2018 WATER QUALITY MONITORING BELTZVILLE RESERVOIR LEHIGHTON, PENNSYLVANIA

U.S. Army Corps of Engineers
Philadelphia District
Environmental Resources Branch

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2018 Water Quality Monitoring
Beltzville Reservoir
Lehighton, Pennsylvania

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1.0 INTRODUCTION

1.1 PURPOSE OF THE MONITORING PROGRAM

The U.S. Army Corps of Engineers (USACE) operates Beltzville Reservoir located in east-central Pennsylvania within the Delaware River Basin. Beltzville Reservoir provides flood control and a dependable water supply to downstream communities along the Pohopoco Creek and Lehigh River. 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 Beltzville Reservoir serves, the USACE monitors water quality to compare with state water quality standards and to diagnose other problems that commonly effect reservoir health such as nutrient enrichment and toxic loadings. This report summarizes the results of water quality monitoring at Beltzville Reservoir from 06 June to 06 September 2018.

1.2 DESCRIPTION OF BELTZVILLE RESERVOIR

Beltzville Reservoir was designed to provide flood control, water supply, and enhanced water quality to downstream communities along the Lehigh River. The damming of Pohopoco Creek approximately three miles upstream of its confluence with the Lehigh River formed the reservoir. The reservoir is located in Carbon County, 3 miles northeast of Lehighton and about 20 miles northwest of Allentown, Pennsylvania. The reservoir dams a drainage area of 96.3 square miles and can impound up to 13 billion gallons of water. The primary water source feeding into the lake is Pohopoco Creek as it flows southwest to the Lehigh River. Secondary water sources include Pine Run and Wild Creek, both entering the reservoir from the north. The reservoir is approximately 7 miles long and, when full, covers an area of 947 acres. The maximum depth of the lake is 140 feet near the face of the dam.

1.3 ELEMENTS OF THE STUDY

The USACE, Philadelphia District, has been monitoring the water quality of Beltzville Reservoir since 1975. Over this time, the yearly monitoring designs have evolved to address new concerns such as the health of public drinking water and contamination of reservoir bottom sediments. The 2018 monitoring program included the following major elements:

- Monthly water quality and bacteria surface water 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 28 June and ending on 06 September 2018; and

- Monthly profile samples for temperature, dissolved oxygen, chlorophyll a, pH, turbidity, and conductivity at all stations in the reservoir and watershed starting on 28 June and ending on 06 September 2018. An additional profile sampling was conducted at Station BZ-6 on 06 June.

2.0 METHODS

2.1 STRATIFICATION MONITORING

Physical stratification monitoring of the water column was conducted five times at Beltzville Reservoir between 28 June and 06 September 2018 (Table 2-1). One additional profile sample was collected at Station BZ-6 on 06 June. Physical stratification parameters included depth, temperature, dissolved oxygen (DO), pH, turbidity, chlorophyll a, and conductivity. Physical stratification was monitored at seven fixed stations throughout the reservoir watershed (Fig. 2-1). Three stations were located within the reservoir body (BZ-3, BZ-6, and BZ-7) for which water quality was measured from the surface to the bottom in 5-foot increments. Surface water quality was measured at four stations, located in upstream source waters (BZ-2S on Pine Run, BZ-4S on Wild Creek, and BZ-5S on Pohopoco Creek) and BZ-1S downstream of the reservoir on Pohopoco Creek. The physical water quality parameters were measured with a calibrated YSI 6600 V2-4 water quality probe. For this report, all of the stratification monitoring results were summarized and compared to water quality standards enacted by the Pennsylvania Department of Environmental Protection (PADEP), where applicable.

2.2 WATER COLUMN CHEMISTRY MONITORING

Water column chemistry monitoring was conducted five times (once a month) at Beltzville Reservoir between 28 June and 06 September 2018 (Table 2-1). Water samples were collected at the seven fixed stations in the reservoir watershed (Fig. 2-1). Surface water samples were collected in release waters downstream of the reservoir (BZ-1S) and on upstream tributary sources Pine Run (BZ-2S), Wild Creek (BZ-4S), and Pohopoco Creek (BZ-5S). Surface, middle, and bottom water samples were collected at three reservoir stations (BZ-3, BZ-6, and BZ-7). Surface water samples were collected by opening sample containers approximately 1 foot below the water's surface. Middle and bottom water samples were collected with a Van Dorn design horizontal water bottle. SGS North America Inc. laboratory in Dayton, New Jersey conducted the laboratory water sample analysis for 2018.

Water samples from all depths were analyzed for ammonia, nitrite, nitrate, total Kjeldahl nitrogen, total phosphorus, soluble phosphorus, total dissolved solids, total suspended solids, biochemical oxygen demand, alkalinity, and total organic carbon. Table 2-2 summarizes the laboratory method detection limits, laboratory/Corps required reporting limits, state regulatory criteria, and allowable maximum hold times for each water quality parameter monitored**.**

Table 2-1. Beltzville Reservoir water quality monitoring schedule for 2018

Date of Sample Collection	Physical Stratification Monitoring (All Stations)	Water Column Chemistry Monitoring (All Stations)	BTEX Monitoring[2] (BZ-3 and -6)	Trophic State Assessment (BZ-6)	Coliform Bacteria Monitoring (All Surface Stations)	Drinking Water Monitoring[1]
06 June	X (Station BZ-6 Only)	-	-	-	-	-
28 June	X	X	-	X	X	-
12 July	X	X	-	X	X	-
31 July	X	X	-	X	X	-
15 August	X	X	-	X	X	-
06 September	X	X	-	X	X	-

(1) Drinking water samples are sampled quarterly by personnel at each reservoir. This data has not been included within the reservoir water quality sampling report.

(2) BTEX sampling was not conducted in 2018 based on historically low and non-detectable levels of these parameters.

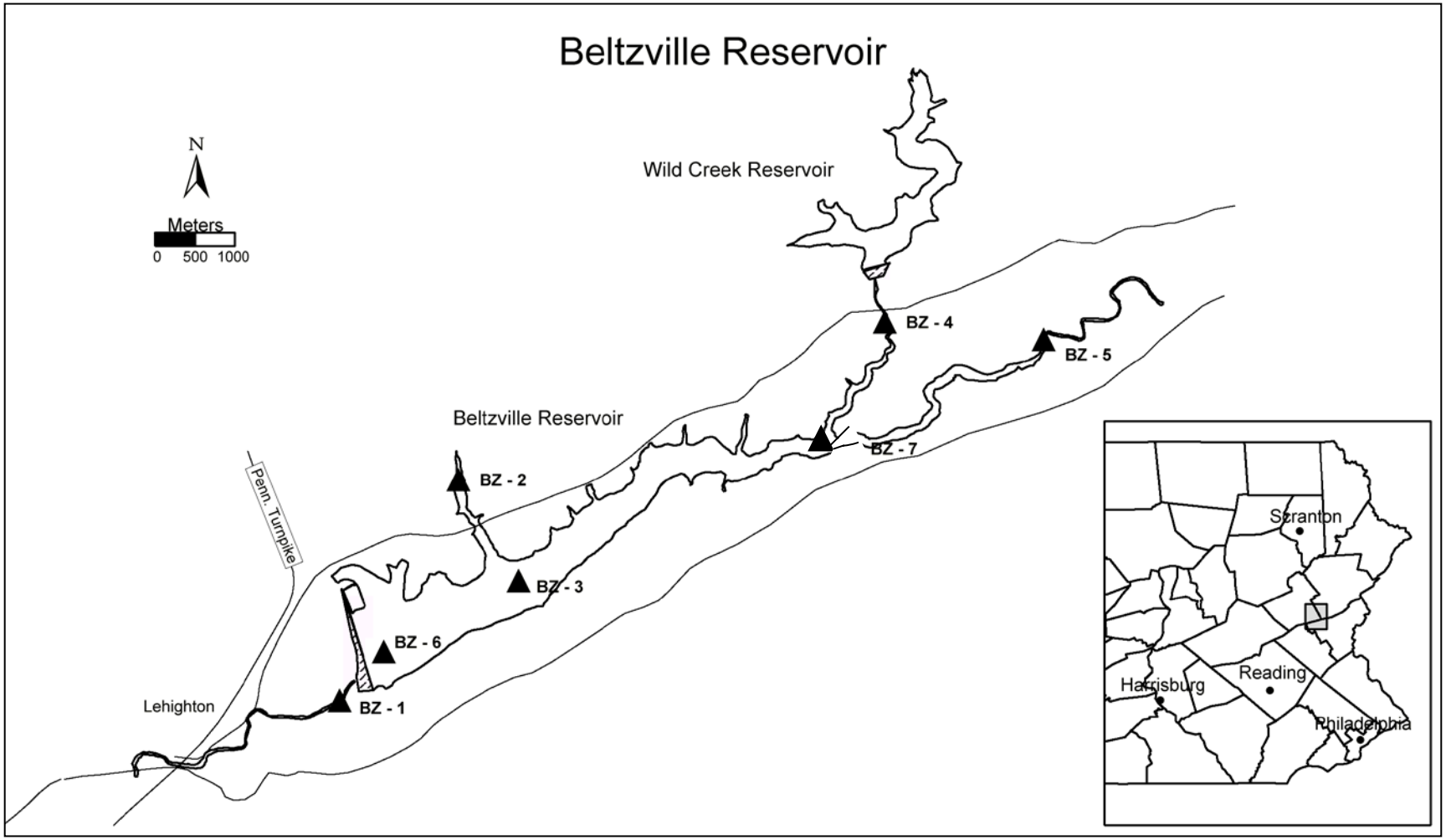

Figure 2-1. Beltzville Reservoir and the location of water quality monitoring stations in 2018.

Table 2-2. Water quality test methods, detection limits, state regulatory criteria, and sample holding times for water quality parameters monitored at Beltzville 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 $CaCO_3$	14
Biochemical Oxygen Demand (BOD)	SM5210 B-11	2.0 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	0.20 mg/L	None	28
Ammonia	SM4500 H-11LACHAT	0.20 mg/L	Temp. and pH dependent	28
Nitrate	EPA 353.2/ SM4500NO2B	0.11 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", 22nd Edition, 2012.
SW846- "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods", 3rd. Edition, November 1986 and updates.
* Total Inorganic Carbon and Total Carbon were not sampled for in 2018

2.3 TROPHIC STATE DETERMINATION

The trophic state of Beltzville Reservoir was determined by methods outlined by Carlson (1977). In general, this method 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 used independently in the determination of monthly trophic state (Table 2-1). Secchi disk depth was measured monthly at reservoir-body station BZ-6. Trophic state determinations were made using criteria defined by Carlson and EPA (1983) and calculated only for Station BZ-6 within the deepest portion of the reservoir.

2.4 RESERVOIR BACTERIA MONITORING

Monitoring for coliform bacteria contaminants was conducted five times at Beltzville Reservoir between 28 June and 06 September 2018 (Table 2-1). Surface water samples were collected at all seven stations and analyzed for total coliform and fecal coliform each month. The samples were collected in the same manner as the chemistry samples or approximately 1-foot below the surface of the water. Table 2-3 presents the test methods, detection limits, PADEP standards, and sample holding times for the bacteria parameters monitored at Beltzville Reservoir in 2018. The bacteria analytical method was based on a membrane filtration technique. All of the samples were analyzed within their maximum allowable hold times.

Table 2-3. Water quality test methods, detection limits, PADEP standards, and sample holding times for bacteria parameters monitored at Beltzville Reservoir in 2018.

Parameter	Total Coliform	Fecal Coliform
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. Beltzville State Park maintains a bathing beach at Beltzville Reservoir and conducts bacteria sampling of that area. Given our logistical limitations (all monthly sampling conducted on one day) and the fact that water contact recreation is permitted within the reservoir, the 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 Beltzville Reservoir bacteria levels within the main reservoir body.

3.0 RESULTS AND DISCUSSION

3.1 STRATIFICATION MONITORING

The following sections summarize the water quality monitoring results of the 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 lake water column based on measures from the deepest portion of the reservoir (station BZ-6 or the "Tower") are described. The discussion of stratification is focused on this station as water quality problems related to depth are generally most severe in deeper water habitats. Corps personnel collected the physical and chemical water quality data discussed herein over the monitoring period from June to September 2018. 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 chemicals 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.

Temperatures of the tributary and downstream release surface waters generally followed a similar seasonal pattern throughout the watershed of Beltzville Reservoir during 2018 with maximum surface water temperatures seen in September at upstream stations (Fig. 3-1). The maximum upstream tributary temperature of 25.49 °C was seen at station BZ-4S on 06 September. The maximum downstream release (BZ-1S) surface water temperature was 19.06 °C on 06 September. Upstream and downstream waters have a variety of environmental and anthropogenic factors potentially influencing surface water temperature. Station BZ-1S is directly influenced by Beltzville Reservoir releases that come from various locations in the water column and is dictated by reservoir release operations. Downstream release temperatures are managed to meet Pennsylvania State High Quality Cold Water Fishery standards. Station BZ-2S is a small well vegetated cold water tributary. Station BZ-4S is influenced by Wild Creek Reservoir releases upstream of Beltzville Reservoir and maintained the highest average tributary surface water temperatures throughout the sampling season. Station BZ-5S is located in an open water area were Pohopoco Creek enters Beltzville Reservoir. These factors, amongst others, result in the temperature variations in surface water temperatures at each tributary station shown in Figure 3.1.

Beltzville Reservoir was stratified with respect to temperature in 2018 (Fig. 3-2). The reservoir surface waters are warmed by the sun and account for warmer surface water temperatures recorded at lake stations (BZ-3, BZ-7, and BZ-6). In June, the onset of stratification was apparent with lake surface temperatures (20.57°C) approximately 13.88°C warmer than the lower water column (6.69°C). A strong stratification pattern was evident from June into August. In September, cooling surface temperatures and erosion of the epilimnion marked the onset of fall turnover and destratification within the reservoir.

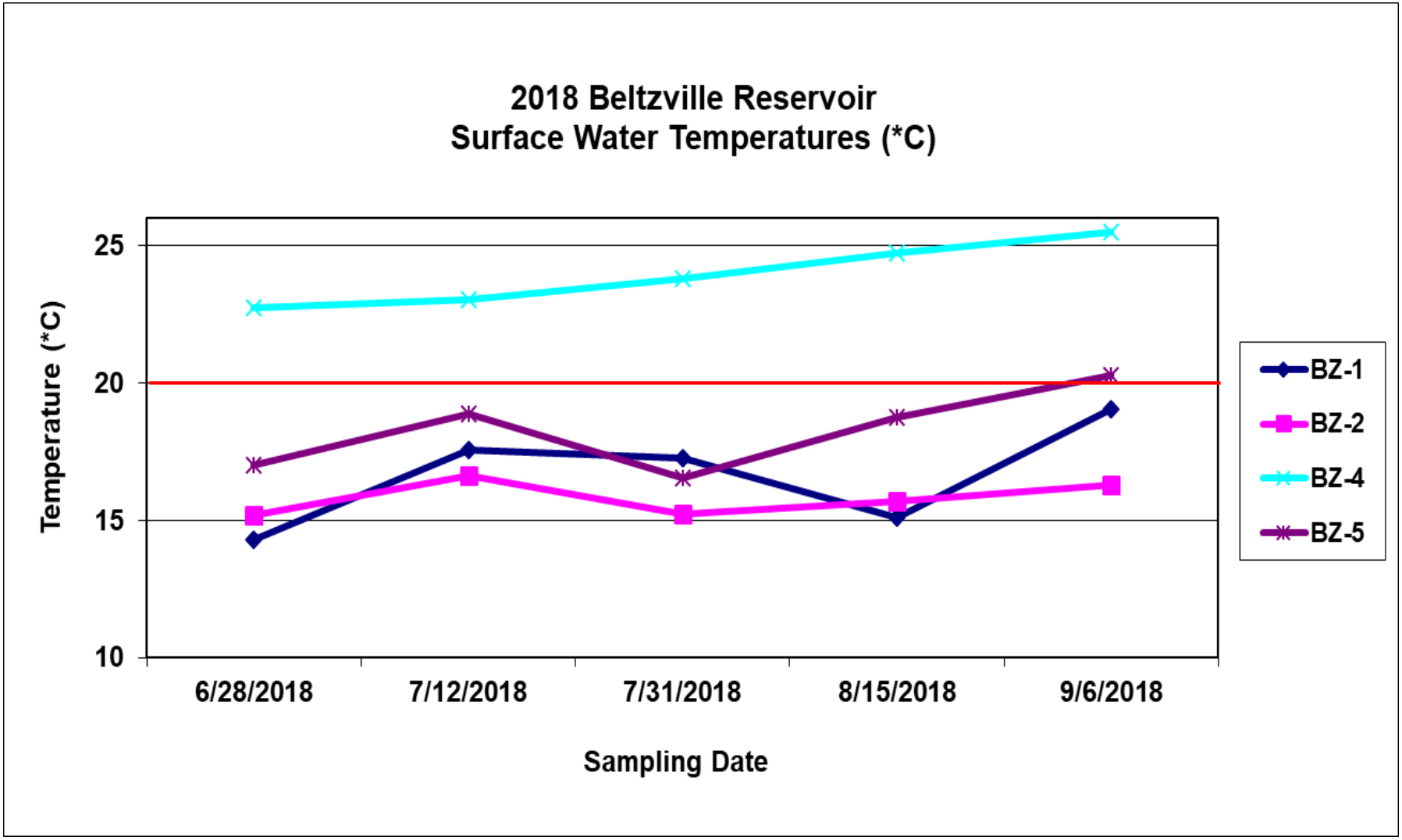

Figure 3-1. Tributary and downstream surface water temperature (°C) measured at Beltzville Reservoir in 2018. See Appendix A for Summary of plotted values. Station BZ-1 reflects releases surface water temperatures downstream of Beltzville Reservoir. The coldwater species preference temperature of 20°C is shown as a red line reference.

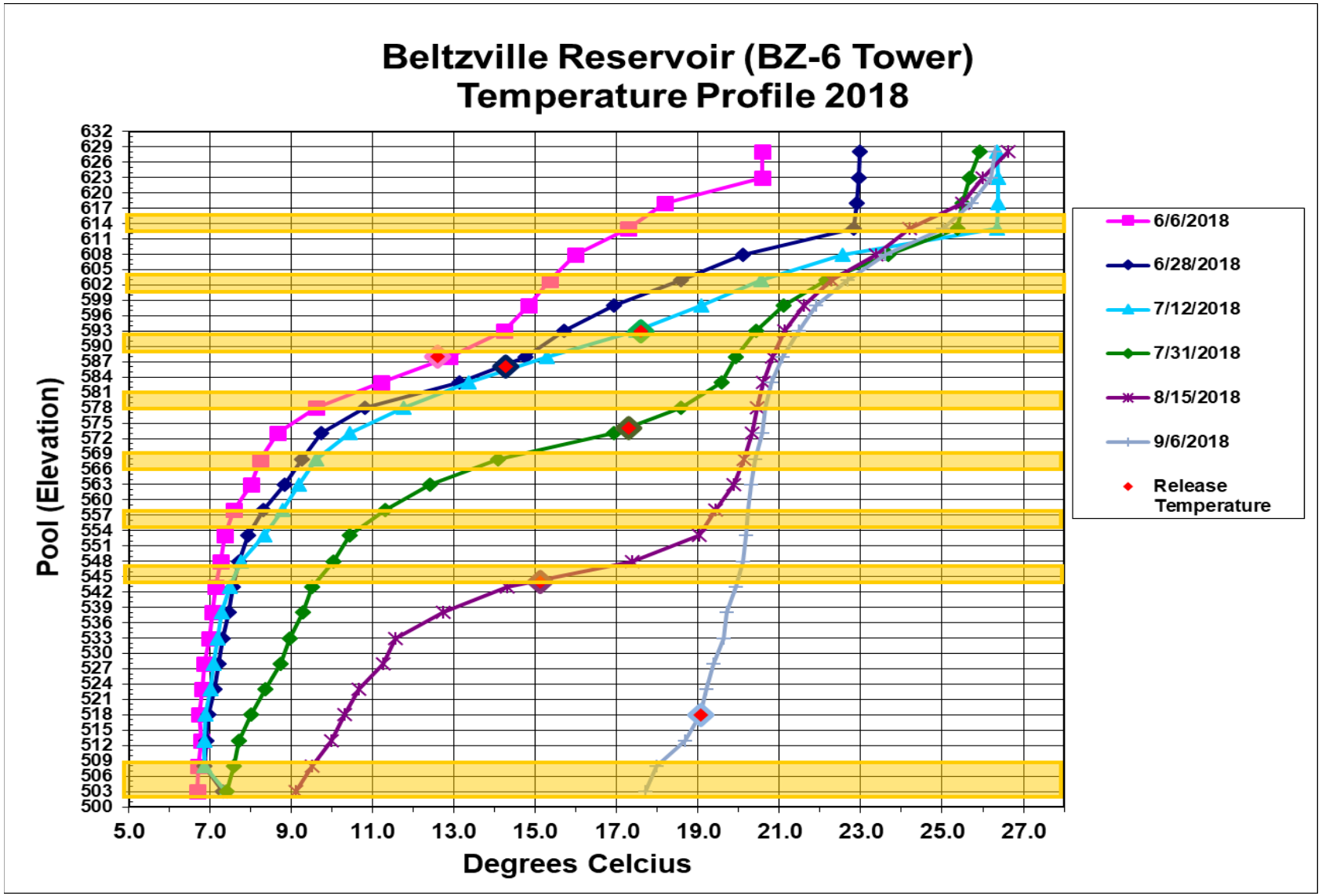

Figure 3-2. Lake temperature profile at station BZ-6 of Beltzville Reservoir in 2018. See Appendix A for summary of plotted values. The yellow bars represent the locations of water control gates in the Beltzville Reservoir control tower. Corresponding downstream release water temperatures at Station BZ-1S on each sampling date is also presented.

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 air and water 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 dissolved oxygen can facilitate the release of nutrients from bottom sediments.

Dissolved oxygen (DO) in the tributary and release surface waters remained primarily within an 8-11 mg/L range of values and followed a similar seasonal pattern throughout the watershed of Beltzville Reservoir during 2018 (Fig. 3-3). Dissolved oxygen concentrations downstream of the reservoir (BZ-1S) averaged 9.73 mg/L for the sampling season. The upstream tributary stations (BZ-2S, -4S, -5S) averaged 8.94 mg/L for the sampling season. The maximum DO reading of 10.34 mg/L occurred at BZ-1S on 15 August and a minimum reading of 7.93 mg/L occurred at BZ-4S on 06 September.

Dissolved Oxygen in the water column at station BZ-6 of Beltzville Reservoir from June through September, exhibited a metalimnetic oxygen minimum (negative heterograde curve) with concentrations decreasing, increasing and decreasing rapidly as measurements were taken from the surface to the lake bottom (Fig. 3-4). This general pattern has been observed at station BZ-6 in previous years and may be due to a lens of low oxygenated water passing through the reservoir from upstream sources, a result of portal operations at the reservoir tower, respiratory oxygen consumption, lake topography or some other factor or combination of factors.

DO concentrations in the water column of Beltzville Reservoir were in compliance with PADEP water quality standards during 2018. The state water quality standard for DO is a minimum concentration of 5-mg/L in the epilimnion of stratified lakes. As shown in Figure 3-4, concentrations falling below the standard were encountered in August and September, but were located below the epilimnion. DO concentrations measured in all surface waters of the reservoir were in compliance with the standard.

The health of aquatic ecosystems is impaired by low DO concentrations in the water column. Hypoxia, or conditions of DO less than 2 mg/L, is generally accepted as the threshold at which the most severe effects on biota occur. Bottom waters that are not mixed during stratification are depleted of oxygen primarily through biological respiration. In 2018, these conditions were seen in the water column at station BZ-6 in September (Appendix A).

