.7	5.2	0.238
		9:17:14	15	21.2	100.9	8.96	7.97	-72.9	144.5	26	4.7	0.304
		9:15:55	20	20.23	90.4	8.18	7.56	-48.5	156.1	37.7	2.1	0.351
		9:14:55	25	19.46	79.5	7.3	7.47	-43.5	154.3	59.1	0.2	0.364
		9:14:00	30	19.44	77.8	7.15	7.51	-45.4	150.5	61.0	1.2	0.362
		9:12:58	32	19.44	77.8	7.14	7.61	-51.5	143.6	82.90	1.3	0.364
BM-10	6/26/2018	10:51:14	0.5	24.06	158.5	13.32	9.03	-137.2	126.4	11.4	2.6	0.282
		10:50:24	5	23.44	153.1	13.01	9	-135.1	131.3	18.9	5.5	0.283
		10:49:13	10	22.04	114.5	10	8.31	-93.4	148.7	28.7	2.4	0.359
		10:47:54	15	20.2	86.6	7.83	7.83	-64.4	158.4	62.7	1.6	0.392
		10:46:41	20	19.71	81.4	7.44	7.72	-58	157.3	161.9	2.2	0.399
BM-10	7/10/2018	9:41:14	0.5	27.24	218.4	17.32	9.33	-156.8	122.8	29.8	11.2	0.273
		9:40:15	5	26.45	153.2	12.32	8.82	-125.7	136.7	27.7	10.9	0.284
		9:39:08	10	24.9	167.3	13.85	8.77	-122.2	139.1	23.2	12.4	0.289
		9:36:58	15	23.22	134.2	11.46	8.48	-104.2	145.5	33.3	8.4	0.324
		9:35:07	20	20.9	91	8.12	7.86	-66.8	157.2	131.8	3.9	0.385
BM-10	7/30/2018	10:37:14	0.5	26.11	240	19.43	9.84	-187.3	106.3	56.5	15.3	0.253
		10:35:33	5	25.09	179.2	14.78	9.3	-153.8	126.3	36.1	7	0.278
		10:34:00	10	23.18	163.2	13.94	9.11	-141.7	134.4	22.1	4.6	0.301
		10:32:06	15	19.38	93.1	8.56	7.99	-73.7	167.7	62.1	0.6	0.391
		10:30:09	20	19.27	91.2	8.4	7.95	-71.5	167.1	96.7	0.8	0.394
BM-10	8/16/2018	11:52:44	0.5	26.18	178.9	14.46	9.4	-160.8	85.7	22.9	17.7	0.249
		11:51:39	5	23.42	114.9	9.77	8.65	-114.5	99.1	18.3	4.6	0.288
		11:50:04	10	19.71	88.9	8.12	7.63	-52.9	128.1	40	0.1	0.341
		11:49:11	15	19.37	86.1	7.92	7.6	-50.9	125	72.6	0	0.346
		11:47:14	20	19.37	87.1	8.01	7.69	-56.4	107.2	91.6	0.4	0.349
BM-10	9/4/2018	9:47:59	0.5	26.01	266.3	21.59	9.95	-193.4	93.5	50.7	19.1	0.232
		9:46:22	5	24.14	158.3	13.28	8.72	-118.5	142.6	34	7.2	0.293
		9:45:31	10	20.64	91.9	8.24	7.66	-54.5	161.8	43.3	1	0.380
		9:44:26	15	20.19	87.6	7.93	7.61	-51.9	159.5	72.7	0	0.396
		9:43:21	20	20.17	87.3	7.9	7.67	-55.1	153.9	93.2	0.9	0.395

## 2018 Blue Marsh Stratification/Profile

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
BM-11	6/26/2018	12:36:31	0.5	17.73	104.7	9.96	7.91	-68.9	137.6	27	2.6	0.257
	7/10/2018	13:32:31	0.5	20.57	105.2	9.46	7.4	-39.4	118	13.2	2.6	0.157
	7/30/2018	12:06:35	0.5	17.9	101.3	9.6	7.78	-61.1	134.6	13.9	0.5	0.148
	8/16/2018	13:42:36	0.5	20.18	102.2	9.26	7.4	-39.4	131.6	15	0.5	0.143
	9/4/2018	11:00:45	0.5	20.45	103.9	9.36	7.74	-59.6	140.7	9.10	1.3	0.157

# **APPENDIX B**

## **BACTERIA SAMPLING DATA TABLES**

**BLUE MARSH RESERVOIR SWIMMING BEACH MONITORING PROGRAM RESULTS**  
**Fecal/e-coli Coliform 2018**

<u>DAY</u>	<u>DATE</u>	<u>FECAL COLIFORM</u>				<u>E-COLI</u>			
		<u>SB1</u>	<u>SB2</u>	<u>SB3</u>	<u>Arith. AVG.&amp;LOG</u>	<u>SB1</u>	<u>SB2</u>	<u>SB3</u>	<u>Ave./LOG</u>
Sat.	12-May				#DIV/0!	18.00	17.00	4.00	13.00
Mon.	14-May				#DIV/0!	8.00	8.00	9.00	8.33
Thurs.	17-May				#DIV/0!	86.00	220.00	360.00	222.00
Mon.	21-May				#DIV/0!	32.00	70.00	16.00	39.33
Tues.	22-May				#DIV/0!	8.00	12.00	5.00	8.33
5 smpl. Log Value		#NUM!	#NUM!	#NUM!	#DIV/0!	1.30	1.48	1.20	1.38
5 smpl. Geo. Mean		#NUM!	#NUM!	#NUM!	#DIV/0!	19.96	30.20	15.96	23.95
Thur.	24-May				#DIV/0!	3.00	10.00	3.00	5.33
5 smpl. Log Value		#NUM!	#NUM!	#NUM!	#DIV/0!	1.14	1.43	1.18	1.30
5 smpl. Geo. Mean		#NUM!	#NUM!	#NUM!	#DIV/0!	13.95	27.16	15.07	20.04
Tues.	29-May				#DIV/0!	25.00	17.00	110.00	50.67
5 smpl. Log Value		#NUM!	#NUM!	#NUM!	#DIV/0!	1.24	1.50	1.40	1.46
5 smpl. Geo. Mean		#NUM!	#NUM!	#NUM!	#DIV/0!	17.52	31.58	24.86	28.76
Thur.	31-May				#DIV/0!	3.00	10.00	3.00	5.33
5 smpl. Log Value		#NUM!	#NUM!	#NUM!	#DIV/0!	0.95	1.23	0.98	1.13
5 smpl. Geo. Mean		#NUM!	#NUM!	#NUM!	#DIV/0!	8.96	17.02	9.54	13.64
Tues.	5-Jun				#DIV/0!	33.00	21.00	10.00	21.33
5 smpl. Log Value		#NUM!	#NUM!	#NUM!	#DIV/0!	0.95	1.13	0.94	1.08
5 smpl. Geo. Mean		#NUM!	#NUM!	#NUM!	#DIV/0!	9.01	13.38	8.69	12.07
Thur.	7-Jun				#DIV/0!	5.00	13.00	4.00	7.33
5 smpl. Log Value		#NUM!	#NUM!	#NUM!	#DIV/0!	0.91	1.13	0.92	1.07
5 smpl. Geo. Mean		#NUM!	#NUM!	#NUM!	#DIV/0!	8.20	13.59	8.31	11.77
Mon.	11-Jun				#DIV/0!	210.00	550.00	240.00	333.33
5 smpl. Log Value		#NUM!	#NUM!	#NUM!	#DIV/0!	1.28	1.48	1.30	1.43
5 smpl. Geo. Mean		#NUM!	#NUM!	#NUM!	#DIV/0!	19.18	30.30	19.96	26.90
Thur.	14-Jun				#DIV/0!	35.00	73.00	23.00	43.67

5 smpl. Log Value	#NUM!	#NUM!	#NUM!	#DIV/0!	1.31	1.61	1.16	1.42
5 smpl. Geo. Mean	#NUM!	#NUM!	#NUM!	#DIV/0!	20.52	40.55	14.60	26.11
Mon. 18-Jun				#DIV/0!	8.00	37.00	5.00	16.67
5 smpl. Log Value	#NUM!	#NUM!	#NUM!	#DIV/0!	1.40	1.72	1.21	1.52
5 smpl. Geo. Mean	#NUM!	#NUM!	#NUM!	#DIV/0!	24.97	52.68	16.17	32.80
Thur. 21-Jun				#DIV/0!	10.00	7.00	10.00	9.00
5 smpl. Log Value	#NUM!	#NUM!	#NUM!	#DIV/0!	1.29	1.63	1.21	1.44
5 smpl. Geo. Mean	#NUM!	#NUM!	#NUM!	#DIV/0!	19.66	42.28	16.17	27.60
Mon. 25-Jun				#DIV/0!	76.00	13.00	12.00	33.67
5 smpl. Log Value	#NUM!	#NUM!	#NUM!	#DIV/0!	1.53	1.63	1.30	1.57
5 smpl. Geo. Mean	#NUM!	#NUM!	#NUM!	#DIV/0!	33.89	42.28	20.14	37.43
Thur. 28-Jun				#DIV/0!	91.00	260.00	180.00	177.00
5 smpl. Log Value	#NUM!	#NUM!	#NUM!	#DIV/0!	1.46	1.56	1.28	1.52
5 smpl. Geo. Mean	#NUM!	#NUM!	#NUM!	#DIV/0!	28.67	36.40	19.01	32.98
Mon. 2-Jul				#DIV/0!	4.00	12.00	6.00	7.33
5 smpl. Log Value	#NUM!	#NUM!	#NUM!	#DIV/0!	1.27	1.40	1.16	1.36
5 smpl. Geo. Mean	#NUM!	#NUM!	#NUM!	#DIV/0!	18.58	25.37	14.53	23.08
Thur. 5-Jul				#DIV/0!	47.00	150.00	140.00	112.33
5 smpl. Log Value	#NUM!	#NUM!	#NUM!	#DIV/0!	1.42	1.53	1.45	1.53
5 smpl. Geo. Mean	#NUM!	#NUM!	#NUM!	#DIV/0!	26.47	33.56	28.30	33.81
Mon. 9-Jul				#DIV/0!	28.00	7.00	58.00	31.00
5 smpl. Log Value	#NUM!	#NUM!	#NUM!	#DIV/0!	1.51	1.53	1.60	1.64
5 smpl. Geo. Mean	#NUM!	#NUM!	#NUM!	#DIV/0!	32.53	33.56	40.22	43.30
Thur. 12-Jul				#DIV/0!	7.00	1.00	2.00	3.33
5 smpl. Log Value	#NUM!	#NUM!	#NUM!	#DIV/0!	1.31	1.30	1.45	1.44
5 smpl. Geo. Mean	#NUM!	#NUM!	#NUM!	#DIV/0!	20.19	20.09	28.11	27.26
Mon. 16-Jul				#DIV/0!	10.00	7.00	84.00	33.67
5 smpl. Log Value	#NUM!	#NUM!	#NUM!	#DIV/0!	1.11	0.99	1.38	1.29
5 smpl. Geo. Mean	#NUM!	#NUM!	#NUM!	#DIV/0!	12.98	9.75	24.13	19.56
Thur. 19-Jul				#DIV/0!	2.00	7.00	7.00	5.33
5 smpl. Log Value	#NUM!	#NUM!	#NUM!	#DIV/0!	1.05	0.94	1.40	1.26
5 smpl. Geo. Mean	#NUM!	#NUM!	#NUM!	#DIV/0!	11.30	8.76	24.89	18.36
Mon. 23-Jul				#DIV/0!	4.00	19.00	32.00	18.33
5 smpl. Log Value	#NUM!	#NUM!	#NUM!	#DIV/0!	0.84	0.76	1.27	1.11

BLUE MARSH BEACH BACTERIA DATA

5 smpl. Geo. Mean		#NUM!	#NUM!	#NUM!	#DIV/0!	6.90	5.79	18.53	12.77
Thur.	26-Jul				#DIV/0!	830.00	920.00	980.00	910.00
5 smpl. Log Value		#NUM!	#NUM!	#NUM!	#DIV/0!	1.13	1.19	1.51	1.40
5 smpl. Geo. Mean		#NUM!	#NUM!	#NUM!	#DIV/0!	13.60	15.37	32.61	25.11
Mon.	30-Jul				#DIV/0!	4.00	46.00	460.00	170.00
5 smpl. Log Value		#NUM!	#NUM!	#NUM!	#DIV/0!	1.08	1.52	1.99	1.74
5 smpl. Geo. Mean		#NUM!	#NUM!	#NUM!	#DIV/0!	12.16	33.04	96.76	55.13
Tues.	31-Jul				#DIV/0!	2.00	11.00	3.00	5.33
5 smpl. Log Value		#NUM!	#NUM!	#NUM!	#DIV/0!	0.95	1.56	1.70	1.58
5 smpl. Geo. Mean		#NUM!	#NUM!	#NUM!	#DIV/0!	8.81	36.17	49.69	38.14
Mon.	2-Aug				#DIV/0!	18.00	22.00	44.00	28.00
5 smpl. Log Value		#NUM!	#NUM!	#NUM!	#DIV/0!	1.14	1.66	1.86	1.73
5 smpl. Geo. Mean		#NUM!	#NUM!	#NUM!	#DIV/0!	13.67	45.48	71.77	53.13
Thur.	6-Aug				#DIV/0!	650.00	1000.00	730.00	793.33
5 smpl. Log Value		#NUM!	#NUM!	#NUM!	#DIV/0!	1.58	2.00	2.13	2.05
5 smpl. Geo. Mean		#NUM!	#NUM!	#NUM!	#DIV/0!	37.85	100.48	134.15	112.88
Wed.	8-Aug				#DIV/0!	16.00	12.00	7.00	11.67
5 smpl. Log Value		#NUM!	#NUM!	#NUM!	#DIV/0!	1.24	1.63	1.70	1.67
5 smpl. Geo. Mean		#NUM!	#NUM!	#NUM!	#DIV/0!	17.18	42.18	49.93	47.23
Thur.	9-Aug				#DIV/0!	6.00	5.00	4.00	5.00
5 smpl. Log Value		#NUM!	#NUM!	#NUM!	#DIV/0!	1.27	1.43	1.29	1.37
5 smpl. Geo. Mean		#NUM!	#NUM!	#NUM!	#DIV/0!	18.63	27.06	19.33	23.33
Mon.	13-Aug				#DIV/0!	490.00	520.00	2400.00	1136.67
5 smpl. Log Value		#NUM!	#NUM!	#NUM!	#DIV/0!	1.75	1.77	1.87	1.83
5 smpl. Geo. Mean		#NUM!	#NUM!	#NUM!	#DIV/0!	55.99	58.52	73.59	68.18
Tues.	14-Aug				#DIV/0!	310.00	440.00	690.00	480.00
5 smpl. Log Value		#NUM!	#NUM!	#NUM!	#DIV/0!	2.00	2.03	2.11	2.08
5 smpl. Geo. Mean		#NUM!	#NUM!	#NUM!	#DIV/0!	98.93	106.54	127.62	120.35
Wed.	15-Aug				#DIV/0!	270.00	150.00	110.00	176.67
5 smpl. Log Value		#NUM!	#NUM!	#NUM!	#DIV/0!	1.92	1.86	1.94	1.95
5 smpl. Geo. Mean		#NUM!	#NUM!	#NUM!	#DIV/0!	82.99	72.90	87.40	89.12
Thur.	16-Aug				#DIV/0!	1.00	7.00	4.00	4.00
5 smpl. Log Value		#NUM!	#NUM!	#NUM!	#DIV/0!	1.68	1.82	1.89	1.86
5 smpl. Geo. Mean		#NUM!	#NUM!	#NUM!	#DIV/0!	47.67	65.45	78.15	71.95

BLUE MARSH BEACH BACTERIA DATA



Fri.	17-Aug				#DIV/0!	1.00	3.00	3.00	2.33
	5 smpl. Log Value	#NUM!	#NUM!	#NUM!	#DIV/0!	1.52	1.77	1.87	1.79
	5 smpl. Geo. Mean	#NUM!	#NUM!	#NUM!	#DIV/0!	33.31	59.10	73.78	61.78
Mon.	20-Aug				#DIV/0!	7.00	2.00	6.00	5.00
	5 smpl. Log Value	#NUM!	#NUM!	#NUM!	#DIV/0!	1.15	1.29	1.35	1.32
	5 smpl. Geo. Mean	#NUM!	#NUM!	#NUM!	#DIV/0!	14.24	19.43	22.26	20.87
Thur.	23-Aug				#DIV/0!	17.00	9.00	12.00	12.67
	5 smpl. Log Value	#NUM!	#NUM!	#NUM!	#DIV/0!	0.90	0.95	1.00	1.00
	5 smpl. Geo. Mean	#NUM!	#NUM!	#NUM!	#DIV/0!	7.97	8.93	9.90	10.09
Mon.	27-Aug				#DIV/0!	7.00	6.00	6.00	6.33
	5 smpl. Log Value	#NUM!	#NUM!	#NUM!	#DIV/0!	0.58	0.67	0.74	0.71
	5 smpl. Geo. Mean	#NUM!	#NUM!	#NUM!	#DIV/0!	3.84	4.69	5.53	5.18
Thur.	30-Aug				#DIV/0!	16.00	81.00	2.00	33.00
	5 smpl. Log Value	#NUM!	#NUM!	#NUM!	#DIV/0!	0.82	0.88	0.68	0.90
	5 smpl. Geo. Mean	#NUM!	#NUM!	#NUM!	#DIV/0!	6.68	7.65	4.82	7.91
Thur.					#DIV/0!				#DIV/0!
	5 smpl. Log Value	#NUM!	#NUM!	#NUM!	#DIV/0!	#NUM!	#NUM!	#NUM!	#DIV/0!
	5 smpl. Geo. Mean	#NUM!	#NUM!	#NUM!	#DIV/0!	#NUM!	#NUM!	#NUM!	#DIV/0!
Fri.					#DIV/0!				#DIV/0!
	5 smpl. Log Value	#NUM!	#NUM!	#NUM!	#DIV/0!	#NUM!	#NUM!	#NUM!	#DIV/0!
	5 smpl. Geo. Mean	#NUM!	#NUM!	#NUM!	#DIV/0!	#NUM!	#NUM!	#NUM!	#DIV/0!
Sat.					#DIV/0!				#DIV/0!
	5 smpl. Log Value	#NUM!	#NUM!	#NUM!	#DIV/0!	#NUM!	#NUM!	#NUM!	#DIV/0!
	5 smpl. Geo. Mean	#NUM!	#NUM!	#NUM!	#DIV/0!	#NUM!	#NUM!	#NUM!	#DIV/0!
Sun.					#DIV/0!				#DIV/0!
	5 smpl. Log Value	#NUM!	#NUM!	#NUM!	#DIV/0!	#NUM!	#NUM!	#NUM!	#DIV/0!
	5 smpl. Geo. Mean	#NUM!	#NUM!	#NUM!	#DIV/0!	#NUM!	#NUM!	#NUM!	#DIV/0!
Tues.					#DIV/0!				#DIV/0!
	5 smpl. Log Value	#NUM!	#NUM!	#NUM!	#DIV/0!	#NUM!	#NUM!	#NUM!	#DIV/0!
	5 smpl. Geo. Mean	#NUM!	#NUM!	#NUM!	#DIV/0!	#NUM!	#NUM!	#NUM!	#DIV/0!
Thur.					#DIV/0!				#DIV/0!
	5 smpl. Log Value	#NUM!	#NUM!	#NUM!	#DIV/0!	#NUM!	#NUM!	#NUM!	#DIV/0!
	5 smpl. Geo. Mean	#NUM!	#NUM!	#NUM!	#DIV/0!	#NUM!	#NUM!	#NUM!	#DIV/0!
					#DIV/0!				#DIV/0!

BLUE MARSH BEACH BACTERIA DATA

# **APPENDIX C**

## **LABORATORY CUSTODY SHEETS**

The results set forth herein are provided by SGS North America Inc.

*e-Hardcopy 2.0*  
*Automated Report*

## Technical Report for

**USACE-Philadelphia District**

**Philadelphia District, Reservoir Sampling**

**W25PHS81145379**

**SGS Job Number: JC68775**

**Sampling Date: 06/26/18**



### Report to:

**Army Corps of Engineers**


**joseph.m.loeper@usace.army.mil**

**ATTN: Joseph Loeper**

**Total number of pages in report: 71**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

  
**A. Paul Ioannidis**  
**General Manager**

**Client Service contact: Tammy McCloskey 732-329-0200**

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA, RI, SC, TX, UT, VA, WV, DoD ELAP (ANAB L2248)

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Test results relate only to samples analyzed.

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## Sample Summary

USACE-Philadelphia District

Job No: JC68775

Philadelphia District, Reservoir Sampling  
Project No: W25PHS81145379

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
JC68775-1	06/26/18	01:15 GW	06/26/18	AQ	Surface Water	BM-1S
JC68775-1F	06/26/18	01:15 GW	06/26/18	AQ	Surface H2O Filtered	BM-1S
JC68775-2	06/26/18	09:01 GW	06/26/18	AQ	Surface Water	BM-2S
JC68775-2F	06/26/18	09:01 GW	06/26/18	AQ	Surface H2O Filtered	BM-2S
JC68775-3	06/26/18	09:01 GW	06/26/18	AQ	Surface Water	BM-2M
JC68775-3F	06/26/18	09:01 GW	06/26/18	AQ	Surface H2O Filtered	BM-2M
JC68775-4	06/26/18	09:01 GW	06/26/18	AQ	Surface Water	BM-2D
JC68775-4F	06/26/18	09:01 GW	06/26/18	AQ	Surface H2O Filtered	BM-2D
JC68775-5	06/26/18	12:15 GW	06/26/18	AQ	Surface Water	BM-5S
JC68775-5F	06/26/18	12:15 GW	06/26/18	AQ	Surface H2O Filtered	BM-5S
JC68775-6	06/26/18	08:29 GW	06/26/18	AQ	Surface Water	BM-6S
JC68775-6F	06/26/18	08:29 GW	06/26/18	AQ	Surface H2O Filtered	BM-6S
JC68775-7	06/26/18	08:29 GW	06/26/18	AQ	Surface Water	BM-6M

**Sample Summary**

(continued)

USACE-Philadelphia District

Job No: JC68775

Philadelphia District, Reservoir Sampling  
Project No: W25PHS81145379

Sample Number	Collected		Matrix Received	Code	Type	Client Sample ID
	Date	Time By				
JC68775-7F	06/26/18	08:29 GW	06/26/18	AQ	Surface H2O Filtered	BM-6M
JC68775-8	06/26/18	08:29 GW	06/26/18	AQ	Surface Water	BM-6D
JC68775-8F	06/26/18	08:29 GW	06/26/18	AQ	Surface H2O Filtered	BM-6D
JC68775-9	06/26/18	09:41 GW	06/26/18	AQ	Surface Water	BM-7S
JC68775-9F	06/26/18	09:41 GW	06/26/18	AQ	Surface H2O Filtered	BM-7S
JC68775-10	06/26/18	09:41 GW	06/26/18	AQ	Surface Water	BM-7M
JC68775-10F	06/26/18	09:41 GW	06/26/18	AQ	Surface H2O Filtered	BM-7M
JC68775-11	06/26/18	09:41 GW	06/26/18	AQ	Surface Water	BM-7D
JC68775-11F	06/26/18	09:41 GW	06/26/18	AQ	Surface H2O Filtered	BM-7D
JC68775-12	06/26/18	11:00 GW	06/26/18	AQ	Surface Water	BM-8S
JC68775-12F	06/26/18	11:00 GW	06/26/18	AQ	Surface H2O Filtered	BM-8S
JC68775-13	06/26/18	11:00 GW	06/26/18	AQ	Surface Water	BM-8M
JC68775-13F	06/26/18	11:00 GW	06/26/18	AQ	Surface H2O Filtered	BM-8M



## Sample Summary

(continued)

USACE-Philadelphia District

**Job No:** JC68775

Philadelphia District, Reservoir Sampling  
 Project No: W25PHS81145379

Sample Number	Collected		Matrix Received	Code	Type	Client Sample ID
	Date	Time By				
JC68775-14	06/26/18	11:00 GW	06/26/18	AQ	Surface Water	BM-8D
JC68775-14F	06/26/18	11:00 GW	06/26/18	AQ	Surface H2O Filtered	BM-8D
JC68775-15	06/26/18	10:15 GW	06/26/18	AQ	Surface Water	BM-9S
JC68775-15F	06/26/18	10:15 GW	06/26/18	AQ	Surface H2O Filtered	BM-9S
JC68775-16	06/26/18	10:15 GW	06/26/18	AQ	Surface Water	BM-9M
JC68775-16F	06/26/18	10:15 GW	06/26/18	AQ	Surface H2O Filtered	BM-9M
JC68775-17	06/26/18	10:15 GW	06/26/18	AQ	Surface Water	BM-9D
JC68775-17F	06/26/18	10:15 GW	06/26/18	AQ	Surface H2O Filtered	BM-9D
JC68775-18	06/26/18	10:43 GW	06/26/18	AQ	Surface Water	BM-10S
JC68775-18F	06/26/18	10:43 GW	06/26/18	AQ	Surface H2O Filtered	BM-10S
JC68775-19	06/26/18	10:43 GW	06/26/18	AQ	Surface Water	BM-10M
JC68775-19F	06/26/18	10:43 GW	06/26/18	AQ	Surface H2O Filtered	BM-10M
JC68775-20	06/26/18	10:43 GW	06/26/18	AQ	Surface Water	BM-10D





## Sample Summary

(continued)

USACE-Philadelphia District

**Job No:** JC68775

Philadelphia District, Reservoir Sampling

Project No: W25PHS81145379

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
JC68775-20F	06/26/18	10:43 GW	06/26/18	AQ	Surface H2O Filtered	BM-10D
JC68775-21	06/26/18	12:15 GW	06/26/18	AQ	Surface Water	BM-11S
JC68775-21F	06/26/18	12:15 GW	06/26/18	AQ	Surface H2O Filtered	BM-11S

## CASE NARRATIVE / CONFORMANCE SUMMARY

**Client:** USACE-Philadelphia District

**Job No** JC68775

**Site:** Philadelphia District, Reservoir Sampling

**Report Date** 7/10/2018 12:00:31 P

On 06/26/2018, 42 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at SGS North America Inc. at a maximum corrected temperature of 3.6 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. Job Number of JC68775 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Compounds qualified as out of range in the continuing calibration summary report are acceptable as per method requirements when there is a high bias but the sample result is non-detect.

### General Chemistry By Method EPA 351.2/LACHAT

**Matrix:** AQ **Batch ID:** GP14146

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68775-1DUP, JC68775-1MS were used as the QC samples for Nitrogen, Total Kjeldahl.

**Matrix:** AQ **Batch ID:** GP14240

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68775-16DUP, JC68775-16MS were used as the QC samples for Nitrogen, Total Kjeldahl.

### General Chemistry By Method EPA 353.2/LACHAT

**Matrix:** AQ **Batch ID:** GP14220

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68646-20DUP, JC68646-20MS were used as the QC samples for Nitrogen, Nitrate + Nitrite.

**Matrix:** AQ **Batch ID:** GP14221

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68775-18DUP, JC68775-18MS were used as the QC samples for Nitrogen, Nitrate + Nitrite.

## General Chemistry By Method EPA 365.3

**Matrix:** AQ                      **Batch ID:** GP14150

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68775-1DUP, JC68775-1MS were used as the QC samples for Phosphorus, Total.

**Matrix:** AQ                      **Batch ID:** GP14190

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68775-20DUP, JC68775-20MS were used as the QC samples for Phosphorus, Total.

**Matrix:** AQ                      **Batch ID:** GP14245

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68785-1DUP, JC68785-1MS were used as the QC samples for Phosphorus, Total.

## General Chemistry By Method EPA353.2/SM4500NO2B

**Matrix:** AQ **Batch ID:** R171012

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68775-19 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171013

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68775-20 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171020

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68775-1 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171021

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68775-2 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171022

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68775-3 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171023

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68775-18 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171024

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68775-4 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171025

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68775-5 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171026

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68775-6 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171027

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68775-7 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171028

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68775-8 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171029

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68775-9 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171030

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68775-10 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171031

- The data for EPA353.2/SM4500NO2B meets quality control requirements.

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## General Chemistry By Method EPA353.2/SM4500NO2B

**Matrix:** AQ                      **Batch ID:** R171031

- JC68775-11 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ                      **Batch ID:** R171032

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68775-12 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ                      **Batch ID:** R171033

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68775-13 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ                      **Batch ID:** R171034

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68775-14 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ                      **Batch ID:** R171035

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68775-15 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ                      **Batch ID:** R171036

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68775-16 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ                      **Batch ID:** R171037

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68775-17 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ                      **Batch ID:** R171039

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68775-21 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

## General Chemistry By Method SM2320 B-11

**Matrix:** AQ

**Batch ID:** GN82137

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68775-1DUP were used as the QC samples for Alkalinity, Total as CaCO<sub>3</sub>.
- JC68775-7 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC68775-3 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC68775-4 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC68775-9 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC68775-8 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC68775-6 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC68775-12 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC68775-11 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC68775-1 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC68775-2 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC68775-10 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC68775-5 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.

**Matrix:** AQ

**Batch ID:** GN82147

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68775-13DUP were used as the QC samples for Alkalinity, Total as CaCO<sub>3</sub>.
- JC68775-18 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC68775-19 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC68775-20 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC68775-21 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC68775-13 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC68775-17 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC68775-16 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC68775-15 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC68775-14 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.

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## General Chemistry By Method SM2540 C-11

**Matrix:** AQ **Batch ID:** GN82121

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68753-1DUP were used as the QC samples for Solids, Total Dissolved.

**Matrix:** AQ **Batch ID:** GN82171

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68876-3DUP were used as the QC samples for Solids, Total Dissolved.

**Matrix:** AQ **Batch ID:** GN82198

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68775-8DUP were used as the QC samples for Solids, Total Dissolved.

**Matrix:** AQ **Batch ID:** GN82231

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68840-6DUP were used as the QC samples for Solids, Total Dissolved.

## General Chemistry By Method SM2540 D-11

**Matrix:** AQ **Batch ID:** GN82104

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68775-1DUP were used as the QC samples for Solids, Total Suspended.
- JC68775-6 for Solids, Total Suspended: Reported sample aliquot obtained from filtration of 900 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.
- JC68775-2 for Solids, Total Suspended: Reported sample aliquot obtained from filtration of 800 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.
- JC68775-3 for Solids, Total Suspended: Reported sample aliquot obtained from filtration of 800 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.

**Matrix:** AQ **Batch ID:** GN82141

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68775-10DUP were used as the QC samples for Solids, Total Suspended.
- JC68775-10 for Solids, Total Suspended: Reported sample aliquot obtained from filtration of 500 mL of sample. Volume was reduced from 1 liter due to insufficient volume.

## General Chemistry By Method SM4500NH3 H-11LACHAT

**Matrix:** AQ **Batch ID:** GP14116

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68657-2DUP, JC68657-2MS, JC68657-2MSD were used as the QC samples for Nitrogen, Ammonia.

**Matrix:** AQ **Batch ID:** GP14117

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68775-15DUP, JC68775-15MS, JC68775-15MSD were used as the QC samples for Nitrogen, Ammonia.

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### General Chemistry By Method SM4500NO2 B-11

**Matrix:** AQ                      **Batch ID:** GN82010

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68775-1DUP, JC68775-1MS were used as the QC samples for Nitrogen, Nitrite.

**Matrix:** AQ                      **Batch ID:** GN82011

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68785-1DUP, JC68785-1MS were used as the QC samples for Nitrogen, Nitrite.

### General Chemistry By Method SM5210 B-11

**Matrix:** AQ                      **Batch ID:** GP14110

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68775-1DUP were used as the QC samples for BOD, 5 Day.

**Matrix:** AQ                      **Batch ID:** GP14111

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68775-21DUP were used as the QC samples for BOD, 5 Day.

### General Chemistry By Method SM5310 B-11

**Matrix:** AQ                      **Batch ID:** GP14235

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68775-21MS, JC68775-21MSD were used as the QC samples for Total Organic Carbon.

**Matrix:** AQ                      **Batch ID:** GP14236

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68775-2MS, JC68775-2MSD were used as the QC samples for Total Organic Carbon.

**Matrix:** AQ                      **Batch ID:** GP14237

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68775-15MS, JC68775-15MSD were used as the QC samples for Total Organic Carbon.



## General Chemistry By Method SM9222 B-97

**Matrix:** AQ**Batch ID:** MB5287

- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68775-21DUP were used as the QC samples for Coliform, Total.
- JC68775-15 for Coliform, Total: Analysis done out of holding time.
- JC68775-2 for Coliform, Total: Analysis done out of holding time.
- JC68775-1 for Coliform, Total: Analysis done out of holding time.
- JC68775-12 for Coliform, Total: Analysis done out of holding time.
- JC68775-18 for Coliform, Total: Analysis done out of holding time.
- JC68775-21 for Coliform, Total: Analysis done out of holding time.
- JC68775-5 for Coliform, Total: Analysis done out of holding time.
- JC68775-9 for Coliform, Total: Analysis done out of holding time.
- JC68775-6 for Coliform, Total: Analysis done out of holding time.

## General Chemistry By Method SM9222 D-06

**Matrix:** AQ**Batch ID:** MB5288

- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68775-21DUP were used as the QC samples for Coliform, Fecal.
- JC68775-6 for Coliform, Fecal: Analysis done out of holding time.
- JC68775-2 for Coliform, Fecal: Analysis done out of holding time.
- JC68775-1 for Coliform, Fecal: Analysis done out of holding time.
- JC68775-18 for Coliform, Fecal: Analysis done out of holding time.
- JC68775-9 for Coliform, Fecal: Analysis done out of holding time.
- JC68775-12 for Coliform, Fecal: Analysis done out of holding time.
- JC68775-15 for Coliform, Fecal: Analysis done out of holding time.
- JC68775-21 for Coliform, Fecal: Analysis done out of holding time.
- JC68775-5 for Coliform, Fecal: Analysis done out of holding time.

SGS North America Inc. certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting the Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

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## Summary of Hits

**Job Number:** JC68775  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 06/26/18



Lab Sample ID	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
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### JC68775-1 BM-1S

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	127	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal <sup>b</sup>	10	2	<sup>c</sup>	col/100ml	SM9222 D-06
Coliform, Total <sup>b</sup>	155	10	<sup>c</sup>	col/100ml	SM9222 B-97
Nitrogen, Ammonia	0.20	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	5.2	0.21	0.21	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	5.2	0.20	0.20	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.027	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.52	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	150	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	3.8 J	4.0	1.0	mg/l	SM2540 D-11
Total Organic Carbon	2.8	1.0	1.0	mg/l	SM5310 B-11

### JC68775-1F BM-1S

No hits reported in this sample.

### JC68775-2 BM-2S

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	105	5.0	4.0	mg/l	SM2320 B-11
Coliform, Total <sup>b</sup>	4	2	<sup>c</sup>	col/100ml	SM9222 B-97
Nitrogen, Nitrate <sup>d</sup>	4.0	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.0	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.016	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.73	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	145	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended <sup>e</sup>	4.6	4.0	1.0	mg/l	SM2540 D-11
Total Organic Carbon	3.4	1.0	1.0	mg/l	SM5310 B-11

### JC68775-2F BM-2S

Phosphorus, Total	0.12	0.050	0.050	mg/l	EPA 365.3
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### JC68775-3 BM-2M

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	128	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate <sup>d</sup>	5.7	0.31	0.31	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	5.7	0.30	0.30	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.023	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.43	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	245	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended <sup>e</sup>	4.9	4.0	1.0	mg/l	SM2540 D-11
Total Organic Carbon	2.4	1.0	1.0	mg/l	SM5310 B-11

## Summary of Hits

**Job Number:** JC68775  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 06/26/18



Lab Sample ID	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
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**JC68775-3F BM-2M**

No hits reported in this sample.

**JC68775-4 BM-2D**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	126	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Ammonia	0.25	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	4.5	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.6	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.066	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.58	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	5.0 J	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	6.0	4.0	1.0	mg/l	SM2540 D-11
Total Organic Carbon	2.4	1.0	1.0	mg/l	SM5310 B-11

**JC68775-4F BM-2D**

Phosphorus, Total	0.15	0.050	0.050	mg/l	EPA 365.3
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**JC68775-5 BM-5S**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	187	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal <sup>b</sup>	540	10	<sup>c</sup>	col/100ml	SM9222 D-06
Coliform, Total <sup>b</sup>	4200	100	<sup>c</sup>	col/100ml	SM9222 B-97
Nitrogen, Nitrate <sup>d</sup>	8.8	0.41	0.41	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	8.8	0.40	0.40	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.011	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.32	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total	0.056	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved	155	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	10.6	4.0	1.0	mg/l	SM2540 D-11
Total Organic Carbon	1.1	1.0	1.0	mg/l	SM5310 B-11

**JC68775-5F BM-5S**

No hits reported in this sample.

**JC68775-6 BM-6S**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	98.3	5.0	4.0	mg/l	SM2320 B-11
Coliform, Total <sup>b</sup>	18.3	10	<sup>c</sup>	col/100ml	SM9222 B-97
Nitrogen, Nitrate <sup>d</sup>	4.0	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.0	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.027	0.010	0.0050	mg/l	SM4500NO2 B-11

## Summary of Hits

**Job Number:** JC68775  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 06/26/18



Lab Sample ID	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
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Nitrogen, Total Kjeldahl		0.70	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		100	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended <sup>f</sup>		3.8 J	4.0	1.0	mg/l	SM2540 D-11
Total Organic Carbon		2.6	1.0	1.0	mg/l	SM5310 B-11

### JC68775-6F BM-6S

No hits reported in this sample.

### JC68775-7 BM-6M

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	124	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate <sup>d</sup>	5.9	0.31	0.31	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	5.9	0.30	0.30	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.030	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.64	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	100	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	2.4 J	4.0	1.0	mg/l	SM2540 D-11
Total Organic Carbon	1.9	1.0	1.0	mg/l	SM5310 B-11

### JC68775-7F BM-6M

No hits reported in this sample.

### JC68775-8 BM-6D

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	106	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Ammonia	0.86	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	4.6	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.6	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.047	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.80	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total	0.10	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved	210	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	29.3	4.0	1.0	mg/l	SM2540 D-11
Total Organic Carbon	2.3	1.0	1.0	mg/l	SM5310 B-11

### JC68775-8F BM-6D

Phosphorus, Total	0.099	0.050	0.050	mg/l	EPA 365.3
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### JC68775-9 BM-7S

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	84.8	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal <sup>b</sup>	2	2	<sup>c</sup>	col/100ml	SM9222 D-06

## Summary of Hits

**Job Number:** JC68775  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 06/26/18



Lab Sample ID	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
Coliform, Total <sup>b</sup>		12	2	<sup>c</sup>	col/100ml	SM9222 B-97
Nitrogen, Nitrate <sup>d</sup>		4.3	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		4.3	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite		0.022	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl		0.57	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		197	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		5.5	4.0	1.0	mg/l	SM2540 D-11
Total Organic Carbon		2.2	1.0	1.0	mg/l	SM5310 B-11

### JC68775-9F BM-7S

No hits reported in this sample.

### JC68775-10 BM-7M

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	125	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Ammonia	0.20	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	5.5	0.21	0.21	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	5.5	0.20	0.20	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.040	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.53	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	56.7	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended <sup>g</sup>	4.0	4.0	1.0	mg/l	SM2540 D-11
Total Organic Carbon	1.5	1.0	1.0	mg/l	SM5310 B-11

### JC68775-10F BM-7M

No hits reported in this sample.

### JC68775-11 BM-7D

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	157	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Ammonia	0.25	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	6.0	0.31	0.31	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	6.0	0.30	0.30	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.041	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.55	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	258	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	9.4	4.0	1.0	mg/l	SM2540 D-11
Total Organic Carbon	1.8	1.0	1.0	mg/l	SM5310 B-11

### JC68775-11F BM-7D

No hits reported in this sample.

## Summary of Hits

**Job Number:** JC68775  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 06/26/18



Lab Sample ID	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
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**JC68775-12 BM-8S**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	81.1	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate <sup>d</sup>	4.3	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.3	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.022	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.63	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	203	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	3.0 J	4.0	1.0	mg/l	SM2540 D-11
Total Organic Carbon	2.2	1.0	1.0	mg/l	SM5310 B-11

**JC68775-12F BM-8S**

No hits reported in this sample.

**JC68775-13 BM-8M**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	98.3	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate <sup>d</sup>	3.7	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	3.7	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.016	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.62	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	127	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	19.3	4.0	1.0	mg/l	SM2540 D-11
Total Organic Carbon	1.7	1.0	1.0	mg/l	SM5310 B-11

**JC68775-13F BM-8M**

No hits reported in this sample.

**JC68775-14 BM-8D**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	115	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Ammonia	0.22	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	4.0	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.0	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.018	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.59	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	140	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	46.5	4.0	1.0	mg/l	SM2540 D-11
Total Organic Carbon	1.9	1.0	1.0	mg/l	SM5310 B-11

**JC68775-14F BM-8D**

No hits reported in this sample.

## Summary of Hits

**Job Number:** JC68775  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 06/26/18



Lab Sample ID	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
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**JC68775-15 BM-9S**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	85.3	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal <sup>b</sup>	2	2	<sup>c</sup>	col/100ml	SM9222 D-06
Coliform, Total <sup>b</sup>	25	10	<sup>c</sup>	col/100ml	SM9222 B-97
Nitrogen, Nitrate <sup>d</sup>	4.4	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.4	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.024	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.67	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	82.5	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	3.9 J	4.0	1.0	mg/l	SM2540 D-11
Total Organic Carbon	2.3	1.0	1.0	mg/l	SM5310 B-11

**JC68775-15F BM-9S**

No hits reported in this sample.

**JC68775-16 BM-9M**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	136	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate <sup>d</sup>	6.2	0.31	0.31	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	6.2	0.30	0.30	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.031	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.74	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	246	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	6.4	4.0	1.0	mg/l	SM2540 D-11
Total Organic Carbon	2.0	1.0	1.0	mg/l	SM5310 B-11

**JC68775-16F BM-9M**

No hits reported in this sample.

**JC68775-17 BM-9D**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	144	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Ammonia	0.25	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	5.4	0.21	0.21	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	5.4	0.20	0.20	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.028	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.99	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	223	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	25.5	4.0	1.0	mg/l	SM2540 D-11
Total Organic Carbon	2.9	1.0	1.0	mg/l	SM5310 B-11

## Summary of Hits

**Job Number:** JC68775  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 06/26/18



Lab Sample ID	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
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**JC68775-17F BM-9D**

No hits reported in this sample.

**JC68775-18 BM-10S**

Alkalinity, Total as CaCO3 <sup>a</sup>	94.1	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal <sup>b</sup>	50	10	c	col/100ml	SM9222 D-06
Coliform, Total <sup>b</sup>	23.3	10	c	col/100ml	SM9222 B-97
Nitrogen, Nitrate <sup>d</sup>	4.6	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.6	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.019	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.80	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	33.3	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	6.5	4.0	1.0	mg/l	SM2540 D-11
Total Organic Carbon	2.8	1.0	1.0	mg/l	SM5310 B-11

**JC68775-18F BM-10S**

No hits reported in this sample.

**JC68775-19 BM-10M**

Alkalinity, Total as CaCO3 <sup>a</sup>	133	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate <sup>d</sup>	6.3	0.31	0.31	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	6.3	0.30	0.30	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.014	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.79	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	227	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	17.6	4.0	1.0	mg/l	SM2540 D-11
Total Organic Carbon	2.2	1.0	1.0	mg/l	SM5310 B-11

**JC68775-19F BM-10M**

No hits reported in this sample.

**JC68775-20 BM-10D**

Alkalinity, Total as CaCO3 <sup>a</sup>	154	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Ammonia	0.21	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	6.4	0.31	0.31	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	6.4	0.30	0.30	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.023	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	1.3	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	96.0	10	4.0	mg/l	SM2540 C-11



## Summary of Hits

**Job Number:** JC68775  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 06/26/18



Lab Sample ID	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
Solids, Total Suspended		92.5	4.0	1.0	mg/l	SM2540 D-11
Total Organic Carbon		2.1	1.0	1.0	mg/l	SM5310 B-11

**JC68775-20F BM-10D**

No hits reported in this sample.

**JC68775-21 BM-11S**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	67.1	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal <sup>b</sup>	520	10	<sup>c</sup>	col/100ml	SM9222 D-06
Coliform, Total <sup>b</sup>	6000	100	<sup>c</sup>	col/100ml	SM9222 B-97
Nitrogen, Nitrate <sup>d</sup>	4.4	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.4	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl	0.40	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	57.5	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	9.9	4.0	1.0	mg/l	SM2540 D-11
Total Organic Carbon	2.0	1.0	1.0	mg/l	SM5310 B-11

**JC68775-21F BM-11S**

No hits reported in this sample.

- (a) Sample was titrated to a final pH of 4.5.
- (b) Analysis done out of holding time.
- (c) Value reported is laboratory DL (MDL).
- (d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)
- (e) Reported sample aliquot obtained from filtration of 800 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.
- (f) Reported sample aliquot obtained from filtration of 900 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.
- (g) Reported sample aliquot obtained from filtration of 500 mL of sample. Volume was reduced from 1 liter due to insufficient volume.

Sample Results

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Report of Analysis

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## Report of Analysis

<b>Client Sample ID:</b> BM-1S	<b>Date Sampled:</b> 06/26/18
<b>Lab Sample ID:</b> JC68775-1F	<b>Date Received:</b> 06/26/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/05/18 17:08 LS	EPA	365.3

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ



## Report of Analysis

<b>Client Sample ID:</b> BM-2S		<b>Date Sampled:</b> 06/26/18
<b>Lab Sample ID:</b> JC68775-2F		<b>Date Received:</b> 06/26/18
<b>Matrix:</b> AQ - Surface H2O Filtered		<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling		

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.12	0.050	0.050	mg/l	1	07/05/18 17:08 LS		EPA 365.3

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ

## Report of Analysis

<b>Client Sample ID:</b> BM-2M		<b>Date Sampled:</b> 06/26/18
<b>Lab Sample ID:</b> JC68775-3		<b>Date Received:</b> 06/26/18
<b>Matrix:</b> AQ - Surface Water		<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling		

4.5  
4

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	128	5.0	4.0	mg/l	1	06/29/18 11:07 CD	SM2320	B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	mg/l	1	06/27/18 20:38 SA	SM5210	B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	06/28/18 15:15 BM	SM4500NH3	H-11/LACHAT
Nitrogen, Nitrate <sup>c</sup>	5.7	0.31	0.31	mg/l	1	07/03/18 13:36 BM	EPA353.2/SM4500NO2B	
Nitrogen, Nitrate + Nitrite	5.7	0.30	0.30	mg/l	3	07/03/18 13:36 BM	EPA 353.2/LACHAT	
Nitrogen, Nitrite	0.023	0.010	0.0050	mg/l	1	06/26/18 19:40 LS	SM4500NO2	B-11
Nitrogen, Total Kjeldahl	0.43	0.20	0.15	mg/l	1	07/02/18 10:30 BM	EPA 351.2/LACHAT	
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/03/18 15:45 LS	EPA 365.3	
Solids, Total Dissolved	245	10	4.0	mg/l	1	06/29/18 11:00 RC	SM2540	C-11
Solids, Total Suspended <sup>d</sup>	4.9	4.0	1.0	mg/l	1	06/28/18 12:49 RC	SM2540	D-11
Total Organic Carbon	2.4	1.0	1.0	mg/l	1	07/03/18 20:04 JO	SM5310	B-11

(a) Sample was titrated to a final pH of 4.5.

(b) Value reported is laboratory DL (MDL).

(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

(d) Reported sample aliquot obtained from filtration of 800 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ

## Report of Analysis

<b>Client Sample ID:</b> BM-2M		<b>Date Sampled:</b> 06/26/18
<b>Lab Sample ID:</b> JC68775-3F		<b>Date Received:</b> 06/26/18
<b>Matrix:</b> AQ - Surface H2O Filtered		<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling		

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/05/18 17:08 LS	EPA	365.3

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ



# Report of Analysis

<b>Client Sample ID:</b> BM-2D		<b>Date Sampled:</b> 06/26/18
<b>Lab Sample ID:</b> JC68775-4		<b>Date Received:</b> 06/26/18
<b>Matrix:</b> AQ - Surface Water		<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling		

4.7  
4

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 <sup>a</sup>	126	5.0	4.0	mg/l	1	06/29/18 11:07	CD	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	mg/l	1	06/27/18 20:40	SA	SM5210 B-11
Nitrogen, Ammonia	0.25	0.20	0.20	mg/l	1	06/28/18 15:17	BM	SM4500NH3 H-11LCHAT
Nitrogen, Nitrate <sup>c</sup>	4.5	0.11	0.11	mg/l	1	07/03/18 12:56	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.6	0.10	0.10	mg/l	1	07/03/18 12:56	BM	EPA 353.2/LCHAT
Nitrogen, Nitrite	0.066	0.010	0.0050	mg/l	1	06/26/18 19:40	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.58	0.20	0.15	mg/l	1	07/02/18 10:31	BM	EPA 351.2/LCHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/03/18 15:45	LS	EPA 365.3
Solids, Total Dissolved	5.0 J	10	4.0	mg/l	1	06/29/18 11:00	RC	SM2540 C-11
Solids, Total Suspended	6.0	4.0	1.0	mg/l	1	06/28/18 12:49	RC	SM2540 D-11
Total Organic Carbon	2.4	1.0	1.0	mg/l	1	07/03/18 20:15	JO	SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation U = Indicates a result < LOD  
 LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ

## Report of Analysis

<b>Client Sample ID:</b> BM-2D		<b>Date Sampled:</b> 06/26/18
<b>Lab Sample ID:</b> JC68775-4F		<b>Date Received:</b> 06/26/18
<b>Matrix:</b> AQ - Surface H2O Filtered		<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling		

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.15	0.050	0.050	mg/l	1	07/05/18 17:08 LS		EPA 365.3

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ





## Report of Analysis

<b>Client Sample ID:</b> BM-6S	<b>Date Sampled:</b> 06/26/18
<b>Lab Sample ID:</b> JC68775-6	<b>Date Received:</b> 06/26/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	98.3	5.0	4.0	mg/l	1	06/29/18 11:07 CD	SM2320	B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	mg/l	1	06/27/18 20:43 SA	SM5210	B-11
Coliform, Fecal <sup>c</sup>	0 J	2		col/100ml	1	06/26/18 19:05 SA	SM9222	D-06
Coliform, Total <sup>c</sup>	18.3	10		col/100ml	10	06/26/18 19:01 SA	SM9222	B-97
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	06/28/18 15:23 BM	SM4500NH3	H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	4.0	0.11	0.11	mg/l	1	07/03/18 13:01 BM	EPA353.2/SM4500NO2B	
Nitrogen, Nitrate + Nitrite	4.0	0.10	0.10	mg/l	1	07/03/18 13:01 BM	EPA 353.2/LACHAT	
Nitrogen, Nitrite	0.027	0.010	0.0050	mg/l	1	06/26/18 19:40 LS	SM4500NO2	B-11
Nitrogen, Total Kjeldahl	0.70	0.20	0.15	mg/l	1	07/02/18 10:33 BM	EPA 351.2/LACHAT	
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/03/18 15:50 LS	EPA 365.3	
Solids, Total Dissolved	100	10	4.0	mg/l	1	06/29/18 16:16 RC	SM2540	C-11
Solids, Total Suspended <sup>e</sup>	3.8 J	4.0	1.0	mg/l	1	06/28/18 12:49 RC	SM2540	D-11
Total Organic Carbon	2.6	1.0	1.0	mg/l	1	07/03/18 21:01 JO	SM5310	B-11

(a) Sample was titrated to a final pH of 4.5.

(b) Value reported is laboratory DL (MDL).

(c) Analysis done out of holding time.

(d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

(e) Reported sample aliquot obtained from filtration of 900 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ

## Report of Analysis

<b>Client Sample ID:</b> BM-6S		<b>Date Sampled:</b> 06/26/18
<b>Lab Sample ID:</b> JC68775-6F		<b>Date Received:</b> 06/26/18
<b>Matrix:</b> AQ - Surface H2O Filtered		<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling		

4.12  
4

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/05/18 17:25 LS		EPA 365.3

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ

### Report of Analysis

<b>Client Sample ID:</b> BM-6M	<b>Date Sampled:</b> 06/26/18
<b>Lab Sample ID:</b> JC68775-7	<b>Date Received:</b> 06/26/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

4.13  
4

**General Chemistry**

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 <sup>a</sup>	124	5.0	4.0	mg/l	1	06/29/18 11:21 CD	SM2320	B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	mg/l	1	06/27/18 20:45 SA	SM5210	B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	06/28/18 15:24 BM	SM4500NH3 H-11	LACHAT
Nitrogen, Nitrate <sup>c</sup>	5.9	0.31	0.31	mg/l	1	07/03/18 13:38 BM	EPA353.2/SM4500NO2B	
Nitrogen, Nitrate + Nitrite	5.9	0.30	0.30	mg/l	3	07/03/18 13:38 BM	EPA 353.2/LACHAT	
Nitrogen, Nitrite	0.030	0.010	0.0050	mg/l	1	06/26/18 19:55 LS	SM4500NO2	B-11
Nitrogen, Total Kjeldahl	0.64	0.20	0.15	mg/l	1	07/02/18 10:35 BM	EPA 351.2/LACHAT	
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/03/18 15:50 LS	EPA 365.3	
Solids, Total Dissolved	100	10	4.0	mg/l	1	06/29/18 16:16 RC	SM2540	C-11
Solids, Total Suspended	2.4 J	4.0	1.0	mg/l	1	06/28/18 12:49 RC	SM2540	D-11
Total Organic Carbon	1.9	1.0	1.0	mg/l	1	07/03/18 21:13 JO	SM5310	B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation U = Indicates a result < LOD  
 LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ

## Report of Analysis

<b>Client Sample ID:</b> BM-6M	<b>Date Sampled:</b> 06/26/18
<b>Lab Sample ID:</b> JC68775-7F	<b>Date Received:</b> 06/26/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/05/18 17:25 LS	EPA	365.3

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ





## Report of Analysis

<b>Client Sample ID:</b> BM-6D	<b>Date Sampled:</b> 06/26/18
<b>Lab Sample ID:</b> JC68775-8F	<b>Date Received:</b> 06/26/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.099	0.050	0.050	mg/l	1	07/05/18 17:25 LS	EPA	365.3

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ



## Report of Analysis

<b>Client Sample ID:</b> BM-7S		<b>Date Sampled:</b> 06/26/18
<b>Lab Sample ID:</b> JC68775-9F		<b>Date Received:</b> 06/26/18
<b>Matrix:</b> AQ - Surface H2O Filtered		<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling		

4.18  
4

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/05/18 17:25 LS	EPA	365.3

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ

## Report of Analysis

<b>Client Sample ID:</b> BM-7M		<b>Date Sampled:</b> 06/26/18
<b>Lab Sample ID:</b> JC68775-10		<b>Date Received:</b> 06/26/18
<b>Matrix:</b> AQ - Surface Water		<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling		

4.19  
4

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	125	5.0	4.0	mg/l	1	06/29/18 11:21 CD	SM2320	B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	mg/l	1	06/27/18 20:51 SA	SM5210	B-11
Nitrogen, Ammonia	0.20	0.20	0.20	mg/l	1	06/28/18 15:38 BM	SM4500NH3	H-11/LACHAT
Nitrogen, Nitrate <sup>c</sup>	5.5	0.21	0.21	mg/l	1	07/03/18 13:41 BM	EPA353.2/SM4500NO2B	
Nitrogen, Nitrate + Nitrite	5.5	0.20	0.20	mg/l	2	07/03/18 13:41 BM	EPA 353.2/LACHAT	
Nitrogen, Nitrite	0.040	0.010	0.0050	mg/l	1	06/26/18 19:55 LS	SM4500NO2	B-11
Nitrogen, Total Kjeldahl	0.53	0.20	0.15	mg/l	1	07/02/18 10:38 BM	EPA 351.2/LACHAT	
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/03/18 15:50 LS	EPA 365.3	
Solids, Total Dissolved	56.7	10	4.0	mg/l	1	06/30/18 08:40 RC	SM2540	C-11
Solids, Total Suspended <sup>d</sup>	4.0	4.0	1.0	mg/l	1	06/29/18 12:20 RC	SM2540	D-11
Total Organic Carbon	1.5	1.0	1.0	mg/l	1	07/03/18 21:46 JO	SM5310	B-11

(a) Sample was titrated to a final pH of 4.5.

(b) Value reported is laboratory DL (MDL).

(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

(d) Reported sample aliquot obtained from filtration of 500 mL of sample. Volume was reduced from 1 liter due to insufficient volume.

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ

## Report of Analysis

<b>Client Sample ID:</b> BM-7M	<b>Date Sampled:</b> 06/26/18
<b>Lab Sample ID:</b> JC68775-10F	<b>Date Received:</b> 06/26/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/05/18 17:25 LS	EPA	365.3

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ



## Report of Analysis

<b>Client Sample ID:</b> BM-7D	<b>Date Sampled:</b> 06/26/18
<b>Lab Sample ID:</b> JC68775-11F	<b>Date Received:</b> 06/26/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/05/18 17:25 LS	EPA	365.3

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ





## Report of Analysis

<b>Client Sample ID:</b> BM-8S		<b>Date Sampled:</b> 06/26/18
<b>Lab Sample ID:</b> JC68775-12F		<b>Date Received:</b> 06/26/18
<b>Matrix:</b> AQ - Surface H2O Filtered		<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling		

4.24  
4

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/05/18 17:25 LS	EPA	365.3

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ

### Report of Analysis

<b>Client Sample ID:</b> BM-8M	<b>Date Sampled:</b> 06/26/18
<b>Lab Sample ID:</b> JC68775-13	<b>Date Received:</b> 06/26/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

4.25  
4

**General Chemistry**

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	98.3	5.0	4.0	mg/l	1	06/29/18 11:38 CD	SM2320	B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	mg/l	1	06/27/18 20:57 SA	SM5210	B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	06/28/18 15:43 BM	SM4500NH3 H-11	LACHAT
Nitrogen, Nitrate <sup>c</sup>	3.7	0.11	0.11	mg/l	1	07/03/18 13:09 BM	EPA353.2/SM4500NO2B	
Nitrogen, Nitrate + Nitrite	3.7	0.10	0.10	mg/l	1	07/03/18 13:09 BM	EPA 353.2/LACHAT	
Nitrogen, Nitrite	0.016	0.010	0.0050	mg/l	1	06/26/18 19:55 LS	SM4500NO2	B-11
Nitrogen, Total Kjeldahl	0.62	0.20	0.15	mg/l	1	07/02/18 10:40 BM	EPA 351.2/LACHAT	
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/03/18 15:50 LS	EPA 365.3	
Solids, Total Dissolved	127	10	4.0	mg/l	1	06/30/18 08:40 RC	SM2540	C-11
Solids, Total Suspended	19.3	4.0	1.0	mg/l	1	06/29/18 12:20 RC	SM2540	D-11
Total Organic Carbon	1.7	1.0	1.0	mg/l	1	07/03/18 23:16 JO	SM5310	B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation U = Indicates a result < LOD  
 LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ

## Report of Analysis

<b>Client Sample ID:</b> BM-8M		<b>Date Sampled:</b> 06/26/18
<b>Lab Sample ID:</b> JC68775-13F		<b>Date Received:</b> 06/26/18
<b>Matrix:</b> AQ - Surface H2O Filtered		<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling		

4.26  
4

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/05/18 17:25 LS		EPA 365.3

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ

### Report of Analysis

<b>Client Sample ID:</b> BM-8D	<b>Date Sampled:</b> 06/26/18
<b>Lab Sample ID:</b> JC68775-14	<b>Date Received:</b> 06/26/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

4.27  
4

**General Chemistry**

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 <sup>a</sup>	115	5.0	4.0	mg/l	1	06/29/18 11:38 CD	SM2320	B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	mg/l	1	06/27/18 20:59 SA	SM5210	B-11
Nitrogen, Ammonia	0.22	0.20	0.20	mg/l	1	06/28/18 15:44 BM	SM4500NH3 H-11	LACHAT
Nitrogen, Nitrate <sup>c</sup>	4.0	0.11	0.11	mg/l	1	07/03/18 13:10 BM	EPA353.2/SM4500NO2B	
Nitrogen, Nitrate + Nitrite	4.0	0.10	0.10	mg/l	1	07/03/18 13:10 BM	EPA 353.2/LACHAT	
Nitrogen, Nitrite	0.018	0.010	0.0050	mg/l	1	06/26/18 19:55 LS	SM4500NO2 B-11	
Nitrogen, Total Kjeldahl	0.59	0.20	0.15	mg/l	1	07/02/18 10:41 BM	EPA 351.2/LACHAT	
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/03/18 15:50 LS	EPA 365.3	
Solids, Total Dissolved	140	10	4.0	mg/l	1	06/30/18 08:40 RC	SM2540 C-11	
Solids, Total Suspended	46.5	4.0	1.0	mg/l	1	06/29/18 12:20 RC	SM2540 D-11	
Total Organic Carbon	1.9	1.0	1.0	mg/l	1	07/03/18 23:30 JO	SM5310 B-11	

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation U = Indicates a result < LOD  
 LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ

## Report of Analysis

<b>Client Sample ID:</b> BM-8D		<b>Date Sampled:</b> 06/26/18
<b>Lab Sample ID:</b> JC68775-14F		<b>Date Received:</b> 06/26/18
<b>Matrix:</b> AQ - Surface H2O Filtered		<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling		

4.28  
4

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/05/18 17:25 LS	EPA	365.3

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ









## Report of Analysis

<b>Client Sample ID:</b> BM-9M	<b>Date Sampled:</b> 06/26/18
<b>Lab Sample ID:</b> JC68775-16F	<b>Date Received:</b> 06/26/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/05/18 17:30 LS	EPA	365.3

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ







## Report of Analysis

<b>Client Sample ID:</b> BM-10S	<b>Date Sampled:</b> 06/26/18
<b>Lab Sample ID:</b> JC68775-18F	<b>Date Received:</b> 06/26/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/05/18 17:30 LS	EPA	365.3

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ



## Report of Analysis

<b>Client Sample ID:</b> BM-10M	<b>Date Sampled:</b> 06/26/18
<b>Lab Sample ID:</b> JC68775-19F	<b>Date Received:</b> 06/26/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/06/18 13:50 LS	EPA	365.3

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ





## Report of Analysis

<b>Client Sample ID:</b> BM-10D		<b>Date Sampled:</b> 06/26/18
<b>Lab Sample ID:</b> JC68775-20F		<b>Date Received:</b> 06/26/18
<b>Matrix:</b> AQ - Surface H2O Filtered		<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling		

4.40  
4

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/06/18 13:50 LS		EPA 365.3

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ



## Report of Analysis

<b>Client Sample ID:</b> BM-11S	<b>Date Sampled:</b> 06/26/18
<b>Lab Sample ID:</b> JC68775-21F	<b>Date Received:</b> 06/26/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/06/18 13:50 LS	EPA	365.3

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ

Misc. Forms

Custody Documents and Other Forms

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Includes the following where applicable:

- Chain of Custody

SW

## CHAIN OF CUSTODY

SGS North America Inc. - Dayton  
 2235 Route 130, Dayton, NJ 08810  
 TEL 732-329-0200 FAX 732-329-3499  
 www.sgs.com/ehsus

1/1/15  
 1/1/15

FED-EX Tracking #  
 SGS Quote #  
 Bottle Order Control # PD-061418-199  
 SGS Job # JC68775

Client / Reporting Information		Project Information		Requested Analysis (see TEST CODE sheet)												Matrix Codes				
Company Name <b>USACE - Phila. District</b>		Project Name <b>USACE - Blue Marsh Reservoir</b>		<b>AIK, AMM, BOD, XN03, TDS</b> <b>TSS, TOC, TN, TP, Y</b> <b>TCF, FCF</b> <b>Total Phosphorus (Asphoric)</b>												DW - Drinking Water GW - Ground Water W - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank				
Street Address <b>100 Penn Sq. East</b>		Street <b>1208 Palisades Dr.</b>																		
City, State, Zip <b>Phila. PA 19107</b>		City, State <b>Leesport PA</b>																		
Project Contact <b>Joe Looper - USACE</b>		Project # <b>#PD-061418-199</b>																		
Phone #		Client Purchase Order #																		
Sampler(s) Name(s) <b>Gregory Wacik</b>		Project Manager																		
Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection			Matrix	# of bottles	Number of preserved bottles												LAB USE ONLY
			Date	Time	Sampled by			HCl	NH <sub>4</sub>	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>2</sub>	None	DI Water	MEHQ	ENCORE				
1F	Bm-15		6/26/15	1:15	JS	SW	10	X	X	X	X	X	X	X	X	X	X			
2F	Bm-2S			9:01	JS	SW	10	X	X	X	X	X	X	X	X	X	X	B7		
3F	Bm-2M			9:01	JS	SW	8	X	X	X	X	X	X	X	X	X	X	C29		
4F	Bm-2D			9:01	JS	SW	8	X	X	X	X	X	X	X	X	X	X	GS472		
5F	Bm-5S			12:15	JS	SW	10	X	X	X	X	X	X	X	X	X	X	C37		
6F	Bm-6S			08:29	JS	SW	10	X	X	X	X	X	X	X	X	X	X	GS472		
7F	Bm-6M			08:29	JS	SW	8	X	X	X	X	X	X	X	X	X	X	9E1		
8F	Bm-6D			08:29	JS	SW	8	X	X	X	X	X	X	X	X	X	X	9E2		
9F	Bm-7S			09:41	JS	SW	10	X	X	X	X	X	X	X	X	X	X			
10F	Bm-7M			09:41	JS	SW	8	X	X	X	X	X	X	X	X	X	X			
11F	Bm-7D			09:41	JS	SW	8	X	X	X	X	X	X	X	X	X	X			
Turnaround Time (Business days)		Approved by (SGS Project Manager)/Date:		Data Deliverable Information												Comments / Special Instructions				
<input type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 3 Day RUSH <input type="checkbox"/> 2 Day RUSH <input type="checkbox"/> 1 Day RUSH <input type="checkbox"/> other				<input type="checkbox"/> Commercial "A" (Level 1) <input type="checkbox"/> NYASP Category A <input type="checkbox"/> Commercial "B" (Level 2) <input type="checkbox"/> NYASP Category B <input type="checkbox"/> FULLT1 (Level 3+4) <input type="checkbox"/> State Forms <input type="checkbox"/> NJ Reduced <input type="checkbox"/> EDD Format <input type="checkbox"/> Commercial "C" <input type="checkbox"/> Other <input type="checkbox"/> NJ Data of Known Quality Protocol Reporting												INITIAL ASSESSMENT <u>Hood</u>				
Emergency & Rush T/A data available via LabLink		Sample Custody must be documented below each time samples change possession, including courier delivery.		Commercial "A" = Results Only; Commercial "B" = Results + QC Summary NJ Reduced = Results + QC Summary + Partial Raw data												LABEL VERIFICATION Sample inventory is verified upon receipt in the Laboratory				
Relinquished to:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:	Date Time:	Received By:	Custody Seal #												On Ice <input type="checkbox"/> <input type="checkbox"/> Preserved where applicable In Intact <input type="checkbox"/> <input type="checkbox"/> Not intact
1	6/26/15 5:00	Chris Arsh	Chris Arsh	6/26/15 17:20	Chris Arsh	6/26/15	Chris Arsh													3 HCP 2 GCP 2 TGP 2 SGP 1 IGP 2 CIP
3																				
5																				

5.1  
 5



# SGS Sample Receipt Summary

**Job Number:** JC68775

**Client:** USACE-PHILADELPHIA DISTRICT

**Project:** PHILADELPHIA DISTRICT, RESERVOIR SAMPL

**Date / Time Received:** 6/26/2018 5:20:00 PM

**Delivery Method:** \_\_\_\_\_

**Airbill #s:** \_\_\_\_\_

**Cooler Temps (Raw Measured) °C:** Cooler 1: (3.4); Cooler 2: (3.6); Cooler 3: (2.7); Cooler 4: (2.2); Cooler 5: (2.5); Cooler 6: (2.1); Cooler 7: (3.2);

**Cooler Temps (Corrected) °C:** Cooler 1: (3.4); Cooler 2: (3.6); Cooler 3: (2.7); Cooler 4: (2.2); Cooler 5: (2.5); Cooler 6: (2.1); Cooler 7: (3.2);

<u>Cooler Security</u>	<u>Y or N</u>		<u>Y or N</u>	
1. Custody Seals Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/> <input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/> <input type="checkbox"/>

<u>Cooler Temperature</u>	<u>Y or N</u>	
1. Temp criteria achieved:	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Cooler temp verification:	IR Gun	
3. Cooler media:	Ice (Bag)	
4. No. Coolers:	7	

<u>Quality Control Preservation</u>	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
1. Trip Blank present / cooler:	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Trip Blank listed on COC:	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Samples preserved properly:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. VOCs headspace free:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

<u>Sample Integrity - Documentation</u>	<u>Y</u>	<u>or</u>	<u>N</u>
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Container labeling complete:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>		<input type="checkbox"/>

<u>Sample Integrity - Condition</u>	<u>Y</u>	<u>or</u>	<u>N</u>
1. Sample recvd within HT:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. All containers accounted for:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Condition of sample:	Intact		

<u>Sample Integrity - Instructions</u>	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
3. Sufficient volume recvd for analysis:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

Test Strip Lot #s:	pH 1-12: 216017	pH 12+ : 208717	Other: (Specify) _____
--------------------	-----------------	-----------------	------------------------

Comments

- 1) For all samples Total Diss LF Phosphorous was rec'd but not noted on COC. Per bottleorder, Filtration is needed and will be sent.
- 2) -1 Collection time on labels is 13:20, not 13:15. ID and date is ok.
- 3) -2, -6, -9, -15 TCF and FCF rec'd out of hold/ within hold but processed out of hold.
- 4) -12, -18, TCF and FCF rec'd nearing hold time, Lab to verify if processed within hold time.

5.1  
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- 1) Proceed as noted
- 2) use sample time of 13:20 from bottle label
- 3) Proceed as noted
- 4) Proceed as noted

Per Joseph Loeper

**JC68775: Chain of Custody**

**Page 4 of 4**

The results set forth herein are provided by SGS North America Inc.

*e-Hardcopy 2.0*  
*Automated Report*

## Technical Report for

USACE-Philadelphia District

Philadelphia District, Reservoir Sampling

W25PHS81145379

SGS Job Number: JC69604

Sampling Date: 07/10/18

Report to:

Army Corps of Engineers

joseph.m.loeper@usace.army.mil

ATTN: Joseph Loeper

Total number of pages in report: **72**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

A. Paul Ioannidis  
General Manager

Client Service contact: Tammy McCloskey 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA, RI, SC, TX, UT, VA, WV, DoD ELAP (ANAB L2248)

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Test results relate only to samples analyzed.

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## Sample Summary

USACE-Philadelphia District

**Job No:** JC69604

Philadelphia District, Reservoir Sampling  
 Project No: W25PHS81145379

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
JC69604-1	07/10/18	14:15 GW	07/10/18	AQ	Surface Water	BM-1S
JC69604-1F	07/10/18	14:15 GW	07/10/18	AQ	Surface H2O Filtered	BM-1S
JC69604-2	07/10/18	12:15 GW	07/10/18	AQ	Surface Water	BM-2S
JC69604-2F	07/10/18	12:15 GW	07/10/18	AQ	Surface H2O Filtered	BM-2S
JC69604-3	07/10/18	12:15 GW	07/10/18	AQ	Surface Water	BM-2M
JC69604-3F	07/10/18	12:15 GW	07/10/18	AQ	Surface H2O Filtered	BM-2M
JC69604-4	07/10/18	12:15 GW	07/10/18	AQ	Surface Water	BM-2D
JC69604-4F	07/10/18	12:15 GW	07/10/18	AQ	Surface H2O Filtered	BM-2D
JC69604-5	07/10/18	13:40 GW	07/10/18	AQ	Surface Water	BM-5S
JC69604-5F	07/10/18	13:40 GW	07/10/18	AQ	Surface H2O Filtered	BM-5S
JC69604-6	07/10/18	08:25 GW	07/10/18	AQ	Surface Water	BM-6S
JC69604-6F	07/10/18	08:25 GW	07/10/18	AQ	Surface H2O Filtered	BM-6S
JC69604-7	07/10/18	08:25 GW	07/10/18	AQ	Surface Water	BM-6D



## Sample Summary

(continued)

USACE-Philadelphia District

**Job No:** JC69604

Philadelphia District, Reservoir Sampling  
 Project No: W25PHS81145379

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
JC69604-7F	07/10/18	08:25 GW	07/10/18	AQ	Surface H2O Filtered	BM-6D
JC69604-8	07/10/18	08:25 GW	07/10/18	AQ	Surface Water	BM-6M
JC69604-8F	07/10/18	08:25 GW	07/10/18	AQ	Surface H2O Filtered	BM-6M
JC69604-9	07/10/18	11:30 GW	07/10/18	AQ	Surface Water	BM-7S
JC69604-9F	07/10/18	11:30 GW	07/10/18	AQ	Surface H2O Filtered	BM-7S
JC69604-10	07/10/18	11:30 GW	07/10/18	AQ	Surface Water	BM-7M
JC69604-10F	07/10/18	11:30 GW	07/10/18	AQ	Surface H2O Filtered	BM-7M
JC69604-11	07/10/18	11:30 GW	07/10/18	AQ	Surface Water	BM-7D
JC69604-11F	07/10/18	11:30 GW	07/10/18	AQ	Surface H2O Filtered	BM-7D
JC69604-12	07/10/18	11:00 GW	07/10/18	AQ	Surface Water	BM-8S
JC69604-12F	07/10/18	11:00 GW	07/10/18	AQ	Surface H2O Filtered	BM-8S
JC69604-13	07/10/18	11:00 GW	07/10/18	AQ	Surface Water	BM-8M
JC69604-13F	07/10/18	11:00 GW	07/10/18	AQ	Surface H2O Filtered	BM-8M



## Sample Summary

(continued)

USACE-Philadelphia District

**Job No:** JC69604

Philadelphia District, Reservoir Sampling  
 Project No: W25PHS81145379

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
JC69604-14	07/10/18	11:00 GW	07/10/18	AQ	Surface Water	BM-8D
JC69604-14F	07/10/18	11:00 GW	07/10/18	AQ	Surface H2O Filtered	BM-8D
JC69604-15	07/10/18	10:15 GW	07/10/18	AQ	Surface Water	BM-9S
JC69604-15F	07/10/18	10:15 GW	07/10/18	AQ	Surface H2O Filtered	BM-9S
JC69604-16	07/10/18	10:15 GW	07/10/18	AQ	Surface Water	BM-9M
JC69604-16F	07/10/18	10:15 GW	07/10/18	AQ	Surface H2O Filtered	BM-9M
JC69604-17	07/10/18	10:15 GW	07/10/18	AQ	Surface Water	BM-9D
JC69604-17F	07/10/18	10:15 GW	07/10/18	AQ	Surface H2O Filtered	BM-9D
JC69604-18	07/10/18	09:30 GW	07/10/18	AQ	Surface Water	BM-10S
JC69604-18F	07/10/18	09:30 GW	07/10/18	AQ	Surface H2O Filtered	BM-10S
JC69604-19	07/10/18	09:30 GW	07/10/18	AQ	Surface Water	BM-10M
JC69604-19F	07/10/18	09:30 GW	07/10/18	AQ	Surface H2O Filtered	BM-10M
JC69604-20	07/10/18	09:30 GW	07/10/18	AQ	Surface Water	BM-10D



### Sample Summary

(continued)

USACE-Philadelphia District

Job No: JC69604

Philadelphia District, Reservoir Sampling  
Project No: W25PHS81145379

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
JC69604-20F	07/10/18	09:30 GW	07/10/18	AQ	Surface H2O Filtered	BM-10D
JC69604-21	07/10/18	13:30 GW	07/10/18	AQ	Surface Water	BM-11S
JC69604-21F	07/10/18	13:30 GW	07/10/18	AQ	Surface H2O Filtered	BM-11S



## CASE NARRATIVE / CONFORMANCE SUMMARY

**Client:** USACE-Philadelphia District

**Job No** JC69604

**Site:** Philadelphia District, Reservoir Sampling

**Report Date** 7/19/2018 5:12:14 PM

On 07/10/2018, 42 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at SGS North America Inc. at a maximum corrected temperature of 2.6 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. Job Number of JC69604 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Compounds qualified as out of range in the continuing calibration summary report are acceptable as per method requirements when there is a high bias but the sample result is non-detect.

### General Chemistry By Method EPA 351.2/LACHAT

**Matrix:** AQ **Batch ID:** GP14467

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69520-2DUP, JC69520-2MS were used as the QC samples for Nitrogen, Total Kjeldahl.
- Matrix Spike Recovery(s) for Nitrogen, Total Kjeldahl are outside control limits. Spike recovery indicates possible matrix interference.

**Matrix:** AQ **Batch ID:** GP14542

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69816-1DUP, JC69816-1MS were used as the QC samples for Nitrogen, Total Kjeldahl.

### General Chemistry By Method EPA 353.2/LACHAT

**Matrix:** AQ **Batch ID:** GP14432

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69449-1DUP, JC69604-5MS were used as the QC samples for Nitrogen, Nitrate + Nitrite.
- Matrix Spike Recovery(s) for Nitrogen, Nitrate + Nitrite are outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

**Matrix:** AQ **Batch ID:** GP14433

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69604-11DUP, JC69604-11MS were used as the QC samples for Nitrogen, Nitrate + Nitrite.
- Matrix Spike Recovery(s) for Nitrogen, Nitrate + Nitrite are outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

## General Chemistry By Method EPA 365.3

**Matrix:** AQ

**Batch ID:** GP14470

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69604-1DUP, JC69604-1MS were used as the QC samples for Phosphorus, Total.

**Matrix:** AQ

**Batch ID:** GP14504

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69604-19DUP, JC69604-19MS were used as the QC samples for Phosphorus, Total.

**Matrix:** AQ

**Batch ID:** GP14506

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69604-18FDUP, JC69604-18FMS were used as the QC samples for Phosphorus, Total.

## General Chemistry By Method EPA353.2/SM4500NO2B

**Matrix:** AQ **Batch ID:** R171280

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69604-7 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171281

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69604-11 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171282

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69604-17 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171283

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69604-20 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171293

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69604-1 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171294

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69604-2 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171295

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69604-3 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171296

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69604-4 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171297

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69604-5 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171298

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69604-6 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171299

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69604-8 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171300

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69604-9 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171301

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69604-10 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171302

- The data for EPA353.2/SM4500NO2B meets quality control requirements.

Thursday, July 19, 2018

Page 3 of 8

## General Chemistry By Method EPA353.2/SM4500NO2B

**Matrix:** AQ                      **Batch ID:** R171302

- JC69604-15 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ                      **Batch ID:** R171303

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69604-16 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ                      **Batch ID:** R171304

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69604-18 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ                      **Batch ID:** R171305

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69604-19 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ                      **Batch ID:** R171306

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69604-21 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ                      **Batch ID:** R171309

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69604-12 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ                      **Batch ID:** R171310

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69604-13 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ                      **Batch ID:** R171311

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69604-14 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

## General Chemistry By Method SM2320 B-11

**Matrix:** AQ

**Batch ID:** GN82746

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69654-3DUP were used as the QC samples for Alkalinity, Total as CaCO<sub>3</sub>.
- JC69604-20 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC69604-21 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.

**Matrix:** AQ

**Batch ID:** GN82769

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69604-1DUP were used as the QC samples for Alkalinity, Total as CaCO<sub>3</sub>.
- JC69604-3 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC69604-7 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC69604-4 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC69604-8 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC69604-1 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC69604-9 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC69604-19 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC69604-5 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC69604-11 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC69604-6 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC69604-16 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC69604-10 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC69604-2 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC69604-12 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC69604-13 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC69604-14 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC69604-17 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC69604-15 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC69604-18 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.

## General Chemistry By Method SM2540 C-11

**Matrix:** AQ

**Batch ID:** GN82743

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69604-5DUP were used as the QC samples for Solids, Total Dissolved.

**Matrix:** AQ

**Batch ID:** GN82762

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69654-3DUP were used as the QC samples for Solids, Total Dissolved.

### General Chemistry By Method SM2540 D-11

**Matrix:** AQ**Batch ID:** GN82734

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69604-1DUP, JC69604-20DUP were used as the QC samples for Solids, Total Suspended.
- JC69604-4 for Solids, Total Suspended: Reported sample aliquot obtained from filtration of 750 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.
- JC69604-6 for Solids, Total Suspended: Reported sample aliquot obtained from filtration of 250 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.
- JC69604-18 for Solids, Total Suspended: Reported sample aliquot obtained from filtration of 300 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.
- JC69604-12 for Solids, Total Suspended: Reported sample aliquot obtained from filtration of 350 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.
- JC69604-15 for Solids, Total Suspended: Reported sample aliquot obtained from filtration of 350 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.

**Matrix:** AQ**Batch ID:** GN82815

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69710-1DUP were used as the QC samples for Solids, Total Suspended.

### General Chemistry By Method SM4500NH3 H-11LCHAT

**Matrix:** AQ**Batch ID:** GP14508

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69504-1DUP, JC69504-1MS, JC69504-1MSD were used as the QC samples for Nitrogen, Ammonia.

**Matrix:** AQ**Batch ID:** GP14509

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69604-8DUP, JC69604-8MS, JC69604-8MSD were used as the QC samples for Nitrogen, Ammonia.

### General Chemistry By Method SM4500NO2 B-11

**Matrix:** AQ**Batch ID:** GN82627

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69604-5DUP, JC69604-5MS were used as the QC samples for Nitrogen, Nitrite.

## General Chemistry By Method SM5210 B-11

**Matrix:** AQ                      **Batch ID:** GP14392

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69604-1DUP were used as the QC samples for BOD, 5 Day.

**Matrix:** AQ                      **Batch ID:** GP14393

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69604-21DUP were used as the QC samples for BOD, 5 Day.
- RPD(s) for Duplicate for BOD, 5 Day are outside control limits for sample GP14393-D1. RPD acceptable due to low duplicate and sample concentrations.

## General Chemistry By Method SM5310 B-11

**Matrix:** AQ                      **Batch ID:** GP14423

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69604-1MS, JC69604-1MSD were used as the QC samples for Total Organic Carbon.

**Matrix:** AQ                      **Batch ID:** GP14424

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69604-12MS, JC69604-12MSD were used as the QC samples for Total Organic Carbon.

**Matrix:** AQ                      **Batch ID:** GP14425

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69604-21MS, JC69604-21MSD were used as the QC samples for Total Organic Carbon.

## General Chemistry By Method SM9222 B-06

**Matrix:** AQ                      **Batch ID:** MB5297

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69604-1DUP were used as the QC samples for Coliform, Total.
- JC69604-9 for Coliform, Total: Analysis done out of holding time.
- JC69604-12 for Coliform, Total: Analysis done out of holding time.
- JC69604-21 for Coliform, Total: Analysis done out of holding time.
- JC69604-2 for Coliform, Total: Analysis done out of holding time.
- JC69604-15 for Coliform, Total: Analysis done out of holding time.
- JC69604-5 for Coliform, Total: Analysis done out of holding time.
- JC69604-18 for Coliform, Total: Analysis done out of holding time.
- JC69604-6 for Coliform, Total: Analysis done out of holding time.