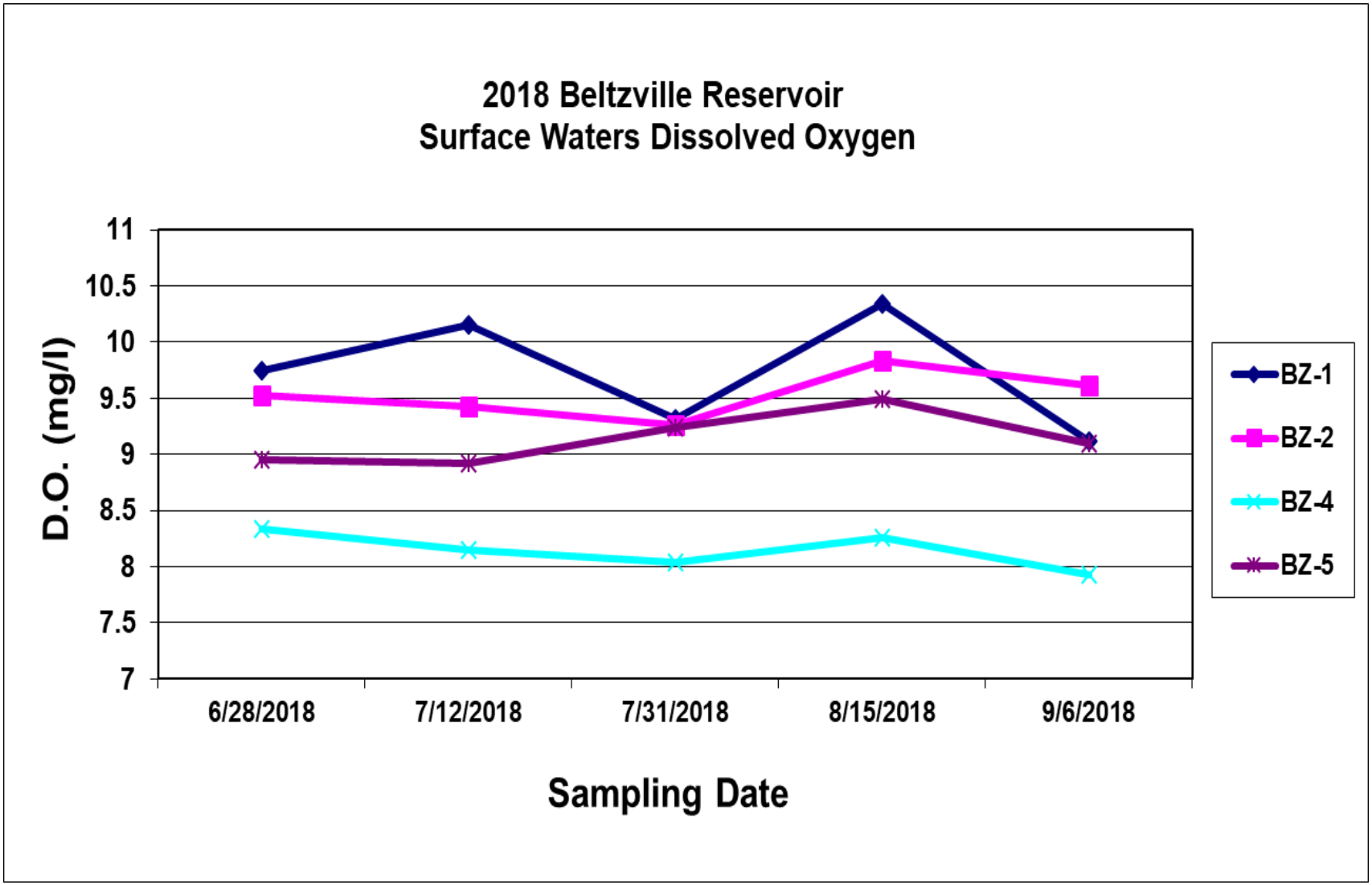

Figure 3-3. Dissolved oxygen concentrations measured in tributary and downstream surface waters at Beltzville Reservoir in 2018. (The PADEP water quality standard for dissolved oxygen is a minimum concentration of 5 mg/L.) See Appendix A for summary of plotted values. Station BZ-1S reflects reservoir release surface waters downstream of Beltzville Reservoir.

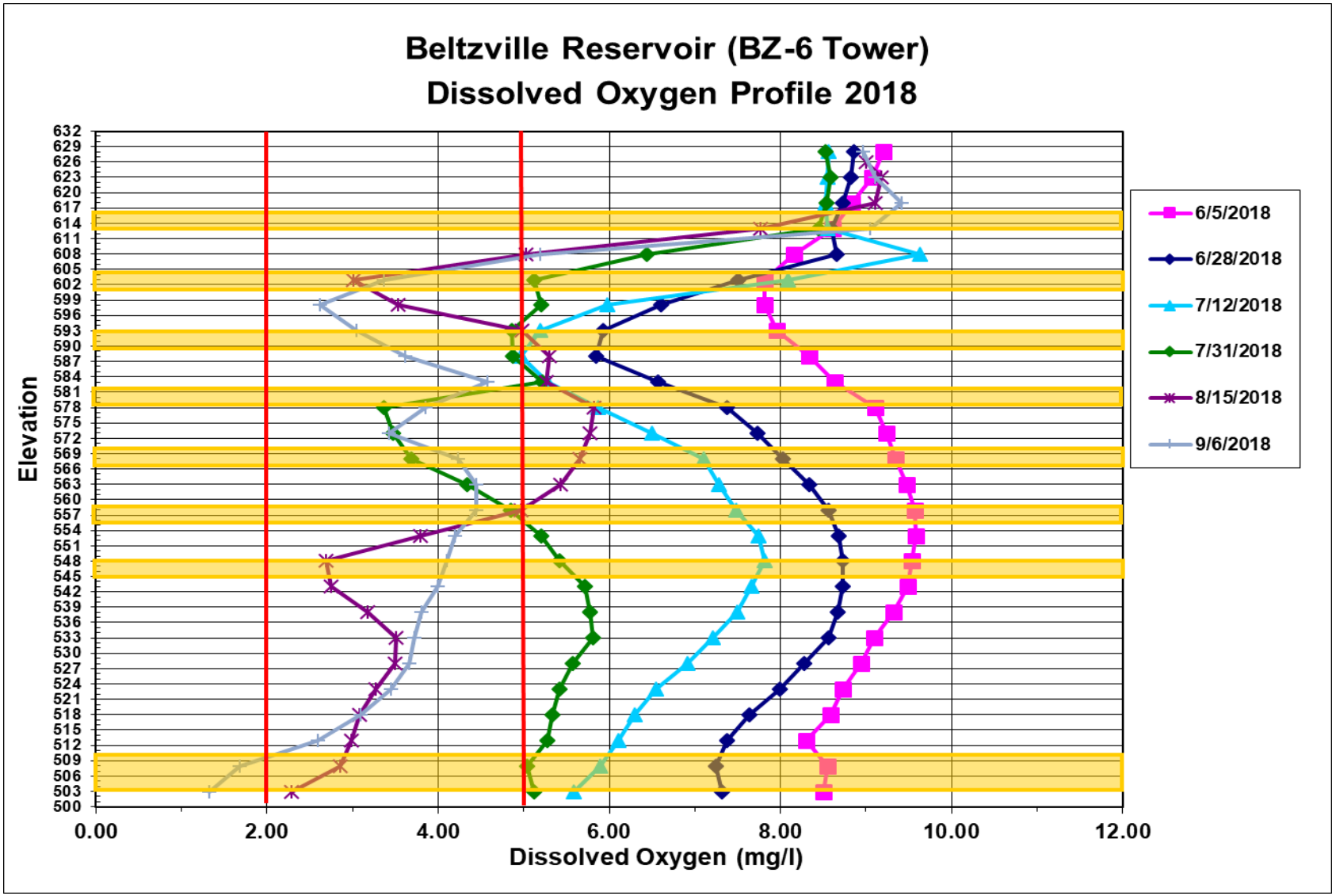

Figure 3-4. Dissolved oxygen profile at station BZ-6 of Beltzville Reservoir in 2018. The PADEP water quality standard for DO is a minimum concentration of 5 mg/L in epilimnion. Start of hypoxia is shown as 2 mg/L. See Appendix A for summary of plotted values.

3.1.3 pH

PH is the measure of the hydrogen –ion concentration in the water. 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 at upstream tributary (BZ-2S, BZ-4S and BZ-5S) and release (BZ-1S) surface water stations primarily stayed within a tight range of values (6.53-7.71) and followed a similar seasonal pattern at Beltzville Reservoir during 2018 (Fig. 3-5).

In all months sampled in 2018, pH values in the lake water column were slightly higher near the water surface, declined rapidly, and remained relatively constant throughout most of the remaining water column (Fig. 3-6). The higher pH readings near the surface can be attributed to algal productivity in the trophic zone of the lake. A slight variation in pH in bottom waters occurred in the portions of the water column experiencing anoxic or low oxygen conditions. This localized change in pH may be attributed to anaerobic oxidation processes in the bottom waters of the lake. The pH measures at all lake and tributary stations at Beltzville Reservoir during 2018 were not in compliance with PADEP pH criteria. The standard for pH is a range of acceptable measures between 6 and 9. Lake surface waters exceeded standards in September (9.03) and were below minimum standards in bottom waters in August (5.88-5.97).

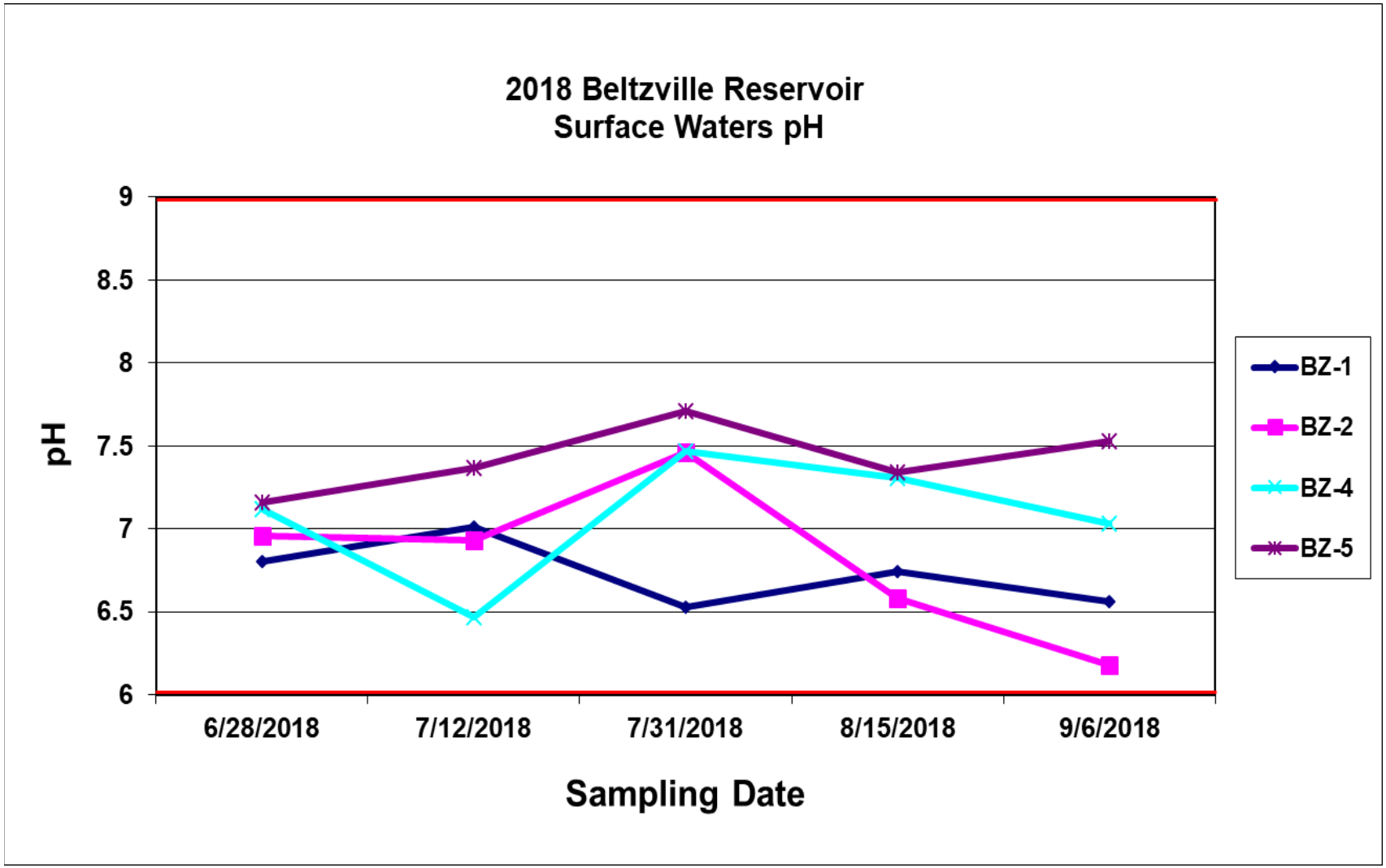

Figure 3-5. pH concentrations measured in tributary and downstream surface waters at Beltzville Reservoir in 2018. (The PADEP water quality standard for pH is between 6 and 9). See Appendix A for summary of plotted values.

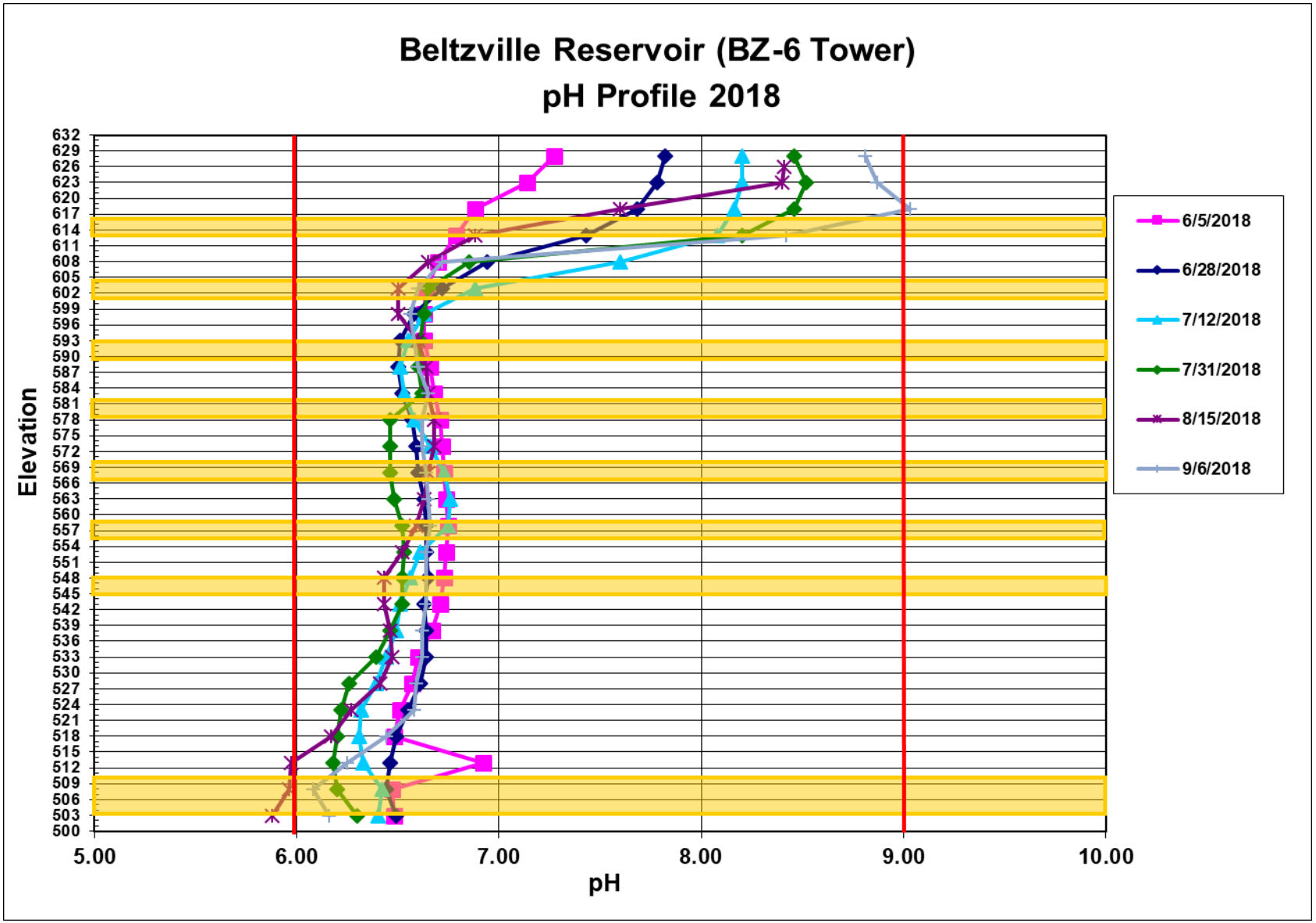

Figure 3-6. pH profile at station BZ-6 of Beltzville Reservoir in 2018. (The PADEP water quality standard for pH is between 6 and 9) See Appendix A for summary of plotted value

3.2 WATER COLUMN CHEMISTRY MONITORING

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

3.2.1 Ammonia

Total Ammonia (NH3) 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. Elevated ammonia in the lower water column of deep, stratified lakes and reservoirs usually results in those that are affected by eutrophication. 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.

Table 3.1 Environmental Protection Agency Ammonia Freshwater Criteria 2013

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.

Ammonia concentrations were low in Beltzville Reservoir during 2018. With the exception of three samples, concentrations measured at all other stations and depths were less than the laboratory reporting limit of 0.20 mg/L during the entire sampling season. The maximum single recorded sample of 0.14 mg/L was collected from station BZ-7M on 06 September. Concentrations of ammonia measured at Beltzville Reservoir were in compliance with the PADEP water quality standards during 2018. The state water quality standard for ammonia is dependent on temperature and pH (Table 3-1).

Table 3.2. Summary of surface, middle, and bottom water quality monitoring data for Beltzville 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
BZ-1S	6/28/2018	10.9	<3.40	<0.05	<0.20	<0.01	0.87	NS	44	0.27	1.70	<0.05	<4.0
	7/12/2018	10.9	<3.40	<0.05	<0.20	0.02	0.76	NS	228	0.28	1.20	<0.05	<1.0
	7/31/2018	4.7	<3.40	<0.05	<0.20	0.02	0.84	NS	65.7	0.34	2.00	<0.05	<3.3
	8/15/2018	11.9	<3.40	<0.05	<0.20	<0.01	0.92	NS	82.9	0.15	1.90	<0.05	3.1
	9/6/2018	14.8	<3.40	<0.05	<0.20	<0.01	0.81	NS	95	0.23	4.00	<0.05	1.6
	Mean	10.64	3.4	.05	.20	.014	.84		103	.25	2.16	.05	2.6
	Stdev	3.29	0	0	0	.005	.05		64.75	.06	.96	0	1.13
	Max	14.8	3.4	.05	.20	.02	.92		228	.34	4	.05	4
	Min	4.7	3.4	.05	.20	.01	.76		44	.15	1.2	.05	1
	No. of Det.	5	0	0	0	2	5		5	5	5	0	2
BZ-2S	6/28/2018	8.8	<3.40	<0.05	<0.20	<0.01	0.26	NS	65	0.22	1.7	<0.05	<4
	7/12/2018	4.7	<3.40	<0.05	<0.20	<0.01	0.24	NS	4	0.19	1.1	<0.05	1.9
	7/31/2018	<4.0	<3.40	<0.05	<0.20	<0.01	0.31	NS	35	<0.15	<1.0	<0.05	2.3
	8/15/2018	6.2	<3.40	<0.05	<0.20	<0.01	0.23	NS	31.3	0.15	1.1	<0.05	2.5
	9/6/2018	8.4	<3.40	<0.05	<0.20	<0.01	0.20	NS	48.8	0.15	1.8	<0.05	2.0
	Mean	6.42	3.4	.05	.20	.01	.25		36.82	.17	1.34	.05	2.54
	Stdev	1.92	0	0	0	0	.04		20.24	.03	.34	0	.76
	Max	8.8	3.4	.05	.20	.01	.31		65	.22	1.8	.05	4
	Min	4	3.4	.05	.20	.01	.20		4	.15	1	.05	1.9
	No. of Det.	4	0	0	0	0	5		5	4	4	0	4

Table 3.2 Continued. Summary of surface, middle, and bottom water quality monitoring data for Beltzville Reservoir in 2018

Station	Date	ALK mg/L	BOD5 mg/L	DISS-P mg/L	NH3 mg/L	NO2 mg/L	NO3 mg/L	PO4 mg/L	TDS mg/L	TKN mg/L	TOC mg/L	TP mg/L	TSS mg/L
BZ-3S	6/28/2018	10.9	<3.40	<0.05	<0.20	<0.01	0.52	NS	57	0.28	1.5	<0.05	<4
	7/12/2018	9.4	<3.40	<0.05	<0.20	<0.01	0.39	NS	58.8	0.21	2.0	<0.05	<2.2
	7/31/2018	<4.0	<3.40	<0.05	<0.20	<0.01	0.32	NS	43	0.18	1.1	<0.05	<2.0
	8/15/2018	10.9	<3.40	<0.05	<0.20	<0.01	0.26	NS	35	0.15	1.8	<0.05	1.7
	9/6/2018	10.6	<3.40	<0.05	<0.20	<0.01	0.21	NS	46.7	0.24	2.9	<0.05	1.8
	Mean	9.16	3.4	.05	.20	.01	.34		48.1	.21	1.8	.05	2.34
	Stdev	2.64	0	0	0	0	.11		8.87	.05	.60	0	.85
	Max	10.9	3.4	.05	.20	.01	.52		58.8	.28	2.9	.05	4
	Min	4.0	3.4	.05	.20	.01	.21		35	.15	1.1	.05	1.7
	No. of Det.	4	0	0	0	0	5		5	5	5	0	2
BZ-3M	6/28/2018	14.6	<3.40	<0.05	<0.20	<0.01	0.94	NS	71.4	0.24	1.8	<0.05	<4
	7/12/2018	10.4	<3.40	<0.05	<0.20	<0.01	0.82	NS	64	0.22	1.4	<0.05	1.3
	7/31/2018	<4.0	<3.40	<0.05	<0.20	<0.01	0.93	NS	47	0.17	<1.0	<0.05	<2.0
	8/15/2018	14	<3.40	<0.05	<0.20	<0.01	0.86	NS	66.3	0.16	2.2	<0.05	<2.0
	9/6/2018	12.7	<3.40	<0.05	<0.20	<0.01	0.74	NS	60	0.18	3.5	<0.05	1.6
	Mean	11.14	3.4	.05	.20	.01	.86		61.74	.19	1.98	.05	2.18
	Stdev	3.85	0	0	0	0	.07		8.24	.03	.86	0	.95
	Max	14.6	3.4	.05	.20	.01	.94		71.4	.24	3.5	.05	4
	Min	4	3.4	.05	.20	.01	.74		47	.16	1	.05	1.3
	No. of Det.	4	0	0	0	0	5		5	5	4	0	2

Table 3.2 Continued. Summary of surface, middle, and bottom water quality monitoring data for Beltzville Reservoir in 2018

Station	Date	ALK mg/L	BOD5 mg/L	DISS-P mg/L	NH3 mg/L	NO2 mg/L	NO3 mg/L	PO4 mg/L	TDS mg/L	TKN mg/L	TOC mg/L	TP mg/L	TSS mg/L
BZ-3B	6/28/2018	6.8	<3.40	<0.05	<0.20	<0.01	0.90	NS	68	<0.20	<1.0	<0.05	<4
	7/12/2018	10.9	<3.40	<0.05	<0.20	<0.01	0.82	NS	73.3	0.21	1.4	<0.05	1.0
	7/31/2018	8.8	<3.40	<0.05	<0.20	<0.01	0.78	NS	55.7	0.15	1.3	<0.05	6.8
	8/15/2018	12.9	<3.40	<0.05	<0.20	<0.01	0.84	NS	54	0.15	1.4	<0.05	1.5
	9/6/2018	12.7	<3.40	<0.05	0.11	<0.01	0.66	NS	77.1	0.30	4.7	<0.05	4.1
	Mean	10.42	3.4	.05	1.62	.01	.80		65.62	.20	1.96	.05	3.48
	Stdev	2.34	0	0	.76	0	.08		9.27	.06	1.38	0	2.09
	Max	12.9	3.4	.05	2	.01	.90		77.1	.30	4.7	.05	6.8
	Min	6.8	3.4	.05	.11	.01	.66		54	.15	1	.05	1
	No. of Det.	5	0	0	1	0	5		5	4	4	0	4
BZ-4S	6/28/2018	8.3	<3.40	<0.05	<0.20	<0.01	<0.11	NS	40	<0.20	1.3	<0.05	6.5
	7/12/2018	4.7	<3.40	<0.05	<0.20	<0.01	<0.11	NS	27.5	0.26	1.3	<0.05	<1.0
	7/31/2018	<4.0	<3.40	<0.05	<0.20	<0.01	0.14	NS	20	0.15	1.6	<0.05	<2.0
	8/15/2018	3.6	<3.40	<0.05	<0.20	<0.01	<0.11	NS	22.2	<0.15	1.7	<0.05	3.3
	9/6/2018	4.2	<3.40	<0.05	<0.20	<0.01	1.0	NS	57.1	0.26	3.3	<0.05	<2.0
	Mean	4.96	3.4	.05	.20	.01	.29		33.36	.20	1.84	.05	2.96
	Stdev	1.71	0	0	0	0	.35		13.75	.05	.75	0	1.92
	Max	8.3	3.4	.05	.20	.01	1		57.1	.26	3.3	.05	6.5
	Min	3.6	3.4	.05	.20	.01	.11		20	.15	1.3	.05	1
	No. of Det.	4	0	0	0	0	2		5	3	5	0	2

Table 3.2 Continued. Summary of surface, middle, and bottom water quality monitoring data for Beltzville Reservoir in 2018

Station	Date	ALK mg/L	BOD5 mg/L	DISS-P mg/L	NH3 mg/L	NO2 mg/L	NO3 mg/L	PO4 mg/L	TDS mg/L	TKN mg/L	TOC mg/L	TP mg/L	TSS mg/L
BZ-5S	6/28/2018	14	<3.40	<0.05	<0.20	<0.01	1.1	NS	62	0.34	2.9	<0.05	22.3
	7/12/2018	7.8	<5.0	<0.05	<0.20	<0.01	1.3	NS	82.5	0.28	<1.0	<0.05	4.3
	7/31/2018	9.8	<3.40	<0.05	<0.20	<0.01	1.3	NS	78.6	0.19	1.0	<0.05	29.3
	8/15/2018	24.3	<3.40	<0.05	<0.20	<0.01	1.2	NS	71.3	0.23	2.2	<0.05	3.4
	9/6/2018	13.2	<3.40	<0.08	<0.20	<0.01	1.4	NS	83.8	0.19	2.4	<0.05	2.5
	Mean	13.82	3.72	.06	.20	.01	1.26		75.64	.25	1.9	.05	12.36
	Stdev	5.70	.64	.01	0	0	.10		8.09	.06	.77	0	11.21
	Max	24.3	5.0	.08	.20	.01	1.4		83.8	.34	2.9	.05	29.3
	Min	7.8	3.4	.05	.20	.01	1.1		62	.19	1	.05	2.5
	No. of Det.	5	0	1	0	0	5		5	5	4	0	5
BZ-6S	6/28/2018	6.8	<3.40	<0.05	<0.20	<0.01	0.50	NS	83	0.25	1.3	<0.05	<4
	7/12/2018	11.4	<5.0	<0.05	<0.20	<0.01	0.42	NS	52	0.20	1.3	<0.05	1.3
	7/31/2018	8.8	<3.40	<0.05	<0.20	<0.01	0.44	NS	59	0.20	1.1	<0.05	<2.0
	8/15/2018	11.4	<3.40	<0.05	<0.20	<0.01	0.33	NS	35	0.15	1.7	<0.05	2.0
	9/6/2018	11.6	<3.40	<0.05	<0.20	<0.01	0.19	NS	53	0.22	2.8	<0.05	1.8
	Mean	10	3.72	.05	.20	.01	.38		56.4	.20	1.64	.05	2.22
	Stdev	1.91	.64	0	0	0	.11		15.51	.03	.61	0	.93
	Max	11.6	5.0	.05	.20	.01	.50		83	.25	2.8	.05	4
	Min	6.8	3.4	.05	.20	.01	.19		35	.15	1.1	.05	1.3
	No. of Det.	5	0	0	0	0	5		5	5	5	0	3

Table 3.2 Continued. Summary of surface, middle, and bottom water quality monitoring data for Beltzville Reservoir in 2018

Station	Date	ALK mg/L	BOD5 mg/L	DISS-P mg/L	NH3 mg/L	NO2 mg/L	NO3 mg/L	PO4 mg/L	TDS mg/L	TKN mg/L	TOC mg/L	TP mg/L	TSS mg/L
BZ-6M	6/28/2018	12	<3.40	<0.05	<0.20	<0.01	0.91	NS	78	0.26	1.8	<0.05	<4.0
	7/12/2018	10.4	<5.0	<0.05	<0.20	<0.01	0.87	NS	58	0.19	<1.0	<0.05	<1.0
	7/31/2018	7.8	<3.40	<0.05	<0.20	<0.01	0.94	NS	55	0.15	<1.0	<0.05	<1.0
	8/15/2018	11.9	<3.40	<0.05	<0.20	0.03	0.75	NS	50	0.13	2.3	<0.05	1.5
	9/6/2018	11.6	<3.40	<0.05	<0.20	<0.01	0.78	NS	63.3	0.17	3.5	<0.05	2.0
	Mean	10.74	3.72	.05	.20	.01	.85		60.86	.18	1.92	.05	2.1
	Stdev	1.58	.64	0	0	.01	.07		9.59	.04	.93	0	1.02
	Max	12	5.0	.05	.20	.03	.94		78	.26	3.5	.05	4
	Min	7.8	3.4	.05	.20	.01	.75		50	.13	1	.05	1
	No. of Det.	5	0	0	0	1	5		5	5	3	0	2
BZ-6B	6/28/2018	11.4	<3.40	<0.05	<0.20	<0.01	0.83	NS	86	0.42	1.2	<0.05	21
	7/12/2018	13.5	<5.0	<0.05	<0.20	<0.01	0.85	NS	90	0.53	1.0	<0.05	22.5
	7/31/2018	9.3	<3.40	0.22	<0.20	<0.01	0.85	NS	22.9	0.19	<1.0	<0.05	<2.0
	8/15/2018	14.5	<3.40	<0.05	<0.20	<0.01	0.72	NS	60	0.14	1.3	<0.05	3.2
	9/6/2018	17.4	<3.40	<0.05	<0.20	<0.01	0.73	NS	86.7	0.19	4.0	<0.05	2.2
	Mean	13.22	3.72	.04	.20	.01	.80		69.12	.29	1.7	.05	10.18
	Stdev	2.75	.64	.01	0	0	.06		25.49	.15	1.56	0	9.47
	Max	17.4	5.0	.05	.20	.01	.85		90	.53	4	.05	22.5
	Min	9.3	3.4	.02	.20	.01	.72		22.9	.14	1	.05	2
	No. of Det.	5	0	1	0	0	5		5	5	4	0	4

Table 3.2 Continued. Summary of surface, middle, and bottom water quality monitoring data for Beltzville Reservoir in 2018

Station	Date	ALK mg/L	BOD5 mg/L	DISS-P mg/L	NH3 mg/L	NO2 mg/L	NO3 mg/L	PO4 mg/L	TDS mg/L	TKN mg/L	TOC mg/L	TP mg/L	TSS mg/L
BZ-7S	6/28/2018	10.9	<3.40	<0.05	<0.20	<0.01	0.51	NS	64	0.23	1.4	<0.05	<4
	7/12/2018	<4.0	<5.0	<0.05	<0.20	<0.01	0.40	NS	50	0.27	1.3	<0.05	1.6
	7/31/2018	<4.0	<3.40	<0.08	<0.20	<0.01	0.21	NS	33	0.18	1.0	<0.05	<2.0
	8/15/2018	9.3	<3.40	<0.05	<0.20	<0.01	0.26	NS	26.7	0.18	2.6	<0.05	2.0
	9/6/2018	11.6	<3.40	<0.05	<0.20	<0.01	0.48	NS	64	0.18	2.6	<0.05	2.0
	Mean	7.96	3.72	.06	.20	.01	.37		47.54	.21	1.78	.05	2.32
	Stdev	3.32	.64	.01	0	0	.12		15.45	.04	.68	0	.85
	Max	11.6	5.0	.08	.20	.01	.51		64	.27	2.6	.05	4
	Min	4	3.4	.05	.20	.01	.21		26.7	.18	1	.05	1.6
	No. of Det.	3	0	0	0	0	5		5	5	5	0	3
BZ-7M	6/28/2018	7.8	<3.40	<0.05	<0.20	<0.01	0.76	NS	56	0.28	1.2	<0.05	<4
	7/12/2018	12.0	<5.0	<0.05	<0.20	<0.01	0.87	NS	50	0.34	<1.0	<0.05	2.5
	7/31/2018	7.8	<3.40	0.06	<0.20	<0.01	0.89	NS	58.8	0.24	1.0	<0.05	2.1
	8/15/2018	8.8	<3.40	<0.05	<0.20	<0.01	0.16	NS	37.8	0.12	1.8	<0.05	1.8
	9/6/2018	14.8	<3.40	<0.05	0.14	<0.01	0.82	NS	70	0.28	2.9	<0.05	49.3
	Mean	10.24	3.72	.05	.19	.01	.7		54.52	.25	1.58	.05	11.94
	Stdev	2.75	.64	0.0	.02	0	.27		10.58	.07	.72	0	18.69
	Max	14.8	5.0	.06	.2	.01	.89		70	.34	2.9	.05	49.3
	Min	7.8	3.4	.05	.14	.01	.16		37.8	.12	1	.05	1.8
	No. of Det.	5	0	2	1	0	5		5	5	4	0	4

Table 3.2 Continued. Summary of surface, middle, and bottom water quality monitoring data for Beltzville Reservoir in 2018

Station	Date	ALK mg/L	BOD5 mg/L	DISS-P mg/L	NH3 mg/L	NO2 mg/L	NO3 mg/L	PO4 mg/L	TDS mg/L	TKN mg/L	TOC mg/L	TP mg/L	TSS mg/L
BZ-7B	6/28/2018	12.5	<3.40	<0.05	<0.20	<0.01	0.87	NS	88	0.24	1.0	<0.05	13.3
	7/12/2018	12.0	<5.0	<0.05	<0.20	0.01	0.79	NS	25	0.26	<1.0	<0.05	4.9
	7/31/2018	8.3	<3.40	1.8	<0.20	<0.01	0.95	NS	50	0.19	1.1	<0.05	<2.0
	8/15/2018	14.0	<3.40	<0.05	<0.20	<0.01	0.94	NS	50	0.21	2.5	<0.05	4.4
	9/6/2018	13.2	<3.40	<0.05	0.11	<0.01	0.86	NS	66.3	0.23	2.9	<0.05	45.8
	Mean	12	3.72	.4	.18	.01	.88		55.86	.23	1.7	.05	14.08
	Stdev	1.97	.64	.7	.04	0	.06		20.80	.02	.83	0	16.31
	Max	14	5.0	1.8	.2	.01	.95		88	.26	2.9	.05	45.8
	Min	8.3	3.4	.05	.11	.01	.79		25	.19	1	.05	2
	No. of Det.	5	0	1	1	0	5		5	5	4	0	4

< Laboratory analysis result was less than the limit of quantification or limit of detection.
NS- Not Sampled

3.2.2 Nitrite and Nitrate

Nitrite (NO2) 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. With the exception of three samples, concentrations measured at all other stations and depths were less than the laboratory reporting limit of 0.01 mg/L during the entire 2018 sampling season. The maximum single recorded sample of 0.03 mg/L was collected from station BZ-6M on 15 August.

Nitrate (NO3) 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 was distributed uniformly in the water column of Beltzville Reservoir during 2018 with sample results ranging from the laboratory reporting limit of <0.11 mg/L to 1.40 mg/L (Table 3-2). The highest recorded single nitrate measure of 1.40 mg/L was measured on 06 September at station BZ-5S. Station BZ-5S maintained the highest seasonal mean concentration (1.26 mg/L) of all stations.

Beltzville Reservoir was in compliance with the PADEP water quality standard for nitrite and nitrate during 2018. The standard is a summed concentration of nitrite and nitrate of less than 10 mg/L. Throughout the monitoring period, a maximum summed concentration across all stations and depths of 1.41 mg/L was measured at station BZ-5S on 06 September.

3.2.3 Total Kjeldahl Nitrogen

Total Kjeldahl nitrogen (TKN) is a measure of organic nitrogen that includes ammonia. Organic nitrogen is not immediately available for biological activity and is therefore not available for plant growth until decomposition to inorganic form occurs. Total kjeldahl nitrogen (TKN) was low in the water column of Beltzville Reservoir during 2018 with single sample concentrations ranging from less than the 0.15 mg/L laboratory reporting limit to 0.53 mg/L (Table 3-2). The highest concentration of 0.53 mg/L was recorded at station BZ-6B on 12 July.

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 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 typically seen at Beltzville Reservoir, sample results for all stations and dates were recorded as <0.05 mg/L (Table 3-2). All sample results exceeded the EPA 0.01 mg/L suggested concentration, however, these results do not accurately reflect total phosphorus concentrations in Beltzville Reservoir and its tributaries.

3.2.5 Dissolved Phosphorus

During the 2018 sampling season, with the exception of five samples, concentrations measured at all other stations and depths were less than the laboratory reporting limit of 0.05 mg/L (Table 3-2). The maximum single recorded sample of 1.80 mg/L was collected from station BZ-7B on 31 July.

3.2.6 Dissolved Phosphate

Orthophosphate (PO4) 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 Beltzville Reservoir.

3.2.7 Total Dissolved Solids

Total dissolved solids (TDS) is a measure of the amount of non-filterable dissolved material in the water. Dissolved salts such as sulfate, magnesium, chloride, and sodium contribute to elevated levels. Concentrations of TDS in the water column of Beltzville Reservoir were consistently low during 2018 (Table 3-2). Concentrations among all stations and depths ranged from 4.0 to 95 mg/L. Total dissolved solids measured at Beltzville Reservoir in 2018 were in compliance with PADEP water quality standards. The state water quality standard for TDS is a maximum concentration of 500 mg/L.

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 concentrations in the waters of Beltzville Reservoir were low during 2018 (Table 3-2). Many concentrations measured at all stations and depths were less than or near the laboratory reporting limit. The maximum concentration of 49.3 mg/L was measured in mid-depth lake waters at station BZ-7M on 06 September. High measures of TSS can be the result of sample collection error associated with capturing disturbed fine sediments in the lake bottom sample during field sampling. This sampling error particularly may apply to any elevated or unexplained high TSS

water samples collected at lake bottom water sampling stations such as BZ-6B, BZ-3B, and BZ-7B.

3.2.9 Biochemical Oxygen Demand

Five-day biochemical oxygen demand (BOD5) 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 concentrations in the water column of Beltzville Reservoir were consistently low in all months and stations sampled (Table 3-2). All samples were below the laboratory reporting limit of 3.4 and 5.0 mg/L for the entire sampling season. Based on the seasonal sampling results, it is inferred that in 2018, Beltzville Reservoir and its associated tributaries contain very clean water with little biodegradable organic wastes.

3.2.10 Alkalinity

Alkalinity (ALK) 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 $CaCO_3$ except where natural conditions are less.

For all sampling stations and depths, alkalinity measures during 2018 ranged from 24.3 mg/L to 3.6 mg/L (Table 3-2). A maximum concentration of 24.3 mg/L was measured in surface waters at station BZ-5S on 15 August. All other reservoir and tributary samples remained below the state minimum criteria (20 mg/L) for the sampling season. The natural alkalinity of water is largely dependent on the underlying geology and soils within the surrounding watershed. The typically low alkalinity measured at Beltzville Reservoir results from the regional geology, which is primarily sandstone and shale. Based on this, the reservoir waters and surrounding tributaries are in compliance with the PADEP alkalinity criteria, due to the regional natural conditions.

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 plant discharges. The amount of carbon in a freshwater stream is an indicator of the organic character of the stream or 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 Beltzville Reservoir were low during 2018 (Table 3-2). Concentrations of TOC at all stations and depths ranged from <1.0 mg/L to 4.7 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* concentrations in the surface waters (0-15 feet) of Beltzville Reservoir were low during 2018 (Appendix A). Concentrations measured in surface waters at all lake body stations ranged between 0.0 and 5.0 ug/L with an average concentration of 1.28 ug/L.

3.3 TROPHIC 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. 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. Classification of Beltzville Reservoir was based on a single sample each month during the sampling season taken at station BZ-6 (Figure 3-7).

TSIs calculated for measures of total phosphorus (Figure 3-7) classified Beltzville Reservoir as eutrophic in June (60.56), early July (60.56), late July (60.56), August (60.56) and September (60.56). TSIs calculated for measures of secchi disk depth (Figure 3-7) classified Beltzville Reservoir as mesotrophic in early July (42.58), late July (42.80), August (43.70), and September (42.80) and oligotrophic in June (38.33). TSIs calculated for measures of chlorophyll *a* (Figure 3-7) classified Beltzville Reservoir as oligotrophic in June (25.59), early July (8.01), late July (28.41), August (29.23), and September (34.12).

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 Beltzville Reservoir in

2018. With this in mind and considering historic sampling results, the trophic state of the reservoir, based on TSI's, was oligotrophic/mesotrophic throughout 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). Taking into account the general agreement between the EPA classifications with that of the Carlson TSI's, the trophic condition of Beltzville Reservoir was predominantly oligotrophic/mesotrophic in 2018.

Table 3-3. EPA trophic classification criteria and average monthly measures for Beltzville Reservoir in 2018.

Water Quality Variable	Oligo-trophic	Meso-trophic	Eutrophic	06 June	12 July	31 July	15 August	06 September
Total phos. (ppb)	<10	10-20	>20	<50	<50	<50	<50	<50
Chlorophyll a (ppb)	<4	4-10	>10	0.6	0.1	0.8	0.87	1.43
Secchi depth (meters)	>4	2-4	<2	4.5	3.35	3.3	3.1	3.3

3.4 RESERVOIR BACTERIA MONITORING

Two forms of coliform bacteria contamination were monitored in the tributary and lake surface waters at Beltzville Reservoir during 2018 including total and fecal coliform (Table 3-4). Total coliform includes *escherica coliform* (*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 values for all stations ranged from <2 colonies/100-ml to greater than the detection limit of 964 colonies/100-ml. Bacteria in natural waters are common and their presence in the sample is not necessarily a human health concern. 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, previous fecal coliform criteria are being used. Fecal contamination was low in Beltzville Reservoir and its tributaries during 2018. 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. The fecal coliform samples collected at Beltzville Reservoir did exceed this standard one time in 2018 at station BZ-5S on 28 June. The cause of this single elevated sample result is unknown but may be a result of upstream watershed activities or land use. Water contact recreation is permitted at Beltzville Reservoir. However, the recreational swimming beach is monitored and managed by the Commonwealth of Pennsylvania. No long term elevated bacteria counts were recorded in the main reservoir body where public water recreation is also permitted.

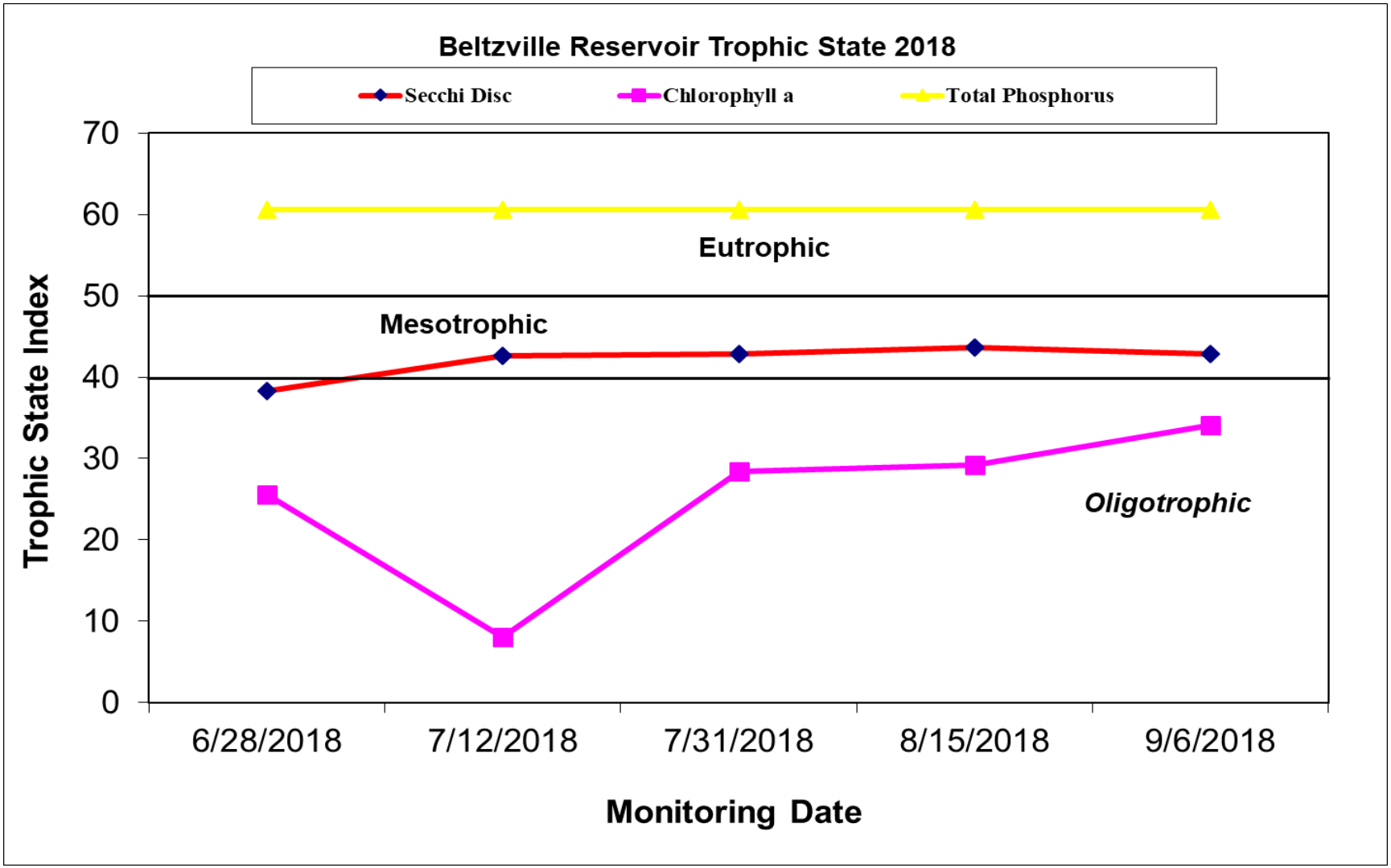

Figure 3-7. Trophic state indices calculated from secchi disk depth and concentrations of total phosphorus and chlorophyll *a* at reservoir Station BZ-6 for Beltzville Reservoir in 2018.

Table 3-4 Bacteria counts (colonies/100ml) at Beltzville Reservoir and tributaries during 2018. NS = Not Sampled in 2018

STATION	DATE	Total Coliform (TC)		Fecal Coliform (FC)		Escherichia coli	
BZ-1S	6/28/2018		104		84		NS
	7/12/2018		82		64		NS
	7/31/2018		84		43		NS
	8/15/2018		580		160		NS
	9/6/2018		104		96		NS
BZ-2S	6/28/2018		118		62		NS
	7/12/2018		90		12		NS
	7/31/2018		214		160		NS
	8/15/2018		231		183		NS
	9/6/2018		144		29		NS
BZ-3S	6/28/2018	<	2	<	4		NS
	7/12/2018	<	4		2		NS
	7/31/2018	<	4	<	4		NS
	8/15/2018	<	4		4		NS
	9/6/2018		8	<	4		NS
BZ-4S	6/28/2018		11		360		NS
	7/12/2018		22		20		NS
	7/31/2018		151		132		NS
	8/15/2018		140		92		NS
	9/6/2018		43		112		NS
BZ-5S	6/28/2018		673		3500		NS
	7/12/2018		530		210		NS
	7/31/2018		530		320		NS
	8/15/2018		964		350		NS
	9/6/2018		96		168		NS
BZ-6S	6/28/2018		7		4		NS
	7/12/2018	<	4		5		NS
	7/31/2018	<	4	<	4		NS
	8/15/2018	<	4	<	4		NS
	9/6/2018		4	<	4		NS
BZ-7S	6/28/2018	<	2	<	4		NS
	7/12/2018		4	<	4		NS
	7/31/2018	<	4	<	4		NS
	8/15/2018	<	4	<	4		NS
	9/6/2018		4		4		NS

- **Highlighted counts exceed single sample State (1000 fecal colonies/100ml) bathing beach criteria.**

4.0 REFERENCES

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APPENDIX A

STRATIFICATION DATA TABLES

2018 Beltzville Reservoir Water Column 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
BZ-1S Outfall Pohopoco	6/5/2018	13:41:56	0.5	12.6	92.3	9.81	7.41	-39.1	126.1	0.8	2.4	0.079
	6/28/2018	6:53:16	0.5	14.28	95.1	9.74	6.8	-4	143.8	3.4	0.0	0.082
	7/12/2018	11:20:52	0.5	17.58	106	10.15	7.01	-16.2	188.6	1.3	0.0	0.089
	7/31/2018	16:00:23	0.5	17.28	97	9.32	6.53	12.3	160	4.1	0.0	0.087
	8/15/2018	15:49:58	0.5	15.11	103	10.34	6.74	-0.2	168.5	1.7	0.0	0.087
	9/6/2018	7:29:13	0.5	19.06	98.5	9.12	6.56	10.5	187.2	3.3	0.0	0.094
BZ-2S Pine Run Trib.												
	6/28/2018	11:39:30	0.5	15.19	94.9	9.53	6.96	-13.3	135.8	27.9	1.0	0.068
	7/12/2018	11:06:52	0.5	16.61	96.7	9.42	6.93	-11.5	194.1	1.5	0.0	0.07
	7/31/2018	15:42:00	0.5	15.22	92.3	9.26	7.46	-42.4	155.5	3.5	0.0	0.073
	8/15/2018	15:38:32	0.5	15.69	98.9	9.83	6.58	9.3	179.9	3.1	0.0	0.072
	9/6/2018	11:22:10	0.5	16.29	97.9	9.61	6.18	32.6	205.5	0.4	0.0	0.061
BZ-3 Bouy/Beach												
	6/28/2018	9:20:11	0.5	23.31	103	8.82	7.84	-65.5	155.5	1.6	3.4	0.088
		9:18:28	5	23.12	102	8.77	7.75	-60.4	157.3	2.6	3.0	0.088
		9:17:34	10	23.04	101	8.67	7.61	-52.1	160.7	1.5	3.6	0.087
		9:16:43	15	22.92	99.3	8.53	7.37	-37.7	164.8	2.5	3.4	0.087
		9:15:44	20	20.16	90.9	8.24	6.86	-7	178.3	1.8	3.2	0.089
		9:14:47	25	18.32	77.2	7.26	6.68	3.5	182.6	2.1	3.4	0.087
		9:13:30	30	17.08	68.9	6.64	6.59	8.7	183.9	1.5	1.9	0.086
		9:12:07	35	15.83	61.6	6.1	6.52	12.4	184.7	1	2.3	0.085
		9:11:06	40	14.62	59.7	6.07	6.5	13.6	184.7	0.2	2.2	0.082
		9:10:04	45	12.88	59	6.23	6.51	13.1	184	0.9	2.5	0.080
		9:07:56	50	11	60.8	6.7	6.52	11.9	182.3	0	2.2	0.079
		9:01:13	55	10.09	66.9	7.53	6.57	9.2	171.4	1	2.8	0.078
		9:00:18	60	9.29	70.9	8.14	6.61	6.9	169.1	1.7	3.1	0.077
		8:59:40	65	8.77	72.1	8.37	6.64	5.1	167.1	0.1	2.5	0.076
		8:58:41	70	8.15	72.2	8.52	6.65	4.3	164.6	1.8	2.6	0.075
		8:57:12	75	7.96	72.6	8.6	6.67	3.5	160.2	0.4	3.1	0.075
		8:54:42	80	7.64	74.1	8.86	6.69	2.1	152.4	0.3	3.1	0.074
		8:52:29	85	7.38	72.6	8.73	6.68	2.8	143.9	0.5	2.9	0.074
		8:51:06	90	7.41	72.1	8.66	6.68	2.4	136.4	-0.4	2.0	0.074
		8:49:51	95	7.2	70	8.46	6.68	2.4	127.1	0.3	2.9	0.074
		8:48:38	100	7.04	66.5	8.06	6.68	2.6	113.7	3.9	3.4	0.074
		8:47:26	105	7.47	65.9	7.9	6.7	1.4	118.7	102.2	1.7	0.088