## General Chemistry By Method SM9222 D-06

**Matrix:** AQ

**Batch ID:** MB5298

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69604-1DUP were used as the QC samples for Coliform, Fecal.
- JC69604-21 for Coliform, Fecal: Analysis done out of holding time.
- JC69604-5 for Coliform, Fecal: Analysis done out of holding time.
- JC69604-15 for Coliform, Fecal: Analysis done out of holding time.
- JC69604-12 for Coliform, Fecal: Analysis done out of holding time.
- JC69604-9 for Coliform, Fecal: Analysis done out of holding time.
- JC69604-18 for Coliform, Fecal: Analysis done out of holding time.
- JC69604-6 for Coliform, Fecal: Analysis done out of holding time.
- JC69604-2 for Coliform, Fecal: Analysis done out of holding time.

SGS North America Inc. certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting the Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

SGS North America Inc. is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. Data release is authorized by SGS North America Inc indicated via signature on the report cover

Thursday, July 19, 2018

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## Summary of Hits

**Job Number:** JC69604  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 07/10/18



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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**JC69604-1      BM-1S**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	137	5.0			mg/l	SM2320 B-11
BOD, 5 Day	6.3	3.4			mg/l	SM5210 B-11
Coliform, Fecal	168	4			col/100ml	SM9222 D-06
Coliform, Total	246	4			col/100ml	SM9222 B-06
Nitrogen, Ammonia	0.20	0.20			mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>b</sup>	4.5	0.11			mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.6	0.10			mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.076	0.010			mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.73	0.20			mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	168	10			mg/l	SM2540 C-11
Solids, Total Suspended	5.5	4.0			mg/l	SM2540 D-11
Total Organic Carbon	2.5	1.0			mg/l	SM5310 B-11

**JC69604-1F      BM-1S**

No hits reported in this sample.

**JC69604-2      BM-2S**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	77.0	5.0			mg/l	SM2320 B-11
BOD, 5 Day	5.5	3.4			mg/l	SM5210 B-11
Nitrogen, Nitrate <sup>b</sup>	3.4	0.11			mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	3.4	0.10			mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.034	0.010			mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	1.6	0.20			mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	53.3	10			mg/l	SM2540 C-11
Solids, Total Suspended	12.0	4.0			mg/l	SM2540 D-11
Total Organic Carbon	3.9	1.0			mg/l	SM5310 B-11

**JC69604-2F      BM-2S**

No hits reported in this sample.

**JC69604-3      BM-2M**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	106	5.0			mg/l	SM2320 B-11
BOD, 5 Day	4.7	3.4			mg/l	SM5210 B-11
Nitrogen, Nitrate <sup>b</sup>	4.7	0.11			mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.7	0.10			mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.034	0.010			mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.68	0.20			mg/l	EPA 351.2/LACHAT
Phosphorus, Total	0.051	0.050			mg/l	EPA 365.3
Solids, Total Dissolved	150	10			mg/l	SM2540 C-11

## Summary of Hits

**Job Number:** JC69604  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 07/10/18



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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Solids, Total Suspended		6.5	4.0		mg/l	SM2540 D-11
Total Organic Carbon		3.2	1.0		mg/l	SM5310 B-11

**JC69604-3F BM-2M**

No hits reported in this sample.

**JC69604-4 BM-2D**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>		160	5.0		mg/l	SM2320 B-11
BOD, 5 Day		6.7	3.4		mg/l	SM5210 B-11
Nitrogen, Ammonia		0.32	0.20		mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>b</sup>		4.7	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		4.8	0.10		mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite		0.14	0.010		mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl		0.45	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		133	10		mg/l	SM2540 C-11
Solids, Total Suspended <sup>c</sup>		5.9	4.0		mg/l	SM2540 D-11
Total Organic Carbon		2.4	1.0		mg/l	SM5310 B-11

**JC69604-4F BM-2D**

No hits reported in this sample.

**JC69604-5 BM-5S**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>		231	5.0		mg/l	SM2320 B-11
BOD, 5 Day		3.5	3.4		mg/l	SM5210 B-11
Coliform, Fecal <sup>d</sup>		4800	100		col/100ml	SM9222 D-06
Coliform, Total <sup>d</sup>		500	100		col/100ml	SM9222 B-06
Nitrogen, Nitrate <sup>b</sup>		8.8	0.31		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		8.8	0.30		mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite		0.021	0.010		mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl		0.27	0.20		mg/l	EPA 351.2/LACHAT
Phosphorus, Total		0.090	0.050		mg/l	EPA 365.3
Solids, Total Dissolved		195	10		mg/l	SM2540 C-11
Solids, Total Suspended		9.4	4.0		mg/l	SM2540 D-11
Total Organic Carbon		1.8	1.0		mg/l	SM5310 B-11

**JC69604-5F BM-5S**

No hits reported in this sample.

## Summary of Hits

**Job Number:** JC69604  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 07/10/18



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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**JC69604-6      BM-6S**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	43.7	5.0			mg/l	SM2320 B-11
BOD, 5 Day	6.4	3.4			mg/l	SM5210 B-11
Coliform, Fecal <sup>d</sup>	2	2			col/100ml	SM9222 D-06
Nitrogen, Nitrate <sup>b</sup>	3.6	0.11			mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	3.6	0.10			mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.037	0.010			mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.72	0.20			mg/l	EPA 351.2/LACHAT
Phosphorus, Total	0.051	0.050			mg/l	EPA 365.3
Solids, Total Dissolved	30.0	10			mg/l	SM2540 C-11
Solids, Total Suspended <sup>e</sup>	11.6	4.0			mg/l	SM2540 D-11
Total Organic Carbon	3.6	1.0			mg/l	SM5310 B-11

**JC69604-6F      BM-6S**

No hits reported in this sample.

**JC69604-7      BM-6D**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	160	5.0			mg/l	SM2320 B-11
BOD, 5 Day	6.2	3.4			mg/l	SM5210 B-11
Nitrogen, Nitrate <sup>b</sup>	5.2	0.21			mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	5.3	0.20			mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.12	0.010			mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.57	0.20			mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	183	10			mg/l	SM2540 C-11
Total Organic Carbon	1.8	1.0			mg/l	SM5310 B-11

**JC69604-7F      BM-6D**

No hits reported in this sample.

**JC69604-8      BM-6M**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	129	5.0			mg/l	SM2320 B-11
BOD, 5 Day	4.8	3.4			mg/l	SM5210 B-11
Nitrogen, Nitrate <sup>b</sup>	4.8	0.11			mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.8	0.10			mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.042	0.010			mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.59	0.20			mg/l	EPA 351.2/LACHAT
Phosphorus, Total	0.072	0.050			mg/l	EPA 365.3
Solids, Total Dissolved	170	10			mg/l	SM2540 C-11
Solids, Total Suspended	6.2	4.0			mg/l	SM2540 D-11
Total Organic Carbon	3.5	1.0			mg/l	SM5310 B-11

## Summary of Hits

**Job Number:** JC69604  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 07/10/18



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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**JC69604-8F      BM-6M**

No hits reported in this sample.

**JC69604-9      BM-7S**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	72.8	5.0		mg/l	SM2320 B-11
BOD, 5 Day	7.5	3.4		mg/l	SM5210 B-11
Coliform, Fecal <sup>d</sup>	22	2		col/100ml	SM9222 D-06
Nitrogen, Nitrate <sup>b</sup>	3.5	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	3.5	0.10		mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.041	0.010		mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.68	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	90.0	10		mg/l	SM2540 C-11
Solids, Total Suspended	15.0	4.0		mg/l	SM2540 D-11
Total Organic Carbon	3.7	1.0		mg/l	SM5310 B-11

**JC69604-9F      BM-7S**

No hits reported in this sample.

**JC69604-10      BM-7M**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	91.5	5.0		mg/l	SM2320 B-11
BOD, 5 Day	4.5	3.4		mg/l	SM5210 B-11
Nitrogen, Nitrate <sup>b</sup>	3.9	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	3.9	0.10		mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.036	0.010		mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.78	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	110	10		mg/l	SM2540 C-11
Solids, Total Suspended	5.8	4.0		mg/l	SM2540 D-11
Total Organic Carbon	3.8	1.0		mg/l	SM5310 B-11

**JC69604-10F      BM-7M**

No hits reported in this sample.

**JC69604-11      BM-7D**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	108	5.0		mg/l	SM2320 B-11
BOD, 5 Day	5.3	3.4		mg/l	SM5210 B-11
Nitrogen, Nitrate <sup>b</sup>	5.6	0.31		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	5.6	0.30		mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.032	0.010		mg/l	SM4500NO2 B-11

## Summary of Hits

**Job Number:** JC69604  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 07/10/18



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
		0.64	0.20		mg/l	EPA 351.2/LACHAT
		163	10		mg/l	SM2540 C-11
		9.4	4.0		mg/l	SM2540 D-11
		2.2	1.0		mg/l	SM5310 B-11

**JC69604-11F BM-7D**

No hits reported in this sample.

**JC69604-12 BM-8S**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	72.8	5.0		mg/l	SM2320 B-11
BOD, 5 Day	6.5	3.4		mg/l	SM5210 B-11
Coliform, Total <sup>d</sup>	7	2		col/100ml	SM9222 B-06
Nitrogen, Nitrate <sup>b</sup>	3.7	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	3.7	0.10		mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.032	0.010		mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.67	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	107	10		mg/l	SM2540 C-11
Solids, Total Suspended <sup>f</sup>	11.4	4.0		mg/l	SM2540 D-11
Total Organic Carbon	4.7	1.0		mg/l	SM5310 B-11

**JC69604-12F BM-8S**

No hits reported in this sample.

**JC69604-13 BM-8M**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	116	5.0		mg/l	SM2320 B-11
BOD, 5 Day	3.6	3.4		mg/l	SM5210 B-11
Nitrogen, Ammonia	0.25	0.20		mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>b</sup>	3.5	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	3.5	0.10		mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.035	0.010		mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.68	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	200	10		mg/l	SM2540 C-11
Solids, Total Suspended	8.3	4.0		mg/l	SM2540 D-11
Total Organic Carbon	2.6	1.0		mg/l	SM5310 B-11

**JC69604-13F BM-8M**

No hits reported in this sample.

## Summary of Hits

**Job Number:** JC69604  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 07/10/18



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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**JC69604-14 BM-8D**

Alkalinity, Total as CaCO3 <sup>a</sup>	110	5.0			mg/l	SM2320 B-11
BOD, 5 Day	4.6	3.4			mg/l	SM5210 B-11
Nitrogen, Ammonia	0.27	0.20			mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>b</sup>	3.3	0.11			mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	3.3	0.10			mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.041	0.010			mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.66	0.20			mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	157	10			mg/l	SM2540 C-11
Solids, Total Suspended	23.4	4.0			mg/l	SM2540 D-11
Total Organic Carbon	2.1	1.0			mg/l	SM5310 B-11

**JC69604-14F BM-8D**

No hits reported in this sample.

**JC69604-15 BM-9S**

Alkalinity, Total as CaCO3 <sup>a</sup>	114	5.0			mg/l	SM2320 B-11
BOD, 5 Day	6.8	3.4			mg/l	SM5210 B-11
Coliform, Total <sup>d</sup>	2	2			col/100ml	SM9222 B-06
Nitrogen, Nitrate <sup>b</sup>	3.6	0.11			mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	3.6	0.10			mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.036	0.010			mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.95	0.20			mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	137	10			mg/l	SM2540 C-11
Solids, Total Suspended <sup>f</sup>	12.0	4.0			mg/l	SM2540 D-11
Total Organic Carbon	3.2	1.0			mg/l	SM5310 B-11

**JC69604-15F BM-9S**

No hits reported in this sample.

**JC69604-16 BM-9M**

Alkalinity, Total as CaCO3 <sup>a</sup>	187	5.0			mg/l	SM2320 B-11
BOD, 5 Day	5.0	3.4			mg/l	SM5210 B-11
Nitrogen, Nitrate <sup>b</sup>	4.0	0.11			mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.0	0.10			mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.032	0.010			mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.58	0.20			mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	86.7	10			mg/l	SM2540 C-11
Solids, Total Suspended	8.3	4.0			mg/l	SM2540 D-11
Total Organic Carbon	2.9	1.0			mg/l	SM5310 B-11

## Summary of Hits

**Job Number:** JC69604  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 07/10/18



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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### JC69604-16F BM-9M

No hits reported in this sample.

### JC69604-17 BM-9D

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	297	5.0			mg/l	SM2320 B-11
BOD, 5 Day	3.9	3.4			mg/l	SM5210 B-11
Nitrogen, Nitrate <sup>b</sup>	6.1	0.31			mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	6.1	0.30			mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.026	0.010			mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.51	0.20			mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	143	10			mg/l	SM2540 C-11
Solids, Total Suspended	147	4.0			mg/l	SM2540 D-11
Total Organic Carbon	1.7	1.0			mg/l	SM5310 B-11

### JC69604-17F BM-9D

No hits reported in this sample.

### JC69604-18 BM-10S

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	146	5.0			mg/l	SM2320 B-11
BOD, 5 Day	7.1	3.4			mg/l	SM5210 B-11
Coliform, Fecal <sup>d</sup>	10	2			col/100ml	SM9222 D-06
Coliform, Total <sup>d</sup>	2	2			col/100ml	SM9222 B-06
Nitrogen, Nitrate <sup>b</sup>	3.6	0.11			mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	3.6	0.10			mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.036	0.010			mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.50	0.20			mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	120	10			mg/l	SM2540 C-11
Solids, Total Suspended <sup>g</sup>	11.3	4.0			mg/l	SM2540 D-11
Total Organic Carbon	3.2	1.0			mg/l	SM5310 B-11

### JC69604-18F BM-10S

No hits reported in this sample.

### JC69604-19 BM-10M

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	166	5.0			mg/l	SM2320 B-11
BOD, 5 Day	6.5	3.4			mg/l	SM5210 B-11
Nitrogen, Nitrate <sup>b</sup>	4.2	0.11			mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.2	0.10			mg/l	EPA 353.2/LACHAT

## Summary of Hits

**Job Number:** JC69604  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 07/10/18



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
		0.024	0.010		mg/l	SM4500NO2 B-11
		0.53	0.20		mg/l	EPA 351.2/LACHAT
		103	10		mg/l	SM2540 C-11
		12.3	4.0		mg/l	SM2540 D-11
		2.8	1.0		mg/l	SM5310 B-11

### JC69604-19F BM-10M

No hits reported in this sample.

### JC69604-20 BM-10D

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	148	5.0		mg/l	SM2320 B-11
BOD, 5 Day	7.8	3.4		mg/l	SM5210 B-11
Nitrogen, Nitrate <sup>b</sup>	6.3	0.31		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	6.3	0.30		mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.013	0.010		mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.39	0.20		mg/l	EPA 351.2/LACHAT
Phosphorus, Total	0.37	0.050		mg/l	EPA 365.3
Solids, Total Dissolved	167	10		mg/l	SM2540 C-11
Solids, Total Suspended	395	4.0		mg/l	SM2540 D-11
Total Organic Carbon	1.4	1.0		mg/l	SM5310 B-11

### JC69604-20F BM-10D

No hits reported in this sample.

### JC69604-21 BM-11S

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	45.8	5.0		mg/l	SM2320 B-11
BOD, 5 Day	3.7	3.4		mg/l	SM5210 B-11
Coliform, Fecal <sup>d</sup>	450	10		col/100ml	SM9222 D-06
Coliform, Total <sup>d</sup>	664	100		col/100ml	SM9222 B-06
Nitrogen, Nitrate <sup>b</sup>	5.3	0.21		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	5.3	0.20		mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.011	0.010		mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.24	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	33.3	10		mg/l	SM2540 C-11
Solids, Total Suspended	7.1	4.0		mg/l	SM2540 D-11
Total Organic Carbon	1.5	1.0		mg/l	SM5310 B-11

### JC69604-21F BM-11S

No hits reported in this sample.



## Summary of Hits

**Job Number:** JC69604  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 07/10/18



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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- (a) Sample was titrated to a final pH of 4.5.
- (b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)
- (c) Reported sample aliquot obtained from filtration of 750 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.
- (d) Analysis done out of holding time.
- (e) Reported sample aliquot obtained from filtration of 250 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.
- (f) Reported sample aliquot obtained from filtration of 350 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.
- (g) Reported sample aliquot obtained from filtration of 300 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.

Sample Results

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Report of Analysis

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**Report of Analysis**

<b>Client Sample ID:</b> BM-1S	<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-1	<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

**General Chemistry**

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	137	5.0	mg/l	1	07/13/18 13:35	FO	SM2320 B-11
BOD, 5 Day	6.3	3.4	mg/l	1	07/11/18 20:49	SA	SM5210 B-11
Coliform, Fecal	168	4	col/100ml	4	07/10/18 22:09	SA	SM9222 D-06
Coliform, Total	246	4	col/100ml	10	07/10/18 22:00	SA	SM9222 B-06
Nitrogen, Ammonia	0.20	0.20	mg/l	1	07/16/18 14:32	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>b</sup>	4.5	0.11	mg/l	1	07/13/18 11:27	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.6	0.10	mg/l	1	07/13/18 11:27	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.076	0.010	mg/l	1	07/11/18 15:55	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.73	0.20	mg/l	1	07/16/18 09:27	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/17/18 16:45	LS	EPA 365.3
Solids, Total Dissolved	168	10	mg/l	1	07/13/18 14:00	RC	SM2540 C-11
Solids, Total Suspended	5.5	4.0	mg/l	1	07/13/18 10:50	RC	SM2540 D-11
Total Organic Carbon	2.5	1.0	mg/l	1	07/13/18 00:28	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.

(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b> BM-1S	<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-1F	<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/17/18 20:55	LS	EPA 365.3

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b> BM-2S	<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-2	<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	77.0	5.0	mg/l	1	07/13/18 13:35	FO	SM2320 B-11
BOD, 5 Day	5.5	3.4	mg/l	1	07/11/18 20:53	SA	SM5210 B-11
Coliform, Fecal <sup>b</sup>	0	0	col/100ml	1	07/10/18 22:09	SA	SM9222 D-06
Coliform, Total <sup>b</sup>	0	4	col/100ml	1	07/10/18 22:00	SA	SM9222 B-06
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/16/18 14:33	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>c</sup>	3.4	0.11	mg/l	1	07/13/18 11:28	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	3.4	0.10	mg/l	1	07/13/18 11:28	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.034	0.010	mg/l	1	07/11/18 15:55	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	1.6	0.20	mg/l	1	07/16/18 09:28	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/17/18 16:45	LS	EPA 365.3
Solids, Total Dissolved	53.3	10	mg/l	1	07/13/18 14:00	RC	SM2540 C-11
Solids, Total Suspended	12.0	4.0	mg/l	1	07/13/18 10:50	RC	SM2540 D-11
Total Organic Carbon	3.9	1.0	mg/l	1	07/13/18 01:12	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.

(b) Analysis done out of holding time.

(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b> BM-2S	<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-2F	<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/17/18 20:55	LS	EPA 365.3

RL = Reporting Limit

4.4  
4

## Report of Analysis

<b>Client Sample ID:</b> BM-2M		<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-3		<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface Water		<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling		

### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	106	5.0	mg/l	1	07/13/18 13:35	FO	SM2320 B-11
BOD, 5 Day	4.7	3.4	mg/l	1	07/11/18 20:54	SA	SM5210 B-11
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/16/18 14:35	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>b</sup>	4.7	0.11	mg/l	1	07/13/18 11:29	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.7	0.10	mg/l	1	07/13/18 11:29	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.034	0.010	mg/l	1	07/11/18 15:55	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.68	0.20	mg/l	1	07/16/18 09:29	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.051	0.050	mg/l	1	07/17/18 16:45	LS	EPA 365.3
Solids, Total Dissolved	150	10	mg/l	1	07/13/18 14:00	RC	SM2540 C-11
Solids, Total Suspended	6.5	4.0	mg/l	1	07/13/18 10:50	RC	SM2540 D-11
Total Organic Carbon	3.2	1.0	mg/l	1	07/13/18 01:24	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.

(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

4.5  
4

## Report of Analysis

<b>Client Sample ID:</b> BM-2M	<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-3F	<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/17/18 20:55	LS	EPA 365.3

RL = Reporting Limit



## Report of Analysis

<b>Client Sample ID:</b> BM-2D	<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-4	<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	160	5.0	mg/l	1	07/13/18 13:35	FO	SM2320 B-11
BOD, 5 Day	6.7	3.4	mg/l	1	07/11/18 20:56	SA	SM5210 B-11
Nitrogen, Ammonia	0.32	0.20	mg/l	1	07/16/18 14:36	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>b</sup>	4.7	0.11	mg/l	1	07/13/18 11:30	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.8	0.10	mg/l	1	07/13/18 11:30	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.14	0.010	mg/l	1	07/11/18 15:55	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.45	0.20	mg/l	1	07/16/18 09:30	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/17/18 16:45	LS	EPA 365.3
Solids, Total Dissolved	133	10	mg/l	1	07/13/18 14:00	RC	SM2540 C-11
Solids, Total Suspended <sup>c</sup>	5.9	4.0	mg/l	1	07/13/18 10:50	RC	SM2540 D-11
Total Organic Carbon	2.4	1.0	mg/l	1	07/13/18 01:40	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.

(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

(c) Reported sample aliquot obtained from filtration of 750 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b> BM-2D	<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-4F	<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/17/18 21:14	LS	EPA 365.3

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b> BM-5S	<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-5	<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	231	5.0	mg/l	1	07/13/18 13:35	FO	SM2320 B-11
BOD, 5 Day	3.5	3.4	mg/l	1	07/11/18 20:58	SA	SM5210 B-11
Coliform, Fecal <sup>b</sup>	4800	100	col/100ml	100	07/10/18 22:09	SA	SM9222 D-06
Coliform, Total <sup>b</sup>	500	100	col/100ml	100	07/10/18 22:00	SA	SM9222 B-06
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/16/18 14:37	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>c</sup>	8.8	0.31	mg/l	1	07/13/18 12:13	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	8.8	0.30	mg/l	3	07/13/18 12:13	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.021	0.010	mg/l	1	07/11/18 15:55	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.27	0.20	mg/l	1	07/16/18 09:30	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.090	0.050	mg/l	1	07/17/18 16:45	LS	EPA 365.3
Solids, Total Dissolved	195	10	mg/l	1	07/13/18 14:00	RC	SM2540 C-11
Solids, Total Suspended	9.4	4.0	mg/l	1	07/13/18 10:50	RC	SM2540 D-11
Total Organic Carbon	1.8	1.0	mg/l	1	07/13/18 01:52	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.

(b) Analysis done out of holding time.

(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b> BM-5S	<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-5F	<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/17/18 21:14	LS	EPA 365.3

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b> BM-6S	<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-6	<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	43.7	5.0	mg/l	1	07/13/18 13:35	FO	SM2320 B-11
BOD, 5 Day	6.4	3.4	mg/l	1	07/11/18 20:59	SA	SM5210 B-11
Coliform, Fecal <sup>b</sup>	2	2	col/100ml	2	07/10/18 22:09	SA	SM9222 D-06
Coliform, Total <sup>b</sup>	0	2	col/100ml	1	07/10/18 22:00	SA	SM9222 B-06
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/16/18 14:39	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>c</sup>	3.6	0.11	mg/l	1	07/13/18 11:33	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	3.6	0.10	mg/l	1	07/13/18 11:33	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.037	0.010	mg/l	1	07/11/18 15:55	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.72	0.20	mg/l	1	07/16/18 09:33	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.051	0.050	mg/l	1	07/17/18 16:45	LS	EPA 365.3
Solids, Total Dissolved	30.0	10	mg/l	1	07/13/18 14:00	RC	SM2540 C-11
Solids, Total Suspended <sup>d</sup>	11.6	4.0	mg/l	1	07/13/18 10:50	RC	SM2540 D-11
Total Organic Carbon	3.6	1.0	mg/l	1	07/13/18 02:27	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.

(b) Analysis done out of holding time.

(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

(d) Reported sample aliquot obtained from filtration of 250 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b> BM-6S	<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-6F	<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/17/18 21:14	LS	EPA 365.3

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b> BM-6D	<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-7	<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	160	5.0	mg/l	1	07/13/18 15:00	FO	SM2320 B-11
BOD, 5 Day	6.2	3.4	mg/l	1	07/11/18 21:01	SA	SM5210 B-11
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/16/18 14:40	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>b</sup>	5.2	0.21	mg/l	1	07/13/18 12:18	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	5.3	0.20	mg/l	2	07/13/18 12:18	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.12	0.010	mg/l	1	07/11/18 16:15	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.57	0.20	mg/l	1	07/16/18 09:34	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/17/18 17:08	LS	EPA 365.3
Solids, Total Dissolved	183	10	mg/l	1	07/13/18 14:00	RC	SM2540 C-11
Solids, Total Suspended	< 4.0	4.0	mg/l	1	07/13/18 10:50	RC	SM2540 D-11
Total Organic Carbon	1.8	1.0	mg/l	1	07/13/18 02:36	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.

(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b> BM-6D	<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-7F	<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/17/18 21:14	LS	EPA 365.3

RL = Reporting Limit



## Report of Analysis

<b>Client Sample ID:</b> BM-6M		<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-8		<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface Water		<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling		

### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	129	5.0	mg/l	1	07/13/18 15:00	FO	SM2320 B-11
BOD, 5 Day	4.8	3.4	mg/l	1	07/11/18 21:03	SA	SM5210 B-11
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/16/18 14:52	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>b</sup>	4.8	0.11	mg/l	1	07/13/18 11:37	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.8	0.10	mg/l	1	07/13/18 11:37	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.042	0.010	mg/l	1	07/11/18 16:15	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.59	0.20	mg/l	1	07/16/18 09:35	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.072	0.050	mg/l	1	07/17/18 17:08	LS	EPA 365.3
Solids, Total Dissolved	170	10	mg/l	1	07/13/18 14:00	RC	SM2540 C-11
Solids, Total Suspended	6.2	4.0	mg/l	1	07/13/18 10:50	RC	SM2540 D-11
Total Organic Carbon	3.5	1.0	mg/l	1	07/13/18 02:48	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.

(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b> BM-6M	<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-8F	<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/17/18 21:14	LS	EPA 365.3

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b> BM-7S	<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-9	<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	72.8	5.0	mg/l	1	07/13/18 15:00	FO	SM2320 B-11
BOD, 5 Day	7.5	3.4	mg/l	1	07/11/18 21:04	SA	SM5210 B-11
Coliform, Fecal <sup>b</sup>	22	2	col/100ml	10	07/10/18 22:09	SA	SM9222 D-06
Coliform, Total <sup>b</sup>	0	2	col/100ml	1	07/10/18 22:00	SA	SM9222 B-06
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/16/18 14:53	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>c</sup>	3.5	0.11	mg/l	1	07/13/18 11:38	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	3.5	0.10	mg/l	1	07/13/18 11:38	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.041	0.010	mg/l	1	07/11/18 16:15	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.68	0.20	mg/l	1	07/16/18 09:35	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/17/18 17:08	LS	EPA 365.3
Solids, Total Dissolved	90.0	10	mg/l	1	07/13/18 14:00	RC	SM2540 C-11
Solids, Total Suspended	15.0	4.0	mg/l	1	07/13/18 10:50	RC	SM2540 D-11
Total Organic Carbon	3.7	1.0	mg/l	1	07/13/18 02:58	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.

(b) Analysis done out of holding time.

(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b> BM-7S	<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-9F	<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/17/18 21:14	LS	EPA 365.3

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b> BM-7M		<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-10		<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface Water		<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling		

4.19  
4

### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	91.5	5.0	mg/l	1	07/13/18 15:00	FO	SM2320 B-11
BOD, 5 Day	4.5	3.4	mg/l	1	07/11/18 21:05	SA	SM5210 B-11
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/16/18 14:55	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>b</sup>	3.9	0.11	mg/l	1	07/13/18 11:45	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	3.9	0.10	mg/l	1	07/13/18 11:45	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.036	0.010	mg/l	1	07/11/18 16:15	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.78	0.20	mg/l	1	07/16/18 09:36	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/17/18 17:08	LS	EPA 365.3
Solids, Total Dissolved	110	10	mg/l	1	07/13/18 14:00	RC	SM2540 C-11
Solids, Total Suspended	5.8	4.0	mg/l	1	07/13/18 10:50	RC	SM2540 D-11
Total Organic Carbon	3.8	1.0	mg/l	1	07/13/18 03:12	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.

(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

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RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b> BM-7M	<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-10F	<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/17/18 21:14	LS	EPA 365.3

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b> BM-7D		<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-11		<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface Water		<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling		

### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 <sup>a</sup>	108	5.0	mg/l	1	07/13/18 15:00	FO	SM2320 B-11
BOD, 5 Day	5.3	3.4	mg/l	1	07/11/18 21:07	SA	SM5210 B-11
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/16/18 14:56	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>b</sup>	5.6	0.31	mg/l	1	07/13/18 12:21	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	5.6	0.30	mg/l	3	07/13/18 12:21	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.032	0.010	mg/l	1	07/11/18 16:15	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.64	0.20	mg/l	1	07/16/18 09:37	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/17/18 17:08	LS	EPA 365.3
Solids, Total Dissolved	163	10	mg/l	1	07/13/18 14:00	RC	SM2540 C-11
Solids, Total Suspended	9.4	4.0	mg/l	1	07/13/18 10:50	RC	SM2540 D-11
Total Organic Carbon	2.2	1.0	mg/l	1	07/16/18 18:17	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.

(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

4.21  
4

## Report of Analysis

<b>Client Sample ID:</b> BM-7D	<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-11F	<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/17/18 21:14	LS	EPA 365.3

RL = Reporting Limit



## Report of Analysis

<b>Client Sample ID:</b> BM-8S	<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-12	<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	72.8	5.0	mg/l	1	07/13/18 15:00	FO	SM2320 B-11
BOD, 5 Day	6.5	3.4	mg/l	1	07/11/18 21:09	SA	SM5210 B-11
Coliform, Fecal <sup>b</sup>	0	2	col/100ml	1	07/10/18 22:09	SA	SM9222 D-06
Coliform, Total <sup>b</sup>	7	2	col/100ml	10	07/10/18 22:00	SA	SM9222 B-06
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/16/18 14:58	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>c</sup>	3.7	0.11	mg/l	1	07/13/18 11:49	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	3.7	0.10	mg/l	1	07/13/18 11:49	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.032	0.010	mg/l	1	07/11/18 16:15	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.67	0.20	mg/l	1	07/16/18 09:38	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/17/18 17:08	LS	EPA 365.3
Solids, Total Dissolved	107	10	mg/l	1	07/13/18 14:00	RC	SM2540 C-11
Solids, Total Suspended <sup>d</sup>	11.4	4.0	mg/l	1	07/13/18 10:50	RC	SM2540 D-11
Total Organic Carbon	4.7	1.0	mg/l	1	07/16/18 18:28	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.

(b) Analysis done out of holding time.

(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

(d) Reported sample aliquot obtained from filtration of 350 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b> BM-8S	<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-12F	<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/17/18 21:14	LS	EPA 365.3

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b> BM-8M	<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-13	<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	116	5.0	mg/l	1	07/13/18 15:00	FO	SM2320 B-11
BOD, 5 Day	3.6	3.4	mg/l	1	07/11/18 21:11	SA	SM5210 B-11
Nitrogen, Ammonia	0.25	0.20	mg/l	1	07/16/18 14:59	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>b</sup>	3.5	0.11	mg/l	1	07/13/18 11:51	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	3.5	0.10	mg/l	1	07/13/18 11:51	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.035	0.010	mg/l	1	07/11/18 16:15	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.68	0.20	mg/l	1	07/16/18 09:39	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/17/18 17:08	LS	EPA 365.3
Solids, Total Dissolved	200	10	mg/l	1	07/13/18 14:00	RC	SM2540 C-11
Solids, Total Suspended	8.3	4.0	mg/l	1	07/13/18 10:50	RC	SM2540 D-11
Total Organic Carbon	2.6	1.0	mg/l	1	07/16/18 19:59	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.

(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b> BM-8M	<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-13F	<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/17/18 21:14	LS	EPA 365.3

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b> BM-8D	<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-14	<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	110	5.0	mg/l	1	07/13/18 15:00	FO	SM2320 B-11
BOD, 5 Day	4.6	3.4	mg/l	1	07/11/18 21:14	SA	SM5210 B-11
Nitrogen, Ammonia	0.27	0.20	mg/l	1	07/16/18 15:01	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>b</sup>	3.3	0.11	mg/l	1	07/13/18 11:52	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	3.3	0.10	mg/l	1	07/13/18 11:52	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.041	0.010	mg/l	1	07/11/18 16:15	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.66	0.20	mg/l	1	07/16/18 09:40	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/17/18 17:08	LS	EPA 365.3
Solids, Total Dissolved	157	10	mg/l	1	07/13/18 14:00	RC	SM2540 C-11
Solids, Total Suspended	23.4	4.0	mg/l	1	07/13/18 10:50	RC	SM2540 D-11
Total Organic Carbon	2.1	1.0	mg/l	1	07/16/18 20:09	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.

(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b> BM-8D	<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-14F	<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/17/18 21:14	LS	EPA 365.3

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b> BM-9S	<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-15	<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	114	5.0	mg/l	1	07/13/18 15:00	FO	SM2320 B-11
BOD, 5 Day	6.8	3.4	mg/l	1	07/11/18 21:16	SA	SM5210 B-11
Coliform, Fecal <sup>b</sup>	0	2	col/100ml	1	07/10/18 22:09	SA	SM9222 D-06
Coliform, Total <sup>b</sup>	2	2	col/100ml	2	07/10/18 22:00	SA	SM9222 B-06
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/16/18 15:02	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>c</sup>	3.6	0.11	mg/l	1	07/13/18 11:53	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	3.6	0.10	mg/l	1	07/13/18 11:53	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.036	0.010	mg/l	1	07/11/18 16:15	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.95	0.20	mg/l	1	07/16/18 09:40	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/17/18 17:08	LS	EPA 365.3
Solids, Total Dissolved	137	10	mg/l	1	07/13/18 14:00	RC	SM2540 C-11
Solids, Total Suspended <sup>d</sup>	12.0	4.0	mg/l	1	07/13/18 10:50	RC	SM2540 D-11
Total Organic Carbon	3.2	1.0	mg/l	1	07/16/18 20:20	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.

(b) Analysis done out of holding time.

(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

(d) Reported sample aliquot obtained from filtration of 350 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b> BM-9S	<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-15F	<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/17/18 21:18	LS	EPA 365.3

RL = Reporting Limit



## Report of Analysis

<b>Client Sample ID:</b> BM-9M		<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-16		<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface Water		<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling		

4.31  
4

### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	187	5.0	mg/l	1	07/13/18 15:00	FO	SM2320 B-11
BOD, 5 Day	5.0	3.4	mg/l	1	07/11/18 21:18	SA	SM5210 B-11
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/16/18 15:06	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>b</sup>	4.0	0.11	mg/l	1	07/13/18 11:54	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.0	0.10	mg/l	1	07/13/18 11:54	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.032	0.010	mg/l	1	07/11/18 16:15	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.58	0.20	mg/l	1	07/16/18 09:43	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/17/18 17:08	LS	EPA 365.3
Solids, Total Dissolved	86.7	10	mg/l	1	07/13/18 16:05	RC	SM2540 C-11
Solids, Total Suspended	8.3	4.0	mg/l	1	07/13/18 10:50	RC	SM2540 D-11
Total Organic Carbon	2.9	1.0	mg/l	1	07/16/18 20:32	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.

(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

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RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b> BM-9M	<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-16F	<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/17/18 21:18	LS	EPA 365.3

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b> BM-9D	<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-17	<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	297	5.0	mg/l	1	07/13/18 15:00	FO	SM2320 B-11
BOD, 5 Day	3.9	3.4	mg/l	1	07/11/18 21:20	SA	SM5210 B-11
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/16/18 15:08	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>b</sup>	6.1	0.31	mg/l	1	07/13/18 12:22	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	6.1	0.30	mg/l	3	07/13/18 12:22	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.026	0.010	mg/l	1	07/11/18 18:20	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.51	0.20	mg/l	1	07/16/18 09:44	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/17/18 17:08	LS	EPA 365.3
Solids, Total Dissolved	143	10	mg/l	1	07/13/18 16:05	RC	SM2540 C-11
Solids, Total Suspended	147	4.0	mg/l	1	07/13/18 10:50	RC	SM2540 D-11
Total Organic Carbon	1.7	1.0	mg/l	1	07/16/18 20:44	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.

(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b> BM-9D	<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-17F	<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/17/18 21:18	LS	EPA 365.3

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b> BM-10S	<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-18	<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	146	5.0	mg/l	1	07/13/18 15:00	FO	SM2320 B-11
BOD, 5 Day	7.1	3.4	mg/l	1	07/11/18 21:21	SA	SM5210 B-11
Coliform, Fecal <sup>b</sup>	10	2	col/100ml	2	07/10/18 22:09	SA	SM9222 D-06
Coliform, Total <sup>b</sup>	2	2	col/100ml	2	07/10/18 22:00	SA	SM9222 B-06
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/16/18 15:09	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>c</sup>	3.6	0.11	mg/l	1	07/13/18 11:56	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	3.6	0.10	mg/l	1	07/13/18 11:56	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.036	0.010	mg/l	1	07/11/18 18:20	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.50	0.20	mg/l	1	07/18/18 14:05	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/17/18 17:10	LS	EPA 365.3
Solids, Total Dissolved	120	10	mg/l	1	07/13/18 16:05	RC	SM2540 C-11
Solids, Total Suspended <sup>d</sup>	11.3	4.0	mg/l	1	07/13/18 10:50	RC	SM2540 D-11
Total Organic Carbon	3.2	1.0	mg/l	1	07/16/18 20:55	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.

(b) Analysis done out of holding time.

(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

(d) Reported sample aliquot obtained from filtration of 300 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b> BM-10S	<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-18F	<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/19/18 13:25	MP	EPA 365.3

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b> BM-10M	<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-19	<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	166	5.0	mg/l	1	07/13/18 15:00	FO	SM2320 B-11
BOD, 5 Day	6.5	3.4	mg/l	1	07/11/18 21:23	SA	SM5210 B-11
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/16/18 15:11	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>b</sup>	4.2	0.11	mg/l	1	07/13/18 11:57	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.2	0.10	mg/l	1	07/13/18 11:57	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.024	0.010	mg/l	1	07/11/18 18:20	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.53	0.20	mg/l	1	07/18/18 14:06	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/17/18 20:55	LS	EPA 365.3
Solids, Total Dissolved	103	10	mg/l	1	07/13/18 16:05	RC	SM2540 C-11
Solids, Total Suspended	12.3	4.0	mg/l	1	07/13/18 10:50	RC	SM2540 D-11
Total Organic Carbon	2.8	1.0	mg/l	1	07/16/18 21:08	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.

(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b> BM-10M	<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-19F	<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/19/18 13:25	MP	EPA 365.3

RL = Reporting Limit



## Report of Analysis

<b>Client Sample ID:</b> BM-10D	<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-20	<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	148	5.0	mg/l	1	07/13/18 15:00	FO	SM2320 B-11
BOD, 5 Day	7.8	3.4	mg/l	1	07/11/18 21:24	SA	SM5210 B-11
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/16/18 15:12	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>b</sup>	6.3	0.31	mg/l	1	07/13/18 13:31	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	6.3	0.30	mg/l	3	07/13/18 13:31	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.013	0.010	mg/l	1	07/11/18 18:20	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.39	0.20	mg/l	1	07/18/18 14:07	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.37	0.050	mg/l	1	07/17/18 20:55	LS	EPA 365.3
Solids, Total Dissolved	167	10	mg/l	1	07/13/18 16:05	RC	SM2540 C-11
Solids, Total Suspended	395	4.0	mg/l	1	07/13/18 10:50	RC	SM2540 D-11
Total Organic Carbon	1.4	1.0	mg/l	1	07/16/18 21:23	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.

(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b> BM-10D	<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-20F	<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/19/18 13:25	MP	EPA 365.3

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b> BM-11S	<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-21	<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	45.8	5.0	mg/l	1	07/13/18 15:00	FO	SM2320 B-11
BOD, 5 Day	3.7	3.4	mg/l	1	07/11/18 21:28	SA	SM5210 B-11
Coliform, Fecal <sup>b</sup>	450	10	col/100ml	10	07/10/18 22:09	SA	SM9222 D-06
Coliform, Total <sup>b</sup>	664	100	col/100ml	100	07/10/18 22:00	SA	SM9222 B-06
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/16/18 15:13	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>c</sup>	5.3	0.21	mg/l	1	07/13/18 13:32	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	5.3	0.20	mg/l	2	07/13/18 13:32	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.011	0.010	mg/l	1	07/11/18 18:21	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.24	0.20	mg/l	1	07/18/18 14:08	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/17/18 20:55	LS	EPA 365.3
Solids, Total Dissolved	33.3	10	mg/l	1	07/13/18 16:05	RC	SM2540 C-11
Solids, Total Suspended	7.1	4.0	mg/l	1	07/16/18 09:56	RC	SM2540 D-11
Total Organic Carbon	1.5	1.0	mg/l	1	07/13/18 07:37	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.

(b) Analysis done out of holding time.

(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b> BM-11S	<b>Date Sampled:</b> 07/10/18
<b>Lab Sample ID:</b> JC69604-21F	<b>Date Received:</b> 07/10/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/19/18 13:25	MP	EPA 365.3

RL = Reporting Limit

Misc. Forms

Custody Documents and Other Forms

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Includes the following where applicable:

- Chain of Custody





## SGS Sample Receipt Summary

**Job Number:** JC69604

**Client:** USACE-PHILADELPHIA DISTRICT

**Project:** PHILADELPHIA DISTRICT, RESERVOIR SAMPL

**Date / Time Received:** 7/10/2018 8:35:00 PM

**Delivery Method:** Accutest Courier

**Airbill #s:**

**Cooler Temps (Raw Measured) °C:** Cooler 1: (1.6); Cooler 2: (1.1); Cooler 3: (1.3); Cooler 4: (1.4); Cooler 5: (2.2); Cooler 6: (2.6); Cooler 7: (1.8);

**Cooler Temps (Corrected) °C:** Cooler 1: (1.6); Cooler 2: (1.1); Cooler 3: (1.3); Cooler 4: (1.4); Cooler 5: (2.2); Cooler 6: (2.6); Cooler 7: (1.8);

<u>Cooler Security</u>	<u>Y or N</u>		<u>Y or N</u>	
1. Custody Seals Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/> <input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/> <input type="checkbox"/>

<u>Cooler Temperature</u>	<u>Y or N</u>	
1. Temp criteria achieved:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Cooler temp verification:	IR Gun	
3. Cooler media:	Ice (Bag)	
4. No. Coolers:	7	

<u>Quality Control Preservation</u>	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
1. Trip Blank present / cooler:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Trip Blank listed on COC:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Samples preserved properly:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. VOCs headspace free:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

<u>Sample Integrity - Documentation</u>	<u>Y or N</u>	
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Container labeling complete:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>	<input type="checkbox"/>

<u>Sample Integrity - Condition</u>	<u>Y or N</u>	
1. Sample recvd within HT:	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. All containers accounted for:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Condition of sample:	Intact	

<u>Sample Integrity - Instructions</u>	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Bottles received for unspecified tests	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Sufficient volume recvd for analysis:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Compositing instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Test Strip Lot #s:      pH 1-12: 216017      pH 12+: 208717      Other: (Specify) \_\_\_\_\_

Comments

- 1) -2, -5, -6, -9, -12, -15, -18, -21 TCF and FCF rec'd out of hold or nearing hold time and processed out of hold.
- 2) -1 TCF & FCF still in hold.
- 3) -7 & -8 As noted by client, the bottles labeled Deep and Middle are switched in the field. Samples set up according to notaian. Bottles labeled BM-6D was logged in as -7, Bottles labeled BM-6M was logged in as -8.
- 4) For all samples, Please note Total Diss LF Phosphorous is not requested on COC but volume was rec'd and filtration request has been sent.

SM089-02 Rev. Date 12/1/16

**JC69604: Chain of Custody**

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Proceed as noted. Joe Loeper notified.

**JC69604: Chain of Custody**  
**Page 4 of 4**

The results set forth herein are provided by SGS North America Inc.

*e-Hardcopy 2.0*  
*Automated Report*

## Technical Report for

USACE-Philadelphia District

Philadelphia District, Reservoir Sampling

W25PHS81145379

SGS Job Number: JC70923

Sampling Date: 07/30/18

Report to:

Army Corps of Engineers


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Total number of pages in report: **74**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

  
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## Sample Summary

USACE-Philadelphia District

**Job No:** JC70923

Philadelphia District, Reservoir Sampling  
 Project No: W25PHS81145379

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
JC70923-1	07/30/18	12:45 SW	07/30/18	AQ	Surface Water	BM-1S
JC70923-1F	07/30/18	12:45 SW	07/30/18	AQ	Surface H2O Filtered	BM-1S
JC70923-2	07/30/18	09:05 SW	07/30/18	AQ	Surface Water	BM-2S
JC70923-2F	07/30/18	09:05 SW	07/30/18	AQ	Surface H2O Filtered	BM-2S
JC70923-3	07/30/18	09:05 SW	07/30/18	AQ	Surface Water	BM-2M
JC70923-3F	07/30/18	09:05 SW	07/30/18	AQ	Surface H2O Filtered	BM-2M
JC70923-4	07/30/18	09:05 SW	07/30/18	AQ	Surface Water	BM-2D
JC70923-4F	07/30/18	09:05 SW	07/30/18	AQ	Surface H2O Filtered	BM-2D
JC70923-5	07/30/18	12:15 SW	07/30/18	AQ	Surface Water	BM-5S
JC70923-5F	07/30/18	12:15 SW	07/30/18	AQ	Surface H2O Filtered	BM-5S
JC70923-6	07/30/18	08:15 SW	07/30/18	AQ	Surface Water	BM-6S
JC70923-6F	07/30/18	08:15 SW	07/30/18	AQ	Surface H2O Filtered	BM-6S
JC70923-7	07/30/18	08:15 SW	07/30/18	AQ	Surface Water	BM-6M



## Sample Summary

(continued)

USACE-Philadelphia District

**Job No:** JC70923

Philadelphia District, Reservoir Sampling  
 Project No: W25PHS81145379

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
JC70923-7F	07/30/18	08:15 SW	07/30/18	AQ	Surface H2O Filtered	BM-6M
JC70923-8	07/30/18	08:15 SW	07/30/18	AQ	Surface Water	BM-6D
JC70923-8F	07/30/18	08:15 SW	07/30/18	AQ	Surface H2O Filtered	BM-6D
JC70923-9	07/30/18	09:30 SW	07/30/18	AQ	Surface Water	BM-7S
JC70923-9F	07/30/18	09:30 SW	07/30/18	AQ	Surface H2O Filtered	BM-7S
JC70923-10	07/30/18	09:30 SW	07/30/18	AQ	Surface Water	BM-7M
JC70923-10F	07/30/18	09:30 SW	07/30/18	AQ	Surface H2O Filtered	BM-7M
JC70923-11	07/30/18	09:30 SW	07/30/18	AQ	Surface Water	BM-7D
JC70923-11F	07/30/18	09:30 SW	07/30/18	AQ	Surface H2O Filtered	BM-7D
JC70923-12	07/30/18	11:00 SW	07/30/18	AQ	Surface Water	BM-8S
JC70923-12F	07/30/18	11:00 SW	07/30/18	AQ	Surface H2O Filtered	BM-8S
JC70923-13	07/30/18	11:00 SW	07/30/18	AQ	Surface Water	BM-8M
JC70923-13F	07/30/18	11:00 SW	07/30/18	AQ	Surface H2O Filtered	BM-8M



## Sample Summary

(continued)

USACE-Philadelphia District

**Job No:** JC70923

Philadelphia District, Reservoir Sampling  
 Project No: W25PHS81145379

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
JC70923-14	07/30/18	11:00 SW	07/30/18	AQ	Surface Water	BM-8D
JC70923-14F	07/30/18	11:00 SW	07/30/18	AQ	Surface H2O Filtered	BM-8D
JC70923-15	07/30/18	10:10 SW	07/30/18	AQ	Surface Water	BM-9S
JC70923-15F	07/30/18	10:10 SW	07/30/18	AQ	Surface H2O Filtered	BM-9S
JC70923-16	07/30/18	10:10 SW	07/30/18	AQ	Surface Water	BM-9M
JC70923-16F	07/30/18	10:10 SW	07/30/18	AQ	Surface H2O Filtered	BM-9M
JC70923-17	07/30/18	10:10 SW	07/30/18	AQ	Surface Water	BM-9D
JC70923-17F	07/30/18	10:10 SW	07/30/18	AQ	Surface H2O Filtered	BM-9D
JC70923-18	07/30/18	10:30 SW	07/30/18	AQ	Surface Water	BM-10S
JC70923-18F	07/30/18	10:30 SW	07/30/18	AQ	Surface H2O Filtered	BM-10S
JC70923-19	07/30/18	10:30 SW	07/30/18	AQ	Surface Water	BM-10M
JC70923-19F	07/30/18	10:30 SW	07/30/18	AQ	Surface H2O Filtered	BM-10M
JC70923-20	07/30/18	10:30 SW	07/30/18	AQ	Surface Water	BM-10D



### Sample Summary

(continued)

USACE-Philadelphia District

Job No: JC70923

Philadelphia District, Reservoir Sampling  
Project No: W25PHS81145379

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JC70923-20F	07/30/18	10:30	07/30/18	AQ	Surface H2O Filtered	BM-10D
JC70923-21	07/30/18	12:00	07/30/18	AQ	Surface Water	BM-11S
JC70923-21F	07/30/18	12:00	07/30/18	AQ	Surface H2O Filtered	BM-11S



## CASE NARRATIVE / CONFORMANCE SUMMARY

**Client:** USACE-Philadelphia District

**Job No** JC70923

**Site:** Philadelphia District, Reservoir Sampling

**Report Date** 8/15/2018 3:31:53 PM

On 07/30/2018, 21 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at SGS North America Inc. at a maximum corrected temperature of 3.4 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. Job Number of JC70923 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Compounds qualified as out of range in the continuing calibration summary report are acceptable as per method requirements when there is a high bias but the sample result is non-detect.

### General Chemistry By Method EPA 351.2/LACHAT

<b>Matrix:</b> AQ	<b>Batch ID:</b> GP15005
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- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC70522-1DUP, JC70522-1MS were used as the QC samples for Nitrogen, Total Kjeldahl.
- Matrix Spike Recovery(s) for Nitrogen, Total Kjeldahl are outside control limits. Spike recovery indicates possible matrix interference.

<b>Matrix:</b> AQ	<b>Batch ID:</b> GP15100
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- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC70923-2DUP, JC70923-2MS were used as the QC samples for Nitrogen, Total Kjeldahl.

### General Chemistry By Method EPA 353.2/LACHAT

<b>Matrix:</b> AQ	<b>Batch ID:</b> GP15063
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- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC70923-1DUP, JC70923-2MS, JC70923-1MS were used as the QC samples for Nitrogen, Nitrate + Nitrite.

<b>Matrix:</b> AQ	<b>Batch ID:</b> GP15074
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- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71207-1DUP, JC71207-1MS were used as the QC samples for Nitrogen, Nitrate + Nitrite.



## General Chemistry By Method EPA353.2/SM4500NO2B

**Matrix:** AQ **Batch ID:** R171963

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC70923-1 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171964

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC70923-2 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171965

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC70923-3 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171966

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC70923-6 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171967

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC70923-5 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171968

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC70923-4 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171969

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC70923-12 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171970

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC70923-11 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171971

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC70923-10 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171972

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC70923-9 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171973

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC70923-8 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171974

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC70923-7 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171975

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC70923-14 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R171976

- The data for EPA353.2/SM4500NO2B meets quality control requirements.

## General Chemistry By Method EPA353.2/SM4500NO2B

**Matrix:** AQ                      **Batch ID:** R171976

- JC70923-15 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ                      **Batch ID:** R171977

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC70923-16 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ                      **Batch ID:** R171978

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC70923-17 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ                      **Batch ID:** R171979

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC70923-18 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ                      **Batch ID:** R171980

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC70923-19 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ                      **Batch ID:** R171981

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC70923-20 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ                      **Batch ID:** R171982

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC70923-13 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ                      **Batch ID:** R171999

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC70923-21 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

## General Chemistry By Method SM2320 B-11

**Matrix:** AQ

**Batch ID:** GN83726

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC70923-1DUP were used as the QC samples for Alkalinity, Total as CaCO<sub>3</sub>.
- JC70923-1 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.

**Matrix:** AQ

**Batch ID:** GN83738

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC70923-2DUP were used as the QC samples for Alkalinity, Total as CaCO<sub>3</sub>.
- JC70923-10 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC70923-17 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC70923-8 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC70923-6 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC70923-4 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC70923-18 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC70923-2 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC70923-12 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC70923-11 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC70923-7 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC70923-16 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC70923-15 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC70923-14 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC70923-13 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC70923-3 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC70923-19 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC70923-5 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC70923-9 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.

**Matrix:** AQ

**Batch ID:** GN83762

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC70944-3DUP were used as the QC samples for Alkalinity, Total as CaCO<sub>3</sub>.
- JC70923-21 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC70923-20 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.

### General Chemistry By Method SM2540 C-11

**Matrix:** AQ                      **Batch ID:** GN83539

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC70923-1DUP were used as the QC samples for Solids, Total Dissolved.

**Matrix:** AQ                      **Batch ID:** GN83592

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC70923-6DUP were used as the QC samples for Solids, Total Dissolved.

### General Chemistry By Method SM2540 D-11

**Matrix:** AQ                      **Batch ID:** GN83536

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC70923-1DUP were used as the QC samples for Solids, Total Suspended.

**Matrix:** AQ                      **Batch ID:** GN83591

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC70923-12DUP were used as the QC samples for Solids, Total Suspended.

### General Chemistry By Method SM4500NH3 H-11LACHAT

**Matrix:** AQ                      **Batch ID:** GP15097

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC70892-1DUP, JC70892-1MSD were used as the QC samples for Nitrogen, Ammonia.
- Matrix Spike Recovery(s) for Nitrogen, Ammonia are outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

**Matrix:** AQ                      **Batch ID:** GP15098

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC70923-15DUP, JC70923-15MS, JC70923-15MSD were used as the QC samples for Nitrogen, Ammonia.

### General Chemistry By Method SM4500NO2 B-11

**Matrix:** AQ                      **Batch ID:** GN83520

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC70923-5DUP, JC70923-5MS were used as the QC samples for Nitrogen, Nitrite.

### General Chemistry By Method SM5210 B-11

**Matrix:** AQ                      **Batch ID:** GP14881

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC70916-1DUP were used as the QC samples for BOD, 5 Day.

**Matrix:** AQ                      **Batch ID:** GP14882

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC70923-12DUP were used as the QC samples for BOD, 5 Day.

### General Chemistry By Method SM5310 B-11

**Matrix:** AQ                      **Batch ID:** GP15125

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC70923-4MS, JC70923-4MSD were used as the QC samples for Total Organic Carbon.

**Matrix:** AQ                      **Batch ID:** GP15145

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC70923-21MS, JC70923-21MSD were used as the QC samples for Total Organic Carbon.

**Matrix:** AQ                      **Batch ID:** GP15173

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC70923-13MS, JC70923-13MSD were used as the QC samples for Total Organic Carbon.

### General Chemistry By Method SM9222 B-06

**Matrix:** AQ                      **Batch ID:** MB5318

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC70923-1DUP were used as the QC samples for Coliform, Total.
- JC70923-12 for Coliform, Total: Analysis done out of holding time.
- JC70923-15 for Coliform, Total: Analysis done out of holding time.
- JC70923-6 for Coliform, Total: Analysis done out of holding time.
- JC70923-21 for Coliform, Total: Analysis done out of holding time.
- JC70923-2 for Coliform, Total: Analysis done out of holding time.
- JC70923-18 for Coliform, Total: Analysis done out of holding time.
- JC70923-9 for Coliform, Total: Analysis done out of holding time.

## General Chemistry By Method SM9222 D-06

**Matrix:** AQ

**Batch ID:** MB5319

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC70923-1DUP were used as the QC samples for Coliform, Fecal.
- JC70923-5 for Coliform, Fecal: Analysis done out of holding time.
- JC70923-21 for Coliform, Fecal: Analysis done out of holding time.
- JC70923-18 for Coliform, Fecal: Analysis done out of holding time.
- JC70923-6 for Coliform, Fecal: Analysis done out of holding time.
- JC70923-15 for Coliform, Fecal: Analysis done out of holding time.
- JC70923-12 for Coliform, Fecal: Analysis done out of holding time.
- JC70923-9 for Coliform, Fecal: Analysis done out of holding time.
- JC70923-2 for Coliform, Fecal: Analysis done out of holding time.

SGS North America Inc. certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting the Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

SGS North America Inc. is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. Data release is authorized by SGS North America Inc indicated via signature on the report cover

Wednesday, August 15, 2018

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## Summary of Hits

**Job Number:** JC70923  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 07/30/18



Lab Sample ID	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
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**JC70923-1 BM-1S**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	117	10	8.0	mg/l	SM2320 B-11
BOD, 5 Day	5.2	3.4	3.4 <sup>b</sup>	mg/l	SM5210 B-11
Coliform, Fecal	300	10	<sup>b</sup>	col/100ml	SM9222 D-06
Coliform, Total	340	10	<sup>b</sup>	col/100ml	SM9222 B-06
Nitrogen, Ammonia	0.62	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>c</sup>	4.6	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.7	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.085	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.73	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total	0.10	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved	178	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	9.5	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon	3.4	1.0	1.0	mg/l	SM5310 B-11

**JC70923-1F BM-1S**

Phosphorus, Total	0.074	0.050	0.050	mg/l	EPA 365.3
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**JC70923-2 BM-2S**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	62.6	5.0	4.0	mg/l	SM2320 B-11
BOD, 5 Day	5.5	3.4	3.4 <sup>b</sup>	mg/l	SM5210 B-11
Coliform, Fecal <sup>d</sup>	14	10	<sup>b</sup>	col/100ml	SM9222 D-06
Coliform, Total <sup>d</sup>	60	10	<sup>b</sup>	col/100ml	SM9222 B-06
Nitrogen, Ammonia	0.83	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>c</sup>	2.6	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	2.7	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.053	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	1.6	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total	0.062	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved	135	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	15.8	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon	3.5	1.0	1.0	mg/l	SM5310 B-11

**JC70923-2F BM-2S**

No hits reported in this sample.

**JC70923-3 BM-2M**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	119	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Ammonia	0.25	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>c</sup>	4.9	0.11	0.11	mg/l	EPA353.2/SM4500NO2B

## Summary of Hits

**Job Number:** JC70923  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 07/30/18



Lab Sample ID	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
		4.9	0.10	0.10	mg/l	EPA 353.2/LACHAT
		0.039	0.010	0.0050	mg/l	SM4500NO2 B-11
		0.69	0.20	0.15	mg/l	EPA 351.2/LACHAT
		0.18	0.050	0.050	mg/l	EPA 365.3
		173	10	4.0	mg/l	SM2540 C-11
		12.8	4.0	2.0	mg/l	SM2540 D-11
		2.2	1.0	1.0	mg/l	SM5310 B-11

**JC70923-3F BM-2M**

Phosphorus, Total	0.060	0.050	0.050	mg/l	EPA 365.3
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**JC70923-4 BM-2D**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	131	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Ammonia	0.29	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>c</sup>	5.7	0.21	0.21	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	5.7	0.20	0.20	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.031	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.74	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total	0.092	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved	197	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	25.1	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon	1.9	1.0	1.0	mg/l	SM5310 B-11

**JC70923-4F BM-2D**

No hits reported in this sample.

**JC70923-5 BM-5S**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	201	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal <sup>d</sup>	2900	100	<sup>b</sup>	col/100ml	SM9222 D-06
Coliform, Total	4000	100	<sup>b</sup>	col/100ml	SM9222 B-06
Nitrogen, Ammonia	0.20	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>c</sup>	8.8	0.31	0.31	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	8.8	0.30	0.30	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.016	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.29	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total	0.051	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved	305	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	18.6	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon	1.0	1.0	1.0	mg/l	SM5310 B-11

## Summary of Hits

**Job Number:** JC70923  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 07/30/18



Lab Sample ID	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
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**JC70923-5F BM-5S**

No hits reported in this sample.

**JC70923-6 BM-6S**

Alkalinity, Total as CaCO3 <sup>a</sup>	72.5	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal <sup>d</sup>	4	4	<sup>b</sup>	col/100ml	SM9222 D-06
Coliform, Total <sup>d</sup>	17	10	<sup>b</sup>	col/100ml	SM9222 B-06
Nitrogen, Nitrate <sup>c</sup>	2.7	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	2.8	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.061	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	1.3	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	154	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	16.7	4.0	2.0	mg/l	SM2540 D-11

**JC70923-6F BM-6S**

No hits reported in this sample.

**JC70923-7 BM-6M**

Alkalinity, Total as CaCO3 <sup>a</sup>	122	5.0	4.0	mg/l	SM2320 B-11
BOD, 5 Day	4.4	3.4	3.4 <sup>b</sup>	mg/l	SM5210 B-11
Nitrogen, Nitrate <sup>c</sup>	4.7	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.8	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.057	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.64	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total	0.097	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved	198	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	8.7	4.0	2.0	mg/l	SM2540 D-11

**JC70923-7F BM-6M**

Phosphorus, Total	0.068	0.050	0.050	mg/l	EPA 365.3
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**JC70923-8 BM-6D**

Alkalinity, Total as CaCO3 <sup>a</sup>	141	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Ammonia	0.20	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>c</sup>	5.8	0.21	0.21	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	5.8	0.20	0.20	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.044	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.69	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total	0.19	0.050	0.050	mg/l	EPA 365.3

## Summary of Hits

**Job Number:** JC70923  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 07/30/18



Lab Sample ID	Client Sample ID	Result/ Analyte	LOQ	LOD	Units	Method
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		Solids, Total Dissolved	216	10	4.0	mg/l	SM2540 C-11
		Solids, Total Suspended	12.7	4.0	2.0	mg/l	SM2540 D-11
		Total Organic Carbon	1.7	1.0	1.0	mg/l	SM5310 B-11

**JC70923-8F BM-6D**

No hits reported in this sample.

**JC70923-9 BM-7S**

		Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	74.0	5.0	4.0	mg/l	SM2320 B-11
		BOD, 5 Day	7.2	3.4	3.4 <sup>b</sup>	mg/l	SM5210 B-11
		Coliform, Fecal <sup>d</sup>	11	10	<sup>b</sup>	col/100ml	SM9222 D-06
		Coliform, Total <sup>d</sup>	46	10	<sup>b</sup>	col/100ml	SM9222 B-06
		Nitrogen, Nitrate <sup>c</sup>	3.0	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
		Nitrogen, Nitrate + Nitrite	3.0	0.10	0.10	mg/l	EPA 353.2/LACHAT
		Nitrogen, Nitrite	0.047	0.010	0.0050	mg/l	SM4500NO2 B-11
		Nitrogen, Total Kjeldahl	2.0	0.20	0.15	mg/l	EPA 351.2/LACHAT
		Phosphorus, Total	0.056	0.050	0.050	mg/l	EPA 365.3
		Solids, Total Dissolved	172	10	4.0	mg/l	SM2540 C-11
		Solids, Total Suspended	13.4	4.0	2.0	mg/l	SM2540 D-11
		Total Organic Carbon	3.8	1.0	1.0	mg/l	SM5310 B-11

**JC70923-9F BM-7S**

No hits reported in this sample.

**JC70923-10 BM-7M**

		Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	98.3	5.0	4.0	mg/l	SM2320 B-11
		Nitrogen, Nitrate <sup>c</sup>	4.2	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
		Nitrogen, Nitrate + Nitrite	4.2	0.10	0.10	mg/l	EPA 353.2/LACHAT
		Nitrogen, Nitrite	0.034	0.010	0.0050	mg/l	SM4500NO2 B-11
		Nitrogen, Total Kjeldahl	0.66	0.20	0.15	mg/l	EPA 351.2/LACHAT
		Phosphorus, Total	0.084	0.050	0.050	mg/l	EPA 365.3
		Solids, Total Dissolved	190	10	4.0	mg/l	SM2540 C-11
		Solids, Total Suspended	7.1	4.0	2.0	mg/l	SM2540 D-11
		Total Organic Carbon	2.6	1.0	1.0	mg/l	SM5310 B-11

**JC70923-10F BM-7M**

No hits reported in this sample.

## Summary of Hits

**Job Number:** JC70923  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 07/30/18



Lab Sample ID	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
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**JC70923-11 BM-7D**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	104	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Ammonia	0.57	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>c</sup>	4.6	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.6	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.032	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.65	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total	0.060	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved	188	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	10.3	4.0	2.0	mg/l	SM2540 D-11

**JC70923-11F BM-7D**

No hits reported in this sample.

**JC70923-12 BM-8S**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	75.6	5.0	4.0	mg/l	SM2320 B-11
BOD, 5 Day	5.9	3.4	3.4 <sup>b</sup>	mg/l	SM5210 B-11
Coliform, Total <sup>d</sup>	14	10	<sup>b</sup>	col/100ml	SM9222 B-06
Nitrogen, Nitrate <sup>c</sup>	2.7	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	2.7	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.027	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	1.9	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	158	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	20.0	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon	3.3	1.0	1.0	mg/l	SM5310 B-11

**JC70923-12F BM-8S**

No hits reported in this sample.

**JC70923-13 BM-8M**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	82.8	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate <sup>c</sup>	3.2	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	3.2	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.031	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.83	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	150	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	19.8	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon	4.8	1.0	1.0	mg/l	SM5310 B-11

## Summary of Hits

**Job Number:** JC70923  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 07/30/18



Lab Sample ID	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
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**JC70923-13F BM-8M**

No hits reported in this sample.

**JC70923-14 BM-8D**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	101	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate <sup>c</sup>	3.8	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	3.8	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.024	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	1.3	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	156	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	17.0	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon	3.0	1.0	1.0	mg/l	SM5310 B-11

**JC70923-14F BM-8D**

No hits reported in this sample.

**JC70923-15 BM-9S**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	74.0	5.0	4.0	mg/l	SM2320 B-11
BOD, 5 Day	6.2	3.4	3.4 <sup>b</sup>	mg/l	SM5210 B-11
Coliform, Fecal <sup>d</sup>	8	4	<sup>b</sup>	col/100ml	SM9222 D-06
Coliform, Total <sup>d</sup>	49	10	<sup>b</sup>	col/100ml	SM9222 B-06
Nitrogen, Ammonia	0.30	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>c</sup>	2.6	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	2.6	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.035	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	2.3	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total	0.21	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved	142	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	20.8	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon	3.7	1.0	1.0	mg/l	SM5310 B-11

**JC70923-15F BM-9S**

No hits reported in this sample.

**JC70923-16 BM-9M**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	148	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate <sup>c</sup>	6.1	0.21	0.21	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	6.1	0.20	0.20	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.023	0.010	0.0050	mg/l	SM4500NO2 B-11

## Summary of Hits

**Job Number:** JC70923  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 07/30/18



Lab Sample ID	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
		0.69	0.20	0.15	mg/l	EPA 351.2/LACHAT
		0.10	0.050	0.050	mg/l	EPA 365.3
		236	10	4.0	mg/l	SM2540 C-11
		35.3	4.0	2.0	mg/l	SM2540 D-11
		2.1	1.0	1.0	mg/l	SM5310 B-11

### JC70923-16F BM-9M

No hits reported in this sample.

### JC70923-17 BM-9D

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	154	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate <sup>c</sup>	6.5	0.21	0.21	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	6.5	0.20	0.20	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.019	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.57	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total	0.064	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved	220	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	18.9	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon	1.3	1.0	1.0	mg/l	SM5310 B-11

### JC70923-17F BM-9D

No hits reported in this sample.

### JC70923-18 BM-10S

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	171	5.0	4.0	mg/l	SM2320 B-11
BOD, 5 Day	5.3	3.4	3.4 <sup>b</sup>	mg/l	SM5210 B-11
Coliform, Fecal <sup>d</sup>	11	4	<sup>b</sup>	col/100ml	SM9222 D-06
Coliform, Total <sup>d</sup>	23	10	<sup>b</sup>	col/100ml	SM9222 B-06
Nitrogen, Nitrate <sup>c</sup>	2.5	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	2.5	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.039	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	3.0	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	144	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	38.8	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon	3.7	1.0	1.0	mg/l	SM5310 B-11

### JC70923-18F BM-10S

No hits reported in this sample.

## Summary of Hits

**Job Number:** JC70923  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 07/30/18



Lab Sample ID	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
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**JC70923-19 BM-10M**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	109	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate <sup>c</sup>	4.5	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.5	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.027	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	2.1	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total	0.15	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved	170	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	395	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon	2.2	1.0	1.0	mg/l	SM5310 B-11

**JC70923-19F BM-10M**

No hits reported in this sample.

**JC70923-20 BM-10D**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	156	5.0	4.0	mg/l	SM2320 B-11
BOD, 5 Day	5.2	3.4	3.4 <sup>b</sup>	mg/l	SM5210 B-11
Nitrogen, Nitrate <sup>c</sup>	7.3	0.31	0.31	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	7.3	0.30	0.30	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.019	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.82	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total	0.099	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved	266	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	55.0	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon	1.2	1.0	1.0	mg/l	SM5310 B-11

**JC70923-20F BM-10D**

No hits reported in this sample.

**JC70923-21 BM-11S**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	38.8	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal <sup>d</sup>	510	10	<sup>b</sup>	col/100ml	SM9222 D-06
Coliform, Total <sup>d</sup>	2600	100	<sup>b</sup>	col/100ml	SM9222 B-06
Nitrogen, Nitrate <sup>c</sup>	4.8	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.8	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0079 J	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.26	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total	0.051	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved	97.8	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	5.9	4.0	2.0	mg/l	SM2540 D-11



## Summary of Hits

**Job Number:** JC70923  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 07/30/18



Lab Sample ID	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
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Total Organic Carbon		1.6	1.0	1.0	mg/l	SM5310 B-11
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**JC70923-21F BM-11S**

No hits reported in this sample.

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)
- (d) Analysis done out of holding time.

Sample Results

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Report of Analysis

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## Report of Analysis

<b>Client Sample ID:</b> BM-1S		<b>Date Sampled:</b> 07/30/18
<b>Lab Sample ID:</b> JC70923-1		<b>Date Received:</b> 07/30/18
<b>Matrix:</b> AQ - Surface Water		<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling		

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 <sup>a</sup>	117	10	8.0	mg/l	1	08/02/18 18:29	JO	SM2320 B-11
BOD, 5 Day	5.2	3.4	3.4 <sup>b</sup>	mg/l	1	07/30/18 21:27	SA	SM5210 B-11
Coliform, Fecal	300	10		col/100ml	10	07/30/18 20:15	SA	SM9222 D-06
Coliform, Total	340	10		col/100ml	10	07/30/18 20:08	SA	SM9222 B-06
Nitrogen, Ammonia	0.62	0.20	0.20	mg/l	1	08/07/18 10:54	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>c</sup>	4.6	0.11	0.11	mg/l	1	08/04/18 16:00	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.7	0.10	0.10	mg/l	1	08/04/18 16:00	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.085	0.010	0.0050	mg/l	1	07/30/18 18:50	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.73	0.20	0.15	mg/l	1	08/04/18 11:18	RP	EPA 351.2/LACHAT
Phosphorus, Total	0.10	0.050	0.050	mg/l	1	08/06/18 20:15	LS	EPA 365.3
Solids, Total Dissolved	178	10	4.0	mg/l	1	07/31/18 16:25	RC	SM2540 C-11
Solids, Total Suspended	9.5	4.0	2.0	mg/l	1	07/31/18 10:50	RC	SM2540 D-11
Total Organic Carbon	3.4	1.0	1.0	mg/l	1	08/13/18 22:28	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.

(b) Value reported is laboratory DL (MDL).

(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ

## Report of Analysis

<b>Client Sample ID:</b> BM-1S		<b>Date Sampled:</b> 07/30/18
<b>Lab Sample ID:</b> JC70923-1F		<b>Date Received:</b> 07/30/18
<b>Matrix:</b> AQ - Surface H2O Filtered		<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling		

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By Method
Phosphorus, Total	0.074	0.050	0.050	mg/l	1	08/07/18 21:20 LS	EPA 365.3

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ



## Report of Analysis

<b>Client Sample ID:</b> BM-2S		<b>Date Sampled:</b> 07/30/18
<b>Lab Sample ID:</b> JC70923-2F		<b>Date Received:</b> 07/30/18
<b>Matrix:</b> AQ - Surface H2O Filtered		<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling		

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/11/18 11:35 LS	EPA	365.3

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ



## Report of Analysis

<b>Client Sample ID:</b> BM-2M	<b>Date Sampled:</b> 07/30/18
<b>Lab Sample ID:</b> JC70923-3F	<b>Date Received:</b> 07/30/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.060	0.050	0.050	mg/l	1	08/11/18 11:35 LS	EPA	365.3

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ





## Report of Analysis

<b>Client Sample ID:</b> BM-2D		<b>Date Sampled:</b> 07/30/18
<b>Lab Sample ID:</b> JC70923-4F		<b>Date Received:</b> 07/30/18
<b>Matrix:</b> AQ - Surface H2O Filtered		<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling		

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/11/18 11:35 LS		EPA 365.3

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ





## Report of Analysis

<b>Client Sample ID:</b> BM-6S	<b>Date Sampled:</b> 07/30/18
<b>Lab Sample ID:</b> JC70923-6	<b>Date Received:</b> 07/30/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	72.5	5.0	4.0	mg/l	1	08/03/18 12:03	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	mg/l	1	07/30/18 21:38	SA	SM5210 B-11
Coliform, Fecal <sup>c</sup>	4	4		col/100ml	4	07/30/18 20:15	SA	SM9222 D-06
Coliform, Total <sup>c</sup>	17	10		col/100ml	10	07/30/18 20:08	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	08/07/18 11:01	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	2.7	0.11	0.11	mg/l	1	08/04/18 16:06	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	2.8	0.10	0.10	mg/l	1	08/04/18 16:06	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.061	0.010	0.0050	mg/l	1	07/30/18 18:50	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	1.3	0.20	0.15	mg/l	1	08/08/18 10:53	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/06/18 20:15	LS	EPA 365.3
Solids, Total Dissolved	154	10	4.0	mg/l	1	08/01/18 13:00	RC	SM2540 C-11
Solids, Total Suspended	16.7	4.0	2.0	mg/l	1	07/31/18 10:50	RC	SM2540 D-11

(a) Sample was titrated to a final pH of 4.5.

(b) Value reported is laboratory DL (MDL).

(c) Analysis done out of holding time.

(d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ

## Report of Analysis

<b>Client Sample ID:</b> BM-6S	<b>Date Sampled:</b> 07/30/18
<b>Lab Sample ID:</b> JC70923-6F	<b>Date Received:</b> 07/30/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/11/18 11:35 LS	EPA	365.3

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ

## Report of Analysis

<b>Client Sample ID:</b> BM-6M	<b>Date Sampled:</b> 07/30/18
<b>Lab Sample ID:</b> JC70923-7	<b>Date Received:</b> 07/30/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	122	5.0	4.0	mg/l	1	08/03/18 12:03	ST	SM2320 B-11
BOD, 5 Day	4.4	3.4	3.4 <sup>b</sup>	mg/l	1	07/30/18 21:40	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	08/07/18 11:06	RP	SM4500NH3 H-11/LACHAT
Nitrogen, Nitrate <sup>c</sup>	4.7	0.11	0.11	mg/l	1	08/04/18 16:07	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.8	0.10	0.10	mg/l	1	08/04/18 16:07	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.057	0.010	0.0050	mg/l	1	07/30/18 19:15	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.64	0.20	0.15	mg/l	1	08/08/18 10:53	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.097	0.050	0.050	mg/l	1	08/06/18 20:25	LS	EPA 365.3
Solids, Total Dissolved	198	10	4.0	mg/l	1	08/01/18 13:00	RC	SM2540 C-11
Solids, Total Suspended	8.7	4.0	2.0	mg/l	1	07/31/18 10:50	RC	SM2540 D-11

(a) Sample was titrated to a final pH of 4.5.

(b) Value reported is laboratory DL (MDL).

(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ

## Report of Analysis

<b>Client Sample ID:</b> BM-6M	<b>Date Sampled:</b> 07/30/18
<b>Lab Sample ID:</b> JC70923-7F	<b>Date Received:</b> 07/30/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.068	0.050	0.050	mg/l	1	08/11/18 11:35 LS	EPA	365.3

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ



# Report of Analysis

<b>Client Sample ID:</b> BM-6D <b>Lab Sample ID:</b> JC70923-8 <b>Matrix:</b> AQ - Surface Water <b>Project:</b> Philadelphia District, Reservoir Sampling	<b>Date Sampled:</b> 07/30/18 <b>Date Received:</b> 07/30/18 <b>Percent Solids:</b> n/a
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4.15  
4

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 <sup>a</sup>	141	5.0	4.0	mg/l	1	08/03/18 12:03	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	mg/l	1	07/30/18 21:42	SA	SM5210 B-11
Nitrogen, Ammonia	0.20	0.20	0.20	mg/l	1	08/07/18 11:07	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>c</sup>	5.8	0.21	0.21	mg/l	1	08/04/18 16:32	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	5.8	0.20	0.20	mg/l	2	08/04/18 16:32	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.044	0.010	0.0050	mg/l	1	07/30/18 19:15	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.69	0.20	0.15	mg/l	1	08/08/18 10:54	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.19	0.050	0.050	mg/l	1	08/06/18 20:25	LS	EPA 365.3
Solids, Total Dissolved	216	10	4.0	mg/l	1	08/01/18 13:00	RC	SM2540 C-11
Solids, Total Suspended	12.7	4.0	2.0	mg/l	1	07/31/18 10:50	RC	SM2540 D-11
Total Organic Carbon	1.7	1.0	1.0	mg/l	1	08/14/18 00:34	CD	SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation U = Indicates a result < LOD  
 LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ

## Report of Analysis

<b>Client Sample ID:</b> BM-6D	<b>Date Sampled:</b> 07/30/18
<b>Lab Sample ID:</b> JC70923-8F	<b>Date Received:</b> 07/30/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/11/18 11:55 LS	EPA	365.3

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ

**Report of Analysis**

<b>Client Sample ID:</b> BM-7S		<b>Date Sampled:</b> 07/30/18
<b>Lab Sample ID:</b> JC70923-9		<b>Date Received:</b> 07/30/18
<b>Matrix:</b> AQ - Surface Water		<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling		

**General Chemistry**

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	74.0	5.0	4.0	mg/l	1	08/03/18 12:03	ST	SM2320 B-11
BOD, 5 Day	7.2	3.4	3.4 <sup>b</sup>	mg/l	1	07/30/18 21:44	SA	SM5210 B-11
Coliform, Fecal <sup>c</sup>	11	10		col/100ml	10	07/30/18 20:15	SA	SM9222 D-06
Coliform, Total <sup>c</sup>	46	10		col/100ml	10	07/30/18 20:08	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	08/07/18 11:09	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	3.0	0.11	0.11	mg/l	1	08/04/18 16:09	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	3.0	0.10	0.10	mg/l	1	08/04/18 16:09	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.047	0.010	0.0050	mg/l	1	07/30/18 19:15	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	2.0	0.20	0.15	mg/l	1	08/08/18 10:55	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.056	0.050	0.050	mg/l	1	08/06/18 20:25	LS	EPA 365.3
Solids, Total Dissolved	172	10	4.0	mg/l	1	08/01/18 13:00	RC	SM2540 C-11
Solids, Total Suspended	13.4	4.0	2.0	mg/l	1	07/31/18 10:50	RC	SM2540 D-11
Total Organic Carbon	3.8	1.0	1.0	mg/l	1	08/14/18 00:46	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.

(b) Value reported is laboratory DL (MDL).

(c) Analysis done out of holding time.

(d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ

## Report of Analysis

<b>Client Sample ID:</b> BM-7S	<b>Date Sampled:</b> 07/30/18
<b>Lab Sample ID:</b> JC70923-9F	<b>Date Received:</b> 07/30/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

4.18  
4

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/11/18 11:55 LS	EPA	365.3

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank

J = Indicates a result > = LOD but < LOQ

### Report of Analysis

<b>Client Sample ID:</b> BM-7M		<b>Date Sampled:</b> 07/30/18
<b>Lab Sample ID:</b> JC70923-10		<b>Date Received:</b> 07/30/18
<b>Matrix:</b> AQ - Surface Water		<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling		

4.19  
4

#### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 <sup>a</sup>	98.3	5.0	4.0	mg/l	1	08/03/18 12:03	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	mg/l	1	07/30/18 21:45	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	08/07/18 11:10	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>c</sup>	4.2	0.11	0.11	mg/l	1	08/04/18 16:10	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.2	0.10	0.10	mg/l	1	08/04/18 16:10	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.034	0.010	0.0050	mg/l	1	07/30/18 19:15	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.66	0.20	0.15	mg/l	1	08/08/18 10:56	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.084	0.050	0.050	mg/l	1	08/06/18 20:25	LS	EPA 365.3
Solids, Total Dissolved	190	10	4.0	mg/l	1	08/01/18 13:00	RC	SM2540 C-11
Solids, Total Suspended	7.1	4.0	2.0	mg/l	1	07/31/18 10:50	RC	SM2540 D-11
Total Organic Carbon	2.6	1.0	1.0	mg/l	1	08/14/18 00:57	CD	SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation U = Indicates a result < LOD  
 LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ

## Report of Analysis

<b>Client Sample ID:</b> BM-7M	<b>Date Sampled:</b> 07/30/18
<b>Lab Sample ID:</b> JC70923-10F	<b>Date Received:</b> 07/30/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/11/18 11:55 LS	EPA	365.3

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ

## Report of Analysis

<b>Client Sample ID:</b> BM-7D <b>Lab Sample ID:</b> JC70923-11 <b>Matrix:</b> AQ - Surface Water <b>Project:</b> Philadelphia District, Reservoir Sampling	<b>Date Sampled:</b> 07/30/18 <b>Date Received:</b> 07/30/18 <b>Percent Solids:</b> n/a
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**General Chemistry**

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 <sup>a</sup>	104	5.0	4.0	mg/l	1	08/03/18 12:03 ST	SM2320	B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	mg/l	1	07/30/18 21:47 SA	SM5210	B-11
Nitrogen, Ammonia	0.57	0.20	0.20	mg/l	1	08/07/18 11:11 RP	SM4500NH3 H-11	LACHAT
Nitrogen, Nitrate <sup>c</sup>	4.6	0.11	0.11	mg/l	1	08/04/18 16:13 RP	EPA353.2/SM4500NO2B	
Nitrogen, Nitrate + Nitrite	4.6	0.10	0.10	mg/l	1	08/04/18 16:13 RP	EPA 353.2/LACHAT	
Nitrogen, Nitrite	0.032	0.010	0.0050	mg/l	1	07/30/18 19:15 LS	SM4500NO2 B-11	
Nitrogen, Total Kjeldahl	0.65	0.20	0.15	mg/l	1	08/08/18 10:57 BM	EPA 351.2/LACHAT	
Phosphorus, Total	0.060	0.050	0.050	mg/l	1	08/06/18 20:25 LS	EPA 365.3	
Solids, Total Dissolved	188	10	4.0	mg/l	1	08/01/18 13:00 RC	SM2540 C-11	
Solids, Total Suspended	10.3	4.0	2.0	mg/l	1	07/31/18 10:50 RC	SM2540 D-11	

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ

## Report of Analysis

<b>Client Sample ID:</b> BM-7D		<b>Date Sampled:</b> 07/30/18
<b>Lab Sample ID:</b> JC70923-11F		<b>Date Received:</b> 07/30/18
<b>Matrix:</b> AQ - Surface H2O Filtered		<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling		

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/11/18 11:55 LS	EPA	365.3

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ



## Report of Analysis

<b>Client Sample ID:</b>	BM-8S	<b>Date Sampled:</b>	07/30/18
<b>Lab Sample ID:</b>	JC70923-12	<b>Date Received:</b>	07/30/18
<b>Matrix:</b>	AQ - Surface Water	<b>Percent Solids:</b>	n/a
<b>Project:</b>	Philadelphia District, Reservoir Sampling		

## General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	75.6	5.0	4.0	mg/l	1	08/03/18 12:03	ST	SM2320 B-11
BOD, 5 Day	5.9	3.4	3.4 <sup>b</sup>	mg/l	1	07/30/18 21:51	SA	SM5210 B-11
Coliform, Fecal <sup>c</sup>	0 J	4		col/100ml	4	07/30/18 20:15	SA	SM9222 D-06
Coliform, Total <sup>c</sup>	14	10		col/100ml	10	07/30/18 20:08	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	08/07/18 11:13	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	2.7	0.11	0.11	mg/l	1	08/04/18 16:15	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	2.7	0.10	0.10	mg/l	1	08/04/18 16:15	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.027	0.010	0.0050	mg/l	1	07/30/18 19:15	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	1.9	0.20	0.15	mg/l	1	08/08/18 10:58	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/06/18 20:25	LS	EPA 365.3
Solids, Total Dissolved	158	10	4.0	mg/l	1	08/01/18 13:00	RC	SM2540 C-11
Solids, Total Suspended	20.0	4.0	2.0	mg/l	1	08/01/18 10:45	RC	SM2540 D-11
Total Organic Carbon	3.3	1.0	1.0	mg/l	1	08/13/18 19:33	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.