2018 Beltzville Reservoir Water Column 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
		8:49:29	0.5	26.34	107	8.65	8.3	-94	120.9	1.5	0.9	0.095
		8:48:11	5.0	26.35	107	8.6	8.28	-92.8	122.7	2.3	0.8	0.095
		8:47:32	10.0	26.34	106	8.57	8.24	-90.6	124.4	2.4	1.0	0.095
		8:46:36	15.0	26.3	106	8.54	8.04	-78.1	127.8	2.2	0.7	0.095
		8:45:16	20.0	23.1	94.2	8.06	6.89	-8.7	154.4	2.7	3.8	0.095
BZ-3		8:44:44	25.0	20.4	73.5	6.63	6.68	3.6	161.3	1.8	3.8	0.092
Bouy/Beach		8:44:01	30.0	18.66	62.9	5.87	6.59	8.5	163.6	1.4	3.3	0.088
		8:43:02	35.0	17.35	53.6	5.14	6.52	12.4	164.7	1.6	3.3	0.088
	7/12/2018	8:42:23	40.0	15.74	50.6	5.02	6.51	13.2	165	1.2	2.9	0.086
		8:41:22	45.0	13.35	51.9	5.42	6.51	13	164.8	0.7	3.6	0.082
		8:40:36	50.0	11.49	55.5	6.05	6.55	10.5	163.5	0.7	3.4	0.080
		8:39:44	55.0	10.08	57.8	6.52	6.58	8.4	161.6	0.7	3.0	0.078
		8:38:44	60.0	9.44	61.1	6.98	6.63	5.4	157.9	0.5	2.6	0.077
		8:36:03	65.0	9.02	66.6	7.69	6.68	2.5	151.2	0.4	2.6	0.076
		8:35:22	70.0	8.69	67.5	7.86	6.69	2.1	149.6	0.4	2.9	0.076
		8:34:38	75.0	8.17	68	8.01	6.71	0.8	147.3	1.7	2.7	0.075
		8:32:55	80.0	7.83	68.9	8.19	6.7	1.3	143.3	-0.1	2.9	0.075
		8:31:44	85.0	7.48	67.5	8.09	6.69	1.8	139.6	0.6	2.9	0.074
		8:30:45	90.0	7.39	66.8	8.03	6.7	1.4	134.7	-0.2	2.8	0.074
		8:29:48	95.0	7.19	62.7	7.57	6.7	1.3	129.3	0.2	3.3	0.074
		8:28:56	100.0	7.07	59.2	7.17	6.72	0.5	122	0.4	2.9	0.074
		8:27:23	105.0	7.01	53.8	6.52	6.78	-2.9	99.6	6.1	5.8	0.076
		13:42:28	0.5	25.87	105	8.55	8.57	-110.3	135.9	2.0	0.0	0.093
		13:41:49	5	25.46	104	8.48	8.48	-104.5	138.4	2.1	1.0	0.092
		13:41:15	10	25.4	102	8.34	8.35	-96.9	140.1	3.2	1.4	0.092
		13:40:27	15	25.35	93	7.63	7.79	-63.3	145.8	2.4	1.3	0.091
		13:39:55	20	23.42	72	6.12	6.81	-4.1	168	2.6	2.0	0.092
		13:38:52	25	22.29	65.1	5.66	6.73	0.9	169.7	2.0	0.2	0.091
BZ-3		13:38:06	30	21.06	65.8	5.86	6.73	0.6	170	2.7	0.0	0.091
Bouy/Beach	7/31/2018	13:37:23	35	20.42	71.8	6.47	6.77	-2.1	168.4	3.2	0.0	0.089
		13:36:41	40	20.04	69.3	6.29	6.73	0.2	169.4	3.8	0.0	0.093
		13:35:30	45	19.61	60.8	5.57	6.66	4.8	170.1	4.3	0.0	0.090
		13:34:32	50	18.99	45.2	4.19	6.55	11	170.9	4.3	0.0	0.090
		13:33:28	55	16.39	31.7	3.1	6.46	15.8	172.2	2.4	0.0	0.088
		13:31:20	60	14.01	35.4	3.65	6.5	13.5	168.4	2.0	0.0	0.083
		13:30:10	65	12.4	38.5	4.11	6.53	11.7	165.7	1.9	0.0	0.081
		13:29:02	70	11.17	41.4	4.55	6.54	10.7	163.7	3.0	0.0	0.080
		13:28:03	75	10.47	41.1	4.59	6.5	13.1	164.2	2.2	0.0	0.080
		13:26:58	80	9.98	44.4	5.01	6.45	16.1	165.1	0.9	0.0	0.078
		13:26:01	85	9.55	44.9	5.12	6.39	19.4	166.3	1.5	0.0	0.078
		13:25:10	90	9.31	44.5	5.1	6.38	20.1	164.6	1.7	0.0	0.077
		13:23:32	95	9.05	38.5	4.45	6.34	22.2	160.6	0.6	0.0	0.077
		13:22:06	100	8.73	37	4.3	6.39	19.4	152.9	1.3	0.0	0.077
		13:20:00	105	8.17	33.3	3.93	6.56	9.3	133.1	1.8	0.0	0.076

2018 Beltzville Reservoir Water Column 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
BZ-3 Bouy/Beach	8/15/2018	13:35:56	0.5	26.73	113	9.02	8.64	-114.8	115.2	1.4	0.0	0.087
		13:35:19	5	26.52	113	9.06	8.66	-115.9	114.9	2.3	0.3	0.087
		13:34:31	10	26.23	113	9.15	8.49	-105.6	117.4	2.2	1.7	0.086
		13:33:49	15	25.08	116	9.53	7.58	-50.4	131.7	2.4	2.9	0.086
		13:32:19	20	23.38	72.2	6.15	6.71	1.7	153.8	1.8	2.0	0.087
		13:31:16	25	22.48	54.3	4.7	6.63	6.7	154.8	2.0	3.3	0.09
		13:30:24	30	21.66	71.3	6.28	6.72	1.1	150.8	1.2	0.0	0.085
		13:29:37	35	21.16	72.9	6.47	6.73	0.7	149.4	1.5	0.0	0.085
		13:28:14	40	20.79	86	7.69	6.84	-6.2	140.4	2.3	0.0	0.078
		13:26:47	45	20.63	64.6	5.8	6.72	1.4	141.2	1.3	0.0	0.09
		13:25:11	50	20.48	73.8	6.65	6.78	-2.6	135.3	1.8	0.0	0.098
		13:24:18	55	20.29	70.7	6.39	6.74	-0.2	134.4	2.5	0.0	0.095
		13:23:39	60	20.15	69.9	6.34	6.75	-0.8	130.9	2.4	0.0	0.094
		13:22:23	65	19.86	65.9	6	6.72	1.1	127.5	2.0	0.0	0.095
		13:21:15	70	19.52	60.8	5.58	6.67	4	124.9	2.4	0.0	0.097
		13:19:50	75	18.78	51.5	4.79	6.6	8.1	118	3.0	0.0	0.096
		13:18:41	80	17.57	39.9	3.81	6.55	11.2	111.2	2.3	0.0	0.094
		13:16:33	85	14.75	17.3	1.76	6.12	35.8	113	1.7	0.0	0.088
		13:16:00	90	13.14	16.6	1.74	6.02	41.4	115.4	1.0	0.0	0.085
		13:15:00	95	11.62	15.8	1.71	6.04	39.8	106.6	1.6	0.0	0.083
		13:13:45	100	10.94	15.3	1.69	6.23	28.7	88.3	1.8	0.0	0.081
		13:11:36	105	9.97	7.6	0.86	6.59	7.9	31.8	3.0	0.0	0.082
BZ-3 Bouy/Beach	9/6/2018	9:26:57	0.5	26.65	112	8.97	8.83	-126.4	97	3.0	0.3	0.084
		9:26:11	5	26.54	112	9.01	8.85	-127.3	97	1.5	1.4	0.084
		9:25:20	10	25.77	115	9.38	9.03	-138	95.1	2.1	2.5	0.083
		9:24:16	15	24.91	110	9.09	8.57	-109.8	102.1	3.0	3.3	0.08
		9:22:56	20	23.55	67.8	5.75	6.73	0.7	142.3	3.5	2.3	0.079
		9:22:07	25	22.57	46.7	4.04	6.63	6.6	144.8	1.2	2.9	0.087
		9:20:53	30	21.91	69	6.04	6.75	-0.7	138.5	1.7	1.5	0.08
		9:19:43	35	21.39	58.8	5.2	6.67	4	139.4	0.7	0.0	0.085
		9:18:47	40	21.11	59.9	5.32	6.67	4.4	137.7	0.5	0.0	0.085
		9:17:56	45	20.85	61.3	5.48	6.65	5	136.5	0.5	0.0	0.089
		9:17:00	50	20.68	60.6	5.44	6.6	8	136.6	0.5	0.0	0.093
		9:16:08	55	20.53	60.1	5.41	6.57	9.8	135.7	0.4	0.0	0.093
		9:15:35	60	20.44	59.4	5.35	6.55	11.4	135.1	0.5	0.0	0.094
		9:14:00	65	20.35	56.2	5.08	6.43	18.3	135.6	0.8	0.0	0.096
		9:13:13	70	20.28	54.8	4.96	6.37	22	135.2	1.5	0.0	0.094
		9:12:22	75	20.15	52	4.71	6.28	27	135.6	1.6	0.0	0.093
		9:11:40	80	20.06	52.2	4.74	6.19	32.7	137	1.2	0.0	0.092
		9:10:50	85	19.91	49.8	4.53	6.02	42.8	141.2	2.5	0.0	0.09
		9:10:04	90	19.82	48.1	4.39	5.98	44.7	136.5	1.9	0.0	0.097
		9:09:04	95	19.67	43.5	3.98	5.99	44.5	126.6	2.9	0.0	0.096
		9:08:10	100	19.48	38.6	3.55	6.04	41.5	113.1	3.2	0.0	0.096
		9:06:56	105	18.97	32	2.97	6.2	31.6	78.2	5.7	0.0	0.096

2018 Beltzville Reservoir Water Column 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
BZ-4S Wild Creek Upstream	6/28/2018	11:21:36	0.5	22.74	96.7	8.33	7.12	-22.4	150.3	3.8	0.0	0.042
	7/12/2018	10:48:37	0.5	23.06	95.1	8.15	6.47	16	170.7	0.4	0.0	0.053
	7/31/2018	15:26:39	0.5	23.82	95.2	8.04	7.47	-43.9	141.1	0.5	0.0	0.043
	8/15/2018	15:23:02	0.5	24.73	99.4	8.26	7.31	-34.4	121.3	6.2	0.8	0.044
	9/6/2018	11:07:33	0.5	25.49	96.8	7.93	7.03	-17.3	148.6	-0.3	0.0	0.044
BZ-5S Pohopoco Upstream	6/28/2018	11:08:22	0.5	16.99	92.6	8.95	7.16	-24.6	140.4	50.7	0.0	0.095
	7/12/2018	10:35:22	0.5	18.88	95.9	8.92	7.37	-37.1	131.3	7.2	0.0	0.116
	7/31/2018	15:12:54	0.5	16.56	94.7	9.24	7.71	-57.2	145.3	17.4	0.1	0.107
	8/15/2018	15:11:57	0.5	18.74	102	9.49	7.34	-35.5	116.5	8.0	0.0	0.11
	9/6/2018	10:54:13	0.5	20.3	101	9.09	7.53	-46.9	125.8	9.4	0.0	0.121
BZ-6 In-Lake Tower	6/5/2018	12:24:02	0.5	20.57	102	9.2	7.27	-31.4	146.5	3.2	0.2	0.043
		12:23:32	5	20.58	101	9.07	7.14	-23.9	150.3	2.4	1.9	0.082
		12:22:51	10	18.19	93.7	8.84	6.88	-8.2	159.6	2.2	3.0	0.081
		12:21:54	15	17.29	89.6	8.61	6.79	-3.1	161.7	1.7	2.9	0.082
		12:20:44	20	15.99	82.7	8.16	6.7	2.3	163.5	1.1	2.4	0.08
		12:19:52	25	15.35	78.1	7.81	6.64	5.7	164.2	1	1.4	0.08
		12:19:03	30	14.82	77.2	7.81	6.63	6.2	162.7	2.2	1.8	0.08
		12:18:09	35	14.23	77.7	7.96	6.63	5.9	162	0.6	1.7	0.08
		12:17:24	40	12.88	79	8.34	6.66	4	161.3	1.4	2.1	0.079
		12:16:46	45	11.2	78.6	8.63	6.68	2.7	161.3	1.9	2.1	0.079
		12:15:33	50	9.61	79.9	9.11	6.71	1.2	160.7	1.7	2.5	0.077
		12:14:51	55	8.67	79.3	9.24	6.72	0.5	160.1	0.8	2.1	0.076
		12:13:58	60	8.23	79.4	9.35	6.73	-0.1	158.9	1.2	2.8	0.075
		12:13:03	65	8	80	9.47	6.74	-0.7	157.9	0.5	2.3	0.074
		12:11:35	70	7.59	80	9.57	6.75	-1.3	156.1	0.6	3.0	0.074
		12:10:33	75	7.36	79.6	9.58	6.74	-0.8	155.5	0.4	2.5	0.073
		12:09:28	80	7.25	79.1	9.53	6.73	-0.2	154.6	0.5	3.1	0.073
		12:08:14	85	7.14	78.5	9.49	6.71	0.8	153.5	0.3	2.3	0.073
		12:06:48	90	7.05	76.9	9.32	6.67	3.3	153.4	-0.1	2.6	0.073
		12:05:16	95	6.99	75	9.1	6.6	7.3	154.2	0	2.8	0.073
		12:04:33	100	6.85	73.4	8.94	6.57	9	154.3	0	3.1	0.073
		12:03:25	105	6.81	71.6	8.73	6.51	12.3	154.6	0	2.9	0.073
		12:02:06	110	6.73	70.3	8.59	6.48	14	153	0.5	3.0	0.073
		11:50:36	115	6.79	68	8.3	6.92	-11	90.3	13.8	7.0	0.073
		12:01:02	120	6.72	70	8.55	6.47	14.2	150.3	0	6.0	0.073
		11:59:57	125	6.69	69.5	8.5	6.48	13.8	145.8	2.4	220.6	0.073

2018 Beltzville Reservoir Water Column 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
BZ-6 In-Lake Tower Secchi 4.50 M	6/28/2018	8:28:21	0.5	22.98	103	8.86	7.82	-64.7	158.1	1.3	0.5	0.087
		8:27:06	5	22.96	103	8.82	7.78	-61.8	159.1	2.6	1.1	0.087
		8:25:52	10	22.91	102	8.73	7.68	-55.9	162	2	0.2	0.087
		8:23:01	15	22.82	99.9	8.6	7.43	-41.2	166.5	2.5	0.6	0.087
		8:21:21	20	20.1	95.4	8.66	6.94	-11.8	178.3	1.6	1.0	0.088
		8:20:17	25	18.59	80.2	7.5	6.72	1	182.7	1.8	3.0	0.086
		8:18:28	30	16.92	68.1	6.6	6.58	9.1	185.2	1.2	2.3	0.085
		8:16:58	35	15.7	59.7	5.93	6.51	13	186	1	2.0	0.083
		8:15:11	40	14.76	57.6	5.84	6.5	13.8	184.8	0.7	2.1	0.082
		8:13:21	45	13.12	62.5	6.57	6.52	12.2	183.7	0.5	2.3	0.08
		8:12:07	50	10.82	66.6	7.38	6.57	9.3	183.2	0.2	2.7	0.078
		8:10:47	55	9.74	68.1	7.73	6.59	7.9	182.3	0.5	2.5	0.077
		8:09:19	60	9.27	69.9	8.03	6.6	7.2	180.9	0.2	2.2	0.077
		8:07:58	65	8.83	71.8	8.34	6.63	5.6	178.5	-0.2	2.1	0.076
		8:06:55	70	8.32	72.8	8.56	6.64	5.2	177.6	1.3	3.4	0.075
		8:05:44	75	7.93	73.1	8.68	6.64	4.8	176.1	2	2.5	0.075
		8:04:25	80	7.72	73.3	8.73	6.65	4.2	173.6	0.5	2.7	0.074
		8:02:17	85	7.55	73	8.73	6.63	5.4	171.2	0	3.0	0.074
		8:01:11	90	7.46	72.3	8.67	6.64	4.8	168.5	0.4	2.7	0.074
		7:59:41	95	7.31	71.1	8.56	6.64	4.9	165.3	0.2	2.6	0.074
		7:58:00	100	7.21	68.6	8.28	6.61	6.8	162.1	0.6	2.7	0.074
		7:56:51	105	7.1	66	7.99	6.55	10.1	161.2	0.7	2.6	0.074
		7:55:40	110	6.97	62.9	7.64	6.49	13.3	159.1	0	2.1	0.074
		7:54:44	115	6.9	60.6	7.37	6.46	15.2	156.3	-0.3	2.7	0.074
		7:53:43	120	6.86	59.4	7.24	6.44	16.5	151.4	0.5	2.7	0.074
		7:51:24	125	7.32	60.8	7.32	6.49	13.1	173.4	5.5	2.5	0.081
BZ-6 In-Lake Tower Secchi 3.35 M	7/12/2018	8:11:48	0.5	26.34	106	8.56	8.2	-88.4	119.5	1.9	0.0	0.095
		8:10:58	5.0	26.37	106	8.55	8.2	-87.8	120.5	2.0	0.0	0.095
		8:09:58	10	26.37	106	8.53	8.16	-85.8	121.4	1.8	0.0	0.095
		8:08:53	15	26.34	106	8.55	8.08	-80.5	124.5	1.7	0.0	0.095
		8:07:28	20	22.55	111	9.63	7.6	-51.2	134.6	1.8	0.0	0.091
		8:05:58	25	20.56	90	8.09	6.88	-8.1	152.5	1.7	0.2	0.090
		8:03:39	30	19.07	64.6	5.98	6.63	6.5	156.7	1.4	0.0	0.089
		8:02:02	35	17.49	54.3	5.19	6.55	10.8	157.4	0.8	1.1	0.088
		8:00:41	40	15.28	49.6	4.97	6.51	13.1	156.8	1.6	0.5	0.084
		8:00:04	45	13.35	50.4	5.27	6.53	11.5	155.4	0.5	1.7	0.081
		7:58:46	50	11.77	54.2	5.87	6.58	8.4	152.2	0.8	1.5	0.079
		7:57:29	55	10.43	58.2	6.5	6.66	4	147	0.9	2.6	0.078
		7:55:57	60	9.6	62.3	7.1	6.73	-0.2	141	1.1	2.0	0.077
		7:55:17	65	9.19	63.3	7.28	6.76	-1.7	138.4	0.9	2.5	0.076
		7:54:25	70	8.79	64.4	7.48	6.75	-1.2	137.3	0.7	2.8	0.076
		7:53:01	75	8.33	65.9	7.74	6.61	6.9	142.1	0.8	2.7	0.075
		7:52:13	80	7.77	65.6	7.81	6.56	9.4	142.8	0.5	2.6	0.074
		7:51:24	85	7.48	63.9	7.66	6.51	12.3	143.2	-0.5	2.4	0.074
		7:50:44	90	7.28	62.1	7.49	6.49	13.5	141.9	-0.2	2.9	0.074
		7:49:55	95	7.18	59.7	7.21	6.44	16.1	140.8	0.1	2.8	0.074
		7:49:09	100	7.09	57.1	6.91	6.39	19.3	140.2	1.4	2.6	0.074
		7:48:16	105	7.02	53.9	6.54	6.32	23.1	139.3	0.6	3.0	0.074
		7:47:40	110	6.89	51.7	6.29	6.31	23.4	136.1	1.2	2.8	0.075
		7:46:09	115	6.86	50.1	6.1	6.33	22.6	125.1	22.7	4.3	0.075
		7:44:25	120	6.85	48.4	5.89	6.42	17.1	101	12.0	14.9	0.075
		7:42:46	125	7.39	46.5	5.58	6.4	18.6	101.7	22.9	1.9	0.097

2018 Beltzville Reservoir Water Column 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
BZ-6 In-Lake Tower Secchi 3.3	7/31/2018	13:06:00	0.5	25.93	105	8.53	8.46	-103.9	140.9	1.2	0.0	0.093
		13:05:02	5	25.68	105	8.58	8.52	-107.1	140.9	2.3	0.9	0.093
		13:04:15	10	25.5	104	8.54	8.46	-103.7	142.5	2.1	1.5	0.093
		13:03:29	15	25.37	103	8.44	8.2	-88	146.5	1.9	1.8	0.092
		13:01:33	20	23.68	76	6.44	6.85	-6.5	171.9	1.3	2.8	0.092
		12:59:37	25	22.16	58.8	5.12	6.65	5.1	177	2.2	0.0	0.094
		12:58:39	30	21.1	58.5	5.2	6.63	6.5	177.8	3.3	0.0	0.091
		12:57:49	35	20.42	53.9	4.86	6.61	7.9	178.6	4.3	0.1	0.09
		12:56:47	40	19.94	53.6	4.87	6.6	8.2	178.3	4.6	0.0	0.089
		12:55:29	45	19.59	56.8	5.21	6.62	7.2	177.3	4.9	0.4	0.089
		12:52:58	50	18.57	35.9	3.36	6.46	16.3	180	3.7	0.0	0.09
		12:51:59	55	16.94	35.9	3.47	6.46	16.3	180.4	1.9	0.0	0.088
		12:50:46	60	14.09	35.8	3.68	6.46	15.6	180.4	3.1	0.0	0.082
		12:48:38	65	12.4	40.6	4.34	6.48	14.4	179.4	2.5	0.0	0.08
		12:47:19	70	11.3	44.3	4.85	6.52	12.2	177.3	2.2	0.0	0.079
		12:45:20	75	10.43	46.6	5.2	6.53	11.5	175.5	2.2	0.0	0.079
		12:44:32	80	10.03	48	5.42	6.52	11.9	175.5	1.2	0.0	0.078
		12:43:44	85	9.51	50	5.71	6.52	11.7	174.9	1.2	0.0	0.077
		12:42:48	90	9.29	50.3	5.77	6.46	15.1	177.1	1.3	0.0	0.077
		12:41:44	95	8.97	50.3	5.81	6.39	19	179.5	0.2	0.0	0.076
		12:40:33	100	8.74	47.9	5.57	6.26	26.9	185	0.6	0.0	0.076
		12:39:51	105	8.37	46.2	5.42	6.22	28.8	185.6	0.8	0.0	0.076
		12:38:59	110	8	45	5.33	6.2	29.7	185	0.6	0.0	0.075
		12:37:34	115	7.71	44.2	5.27	6.18	31	183.9	2.0	0.0	0.075
		2:07:49	120	7.58	42.2	5.04	6.2	29.7	176.5	2.7	0.0	0.075
		2:06:19	125	7.4	42.6	5.12	6.3	24.1	166.7	2.1	0.0	0.075
BZ-6 In-Lake Tower Secchi 3.1	8/15/2018	12:56:36	0.5	26.62	112	9	8.41	-101.1	153.4	1.2	0.0	0.087
		12:55:41	5	25.99	113	9.18	8.4	-100	155.1	1.9	0.4	0.086
		12:54:39	10	25.5	111	9.11	7.6	-51.9	170.1	2.1	2.2	0.086
		12:53:33	15	24.2	92.6	7.77	6.88	-8.5	187.5	2.7	5.3	0.084
		12:52:08	20	23.38	59	5.03	6.65	5.2	194.3	1.5	4.8	0.09
		12:50:32	25	22.27	34.6	3.01	6.5	14.5	199.3	1.4	1.7	0.091
		12:49:01	30	21.6	40.1	3.53	6.5	14	198.2	0.2	0.4	0.09
		12:47:22	35	21.13	56.1	4.98	6.6	8.5	194.4	0.7	0.0	0.089
		12:46:07	40	20.84	59.3	5.3	6.64	5.9	192.4	3.8	0.0	0.09
		12:44:34	45	20.6	58.6	5.26	6.65	5.3	191	0.9	0.0	0.09
		12:42:37	50	20.46	64.6	5.82	6.68	3.5	189.5	1.0	0.6	0.091
		12:41:22	55	20.32	63.9	5.77	6.68	3.6	189.1	1.5	0.5	0.091
		12:39:47	60	20.13	62.3	5.65	6.65	5.3	190.2	1.5	0.0	0.093
		12:38:55	65	19.89	59.6	5.43	6.63	6.3	190.1	1.0	0.0	0.095
		12:37:46	70	19.43	54.1	4.97	6.59	8.9	190.3	1.6	0.2	0.094
		12:35:52	75	19.04	40.9	3.79	6.52	12.9	191	2.2	0.0	0.093
		12:34:14	80	17.37	28.1	2.69	6.43	17.8	193.4	1.2	0.0	0.091
		12:33:15	85	14.31	26.9	2.75	6.43	17.6	193.3	1.5	0.0	0.085
		12:31:55	90	12.73	29.9	3.17	6.46	15.8	190.7	0.7	0.0	0.083
		12:30:55	95	11.57	32.3	3.51	6.47	15.2	189.9	3.6	0.0	0.081
		12:29:47	100	11.26	32	3.5	6.41	18.6	191.2	0.8	0.0	0.081
		12:28:26	105	10.67	29.5	3.27	6.27	26.1	195.8	0.6	0.0	0.08
		12:27:08	110	10.3	27.5	3.08	6.17	31.9	198.2	0.8	0.0	0.08
		12:25:44	115	9.98	26.4	2.99	5.97	43.5	205.5	1.3	0.0	0.079
		12:24:58	120	9.51	25.1	2.86	5.96	44	202.5	1.1	0.0	0.079
		12:22:16	125	9.11	19.7	2.28	5.88	48.6	207.4	1.5	0.0	0.079

2018 Beltzville Reservoir Water Column 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
BZ-6 In-Lake Tower Secchi 3.30 M	9/6/2018	8:49:33	0.5	26.3	111	8.96	8.81	-124.9	102	1.5	0.0	0.083
		8:48:34	5	26.21	113	9.11	8.87	-128.8	101.4	2.1	1.5	0.083
		8:47:53	10	25.73	115	9.41	9.03	-138.2	98.9	3.2	2.8	0.083
		8:46:43	15	25.02	110	9.05	8.42	-101.1	105.6	3.2	3.7	0.081
		8:44:59	20	23.61	61.2	5.19	6.72	1.6	146.1	2.5	3.0	0.084
		8:43:35	25	22.67	38.9	3.36	6.6	8.5	148.4	0.9	2.6	0.087
		8:42:17	30	21.91	30	2.62	6.56	10.7	148	1.0	1.0	0.088
		8:40:57	35	21.47	34.4	3.04	6.58	9.8	146.5	0.8	0.5	0.088
		8:40:09	40	21.07	40.7	3.62	6.6	8.1	144.7	1.0	0.4	0.087
		8:39:00	45	20.8	51.2	4.58	6.65	5.2	141.5	1.3	0.0	0.087
		8:37:16	50	20.66	42.9	3.85	6.62	6.9	139.5	1.4	0.0	0.088
		8:36:26	55	20.57	38.1	3.43	6.62	7.1	138.1	1.9	0.0	0.089
		8:34:58	60	20.41	47	4.23	6.64	5.6	135.5	0.6	0.0	0.09
		8:33:57	65	20.31	49.3	4.45	6.65	5	133.1	1.0	0.0	0.092
		8:33:10	70	20.24	49	4.44	6.66	5	130.9	1.2	0.0	0.092
		8:32:13	75	20.17	46.4	4.2	6.64	5.8	129.1	1.4	0.0	0.092
		8:31:30	80	20.11	45.3	4.1	6.64	6.1	127.1	1.3	0.0	0.092
		8:30:39	85	19.94	43.8	3.99	6.64	6.1	124.3	1.1	0.0	0.092
		8:29:33	90	19.7	41.5	3.8	6.62	7	121.6	3.0	0.0	0.092
		8:28:49	95	19.64	40.6	3.72	6.62	6.8	118.6	2.2	0.0	0.093
		8:27:35	100	19.39	39.8	3.66	6.59	8.7	116.4	6.4	0.0	0.093
		8:26:34	105	19.2	37.4	3.45	6.58	9.2	112.2	2.0	0.0	0.093
		8:24:15	110	19.05	33.3	3.09	6.44	17.8	110.4	3.4	0.0	0.094
		8:22:31	115	18.67	27.9	2.6	6.25	28.8	110.8	3.9	0.0	0.094
		8:20:56	120	17.99	17.8	1.68	6.08	38.8	106.4	11.2	0.0	0.096
		8:19:56	125	17.7	14	1.33	6.16	33.7	89.3	29.6	4.1	0.097
BZ-7 Upper Lake No-Wake	6/28/2018	9:49:49	0.5	23.57	104	8.81	7.58	-50.1	145.5	3.4	3.9	0.087
		9:49:07	5	23.41	104	8.81	7.57	-49.7	145.5	3.4	4.1	0.087
		9:47:39	10	23.34	101	8.57	7.31	-34	150.1	3.7	5.0	0.087
		9:46:43	15	22.23	94.4	8.22	6.98	-14	156.9	3.2	4.0	0.089
		9:45:52	20	20.4	87.9	7.92	6.87	-8	160.5	4.4	2.7	0.106
		9:45:01	25	19.16	79.2	7.32	6.78	-2.6	161.5	5.4	3.0	0.106
		9:44:20	30	18.38	72	6.76	6.69	3	161.9	4.8	2.7	0.101
		9:42:38	35	17.41	60.9	5.83	6.55	11	159.2	3.9	2.2	0.095
		9:41:47	40	16.27	55.5	5.45	6.5	13.5	156.3	1	2.7	0.092
		9:40:42	45	14.77	51.6	5.23	6.48	14.8	150.8	1.7	2.9	0.089
		9:39:56	50	11.72	49.3	5.35	6.47	15.3	147.3	1.6	2.6	0.083
		9:38:49	55	10.49	50.7	5.66	6.5	12.9	140.3	2.3	2.6	0.08
BZ-7 Upper Lake No-Wake	7/12/2018	9:26:07	0.5	26.77	110	8.79	8.44	-102.8	130.3	1.7	0.0	0.095
		9:25:32	5	26.77	110	8.79	8.39	-99.6	132.1	2.6	1.2	0.095
		9:24:26	10	26.45	110	8.89	7.89	-69.2	140.8	3.5	2.0	0.095
		9:23:36	15	24.56	106	8.86	7.21	-27.9	156.1	2.7	2.0	0.096
		9:22:40	20	22.93	86.4	7.42	6.9	-9.4	164.9	3.2	1.9	0.103
		9:21:29	25	21.75	74.6	6.55	6.76	-1.5	167.8	6.1	1.9	0.113
		9:20:14	30	18.4	43.2	4.06	6.51	13.4	173.8	2.6	1.7	0.096
		9:19:26	35	16.25	39.1	3.84	6.5	13.7	172.9	3.1	3.3	0.092
		9:17:57	40	12.99	40.5	4.27	6.48	14.7	172.8	3.9	3.3	0.085
		9:16:50	45	11.05	42.7	4.7	6.47	14.9	171.3	1.5	2.7	0.081
		9:15:51	50	10.03	44.2	4.98	6.52	12.2	166.4	0.4	2.2	0.08
		9:14:28	55	9.86	46.1	5.22	6.62	6	153.6	2.9	2.3	0.079
		9:13:37	57	9.91	48.6	5.49	6.75	-1.4	154.8	3	1.6	0.079

2018 Beltzville Reservoir Water Column 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
		14:15:59	0.5	26.15	110	8.93	8.75	-121.3	124.6	1.8	1.9	0.082
		14:14:29	5	25.63	108	8.85	8.49	-105.5	129.5	2.0	2.6	0.083
		14:13:38	10	24.52	103	8.58	7.33	-35.1	147.1	2.5	2.7	0.075
BZ-7		14:12:44	15	24.06	91.3	7.68	7.11	-22	150.9	1.7	1.2	0.065
Upper Lake	7/31/2018	14:11:57	20	22.73	88.1	7.6	7.05	-18.5	154.5	2.4	0.1	0.096
No-Wake		14:10:28	25	21.24	89.7	7.96	7.06	-18.8	153.7	4.4	0.5	0.103
		14:09:28	30	20.32	90	8.13	7.05	-18.3	152.7	5.0	0.7	0.103
		14:08:36	35	19.91	90.8	8.27	7.05	-18.3	151.3	5.2	0.1	0.100
		14:07:57	40	19.56	89.4	8.2	7.02	-16.8	150.7	4.6	0.0	0.100
		14:06:36	45	19.11	83.3	7.71	6.94	-12	150.6	6.6	0.1	0.100
		14:05:16	50	18.82	71.6	6.66	6.85	-6.7	149.6	6.2	0.0	0.100
		14:03:14	55	14.88	20.9	2.11	6.41	18.8	163.3	250.6	1.5	0.089
		14:07:58	0.5	26.89	116	9.28	8.69	-118	122.8	1.7	0.0	0.082
		14:07:22	5	26.19	115	9.28	8.51	-106.8	127	2.0	0.2	0.08
		14:06:51	10	25.91	112	9.13	8.19	-87.1	132	1.6	1.7	0.078
		14:06:24	15	25.77	109	8.91	7.66	-55.4	138.9	1.2	2.5	0.074
		14:05:49	20	25.29	104	8.57	7.13	-23.6	151.9	2.0	1.7	0.064
BZ-7	8/15/2018	14:05:04	25	23.96	94.5	7.96	6.96	-13.3	156.3	2.3	0.0	0.052
Upper Lake		14:04:25	30	22.7	87.9	7.58	6.82	-5	164.8	4.6	0.0	0.077
No-Wake		14:02:42	35	20.93	91	8.13	6.59	9.1	181.1	11.1	0.2	0.089
		14:01:47	40	20.52	89.7	8.07	6.58	9.5	180.8	9.4	0.7	0.091
		14:01:08	45	20.45	88.6	7.98	6.6	8.2	178.7	9.0	0.0	0.091
		14:00:30	50	20.1	86.3	7.83	6.62	6.8	177.2	8.0	0.0	0.094
		13:59:41	55	20.12	86.9	7.88	6.71	1.9	174.4	9.9	0.3	0.094
		9:59:03	0.5	27.49	111	8.8	8.54	-109.3	117.4	1.9	0.2	0.085
		9:58:15	5	27.39	111	8.8	8.4	-100.5	120.1	1.5	0.2	0.084
		9:57:12	10	25.87	110	8.94	7.88	-68.3	128.9	1.9	1.6	0.079
		9:56:03	15	24.49	93.3	7.78	7.06	-18.9	148.8	2.1	1.7	0.071
		9:55:04	20	23.05	80.4	6.89	6.8	-3.8	161.1	1.8	0.8	0.085
BZ-7		9:54:12	25	22.02	82.5	7.21	6.7	2.7	168.6	4.4	0.0	0.100
Upper Lake	9/6/2018	9:53:07	30	21.4	81.5	7.21	6.57	10.1	175.7	2.9	0.0	0.104
No-Wake		9:52:13	35	21.16	78.8	7	6.44	17.7	182.3	3.5	0.0	0.103
		9:51:18	40	20.79	74.7	6.69	6.3	26	189.6	2.6	0.0	0.101
		9:50:01	45	20.66	72.7	6.53	6.32	24.9	188.1	2.7	0.0	0.101
		9:49:14	50	20.57	70.8	6.36	6.36	22.8	186	4.7	0.0	0.101
		9:48:24	55	20.53	70.1	6.31	6.43	18.6	182.4	3.8	0.0	0.101
		9:47:10	57	20.53	70.7	6.36	6.62	7	172.7	4.3	0.0	0.101

APPENDIX B

LABORATORY REPORTS

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: JC68915

Sampling Date: 06/28/18

Report to:

Army Corps of Engineers

joseph.m.loeper@usace.army.mil

ATTN: Joseph Loeper

Total number of pages in report: 46

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)

Sections: 1 2 3 4 5

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Sample Summary

USACE-Philadelphia District

Job No: JC68915

Philadelphia District, Reservoir Sampling
Project No: W25PHS81145379

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
JC68915-1	06/28/18	06:45	GW	06/28/18	AQ	Surface Water	BZ-1S
JC68915-1F	06/28/18	06:45	GW	06/28/18	AQ	Surface H2O Filtered	BZ-1S
JC68915-2	06/28/18	11:45	GW	06/28/18	AQ	Surface Water	BZ-2S
JC68915-2F	06/28/18	11:45	GW	06/28/18	AQ	Surface H2O Filtered	BZ-2S
JC68915-3	06/28/18	08:35	GW	06/28/18	AQ	Surface Water	BZ-3S
JC68915-3F	06/28/18	08:35	GW	06/28/18	AQ	Surface H2O Filtered	BZ-3S
JC68915-4	06/28/18	08:35	GW	06/28/18	AQ	Surface Water	BZ-3M
JC68915-4F	06/28/18	08:35	GW	06/28/18	AQ	Surface H2O Filtered	BZ-3M
JC68915-5	06/28/18	08:35	GW	06/28/18	AQ	Surface Water	BZ-3D
JC68915-5F	06/28/18	08:35	GW	06/28/18	AQ	Surface H2O Filtered	BZ-3D
JC68915-6	06/28/18	11:30	GW	06/28/18	AQ	Surface Water	BZ-4S
JC68915-6F	06/28/18	11:30	GW	06/28/18	AQ	Surface H2O Filtered	BZ-4S
JC68915-7	06/28/18	11:10	GW	06/28/18	AQ	Surface Water	BZ-5S

Sample Summary
(continued)

USACE-Philadelphia District

Job No: JC68915

Philadelphia District, Reservoir Sampling
Project No: W25PHS81145379

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
JC68915-7F	06/28/18	11:10	GW	06/28/18	AQ	Surface H2O Filtered	BZ-5S
JC68915-8	06/28/18	08:00	GW	06/28/18	AQ	Surface Water	BZ-6S
JC68915-8F	06/28/18	08:00	GW	06/28/18	AQ	Surface H2O Filtered	BZ-6S
JC68915-9	06/28/18	08:00	GW	06/28/18	AQ	Surface Water	BZ-6M
JC68915-9F	06/28/18	08:00	GW	06/28/18	AQ	Surface H2O Filtered	BZ-6M
JC68915-10	06/28/18	08:00	GW	06/28/18	AQ	Surface Water	BZ-6D
JC68915-10F	06/28/18	08:00	GW	06/28/18	AQ	Surface H2O Filtered	BZ-6D
JC68915-11	06/28/18	09:40	GW	06/28/18	AQ	Surface Water	BZ-7S
JC68915-11F	06/28/18	09:40	GW	06/28/18	AQ	Surface H2O Filtered	BZ-7S
JC68915-12	06/28/18	09:40	GW	06/28/18	AQ	Surface Water	BZ-7M
JC68915-12F	06/28/18	09:40	GW	06/28/18	AQ	Surface H2O Filtered	BZ-7M
JC68915-13	06/28/18	09:40	GW	06/28/18	AQ	Surface Water	BZ-7D
JC68915-13F	06/28/18	09:40	GW	06/28/18	AQ	Surface H2O Filtered	BZ-7D

CASE NARRATIVE / CONFORMANCE SUMMARY

Client:	USACE-Philadelphia District	**Job No**	JC68915
Site:	Philadelphia District, Reservoir Sampling	**Report Date**	7/12/2018 5:29:35 PM

On 06/28/2018, 26 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at SGS North America Inc. at a maximum corrected temperature of 4.8 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. Job Number of JC68915 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:** GP14300

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68841-12MS, JC68841-12DUP were used as the QC samples for Nitrogen, Total Kjeldahl.
- RPD(s) for Duplicate for Nitrogen, Total Kjeldahl are outside control limits for sample GP14300-D1. RPD acceptable due to low duplicate and sample concentrations.

General Chemistry By Method EPA 353.2/LACHAT

Matrix: AQ **Batch ID:** GP14357

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68915-3DUP, JC68915-3MS were used as the QC samples for Nitrogen, Nitrate + Nitrite.

Matrix: AQ **Batch ID:** GP14407

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68915-5DUP, JC68915-5MS, JC68915-9MS were used as the QC samples for Nitrogen, Nitrate + Nitrite.

General Chemistry By Method EPA 365.3

Matrix: AQ **Batch ID:** GP14360

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68915-1DUP, JC68915-1MS were used as the QC samples for Phosphorus, Total.

Matrix: AQ **Batch ID:** GP14385

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68915-1FDUP, JC68915-1FMS were used as the QC samples for Phosphorus, Total.

General Chemistry By Method EPA353.2/SM4500NO2B

Matrix: AQ **Batch ID:** R171216

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68915-1 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171217

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68915-2 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171218

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68915-3 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171219

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68915-4 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171236

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68915-9 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171237

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68915-5 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171238

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68915-6 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171239

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68915-7 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171240

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68915-8 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171241

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68915-10 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171242

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68915-11 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171243

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68915-12 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171244

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC68915-13 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

General Chemistry By Method SM2320 B-11

Matrix: AQ	Batch ID: GN82406

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68915-1DUP were used as the QC samples for Alkalinity, Total as CaCO3.
- JC68915-4 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC68915-9 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC68915-8 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC68915-7 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC68915-6 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC68915-5 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC68915-3 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC68915-2 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC68915-13 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC68915-12 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC68915-11 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC68915-1 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC68915-10 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.

General Chemistry By Method SM2540 C-11

Matrix: AQ	Batch ID: GN82294

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68915-1DUP were used as the QC samples for Solids, Total Dissolved.

Matrix: AQ	Batch ID: GN82324

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69096-1DUP were used as the QC samples for Solids, Total Dissolved.

General Chemistry By Method SM2540 D-11

Matrix: AQ	Batch ID: GN82302

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68824-12DUP were used as the QC samples for Solids, Total Suspended.
- JC68915-3 for Solids, Total Suspended: Reported sample aliquot obtained from filtration of 500 mL of sample. Volume was reduced from 1 liter due to limited volume.
- JC68915-1 for Solids, Total Suspended: Reported sample aliquot obtained from filtration of 900 mL of sample. Volume was reduced from 1 liter due to limited volume.

Matrix: AQ	Batch ID: GN82344

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68925-1DUP were used as the QC samples for Solids, Total Suspended.
- JC68915-12 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.

General Chemistry By Method SM4500NH3 H-11LACHAT

Matrix: AQ **Batch ID:** GP14325

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69096-1DUP, JC69096-1MS, JC69096-1MSD were used as the QC samples for Nitrogen, Ammonia.

General Chemistry By Method SM4500NO2 B-11

Matrix: AQ **Batch ID:** GN82128

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68915-2DUP, JC68915-2MS were used as the QC samples for Nitrogen, Nitrite.

General Chemistry By Method SM5210 B-11

Matrix: AQ **Batch ID:** GP14133

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68840-8DUP were used as the QC samples for BOD, 5 Day.

General Chemistry By Method SM5310 B-11

Matrix: AQ **Batch ID:** GP14287

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68915-1MS, JC68915-1MSD were used as the QC samples for Total Organic Carbon.

Matrix: AQ **Batch ID:** GP14288

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68915-8MS, JC68915-8MSD were used as the QC samples for Total Organic Carbon.

General Chemistry By Method SM9222 B-06

Matrix: AQ **Batch ID:** MB5290

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68915-1DUP were used as the QC samples for Coliform, Total.
- RPD(s) for Duplicate for Coliform, Total are outside control limits for sample MB5290-D1. High RPD due to possible sample nonhomogeneity.
- JC68915-11 for Coliform, Total: Outside of 8 hour holding time, but within 24 hour window accepted by client for this project.
- JC68915-8 for Coliform, Total: Outside of 8 hour holding time, but within 24 hour window accepted by client for this project.
- JC68915-1 for Coliform, Total: Outside of 8 hour holding time, but within 24 hour window accepted by client for this project.
- JC68915-7 for Coliform, Total: Outside of 8 hour holding time, but within 24 hour window accepted by client for this project.
- JC68915-6 for Coliform, Total: Outside of 8 hour holding time, but within 24 hour window accepted by client for this project.
- JC68915-3 for Coliform, Total: Outside of 8 hour holding time, but within 24 hour window accepted by client for this project.
- JC68915-2 for Coliform, Total: Outside of 8 hour holding time, but within 24 hour window accepted by client for this project.

General Chemistry By Method SM9222 D-06

Matrix: AQ **Batch ID:** MB5291

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC68915-1DUP were used as the QC samples for Coliform, Fecal.
- RPD(s) for Duplicate for Coliform, Fecal are outside control limits for sample MB5291-D1. High RPD due to possible sample nonhomogeneity.
- JC68915-2 for Coliform, Fecal: Outside of 8 hour holding time, but within 24 hour window accepted by client for this project.
- JC68915-3 for Coliform, Fecal: Outside of 8 hour holding time, but within 24 hour window accepted by client for this project.
- JC68915-6 for Coliform, Fecal: Outside of 8 hour holding time, but within 24 hour window accepted by client for this project.
- JC68915-8 for Coliform, Fecal: Outside of 8 hour holding time, but within 24 hour window accepted by client for this project.
- JC68915-7 for Coliform, Fecal: Outside of 8 hour holding time, but within 24 hour window accepted by client for this project.
- JC68915-1 for Coliform, Fecal: Outside of 8 hour holding time, but within 24 hour window accepted by client for this project.

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: JC68915
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 06/28/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
JC68915-1	**BZ-1S**					
Alkalinity, Total as CaCO3 [a]		10.9	5.0		mg/l	SM2320 B-11
Coliform, Fecal [b]		84	4		col/100ml	SM9222 D-06
Coliform, Total [c]		104	4		col/100ml	SM9222 B-06
Nitrogen, Nitrate [d]		0.87	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.87	0.10		mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.27	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		44.0	10		mg/l	SM2540 C-11
Total Organic Carbon		1.7	1.0		mg/l	SM5310 B-11
JC68915-1F	**BZ-1S**					
No hits reported in this sample.						
JC68915-2	**BZ-2S**					
Alkalinity, Total as CaCO3 [a]		8.8	5.0		mg/l	SM2320 B-11
Coliform, Fecal [b]		62	2		col/100ml	SM9222 D-06
Coliform, Total [c]		118	2		col/100ml	SM9222 B-06
Nitrogen, Nitrate [d]		0.26	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.26	0.10		mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.22	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		65.0	10		mg/l	SM2540 C-11
Total Organic Carbon		2.4	1.0		mg/l	SM5310 B-11
JC68915-2F	**BZ-2S**					
No hits reported in this sample.						
JC68915-3	**BZ-3S**					
Alkalinity, Total as CaCO3 [a]		10.9	5.0		mg/l	SM2320 B-11
Nitrogen, Nitrate [d]		0.52	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.52	0.10		mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.28	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		57.0	10		mg/l	SM2540 C-11
Total Organic Carbon		1.5	1.0		mg/l	SM5310 B-11
JC68915-3F	**BZ-3S**					
No hits reported in this sample.						