(b) Value reported is laboratory DL (MDL).

(c) Analysis done out of holding time.

(d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ

## Report of Analysis

<b>Client Sample ID:</b> BM-8S	<b>Date Sampled:</b> 07/30/18
<b>Lab Sample ID:</b> JC70923-12F	<b>Date Received:</b> 07/30/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/11/18 11:55 LS	EPA	365.3

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ

### Report of Analysis

<b>Client Sample ID:</b> BM-8M		<b>Date Sampled:</b> 07/30/18
<b>Lab Sample ID:</b> JC70923-13		<b>Date Received:</b> 07/30/18
<b>Matrix:</b> AQ - Surface Water		<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling		

4.25  
4

#### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	82.8	5.0	4.0	mg/l	1	08/03/18 12:03	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	mg/l	1	07/30/18 21:55	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	08/07/18 11:14	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>c</sup>	3.2	0.11	0.11	mg/l	1	08/04/18 16:16	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	3.2	0.10	0.10	mg/l	1	08/04/18 16:16	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.031	0.010	0.0050	mg/l	1	07/30/18 19:15	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.83	0.20	0.15	mg/l	1	08/08/18 10:59	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/06/18 20:25	LS	EPA 365.3
Solids, Total Dissolved	150	10	4.0	mg/l	1	08/01/18 13:00	RC	SM2540 C-11
Solids, Total Suspended	19.8	4.0	2.0	mg/l	1	08/01/18 10:45	RC	SM2540 D-11
Total Organic Carbon	4.8	1.0	1.0	mg/l	1	08/13/18 20:23	CD	SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation  
 LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ  
 U = Indicates a result < LOD

## Report of Analysis

<b>Client Sample ID:</b> BM-8M	<b>Date Sampled:</b> 07/30/18
<b>Lab Sample ID:</b> JC70923-13F	<b>Date Received:</b> 07/30/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/11/18 11:55 LS	EPA	365.3

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ

**Report of Analysis**

<b>Client Sample ID:</b> BM-8D	<b>Date Sampled:</b> 07/30/18
<b>Lab Sample ID:</b> JC70923-14	<b>Date Received:</b> 07/30/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

**General Chemistry**

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	101	5.0	4.0	mg/l	1	08/03/18 12:03	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	mg/l	1	07/30/18 21:57	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	08/07/18 11:16	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>c</sup>	3.8	0.11	0.11	mg/l	1	08/04/18 16:17	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	3.8	0.10	0.10	mg/l	1	08/04/18 16:17	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.024	0.010	0.0050	mg/l	1	07/30/18 19:15	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	1.3	0.20	0.15	mg/l	1	08/08/18 10:59	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/06/18 20:25	LS	EPA 365.3
Solids, Total Dissolved	156	10	4.0	mg/l	1	08/01/18 13:00	RC	SM2540 C-11
Solids, Total Suspended	17.0	4.0	2.0	mg/l	1	08/01/18 10:45	RC	SM2540 D-11
Total Organic Carbon	3.0	1.0	1.0	mg/l	1	08/13/18 21:06	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.

(b) Value reported is laboratory DL (MDL).

(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ

## Report of Analysis

<b>Client Sample ID:</b> BM-8D	<b>Date Sampled:</b> 07/30/18
<b>Lab Sample ID:</b> JC70923-14F	<b>Date Received:</b> 07/30/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/11/18 11:55 LS	EPA	365.3

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ

## Report of Analysis

<b>Client Sample ID:</b> BM-9S	<b>Date Sampled:</b> 07/30/18
<b>Lab Sample ID:</b> JC70923-15	<b>Date Received:</b> 07/30/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	74.0	5.0	4.0	mg/l	1	08/03/18 12:03	ST	SM2320 B-11
BOD, 5 Day	6.2	3.4	3.4 <sup>b</sup>	mg/l	1	07/30/18 21:58	SA	SM5210 B-11
Coliform, Fecal <sup>c</sup>	8	4		col/100ml	4	07/30/18 20:15	SA	SM9222 D-06
Coliform, Total <sup>c</sup>	49	10		col/100ml	10	07/30/18 20:08	SA	SM9222 B-06
Nitrogen, Ammonia	0.30	0.20	0.20	mg/l	1	08/07/18 11:27	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	2.6	0.11	0.11	mg/l	1	08/04/18 16:18	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	2.6	0.10	0.10	mg/l	1	08/04/18 16:18	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.035	0.010	0.0050	mg/l	1	07/30/18 19:15	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	2.3	0.20	0.15	mg/l	1	08/08/18 11:02	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.21	0.050	0.050	mg/l	1	08/06/18 20:25	LS	EPA 365.3
Solids, Total Dissolved	142	10	4.0	mg/l	1	08/01/18 13:00	RC	SM2540 C-11
Solids, Total Suspended	20.8	4.0	2.0	mg/l	1	08/01/18 10:45	RC	SM2540 D-11
Total Organic Carbon	3.7	1.0	1.0	mg/l	1	08/13/18 21:19	CD	SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Analysis done out of holding time.
- (d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation U = Indicates a result < LOD  
 LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ

## Report of Analysis

<b>Client Sample ID:</b> BM-9S		<b>Date Sampled:</b> 07/30/18
<b>Lab Sample ID:</b> JC70923-15F		<b>Date Received:</b> 07/30/18
<b>Matrix:</b> AQ - Surface H2O Filtered		<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling		

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/11/18 11:55 LS	EPA	365.3

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ

4.30  
4





## Report of Analysis

<b>Client Sample ID:</b> BM-9M	<b>Date Sampled:</b> 07/30/18
<b>Lab Sample ID:</b> JC70923-16F	<b>Date Received:</b> 07/30/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/11/18 11:55 LS	EPA	365.3

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ

## Report of Analysis

<b>Client Sample ID:</b> BM-9D		<b>Date Sampled:</b> 07/30/18
<b>Lab Sample ID:</b> JC70923-17		<b>Date Received:</b> 07/30/18
<b>Matrix:</b> AQ - Surface Water		<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling		

## General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	154	5.0	4.0	mg/l	1	08/03/18 12:03 ST	SM2320	B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	mg/l	1	07/30/18 22:02 SA	SM5210	B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	08/07/18 11:30 RP	SM4500NH3 H-11	LACHAT
Nitrogen, Nitrate <sup>c</sup>	6.5	0.21	0.21	mg/l	1	08/04/18 16:35 RP	EPA353.2/SM4500NO2B	
Nitrogen, Nitrate + Nitrite	6.5	0.20	0.20	mg/l	2	08/04/18 16:35 RP	EPA 353.2/LACHAT	
Nitrogen, Nitrite	0.019	0.010	0.0050	mg/l	1	07/30/18 21:00 LS	SM4500NO2	B-11
Nitrogen, Total Kjeldahl	0.57	0.20	0.15	mg/l	1	08/08/18 11:04 BM	EPA 351.2/LACHAT	
Phosphorus, Total	0.064	0.050	0.050	mg/l	1	08/06/18 20:30 LS	EPA 365.3	
Solids, Total Dissolved	220	10	4.0	mg/l	1	08/01/18 13:00 RC	SM2540	C-11
Solids, Total Suspended	18.9	4.0	2.0	mg/l	1	08/01/18 10:45 RC	SM2540	D-11
Total Organic Carbon	1.3	1.0	1.0	mg/l	1	08/09/18 15:17 CD	SM5310	B-11

(a) Sample was titrated to a final pH of 4.5.

(b) Value reported is laboratory DL (MDL).

(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ

## Report of Analysis

<b>Client Sample ID:</b> BM-9D	<b>Date Sampled:</b> 07/30/18
<b>Lab Sample ID:</b> JC70923-17F	<b>Date Received:</b> 07/30/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/11/18 11:55 LS	EPA	365.3

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank

J = Indicates a result > = LOD but < LOQ

## Report of Analysis

<b>Client Sample ID:</b> BM-10S	<b>Date Sampled:</b> 07/30/18
<b>Lab Sample ID:</b> JC70923-18	<b>Date Received:</b> 07/30/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	171	5.0	4.0	mg/l	1	08/03/18 12:03	ST	SM2320 B-11
BOD, 5 Day	5.3	3.4	3.4 <sup>b</sup>	mg/l	1	07/30/18 22:04	SA	SM5210 B-11
Coliform, Fecal <sup>c</sup>	11	4		col/100ml	4	07/30/18 20:15	SA	SM9222 D-06
Coliform, Total <sup>c</sup>	23	10		col/100ml	10	07/30/18 20:08	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	08/07/18 11:32	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	2.5	0.11	0.11	mg/l	1	08/04/18 16:21	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	2.5	0.10	0.10	mg/l	1	08/04/18 16:21	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.039	0.010	0.0050	mg/l	1	07/30/18 21:00	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	3.0	0.20	0.15	mg/l	1	08/08/18 11:05	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/07/18 21:20	LS	EPA 365.3
Solids, Total Dissolved	144	10	4.0	mg/l	1	08/01/18 13:00	RC	SM2540 C-11
Solids, Total Suspended	38.8	4.0	2.0	mg/l	1	08/01/18 10:45	RC	SM2540 D-11
Total Organic Carbon	3.7	1.0	1.0	mg/l	1	08/09/18 15:28	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.

(b) Value reported is laboratory DL (MDL).

(c) Analysis done out of holding time.

(d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ

## Report of Analysis

<b>Client Sample ID:</b> BM-10S	<b>Date Sampled:</b> 07/30/18
<b>Lab Sample ID:</b> JC70923-18F	<b>Date Received:</b> 07/30/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/11/18 11:55 LS	EPA	365.3

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ

## Report of Analysis

<b>Client Sample ID:</b> BM-10M	<b>Date Sampled:</b> 07/30/18
<b>Lab Sample ID:</b> JC70923-19	<b>Date Received:</b> 07/30/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	109	5.0	4.0	mg/l	1	08/03/18 12:03 ST	SM2320	B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	mg/l	1	07/30/18 22:06 SA	SM5210	B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	08/07/18 11:33 RP	SM4500NH3	H-11/LACHAT
Nitrogen, Nitrate <sup>c</sup>	4.5	0.11	0.11	mg/l	1	08/04/18 16:22 RP	EPA353.2/SM4500NO2B	
Nitrogen, Nitrate + Nitrite	4.5	0.10	0.10	mg/l	1	08/04/18 16:22 RP	EPA 353.2/LACHAT	
Nitrogen, Nitrite	0.027	0.010	0.0050	mg/l	1	07/30/18 21:00 LS	SM4500NO2	B-11
Nitrogen, Total Kjeldahl	2.1	0.20	0.15	mg/l	1	08/08/18 11:05 BM	EPA 351.2/LACHAT	
Phosphorus, Total	0.15	0.050	0.050	mg/l	1	08/07/18 21:20 LS	EPA 365.3	
Solids, Total Dissolved	170	10	4.0	mg/l	1	08/01/18 13:00 RC	SM2540	C-11
Solids, Total Suspended	395	4.0	2.0	mg/l	1	08/01/18 10:45 RC	SM2540	D-11
Total Organic Carbon	2.2	1.0	1.0	mg/l	1	08/09/18 15:39 CD	SM5310	B-11

(a) Sample was titrated to a final pH of 4.5.

(b) Value reported is laboratory DL (MDL).

(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ

## Report of Analysis

<b>Client Sample ID:</b> BM-10M	<b>Date Sampled:</b> 07/30/18
<b>Lab Sample ID:</b> JC70923-19F	<b>Date Received:</b> 07/30/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/11/18 12:00 LS	EPA	365.3

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ





## Report of Analysis

<b>Client Sample ID:</b> BM-10D	<b>Date Sampled:</b> 07/30/18
<b>Lab Sample ID:</b> JC70923-20F	<b>Date Received:</b> 07/30/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/11/18 12:00 LS	EPA	365.3

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ

### Report of Analysis

<b>Client Sample ID:</b> BM-11S		<b>Date Sampled:</b> 07/30/18
<b>Lab Sample ID:</b> JC70923-21		<b>Date Received:</b> 07/30/18
<b>Matrix:</b> AQ - Surface Water		<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling		

#### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	38.8	5.0	4.0	mg/l	1	08/03/18 15:58	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	mg/l	1	07/30/18 22:08	SA	SM5210 B-11
Coliform, Fecal <sup>c</sup>	510	10		col/100ml	10	07/30/18 20:15	SA	SM9222 D-06
Coliform, Total <sup>c</sup>	2600	100		col/100ml	100	07/30/18 20:08	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	08/07/18 11:36	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	4.8	0.11	0.11	mg/l	1	08/06/18 11:59	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.8	0.10	0.10	mg/l	1	08/06/18 11:59	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0079 J	0.010	0.0050	mg/l	1	07/30/18 21:00	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.26	0.20	0.15	mg/l	1	08/08/18 11:07	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.051	0.050	0.050	mg/l	1	08/07/18 21:20	LS	EPA 365.3
Solids, Total Dissolved	97.8	10	4.0	mg/l	1	08/01/18 13:00	RC	SM2540 C-11
Solids, Total Suspended	5.9	4.0	2.0	mg/l	1	08/01/18 10:45	RC	SM2540 D-11
Total Organic Carbon	1.6	1.0	1.0	mg/l	1	08/09/18 16:49	CD	SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Analysis done out of holding time.
- (d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation U = Indicates a result < LOD  
 LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ

## Report of Analysis

<b>Client Sample ID:</b> BM-11S	<b>Date Sampled:</b> 07/30/18
<b>Lab Sample ID:</b> JC70923-21F	<b>Date Received:</b> 07/30/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/11/18 12:00 LS	EPA	365.3

LOQ = Limit of Quantitation

U = Indicates a result < LOD

LOD = Limit of Detection B = Analyte found in associated blank J = Indicates a result > = LOD but < LOQ

Misc. Forms

Custody Documents and Other Forms

---

Includes the following where applicable:

- Chain of Custody

SW

**CHAIN OF CUSTODY**

SGS North America Inc. - Dayton  
2235 Route 130, Dayton, NJ 08810  
TEL 732-329-0200 FAX 732-329-3499  
www.sgs.com/ehsusaa

<b>Client / Reporting Information</b> Company Name: <b>USACE-Philadelphia District</b> Street Address: <b>100 Penn Sq, East</b> City: <b>Philadelphia PA 19107</b> Project Contact: <b>Joe Loeper</b> Phone #: <b>215-656-6545</b> Sampler(s) Name(s): <b>Ereg Wacik</b>		<b>Project Information</b> Project Name: <b>USACE- Blue Marsh Reservoir</b> Street: <b>1268 Palisades DR</b> City: <b>Leesport PA</b> Project #: <b>PD-07918-12a</b> Project Manager:		<b>Requested Analysis ( see TEST CODE sheet)</b> AIK, AMN, BOD, TDS TOC, TSS, TP04 (Dissolved) TKN, XN030 (Bottle) TP04 (Dissolved lab filter) FCF, TCF		<b>Matrix Codes</b> DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Sol SL - Sludge SED-Sediment OL - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB-Field Blank EB-Equipment Blank RB- Rinse Blank TB-Trip Blank
Street Address: <b>100 Penn Sq, East</b> City: <b>Philadelphia PA 19107</b> Project Contact: <b>Joe Loeper</b> Phone #: <b>215-656-6545</b> Sampler(s) Name(s): <b>Ereg Wacik</b>		Street: <b>1268 Palisades DR</b> City: <b>Leesport PA</b> Project #: <b>PD-07918-12a</b> Project Manager:		Billing Information (if different from Report to) Company Name: Street Address: City: State: Zip:		Matrix Codes
Turnaround Time ( Business days) <input type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 3 Day RUSH <input type="checkbox"/> 2 Day RUSH <input type="checkbox"/> 1 Day RUSH <input type="checkbox"/> other		Approved by (SGS Project Manager)/Date: _____		Data Deliverable Information <input type="checkbox"/> Commercial "A" (Level 1) <input type="checkbox"/> Commercial "B" (Level 2) <input type="checkbox"/> FULLT1 (Level 3+4) <input type="checkbox"/> NJ Reduced <input type="checkbox"/> Commercial "C" <input type="checkbox"/> NJ Data of Known Quality Protocol Reporting Commercial "A" = Results Only; Commercial "B" = Results + QC Summary NJ Reduced = Results + QC Summary + Partial Raw data		Comments / Special Instructions one TSS Bottle not used, one XN030 bottle not used, TP04 dissolved lab filter, XN030 combined with TP04/TKN bottle. INITIAL ASSESSMENT LABEL VERIFICATION
Sample Custody must be documented below each time samples change possession, including courier delivery.						
Relinquished By: <b>[Signature]</b> Date Time: <b>7/30/18 1:30</b>		Received By: <b>SCHAU</b> Date Time: <b>7/30/18 1340</b>		Relinquished By: <b>[Signature]</b> Date Time: <b>7/30/18</b>		Received By: <b>[Signature]</b> Date Time: <b>7/30/18</b>
Relinquished By: <b>[Signature]</b> Date Time:		Received By:		Custody Seal #		Intact <input type="checkbox"/> Not intact <input type="checkbox"/> Preserved where applicable <input type="checkbox"/> On Ice <input checked="" type="checkbox"/> Cooler Temp <b>CIP</b>

5.1  
5

33-31-32-35-35-31-31

SGS North America Inc. - Dayton  
 2235 Route 130, Dayton, NJ 08810  
 TEL. 732-329-0200 FAX 732-329-3499  
 www.sgs.com/ehsusa

FED-EX Tracking #	Bottle Order Control #
SGS Quote #	SGS Job # <u>JC70923</u>

Client / Reporting Information		Project Information					Requested Analysis ( see TEST CODE sheet)												Matrix Codes								
Company Name <u>USACE-Phila. District</u>		Project Name <u>USACE- Blue Marsh Reservoir</u>					Analysis												Matrix Codes								
Street Address <u>100 Penn Sq. East</u>		Street <u>1268 Palisades Dr.</u>																	DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank								
City State Zip <u>Philadelphia PA 19107</u>		City State <u>Leesport PA</u>																									
Project Contact <u>Joe Loeper</u>		Project # <u>PD-017918-122</u>																									
Phone # <u>215-656-6545</u>		Client Purchase Order #																									
Fax #		City State Zip																									
Sampler(s) Name(s) <u>Greg Wacik</u>		Project Manager <u>610- Phone #</u> <u>597-9780</u>																									
Lab Sample #	Field ID / Point of Collection	MEOH/IDI Vial #	Collection			Matrix	# of bottles	Number of preserved bottles												LAB USE ONLY							
			Date	Time	Sampled by			HCl	NH <sub>3</sub>	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NONE	DI Water	MEOH	ENCORE	Meq/Bottle											
12F	BM-8S		7/30/18	11:00	LS	SW	10	X		X										X	X	X	X	X			
13F	BM-8M		7/30/18	11:00	LS	SW	8	X		X										X	X	X	X	X			
14F	BM-8D			11:00	LS	SW	8	X		X											X	X	X	X	X		
15F	BM-9S			10:10	LS	SW	10	X		X											X	X	X	X	X		
16F	BM-9M			10:10	LS	SW	8	X		X											X	X	X	X	X		
17F	BM-9D			10:10	LS	SW	8	X		X											X	X	X	X	X		
18F	BM-10S			10:30	LS	SW	10	X		X											X	X	X	X	X		
19F	BM-10M			10:30	LS	SW	8	X		X											X	X	X	X	X		
20F	BM-10D			10:30	LS	SW	8	X		X											X	X	X	X	X		
21F	BM-11S			12:00	LS	SW	10	X		X											X	X	X	X	X		
Turnaround Time ( Business days)		Approved by (SGS Project Manager)/Date:					Data Deliverable Information												Comments / Special Instructions								
<input type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 3 Day RUSH <input type="checkbox"/> 2 Day RUSH <input type="checkbox"/> 1 Day RUSH <input type="checkbox"/> other _____		<input type="checkbox"/> Commercial "A" (Level 1) <input type="checkbox"/> NYASP Category A <input type="checkbox"/> Commercial "B" (Level 2) <input type="checkbox"/> NYASP Category B <input type="checkbox"/> FULLT1 (Level 344) <input type="checkbox"/> State Forms <input type="checkbox"/> NJ Reduced <input type="checkbox"/> EDD Format <input type="checkbox"/> Commercial "C" <input type="checkbox"/> Other _____ <input type="checkbox"/> NJ Date of Known Quality Protocol Reporting					Comments / Special Instructions <u>ONE TSS BOTTLE NOT FILLED, ONE XNO30 BOTTLE</u> <u>NOT USED, TPO4 DISSOLVED LAB FILTER,</u> <u>XNO30 COMBINED WITH TPO4/TKN BOTTLE.</u>																				
Emergency & Rush T/A data available via LabLink						NJ Reduced = Results + QC Summary + Partial Raw data						Sample inventory is verified upon receipt in the Laboratory															
Sample Custody must be documented below each time samples change possession, including courier delivery.																											
Relinquished by Sampler: [Signature]		Date/Time: 7/30/18 1:30		Received By: [Signature]		Date/Time: 7/30/18 1:30		Relinquished By: [Signature]		Date/Time: 7/30/18		Received By: [Signature]		Date/Time: 7/26													
Relinquished by Sampler:		Date/Time:		Received By:		Date/Time:		Relinquished By:		Date/Time:		Received By:		Date/Time:													
Relinquished by:		Date/Time:		Received By:		Date/Time:		Custody Seal #		<input type="checkbox"/> Intact <input type="checkbox"/> Not intact		Preserved where applicable <input type="checkbox"/>		On Ice <input checked="" type="checkbox"/>													

5.1  
 5

# SGS Sample Receipt Summary

**Job Number:** JC70923

**Client:** USACE-PHILADELPHIA DISTRICT

**Project:** PHILADELPHIA DISTRICT, RESERVOIR SAMPL

**Date / Time Received:** 7/30/2018 4:26:00 PM

**Delivery Method:**

**Airbill #s:**

**Cooler Temps (Raw Measured) °C:** Cooler 1: (3.3); Cooler 2: (3.1); Cooler 3: (3.2); Cooler 4: (3.5); Cooler 5: (3.5); Cooler 6: (3.1); Cooler 7: (3.1);

**Cooler Temps (Corrected) °C:** Cooler 1: (3.2); Cooler 2: (3.0); Cooler 3: (3.1); Cooler 4: (3.4); Cooler 5: (3.4); Cooler 6: (3.0); Cooler 7: (3.0);

<u>Cooler Security</u>	<u>Y or N</u>		<u>Y or N</u>	
1. Custody Seals Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/> <input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/> <input type="checkbox"/>

<u>Cooler Temperature</u>	<u>Y or N</u>	
1. Temp criteria achieved:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Cooler temp verification:	IR Gun	
3. Cooler media:	Ice (Bag)	
4. No. Coolers:	7	

<u>Quality Control Preservation</u>	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
1. Trip Blank present / cooler:	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Trip Blank listed on COC:	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Samples preserved properly:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. VOCs headspace free:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

<u>Sample Integrity - Documentation</u>	<u>Y or N</u>	
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Container labeling complete:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>	<input type="checkbox"/>

<u>Sample Integrity - Condition</u>	<u>Y or N</u>	
1. Sample recvd within HT:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. All containers accounted for:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Condition of sample:	Intact	

<u>Sample Integrity - Instructions</u>	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
3. Sufficient volume recvd for analysis:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

Test Strip Lot #s:	pH 1-12: 216017	pH 12+:	208717	Other: (Specify)	
--------------------	-----------------	---------	--------	------------------	--

Comments: -6 TCF/FCF Rec'd out of hold.  
-2 and -9 TCF/FCF rec'd in hold, processed out of hold.



Proceed as noted, client is following 30 hour hold time for TCF / FCF on this project.

**JC70923: Chain of Custody**  
**Page 4 of 6**

Job Change Order: JC70923

Requested Date: 8/13/2018 Received Date: 7/30/2018  
Account Name: USACE-Philadelphia District Due Date: 8/13/2018  
Project Description: Philadelphia District, Reservoir Sampling Deliverable: FULT1  
C/O Initiated By: TAMMY PM: TM TAT (Days): 14

=====  
Sample #: JC70923-all Change:  
Dept: revise deliverables to REDT2  
TAT: 14  
=====

Above Changes Per: Joseph Loeper Date/Time: 8/13/2018 12:39:32 PM

To Client: This Change Order is confirmation of the revisions, previously discussed with the Client Service Representative.

**Job Change Order: JC70923**

**Requested Date:** 8/15/2018      **Received Date:** 7/30/2018  
**Account Name:** USACE-Philadelphia District      **Due Date:** 8/13/2018  
**Project Description:** Philadelphia District, Reservoir Sampling      **Deliverable:** REDT2  
**C/O Initiated By:** PD      **PM:** TM      **TAT (Days):** 14

=====  
**Sample #:** JC70923-6, -7, -11      **Change:**  
**Dept:**      Cancel TOC due to instrument issues/sample depleted.

**TAT:** 14  
=====

**JC70923: Chain of Custody**  
**Page 6 of 6**

**Above Changes Per:** Tammy McCloskey      **Date/Time:** 8/15/2018 12:12:24 PM

To Client: This Change Order is confirmation of the revisions, previously discussed with the Client Service Representative.

The results set forth herein are provided by SGS North America Inc.

*e-Hardcopy 2.0*  
*Automated Report*

## Technical Report for

USACE-Philadelphia District

Philadelphia District, Reservoir Sampling

W25PHS81145379

SGS Job Number: JC72034

Sampling Date: 08/16/18

Report to:

Army Corps of Engineers

joseph.m.loeper@usace.army.mil

ATTN: Joseph Loeper

Total number of pages in report: **72**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

A. Paul Ioannidis  
General Manager

Client Service contact: Tammy McCloskey 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA, RI, SC, TX, UT, VA, WV, DoD ELAP (ANAB L2248)

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Test results relate only to samples analyzed.

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## Sample Summary

USACE-Philadelphia District

**Job No:** JC72034

Philadelphia District, Reservoir Sampling  
 Project No: W25PHS81145379

Sample Number	Collected		Matrix Received	Code	Type	Client Sample ID
	Date	Time By				
JC72034-1	08/16/18	07:30 GW	08/16/18	AQ	Surface Water	BM-1S
JC72034-1F	08/16/18	07:30 GW	08/16/18	AQ	Surface H2O Filtered	BM-1S
JC72034-2	08/16/18	10:00 GW	08/16/18	AQ	Surface Water	BM-2S
JC72034-2F	08/16/18	10:00 GW	08/16/18	AQ	Surface H2O Filtered	BM-2S
JC72034-3	08/16/18	10:00 GW	08/16/18	AQ	Surface Water	BM-2M
JC72034-3F	08/16/18	10:00 GW	08/16/18	AQ	Surface H2O Filtered	BM-2M
JC72034-4	08/16/18	10:00 GW	08/16/18	AQ	Surface Water	BM-2D
JC72034-4F	08/16/18	10:00 GW	08/16/18	AQ	Surface H2O Filtered	BM-2D
JC72034-5	08/16/18	13:35 GW	08/16/18	AQ	Surface Water	BM-5S
JC72034-5F	08/16/18	13:35 GW	08/16/18	AQ	Surface H2O Filtered	BM-5S
JC72034-6	08/16/18	09:15 GW	08/16/18	AQ	Surface Water	BM-6S
JC72034-6F	08/16/18	09:15 GW	08/16/18	AQ	Surface H2O Filtered	BM-6S
JC72034-7	08/16/18	09:15 GW	08/16/18	AQ	Surface Water	BM-6M



## Sample Summary

(continued)

USACE-Philadelphia District

**Job No:** JC72034

Philadelphia District, Reservoir Sampling  
 Project No: W25PHS81145379

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
JC72034-7F	08/16/18	09:15 GW	08/16/18	AQ	Surface H2O Filtered	BM-6M
JC72034-8	08/16/18	09:15 GW	08/16/18	AQ	Surface Water	BM-6D
JC72034-8F	08/16/18	09:15 GW	08/16/18	AQ	Surface H2O Filtered	BM-6D
JC72034-9	08/16/18	10:30 GW	08/16/18	AQ	Surface Water	BM-7S
JC72034-9F	08/16/18	10:30 GW	08/16/18	AQ	Surface H2O Filtered	BM-7S
JC72034-10	08/16/18	10:30 GW	08/16/18	AQ	Surface Water	BM-7M
JC72034-10F	08/16/18	10:30 GW	08/16/18	AQ	Surface H2O Filtered	BM-7M
JC72034-11	08/16/18	10:30 GW	08/16/18	AQ	Surface Water	BM-7D
JC72034-11F	08/16/18	10:30 GW	08/16/18	AQ	Surface H2O Filtered	BM-7D
JC72034-12	08/16/18	12:15 GW	08/16/18	AQ	Surface Water	BM-8S
JC72034-12F	08/16/18	12:15 GW	08/16/18	AQ	Surface H2O Filtered	BM-8S
JC72034-13	08/16/18	12:15 GW	08/16/18	AQ	Surface Water	BM-8M
JC72034-13F	08/16/18	12:15 GW	08/16/18	AQ	Surface H2O Filtered	BM-8M





## Sample Summary

(continued)

USACE-Philadelphia District

**Job No:** JC72034

Philadelphia District, Reservoir Sampling  
 Project No: W25PHS81145379

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
JC72034-14	08/16/18	12:15 GW	08/16/18	AQ	Surface Water	BM-8D
JC72034-14F	08/16/18	12:15 GW	08/16/18	AQ	Surface H2O Filtered	BM-8D
JC72034-15	08/16/18	11:00 GW	08/16/18	AQ	Surface Water	BM-9S
JC72034-15F	08/16/18	11:00 GW	08/16/18	AQ	Surface H2O Filtered	BM-9S
JC72034-16	08/16/18	11:00 GW	08/16/18	AQ	Surface Water	BM-9M
JC72034-16F	08/16/18	11:00 GW	08/16/18	AQ	Surface H2O Filtered	BM-9M
JC72034-17	08/16/18	11:00 GW	08/16/18	AQ	Surface Water	BM-9D
JC72034-17F	08/16/18	11:00 GW	08/16/18	AQ	Surface H2O Filtered	BM-9D
JC72034-18	08/16/18	11:40 GW	08/16/18	AQ	Surface Water	BM-10S
JC72034-18F	08/16/18	11:40 GW	08/16/18	AQ	Surface H2O Filtered	BM-10S
JC72034-19	08/16/18	11:40 GW	08/16/18	AQ	Surface Water	BM-10M
JC72034-19F	08/16/18	11:40 GW	08/16/18	AQ	Surface H2O Filtered	BM-10M
JC72034-20	08/16/18	11:40 GW	08/16/18	AQ	Surface Water	BM-10D



### Sample Summary

(continued)

USACE-Philadelphia District

Job No: JC72034

Philadelphia District, Reservoir Sampling  
Project No: W25PHS81145379

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JC72034-20F	08/16/18	11:40	GW	08/16/18	AQ Surface H2O Filtered	BM-10D
JC72034-21	08/16/18	13:35	GW	08/16/18	AQ Surface Water	BM-11S
JC72034-21F	08/16/18	13:35	GW	08/16/18	AQ Surface H2O Filtered	BM-11S

## CASE NARRATIVE / CONFORMANCE SUMMARY

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**Client:** USACE-Philadelphia District

**Job No** JC72034

**Site:** Philadelphia District, Reservoir Sampling

**Report Date** 8/30/2018 2:05:38 PM

On 08/16/2018, 42 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at SGS North America Inc. at a maximum corrected temperature of 3.8 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. Job Number of JC72034 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Compounds qualified as out of range in the continuing calibration summary report are acceptable as per method requirements when there is a high bias but the sample result is non-detect.

### General Chemistry By Method EPA 351.2/LACHAT

**Matrix:** AQ

**Batch ID:** GP15413

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71863-1DUP, JC71863-1MS were used as the QC samples for Nitrogen, Total Kjeldahl.
- Matrix Spike Recovery(s) for Nitrogen, Total Kjeldahl are outside control limits. Spike recovery indicates possible matrix interference.

**Matrix:** AQ

**Batch ID:** GP15511

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC72034-6DUP, JC72034-6MS were used as the QC samples for Nitrogen, Total Kjeldahl.

### General Chemistry By Method EPA 353.2/LACHAT

**Matrix:** AQ

**Batch ID:** GP15524

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC72034-1DUP, JC72034-2MS, JC72034-1MS were used as the QC samples for Nitrogen, Nitrate + Nitrite.

**Matrix:** AQ

**Batch ID:** GP15525

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC72075-5DUP, JC72075-5MS were used as the QC samples for Nitrogen, Nitrate + Nitrite.

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## General Chemistry By Method EPA 365.3

**Matrix:** AQ                      **Batch ID:** GP15537

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71961-1FDUP, JC71961-1FMS were used as the QC samples for Phosphorus, Total.

**Matrix:** AQ                      **Batch ID:** GP15548

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC72034-6DUP, JC72034-6MS were used as the QC samples for Phosphorus, Total.

**Matrix:** AQ                      **Batch ID:** GP15578

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC72034-1FDUP, JC72034-1FMS were used as the QC samples for Phosphorus, Total.

**Matrix:** AQ                      **Batch ID:** GP15634

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC72034-21FDUP, JC72034-21FMS were used as the QC samples for Phosphorus, Total.

## General Chemistry By Method EPA353.2/SM4500NO2B

**Matrix:** AQ **Batch ID:** R172412

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC72034-17 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R172413

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC72034-18 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R172414

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC72034-19 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R172415

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC72034-20 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R172425

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC72034-1 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R172426

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC72034-2 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R172427

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC72034-3 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R172428

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC72034-4 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R172429

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC72034-5 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R172430

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC72034-6 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R172431

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC72034-7 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R172432

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC72034-8 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R172433

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC72034-9 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R172434

- The data for EPA353.2/SM4500NO2B meets quality control requirements.

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## General Chemistry By Method EPA353.2/SM4500NO2B

**Matrix:** AQ                      **Batch ID:** R172434

- JC72034-10 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ                      **Batch ID:** R172435

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC72034-11 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ                      **Batch ID:** R172436

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC72034-12 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ                      **Batch ID:** R172437

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC72034-13 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ                      **Batch ID:** R172438

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC72034-14 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ                      **Batch ID:** R172439

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC72034-15 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ                      **Batch ID:** R172440

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC72034-16 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ                      **Batch ID:** R172450

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC72034-21 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

## General Chemistry By Method SM2320 B-11

**Matrix:** AQ

**Batch ID:** GN84715

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC72034-1DUP were used as the QC samples for Alkalinity, Total as CaCO<sub>3</sub>.
- JC72034-9 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC72034-12 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC72034-13 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC72034-14 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC72034-15 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC72034-16 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC72034-17 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC72034-2 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC72034-10 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC72034-4 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC72034-1 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC72034-6 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC72034-8 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC72034-3 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC72034-11 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC72034-5 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC72034-7 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.

**Matrix:** AQ

**Batch ID:** GN84852

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC72414-1DUP were used as the QC samples for Alkalinity, Total as CaCO<sub>3</sub>.
- JC72034-18 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC72034-19 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC72034-20 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC72034-21 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.

## General Chemistry By Method SM2540 C-11

**Matrix:** AQ

**Batch ID:** GN84514

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC72034-1DUP were used as the QC samples for Solids, Total Dissolved.

**Matrix:** AQ

**Batch ID:** GN84540

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC72107-1DUP were used as the QC samples for Solids, Total Dissolved.

### General Chemistry By Method SM2540 D-11

**Matrix:** AQ                      **Batch ID:** GN84508

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC72013-1DUP were used as the QC samples for Solids, Total Suspended.

**Matrix:** AQ                      **Batch ID:** GN84542

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC72034-11DUP were used as the QC samples for Solids, Total Suspended.

### General Chemistry By Method SM4500NH3 H-11LACHAT

**Matrix:** AQ                      **Batch ID:** GP15492

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC72034-1DUP, JC72034-1MS, JC72034-1MSD were used as the QC samples for Nitrogen, Ammonia.

**Matrix:** AQ                      **Batch ID:** GP15493

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC72034-18DUP, JC72034-18MS, JC72034-18MSD were used as the QC samples for Nitrogen, Ammonia.

### General Chemistry By Method SM4500NO2 B-11

**Matrix:** AQ                      **Batch ID:** GN84394

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71996-5DUP, JC71996-5MS were used as the QC samples for Nitrogen, Nitrite.

**Matrix:** AQ                      **Batch ID:** GN84410

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC72054-7ADUP, JC72054-7AMS were used as the QC samples for Nitrogen, Nitrite.

### General Chemistry By Method SM5210 B-11

**Matrix:** AQ                      **Batch ID:** GP15344

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC72034-1DUP were used as the QC samples for BOD, 5 Day.

**Matrix:** AQ                      **Batch ID:** GP15363

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC72034-12DUP were used as the QC samples for BOD, 5 Day.



## General Chemistry By Method SM5310 B-11

**Matrix:** AQ

**Batch ID:** GP15532

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC72034-1MS, JC72034-1MSD were used as the QC samples for Total Organic Carbon.

**Matrix:** AQ

**Batch ID:** GP15574

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC72034-16MS, JC72034-16MSD were used as the QC samples for Total Organic Carbon.

**Matrix:** AQ

**Batch ID:** GP15576

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC72034-21MS, JC72034-21MSD were used as the QC samples for Total Organic Carbon.

## General Chemistry By Method SM9222 B-06

**Matrix:** AQ

**Batch ID:** MB5345

- All method blanks for this batch meet method specific criteria.
- Sample(s) JC72034-1DUP were used as the QC samples for Coliform, Total.
- JC72034-21 for Coliform, Total: Analysis done out of holding time.
- JC72034-5 for Coliform, Total: Analysis done out of holding time.
- JC72034-18 for Coliform, Total: Analysis done out of holding time.
- JC72034-12 for Coliform, Total: Analysis done out of holding time.
- JC72034-2 for Coliform, Total: Analysis done out of holding time.
- JC72034-9 for Coliform, Total: Analysis done out of holding time.
- JC72034-6 for Coliform, Total: Analysis done out of holding time.
- JC72034-1 for Coliform, Total: Analysis done out of holding time.
- JC72034-15 for Coliform, Total: Analysis done out of holding time.

## General Chemistry By Method SM9222 D-06

**Matrix:** AQ

**Batch ID:** MB5346

- All method blanks for this batch meet method specific criteria.
- Sample(s) JC72034-1DUP were used as the QC samples for Coliform, Fecal.
- JC72034-1 for Coliform, Fecal: Analysis done out of holding time.
- JC72034-5 for Coliform, Fecal: Analysis done out of holding time.
- JC72034-15 for Coliform, Fecal: Analysis done out of holding time.
- JC72034-18 for Coliform, Fecal: Analysis done out of holding time.
- JC72034-12 for Coliform, Fecal: Analysis done out of holding time.
- JC72034-21 for Coliform, Fecal: Analysis done out of holding time.
- JC72034-2 for Coliform, Fecal: Analysis done out of holding time.
- JC72034-6 for Coliform, Fecal: Analysis done out of holding time.
- JC72034-9 for Coliform, Fecal: Analysis done out of holding time.