Summary of Hits

Job Number: JC68915
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 06/28/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
JC68915-4	**BZ-3M**					
Alkalinity, Total as CaCO3 [a]		14.6	5.0		mg/l	SM2320 B-11
Nitrogen, Nitrate [d]		0.94	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.94	0.10		mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.24	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		71.4	10		mg/l	SM2540 C-11
Total Organic Carbon		1.8	1.0		mg/l	SM5310 B-11
JC68915-4F	**BZ-3M**					
No hits reported in this sample.						
JC68915-5	**BZ-3D**					
Alkalinity, Total as CaCO3 [a]		6.8	5.0		mg/l	SM2320 B-11
Nitrogen, Nitrate [d]		0.90	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.90	0.10		mg/l	EPA 353.2/LACHAT
Solids, Total Dissolved		68.0	10		mg/l	SM2540 C-11
JC68915-5F	**BZ-3D**					
No hits reported in this sample.						
JC68915-6	**BZ-4S**					
Alkalinity, Total as CaCO3 [a]		8.3	5.0		mg/l	SM2320 B-11
Coliform, Fecal [b]		360	10		col/100ml	SM9222 D-06
Coliform, Total [c]		118	2		col/100ml	SM9222 B-06
Solids, Total Dissolved		40.0	10		mg/l	SM2540 C-11
Solids, Total Suspended		6.5	4.0		mg/l	SM2540 D-11
Total Organic Carbon		1.3	1.0		mg/l	SM5310 B-11
JC68915-6F	**BZ-4S**					
No hits reported in this sample.						
JC68915-7	**BZ-5S**					
Alkalinity, Total as CaCO3 [a]		14.0	5.0		mg/l	SM2320 B-11
Coliform, Fecal [b]		3500	100		col/100ml	SM9222 D-06
Coliform, Total [c]		673	10		col/100ml	SM9222 B-06
Nitrogen, Nitrate [d]		1.1	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		1.1	0.10		mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.34	0.20		mg/l	EPA 351.2/LACHAT

Summary of Hits

Job Number: JC68915
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 06/28/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Solids, Total Dissolved		62.0	10		mg/l	SM2540 C-11
Solids, Total Suspended		22.3	4.0		mg/l	SM2540 D-11
Total Organic Carbon		2.9	1.0		mg/l	SM5310 B-11
JC68915-7F	**BZ-5S**					
No hits reported in this sample.						
JC68915-8	**BZ-6S**					
Alkalinity, Total as CaCO3 [a]		6.8	5.0		mg/l	SM2320 B-11
Coliform, Fecal [b]		4	2		col/100ml	SM9222 D-06
Coliform, Total [c]		7	2		col/100ml	SM9222 B-06
Nitrogen, Nitrate [d]		0.50	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.50	0.10		mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.25	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		83.0	10		mg/l	SM2540 C-11
Total Organic Carbon		1.3	1.0		mg/l	SM5310 B-11
JC68915-8F	**BZ-6S**					
No hits reported in this sample.						
JC68915-9	**BZ-6M**					
Alkalinity, Total as CaCO3 [a]		12.0	5.0		mg/l	SM2320 B-11
Nitrogen, Nitrate [d]		0.91	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.91	0.10		mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.26	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		78.0	10		mg/l	SM2540 C-11
Total Organic Carbon		1.8	1.0		mg/l	SM5310 B-11
JC68915-9F	**BZ-6M**					
No hits reported in this sample.						
JC68915-10	**BZ-6D**					
Alkalinity, Total as CaCO3 [a]		11.4	5.0		mg/l	SM2320 B-11
Nitrogen, Nitrate [d]		0.83	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.83	0.10		mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.42	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		86.0	10		mg/l	SM2540 C-11
Solids, Total Suspended		21.0	4.0		mg/l	SM2540 D-11
Total Organic Carbon		1.2	1.0		mg/l	SM5310 B-11

Summary of Hits

Job Number: JC68915
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 06/28/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
JC68915-10F	**BZ-6D**					
No hits reported in this sample.						
JC68915-11	**BZ-7S**					
Alkalinity, Total as CaCO3 [a]		10.9	5.0		mg/l	SM2320 B-11
Nitrogen, Nitrate [d]		0.51	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.51	0.10		mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.23	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		64.0	10		mg/l	SM2540 C-11
Total Organic Carbon		1.4	1.0		mg/l	SM5310 B-11
JC68915-11F	**BZ-7S**					
No hits reported in this sample.						
JC68915-12	**BZ-7M**					
Alkalinity, Total as CaCO3 [a]		7.8	5.0		mg/l	SM2320 B-11
Nitrogen, Nitrate [d]		0.76	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.76	0.10		mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.28	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		56.0	10		mg/l	SM2540 C-11
Total Organic Carbon		1.2	1.0		mg/l	SM5310 B-11
JC68915-12F	**BZ-7M**					
No hits reported in this sample.						
JC68915-13	**BZ-7D**					
Alkalinity, Total as CaCO3 [a]		12.5	5.0		mg/l	SM2320 B-11
Nitrogen, Nitrate [d]		0.87	0.11		mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.87	0.10		mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.24	0.20		mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		88.0	10		mg/l	SM2540 C-11
Solids, Total Suspended		13.3	4.0		mg/l	SM2540 D-11
Total Organic Carbon		1.0	1.0		mg/l	SM5310 B-11
JC68915-13F	**BZ-7D**					
No hits reported in this sample.						

Summary of Hits

Job Number: JC68915
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 06/28/18

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
Analyte						

(a) Sample was titrated to a final pH of 4.2.
(b) Outside of 8 hour holding time, but within 24 hour window accepted by client for this project.
(c) Outside of 8 hour holding time, but within 24 hour window accepted by client for this project.
(d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID: BZ-1S
Lab Sample ID: JC68915-1
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 06/28/18
Date Received: 06/28/18
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	10.9	5.0	mg/l	1	07/05/18 22:20	CB	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	06/28/18 21:49	SA	SM5210 B-11
Coliform, Fecal [b]	84	4	col/100ml	4	06/28/18 17:25	SA	SM9222 D-06
Coliform, Total [c]	104	4	col/100ml	4	06/28/18 17:24	SA	SM9222 B-06
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/09/18 13:04	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.87	0.11	mg/l	1	07/10/18 14:27	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.87	0.10	mg/l	1	07/10/18 14:27	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	06/28/18 21:18	JO	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.27	0.20	mg/l	1	07/11/18 11:17	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/11/18 09:29	MP	EPA 365.3
Solids, Total Dissolved	44.0	10	mg/l	1	07/03/18 11:00	RC	SM2540 C-11
Solids, Total Suspended [e]	< 4.0	4.0	mg/l	1	07/03/18 13:40	RC	SM2540 D-11
Total Organic Carbon	1.7	1.0	mg/l	1	07/06/18 17:34	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Outside of 8 hour holding time, but within 24 hour window accepted by client for this project.
(c) Outside of 8 hour holding time, but within 24 hour window accepted by client for this project.
(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 limited volume.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BZ-1S		
Lab Sample ID:	JC68915-1F	**Date Sampled:**	06/28/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	06/28/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/12/18 11:03	MP	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID: BZ-2S
Lab Sample ID: JC68915-2
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 06/28/18
Date Received: 06/28/18
Percent Solids: n/a

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	8.8	5.0	mg/l	1	07/05/18 22:20	CB	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	06/28/18 21:51	SA	SM5210 B-11
Coliform, Fecal [b]	62	2	col/100ml	2	06/28/18 17:25	SA	SM9222 D-06
Coliform, Total [c]	118	2	col/100ml	2	06/28/18 17:24	SA	SM9222 B-06
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/09/18 13:05	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.26	0.11	mg/l	1	07/10/18 14:29	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.26	0.10	mg/l	1	07/10/18 14:29	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	06/28/18 21:18	JO	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.22	0.20	mg/l	1	07/11/18 11:17	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/11/18 09:29	MP	EPA 365.3
Solids, Total Dissolved	65.0	10	mg/l	1	07/03/18 11:00	RC	SM2540 C-11
Solids, Total Suspended	< 4.0	4.0	mg/l	1	07/03/18 13:40	RC	SM2540 D-11
Total Organic Carbon	2.4	1.0	mg/l	1	07/06/18 18:31	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Outside of 8 hour holding time, but within 24 hour window accepted by client for this project.
(c) Outside of 8 hour holding time, but within 24 hour window accepted by client for this project.
(d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BZ-2S		
Lab Sample ID:	JC68915-2F	**Date Sampled:**	06/28/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	06/28/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/12/18 11:03	MP	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BZ-3S		
Lab Sample ID:	JC68915-3	**Date Sampled:**	06/28/18
Matrix:	AQ - Surface Water	**Date Received:**	06/28/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	10.9	5.0	mg/l	1	07/05/18 22:20	CB	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	06/28/18 21:52	SA	SM5210 B-11
Coliform, Fecal [b]	0	0	col/100ml	1	06/28/18 17:25	SA	SM9222 D-06
Coliform, Total [c]	< 2	2	col/100ml	1	06/28/18 17:24	SA	SM9222 B-06
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/09/18 13:07	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.52	0.11	mg/l	1	07/10/18 14:30	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.52	0.10	mg/l	1	07/10/18 14:30	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	06/28/18 21:18	JO	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.28	0.20	mg/l	1	07/11/18 11:18	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/11/18 09:29	MP	EPA 365.3
Solids, Total Dissolved	57.0	10	mg/l	1	07/03/18 11:00	RC	SM2540 C-11
Solids, Total Suspended [e]	< 4.0	4.0	mg/l	1	07/03/18 13:40	RC	SM2540 D-11
Total Organic Carbon	1.5	1.0	mg/l	1	07/06/18 18:42	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Outside of 8 hour holding time, but within 24 hour window accepted by client for this project.
(c) Outside of 8 hour holding time, but within 24 hour window accepted by client for this project.
(d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)
(e) Reported sample aliquot obtained from filtration of 500 mL of sample. Volume was reduced from 1 liter due to limited volume.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BZ-3S		
Lab Sample ID:	JC68915-3F	**Date Sampled:**	06/28/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	06/28/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/12/18 11:03	MP	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BZ-3M		
Lab Sample ID:	JC68915-4	**Date Sampled:**	06/28/18
Matrix:	AQ - Surface Water	**Date Received:**	06/28/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	14.6	5.0	mg/l	1	07/05/18 22:20	CB	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	06/28/18 21:54	SA	SM5210 B-11
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/09/18 13:08	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [b]	0.94	0.11	mg/l	1	07/10/18 14:31	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.94	0.10	mg/l	1	07/10/18 14:31	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	06/28/18 21:18	JO	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.24	0.20	mg/l	1	07/11/18 11:19	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/11/18 09:29	MP	EPA 365.3
Solids, Total Dissolved	71.4	10	mg/l	1	07/03/18 11:00	RC	SM2540 C-11
Solids, Total Suspended	< 4.0	4.0	mg/l	1	07/04/18 10:35	RC	SM2540 D-11
Total Organic Carbon	1.8	1.0	mg/l	1	07/06/18 18:53	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BZ-3M		
Lab Sample ID:	JC68915-4F	**Date Sampled:**	06/28/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	06/28/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/12/18 11:03	MP	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BZ-3D		
Lab Sample ID:	JC68915-5	**Date Sampled:**	06/28/18
Matrix:	AQ - Surface Water	**Date Received:**	06/28/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	6.8	5.0	mg/l	1	07/05/18 22:20	CB	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	06/28/18 21:56	SA	SM5210 B-11
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/09/18 13:12	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [b]	0.90	0.11	mg/l	1	07/12/18 14:16	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.90	0.10	mg/l	1	07/12/18 14:16	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	06/28/18 21:18	JO	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	< 0.20	0.20	mg/l	1	07/11/18 11:22	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/11/18 09:29	MP	EPA 365.3
Solids, Total Dissolved	68.0	10	mg/l	1	07/03/18 11:00	RC	SM2540 C-11
Solids, Total Suspended	< 4.0	4.0	mg/l	1	07/04/18 10:35	RC	SM2540 D-11
Total Organic Carbon	< 1.0	1.0	mg/l	1	07/06/18 19:06	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BZ-3D		
Lab Sample ID:	JC68915-5F	**Date Sampled:**	06/28/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	06/28/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/12/18 11:03	MP	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BZ-4S		
Lab Sample ID:	JC68915-6	**Date Sampled:**	06/28/18
Matrix:	AQ - Surface Water	**Date Received:**	06/28/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	8.3	5.0	mg/l	1	07/05/18 22:20	CB	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	06/28/18 21:58	SA	SM5210 B-11
Coliform, Fecal [b]	360	10	col/100ml	10	06/28/18 17:25	SA	SM9222 D-06
Coliform, Total [c]	118	2	col/100ml	2	06/28/18 17:24	SA	SM9222 B-06
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/09/18 13:14	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	< 0.11	0.11	mg/l	1	07/12/18 14:17	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	< 0.10	0.10	mg/l	1	07/12/18 14:17	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	06/28/18 21:18	JO	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	< 0.20	0.20	mg/l	1	07/11/18 11:22	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/11/18 09:29	MP	EPA 365.3
Solids, Total Dissolved	40.0	10	mg/l	1	07/03/18 11:00	RC	SM2540 C-11
Solids, Total Suspended	6.5	4.0	mg/l	1	07/04/18 10:35	RC	SM2540 D-11
Total Organic Carbon	1.3	1.0	mg/l	1	07/06/18 19:15	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Outside of 8 hour holding time, but within 24 hour window accepted by client for this project.
(c) Outside of 8 hour holding time, but within 24 hour window accepted by client for this project.
(d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BZ-4S		
Lab Sample ID:	JC68915-6F	**Date Sampled:**	06/28/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	06/28/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/12/18 11:03	MP	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BZ-5S		
Lab Sample ID:	JC68915-7	**Date Sampled:**	06/28/18
Matrix:	AQ - Surface Water	**Date Received:**	06/28/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	14.0	5.0	mg/l	1	07/05/18 22:20	CB	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	06/28/18 22:00	SA	SM5210 B-11
Coliform, Fecal [b]	3500	100	col/100ml	100	06/28/18 17:25	SA	SM9222 D-06
Coliform, Total [c]	673	10	col/100ml	10	06/28/18 17:24	SA	SM9222 B-06
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/09/18 13:15	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	1.1	0.11	mg/l	1	07/12/18 14:19	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	1.1	0.10	mg/l	1	07/12/18 14:19	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	06/28/18 21:25	JO	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.34	0.20	mg/l	1	07/11/18 11:23	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/11/18 09:58	MP	EPA 365.3
Solids, Total Dissolved	62.0	10	mg/l	1	07/03/18 15:40	RI	SM2540 C-11
Solids, Total Suspended	22.3	4.0	mg/l	1	07/04/18 10:35	RC	SM2540 D-11
Total Organic Carbon	2.9	1.0	mg/l	1	07/06/18 19:34	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Outside of 8 hour holding time, but within 24 hour window accepted by client for this project.
(c) Outside of 8 hour holding time, but within 24 hour window accepted by client for this project.
(d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BZ-5S		
Lab Sample ID:	JC68915-7F	**Date Sampled:**	06/28/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	06/28/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/12/18 11:19	MP	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BZ-6S		
Lab Sample ID:	JC68915-8	**Date Sampled:**	06/28/18
Matrix:	AQ - Surface Water	**Date Received:**	06/28/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	6.8	5.0	mg/l	1	07/05/18 22:20	CB	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	06/28/18 22:02	SA	SM5210 B-11
Coliform, Fecal [b]	4	2	col/100ml	2	06/28/18 17:25	SA	SM9222 D-06
Coliform, Total [c]	7	2	col/100ml	2	06/28/18 17:24	SA	SM9222 B-06
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/09/18 13:17	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.50	0.11	mg/l	1	07/12/18 14:20	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.50	0.10	mg/l	1	07/12/18 14:20	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	06/28/18 21:25	JO	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.25	0.20	mg/l	1	07/11/18 11:24	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/11/18 09:58	MP	EPA 365.3
Solids, Total Dissolved	83.0	10	mg/l	1	07/03/18 15:40	RI	SM2540 C-11
Solids, Total Suspended	< 4.0	4.0	mg/l	1	07/04/18 10:35	RC	SM2540 D-11
Total Organic Carbon	1.3	1.0	mg/l	1	07/06/18 20:42	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Outside of 8 hour holding time, but within 24 hour window accepted by client for this project.
(c) Outside of 8 hour holding time, but within 24 hour window accepted by client for this project.
(d) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BZ-6S		
Lab Sample ID:	JC68915-8F	**Date Sampled:**	06/28/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	06/28/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/12/18 11:19	MP	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BZ-6M		
Lab Sample ID:	JC68915-9	**Date Sampled:**	06/28/18
Matrix:	AQ - Surface Water	**Date Received:**	06/28/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	12.0	5.0	mg/l	1	07/05/18 22:20	CB	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	06/28/18 22:04	SA	SM5210 B-11
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/09/18 13:18	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [b]	0.91	0.11	mg/l	1	07/12/18 14:21	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.91	0.10	mg/l	1	07/12/18 14:21	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	06/28/18 21:25	JO	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.26	0.20	mg/l	1	07/11/18 11:25	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/11/18 09:58	MP	EPA 365.3
Solids, Total Dissolved	78.0	10	mg/l	1	07/03/18 15:40	RI	SM2540 C-11
Solids, Total Suspended	< 4.0	4.0	mg/l	1	07/04/18 10:35	RC	SM2540 D-11
Total Organic Carbon	1.8	1.0	mg/l	1	07/06/18 21:15	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BZ-6M		
Lab Sample ID:	JC68915-9F	**Date Sampled:**	06/28/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	06/28/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/12/18 11:19	MP	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BZ-6D		
Lab Sample ID:	JC68915-10	**Date Sampled:**	06/28/18
Matrix:	AQ - Surface Water	**Date Received:**	06/28/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	11.4	5.0	mg/l	1	07/05/18 22:20	CB	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	06/28/18 22:06	SA	SM5210 B-11
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/09/18 13:20	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [b]	0.83	0.11	mg/l	1	07/12/18 14:24	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.83	0.10	mg/l	1	07/12/18 14:24	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	06/28/18 21:25	JO	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.42	0.20	mg/l	1	07/11/18 11:26	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/11/18 09:58	MP	EPA 365.3
Solids, Total Dissolved	86.0	10	mg/l	1	07/03/18 15:40	RI	SM2540 C-11
Solids, Total Suspended	21.0	4.0	mg/l	1	07/04/18 10:35	RC	SM2540 D-11
Total Organic Carbon	1.2	1.0	mg/l	1	07/06/18 21:26	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BZ-6D		
Lab Sample ID:	JC68915-10F	**Date Sampled:**	06/28/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	06/28/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/12/18 11:19	MP	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BZ-7S		
Lab Sample ID:	JC68915-11	**Date Sampled:**	06/28/18
Matrix:	AQ - Surface Water	**Date Received:**	06/28/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	10.9	5.0	mg/l	1	07/05/18 22:20	CB	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	06/28/18 22:08	SA	SM5210 B-11
Coliform, Fecal	0	0	col/100ml	1	06/28/18 17:25	SA	SM9222 D-06
Coliform, Total [b]	< 2	2	col/100ml	1	06/28/18 17:24	SA	SM9222 B-06
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/09/18 13:21	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.51	0.11	mg/l	1	07/12/18 14:25	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.51	0.10	mg/l	1	07/12/18 14:25	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	06/28/18 21:25	JO	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.23	0.20	mg/l	1	07/11/18 11:27	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/11/18 09:58	MP	EPA 365.3
Solids, Total Dissolved	64.0	10	mg/l	1	07/03/18 15:40	RI	SM2540 C-11
Solids, Total Suspended	< 4.0	4.0	mg/l	1	07/04/18 10:35	RC	SM2540 D-11
Total Organic Carbon	1.4	1.0	mg/l	1	07/06/18 21:38	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Outside of 8 hour holding time, but within 24 hour window accepted by client for this project.
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BZ-7S		
Lab Sample ID:	JC68915-11F	**Date Sampled:**	06/28/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	06/28/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/12/18 11:19	MP	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BZ-7M		
Lab Sample ID:	JC68915-12	**Date Sampled:**	06/28/18
Matrix:	AQ - Surface Water	**Date Received:**	06/28/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	7.8	5.0	mg/l	1	07/05/18 22:20	CB	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	06/28/18 22:10	SA	SM5210 B-11
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/09/18 13:23	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [b]	0.76	0.11	mg/l	1	07/12/18 14:26	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.76	0.10	mg/l	1	07/12/18 14:26	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	06/28/18 21:25	JO	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.28	0.20	mg/l	1	07/11/18 11:27	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/11/18 09:58	MP	EPA 365.3
Solids, Total Dissolved	56.0	10	mg/l	1	07/03/18 15:40	RI	SM2540 C-11
Solids, Total Suspended [c]	< 4.0	4.0	mg/l	1	07/04/18 10:35	RC	SM2540 D-11
Total Organic Carbon	1.2	1.0	mg/l	1	07/06/18 21:49	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)
(c) Reported sample aliquot obtained from filtration of 900 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BZ-7M		
Lab Sample ID:	JC68915-12F	**Date Sampled:**	06/28/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	06/28/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/12/18 11:19	MP	EPA 365.3

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BZ-7D		
Lab Sample ID:	JC68915-13	**Date Sampled:**	06/28/18
Matrix:	AQ - Surface Water	**Date Received:**	06/28/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	12.5	5.0	mg/l	1	07/05/18 22:20	CB	SM2320 B-11
BOD, 5 Day	< 3.4	3.4	mg/l	1	06/28/18 22:12	SA	SM5210 B-11
Nitrogen, Ammonia	< 0.20	0.20	mg/l	1	07/09/18 13:24	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [b]	0.87	0.11	mg/l	1	07/12/18 14:27	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.87	0.10	mg/l	1	07/12/18 14:27	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	< 0.010	0.010	mg/l	1	06/28/18 21:25	JO	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.24	0.20	mg/l	1	07/11/18 11:28	BM	EPA 351.2/LACHAT
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/11/18 09:58	MP	EPA 365.3
Solids, Total Dissolved	88.0	10	mg/l	1	07/03/18 15:40	RI	SM2540 C-11
Solids, Total Suspended	13.3	4.0	mg/l	1	07/04/18 10:35	RC	SM2540 D-11
Total Organic Carbon	1.0	1.0	mg/l	1	07/06/18 22:00	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	BZ-7D		
Lab Sample ID:	JC68915-13F	**Date Sampled:**	06/28/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	06/28/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Phosphorus, Total	< 0.050	0.050	mg/l	1	07/12/18 11:19	MP	EPA 365.3

RL = Reporting Limit

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

SW

PAGE 1 OF 2

FED-EX Tracking #: IMPULSE | Bottle Order Control #: PD-061418.199
SGS Quote #: | SGS Job #: JC68915

Client / Reporting Information

Company Name: USACE - Phila, District
Street Address: 100 Penn Sq. East
City: Phila. State: PA Zip: 19107
Project Contact: Joe Loeper - USACE E-mail:
Phone #: Fax #:
Sampler(s) Name(s): Gregory Wacik Phone #: 610-597-9780

Project Information

Project Name: USACE - Beltzville Reservoir
Street: 2145 Pohopoco Drive
City: Lehighton State: PA
Project #: #PD-061418-199
Client Purchase Order #:
Project Manager:

Billing Information (if different from Report to)

Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis (see TEST CODE sheet)

Matrix Codes: 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

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	MA25203	Alk, Amm, BOD, NO3O, TDS, TSS	Toc, TKN, TP04	TCF, FCF	Total Phosphorus (from TKN and NO3O bottle)	LAB USE ONLY
1F	BZ-1S		6/28/18	0645	CW	SW	10	X			X					X	X	X	X	X	B7
2F	BZ-2S			1145	MW	SW	10	X			X					X	X	X	X	X	G5973
3F	BZ-3S			835	MW	SW	10	X			X					X	X	X	X	X	B4
4F	BZ-3M			835	MW	SW	8	X			X						X	X		X	19M1
5F	BZ-3D			835	MW	SW	8	X			X						X	X		X	G37
6F	BZ-4S			1130	MW	SW	10	X			X					X	X	X	X	X	
7F	BZ-5S			1110	MW	SW	10	X			X					X	X	X	X	X	
8F	BZ-6S			800	MW	SW	10	X			X					X	X	X	X	X	
9F	BZ-6M			800	MW	SW	8	X			X						X	X		X	
10F	BZ-6D			800	MW	SW	8	X			X						X	X		X	

Turnaround Time (Business days)

Approved by (SGS Project Manager)/Date:

- [ ] Std. 10 Business Days
- [ ] 5 Day RUSH
- [ ] 3 Day RUSH
- [ ] 2 Day RUSH
- [ ] 1 Day RUSH
- [ ] other

Emergency & Rush T/A data available via LabLink

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NJ Data of Known Quality Protocol Reporting
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [ ] EDD Format
- [ ] Other

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

INITIAL ASESSMENT 2B (M)

LABEL VERIFICATION

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:	Date/Time:	Received By:	Relinquished By:	Date Time:	Received By:
1		6/28/18 1230			6/28/18 1425	
2						
3						
4						
5						

Custody Seal # [ ] Intact [ ] Not intact | Preserved where applicable | On Ice | Cooler Temp: 4.8, 3.0, 3.9, 4.1, 4.7

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions

5.1 5

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 #: JC68915

Client / Reporting Information

Company Name: USACE-Phila District
Street Address: 100 Penn Sq. East
City: Phila. State: PA Zip: 19107
Project Contact: Joe Loeper - USACE E-mail:
Phone #: Fax #:
Sampler(s) Name(s): Gregory Wacik Phone #: 610-597-9780

Project Information

Project Name: USACE - Beltzville Reservoir
Street: 2145 Pohopoco Dr.
City: Lehighton, State: PA
Project #: #PD-061418-199
Client Purchase Order #:
Project Manager:

Billing Information (if different from Report to)
Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis (see TEST CODE sheet): N0353203; Alk, AMN, BOD, XN030, TPS, TSS; TOC, TKN, TP04; TCE, FCE; Total Phosphorus (and XN030 from TKN bottle)

Matrix Codes: 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

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Date	Time	Sampled by	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	N0353203	Alk, AMN, BOD, XN030, TPS, TSS	TOC, TKN, TP04	TCE, FCE	Total Phosphorus (and XN030 from TKN bottle)	LAB USE ONLY
11F	BZ-7S		6/28/18	0940	[signature]	SW	10	X			X					X	X	X	X	X	
12F	BZ-7M		6/28/18	0940	[signature]	SW	8	X			X						X	X		X	
13F	BZ-7D		6/28/18	0940	[signature]	SW	8	X			X						X	X		X	

Turnaround Time (Business days)
- [ ] Std. 10 Business Days
- [ ] 5 Day RUSH
- [ ] 3 Day RUSH
- [ ] 2 Day RUSH
- [ ] 1 Day RUSH
- [ ] other

Emergency & Rush T/A data available via LabLink

Approved by (SGS Project Manager)/Date:

Data Deliverable Information
- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NJ Data of Known Quality Protocol Reporting
- [ ] NYASP Category A
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- [ ] State Forms
- [ ] EDD Format
- [ ] Other

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

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:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1 [signature]	6/28/18 1230	1 [signature]	2 [signature]	6/28/18 1425	2 [signature]
3 Relinquished by Sampler:	Date Time:	3 Received By:	4 Relinquished By:	Date Time:	4 Received By:
5 Relinquished by:	Date Time:	5 Received By:	Custody Seal #	Intact / Not intact	Preserved where applicable; On Ice; Cooler Temp

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions

JC68915: Chain of Custody
Page 2 of 4

SGS Sample Receipt Summary

Job Number: JC68915 **Client:** USACE-PHILADELPHIA DISTRICT **Project:** PHILADELPHIA DISTRICT, RESERVOIR SAMPL

Date / Time Received: 6/28/2018 2:25:00 PM **Delivery Method:** Other Courier **Airbill #'s:**

Cooler Temps (Raw Measured) °C: Cooler 1: (4.8); Cooler 2: (3.0); Cooler 3: (3.9); Cooler 4: (4.1); Cooler 5: (4.7);

Cooler Temps (Corrected) °C: Cooler 1: (4.8); Cooler 2: (3.0); Cooler 3: (3.9); Cooler 4: (4.1); Cooler 5: (4.7);

Cooler Security	Y or N		Y or N
1. Custody Seals Present:	☑ ☐	3. COC Present:	☑ ☐
2. Custody Seals Intact:	☑ ☐	4. Smpl Dates/Time OK	☑ ☐

Cooler Temperature	Y or N
1. Temp criteria achieved:	☑ ☐
2. Cooler temp verification:	IR Gun
3. Cooler media:	Ice (Bag)
4. No. Coolers:	5

Quality Control Preservation	Y or N	N/A
1. Trip Blank present / cooler:	☐ ☑	☐
2. Trip Blank listed on COC:	☐ ☑	☐
3. Samples preserved properly:	☑ ☐	
4. VOCs headspace free:	☐ ☐	☑

Sample Integrity - Documentation	Y or N
1. Sample labels present on bottles:	☑ ☐
2. Container labeling complete:	☑ ☐
3. Sample container label / COC agree:	☑ ☐

Sample Integrity - Condition	Y or N
1. Sample recvd within HT:	☑ ☐
2. All containers accounted for:	☑ ☐
3. Condition of sample:	Intact

Sample Integrity - Instructions	Y or N	N/A
1. Analysis requested is clear:	☑ ☐	
2. Bottles received for unspecified tests	☐ ☑	
3. Sufficient volume recvd for analysis:	☑ ☐	
4. Compositing instructions clear:	☐ ☐	☑
5. Filtering instructions clear:	☐ ☐	☑

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 TCF/FCF rec' in hold but processed out of hold.
3) For all other samples requesting TCF/FCF, lab to notify PM whether samples were set up within hold or not.