SGS North America Inc. certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting the Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

SGS North America Inc. is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. Data release is authorized by SGS North America Inc indicated via signature on the report cover

## Summary of Hits

**Job Number:** JC72034  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 08/16/18



Lab Sample ID	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
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**JC72034-1 BM-1S**

Alkalinity, Total as CaCO3 <sup>a</sup>	115	5.0	4.0	mg/l	SM2320 B-11
BOD, 5 Day	3.7 J	4.0	3.4 <sup>b</sup>	mg/l	SM5210 B-11
Coliform, Fecal <sup>c</sup>	10800	100	<sup>b</sup>	col/100ml	SM9222 D-06
Coliform, Total <sup>c</sup>	673	10	<sup>b</sup>	col/100ml	SM9222 B-06
Nitrogen, Ammonia	0.16 J	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	4.1	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.2	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.051	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.50	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	188	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	9.1	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon	3.1	1.0	1.0	mg/l	SM5310 B-11

**JC72034-1F BM-1S**

No hits reported in this sample.

**JC72034-2 BM-2S**

Alkalinity, Total as CaCO3 <sup>a</sup>	174	5.0	4.0	mg/l	SM2320 B-11
BOD, 5 Day	3.4	3.4	3.4 <sup>b</sup>	mg/l	SM5210 B-11
Coliform, Fecal <sup>c</sup>	136	4	<sup>b</sup>	col/100ml	SM9222 D-06
Coliform, Total <sup>c</sup>	8	4	<sup>b</sup>	col/100ml	SM9222 B-06
Nitrogen, Nitrate <sup>d</sup>	2.1	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	2.1	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.024	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.62	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total	0.027 J	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved	100	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	14.4	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon	4.6	1.0	1.0	mg/l	SM5310 B-11

**JC72034-2F BM-2S**

No hits reported in this sample.

**JC72034-3 BM-2M**

Alkalinity, Total as CaCO3 <sup>a</sup>	109	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Ammonia	0.11 J	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	4.0	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.0	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.036	0.010	0.0050	mg/l	SM4500NO2 B-11

## Summary of Hits

**Job Number:** JC72034  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 08/16/18



Lab Sample ID	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
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Nitrogen, Total Kjeldahl		0.85	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		164	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		7.7	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		3.3	1.0	1.0	mg/l	SM5310 B-11

### JC72034-3F BM-2M

No hits reported in this sample.

### JC72034-4 BM-2D

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	109	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Ammonia	0.29	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	4.7	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.7	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.035	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.66	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total	0.041 J	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved	174	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	20.2	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon	2.9	1.0	1.0	mg/l	SM5310 B-11

### JC72034-4F BM-2D

No hits reported in this sample.

### JC72034-5 BM-5S

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	217	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal <sup>c</sup>	4300	100	<sup>b</sup>	col/100ml	SM9222 D-06
Coliform, Total <sup>c</sup>	3600	100	<sup>b</sup>	col/100ml	SM9222 B-06
Nitrogen, Nitrate <sup>d</sup>	7.9	0.31	0.31	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	7.9	0.30	0.30	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.012	0.010	0.0050	mg/l	SM4500NO2 B-11
Solids, Total Dissolved	304	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	16.4	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon	1.2	1.0	1.0	mg/l	SM5310 B-11

### JC72034-5F BM-5S

No hits reported in this sample.

### JC72034-6 BM-6S

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	69.9	5.0	4.0	mg/l	SM2320 B-11
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## Summary of Hits

**Job Number:** JC72034  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 08/16/18



Lab Sample ID	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
		29	10	b	col/100ml	SM9222 D-06
		2.2	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
		2.2	0.10	0.10	mg/l	EPA 353.2/LACHAT
		0.023	0.010	0.0050	mg/l	SM4500NO2 B-11
		0.61	0.20	0.15	mg/l	EPA 351.2/LACHAT
		0.051	0.050	0.050	mg/l	EPA 365.3
		144	10	4.0	mg/l	SM2540 C-11
		9.8	4.0	2.0	mg/l	SM2540 D-11
		3.7	1.0	1.0	mg/l	SM5310 B-11

### JC72034-6F BM-6S

Phosphorus, Total	0.039 J	0.050	0.050	mg/l	EPA 365.3
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### JC72034-7 BM-6M

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	115	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Ammonia	0.14 J	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	4.1	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.1	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.020	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.53	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total	0.031 J	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved	142	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	10.3	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon	3.3	1.0	1.0	mg/l	SM5310 B-11

### JC72034-7F BM-6M

No hits reported in this sample.

### JC72034-8 BM-6D

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	269	5.0	4.0	mg/l	SM2320 B-11
BOD, 5 Day	4.6	3.4	3.4 <sup>b</sup>	mg/l	SM5210 B-11
Nitrogen, Ammonia	0.34	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	4.8	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.9	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.099	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.58	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total	0.027 J	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved	180	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	10.8	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon	2.1	1.0	1.0	mg/l	SM5310 B-11

## Summary of Hits

**Job Number:** JC72034  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 08/16/18



Lab Sample ID	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
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**JC72034-8F BM-6D**

No hits reported in this sample.

**JC72034-9 BM-7S**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	187	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal <sup>c</sup>	88	4	<sup>b</sup>	col/100ml	SM9222 D-06
Coliform, Total <sup>c</sup>	8	4	<sup>b</sup>	col/100ml	SM9222 B-06
Nitrogen, Nitrate <sup>d</sup>	2.3	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	2.3	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.036	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.43	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	110	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	12.6	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon	3.9	1.0	1.0	mg/l	SM5310 B-11

**JC72034-9F BM-7S**

No hits reported in this sample.

**JC72034-10 BM-7M**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	94.7	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Ammonia	0.099 J	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	3.6	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	3.6	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.024	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.50	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	102	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	7.7	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon	3.2	1.0	1.0	mg/l	SM5310 B-11

**JC72034-10F BM-7M**

No hits reported in this sample.

**JC72034-11 BM-7D**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	122	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Ammonia	0.14 J	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	5.4	0.21	0.21	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	5.4	0.20	0.20	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.018	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.54	0.20	0.15	mg/l	EPA 351.2/LACHAT

## Summary of Hits

**Job Number:** JC72034  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 08/16/18



Lab Sample ID	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
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Solids, Total Dissolved		138	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		34.9	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		2.7	1.0	1.0	mg/l	SM5310 B-11

### JC72034-11F BM-7D

No hits reported in this sample.

### JC72034-12 BM-8S

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>		77.6	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate <sup>d</sup>		2.3	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		2.3	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite		0.026	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl		0.61	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		52.5	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		25.7	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		4.4	1.0	1.0	mg/l	SM5310 B-11

### JC72034-12F BM-8S

No hits reported in this sample.

### JC72034-13 BM-8M

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>		80.2	5.0	4.0	mg/l	SM2320 B-11
BOD, 5 Day		5.7	3.4	3.4 <sup>b</sup>	mg/l	SM5210 B-11
Nitrogen, Nitrate <sup>d</sup>		2.5	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		2.5	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite		0.029	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl		0.48	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		150	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		16.5	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		4.0	1.0	1.0	mg/l	SM5310 B-11

### JC72034-13F BM-8M

No hits reported in this sample.

### JC72034-14 BM-8D

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>		91.1	5.0	4.0	mg/l	SM2320 B-11
BOD, 5 Day		7.0	3.4	3.4 <sup>b</sup>	mg/l	SM5210 B-11
Nitrogen, Ammonia		0.17 J	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>		3.3	0.11	0.11	mg/l	EPA353.2/SM4500NO2B

## Summary of Hits

**Job Number:** JC72034  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 08/16/18



Lab Sample ID Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
Nitrogen, Nitrate + Nitrite		3.3	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite		0.024	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl		0.45	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total		0.088	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved		190	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		34.0	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		3.7	1.0	1.0	mg/l	SM5310 B-11

### JC72034-14F BM-8D

No hits reported in this sample.

### JC72034-15 BM-9S

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>		80.2	5.0	4.0	mg/l	SM2320 B-11
BOD, 5 Day		4.3	3.4	3.4 <sup>b</sup>	mg/l	SM5210 B-11
Coliform, Fecal <sup>c</sup>		46	4	<sup>b</sup>	col/100ml	SM9222 D-06
Coliform, Total <sup>c</sup>		4	4	<sup>b</sup>	col/100ml	SM9222 B-06
Nitrogen, Nitrate <sup>d</sup>		2.4	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		2.4	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite		0.035	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl		0.51	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		140	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		15.8	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		4.4	1.0	1.0	mg/l	SM5310 B-11

### JC72034-15F BM-9S

No hits reported in this sample.

### JC72034-16 BM-9M

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>		69.9	5.0	4.0	mg/l	SM2320 B-11
BOD, 5 Day		4.5	3.4	3.4 <sup>b</sup>	mg/l	SM5210 B-11
Nitrogen, Nitrate <sup>d</sup>		3.1	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		3.1	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite		0.023	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl		0.44	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		144	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		8.9	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		5.5	1.0	1.0	mg/l	SM5310 B-11

### JC72034-16F BM-9M

No hits reported in this sample.



## Summary of Hits

**Job Number:** JC72034  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 08/16/18



Lab Sample ID	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
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**JC72034-17 BM-9D**

Alkalinity, Total as CaCO3 <sup>a</sup>	123	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Ammonia	0.14 J	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	5.6	0.21	0.21	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	5.6	0.20	0.20	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.022	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.56	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total	0.051	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved	190	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	121	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon	2.6	1.0	1.0	mg/l	SM5310 B-11

**JC72034-17F BM-9D**

Phosphorus, Total	0.039 J	0.050	0.050	mg/l	EPA 365.3
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**JC72034-18 BM-10S**

Alkalinity, Total as CaCO3 <sup>a</sup>	79.7	5.0	4.0	mg/l	SM2320 B-11
BOD, 5 Day	6.8	3.4	3.4 <sup>b</sup>	mg/l	SM5210 B-11
Coliform, Fecal <sup>c</sup>	54	4	<sup>b</sup>	col/100ml	SM9222 D-06
Coliform, Total <sup>c</sup>	31	4	<sup>b</sup>	col/100ml	SM9222 B-06
Nitrogen, Nitrate <sup>d</sup>	2.6	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	2.6	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.020	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.46	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	144	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	17.4	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon	4.6	1.0	1.0	mg/l	SM5310 B-11

**JC72034-18F BM-10S**

No hits reported in this sample.

**JC72034-19 BM-10M**

Alkalinity, Total as CaCO3 <sup>a</sup>	76.1	5.0	4.0	mg/l	SM2320 B-11
BOD, 5 Day	5.8	3.4	3.4 <sup>b</sup>	mg/l	SM5210 B-11
Nitrogen, Nitrate <sup>d</sup>	2.9	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	2.9	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.015	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.48	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	136	10	4.0	mg/l	SM2540 C-11

## Summary of Hits

**Job Number:** JC72034  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 08/16/18



Lab Sample ID	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
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Solids, Total Suspended		15.3	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		3.9	1.0	1.0	mg/l	SM5310 B-11

### JC72034-19F BM-10M

No hits reported in this sample.

### JC72034-20 BM-10D

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>		140	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Ammonia	0.11 J		0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	6.4		0.21	0.21	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	6.4		0.20	0.20	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.011		0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.33		0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total	0.037 J		0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved	240		10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	48.0		4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon	2.7		1.0	1.0	mg/l	SM5310 B-11

### JC72034-20F BM-10D

Phosphorus, Total	0.031 J		0.050	0.050	mg/l	EPA 365.3
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### JC72034-21 BM-11S

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	34.2		5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal <sup>c</sup>	3100		100	<sup>b</sup>	col/100ml	SM9222 D-06
Coliform, Total <sup>c</sup>	4500		100	<sup>b</sup>	col/100ml	SM9222 B-06
Nitrogen, Nitrate <sup>d</sup>	4.2		0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.2		0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0034 J		0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.32		0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total	0.033 J		0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved	124		10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	14.6		4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon	2.8		1.0	1.0	mg/l	SM5310 B-11

### JC72034-21F BM-11S

No hits reported in this sample.

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Analysis done out of holding time.

## Summary of Hits

**Job Number:** JC72034  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 08/16/18



Lab Sample ID	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
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(d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Sample Results

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Report of Analysis

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# Report of Analysis

<b>Client Sample ID:</b> BM-1S	<b>Date Sampled:</b> 08/16/18
<b>Lab Sample ID:</b> JC72034-1	<b>Date Received:</b> 08/16/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	115	5.0	4.0	3.6	mg/l	1	08/23/18 16:04	ST SM2320 B-11
BOD, 5 Day	3.7 J	4.0	3.4 <sup>b</sup>	3.4	mg/l	1	08/16/18 22:46	SA SM5210 B-11
Coliform, Fecal <sup>c</sup>	10800	100			col/100ml	100	08/16/18 21:58	SA SM9222 D-06
Coliform, Total <sup>c</sup>	673	10			col/100ml	10	08/16/18 21:49	SA SM9222 B-06
Nitrogen, Ammonia	0.16 J	0.20	0.20	0.089	mg/l	1	08/23/18 12:03	BM SM4500NH3 H-11LCHAT
Nitrogen, Nitrate <sup>d</sup>	4.1	0.11	0.11	0.046	mg/l	1	08/24/18 16:28	RP EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.2	0.10	0.10	0.043	mg/l	1	08/24/18 16:28	RP EPA 353.2/LCHAT
Nitrogen, Nitrite	0.051	0.010	0.0050	0.0030	mg/l	1	08/16/18 21:10	LS SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.50	0.20	0.15	0.12	mg/l	1	08/22/18 10:28	BM EPA 351.2/LCHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/27/18 10:04	MP EPA 365.3
Solids, Total Dissolved	188	10	4.0	1.8	mg/l	1	08/20/18 14:35	RC SM2540 C-11
Solids, Total Suspended	9.1	4.0	2.0	1.5	mg/l	1	08/20/18 10:56	RC SM2540 D-11
Total Organic Carbon	3.1	1.0	1.0	0.72	mg/l	1	08/25/18 05:30	JO SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Analysis done out of holding time.
- (d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

4.1  
4

# Report of Analysis

<b>Client Sample ID:</b> BM-1S	<b>Date Sampled:</b> 08/16/18
<b>Lab Sample ID:</b> JC72034-1F	<b>Date Received:</b> 08/16/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/29/18 12:00	MP EPA 365.3

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-2S	<b>Date Sampled:</b> 08/16/18
<b>Lab Sample ID:</b> JC72034-2	<b>Date Received:</b> 08/16/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	174	5.0	4.0	3.6	mg/l	1	08/23/18 16:04	ST SM2320 B-11
BOD, 5 Day	3.4	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	08/16/18 22:50	SA SM5210 B-11
Coliform, Fecal <sup>c</sup>	136	4			col/100ml	4	08/16/18 21:58	SA SM9222 D-06
Coliform, Total <sup>c</sup>	8	4			col/100ml	4	08/16/18 21:49	SA SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/23/18 12:05	BM SM4500NH3 H-11LCHAT
Nitrogen, Nitrate <sup>d</sup>	2.1	0.11	0.11	0.046	mg/l	1	08/24/18 16:30	RP EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	2.1	0.10	0.10	0.043	mg/l	1	08/24/18 16:30	RP EPA 353.2/LCHAT
Nitrogen, Nitrite	0.024	0.010	0.0050	0.0030	mg/l	1	08/16/18 21:10	LS SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.62	0.20	0.15	0.12	mg/l	1	08/22/18 10:29	BM EPA 351.2/LCHAT
Phosphorus, Total	0.027 J	0.050	0.050	0.027	mg/l	1	08/27/18 10:28	MP EPA 365.3
Solids, Total Dissolved	100	10	4.0	1.8	mg/l	1	08/20/18 14:35	RC SM2540 C-11
Solids, Total Suspended	14.4	4.0	2.0	1.5	mg/l	1	08/20/18 10:56	RC SM2540 D-11
Total Organic Carbon	4.6	1.0	1.0	0.72	mg/l	1	08/25/18 06:04	JO SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Analysis done out of holding time.
- (d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

4.3  
4

# Report of Analysis

<b>Client Sample ID:</b> BM-2S	<b>Date Sampled:</b> 08/16/18
<b>Lab Sample ID:</b> JC72034-2F	<b>Date Received:</b> 08/16/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/29/18 12:00	MP EPA 365.3

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ



# Report of Analysis

<b>Client Sample ID:</b> BM-2M	<b>Date Sampled:</b> 08/16/18
<b>Lab Sample ID:</b> JC72034-3	<b>Date Received:</b> 08/16/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	109	5.0	4.0	3.6	mg/l	1	08/23/18 16:04	ST SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	08/16/18 22:51	SA SM5210 B-11
Nitrogen, Ammonia	0.11 J	0.20	0.20	0.089	mg/l	1	08/23/18 12:09	BM SM4500NH3 H-11LCHAT
Nitrogen, Nitrate <sup>c</sup>	4.0	0.11	0.11	0.046	mg/l	1	08/24/18 16:31	RP EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.0	0.10	0.10	0.043	mg/l	1	08/24/18 16:31	RP EPA 353.2/LCHAT
Nitrogen, Nitrite	0.036	0.010	0.0050	0.0030	mg/l	1	08/16/18 21:10	LS SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.85	0.20	0.15	0.12	mg/l	1	08/22/18 10:29	BM EPA 351.2/LCHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/27/18 10:28	MP EPA 365.3
Solids, Total Dissolved	164	10	4.0	1.8	mg/l	1	08/20/18 14:35	RC SM2540 C-11
Solids, Total Suspended	7.7	4.0	2.0	1.5	mg/l	1	08/20/18 10:56	RC SM2540 D-11
Total Organic Carbon	3.3	1.0	1.0	0.72	mg/l	1	08/25/18 06:15	JO SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-2M	<b>Date Sampled:</b> 08/16/18
<b>Lab Sample ID:</b> JC72034-3F	<b>Date Received:</b> 08/16/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/29/18 12:00	MP EPA 365.3

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-2D	<b>Date Sampled:</b> 08/16/18
<b>Lab Sample ID:</b> JC72034-4	<b>Date Received:</b> 08/16/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	109	5.0	4.0	3.6	mg/l	1	08/23/18 16:04	ST SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	08/16/18 22:53	SA SM5210 B-11
Nitrogen, Ammonia	0.29	0.20	0.20	0.089	mg/l	1	08/23/18 12:10	BM SM4500NH3 H-11LCHAT
Nitrogen, Nitrate <sup>c</sup>	4.7	0.11	0.11	0.046	mg/l	1	08/24/18 16:32	RP EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.7	0.10	0.10	0.043	mg/l	1	08/24/18 16:32	RP EPA 353.2/LCHAT
Nitrogen, Nitrite	0.035	0.010	0.0050	0.0030	mg/l	1	08/16/18 21:10	LS SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.66	0.20	0.15	0.12	mg/l	1	08/22/18 10:30	BM EPA 351.2/LCHAT
Phosphorus, Total	0.041 J	0.050	0.050	0.027	mg/l	1	08/27/18 10:28	MP EPA 365.3
Solids, Total Dissolved	174	10	4.0	1.8	mg/l	1	08/20/18 14:35	RC SM2540 C-11
Solids, Total Suspended	20.2	4.0	2.0	1.5	mg/l	1	08/20/18 10:56	RC SM2540 D-11
Total Organic Carbon	2.9	1.0	1.0	0.72	mg/l	1	08/25/18 06:27	JO SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

4.7  
4

# Report of Analysis

<b>Client Sample ID:</b> BM-2D	<b>Date Sampled:</b> 08/16/18
<b>Lab Sample ID:</b> JC72034-4F	<b>Date Received:</b> 08/16/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/29/18 12:00	MP EPA 365.3

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-5S	<b>Date Sampled:</b> 08/16/18
<b>Lab Sample ID:</b> JC72034-5	<b>Date Received:</b> 08/16/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	217	5.0	4.0	3.6	mg/l	1	08/23/18 16:04	ST SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	08/16/18 22:54	SA SM5210 B-11
Coliform, Fecal <sup>c</sup>	4300	100			col/100ml	100	08/16/18 21:58	SA SM9222 D-06
Coliform, Total <sup>c</sup>	3600	100			col/100ml	100	08/16/18 21:49	SA SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/23/18 12:12	BM SM4500NH3 H-11LCHAT
Nitrogen, Nitrate <sup>d</sup>	7.9	0.31	0.31	0.13	mg/l	1	08/24/18 17:43	RP EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	7.9	0.30	0.30	0.13	mg/l	3	08/24/18 17:43	RP EPA 353.2/LCHAT
Nitrogen, Nitrite	0.012	0.010	0.0050	0.0030	mg/l	1	08/16/18 21:10	LS SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.15 U	0.20	0.15	0.12	mg/l	1	08/22/18 10:31	BM EPA 351.2/LCHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/27/18 10:28	MP EPA 365.3
Solids, Total Dissolved	304	10	4.0	1.8	mg/l	1	08/20/18 14:35	RC SM2540 C-11
Solids, Total Suspended	16.4	4.0	2.0	1.5	mg/l	1	08/20/18 10:56	RC SM2540 D-11
Total Organic Carbon	1.2	1.0	1.0	0.72	mg/l	1	08/25/18 06:48	JO SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Analysis done out of holding time.
- (d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-5S	<b>Date Sampled:</b> 08/16/18
<b>Lab Sample ID:</b> JC72034-5F	<b>Date Received:</b> 08/16/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/29/18 12:00	MP EPA 365.3

4.10  
4

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-6S	
<b>Lab Sample ID:</b> JC72034-6	<b>Date Sampled:</b> 08/16/18
<b>Matrix:</b> AQ - Surface Water	<b>Date Received:</b> 08/16/18
	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	69.9	5.0	4.0	3.6	mg/l	1	08/23/18 16:04	ST SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	08/16/18 22:55	SA SM5210 B-11
Coliform, Fecal <sup>c</sup>	29	10			col/100ml	10	08/16/18 21:58	SA SM9222 D-06
Coliform, Total <sup>c</sup>	0 J	4			col/100ml	1	08/16/18 21:49	SA SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/23/18 12:13	BM SM4500NH3 H-11LCHAT
Nitrogen, Nitrate <sup>d</sup>	2.2	0.11	0.11	0.046	mg/l	1	08/24/18 16:34	RP EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	2.2	0.10	0.10	0.043	mg/l	1	08/24/18 16:34	RP EPA 353.2/LCHAT
Nitrogen, Nitrite	0.023	0.010	0.0050	0.0030	mg/l	1	08/16/18 21:30	LS SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.61	0.20	0.15	0.12	mg/l	1	08/24/18 13:56	RP EPA 351.2/LCHAT
Phosphorus, Total	0.051	0.050	0.050	0.027	mg/l	1	08/29/18 09:41	MP EPA 365.3
Solids, Total Dissolved	144	10	4.0	1.8	mg/l	1	08/20/18 14:35	RC SM2540 C-11
Solids, Total Suspended	9.8	4.0	2.0	1.5	mg/l	1	08/20/18 10:56	RC SM2540 D-11
Total Organic Carbon	3.7	1.0	1.0	0.72	mg/l	1	08/25/18 07:22	JO SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Analysis done out of holding time.
- (d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-6S	<b>Date Sampled:</b> 08/16/18
<b>Lab Sample ID:</b> JC72034-6F	<b>Date Received:</b> 08/16/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.039 J	0.050	0.050	0.027	mg/l	1	08/29/18 12:00	MP EPA 365.3

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ



# Report of Analysis

<b>Client Sample ID:</b> BM-6M	<b>Date Sampled:</b> 08/16/18
<b>Lab Sample ID:</b> JC72034-7	<b>Date Received:</b> 08/16/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	115	5.0	4.0	3.6	mg/l	1	08/23/18 16:04	ST SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	08/16/18 22:57	SA SM5210 B-11
Nitrogen, Ammonia	0.14 J	0.20	0.20	0.089	mg/l	1	08/23/18 12:15	BM SM4500NH3 H-11LCHAT
Nitrogen, Nitrate <sup>c</sup>	4.1	0.11	0.11	0.046	mg/l	1	08/24/18 16:58	RP EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.1	0.10	0.10	0.043	mg/l	1	08/24/18 16:58	RP EPA 353.2/LCHAT
Nitrogen, Nitrite	0.020	0.010	0.0050	0.0030	mg/l	1	08/16/18 21:30	LS SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.53	0.20	0.15	0.12	mg/l	1	08/24/18 13:57	RP EPA 351.2/LCHAT
Phosphorus, Total	0.031 J	0.050	0.050	0.027	mg/l	1	08/29/18 09:41	MP EPA 365.3
Solids, Total Dissolved	142	10	4.0	1.8	mg/l	1	08/20/18 14:35	RC SM2540 C-11
Solids, Total Suspended	10.3	4.0	2.0	1.5	mg/l	1	08/20/18 10:56	RC SM2540 D-11
Total Organic Carbon	3.3	1.0	1.0	0.72	mg/l	1	08/25/18 07:34	JO SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-6M	<b>Date Sampled:</b> 08/16/18
<b>Lab Sample ID:</b> JC72034-7F	<b>Date Received:</b> 08/16/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/29/18 12:15	MP EPA 365.3

4.14  
4

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-6D	<b>Date Sampled:</b> 08/16/18
<b>Lab Sample ID:</b> JC72034-8	<b>Date Received:</b> 08/16/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	269	5.0	4.0	3.6	mg/l	1	08/23/18 16:04	ST SM2320 B-11
BOD, 5 Day	4.6	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	08/16/18 22:59	SA SM5210 B-11
Nitrogen, Ammonia	0.34	0.20	0.20	0.089	mg/l	1	08/23/18 12:16	BM SM4500NH3 H-11LCHAT
Nitrogen, Nitrate <sup>c</sup>	4.8	0.11	0.11	0.046	mg/l	1	08/24/18 16:59	RP EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.9	0.10	0.10	0.043	mg/l	1	08/24/18 16:59	RP EPA 353.2/LCHAT
Nitrogen, Nitrite	0.099	0.010	0.0050	0.0030	mg/l	1	08/16/18 21:30	LS SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.58	0.20	0.15	0.12	mg/l	1	08/24/18 13:58	RP EPA 351.2/LCHAT
Phosphorus, Total	0.027 J	0.050	0.050	0.027	mg/l	1	08/29/18 09:41	MP EPA 365.3
Solids, Total Dissolved	180	10	4.0	1.8	mg/l	1	08/20/18 14:35	RC SM2540 C-11
Solids, Total Suspended	10.8	4.0	2.0	1.5	mg/l	1	08/20/18 10:56	RC SM2540 D-11
Total Organic Carbon	2.1	1.0	1.0	0.72	mg/l	1	08/25/18 07:44	JO SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-6D	<b>Date Sampled:</b> 08/16/18
<b>Lab Sample ID:</b> JC72034-8F	<b>Date Received:</b> 08/16/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/29/18 12:15	MP EPA 365.3

4.16  
4

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-7S	<b>Date Sampled:</b> 08/16/18
<b>Lab Sample ID:</b> JC72034-9	<b>Date Received:</b> 08/16/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	187	5.0	4.0	3.6	mg/l	1	08/23/18 16:04	ST SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	08/16/18 23:01	SA SM5210 B-11
Coliform, Fecal <sup>c</sup>	88	4			col/100ml	4	08/16/18 21:58	SA SM9222 D-06
Coliform, Total <sup>c</sup>	8	4			col/100ml	4	08/16/18 21:49	SA SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/23/18 12:18	BM SM4500NH3 H-11LCHAT
Nitrogen, Nitrate <sup>d</sup>	2.3	0.11	0.11	0.046	mg/l	1	08/24/18 17:00	RP EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	2.3	0.10	0.10	0.043	mg/l	1	08/24/18 17:00	RP EPA 353.2/LCHAT
Nitrogen, Nitrite	0.036	0.010	0.0050	0.0030	mg/l	1	08/16/18 21:30	LS SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.43	0.20	0.15	0.12	mg/l	1	08/24/18 13:59	RP EPA 351.2/LCHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/29/18 09:41	MP EPA 365.3
Solids, Total Dissolved	110	10	4.0	1.8	mg/l	1	08/20/18 14:35	RC SM2540 C-11
Solids, Total Suspended	12.6	4.0	2.0	1.5	mg/l	1	08/20/18 10:56	RC SM2540 D-11
Total Organic Carbon	3.9	1.0	1.0	0.72	mg/l	1	08/25/18 07:56	JO SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Analysis done out of holding time.
- (d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

4.17  
4

# Report of Analysis

<b>Client Sample ID:</b> BM-7S	<b>Date Sampled:</b> 08/16/18
<b>Lab Sample ID:</b> JC72034-9F	<b>Date Received:</b> 08/16/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/29/18 12:15	MP EPA 365.3

4.18  
4

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-7M	<b>Date Sampled:</b> 08/16/18
<b>Lab Sample ID:</b> JC72034-10	<b>Date Received:</b> 08/16/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	94.7	5.0	4.0	3.6	mg/l	1	08/23/18 16:04	ST SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	08/16/18 23:03	SA SM5210 B-11
Nitrogen, Ammonia	0.099 J	0.20	0.20	0.089	mg/l	1	08/23/18 12:19	BM SM4500NH3 H-11LCHAT
Nitrogen, Nitrate <sup>c</sup>	3.6	0.11	0.11	0.046	mg/l	1	08/24/18 17:01	RP EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	3.6	0.10	0.10	0.043	mg/l	1	08/24/18 17:01	RP EPA 353.2/LCHAT
Nitrogen, Nitrite	0.024	0.010	0.0050	0.0030	mg/l	1	08/16/18 21:30	LS SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.50	0.20	0.15	0.12	mg/l	1	08/24/18 14:00	RP EPA 351.2/LCHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/29/18 09:41	MP EPA 365.3
Solids, Total Dissolved	102	10	4.0	1.8	mg/l	1	08/20/18 14:35	RC SM2540 C-11
Solids, Total Suspended	7.7	4.0	2.0	1.5	mg/l	1	08/20/18 10:56	RC SM2540 D-11
Total Organic Carbon	3.2	1.0	1.0	0.72	mg/l	1	08/25/18 08:08	JO SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-7M	<b>Date Sampled:</b> 08/16/18
<b>Lab Sample ID:</b> JC72034-10F	<b>Date Received:</b> 08/16/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/29/18 12:15	MP EPA 365.3

4.20  
4

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ



# Report of Analysis

<b>Client Sample ID:</b> BM-7D	<b>Date Sampled:</b> 08/16/18
<b>Lab Sample ID:</b> JC72034-11	<b>Date Received:</b> 08/16/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	122	5.0	4.0	3.6	mg/l	1	08/23/18 16:04	ST SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	08/16/18 23:04	SA SM5210 B-11
Nitrogen, Ammonia	0.14 J	0.20	0.20	0.089	mg/l	1	08/23/18 12:20	BM SM4500NH3 H-11LCHAT
Nitrogen, Nitrate <sup>c</sup>	5.4	0.21	0.21	0.089	mg/l	1	08/24/18 17:45	RP EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	5.4	0.20	0.20	0.086	mg/l	2	08/24/18 17:45	RP EPA 353.2/LCHAT
Nitrogen, Nitrite	0.018	0.010	0.0050	0.0030	mg/l	1	08/16/18 21:30	LS SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.54	0.20	0.15	0.12	mg/l	1	08/24/18 14:01	RP EPA 351.2/LCHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/29/18 09:41	MP EPA 365.3
Solids, Total Dissolved	138	10	4.0	1.8	mg/l	1	08/20/18 14:35	RC SM2540 C-11
Solids, Total Suspended	34.9	4.0	2.0	1.5	mg/l	1	08/20/18 16:38	RC SM2540 D-11
Total Organic Carbon	2.7	1.0	1.0	0.72	mg/l	1	08/29/18 02:22	JO SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-7D	<b>Date Sampled:</b> 08/16/18
<b>Lab Sample ID:</b> JC72034-11F	<b>Date Received:</b> 08/16/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/29/18 12:15	MP EPA 365.3

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-8S	<b>Date Sampled:</b> 08/16/18
<b>Lab Sample ID:</b> JC72034-12	<b>Date Received:</b> 08/16/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	77.6	5.0	4.0	3.6	mg/l	1	08/23/18 16:04	ST SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	08/17/18 14:20	LS SM5210 B-11
Coliform, Fecal <sup>c</sup>	0 J	4			col/100ml	1	08/16/18 21:58	SA SM9222 D-06
Coliform, Total <sup>c</sup>	0 J	4			col/100ml	1	08/16/18 21:49	SA SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/23/18 12:22	BM SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	2.3	0.11	0.11	0.046	mg/l	1	08/24/18 17:03	RP EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	2.3	0.10	0.10	0.043	mg/l	1	08/24/18 17:03	RP EPA 353.2/LACHAT
Nitrogen, Nitrite	0.026	0.010	0.0050	0.0030	mg/l	1	08/16/18 21:30	LS SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.61	0.20	0.15	0.12	mg/l	1	08/24/18 14:02	RP EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/29/18 10:04	MP EPA 365.3
Solids, Total Dissolved	52.5	10	4.0	1.8	mg/l	1	08/20/18 14:35	RC SM2540 C-11
Solids, Total Suspended	25.7	4.0	2.0	1.5	mg/l	1	08/20/18 16:38	RC SM2540 D-11
Total Organic Carbon	4.4	1.0	1.0	0.72	mg/l	1	08/29/18 02:33	JO SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Analysis done out of holding time.
- (d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-8S	<b>Date Sampled:</b> 08/16/18
<b>Lab Sample ID:</b> JC72034-12F	<b>Date Received:</b> 08/16/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/29/18 12:15	MP EPA 365.3

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-8M	<b>Date Sampled:</b> 08/16/18
<b>Lab Sample ID:</b> JC72034-13	<b>Date Received:</b> 08/16/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	80.2	5.0	4.0	3.6	mg/l	1	08/23/18 16:04	ST SM2320 B-11
BOD, 5 Day	5.7	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	08/17/18 14:24	LS SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/23/18 12:26	BM SM4500NH3 H-11LCHAT
Nitrogen, Nitrate <sup>c</sup>	2.5	0.11	0.11	0.046	mg/l	1	08/24/18 17:04	RP EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	2.5	0.10	0.10	0.043	mg/l	1	08/24/18 17:04	RP EPA 353.2/LCHAT
Nitrogen, Nitrite	0.029	0.010	0.0050	0.0030	mg/l	1	08/16/18 21:30	LS SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.48	0.20	0.15	0.12	mg/l	1	08/24/18 14:02	RP EPA 351.2/LCHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/29/18 10:04	MP EPA 365.3
Solids, Total Dissolved	150	10	4.0	1.8	mg/l	1	08/20/18 15:55	RC SM2540 C-11
Solids, Total Suspended	16.5	4.0	2.0	1.5	mg/l	1	08/20/18 16:38	RC SM2540 D-11
Total Organic Carbon	4.0	1.0	1.0	0.72	mg/l	1	08/29/18 02:44	JO SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-8M	<b>Date Sampled:</b> 08/16/18
<b>Lab Sample ID:</b> JC72034-13F	<b>Date Received:</b> 08/16/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/29/18 12:15	MP EPA 365.3

4.26  
4

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-8D	
<b>Lab Sample ID:</b> JC72034-14	<b>Date Sampled:</b> 08/16/18
<b>Matrix:</b> AQ - Surface Water	<b>Date Received:</b> 08/16/18
	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	91.1	5.0	4.0	3.6	mg/l	1	08/23/18 16:04	ST SM2320 B-11
BOD, 5 Day	7.0	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	08/17/18 14:25	LS SM5210 B-11
Nitrogen, Ammonia	0.17 J	0.20	0.20	0.089	mg/l	1	08/23/18 12:28	BM SM4500NH3 H-11LCHAT
Nitrogen, Nitrate <sup>c</sup>	3.3	0.11	0.11	0.046	mg/l	1	08/24/18 17:06	RP EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	3.3	0.10	0.10	0.043	mg/l	1	08/24/18 17:06	RP EPA 353.2/LCHAT
Nitrogen, Nitrite	0.024	0.010	0.0050	0.0030	mg/l	1	08/16/18 21:30	LS SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.45	0.20	0.15	0.12	mg/l	1	08/24/18 14:05	RP EPA 351.2/LCHAT
Phosphorus, Total	0.088	0.050	0.050	0.027	mg/l	1	08/29/18 10:04	MP EPA 365.3
Solids, Total Dissolved	190	10	4.0	1.8	mg/l	1	08/20/18 15:55	RC SM2540 C-11
Solids, Total Suspended	34.0	4.0	2.0	1.5	mg/l	1	08/20/18 16:38	RC SM2540 D-11
Total Organic Carbon	3.7	1.0	1.0	0.72	mg/l	1	08/29/18 02:55	JO SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

4.27  
4

# Report of Analysis

<b>Client Sample ID:</b> BM-8D	<b>Date Sampled:</b> 08/16/18
<b>Lab Sample ID:</b> JC72034-14F	<b>Date Received:</b> 08/16/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/29/18 12:15	MP EPA 365.3

4.28  
4

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ



# Report of Analysis

<b>Client Sample ID:</b> BM-9S	<b>Date Sampled:</b> 08/16/18
<b>Lab Sample ID:</b> JC72034-15	<b>Date Received:</b> 08/16/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	80.2	5.0	4.0	3.6	mg/l	1	08/23/18 16:04	ST SM2320 B-11
BOD, 5 Day	4.3	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	08/17/18 14:26	LS SM5210 B-11
Coliform, Fecal <sup>c</sup>	46	4			col/100ml	10	08/16/18 21:58	SA SM9222 D-06
Coliform, Total <sup>c</sup>	4	4			col/100ml	4	08/16/18 21:49	SA SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/23/18 12:29	BM SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	2.4	0.11	0.11	0.046	mg/l	1	08/24/18 17:07	RP EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	2.4	0.10	0.10	0.043	mg/l	1	08/24/18 17:07	RP EPA 353.2/LACHAT
Nitrogen, Nitrite	0.035	0.010	0.0050	0.0030	mg/l	1	08/16/18 21:30	LS SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.51	0.20	0.15	0.12	mg/l	1	08/24/18 14:06	RP EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/29/18 10:04	MP EPA 365.3
Solids, Total Dissolved	140	10	4.0	1.8	mg/l	1	08/20/18 15:55	RC SM2540 C-11
Solids, Total Suspended	15.8	4.0	2.0	1.5	mg/l	1	08/20/18 16:38	RC SM2540 D-11
Total Organic Carbon	4.4	1.0	1.0	0.72	mg/l	1	08/29/18 03:07	JO SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Analysis done out of holding time.
- (d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

## Report of Analysis

<b>Client Sample ID:</b> BM-9S	<b>Date Sampled:</b> 08/16/18
<b>Lab Sample ID:</b> JC72034-15F	<b>Date Received:</b> 08/16/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/29/18 12:15	MP EPA 365.3

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-9M	<b>Date Sampled:</b> 08/16/18
<b>Lab Sample ID:</b> JC72034-16	<b>Date Received:</b> 08/16/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	69.9	5.0	4.0	3.6	mg/l	1	08/23/18 16:04	ST SM2320 B-11
BOD, 5 Day	4.5	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	08/17/18 14:29	LS SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/23/18 12:31	BM SM4500NH3 H-11LCHAT
Nitrogen, Nitrate <sup>c</sup>	3.1	0.11	0.11	0.046	mg/l	1	08/24/18 17:08	RP EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	3.1	0.10	0.10	0.043	mg/l	1	08/24/18 17:08	RP EPA 353.2/LCHAT
Nitrogen, Nitrite	0.023	0.010	0.0050	0.0030	mg/l	1	08/16/18 22:15	LS SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.44	0.20	0.15	0.12	mg/l	1	08/24/18 14:07	RP EPA 351.2/LCHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/29/18 10:04	MP EPA 365.3
Solids, Total Dissolved	144	10	4.0	1.8	mg/l	1	08/20/18 15:55	RC SM2540 C-11
Solids, Total Suspended	8.9	4.0	2.0	1.5	mg/l	1	08/20/18 16:38	RC SM2540 D-11
Total Organic Carbon	5.5	1.0	1.0	0.72	mg/l	1	08/29/18 03:17	JO SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

## Report of Analysis

<b>Client Sample ID:</b> BM-9M	<b>Date Sampled:</b> 08/16/18
<b>Lab Sample ID:</b> JC72034-16F	<b>Date Received:</b> 08/16/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/29/18 12:15	MP EPA 365.3

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-9D	
<b>Lab Sample ID:</b> JC72034-17	<b>Date Sampled:</b> 08/16/18
<b>Matrix:</b> AQ - Surface Water	<b>Date Received:</b> 08/16/18
	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	123	5.0	4.0	3.6	mg/l	1	08/23/18 16:04	ST SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	08/17/18 14:31	LS SM5210 B-11
Nitrogen, Ammonia	0.14 J	0.20	0.20	0.089	mg/l	1	08/23/18 12:32	BM SM4500NH3 H-11LCHAT
Nitrogen, Nitrate <sup>c</sup>	5.6	0.21	0.21	0.089	mg/l	1	08/24/18 17:51	RP EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	5.6	0.20	0.20	0.086	mg/l	2	08/24/18 17:51	RP EPA 353.2/LCHAT
Nitrogen, Nitrite	0.022	0.010	0.0050	0.0030	mg/l	1	08/16/18 22:15	LS SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.56	0.20	0.15	0.12	mg/l	1	08/24/18 14:08	RP EPA 351.2/LCHAT
Phosphorus, Total	0.051	0.050	0.050	0.027	mg/l	1	08/29/18 10:04	MP EPA 365.3
Solids, Total Dissolved	190	10	4.0	1.8	mg/l	1	08/20/18 15:55	RC SM2540 C-11
Solids, Total Suspended	121	4.0	2.0	1.5	mg/l	1	08/20/18 16:38	RC SM2540 D-11
Total Organic Carbon	2.6	1.0	1.0	0.72	mg/l	1	08/29/18 04:13	JO SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-9D	<b>Date Sampled:</b> 08/16/18
<b>Lab Sample ID:</b> JC72034-17F	<b>Date Received:</b> 08/16/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.039 J	0.050	0.050	0.027	mg/l	1	08/29/18 12:23	MP EPA 365.3

4.34  
4

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-10S	<b>Date Sampled:</b> 08/16/18
<b>Lab Sample ID:</b> JC72034-18	<b>Date Received:</b> 08/16/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	79.7	5.0	4.0	3.6	mg/l	1	08/27/18	ST SM2320 B-11
BOD, 5 Day	6.8	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	08/17/18 14:32	LS SM5210 B-11
Coliform, Fecal <sup>c</sup>	54	4			col/100ml	10	08/16/18 21:58	SA SM9222 D-06
Coliform, Total <sup>c</sup>	31	4			col/100ml	10	08/16/18 21:49	SA SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/23/18 12:44	BM SM4500NH3 H-11LCHAT
Nitrogen, Nitrate <sup>d</sup>	2.6	0.11	0.11	0.046	mg/l	1	08/24/18 17:38	RP EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	2.6	0.10	0.10	0.043	mg/l	1	08/24/18 17:38	RP EPA 353.2/LCHAT
Nitrogen, Nitrite	0.020	0.010	0.0050	0.0030	mg/l	1	08/16/18 22:15	LS SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.46	0.20	0.15	0.12	mg/l	1	08/24/18 14:08	RP EPA 351.2/LCHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/29/18 10:04	MP EPA 365.3
Solids, Total Dissolved	144	10	4.0	1.8	mg/l	1	08/20/18 15:55	RC SM2540 C-11
Solids, Total Suspended	17.4	4.0	2.0	1.5	mg/l	1	08/20/18 16:38	RC SM2540 D-11
Total Organic Carbon	4.6	1.0	1.0	0.72	mg/l	1	08/29/18 04:24	JO SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Analysis done out of holding time.
- (d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

4.35  
4

# Report of Analysis

<b>Client Sample ID:</b> BM-10S	<b>Date Sampled:</b> 08/16/18
<b>Lab Sample ID:</b> JC72034-18F	<b>Date Received:</b> 08/16/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/29/18 12:23	MP EPA 365.3

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ



# Report of Analysis

<b>Client Sample ID:</b> BM-10M	
<b>Lab Sample ID:</b> JC72034-19	<b>Date Sampled:</b> 08/16/18
<b>Matrix:</b> AQ - Surface Water	<b>Date Received:</b> 08/16/18
	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	76.1	5.0	4.0	3.6	mg/l	1	08/27/18	ST SM2320 B-11
BOD, 5 Day	5.8	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	08/17/18 14:33	LS SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/23/18 12:45	BM SM4500NH3 H-11LCHAT
Nitrogen, Nitrate <sup>c</sup>	2.9	0.11	0.11	0.046	mg/l	1	08/24/18 17:39	RP EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	2.9	0.10	0.10	0.043	mg/l	1	08/24/18 17:39	RP EPA 353.2/LCHAT
Nitrogen, Nitrite	0.015	0.010	0.0050	0.0030	mg/l	1	08/16/18 22:15	LS SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.48	0.20	0.15	0.12	mg/l	1	08/24/18 14:09	RP EPA 351.2/LCHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/29/18 10:04	MP EPA 365.3
Solids, Total Dissolved	136	10	4.0	1.8	mg/l	1	08/20/18 15:55	RC SM2540 C-11
Solids, Total Suspended	15.3	4.0	2.0	1.5	mg/l	1	08/20/18 16:38	RC SM2540 D-11
Total Organic Carbon	3.9	1.0	1.0	0.72	mg/l	1	08/29/18 04:35	JO SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-10M	<b>Date Sampled:</b> 08/16/18
<b>Lab Sample ID:</b> JC72034-19F	<b>Date Received:</b> 08/16/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/29/18 12:23	MP EPA 365.3

4.38  
4

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-10D	
<b>Lab Sample ID:</b> JC72034-20	<b>Date Sampled:</b> 08/16/18
<b>Matrix:</b> AQ - Surface Water	<b>Date Received:</b> 08/16/18
	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	140	5.0	4.0	3.6	mg/l	1	08/27/18	ST SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	08/17/18 14:35	LS SM5210 B-11
Nitrogen, Ammonia	0.11 J	0.20	0.20	0.089	mg/l	1	08/23/18 12:46	BM SM4500NH3 H-11LCHAT
Nitrogen, Nitrate <sup>c</sup>	6.4	0.21	0.21	0.089	mg/l	1	08/24/18 17:53	RP EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	6.4	0.20	0.20	0.086	mg/l	2	08/24/18 17:53	RP EPA 353.2/LCHAT
Nitrogen, Nitrite	0.011	0.010	0.0050	0.0030	mg/l	1	08/16/18 22:15	LS SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.33	0.20	0.15	0.12	mg/l	1	08/24/18 14:10	RP EPA 351.2/LCHAT
Phosphorus, Total	0.037 J	0.050	0.050	0.027	mg/l	1	08/29/18 10:04	MP EPA 365.3
Solids, Total Dissolved	240	10	4.0	1.8	mg/l	1	08/20/18 15:55	RC SM2540 C-11
Solids, Total Suspended	48.0	4.0	2.0	1.5	mg/l	1	08/20/18 16:38	RC SM2540 D-11
Total Organic Carbon	2.7	1.0	1.0	0.72	mg/l	1	08/29/18 04:47	JO SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-10D	<b>Date Sampled:</b> 08/16/18
<b>Lab Sample ID:</b> JC72034-20F	<b>Date Received:</b> 08/16/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.031 J	0.050	0.050	0.027	mg/l	1	08/29/18 12:23	MP EPA 365.3

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-11S	<b>Date Sampled:</b> 08/16/18
<b>Lab Sample ID:</b> JC72034-21	<b>Date Received:</b> 08/16/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	34.2	5.0	4.0	3.6	mg/l	1	08/27/18	ST SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	08/17/18 14:37	LS SM5210 B-11
Coliform, Fecal <sup>c</sup>	3100	100			col/100ml	100	08/16/18 21:58	SA SM9222 D-06
Coliform, Total <sup>c</sup>	4500	100			col/100ml	100	08/16/18 21:49	SA SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/23/18 12:48	BM SM4500NH3 H-11LCHAT
Nitrogen, Nitrate <sup>d</sup>	4.2	0.11	0.11	0.046	mg/l	1	08/27/18 11:47	BM EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.2	0.10	0.10	0.043	mg/l	1	08/27/18 11:47	BM EPA 353.2/LCHAT
Nitrogen, Nitrite	0.0034 J	0.010	0.0050	0.0030	mg/l	1	08/16/18 22:15	LS SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.32	0.20	0.15	0.12	mg/l	1	08/24/18 14:11	RP EPA 351.2/LCHAT
Phosphorus, Total	0.033 J	0.050	0.050	0.027	mg/l	1	08/29/18 10:04	MP EPA 365.3
Solids, Total Dissolved	124	10	4.0	1.8	mg/l	1	08/20/18 15:55	RC SM2540 C-11
Solids, Total Suspended	14.6	4.0	2.0	1.5	mg/l	1	08/20/18 16:38	RC SM2540 D-11
Total Organic Carbon	2.8	1.0	1.0	0.72	mg/l	1	08/29/18 08:50	JO SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Analysis done out of holding time.
- (d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

4.41  
4

## Report of Analysis

<b>Client Sample ID:</b> BM-11S	<b>Date Sampled:</b> 08/16/18
<b>Lab Sample ID:</b> JC72034-21F	<b>Date Received:</b> 08/16/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/30/18 09:28	MP EPA 365.3

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

Misc. Forms

Custody Documents and Other Forms

---

Includes the following where applicable:

- Chain of Custody







CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX 732-329-3499
www.sgs.com/ehsusa

FED-EX Tracking #
Bottle Order Control #
SGS Quote #
SGS Job # JC72034

Client / Reporting Information
Project Information
Requested Analysis (see TEST CODE sheet)
Matrix Codes

Table with columns: Lab Sample #, Field ID / Point of Collection, MEOH/DI Val #, Date, Time, Sampled by, Matrix, # of bottles, and various test parameters (HCO3, NH3, NH2O4, NONE, DI Water, MESH, ENCORE). Rows include samples 12F BM-8S through 21F BM-11S.

Turnaround Time (Business days)
Data Deliverable Information
Comments / Special Instructions
One TSS Bottle NOT Filled. One XN250 Bottle NOT USED. TP04 dissolved lab filter. XN250 Combined with TP04/TKN Bottle.

Emergency & Rush TIA data available via Lab Link
Sample Custody must be documented below each time samples change possession, including courier delivery.
Relinquished by: [Signature] Date/Time: 8/16/18 1430
Received By: [Signature] Date/Time: 8/16/18 1724

Custody Seal #
Intact / Not intact
Preserved where applicable
On Ice
Cooling Temp: 3.5-5.0

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions

# SGS Sample Receipt Summary

**Job Number:** JC72034

**Client:** USACE-PHILADELPHIA DISTRICT

**Project:** PHILADELPHIA DISTRICT, RESERVOIR SAMPL

**Date / Time Received:** 8/16/2018 5:24:00 PM

**Delivery Method:** Accutest Courier

**Airbill #s:**

**Cooler Temps (Raw Measured) °C:** Cooler 1: (3.8); Cooler 2: (3.9); Cooler 3: (3.8); Cooler 4: (3.7); Cooler 5: (3.5); Cooler 6: (3.8); Cooler 7: (2.8);

**Cooler Temps (Corrected) °C:** Cooler 1: (3.7); Cooler 2: (3.8); Cooler 3: (3.7); Cooler 4: (3.6); Cooler 5: (3.4); Cooler 6: (3.7); Cooler 7: (2.7);

**Cooler Security**

	<u>Y</u>	<u>or</u>	<u>N</u>		<u>Y</u>	<u>or</u>	<u>N</u>
1. Custody Seals Present:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/>		<input type="checkbox"/>

**Cooler Temperature**

	<u>Y</u>	<u>or</u>	<u>N</u>
1. Temp criteria achieved:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Cooler temp verification:	IR Gun		
3. Cooler media:	Ice (Bag)		
4. No. Coolers:	7		

**Quality Control Preservation**

	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
1. Trip Blank present / cooler:	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Trip Blank listed on COC:	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Samples preserved properly:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. VOCs headspace free:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Sample Integrity - Documentation**

	<u>Y</u>	<u>or</u>	<u>N</u>
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Container labeling complete:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>		<input type="checkbox"/>

**Sample Integrity - Condition**

	<u>Y</u>	<u>or</u>	<u>N</u>
1. Sample recvd within HT:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. All containers accounted for:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Condition of sample:	Intact		

**Sample Integrity - Instructions**

	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
2. Bottles received for unspecified tests:	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
3. Sufficient volume recvd for analysis:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

Test Strip Lot #s:                pH 1-12: 216017                                pH 12+: 208717                                Other: (Specify) \_\_\_\_\_

Comments -1, -2, -6, -9, TCF/FCF Rec'd/processed out of hold. Lab to verify all other TCF/FCF samples.

SM089-02 Rev. Date 12/1/16

5.1  
5

Proceed as noted, this project follows 30 hour hold time for both TCF and FCF per Joseph Loeper.

**JC72034: Chain of Custody**  
**Page 4 of 4**

The results set forth herein are provided by SGS North America Inc.

*e-Hardcopy 2.0*  
*Automated Report*

## Technical Report for

USACE-Philadelphia District

Philadelphia District, Reservoir Sampling

W25PHS81145379

SGS Job Number: JC73084

Sampling Date: 09/04/18

Report to:

Army Corps of Engineers


joseph.m.loeper@usace.army.mil

ATTN: Joseph Loeper

Total number of pages in report: **72**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

  
A. Paul Ioannidis  
General Manager

Client Service contact: Tammy McCloskey 732-329-0200

Certifications: NJ(12129), NY(10983), CA, CT, FL, IL, IN, KS, KY, LA, MA, MD, ME, MN, NC, OH VAP (CL0056), AK (UST-103), AZ (AZ0786), PA, RI, SC, TX, UT, VA, WV, DoD ELAP (ANAB L2248)

This report shall not be reproduced, except in its entirety, without the written approval of SGS.  
Test results relate only to samples analyzed.

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## Sample Summary

USACE-Philadelphia District

Job No: JC73084

Philadelphia District, Reservoir Sampling  
Project No: W25PHS81145379

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
JC73084-1	09/04/18	11:40 GW	09/04/18	AQ	Surface Water	BM-1S
JC73084-1F	09/04/18	11:40 GW	09/04/18	AQ	Surface H2O Filtered	BM-1S
JC73084-2	09/04/18	08:20 GW	09/04/18	AQ	Surface Water	BM-2S
JC73084-2F	09/04/18	08:20 GW	09/04/18	AQ	Surface H2O Filtered	BM-2S
JC73084-3	09/04/18	08:20 GW	09/04/18	AQ	Surface Water	BM-2M
JC73084-3F	09/04/18	08:20 GW	09/04/18	AQ	Surface H2O Filtered	BM-2M
JC73084-4	09/04/18	08:20 GW	09/04/18	AQ	Surface Water	BM-2D
JC73084-4F	09/04/18	08:20 GW	09/04/18	AQ	Surface H2O Filtered	BM-2D
JC73084-5	09/04/18	11:05 GW	09/04/18	AQ	Surface Water	BM-5S
JC73084-5F	09/04/18	11:05 GW	09/04/18	AQ	Surface H2O Filtered	BM-5S
JC73084-6	09/04/18	08:00 GW	09/04/18	AQ	Surface Water	BM-6S
JC73084-6F	09/04/18	08:00 GW	09/04/18	AQ	Surface H2O Filtered	BM-6S
JC73084-7	09/04/18	08:00 GW	09/04/18	AQ	Surface Water	BM-6M

**Sample Summary**

(continued)

USACE-Philadelphia District

**Job No:** JC73084Philadelphia District, Reservoir Sampling  
Project No: W25PHS81145379

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
JC73084-7F	09/04/18	08:00 GW	09/04/18	AQ	Surface H2O Filtered	BM-6M
JC73084-8	09/04/18	08:00 GW	09/04/18	AQ	Surface Water	BM-6D
JC73084-8F	09/04/18	08:00 GW	09/04/18	AQ	Surface H2O Filtered	BM-6D
JC73084-9	09/04/18	08:50 GW	09/04/18	AQ	Surface Water	BM-7S
JC73084-9F	09/04/18	08:50 GW	09/04/18	AQ	Surface H2O Filtered	BM-7S
JC73084-10	09/04/18	08:50 GW	09/04/18	AQ	Surface Water	BM-7M
JC73084-10F	09/04/18	08:50 GW	09/04/18	AQ	Surface H2O Filtered	BM-7M
JC73084-11	09/04/18	08:50 GW	09/04/18	AQ	Surface Water	BM-7D
JC73084-11F	09/04/18	08:50 GW	09/04/18	AQ	Surface H2O Filtered	BM-7D
JC73084-12	09/04/18	10:10 GW	09/04/18	AQ	Surface Water	BM-8S
JC73084-12F	09/04/18	10:10 GW	09/04/18	AQ	Surface H2O Filtered	BM-8S
JC73084-13	09/04/18	10:10 GW	09/04/18	AQ	Surface Water	BM-8M
JC73084-13F	09/04/18	10:10 GW	09/04/18	AQ	Surface H2O Filtered	BM-8M





## Sample Summary

(continued)

USACE-Philadelphia District

**Job No:** JC73084

Philadelphia District, Reservoir Sampling  
 Project No: W25PHS81145379

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
JC73084-14	09/04/18	10:10 GW	09/04/18	AQ	Surface Water	BM-8D
JC73084-14F	09/04/18	10:10 GW	09/04/18	AQ	Surface H2O Filtered	BM-8D
JC73084-15	09/04/18	09:20 GW	09/04/18	AQ	Surface Water	BM-9S
JC73084-15F	09/04/18	09:20 GW	09/04/18	AQ	Surface H2O Filtered	BM-9S
JC73084-16	09/04/18	09:20 GW	09/04/18	AQ	Surface Water	BM-9M
JC73084-16F	09/04/18	09:20 GW	09/04/18	AQ	Surface H2O Filtered	BM-9M
JC73084-17	09/04/18	09:20 GW	09/04/18	AQ	Surface Water	BM-9D
JC73084-17F	09/04/18	09:20 GW	09/04/18	AQ	Surface H2O Filtered	BM-9D
JC73084-18	09/04/18	09:45 GW	09/04/18	AQ	Surface Water	BM-10S
JC73084-18F	09/04/18	09:45 GW	09/04/18	AQ	Surface H2O Filtered	BM-10S
JC73084-19	09/04/18	09:45 GW	09/04/18	AQ	Surface Water	BM-10M
JC73084-19F	09/04/18	09:45 GW	09/04/18	AQ	Surface H2O Filtered	BM-10M
JC73084-20	09/04/18	09:45 GW	09/04/18	AQ	Surface Water	BM-10D



### Sample Summary

(continued)

USACE-Philadelphia District

Job No: JC73084

Philadelphia District, Reservoir Sampling  
Project No: W25PHS81145379

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
JC73084-20F	09/04/18	09:45	GW	09/04/18	AQ Surface H2O Filtered	BM-10D
JC73084-21	09/04/18	11:10	GW	09/04/18	AQ Surface Water	BM-11S
JC73084-21F	09/04/18	11:10	GW	09/04/18	AQ Surface H2O Filtered	BM-11S

## CASE NARRATIVE / CONFORMANCE SUMMARY

**Client:** USACE-Philadelphia District

**Job No** JC73084

**Site:** Philadelphia District, Reservoir Sampling

**Report Date** 9/19/2018 2:46:20 PM

On 09/04/2018, 42 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at SGS North America Inc. at a maximum corrected temperature of 3.1 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. Job Number of JC73084 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Compounds qualified as out of range in the continuing calibration summary report are acceptable as per method requirements when there is a high bias but the sample result is non-detect.

### General Chemistry By Method EPA 351.2/LACHAT

**Matrix:** AQ **Batch ID:** GP15832

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73084-1DUP, JC73084-1MS were used as the QC samples for Nitrogen, Total Kjeldahl.

**Matrix:** AQ **Batch ID:** GP15833

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73084-21DUP, JC73084-21MS were used as the QC samples for Nitrogen, Total Kjeldahl.
- Matrix Spike Recovery(s) for Nitrogen, Total Kjeldahl are outside control limits. Spike recovery indicates possible matrix interference.
- RPD(s) for Duplicate for Nitrogen, Total Kjeldahl are outside control limits for sample GP15833-D1. RPD acceptable due to low duplicate and sample concentrations.

### General Chemistry By Method EPA 353.2/LACHAT

**Matrix:** AQ **Batch ID:** GP15786

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC72863-1DUP, JC72863-1MS were used as the QC samples for Nitrogen, Nitrate + Nitrite.

**Matrix:** AQ **Batch ID:** GP15787

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73084-21DUP, JC73084-21MS were used as the QC samples for Nitrogen, Nitrate + Nitrite.
- Matrix Spike Recovery(s) for Nitrogen, Nitrate + Nitrite are outside control limits. Spike recovery indicates possible matrix interference.

## General Chemistry By Method EPA 365.3

**Matrix:** AQ                      **Batch ID:** GP15781

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC72879-1ADUP, JC72879-1AMS were used as the QC samples for Phosphorus, Total.

**Matrix:** AQ                      **Batch ID:** GP15815

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73084-10DUP, JC73084-10MS were used as the QC samples for Phosphorus, Total.

**Matrix:** AQ                      **Batch ID:** GP15865

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73125-1DUP, JC73125-1MS were used as the QC samples for Phosphorus, Total.

## General Chemistry By Method EPA353.2/SM4500NO2B

**Matrix:** AQ **Batch ID:** R172645

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73084-1 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R172646

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73084-2 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R172647

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73084-3 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R172648

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73084-4 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R172649

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73084-5 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R172650

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73084-6 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R172651

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73084-7 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R172652

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73084-8 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R172653

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73084-9 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R172654

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73084-10 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R172655

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73084-11 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R172656

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73084-12 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R172657

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73084-13 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ **Batch ID:** R172658

- The data for EPA353.2/SM4500NO2B meets quality control requirements.

## General Chemistry By Method EPA353.2/SM4500NO2B

**Matrix:** AQ                      **Batch ID:** R172658

- JC73084-14 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ                      **Batch ID:** R172659

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73084-15 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ                      **Batch ID:** R172660

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73084-16 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ                      **Batch ID:** R172661

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73084-17 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ                      **Batch ID:** R172662

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73084-18 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ                      **Batch ID:** R172663

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73084-19 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ                      **Batch ID:** R172664

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73084-20 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

**Matrix:** AQ                      **Batch ID:** R172665

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73084-21 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

## General Chemistry By Method SM2320 B-11

**Matrix:** AQ

**Batch ID:** GN85337

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73065-1DUP were used as the QC samples for Alkalinity, Total as CaCO<sub>3</sub>.
- JC73084-5 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC73084-6 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC73084-7 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC73084-8 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC73084-3 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC73084-4 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC73084-9 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC73084-1 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC73084-2 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.

**Matrix:** AQ

**Batch ID:** GN85496

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73084-10DUP were used as the QC samples for Alkalinity, Total as CaCO<sub>3</sub>.
- JC73084-12 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC73084-19 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC73084-20 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC73084-14 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC73084-13 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC73084-15 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC73084-10 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC73084-16 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC73084-17 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC73084-18 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC73084-21 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.
- JC73084-11 for Alkalinity, Total as CaCO<sub>3</sub>: Sample was titrated to a final pH of 4.5.

## General Chemistry By Method SM2540 C-11

**Matrix:** AQ

**Batch ID:** GN85250

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73084-1DUP were used as the QC samples for Solids, Total Dissolved.

**Matrix:** AQ

**Batch ID:** GN85274

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73084-17DUP were used as the QC samples for Solids, Total Dissolved.

### General Chemistry By Method SM2540 D-11

**Matrix:** AQ                      **Batch ID:** GN85248

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73084-1DUP were used as the QC samples for Solids, Total Suspended.
- JC73084-15 for Solids, Total Suspended: Reported sample aliquot obtained from filtration of 250 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.
- JC73084-6 for Solids, Total Suspended: Reported sample aliquot obtained from filtration of 350 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.

**Matrix:** AQ                      **Batch ID:** GN85262

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73084-16DUP were used as the QC samples for Solids, Total Suspended.

### General Chemistry By Method SM4500NH3 H-11LACHAT

**Matrix:** AQ                      **Batch ID:** GP15796

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73054-4DUP, JC73054-4MS, JC73054-4MSD were used as the QC samples for Nitrogen, Ammonia.

**Matrix:** AQ                      **Batch ID:** GP15797

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73084-14DUP, JC73084-14MS, JC73084-14MSD were used as the QC samples for Nitrogen, Ammonia.

### General Chemistry By Method SM4500NO2 B-11

**Matrix:** AQ                      **Batch ID:** GN85241

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73084-1DUP, JC73084-1MS were used as the QC samples for Nitrogen, Nitrite.

**Matrix:** AQ                      **Batch ID:** GN85252

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73084-15DUP, JC73084-15MS were used as the QC samples for Nitrogen, Nitrite.

### General Chemistry By Method SM5210 B-11

**Matrix:** AQ                      **Batch ID:** GP15773

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73084-1DUP were used as the QC samples for BOD, 5 Day.

**Matrix:** AQ                      **Batch ID:** GP15774

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73084-21DUP were used as the QC samples for BOD, 5 Day.



## General Chemistry By Method SM5310 B-11

**Matrix:** AQ**Batch ID:** GP15946

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73084-6MS, JC73084-6MSD were used as the QC samples for Total Organic Carbon.

**Matrix:** AQ**Batch ID:** GP15947

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73084-20MS, JC73084-20MSD were used as the QC samples for Total Organic Carbon.

**Matrix:** AQ**Batch ID:** GP15948

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73160-5MS, JC73160-5MSD were used as the QC samples for Total Organic Carbon.

## General Chemistry By Method SM9222 B-06

**Matrix:** AQ**Batch ID:** MB5369

- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73084-1DUP were used as the QC samples for Coliform, Total.
- JC73084-1 for Coliform, Total: Analysis done out of holding time.
- JC73084-9 for Coliform, Total: Analysis done out of holding time.
- JC73084-6 for Coliform, Total: Analysis done out of holding time.
- JC73084-5 for Coliform, Total: Analysis done out of holding time.
- JC73084-21 for Coliform, Total: Analysis done out of holding time.
- JC73084-2 for Coliform, Total: Analysis done out of holding time.
- JC73084-18 for Coliform, Total: Analysis done out of holding time.
- JC73084-15 for Coliform, Total: Analysis done out of holding time.
- JC73084-12 for Coliform, Total: Analysis done out of holding time.

## General Chemistry By Method SM9222 D-06

**Matrix:** AQ**Batch ID:** MB5370

- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73084-1DUP were used as the QC samples for Coliform, Fecal.
- JC73084-21 for Coliform, Fecal: Analysis done out of holding time.
- JC73084-1 for Coliform, Fecal: Analysis done out of holding time.
- JC73084-15 for Coliform, Fecal: Analysis done out of holding time.
- JC73084-12 for Coliform, Fecal: Analysis done out of holding time.
- JC73084-18 for Coliform, Fecal: Analysis done out of holding time.
- JC73084-9 for Coliform, Fecal: Analysis done out of holding time.
- JC73084-2 for Coliform, Fecal: Analysis done out of holding time.
- JC73084-5 for Coliform, Fecal: Analysis done out of holding time.
- JC73084-6 for Coliform, Fecal: Analysis done out of holding time.

SGS North America Inc. certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting the Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

SGS North America Inc. is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. Data release is authorized by SGS North America Inc indicated via signature on the report cover

# Summary of Hits

**Job Number:** JC73084  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 09/04/18



Lab Sample ID	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
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**JC73084-1 BM-1S**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	118	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal <sup>b</sup>	360	10	<sup>c</sup>	col/100ml	SM9222 D-06
Coliform, Total <sup>b</sup>	590	10	<sup>c</sup>	col/100ml	SM9222 B-06
Nitrogen, Ammonia	0.16 J	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	4.0	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.1	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.057	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.61	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total	0.064	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved	210	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	9.1	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon	13.6	1.0	1.0	mg/l	SM5310 B-11

**JC73084-1F BM-1S**

Phosphorus, Total	0.090	0.050	0.050	mg/l	EPA 365.3
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**JC73084-2 BM-2S**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	72.3	5.0	4.0	mg/l	SM2320 B-11
BOD, 5 Day	6.8	3.4	3.4 <sup>c</sup>	mg/l	SM5210 B-11
Coliform, Fecal <sup>b</sup>	20	10	<sup>c</sup>	col/100ml	SM9222 D-06
Coliform, Total <sup>b</sup>	67	4	<sup>c</sup>	col/100ml	SM9222 B-06
Nitrogen, Nitrate <sup>d</sup>	2.5	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	2.5	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.031	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	27.3	8.0	6.0	mg/l	EPA 351.2/LACHAT
Phosphorus, Total	0.074	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved	115	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	58.0	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon	8.3	1.0	1.0	mg/l	SM5310 B-11

**JC73084-2F BM-2S**

Phosphorus, Total	0.060	0.050	0.050	mg/l	EPA 365.3
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**JC73084-3 BM-2M**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	114	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Ammonia	0.17 J	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	3.9	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	3.9	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.044	0.010	0.0050	mg/l	SM4500NO2 B-11

## Summary of Hits

**Job Number:** JC73084  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 09/04/18



Lab Sample ID	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
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Nitrogen, Total Kjeldahl		0.42	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total		0.092	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved		193	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		18.2	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		13.2	1.0	1.0	mg/l	SM5310 B-11

### JC73084-3F BM-2M

Phosphorus, Total		0.12	0.050	0.050	mg/l	EPA 365.3
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### JC73084-4 BM-2D

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>		126	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Ammonia		0.16 J	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>		4.7	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		4.7	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite		0.032	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl		0.47	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total		0.16	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved		233	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		13.3	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		12.2	1.0	1.0	mg/l	SM5310 B-11

### JC73084-4F BM-2D

Phosphorus, Total		0.11	0.050	0.050	mg/l	EPA 365.3
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### JC73084-5 BM-5S

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>		199	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal <sup>b</sup>		550	10	<sup>c</sup>	col/100ml	SM9222 D-06
Coliform, Total <sup>b</sup>		4500	100	<sup>c</sup>	col/100ml	SM9222 B-06
Nitrogen, Nitrate <sup>d</sup>		7.1	0.31	0.31	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		7.1	0.30	0.30	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite		0.033	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl		0.34	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total		0.097	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved		314	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		19.0	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		4.3	1.0	1.0	mg/l	SM5310 B-11

### JC73084-5F BM-5S

Phosphorus, Total		0.074	0.050	0.050	mg/l	EPA 365.3
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## Summary of Hits

**Job Number:** JC73084  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 09/04/18



Lab Sample ID	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
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### JC73084-6 BM-6S

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	69.7	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal <sup>b</sup>	12	4	<sup>c</sup>	col/100ml	SM9222 D-06
Coliform, Total <sup>b</sup>	9	4	<sup>c</sup>	col/100ml	SM9222 B-06
Nitrogen, Nitrate <sup>d</sup>	2.3	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	2.3	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.028	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.35	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved	75.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended <sup>e</sup>	12.3	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon	6.7	1.0	1.0	mg/l	SM5310 B-11

### JC73084-6F BM-6S

No hits reported in this sample.

### JC73084-7 BM-6M

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	121	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Ammonia	0.18 J	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	4.4	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.5	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.070	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.46	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total	0.060	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved	182	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	10.3	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon	9.1	1.0	1.0	mg/l	SM5310 B-11

### JC73084-7F BM-6M

Phosphorus, Total	0.056	0.050	0.050	mg/l	EPA 365.3
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### JC73084-8 BM-6D

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	35.9	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Ammonia	0.21	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	4.4	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.5	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.081	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.49	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total	0.051	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved	193	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	11.3	4.0	2.0	mg/l	SM2540 D-11

## Summary of Hits

**Job Number:** JC73084  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 09/04/18



Lab Sample ID	Client Sample ID	Result/ Analyte	LOQ	LOD	Units	Method
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Total Organic Carbon		9.7	1.0	1.0	mg/l	SM5310 B-11
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**JC73084-8F      BM-6D**

Phosphorus, Total		0.070	0.050	0.050	mg/l	EPA 365.3
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**JC73084-9      BM-7S**

Alkalinity, Total as CaCO3 <sup>a</sup>		77.4	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal <sup>b</sup>		40	10	<sup>c</sup>	col/100ml	SM9222 D-06
Coliform, Total <sup>b</sup>		80	4	<sup>c</sup>	col/100ml	SM9222 B-06
Nitrogen, Ammonia		0.25	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>		2.3	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		2.3	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite		0.026	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl		1.8	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		70.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		20.4	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		6.6	1.0	1.0	mg/l	SM5310 B-11

**JC73084-9F      BM-7S**

No hits reported in this sample.

**JC73084-10      BM-7M**

Alkalinity, Total as CaCO3 <sup>a</sup>		116	5.0	4.0	mg/l	SM2320 B-11
BOD, 5 Day		7.6	3.4	3.4 <sup>c</sup>	mg/l	SM5210 B-11
Nitrogen, Ammonia		1.7	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>		3.7	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		3.7	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite		0.031	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl		1.2	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total		1.6	0.25	0.25	mg/l	EPA 365.3
Solids, Total Dissolved		100	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		450	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		8.1	1.0	1.0	mg/l	SM5310 B-11

**JC73084-10F      BM-7M**

Phosphorus, Total		1.3	0.25	0.25	mg/l	EPA 365.3
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**JC73084-11      BM-7D**

Alkalinity, Total as CaCO3 <sup>a</sup>		129	5.0	4.0	mg/l	SM2320 B-11
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## Summary of Hits

**Job Number:** JC73084  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 09/04/18



Lab Sample ID	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
BOD, 5 Day		10.1	3.4	3.4 <sup>c</sup>	mg/l	SM5210 B-11
Nitrogen, Ammonia		0.78	0.20	0.20	mg/l	SM4500NH3 H-11/LACHAT
Nitrogen, Nitrate <sup>d</sup>		4.0	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		4.0	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite		0.049	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl		0.48	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total		0.24	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved		100	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		233	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		7.3	1.0	1.0	mg/l	SM5310 B-11
<b>JC73084-11F BM-7D</b>						
Phosphorus, Total		0.20	0.050	0.050	mg/l	EPA 365.3
<b>JC73084-12 BM-8S</b>						
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>		68.6	5.0	4.0	mg/l	SM2320 B-11
Coliform, Total <sup>b</sup>		4	4	<sup>c</sup>	col/100ml	SM9222 B-06
Nitrogen, Nitrate <sup>d</sup>		2.1	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		2.1	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite		0.022	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl		0.41	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total		0.037 J	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved		117	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		20.3	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		5.0	1.0	1.0	mg/l	SM5310 B-11
<b>JC73084-12F BM-8S</b>						
Phosphorus, Total		0.027 J	0.050	0.050	mg/l	EPA 365.3
<b>JC73084-13 BM-8M</b>						
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>		73.9	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate <sup>d</sup>		2.4	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		2.4	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite		0.020	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl		0.30	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total		0.037 J	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved		96.7	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		13.8	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		5.1	1.0	1.0	mg/l	SM5310 B-11

## Summary of Hits

**Job Number:** JC73084  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 09/04/18



Lab Sample ID	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
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**JC73084-13F BM-8M**

Phosphorus, Total	0.031 J	0.050	0.050	mg/l	EPA 365.3
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**JC73084-14 BM-8D**

Alkalinity, Total as CaCO3 <sup>a</sup>	89.7	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate <sup>d</sup>	3.1	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	3.1	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.016	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.32	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total	0.031 J	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved	147	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	9.4	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon	6.4	1.0	1.0	mg/l	SM5310 B-11

**JC73084-14F BM-8D**

No hits reported in this sample.

**JC73084-15 BM-9S**

Alkalinity, Total as CaCO3 <sup>a</sup>	74.4	5.0	4.0	mg/l	SM2320 B-11
Coliform, Total <sup>b</sup>	60	4	<sup>c</sup>	col/100ml	SM9222 B-06
Nitrogen, Nitrate <sup>d</sup>	2.2	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	2.2	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.030	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.41	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total	0.033 J	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved	100	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended <sup>f</sup>	15.2	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon	6.6	1.0	1.0	mg/l	SM5310 B-11

**JC73084-15F BM-9S**

Phosphorus, Total	0.029 J	0.050	0.050	mg/l	EPA 365.3
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**JC73084-16 BM-9M**

Alkalinity, Total as CaCO3 <sup>a</sup>	123	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Ammonia	0.72	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	4.0	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.0	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.030	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.38	0.20	0.15	mg/l	EPA 351.2/LACHAT



## Summary of Hits

**Job Number:** JC73084  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 09/04/18



Lab Sample ID	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
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Phosphorus, Total		0.068	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved		153	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		53.4	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		7.7	1.0	1.0	mg/l	SM5310 B-11

**JC73084-16F BM-9M**

Phosphorus, Total		0.049 J	0.050	0.050	mg/l	EPA 365.3
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**JC73084-17 BM-9D**

Alkalinity, Total as CaCO3 <sup>a</sup>		156	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Ammonia		0.099 J	0.20	0.20	mg/l	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>		5.8	0.21	0.21	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		5.8	0.20	0.20	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite		0.032	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl		0.34	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total		0.12	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved		180	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		39.6	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		8.4	1.0	1.0	mg/l	SM5310 B-11

**JC73084-17F BM-9D**

Phosphorus, Total		0.10	0.050	0.050	mg/l	EPA 365.3
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**JC73084-18 BM-10S**

Alkalinity, Total as CaCO3 <sup>a</sup>		68.6	5.0	4.0	mg/l	SM2320 B-11
Coliform, Total <sup>b</sup>		8	4	<sup>c</sup>	col/100ml	SM9222 B-06
Nitrogen, Nitrate <sup>d</sup>		2.0	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		2.0	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite		0.029	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl		0.39	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total		0.060	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved		80.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		22.0	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		6.4	1.0	1.0	mg/l	SM5310 B-11

**JC73084-18F BM-10S**

Phosphorus, Total		0.066	0.050	0.050	mg/l	EPA 365.3
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## Summary of Hits

**Job Number:** JC73084  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 09/04/18



Lab Sample ID	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
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**JC73084-19 BM-10M**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	177	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate <sup>d</sup>	3.7	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	3.7	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.026	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.31	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total	0.045 J	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved	143	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	12.3	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon	6.1	1.0	1.0	mg/l	SM5310 B-11

**JC73084-19F BM-10M**

Phosphorus, Total	0.039 J	0.050	0.050	mg/l	EPA 365.3
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**JC73084-20 BM-10D**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	167	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate <sup>d</sup>	5.9	0.21	0.21	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	5.9	0.20	0.20	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.036	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.29	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total	0.23	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved	197	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	21.7	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon	5.6	1.0	1.0	mg/l	SM5310 B-11

**JC73084-20F BM-10D**

Phosphorus, Total	0.25	0.050	0.050	mg/l	EPA 365.3
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**JC73084-21 BM-11S**

Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	44.3	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal <sup>b</sup>	500	10	<sup>c</sup>	col/100ml	SM9222 D-06
Coliform, Total <sup>b</sup>	918	100	<sup>c</sup>	col/100ml	SM9222 B-06
Nitrogen, Nitrate <sup>d</sup>	4.0	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.0	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0051 J	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.17 J	0.20	0.15	mg/l	EPA 351.2/LACHAT
Phosphorus, Total	0.033 J	0.050	0.050	mg/l	EPA 365.3
Solids, Total Dissolved	83.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended	4.2	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon	3.6	1.0	1.0	mg/l	SM5310 B-11

## Summary of Hits

**Job Number:** JC73084  
**Account:** USACE-Philadelphia District  
**Project:** Philadelphia District, Reservoir Sampling  
**Collected:** 09/04/18



Lab Sample ID	Client Sample ID	Result/ Analyte	LOQ	LOD	Units	Method
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**JC73084-21F    BM-11S**

No hits reported in this sample.

- (a) Sample was titrated to a final pH of 4.5.
- (b) Analysis done out of holding time.
- (c) Value reported is laboratory DL (MDL).
- (d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)
- (e) Reported sample aliquot obtained from filtration of 350 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.
- (f) Reported sample aliquot obtained from filtration of 250 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.