SM089-02 Rev. Date 12/1/16

Responded to by: Tammy McCloskey Response Date: 6/28/18

Proceed as noted

JC68915: 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: JC69748

Sampling Date: 07/12/18

Report to:

Army Corps of Engineers

joseph.m.loeper@usace.army.mil

ATTN: Joseph Loeper

Total number of pages in report: 45

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)

Sections: 1 2 3 4 5

Table of Contents

Sample Summary

USACE-Philadelphia District

Job No: JC69748

Philadelphia District, Reservoir Sampling
Project No: W25PHS81145379

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
JC69748-1	07/12/18	11:20	GW	07/12/18	AQ	Surface Water	BZ-1S
JC69748-1F	07/12/18	11:20	GW	07/12/18	AQ	Surface H2O Filtered	BZ-1S
JC69748-2	07/12/18	11:10	GW	07/12/18	AQ	Surface Water	BZ-2S
JC69748-2F	07/12/18	11:10	GW	07/12/18	AQ	Surface H2O Filtered	BZ-2S
JC69748-3	07/12/18	08:25	GW	07/12/18	AQ	Surface Water	BZ-3S
JC69748-3F	07/12/18	08:25	GW	07/12/18	AQ	Surface H2O Filtered	BZ-3S
JC69748-4	07/12/18	08:25	GW	07/12/18	AQ	Surface Water	BZ-3M
JC69748-4F	07/12/18	08:25	GW	07/12/18	AQ	Surface H2O Filtered	BZ-3M
JC69748-5	07/12/18	08:25	GW	07/12/18	AQ	Surface Water	BZ-3D
JC69748-5F	07/12/18	08:25	GW	07/12/18	AQ	Surface H2O Filtered	BZ-3D
JC69748-6	07/12/18	10:50	GW	07/12/18	AQ	Surface Water	BZ-4S
JC69748-6F	07/12/18	10:50	GW	07/12/18	AQ	Surface H2O Filtered	BZ-4S
JC69748-7	07/12/18	10:20	GW	07/12/18	AQ	Surface Water	BZ-5S

Sample Summary
(continued)

USACE-Philadelphia District

Job No: JC69748

Philadelphia District, Reservoir Sampling
Project No: W25PHS81145379

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
JC69748-7F	07/12/18	10:20	GW	07/12/18	AQ	Surface H2O Filtered	BZ-5S
JC69748-8	07/12/18	07:45	GW	07/12/18	AQ	Surface Water	BZ-6S
JC69748-8F	07/12/18	07:45	GW	07/12/18	AQ	Surface H2O Filtered	BZ-6S
JC69748-9	07/12/18	07:45	GW	07/12/18	AQ	Surface Water	BZ-6M
JC69748-9F	07/12/18	07:45	GW	07/12/18	AQ	Surface H2O Filtered	BZ-6M
JC69748-10	07/12/18	07:45	GW	07/12/18	AQ	Surface Water	BZ-6D
JC69748-10F	07/12/18	07:45	GW	07/12/18	AQ	Surface H2O Filtered	BZ-6D
JC69748-11	07/12/18	09:30	GW	07/12/18	AQ	Surface Water	BZ-7S
JC69748-11F	07/12/18	09:30	GW	07/12/18	AQ	Surface H2O Filtered	BZ-7S
JC69748-12	07/12/18	09:30	GW	07/12/18	AQ	Surface Water	BZ-7M
JC69748-12F	07/12/18	09:30	GW	07/12/18	AQ	Surface H2O Filtered	BZ-7M
JC69748-13	07/12/18	09:30	GW	07/12/18	AQ	Surface Water	BZ-7D
JC69748-13F	07/12/18	09:30	GW	07/12/18	AQ	Surface H2O Filtered	BZ-7D

CASE NARRATIVE / CONFORMANCE SUMMARY

Client:	USACE-Philadelphia District	**Job No**	JC69748
Site:	Philadelphia District, Reservoir Sampling	**Report Date**	7/25/2018 9:50:08 AM

On 07/12/2018, 26 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 JC69748 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:** GP14672

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69748-2DUP, JC69748-2MS were used as the QC samples for Nitrogen, Total Kjeldahl.

General Chemistry By Method EPA 353.2/LACHAT

Matrix: AQ **Batch ID:** GP14644

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69748-2DUP, JC69748-2MS, JC69748-3MS 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.

Matrix: AQ **Batch ID:** GP14645

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69748-13DUP, JC69748-13MS were used as the QC samples for Nitrogen, Nitrate + Nitrite.

General Chemistry By Method EPA 365.3

Matrix: AQ **Batch ID:** GP14660

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69748-1DUP, JC69748-1MS were used as the QC samples for Phosphorus, Total.

Matrix: AQ **Batch ID:** GP14676

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69748-1FDUP, JC69748-1FMS were used as the QC samples for Phosphorus, Total.

General Chemistry By Method EPA353.2/SM4500NO2B

Matrix: AQ **Batch ID:** R171493

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69748-11 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171494

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69748-12 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171495

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69748-13 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171508

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69748-7 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171509

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69748-8 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171510

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69748-9 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171511

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69748-10 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171524

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69748-2 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171568

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69748-1 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171569

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69748-3 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171571

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69748-4 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171572

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69748-5 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R171573

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC69748-6 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

General Chemistry By Method SM2320 B-11

Matrix: AQ	Batch ID: GN83108

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69920-3DUP were used as the QC samples for Alkalinity, Total as CaCO3.
- JC69748-12 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC69748-11 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC69748-1 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC69748-2 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC69748-3 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC69748-5 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC69748-6 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC69748-4 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC69748-13 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC69748-7 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC69748-8 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC69748-10 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC69748-9 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.

General Chemistry By Method SM2540 C-11

Matrix: AQ	Batch ID: GN82889

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69467-1DUP were used as the QC samples for Solids, Total Dissolved.

Matrix: AQ	Batch ID: GN82957

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69748-3DUP were used as the QC samples for Solids, Total Dissolved.

General Chemistry By Method SM2540 D-11

Matrix: AQ	Batch ID: GN82948

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69748-3DUP were used as the QC samples for Solids, Total Suspended.
- JC69748-11 for Solids, Total Suspended: Reported sample aliquot obtained from filtration of 500 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.

Matrix: AQ	Batch ID: GN82984

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69748-1DUP were used as the QC samples for Solids, Total Suspended.

General Chemistry By Method SM4500NH3 H-11LACHAT

Matrix: AQ	Batch ID: GP14600

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69748-2DUP, JC69748-2MS, JC69748-2MSD were used as the QC samples for Nitrogen, Ammonia.

General Chemistry By Method SM4500NO2 B-11

Matrix: AQ	Batch ID: GN82724

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69748-2DUP, JC69748-2MS were used as the QC samples for Nitrogen, Nitrite.

General Chemistry By Method SM5210 B-11

Matrix: AQ	Batch ID: GP14429

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69712-1DUP were used as the QC samples for BOD, 5 Day.

Matrix: AQ	Batch ID: GP14459

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69748-7DUP were used as the QC samples for BOD, 5 Day.

General Chemistry By Method SM5310 B-11

Matrix: AQ	Batch ID: GP14539

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69467-12MS, JC69467-12MSD were used as the QC samples for Total Organic Carbon.

Matrix: AQ	Batch ID: GP14540

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69748-1MS, JC69748-1MSD were used as the QC samples for Total Organic Carbon.

General Chemistry By Method SM9222 B-06

Matrix: AQ	Batch ID: MB5304

- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69748-11DUP were used as the QC samples for Coliform, Total.
- JC69748-8 for Coliform, Total: Analysis done out of holding time.
- JC69748-3 for Coliform, Total: Analysis done out of holding time.
- MB5304-MB1 for Coliform, Total: High RPD due to possible sample nonhomogeneity.

General Chemistry By Method SM9222 D-06

Matrix: AQ **Batch ID:** MB5305

- All method blanks for this batch meet method specific criteria.
- Sample(s) JC69748-11DUP were used as the QC samples for Coliform, Fecal.
- JC69748-8 for Coliform, Fecal: Analysis done out of holding time.
- JC69748-3 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: JC69748
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 07/12/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
JC69748-1	**BZ-1S**					
Alkalinity, Total as CaCO3 [a]		10.9	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal		64	4	[b]	col/100ml	SM9222 D-06
Coliform, Total		82	2	[b]	col/100ml	SM9222 B-06
Nitrogen, Nitrate [c]		0.76	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.78	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		0.28	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		228	10	4.0	mg/l	SM2540 C-11
Total Organic Carbon		1.2	1.0	1.0	mg/l	SM5310 B-11
JC69748-1F	**BZ-1S**					
No hits reported in this sample.						
JC69748-2	**BZ-2S**					
Alkalinity, Total as CaCO3 [a]		4.7 J	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal		12	2	[b]	col/100ml	SM9222 D-06
Coliform, Total		90	2	[b]	col/100ml	SM9222 B-06
Nitrogen, Nitrate [c]		0.24	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.24	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.19 J	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		4.0 J	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		1.9 J	4.0	1.0	mg/l	SM2540 D-11
Total Organic Carbon		1.1	1.0	1.0	mg/l	SM5310 B-11
JC69748-2F	**BZ-2S**					
No hits reported in this sample.						
JC69748-3	**BZ-3S**					
Alkalinity, Total as CaCO3 [a]		9.4	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal [d]		2	2	[b]	col/100ml	SM9222 D-06
Nitrogen, Nitrate [c]		0.39	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.40	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		0.21	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		58.8	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		2.2 J	4.0	1.0	mg/l	SM2540 D-11
Total Organic Carbon		2.0	1.0	1.0	mg/l	SM5310 B-11

Summary of Hits

Job Number: JC69748
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 07/12/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
JC69748-3F	**BZ-3S**					
No hits reported in this sample.						
JC69748-4	**BZ-3M**					
Alkalinity, Total as CaCO3 [a]		10.4	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate [c]		0.82	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.82	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.22	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		64.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		1.3 J	4.0	1.0	mg/l	SM2540 D-11
Total Organic Carbon		1.4	1.0	1.0	mg/l	SM5310 B-11
JC69748-4F	**BZ-3M**					
No hits reported in this sample.						
JC69748-5	**BZ-3D**					
Alkalinity, Total as CaCO3 [a]		10.9	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate [c]		0.82	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.82	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.21	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		73.3	10	4.0	mg/l	SM2540 C-11
Total Organic Carbon		1.4	1.0	1.0	mg/l	SM5310 B-11
JC69748-5F	**BZ-3D**					
No hits reported in this sample.						
JC69748-6	**BZ-4S**					
Alkalinity, Total as CaCO3 [a]		4.7 J	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal		20	2	[b]	col/100ml	SM9222 D-06
Coliform, Total		22	2	[b]	col/100ml	SM9222 B-06
Nitrogen, Total Kjeldahl		0.26	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		27.5	10	4.0	mg/l	SM2540 C-11
Total Organic Carbon		1.3	1.0	1.0	mg/l	SM5310 B-11
JC69748-6F	**BZ-4S**					
No hits reported in this sample.						

Summary of Hits

Job Number: JC69748
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 07/12/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
JC69748-7	**BZ-5S**					
Alkalinity, Total as CaCO3 [a]		7.8	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal		210	2	[b]	col/100ml	SM9222 D-06
Coliform, Total		530	10	[b]	col/100ml	SM9222 B-06
Nitrogen, Nitrate [c]		1.3	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		1.3	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.28	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		4.3	4.0	1.0	mg/l	SM2540 D-11
JC69748-7F	**BZ-5S**					
No hits reported in this sample.						
JC69748-8	**BZ-6S**					
Alkalinity, Total as CaCO3 [a]		11.4	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal [d]		5	2	[b]	col/100ml	SM9222 D-06
Nitrogen, Nitrate [c]		0.42	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.43	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite		0.0060 J	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl		0.20	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		52.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		1.3 J	4.0	1.0	mg/l	SM2540 D-11
Total Organic Carbon		1.3	1.0	1.0	mg/l	SM5310 B-11
JC69748-8F	**BZ-6S**					
No hits reported in this sample.						
JC69748-9	**BZ-6M**					
Alkalinity, Total as CaCO3 [a]		10.4	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate [c]		0.87	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.87	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.19 J	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		58.0	10	4.0	mg/l	SM2540 C-11
JC69748-9F	**BZ-6M**					
No hits reported in this sample.						

Summary of Hits

Job Number: JC69748
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 07/12/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
JC69748-10	**BZ-6D**					
Alkalinity, Total as CaCO3 [a]		13.5	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate [c]		0.85	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.85	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.53	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		90.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		22.5	4.0	1.0	mg/l	SM2540 D-11
Total Organic Carbon		1.0	1.0	1.0	mg/l	SM5310 B-11
JC69748-10F	**BZ-6D**					
No hits reported in this sample.						
JC69748-11	**BZ-7S**					
Coliform, Total		4	4	[b]	col/100ml	SM9222 B-06
Nitrogen, Nitrate [c]		0.40	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.40	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.27	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		50.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended [e]		1.6 J	4.0	1.0	mg/l	SM2540 D-11
Total Organic Carbon		1.3	1.0	1.0	mg/l	SM5310 B-11
JC69748-11F	**BZ-7S**					
No hits reported in this sample.						
JC69748-12	**BZ-7M**					
Alkalinity, Total as CaCO3 [a]		12.0	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate [c]		0.87	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.87	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.34	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		50.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		2.5 J	4.0	1.0	mg/l	SM2540 D-11
JC69748-12F	**BZ-7M**					
No hits reported in this sample.						
JC69748-13	**BZ-7D**					
Alkalinity, Total as CaCO3 [a]		12.0	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate [c]		0.79	0.11	0.11	mg/l	EPA353.2/SM4500NO2B

Summary of Hits

Job Number: JC69748
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 07/12/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
Nitrogen, Nitrate + Nitrite		0.80	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite		0.014	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl		0.26	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		25.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		4.9	4.0	1.0	mg/l	SM2540 D-11

JC69748-13F BZ-7D

No hits reported in this sample.

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)
(d) Analysis done out of holding time.
(e) Reported sample aliquot obtained from filtration of 500 mL of sample. Volume was reduced from 1 liter due to nature of sample matrix.

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID: BZ-1S
Lab Sample ID: JC69748-1
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/12/18
Date Received: 07/12/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	10.9	5.0	4.0	mg/l	1	07/20/18 14:10	JO	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	07/12/18 23:02	SA	SM5210 B-11
Coliform, Fecal	64	4		col/100ml	2	07/12/18 16:34	SA	SM9222 D-06
Coliform, Total	82	2		col/100ml	2	07/12/18 16:28	MW	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	07/19/18 11:45	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.76	0.11	0.11	mg/l	1	07/23/18 13:26	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.78	0.10	0.10	mg/l	1	07/23/18 13:26	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.020	0.010	0.0050	mg/l	1	07/12/18 19:20	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.28	0.20	0.15	mg/l	1	07/23/18 08:58	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/21/18 12:35	LS	EPA 365.3
Solids, Total Dissolved	228	10	4.0	mg/l	1	07/17/18 14:00	RC	SM2540 C-11
Solids, Total Suspended	1.0 U	4.0	1.0	mg/l	1	07/19/18 09:20	RC	SM2540 D-11
Total Organic Carbon	1.2	1.0	1.0	mg/l	1	07/18/18 23:06	JO	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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
U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	BZ-1S		
Lab Sample ID:	JC69748-1F	**Date Sampled:**	07/12/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/12/18
		Percent Solids:	n/a
Project:	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	07/24/18 16:16	MP	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID: BZ-2S
Lab Sample ID: JC69748-2
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/12/18
Date Received: 07/12/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.7 J	5.0	4.0	mg/l	1	07/20/18 14:10	JO	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	07/12/18 23:04	SA	SM5210 B-11
Coliform, Fecal	12	2		col/100ml	2	07/12/18 16:34	SA	SM9222 D-06
Coliform, Total	90	2		col/100ml	2	07/12/18 16:28	MW	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	07/19/18 11:46	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.24	0.11	0.11	mg/l	1	07/20/18 15:08	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.24	0.10	0.10	mg/l	1	07/20/18 15:08	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	mg/l	1	07/12/18 19:20	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.19 J	0.20	0.15	mg/l	1	07/23/18 08:59	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/21/18 12:35	LS	EPA 365.3
Solids, Total Dissolved	4.0 J	10	4.0	mg/l	1	07/17/18 14:00	RC	SM2540 C-11
Solids, Total Suspended	1.9 J	4.0	1.0	mg/l	1	07/19/18 09:20	RC	SM2540 D-11
Total Organic Carbon	1.1	1.0	1.0	mg/l	1	07/18/18 23:41	JO	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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
U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	BZ-2S		
Lab Sample ID:	JC69748-2F	**Date Sampled:**	07/12/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/12/18
		Percent Solids:	n/a
Project:	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	07/24/18 16:16	MP	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	BZ-3S		
Lab Sample ID:	JC69748-3	**Date Sampled:**	07/12/18
Matrix:	AQ - Surface Water	**Date Received:**	07/12/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	9.4	5.0	4.0	mg/l	1	07/20/18 14:10	JO	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	07/12/18 23:06	SA	SM5210 B-11
Coliform, Fecal [c]	2	2		col/100ml	2	07/12/18 16:34	SA	SM9222 D-06
Coliform, Total [c]	0	0		col/100ml	1	07/12/18 16:28	MW	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	07/19/18 11:50	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.39	0.11	0.11	mg/l	1	07/23/18 13:30	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.40	0.10	0.10	mg/l	1	07/23/18 13:30	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0051 J	0.010	0.0050	mg/l	1	07/12/18 19:20	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.21	0.20	0.15	mg/l	1	07/23/18 08:59	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/21/18 12:35	LS	EPA 365.3
Solids, Total Dissolved	58.8	10	4.0	mg/l	1	07/18/18 14:35	RC	SM2540 C-11
Solids, Total Suspended	2.2 J	4.0	1.0	mg/l	1	07/18/18 10:55	RC	SM2540 D-11
Total Organic Carbon	2.0	1.0	1.0	mg/l	1	07/18/18 23:54	JO	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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
LOD = Limit of Detection B = Analyte found in associated blank
U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	BZ-3S		
Lab Sample ID:	JC69748-3F	**Date Sampled:**	07/12/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/12/18
		Percent Solids:	n/a
Project:	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	07/24/18 16:16	MP	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID: BZ-3M
Lab Sample ID: JC69748-4
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/12/18
Date Received: 07/12/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	10.4	5.0	4.0	mg/l	1	07/20/18 14:10	JO	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	07/12/18 23:07	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	07/19/18 11:52	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.82	0.11	0.11	mg/l	1	07/23/18 13:31	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.82	0.10	0.10	mg/l	1	07/23/18 13:31	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	mg/l	1	07/12/18 19:20	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.22	0.20	0.15	mg/l	1	07/23/18 09:00	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/21/18 12:35	LS	EPA 365.3
Solids, Total Dissolved	64.0	10	4.0	mg/l	1	07/18/18 14:35	RC	SM2540 C-11
Solids, Total Suspended	1.3 J	4.0	1.0	mg/l	1	07/18/18 10:55	RC	SM2540 D-11
Total Organic Carbon	1.4	1.0	1.0	mg/l	1	07/19/18 00:06	JO	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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
U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	BZ-3M		
Lab Sample ID:	JC69748-4F	**Date Sampled:**	07/12/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/12/18
		Percent Solids:	n/a
Project:	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	07/24/18 16:16	MP	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID: BZ-3D
Lab Sample ID: JC69748-5
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/12/18
Date Received: 07/12/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	10.9	5.0	4.0	mg/l	1	07/20/18 14:10	JO	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	07/12/18 23:08	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	07/19/18 11:53	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.82	0.11	0.11	mg/l	1	07/23/18 13:32	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.82	0.10	0.10	mg/l	1	07/23/18 13:32	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	mg/l	1	07/12/18 19:20	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.21	0.20	0.15	mg/l	1	07/23/18 09:01	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/21/18 12:35	LS	EPA 365.3
Solids, Total Dissolved	73.3	10	4.0	mg/l	1	07/18/18 14:35	RC	SM2540 C-11
Solids, Total Suspended	1.0 U	4.0	1.0	mg/l	1	07/18/18 10:55	RC	SM2540 D-11
Total Organic Carbon	1.4	1.0	1.0	mg/l	1	07/19/18 00:28	JO	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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
U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	BZ-3D		
Lab Sample ID:	JC69748-5F	**Date Sampled:**	07/12/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/12/18
		Percent Solids:	n/a
Project:	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	07/24/18 16:16	MP	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID: BZ-4S
Lab Sample ID: JC69748-6
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/12/18
Date Received: 07/12/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.7 J	5.0	4.0	mg/l	1	07/20/18 14:10	JO	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	07/12/18 23:10	SA	SM5210 B-11
Coliform, Fecal	20	2		col/100ml	2	07/12/18 16:34	SA	SM9222 D-06
Coliform, Total	22	2		col/100ml	2	07/12/18 16:28	MW	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	07/19/18 11:55	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.11 U	0.11	0.11	mg/l	1	07/23/18 13:33	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10 U	0.10	0.10	mg/l	1	07/23/18 13:33	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	mg/l	1	07/12/18 19:20	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.26	0.20	0.15	mg/l	1	07/23/18 09:02	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/21/18 12:35	LS	EPA 365.3
Solids, Total Dissolved	27.5	10	4.0	mg/l	1	07/18/18 14:35	RC	SM2540 C-11
Solids, Total Suspended	1.0 U	4.0	1.0	mg/l	1	07/18/18 10:55	RC	SM2540 D-11
Total Organic Carbon	1.3	1.0	1.0	mg/l	1	07/19/18 01:03	JO	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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
U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	BZ-4S		
Lab Sample ID:	JC69748-6F	**Date Sampled:**	07/12/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/12/18
		Percent Solids:	n/a
Project:	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	07/24/18 16:16	MP	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	BZ-5S		
Lab Sample ID:	JC69748-7	**Date Sampled:**	07/12/18
Matrix:	AQ - Surface Water	**Date Received:**	07/12/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	7.8	5.0	4.0	mg/l	1	07/20/18 14:48	JO	SM2320 B-11
BOD, 5 Day	5.0 U	5.0	5.0 [b]	mg/l	1	07/13/18 20:56	MW	SM5210 B-11
Coliform, Fecal	210	2		col/100ml	10	07/12/18 16:34	SA	SM9222 D-06
Coliform, Total	530	10		col/100ml	10	07/12/18 16:28	MW	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	07/19/18 11:56	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	1.3	0.11	0.11	mg/l	1	07/20/18 15:21	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	1.3	0.10	0.10	mg/l	1	07/20/18 15:21	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	mg/l	1	07/12/18 19:54	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.28	0.20	0.15	mg/l	1	07/23/18 09:04	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/21/18 12:56	LS	EPA 365.3
Solids, Total Dissolved	82.5	10	4.0	mg/l	1	07/18/18 14:35	RC	SM2540 C-11
Solids, Total Suspended	4.3	4.0	1.0	mg/l	1	07/18/18 10:55	RC	SM2540 D-11
Total Organic Carbon	1.0 U	1.0	1.0	mg/l	1	07/19/18 01:16	JO	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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
U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	BZ-5S		
Lab Sample ID:	JC69748-7F	**Date Sampled:**	07/12/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/12/18
		Percent Solids:	n/a
Project:	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	07/24/18 16:37	MP	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID: BZ-6S
Lab Sample ID: JC69748-8
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/12/18
Date Received: 07/12/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	11.4	5.0	4.0	mg/l	1	07/20/18 14:48	JO	SM2320 B-11
BOD, 5 Day	5.0 U	5.0	5.0 [b]	mg/l	1	07/13/18 20:59	MW	SM5210 B-11
Coliform, Fecal [c]	5	2		col/100ml	2	07/12/18 16:34	SA	SM9222 D-06
Coliform, Total [c]	0	0		col/100ml	1	07/12/18 16:28	MW	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	07/19/18 11:57	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.42	0.11	0.11	mg/l	1	07/20/18 15:22	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.43	0.10	0.10	mg/l	1	07/20/18 15:22	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0060 J	0.010	0.0050	mg/l	1	07/12/18 19:54	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.20	0.20	0.15	mg/l	1	07/23/18 09:05	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/21/18 12:56	LS	EPA 365.3
Solids, Total Dissolved	52.0	10	4.0	mg/l	1	07/18/18 14:35	RC	SM2540 C-11
Solids, Total Suspended	1.3 J	4.0	1.0	mg/l	1	07/18/18 10:55	RC	SM2540 D-11
Total Organic Carbon	1.3	1.0	1.0	mg/l	1	07/19/18 01:31	JO	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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
LOD = Limit of Detection B = Analyte found in associated blank
U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	BZ-6S		
Lab Sample ID:	JC69748-8F	**Date Sampled:**	07/12/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/12/18
		Percent Solids:	n/a
Project:	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	07/24/18 16:37	MP	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID: BZ-6M
Lab Sample ID: JC69748-9
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/12/18
Date Received: 07/12/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	10.4	5.0	4.0	mg/l	1	07/20/18 14:48	JO	SM2320 B-11
BOD, 5 Day	5.0 U	5.0	5.0 [b]	mg/l	1	07/13/18 21:00	MW	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	07/19/18 11:59	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.87	0.11	0.11	mg/l	1	07/20/18 15:24	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.87	0.10	0.10	mg/l	1	07/20/18 15:24	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	mg/l	1	07/12/18 19:54	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.19 J	0.20	0.15	mg/l	1	07/23/18 09:06	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/21/18 12:56	LS	EPA 365.3
Solids, Total Dissolved	58.0	10	4.0	mg/l	1	07/18/18 14:35	RC	SM2540 C-11
Solids, Total Suspended	1.0 U	4.0	1.0	mg/l	1	07/18/18 10:55	RC	SM2540 D-11
Total Organic Carbon	1.0 U	1.0	1.0	mg/l	1	07/19/18 01:43	JO	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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
U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	BZ-6M		
Lab Sample ID:	JC69748-9F	**Date Sampled:**	07/12/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/12/18
		Percent Solids:	n/a
Project:	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	07/24/18 16:37	MP	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	BZ-6D		
Lab Sample ID:	JC69748-10	**Date Sampled:**	07/12/18
Matrix:	AQ - Surface Water	**Date Received:**	07/12/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	13.5	5.0	4.0	mg/l	1	07/20/18 14:48	JO	SM2320 B-11
BOD, 5 Day	5.0 U	5.0	5.0 [b]	mg/l	1	07/13/18 21:01	MW	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	07/19/18 12:00	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.85	0.11	0.11	mg/l	1	07/20/18 15:25	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.85	0.10	0.10	mg/l	1	07/20/18 15:25	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	mg/l	1	07/12/18 19:54	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.53	0.20	0.15	mg/l	1	07/23/18 09:07	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/21/18 12:56	LS	EPA 365.3
Solids, Total Dissolved	90.0	10	4.0	mg/l	1	07/18/18 14:35	RC	SM2540 C-11
Solids, Total Suspended	22.5	4.0	1.0	mg/l	1	07/18/18 10:55	RC	SM2540 D-11
Total Organic Carbon	1.0	1.0	1.0	mg/l	1	07/19/18 01:56	JO	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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
U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	BZ-6D		
Lab Sample ID:	JC69748-10F	**Date Sampled:**	07/12/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/12/18
		Percent Solids:	n/a
Project:	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	07/24/18 16:37	MP	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	BZ-7S		
Lab Sample ID:	JC69748-11	**Date Sampled:**	07/12/18
Matrix:	AQ - Surface Water	**Date Received:**	07/12/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.0 U	5.0	4.0	mg/l	1	07/20/18 14:48	JO	SM2320 B-11
BOD, 5 Day	5.0 U	5.0	5.0 [b]	mg/l	1	07/13/18 21:03	MW	SM5210 B-11
Coliform, Fecal	0 J	4		col/100ml	1	07/12/18 16:34	SA	SM9222 D-06
Coliform, Total	4	4		col/100ml	4	07/12/18 16:28	MW	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	07/19/18 12:02	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.40	0.11	0.11	mg/l	1	07/20/18 15:26	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.40	0.10	0.10	mg/l	1	07/20/18 15:26	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	mg/l	1	07/12/18 19:54	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.27	0.20	0.15	mg/l	1	07/23/18 09:08	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/21/18 12:56	LS	EPA 365.3
Solids, Total Dissolved	50.0	10	4.0	mg/l	1	07/18/18 14:35	RC	SM2540 C-11
Solids, Total Suspended [d]	1.6 J	4.0	1.0	mg/l	1	07/18/18 10:55	RC	SM2540 D-11
Total Organic Carbon	1.3	1.0	1.0	mg/l	1	07/19/18 21:58	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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 nature of sample matrix.