Sample Results

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Report of Analysis

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# Report of Analysis

<b>Client Sample ID:</b> BM-1S	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> JC73084-1	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	118	5.0	4.0	3.6	mg/l	1	09/06/18 15:15	LS SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	09/05/18 20:32	SA SM5210 B-11
Coliform, Fecal <sup>c</sup>	360	10			col/100ml	10	09/04/18 21:08	SA SM9222 D-06
Coliform, Total <sup>c</sup>	590	10			col/100ml	10	09/04/18 20:16	SA SM9222 B-06
Nitrogen, Ammonia	0.16 J	0.20	0.20	0.089	mg/l	1	09/07/18 10:37	BM SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	4.0	0.11	0.11	0.093	mg/l	1	09/06/18 12:55	BM EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.1	0.10	0.10	0.090	mg/l	1	09/06/18 12:55	BM EPA 353.2/LACHAT
Nitrogen, Nitrite	0.057	0.010	0.0050	0.0030	mg/l	1	09/05/18 10:47	ST SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.61	0.20	0.15	0.12	mg/l	1	09/13/18 12:30	BM EPA 351.2/LACHAT
Phosphorus, Total	0.064	0.050	0.050	0.027	mg/l	1	09/07/18 09:53	MP EPA 365.3
Solids, Total Dissolved	210	10	4.0	1.8	mg/l	1	09/05/18 15:23	RC SM2540 C-11
Solids, Total Suspended	9.1	4.0	2.0	1.5	mg/l	1	09/05/18 10:29	RC SM2540 D-11
Total Organic Carbon	13.6	1.0	1.0	0.72	mg/l	1	09/18/18 01:58	CD SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Analysis done out of holding time.
- (d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

4.1  
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## Report of Analysis

<b>Client Sample ID:</b> BM-1S	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> JC73084-1F	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.090	0.050	0.050	0.027	mg/l	1	09/08/18 15:10	LS EPA 365.3

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-2S	
<b>Lab Sample ID:</b> JC73084-2	<b>Date Sampled:</b> 09/04/18
<b>Matrix:</b> AQ - Surface Water	<b>Date Received:</b> 09/04/18
	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	72.3	5.0	4.0	3.6	mg/l	1	09/06/18 15:15	LS SM2320 B-11
BOD, 5 Day	6.8	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	09/05/18 20:34	SA SM5210 B-11
Coliform, Fecal <sup>c</sup>	20	10			col/100ml	10	09/04/18 21:08	SA SM9222 D-06
Coliform, Total <sup>c</sup>	67	4			col/100ml	10	09/04/18 20:16	SA SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	09/07/18 10:39	BM SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	2.5	0.11	0.11	0.093	mg/l	1	09/06/18 12:56	BM EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	2.5	0.10	0.10	0.090	mg/l	1	09/06/18 12:56	BM EPA 353.2/LACHAT
Nitrogen, Nitrite	0.031	0.010	0.0050	0.0030	mg/l	1	09/05/18 10:47	ST SM4500NO2 B-11
Nitrogen, Total Kjeldahl	27.3	8.0	6.0	4.7	mg/l	40	09/10/18 09:44	BM EPA 351.2/LACHAT
Phosphorus, Total	0.074	0.050	0.050	0.027	mg/l	1	09/07/18 09:53	MP EPA 365.3
Solids, Total Dissolved	115	10	4.0	1.8	mg/l	1	09/05/18 15:23	RC SM2540 C-11
Solids, Total Suspended	58.0	4.0	2.0	1.5	mg/l	1	09/05/18 10:29	RC SM2540 D-11
Total Organic Carbon	8.3	1.0	1.0	0.72	mg/l	1	09/18/18 02:10	CD SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Analysis done out of holding time.
- (d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-2S	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> JC73084-2F	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.060	0.050	0.050	0.027	mg/l	1	09/08/18 15:10	LS EPA 365.3

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

4.4  
4



# Report of Analysis

<b>Client Sample ID:</b> BM-2M	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> JC73084-3	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	114	5.0	4.0	3.6	mg/l	1	09/06/18 15:15	LS SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	09/05/18 20:36	SA SM5210 B-11
Nitrogen, Ammonia	0.17 J	0.20	0.20	0.089	mg/l	1	09/07/18 10:40	BM SM4500NH3 H-11LCHAT
Nitrogen, Nitrate <sup>c</sup>	3.9	0.11	0.11	0.093	mg/l	1	09/06/18 12:57	BM EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	3.9	0.10	0.10	0.090	mg/l	1	09/06/18 12:57	BM EPA 353.2/LCHAT
Nitrogen, Nitrite	0.044	0.010	0.0050	0.0030	mg/l	1	09/05/18 10:47	ST SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.42	0.20	0.15	0.12	mg/l	1	09/10/18 09:46	BM EPA 351.2/LCHAT
Phosphorus, Total	0.092	0.050	0.050	0.027	mg/l	1	09/07/18 09:53	MP EPA 365.3
Solids, Total Dissolved	193	10	4.0	1.8	mg/l	1	09/05/18 15:23	RC SM2540 C-11
Solids, Total Suspended	18.2	4.0	2.0	1.5	mg/l	1	09/05/18 10:29	RC SM2540 D-11
Total Organic Carbon	13.2	1.0	1.0	0.72	mg/l	1	09/18/18 02:21	CD SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-2M	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> JC73084-3F	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.12	0.050	0.050	0.027	mg/l	1	09/08/18 15:10	LS EPA 365.3

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-2D	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> JC73084-4	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	126	5.0	4.0	3.6	mg/l	1	09/06/18 15:15	LS SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	09/05/18 20:37	SA SM5210 B-11
Nitrogen, Ammonia	0.16 J	0.20	0.20	0.089	mg/l	1	09/07/18 10:41	BM SM4500NH3 H-11LCHAT
Nitrogen, Nitrate <sup>c</sup>	4.7	0.11	0.11	0.093	mg/l	1	09/06/18 12:58	BM EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.7	0.10	0.10	0.090	mg/l	1	09/06/18 12:58	BM EPA 353.2/LCHAT
Nitrogen, Nitrite	0.032	0.010	0.0050	0.0030	mg/l	1	09/05/18 10:47	ST SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.47	0.20	0.15	0.12	mg/l	1	09/10/18 09:47	BM EPA 351.2/LCHAT
Phosphorus, Total	0.16	0.050	0.050	0.027	mg/l	1	09/07/18 09:53	MP EPA 365.3
Solids, Total Dissolved	233	10	4.0	1.8	mg/l	1	09/05/18 15:23	RC SM2540 C-11
Solids, Total Suspended	13.3	4.0	2.0	1.5	mg/l	1	09/05/18 10:29	RC SM2540 D-11
Total Organic Carbon	12.2	1.0	1.0	0.72	mg/l	1	09/18/18 02:32	CD SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

4.7  
4

# Report of Analysis

<b>Client Sample ID:</b> BM-2D	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> JC73084-4F	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.11	0.050	0.050	0.027	mg/l	1	09/08/18 15:10	LS EPA 365.3

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-5S	
<b>Lab Sample ID:</b> JC73084-5	<b>Date Sampled:</b> 09/04/18
<b>Matrix:</b> AQ - Surface Water	<b>Date Received:</b> 09/04/18
	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	199	5.0	4.0	3.6	mg/l	1	09/06/18 15:48	LS SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	09/05/18 20:39	SA SM5210 B-11
Coliform, Fecal <sup>c</sup>	550	10			col/100ml	10	09/04/18 21:08	SA SM9222 D-06
Coliform, Total <sup>c</sup>	4500	100			col/100ml	100	09/04/18 20:16	SA SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	09/07/18 10:43	BM SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	7.1	0.31	0.31	0.27	mg/l	1	09/06/18 13:52	BM EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	7.1	0.30	0.30	0.27	mg/l	3	09/06/18 13:52	BM EPA 353.2/LACHAT
Nitrogen, Nitrite	0.033	0.010	0.0050	0.0030	mg/l	1	09/05/18 10:47	ST SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.34	0.20	0.15	0.12	mg/l	1	09/10/18 09:48	BM EPA 351.2/LACHAT
Phosphorus, Total	0.097	0.050	0.050	0.027	mg/l	1	09/07/18 09:53	MP EPA 365.3
Solids, Total Dissolved	314	10	4.0	1.8	mg/l	1	09/05/18 15:23	RC SM2540 C-11
Solids, Total Suspended	19.0	4.0	2.0	1.5	mg/l	1	09/05/18 10:29	RC SM2540 D-11
Total Organic Carbon	4.3	1.0	1.0	0.72	mg/l	1	09/18/18 02:43	CD SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Analysis done out of holding time.
- (d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-5S	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> JC73084-5F	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.074	0.050	0.050	0.027	mg/l	1	09/08/18 15:15	LS EPA 365.3

4.10  
4

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-6S	
<b>Lab Sample ID:</b> JC73084-6	<b>Date Sampled:</b> 09/04/18
<b>Matrix:</b> AQ - Surface Water	<b>Date Received:</b> 09/04/18
	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	69.7	5.0	4.0	3.6	mg/l	1	09/06/18 15:48	LS SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	09/05/18 20:40	SA SM5210 B-11
Coliform, Fecal <sup>c</sup>	12	4			col/100ml	4	09/04/18 21:08	SA SM9222 D-06
Coliform, Total <sup>c</sup>	9	4			col/100ml	10	09/04/18 20:16	SA SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	09/07/18 10:44	BM SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	2.3	0.11	0.11	0.093	mg/l	1	09/06/18 13:01	BM EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	2.3	0.10	0.10	0.090	mg/l	1	09/06/18 13:01	BM EPA 353.2/LACHAT
Nitrogen, Nitrite	0.028	0.010	0.0050	0.0030	mg/l	1	09/05/18 10:47	ST SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.35	0.20	0.15	0.12	mg/l	1	09/10/18 09:49	BM EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/07/18 09:53	MP EPA 365.3
Solids, Total Dissolved	75.0	10	4.0	1.8	mg/l	1	09/05/18 15:23	RC SM2540 C-11
Solids, Total Suspended <sup>e</sup>	12.3	4.0	2.0	1.5	mg/l	1	09/05/18 10:29	RC SM2540 D-11
Total Organic Carbon	6.7	1.0	1.0	0.72	mg/l	1	09/18/18 02:54	CD SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Analysis done out of holding time.
- (d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)
- (e) Reported sample aliquot obtained from filtration of 350 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

4.11  
4

# Report of Analysis

<b>Client Sample ID:</b> BM-6S	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> JC73084-6F	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/08/18 15:15	LS EPA 365.3

4.12  
4

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ



# Report of Analysis

<b>Client Sample ID:</b> BM-6M	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> JC73084-7	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	121	5.0	4.0	3.6	mg/l	1	09/06/18 15:48	LS SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	09/05/18 20:42	SA SM5210 B-11
Nitrogen, Ammonia	0.18 J	0.20	0.20	0.089	mg/l	1	09/07/18 10:46	BM SM4500NH3 H-11LCHAT
Nitrogen, Nitrate <sup>c</sup>	4.4	0.11	0.11	0.093	mg/l	1	09/06/18 13:04	BM EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.5	0.10	0.10	0.090	mg/l	1	09/06/18 13:04	BM EPA 353.2/LCHAT
Nitrogen, Nitrite	0.070	0.010	0.0050	0.0030	mg/l	1	09/05/18 10:47	ST SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.46	0.20	0.15	0.12	mg/l	1	09/10/18 09:50	BM EPA 351.2/LCHAT
Phosphorus, Total	0.060	0.050	0.050	0.027	mg/l	1	09/07/18 10:11	MP EPA 365.3
Solids, Total Dissolved	182	10	4.0	1.8	mg/l	1	09/05/18 15:23	RC SM2540 C-11
Solids, Total Suspended	10.3	4.0	2.0	1.5	mg/l	1	09/05/18 10:29	RC SM2540 D-11
Total Organic Carbon	9.1	1.0	1.0	0.72	mg/l	1	09/18/18 03:50	CD SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-6M	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> JC73084-7F	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.056	0.050	0.050	0.027	mg/l	1	09/08/18 15:15	LS EPA 365.3

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-6D	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> JC73084-8	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	35.9	5.0	4.0	3.6	mg/l	1	09/06/18 15:48	LS SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	09/05/18 20:44	SA SM5210 B-11
Nitrogen, Ammonia	0.21	0.20	0.20	0.089	mg/l	1	09/07/18 10:47	BM SM4500NH3 H-11LCHAT
Nitrogen, Nitrate <sup>c</sup>	4.4	0.11	0.11	0.093	mg/l	1	09/06/18 13:05	BM EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.5	0.10	0.10	0.090	mg/l	1	09/06/18 13:05	BM EPA 353.2/LCHAT
Nitrogen, Nitrite	0.081	0.010	0.0050	0.0030	mg/l	1	09/05/18 10:47	ST SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.49	0.20	0.15	0.12	mg/l	1	09/10/18 09:50	BM EPA 351.2/LCHAT
Phosphorus, Total	0.051	0.050	0.050	0.027	mg/l	1	09/07/18 10:11	MP EPA 365.3
Solids, Total Dissolved	193	10	4.0	1.8	mg/l	1	09/05/18 15:23	RC SM2540 C-11
Solids, Total Suspended	11.3	4.0	2.0	1.5	mg/l	1	09/05/18 10:29	RC SM2540 D-11
Total Organic Carbon	9.7	1.0	1.0	0.72	mg/l	1	09/18/18 04:01	CD SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-6D	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> JC73084-8F	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.070	0.050	0.050	0.027	mg/l	1	09/08/18 15:15	LS EPA 365.3

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-7S	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> JC73084-9	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	77.4	5.0	4.0	3.6	mg/l	1	09/06/18 15:48	LS SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	09/05/18 20:46	SA SM5210 B-11
Coliform, Fecal <sup>c</sup>	40	10			col/100ml	10	09/04/18 21:08	SA SM9222 D-06
Coliform, Total <sup>c</sup>	80	4			col/100ml	4	09/04/18 20:16	SA SM9222 B-06
Nitrogen, Ammonia	0.25	0.20	0.20	0.089	mg/l	1	09/07/18 10:52	BM SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	2.3	0.11	0.11	0.093	mg/l	1	09/06/18 13:06	BM EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	2.3	0.10	0.10	0.090	mg/l	1	09/06/18 13:06	BM EPA 353.2/LACHAT
Nitrogen, Nitrite	0.026	0.010	0.0050	0.0030	mg/l	1	09/05/18 10:47	ST SM4500NO2 B-11
Nitrogen, Total Kjeldahl	1.8	0.20	0.15	0.12	mg/l	1	09/10/18 09:51	BM EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/07/18 10:11	MP EPA 365.3
Solids, Total Dissolved	70.0	10	4.0	1.8	mg/l	1	09/05/18 15:23	RC SM2540 C-11
Solids, Total Suspended	20.4	4.0	2.0	1.5	mg/l	1	09/05/18 10:29	RC SM2540 D-11
Total Organic Carbon	6.6	1.0	1.0	0.72	mg/l	1	09/18/18 04:12	CD SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Analysis done out of holding time.
- (d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

4.17  
4

# Report of Analysis

<b>Client Sample ID:</b> BM-7S	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> JC73084-9F	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/11/18 14:35	LS EPA 365.3

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-7M	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> JC73084-10	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	116	5.0	4.0	3.6	mg/l	1	09/11/18 10:20	ST SM2320 B-11
BOD, 5 Day	7.6	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	09/05/18 20:48	SA SM5210 B-11
Nitrogen, Ammonia	1.7	0.20	0.20	0.089	mg/l	1	09/07/18 10:53	BM SM4500NH3 H-11LCHAT
Nitrogen, Nitrate <sup>c</sup>	3.7	0.11	0.11	0.093	mg/l	1	09/06/18 13:07	BM EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	3.7	0.10	0.10	0.090	mg/l	1	09/06/18 13:07	BM EPA 353.2/LCHAT
Nitrogen, Nitrite	0.031	0.010	0.0050	0.0030	mg/l	1	09/05/18 10:47	ST SM4500NO2 B-11
Nitrogen, Total Kjeldahl	1.2	0.20	0.15	0.12	mg/l	1	09/10/18 09:52	BM EPA 351.2/LCHAT
Phosphorus, Total	1.6	0.25	0.25	0.14	mg/l	5	09/08/18 15:15	LS EPA 365.3
Solids, Total Dissolved	100	10	4.0	1.8	mg/l	1	09/05/18 15:23	RC SM2540 C-11
Solids, Total Suspended	450	4.0	2.0	1.5	mg/l	1	09/05/18 10:29	RC SM2540 D-11
Total Organic Carbon	8.1	1.0	1.0	0.72	mg/l	1	09/19/18 12:27	CD SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-7M	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> JC73084-10F	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	1.3	0.25	0.25	0.14	mg/l	5	09/11/18 15:04	LS EPA 365.3

4.20  
4

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ



# Report of Analysis

<b>Client Sample ID:</b> BM-7D	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> JC73084-11	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	129	5.0	4.0	3.6	mg/l	1	09/11/18 10:20	ST SM2320 B-11
BOD, 5 Day	10.1	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	09/05/18 20:49	SA SM5210 B-11
Nitrogen, Ammonia	0.78	0.20	0.20	0.089	mg/l	1	09/07/18 10:54	BM SM4500NH3 H-11LCHAT
Nitrogen, Nitrate <sup>c</sup>	4.0	0.11	0.11	0.093	mg/l	1	09/06/18 13:08	BM EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.0	0.10	0.10	0.090	mg/l	1	09/06/18 13:08	BM EPA 353.2/LCHAT
Nitrogen, Nitrite	0.049	0.010	0.0050	0.0030	mg/l	1	09/05/18 10:47	ST SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.48	0.20	0.15	0.12	mg/l	1	09/10/18 09:53	BM EPA 351.2/LCHAT
Phosphorus, Total	0.24	0.050	0.050	0.027	mg/l	1	09/08/18 14:45	LS EPA 365.3
Solids, Total Dissolved	100	10	4.0	1.8	mg/l	1	09/05/18 15:23	RC SM2540 C-11
Solids, Total Suspended	233	4.0	2.0	1.5	mg/l	1	09/05/18 10:29	RC SM2540 D-11
Total Organic Carbon	7.3	1.0	1.0	0.72	mg/l	1	09/19/18 12:49	CD SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-7D	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> JC73084-11F	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.20	0.050	0.050	0.027	mg/l	1	09/11/18 14:35	LS EPA 365.3

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-8S	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> JC73084-12	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	68.6	5.0	4.0	3.6	mg/l	1	09/11/18 10:20	ST SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	09/05/18 20:51	SA SM5210 B-11
Coliform, Fecal <sup>c</sup>	0	0			col/100ml	1	09/04/18 21:08	SA SM9222 D-06
Coliform, Total <sup>c</sup>	4	4			col/100ml	4	09/04/18 20:16	SA SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	09/07/18 10:56	BM SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	2.1	0.11	0.11	0.093	mg/l	1	09/06/18 13:14	BM EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	2.1	0.10	0.10	0.090	mg/l	1	09/06/18 13:14	BM EPA 353.2/LACHAT
Nitrogen, Nitrite	0.022	0.010	0.0050	0.0030	mg/l	1	09/05/18 10:47	ST SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.41	0.20	0.15	0.12	mg/l	1	09/10/18 09:54	BM EPA 351.2/LACHAT
Phosphorus, Total	0.037 J	0.050	0.050	0.027	mg/l	1	09/08/18 14:45	LS EPA 365.3
Solids, Total Dissolved	117	10	4.0	1.8	mg/l	1	09/05/18 15:23	RC SM2540 C-11
Solids, Total Suspended	20.3	4.0	2.0	1.5	mg/l	1	09/05/18 10:29	RC SM2540 D-11
Total Organic Carbon	5.0	1.0	1.0	0.72	mg/l	1	09/18/18 18:28	CD SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Analysis done out of holding time.
- (d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-8S	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> JC73084-12F	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.027 J	0.050	0.050	0.027	mg/l	1	09/11/18 14:35	LS EPA 365.3

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-8M	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> JC73084-13	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	73.9	5.0	4.0	3.6	mg/l	1	09/11/18 10:20	ST SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	09/05/18 20:53	SA SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	09/07/18 10:57	BM SM4500NH3 H-11LCHAT
Nitrogen, Nitrate <sup>c</sup>	2.4	0.11	0.11	0.093	mg/l	1	09/06/18 13:17	BM EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	2.4	0.10	0.10	0.090	mg/l	1	09/06/18 13:17	BM EPA 353.2/LCHAT
Nitrogen, Nitrite	0.020	0.010	0.0050	0.0030	mg/l	1	09/05/18 10:47	ST SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.30	0.20	0.15	0.12	mg/l	1	09/10/18 09:56	BM EPA 351.2/LCHAT
Phosphorus, Total	0.037 J	0.050	0.050	0.027	mg/l	1	09/08/18 14:45	LS EPA 365.3
Solids, Total Dissolved	96.7	10	4.0	1.8	mg/l	1	09/05/18 15:23	RC SM2540 C-11
Solids, Total Suspended	13.8	4.0	2.0	1.5	mg/l	1	09/05/18 10:29	RC SM2540 D-11
Total Organic Carbon	5.1	1.0	1.0	0.72	mg/l	1	09/18/18 18:39	CD SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-8M	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> JC73084-13F	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.031 J	0.050	0.050	0.027	mg/l	1	09/11/18 14:35	LS EPA 365.3

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-8D	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> JC73084-14	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	89.7	5.0	4.0	3.6	mg/l	1	09/11/18 10:20	ST SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	09/05/18 20:56	SA SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	09/07/18 11:09	BM SM4500NH3 H-11LCHAT
Nitrogen, Nitrate <sup>c</sup>	3.1	0.11	0.11	0.093	mg/l	1	09/06/18 13:19	BM EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	3.1	0.10	0.10	0.090	mg/l	1	09/06/18 13:19	BM EPA 353.2/LCHAT
Nitrogen, Nitrite	0.016	0.010	0.0050	0.0030	mg/l	1	09/05/18 10:47	ST SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.32	0.20	0.15	0.12	mg/l	1	09/10/18 09:57	BM EPA 351.2/LCHAT
Phosphorus, Total	0.031 J	0.050	0.050	0.027	mg/l	1	09/08/18 14:45	LS EPA 365.3
Solids, Total Dissolved	147	10	4.0	1.8	mg/l	1	09/05/18 15:23	RC SM2540 C-11
Solids, Total Suspended	9.4	4.0	2.0	1.5	mg/l	1	09/05/18 10:29	RC SM2540 D-11
Total Organic Carbon	6.4	1.0	1.0	0.72	mg/l	1	09/18/18 19:13	CD SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

4.27  
4

## Report of Analysis

<b>Client Sample ID:</b> BM-8D	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> JC73084-14F	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

### General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/11/18 15:00	LS EPA 365.3

4.28  
4

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ



# Report of Analysis

<b>Client Sample ID:</b> BM-9S	
<b>Lab Sample ID:</b> JC73084-15	<b>Date Sampled:</b> 09/04/18
<b>Matrix:</b> AQ - Surface Water	<b>Date Received:</b> 09/04/18
	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	74.4	5.0	4.0	3.6	mg/l	1	09/11/18 10:20	ST SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	09/05/18 20:58	SA SM5210 B-11
Coliform, Fecal <sup>c</sup>	0	0			col/100ml	1	09/04/18 21:08	SA SM9222 D-06
Coliform, Total <sup>c</sup>	60	4			col/100ml	10	09/04/18 20:16	SA SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	09/07/18 11:10	BM SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	2.2	0.11	0.11	0.093	mg/l	1	09/06/18 13:20	BM EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	2.2	0.10	0.10	0.090	mg/l	1	09/06/18 13:20	BM EPA 353.2/LACHAT
Nitrogen, Nitrite	0.030	0.010	0.0050	0.0030	mg/l	1	09/05/18 11:51	ST SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.41	0.20	0.15	0.12	mg/l	1	09/10/18 09:58	BM EPA 351.2/LACHAT
Phosphorus, Total	0.033 J	0.050	0.050	0.027	mg/l	1	09/08/18 14:45	LS EPA 365.3
Solids, Total Dissolved	100	10	4.0	1.8	mg/l	1	09/05/18 15:23	RC SM2540 C-11
Solids, Total Suspended <sup>e</sup>	15.2	4.0	2.0	1.5	mg/l	1	09/05/18 10:29	RC SM2540 D-11
Total Organic Carbon	6.6	1.0	1.0	0.72	mg/l	1	09/18/18 19:24	CD SM5310 B-11

(a) Sample was titrated to a final pH of 4.5.

(b) Value reported is laboratory DL (MDL).

(c) Analysis done out of holding time.

(d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

(e) Reported sample aliquot obtained from filtration of 250 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-9S	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> JC73084-15F	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.029 J	0.050	0.050	0.027	mg/l	1	09/11/18 15:00	LS EPA 365.3

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-9M	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> JC73084-16	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	123	5.0	4.0	3.6	mg/l	1	09/11/18 12:30	ST SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	09/05/18 21:00	SA SM5210 B-11
Nitrogen, Ammonia	0.72	0.20	0.20	0.089	mg/l	1	09/07/18 11:12	BM SM4500NH3 H-11LCHAT
Nitrogen, Nitrate <sup>c</sup>	4.0	0.11	0.11	0.093	mg/l	1	09/06/18 13:21	BM EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.0	0.10	0.10	0.090	mg/l	1	09/06/18 13:21	BM EPA 353.2/LCHAT
Nitrogen, Nitrite	0.030	0.010	0.0050	0.0030	mg/l	1	09/05/18 11:51	ST SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.38	0.20	0.15	0.12	mg/l	1	09/10/18 09:59	BM EPA 351.2/LCHAT
Phosphorus, Total	0.068	0.050	0.050	0.027	mg/l	1	09/08/18 15:10	LS EPA 365.3
Solids, Total Dissolved	153	10	4.0	1.8	mg/l	1	09/05/18 15:23	RC SM2540 C-11
Solids, Total Suspended	53.4	4.0	2.0	1.5	mg/l	1	09/05/18 12:04	RC SM2540 D-11
Total Organic Carbon	7.7	1.0	1.0	0.72	mg/l	1	09/18/18 19:35	CD SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-9M	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> JC73084-16F	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.049 J	0.050	0.050	0.027	mg/l	1	09/11/18 15:00	LS EPA 365.3

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-9D	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> JC73084-17	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	156	5.0	4.0	3.6	mg/l	1	09/11/18 12:30	ST SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	09/05/18 21:02	SA SM5210 B-11
Nitrogen, Ammonia	0.099 J	0.20	0.20	0.089	mg/l	1	09/07/18 11:13	BM SM4500NH3 H-11LCHAT
Nitrogen, Nitrate <sup>c</sup>	5.8	0.21	0.21	0.18	mg/l	1	09/06/18 13:53	BM EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	5.8	0.20	0.20	0.18	mg/l	2	09/06/18 13:53	BM EPA 353.2/LCHAT
Nitrogen, Nitrite	0.032	0.010	0.0050	0.0030	mg/l	1	09/05/18 11:51	ST SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.34	0.20	0.15	0.12	mg/l	1	09/10/18 10:00	BM EPA 351.2/LCHAT
Phosphorus, Total	0.12	0.050	0.050	0.027	mg/l	1	09/08/18 15:10	LS EPA 365.3
Solids, Total Dissolved	180	10	4.0	1.8	mg/l	1	09/05/18 12:58	RC SM2540 C-11
Solids, Total Suspended	39.6	4.0	2.0	1.5	mg/l	1	09/05/18 12:04	RC SM2540 D-11
Total Organic Carbon	8.4	1.0	1.0	0.72	mg/l	1	09/18/18 19:46	CD SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-9D	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> JC73084-17F	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.10	0.050	0.050	0.027	mg/l	1	09/11/18 15:00	LS EPA 365.3

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-10S	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> JC73084-18	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	68.6	5.0	4.0	3.6	mg/l	1	09/11/18 12:30	ST SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	09/05/18 21:03	SA SM5210 B-11
Coliform, Fecal <sup>c</sup>	0	0			col/100ml	1	09/04/18 21:08	SA SM9222 D-06
Coliform, Total <sup>c</sup>	8	4			col/100ml	11	09/04/18 20:16	SA SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	09/07/18 11:15	BM SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	2.0	0.11	0.11	0.093	mg/l	1	09/06/18 13:23	BM EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	2.0	0.10	0.10	0.090	mg/l	1	09/06/18 13:23	BM EPA 353.2/LACHAT
Nitrogen, Nitrite	0.029	0.010	0.0050	0.0030	mg/l	1	09/05/18 11:51	ST SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.39	0.20	0.15	0.12	mg/l	1	09/10/18 10:01	BM EPA 351.2/LACHAT
Phosphorus, Total	0.060	0.050	0.050	0.027	mg/l	1	09/08/18 15:10	LS EPA 365.3
Solids, Total Dissolved	80.0	10	4.0	1.8	mg/l	1	09/05/18 12:58	RC SM2540 C-11
Solids, Total Suspended	22.0	4.0	2.0	1.5	mg/l	1	09/05/18 12:04	RC SM2540 D-11
Total Organic Carbon	6.4	1.0	1.0	0.72	mg/l	1	09/18/18 19:57	CD SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Analysis done out of holding time.
- (d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-10S	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> JC73084-18F	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.066	0.050	0.050	0.027	mg/l	1	09/11/18 15:00	LS EPA 365.3

4.36  
4

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ



# Report of Analysis

<b>Client Sample ID:</b> BM-10M	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> JC73084-19	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	177	5.0	4.0	3.6	mg/l	1	09/11/18 12:30	ST SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	09/05/18 21:06	SA SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	09/07/18 11:16	BM SM4500NH3 H-11LCHAT
Nitrogen, Nitrate <sup>c</sup>	3.7	0.11	0.11	0.093	mg/l	1	09/06/18 13:24	BM EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	3.7	0.10	0.10	0.090	mg/l	1	09/06/18 13:24	BM EPA 353.2/LCHAT
Nitrogen, Nitrite	0.026	0.010	0.0050	0.0030	mg/l	1	09/05/18 11:51	ST SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.31	0.20	0.15	0.12	mg/l	1	09/10/18 10:01	BM EPA 351.2/LCHAT
Phosphorus, Total	0.045 J	0.050	0.050	0.027	mg/l	1	09/08/18 15:10	LS EPA 365.3
Solids, Total Dissolved	143	10	4.0	1.8	mg/l	1	09/05/18 12:58	RC SM2540 C-11
Solids, Total Suspended	12.3	4.0	2.0	1.5	mg/l	1	09/05/18 12:04	RC SM2540 D-11
Total Organic Carbon	6.1	1.0	1.0	0.72	mg/l	1	09/18/18 20:09	CD SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-10M	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> JC73084-19F	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.039 J	0.050	0.050	0.027	mg/l	1	09/11/18 15:00	LS EPA 365.3

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-10D	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> JC73084-20	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	167	5.0	4.0	3.6	mg/l	1	09/11/18 12:30	ST SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	09/05/18 21:08	SA SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	09/07/18 11:17	BM SM4500NH3 H-11LCHAT
Nitrogen, Nitrate <sup>c</sup>	5.9	0.21	0.21	0.18	mg/l	1	09/06/18 13:55	BM EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	5.9	0.20	0.20	0.18	mg/l	2	09/06/18 13:55	BM EPA 353.2/LCHAT
Nitrogen, Nitrite	0.036	0.010	0.0050	0.0030	mg/l	1	09/05/18 11:51	ST SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.29	0.20	0.15	0.12	mg/l	1	09/10/18 10:02	BM EPA 351.2/LCHAT
Phosphorus, Total	0.23	0.050	0.050	0.027	mg/l	1	09/08/18 15:10	LS EPA 365.3
Solids, Total Dissolved	197	10	4.0	1.8	mg/l	1	09/05/18 12:58	RC SM2540 C-11
Solids, Total Suspended	21.7	4.0	2.0	1.5	mg/l	1	09/05/18 12:04	RC SM2540 D-11
Total Organic Carbon	5.6	1.0	1.0	0.72	mg/l	1	09/18/18 20:20	CD SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-10D	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> JC73084-20F	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.25	0.050	0.050	0.027	mg/l	1	09/11/18 15:00	LS EPA 365.3

4.40  
4

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-11S	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> JC73084-21	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> AQ - Surface Water	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Alkalinity, Total as CaCO <sub>3</sub> <sup>a</sup>	44.3	5.0	4.0	3.6	mg/l	1	09/11/18 12:30	ST SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 <sup>b</sup>	3.4	mg/l	1	09/05/18 22:36	SA SM5210 B-11
Coliform, Fecal <sup>c</sup>	500	10			col/100ml	10	09/04/18 21:08	SA SM9222 D-06
Coliform, Total <sup>c</sup>	918	100			col/100ml	100	09/04/18 20:16	SA SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	09/07/18 11:19	BM SM4500NH3 H-11LACHAT
Nitrogen, Nitrate <sup>d</sup>	4.0	0.11	0.11	0.093	mg/l	1	09/06/18 13:26	BM EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	4.0	0.10	0.10	0.090	mg/l	1	09/06/18 13:26	BM EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0051 J	0.010	0.0050	0.0030	mg/l	1	09/05/18 11:51	ST SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.17 J	0.20	0.15	0.12	mg/l	1	09/10/18 10:08	BM EPA 351.2/LACHAT
Phosphorus, Total	0.033 J	0.050	0.050	0.027	mg/l	1	09/08/18 15:10	LS EPA 365.3
Solids, Total Dissolved	83.0	10	4.0	1.8	mg/l	1	09/05/18 12:58	RC SM2540 C-11
Solids, Total Suspended	4.2	4.0	2.0	1.5	mg/l	1	09/05/18 12:04	RC SM2540 D-11
Total Organic Carbon	3.6	1.0	1.0	0.72	mg/l	1	09/18/18 15:21	CD SM5310 B-11

- (a) Sample was titrated to a final pH of 4.5.
- (b) Value reported is laboratory DL (MDL).
- (c) Analysis done out of holding time.
- (d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

# Report of Analysis

<b>Client Sample ID:</b> BM-11S	<b>Date Sampled:</b> 09/04/18
<b>Lab Sample ID:</b> JC73084-21F	<b>Date Received:</b> 09/04/18
<b>Matrix:</b> AQ - Surface H2O Filtered	<b>Percent Solids:</b> n/a
<b>Project:</b> Philadelphia District, Reservoir Sampling	

## General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By Method
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/11/18 15:00	LS EPA 365.3

LOQ = Limit of Quantitation    DL = Detection Limit    U = Indicates a result < LOD  
 LOD = Limit of Detection    B = Analyte found in associated blank    J = Indicates a result > = DL (MDL) but < LOQ

Misc. Forms

Custody Documents and Other Forms

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Includes the following where applicable:

- Chain of Custody

SGS North America Inc. - Dayton  
2235 Route 130, Dayton, NJ 08810  
TEL. 732-329-0200 FAX 732-329-3499  
www.sgs.com/ehsusa

FED-EX Tracking #  
SGS Order Control # **PD-08318-113**  
SGS Job # **JC73084**

Company Information		Project Information		Requested Analysis (see TEST CODE sheet)												Matrix Codes
Company Name: <b>USACE-Philadelphia District</b>		Project Name: <b>USACE-Blue Marsh Reservoir</b>		<b>AIK, AMU, BOD, TDS</b> <b>TSS, TPO4 (Total Phosphorus)</b> <b>TKN, XN030 (TKN/TPW Colloids)</b> <b>TPO4 (TPW Lab Filter)</b> <b>FCF, TCF</b>												DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank
Street Address: <b>100 Penn Sq, East</b>		Street: <b>1268 Palisades Dr</b>														
City: <b>Philadelphia PA 19107</b>		City: <b>Leopold PA</b>		Billing Information (if different from Report to) Company Name: _____ Street Address: _____ City: _____ State: _____ Zip: _____												<b>LAB USE ONLY</b>  643 650 645 637 646 T3 19C3
Project Contact: <b>Joe Weper</b>		Project #		Turnaround Time (Business days)												
Phone # <b>215-656-6545</b>		Client Purchase Order # <b>PD-08318-113</b>		Data Deliverable Information												Comments / Special Instructions <b>One TSS bottle not filled, one XN030 bottle not used. TPO4 dissolved lab filter. XN030 combined with TPO4/TKN/SOL</b>
Fax # <b>610-577-9180</b>		Project Manager		Approved by (SGS Project Manager)/Date: <b>[Signature] 3A</b> <b>INITIAL ASSESSMENT</b> <b>LABEL VERIFICATION</b>												Sample inventory is verified upon receipt in the Laboratory
E-mail		Attention:		Commercial "A" (Level 1) <input type="checkbox"/> NYASP Category A Commercial "B" (Level 2) <input type="checkbox"/> NYASP Category B FULLT1 (Level 3+4) <input type="checkbox"/> State Forms NJ Reduced <input type="checkbox"/> EDD Format Commercial "C" <input type="checkbox"/> Other NJ Data of Known Quality Protocol Reporting <input type="checkbox"/>												Emergency & Rush T/A data available via LabLink
Sample Name(s)		Project Manager		Commercial "A" = Results Only; Commercial "B" = Results + QC Summary NJ Reduced = Results + QC Summary + Partial Raw data												Sample Custody must be documented below each time sample changes possession, including courier delivery.
Lab Sample #		Project Manager		Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 14:00</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>												Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>
Field ID / Point of Collection		Project Manager		Custody Seal # <input type="checkbox"/> Intact Preserved where applicable <input type="checkbox"/> On Ice <input checked="" type="checkbox"/> Cooler Temp.: <b>3.4 CIP</b>												Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>
MEOH/DI Vial #		Project Manager		Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>												Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>
Date		Project Manager		Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>												Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>
Time		Project Manager		Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>												Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>
Sampled by		Project Manager		Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>												Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>
Matrix		Project Manager		Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>												Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>
# of bottles		Project Manager		Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>												Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>
HCl		Project Manager		Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>												Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>
NaOH		Project Manager		Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>												Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>
HNO3		Project Manager		Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>												Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>
H2SO4		Project Manager		Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>												Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>
HNO2		Project Manager		Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>												Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>
DI Water		Project Manager		Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>												Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>
MEOH		Project Manager		Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>												Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>
ENCORE		Project Manager		Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>												Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>
Matrix		Project Manager		Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>												Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>
HCl		Project Manager		Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>												Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>
NaOH		Project Manager		Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>												Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>
HNO3		Project Manager		Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>												Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>
H2SO4		Project Manager		Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>												Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>
HNO2		Project Manager		Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>												Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>
DI Water		Project Manager		Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>												Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>
MEOH		Project Manager		Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>												Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>
ENCORE		Project Manager		Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>												Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b> Requisitioned By: <b>[Signature]</b> Date Time: <b>9/4/18 18:15</b>



SGS North America Inc. - Dayton  
 2235 Route 130, Dayton, NJ 08810  
 TEL. 732-329-0200 FAX 732-329-3499  
 www.sgs.com/ehsusa

FED-EX Tracking #  
 SGS Quote #  
 Bottle Order Control #  
 SGS Job # **JC73084**

Client / Reporting Information		Project Information				Testing Analysis (see TEST CODE sheet)												Matrix Codes							
Company Name <b>USACE - Philadelphia District</b>		Project Name <b>USACE - Blue Marsh Reservoir</b>				<b>AIK, AMN, BOD, TDS, TPC, TSS, TP04 (Total Phosphate), TKW, XW030 (TKW/TP04 Bottle), TP04 (dissolved lab filter), FCF, TCF</b>												DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank EB - Equipment Blank RB - Rinse Blank TB - Trip Blank							
Street Address <b>100 Penn Sq. East</b>		Street <b>1268 Patuxent DR</b>		Billing Information (if different from Report to) Company Name <b>Leesport, PA</b>																					
City, State, Zip <b>Philadelphia PA 19107</b>		City, State <b>Leesport, PA</b>		Street Address																					
Project Contact <b>Joe Cooper</b>		Project #		City, State, Zip																					
Phone # <b>215-656-6545</b>		Client Purchase Order #		City, State, Zip																					
Sampler(s) Name(s) <b>Greg Wacik 610-597-9780</b>		Project Manager		Attention:																					
Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection			Matrix	# of bottles	Number of preserved bottles												LAB USE ONLY					
			Date	Time	Sampled by			HCl	NaOH	HN03	H2SO4	None	DI Water	MEOH	ENCORE	Other									
12P	BM-8S		9/4/18	1010	RPW SW	11	X	X	X								X	X	X	X	X	X	X		
13P	BM-8M			1010		9	X	X	X								X	X	X	X	X	X	X		
14P	BM-8D			1010		9	X	X	X								X	X	X	X	X	X	X		
15P	BM-9S			0920		11	X	X	X								X	X	X	X	X	X	X		
16P	BM-9M			0920		9	X	X	X								X	X	X	X	X	X	X		
17P	BM-9D			0920		9	X	X	X								X	X	X	X	X	X	X		
18P	BM-10S			0945		11	X	X	X								X	X	X	X	X	X	X		
19P	BM-10M			0945		9	X	X	X								X	X	X	X	X	X	X		
20P	BM-10D			0945		9	X	X	X								X	X	X	X	X	X	X		
21P	BM-11S			1110		11	X	X	X								X	X	X	X	X	X	X		
Turnaround Time (Business days)		Approved by (SGS Project Manager)/Date:				Date Deliverable Information												Comments / Special Instructions							
<input type="checkbox"/> Std. 10 Business Days <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 3 Day RUSH <input type="checkbox"/> 2 Day RUSH <input type="checkbox"/> 1 Day RUSH <input type="checkbox"/> other						<input type="checkbox"/> Commercial "A" (Level 1) <input type="checkbox"/> Commercial "B" (Level 2) <input type="checkbox"/> FULLT1 (Level 3+4) <input type="checkbox"/> NJ Reduced <input type="checkbox"/> Commercial "C" <input type="checkbox"/> NJ Data of Known Quality Protocol Reporting Commercial "A" = Results Only; Commercial "B" = Results + QC Summary NJ Reduced = Results + QC Summary + Partial Raw data												ONE TSS Bottle NOT filled, ONE XW030 Bottle NOT used. TP04 dissolved lab filter, XW030 combined with TP04/TKW BOTTLE							
Emergency & Rush T/A data available via LabLink		Sample inventory is verified upon receipt in the Laboratory																							
Relinquished by Sampler:		Date Time:		Received By:		Relinquished By:		Date Time:		Received By:		Date Time:		Received By:		Custody Seal #	<input type="checkbox"/> Intact <input checked="" type="checkbox"/> Not intact	Preserved where applicable	On Ice	Cooler Temp.					
3		9/4/18 18:15		[Signature]		2		9/4/18 18:15		[Signature]		2		[Signature]		[Signature]				34 CIP					
5				3		4				4										33 CIP 36 CIP 37 CIP 32 CIP 37 CIP 32 CIP					

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## SGS Sample Receipt Summary

**Job Number:** JC73084

**Client:** USACE-PHILADELPHIA DISTRICT

**Project:** PHILADELPHIA DISTRICT, RESERVOIR SAMPL

**Date / Time Received:** 9/4/2018 6:15:00 PM

**Delivery Method:** Accutest Courier

**Airbill #s:**

**Cooler Temps (Raw Measured) °C:** Cooler 1: (3.3); Cooler 2: (3.2); Cooler 3: (3.6); Cooler 4: (3.7); Cooler 5: (3.7); Cooler 6: (3.2); Cooler 7: (3.4);

**Cooler Temps (Corrected) °C:** Cooler 1: (2.7); Cooler 2: (2.6); Cooler 3: (3.0); Cooler 4: (3.1); Cooler 5: (3.1); Cooler 6: (2.6); Cooler 7: (2.8);

<u>Cooler Security</u>	<u>Y or N</u>		<u>Y or N</u>	
1. Custody Seals Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/> <input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/> <input type="checkbox"/>

<u>Cooler Temperature</u>	<u>Y or N</u>	
1. Temp criteria achieved:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Cooler temp verification:	IR Gun	
3. Cooler media:	Ice (Bag)	
4. No. Coolers:	7	

<u>Quality Control Preservation</u>	<u>Y</u>	<u>or N</u>	<u>N/A</u>
1. Trip Blank present / cooler:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Trip Blank listed on COC:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Samples preserved properly:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. VOCs headspace free:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

<u>Sample Integrity - Documentation</u>	<u>Y</u>	<u>or N</u>
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Container labeling complete:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>	<input type="checkbox"/>

<u>Sample Integrity - Condition</u>	<u>Y</u>	<u>or N</u>
1. Sample recvd within HT:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. All containers accounted for:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Condition of sample:	Intact	

<u>Sample Integrity - Instructions</u>	<u>Y</u>	<u>or N</u>	<u>N/A</u>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3. Sufficient volume recvd for analysis:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Test Strip Lot #s:	pH 1-12: 216017	pH 12+: 208717	Other: (Specify)
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Comments: -1,-5 and -21: Received TCF/FCF volumes within hold, processed outside of hold time. Lab to verify if -1 was run within hold time.  
 -2,-6,-9,-12,-15,-18: Received and processed TCF/FCF volumes outside of hold time.

SM089-02 Rev. Date 12/1/16

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Please proceed with analysis. TCF and FCF have 30 hour hold time for this project per Joseph Loeper.

**JC73084: Chain of Custody**  
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