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

Report of Analysis

Client Sample ID:	BZ-7S		
Lab Sample ID:	JC69748-11F	**Date Sampled:**	07/12/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/12/18
		Percent Solids:	n/a
Project:	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	07/24/18 16:37	MP	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID: BZ-7M
Lab Sample ID: JC69748-12
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/12/18
Date Received: 07/12/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	12.0	5.0	4.0	mg/l	1	07/20/18 14:48	JO	SM2320 B-11
BOD, 5 Day	5.0 U	5.0	5.0 [b]	mg/l	1	07/13/18 21:04	MW	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	07/19/18 12:03	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.87	0.11	0.11	mg/l	1	07/20/18 15:27	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.87	0.10	0.10	mg/l	1	07/20/18 15:27	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	mg/l	1	07/12/18 19:54	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.34	0.20	0.15	mg/l	1	07/23/18 09:09	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/21/18 12:56	LS	EPA 365.3
Solids, Total Dissolved	50.0	10	4.0	mg/l	1	07/18/18 14:35	RC	SM2540 C-11
Solids, Total Suspended	2.5 J	4.0	1.0	mg/l	1	07/18/18 10:55	RC	SM2540 D-11
Total Organic Carbon	1.0 U	1.0	1.0	mg/l	1	07/19/18 22:32	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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
U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	BZ-7M		
Lab Sample ID:	JC69748-12F	**Date Sampled:**	07/12/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/12/18
		Percent Solids:	n/a
Project:	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	07/24/18 16:37	MP	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	BZ-7D		
Lab Sample ID:	JC69748-13	**Date Sampled:**	07/12/18
Matrix:	AQ - Surface Water	**Date Received:**	07/12/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	12.0	5.0	4.0	mg/l	1	07/20/18 14:48	JO	SM2320 B-11
BOD, 5 Day	5.0 U	5.0	5.0 [b]	mg/l	1	07/13/18 21:06	MW	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	07/19/18 12:08	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.79	0.11	0.11	mg/l	1	07/20/18 15:28	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.80	0.10	0.10	mg/l	1	07/20/18 15:28	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.014	0.010	0.0050	mg/l	1	07/12/18 19:54	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.26	0.20	0.15	mg/l	1	07/23/18 09:10	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	07/21/18 12:56	LS	EPA 365.3
Solids, Total Dissolved	25.0	10	4.0	mg/l	1	07/18/18 14:35	RC	SM2540 C-11
Solids, Total Suspended	4.9	4.0	1.0	mg/l	1	07/18/18 10:55	RC	SM2540 D-11
Total Organic Carbon	1.0 U	1.0	1.0	mg/l	1	07/19/18 22:43	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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
U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	BZ-7D		
Lab Sample ID:	JC69748-13F	**Date Sampled:**	07/12/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/12/18
		Percent Solids:	n/a
Project:	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	07/24/18 16:37	MP	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

SGS

CHAIN OF CUSTODY

SW

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

PAGE ___ OF ___

FED-EX Tracking #
Bottle Order Control # PD-062518-64
SGS Quote #
SGS Job # JC69748

Client / Reporting Information
Company Name: USACE - Phila. ~~District~~
Street Address: 100 Penn Sq. East
City: Philadelphia State: PA Zip: 19107
Project Contact: Joe Loeper E-mail:
Phone #: Fax #:
Sampler(s) Name(s): Greg Wacik Phone #: 610-597-9780

Project Information
Project Name: US ARMY CORPS of Eng. - Beltzville Reservoir
Street: 2145 Pohopoco Dr.
City: Lehighton State: PA
Project #: PD-062518-64
Client Purchase Order #:
Project Manager:

Billing Information (if different from Report to)
Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis (see TEST CODE sheet): AlK, AMN, BOD, XN030; TDS, TOC, TPO4, TKN; TSS, Total Phosphorus; FCF, TCF

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Date	Time	Sampled by	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Na2S2O3	AlK, AMN, BOD, XN030	TDS, TOC, TPO4, TKN	TSS, Total Phosphorus	FCF, TCF	LAB USE ONLY
1F	BZ-1S		7/12/18	1120	GW	SW	11	X			X					X	X	X	X	X	G97
2F	BZ-2S		↓	1110	↓	SW	11	X			X					X	X	X	X	X	B28
3F	BZ-3S		↓	825	↓	SW	11	X			X					X	X	X	X	X	G46 T5
4F	BZ-3M		↓	825	↓	SW	9	X			X						X	X	X		-
5F	BZ-3D		↓	825	↓	SW	9	X			X						X	X	X		G37
6F	BZ-4S		↓	1050	↓	SW	11	X			X					X	X	X	X	X	19C3
7F	BZ-5S		↓	1020	↓	SW	11	X			X					X	X	X	X	X	
8F	BZ-6S		↓	745	↓	SW	11	X			X					X	X	X	X	X	
9F	BZ-6M		↓	745	↓	SW	9	X			X						X	X	X		
10F	BZ-6D		↓	745	↓	SW	9	X			X						X	X	X		

Matrix Codes: 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

Turnaround Time (Business days)
- ☐ Std. 10 Business Days
- ☐ 5 Day RUSH
- ☐ 3 Day RUSH
- ☐ 2 Day RUSH
- ☐ 1 Day RUSH
- ☐ other ______

Approved by (SGS Project Manager)/Date:

Emergency & Rush T/A data available via LabLink

Data Deliverable Information
- ☐ Commercial "A" (Level 1)
- ☐ Commercial "B" (Level 2)
- ☐ FULLT1 (Level 3+4)
- ☐ NJ Reduced
- ☐ Commercial "C"
- ☐ *NJ Data of Known Quality Protocol Reporting*
- ☐ NYASP Category A
- ☐ NYASP Category B
- ☐ State Forms
- ☐ EDD Format ______
- ☐ Other ______

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions
INITIAL ASSESSMENT ___
LABEL VERIFICATION ___
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:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1 [signature]	7/12/18 1200	1 [signature]	2 [signature]	7-12-18 1545	2 [signature]
Relinquished by Sampler: 3	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
Relinquished by: 5	Date Time:	Received By: 5	Custody Seal #	☐ Intact ☐ Not intact	Preserved where applicable / On Ice ☐ / Cooler Temp.

0.3.4 - 0.3.1 0.3.3 0.3.6 0.3.5

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions.

JC69748: Chain of Custody
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5

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

PAGE ___ OF ___

FED-EX Tracking # | Bottle Order Control #
SGS Quote # | SGS Job # JC69748

Client / Reporting Information

Company Name: USACE - Phila. District
Street Address: 100 Penn Sq. East
City: Philadelphia State: PA Zip: 19107
Project Contact: Joe Loeper E-mail:
Phone # Fax #
Sampler(s) Name(s): Greg Wacik 610- Phone # 597-9780

Project Information

Project Name: US ARMY CORPS of Eng. - Beltzville Reservoir
Street: 2145 Pohopoco Dr
City: Lehighton State: PA
Project # PD-062518-64
Client Purchase Order #
Project Manager
Attention:

Billing Information (if different from Report to)

Company Name
Street Address
City State Zip

Requested Analysis (see TEST CODE sheet)

Alk, AMN, BOD, XN030
TDS, TOC, TP04, TKN
TSS, Total Phosphorus
FCF, TCF

Matrix Codes

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

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Na2S2O3	Alk, AMN, BOD, XN030	TDS, TOC, TP04, TKN	TSS, Total Phosphorus	FCF, TCF	LAB USE ONLY
11F	BZ-7S		7/12/18	0930	JF	SW	11	X			X				X		X	X	X	X	
12F	BZ-7M		7/12/18	0930	JF	SW	9	X			X						X	X	X		
13F	BZ-7D		7/12/18	0930	JF	SW	9	X			X						X	X	X		

Turnaround Time (Business days)

Approved by (SGS Project Manager)/Date:

- Std. 10 Business Days
- 5 Day RUSH
- 3 Day RUSH
- 2 Day RUSH
- 1 Day RUSH
- other

Emergency & Rush T/A data available via LabLink

Data Deliverable Information

- Commercial "A" (Level 1)
- Commercial "B" (Level 2)
- FULLT1 (Level 3+4)
- NJ Reduced
- Commercial "C"
- NYASP Category A
- NYASP Category B
- State Forms
- EDD Format
- Other
- *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

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:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1	7/12/18 1200	1	2	7/12/18 1345	2
Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
3		3	4		4
Relinquished by:	Date Time:	Received By:	Custody Seal #	Intact / Not intact	Preserved where applicable	On Ice	Cooler Temp.
5		5					

0.4 0.1 0.3 0.6 0.5 0.0

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions.

SGS Sample Receipt Summary

Job Number: JC69748 **Client:** USACE-PHILADELPHIA DISTRICT **Project:** PHILADELPHIA DISTRICT, RESERVOIR SAMPL

Date / Time Received: 7/12/2018 1:45:00 PM **Delivery Method:** Accutest Courier **Airbill #'s:**

Cooler Temps (Raw Measured) °C: Cooler 1: (3.4); Cooler 2: (3.1); Cooler 3: (3.3); Cooler 4: (3.6); Cooler 5: (3.5);

Cooler Temps (Corrected) °C: Cooler 1: (3.4); Cooler 2: (3.1); Cooler 3: (3.3); Cooler 4: (3.6); Cooler 5: (3.5);

Cooler Security	Y	N		Y	N
1. Custody Seals Present:	☑	☐	3. COC Present:	☑	☐
2. Custody Seals Intact:	☑	☐	4. Smpl Dates/Time OK	☑	☐

Cooler Temperature	Y	N
1. Temp criteria achieved:	☑	☐
2. Cooler temp verification:	IR Gun	
3. Cooler media:	Ice (Bag)	
4. No. Coolers:	5	

Quality Control Preservation	Y	N	N/A
1. Trip Blank present / cooler:	☐	☑	☐
2. Trip Blank listed on COC:	☐	☑	☐
3. Samples preserved properly:	☑	☐	
4. VOCs headspace free:	☐	☐	☑

Sample Integrity - Documentation	Y	N
1. Sample labels present on bottles:	☑	☐
2. Container labeling complete:	☑	☐
3. Sample container label / COC agree:	☑	☐

Sample Integrity - Condition	Y	N
1. Sample recvd within HT:	☑	☐
2. All containers accounted for:	☑	☐
3. Condition of sample:	Intact	

Sample Integrity - Instructions	Y	N	N/A
1. Analysis requested is clear:	☑	☐	
2. Bottles received for unspecified tests	☐	☑	
3. Sufficient volume recvd for analysis:	☑	☐	
4. Compositing instructions clear:	☐	☐	☑
5. Filtering instructions clear:	☐	☐	☑

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

Comments -1 thru -13 Please note Total Diss LF Phosphorous was rec'd but not noted as such on COC. Filtration request has been sent.

SM089-03
Rev. Date 12/7/17

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: JC71016

Sampling Date: 07/31/18

Report to:

Army Corps of Engineers

joseph.m.loeper@usace.army.mil

ATTN: Joseph Loeper

Total number of pages in report: **46**

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)

Sections: 1 2 3 4 5

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Sample Summary

USACE-Philadelphia District

Job No: JC71016

Philadelphia District, Reservoir Sampling
Project No: W25PHS81145379

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
JC71016-1	07/31/18	15:50	SW	07/31/18	AQ	Surface Water	BZ-1S
JC71016-1F	07/31/18	15:50	SW	07/31/18	AQ	Surface H2O Filtered	BZ-1S
JC71016-2	07/31/18	15:35	SW	07/31/18	AQ	Surface Water	BZ-2S
JC71016-2F	07/31/18	15:35	SW	07/31/18	AQ	Surface H2O Filtered	BZ-2S
JC71016-3	07/31/18	13:10	SW	07/31/18	AQ	Surface Water	BZ-3S
JC71016-3F	07/31/18	13:10	SW	07/31/18	AQ	Surface H2O Filtered	BZ-3S
JC71016-4	07/31/18	13:10	SW	07/31/18	AQ	Surface Water	BZ-3M
JC71016-4F	07/31/18	13:10	SW	07/31/18	AQ	Surface H2O Filtered	BZ-3M
JC71016-5	07/31/18	13:10	SW	07/31/18	AQ	Surface Water	BZ-3D
JC71016-5F	07/31/18	13:10	SW	07/31/18	AQ	Surface H2O Filtered	BZ-3D
JC71016-6	07/31/18	15:20	SW	07/31/18	AQ	Surface Water	BZ-4S
JC71016-6F	07/31/18	15:20	SW	07/31/18	AQ	Surface H2O Filtered	BZ-4S
JC71016-7	07/31/18	15:10	SW	07/31/18	AQ	Surface Water	BZ-5S

Sample Summary
(continued)

USACE-Philadelphia District

Job No: JC71016

Philadelphia District, Reservoir Sampling
Project No: W25PHS81145379

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
JC71016-7F	07/31/18	15:10	SW	07/31/18	AQ	Surface H2O Filtered	BZ-5S
JC71016-8	07/31/18	12:15	SW	07/31/18	AQ	Surface Water	BZ-6S
JC71016-8F	07/31/18	12:15	SW	07/31/18	AQ	Surface H2O Filtered	BZ-6S
JC71016-9	07/31/18	12:15	SW	07/31/18	AQ	Surface Water	BZ-6M
JC71016-9F	07/31/18	12:15	SW	07/31/18	AQ	Surface H2O Filtered	BZ-6M
JC71016-10	07/31/18	12:15	SW	07/31/18	AQ	Surface Water	BZ-6D
JC71016-10F	07/31/18	12:15	SW	07/31/18	AQ	Surface H2O Filtered	BZ-6D
JC71016-11	07/31/18	14:00	SW	07/31/18	AQ	Surface Water	BZ-7S
JC71016-11F	07/31/18	14:00	SW	07/31/18	AQ	Surface H2O Filtered	BZ-7S
JC71016-12	07/31/18	14:00	SW	07/31/18	AQ	Surface Water	BZ-7M
JC71016-12F	07/31/18	14:00	SW	07/31/18	AQ	Surface H2O Filtered	BZ-7M
JC71016-13	07/31/18	14:00	SW	07/31/18	AQ	Surface Water	BZ-7D
JC71016-13F	07/31/18	14:00	SW	07/31/18	AQ	Surface H2O Filtered	BZ-7D

CASE NARRATIVE / CONFORMANCE SUMMARY

Client:	USACE-Philadelphia District	**Job No**	JC71016
Site:	Philadelphia District, Reservoir Sampling	**Report Date**	8/14/2018 12:47:09 P

On 07/31/2018, 26 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at SGS North America Inc. at a maximum corrected temperature of 3.2 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. Job Number of JC71016 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:** GP15213

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71016-2DUP, JC71016-2MS were used as the QC samples for Nitrogen, Total Kjeldahl.

General Chemistry By Method EPA 353.2/LACHAT

Matrix: AQ **Batch ID:** GP15148

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC70944-2DUP, JC70944-2MB, JC70944-2MS were used as the QC samples for Nitrogen, Nitrate + Nitrite.

Matrix: AQ **Batch ID:** GP15199

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71016-2DUP, JC71016-11MS, JC71016-2MS 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.
- RPD(s) for Duplicate for Nitrogen, Nitrate + Nitrite are outside control limits for sample GP15199-D1. RPD acceptable due to low duplicate and sample concentrations.

General Chemistry By Method EPA 365.3

Matrix: AQ **Batch ID:** GP15093

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71016-1DUP, JC71016-1MS were used as the QC samples for Phosphorus, Total.

Matrix: AQ **Batch ID:** GP15175

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71016-1FMS, JC71016-1FDUP were used as the QC samples for Phosphorus, Total.
- RPD(s) for Duplicate for Phosphorus, Total are outside control limits for sample GP15175-D1. RPD acceptable due to low duplicate and sample concentrations.

General Chemistry By Method EPA353.2/SM4500NO2B

Matrix: AQ **Batch ID:** R172075

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71016-1 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172116

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71016-3 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172117

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71016-2 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172118

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71016-4 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172119

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71016-5 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172120

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71016-6 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172121

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71016-7 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172122

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71016-8 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172123

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71016-9 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172124

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71016-10 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172125

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71016-11 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172126

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71016-12 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172127

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71016-13 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

General Chemistry By Method SM2320 B-11

Matrix: AQ **Batch ID:** GN83832

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71016-1DUP were used as the QC samples for Alkalinity, Total as CaCO3.
- RPD(s) for Duplicate for Alkalinity, Total as CaCO3 are outside control limits for sample GN83832-D1. RPD acceptable due to low duplicate and sample concentrations.
- JC71016-7 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71016-2 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71016-9 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71016-8 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71016-1 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71016-3 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71016-4 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71016-5 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71016-6 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71016-10 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71016-12 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71016-11 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71016-13 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.

General Chemistry By Method SM2540 C-11

Matrix: AQ **Batch ID:** GN83688

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71016-1DUP were used as the QC samples for Solids, Total Dissolved.

General Chemistry By Method SM2540 D-11

Matrix: AQ **Batch ID:** GN83682

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71016-1DUP were used as the QC samples for Solids, Total Suspended.

General Chemistry By Method SM4500NH3 H-11LACHAT

Matrix: AQ **Batch ID:** GP15168

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71016-1DUP, JC71016-1MS, JC71016-1MSD were used as the QC samples for Nitrogen, Ammonia.

General Chemistry By Method SM4500NO2 B-11

Matrix: AQ **Batch ID:** GN83553

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71016-2DUP, JC71016-2MS were used as the QC samples for Nitrogen, Nitrite.

General Chemistry By Method SM5210 B-11

Matrix: AQ	Batch ID: GP14918

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC70984-1DUP were used as the QC samples for BOD, 5 Day.

General Chemistry By Method SM5310 B-11

Matrix: AQ	Batch ID: GP15246

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71016-11MS, JC71016-11MSD were used as the QC samples for Total Organic Carbon.

Matrix: AQ	Batch ID: GP15248

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71016-1MS, JC71016-1MSD were used as the QC samples for Total Organic Carbon.

General Chemistry By Method SM9222 B-06

Matrix: AQ	Batch ID: MB5320

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71016-1DUP were used as the QC samples for Coliform, Total.
- JC71016-8 for Coliform, Total: Analysis done out of holding time.
- JC71016-7 for Coliform, Total: Analysis done out of holding time.
- JC71016-6 for Coliform, Total: Analysis done out of holding time.
- JC71016-11 for Coliform, Total: Analysis done out of holding time.
- JC71016-2 for Coliform, Total: Analysis done out of holding time.
- JC71016-3 for Coliform, Total: Analysis done out of holding time.

General Chemistry By Method SM9222 D-06

Matrix: AQ	Batch ID: MB5321

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71016-1DUP were used as the QC samples for Coliform, Fecal.
- JC71016-8 for Coliform, Fecal: Analysis done out of holding time.
- JC71016-11 for Coliform, Fecal: Analysis done out of holding time.
- JC71016-3 for Coliform, Fecal: Analysis done out of holding time.

Summary of Hits

Job Number: JC71016
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 07/31/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
JC71016-1	**BZ-1S**					
Alkalinity, Total as CaCO3 [a]		4.7 J	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal		43	10	[b]	col/100ml	SM9222 D-06
Coliform, Total		84	4	[b]	col/100ml	SM9222 B-06
Nitrogen, Nitrate [c]		0.84	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.86	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		0.34	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		65.7	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		3.3 J	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		2.0	1.0	1.0	mg/l	SM5310 B-11
JC71016-1F	**BZ-1S**					
No hits reported in this sample.						
JC71016-2	**BZ-2S**					
Coliform, Fecal		160	10	[b]	col/100ml	SM9222 D-06
Coliform, Total [d]		214	10	[b]	col/100ml	SM9222 B-06
Nitrogen, Nitrate [c]		0.31	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.31	0.10	0.10	mg/l	EPA 353.2/LACHAT
Solids, Total Dissolved		35.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		2.3 J	4.0	2.0	mg/l	SM2540 D-11
JC71016-2F	**BZ-2S**					
No hits reported in this sample.						
JC71016-3	**BZ-3S**					
Nitrogen, Nitrate [c]		0.32	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.33	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		0.18 J	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		43.0	10	4.0	mg/l	SM2540 C-11
Total Organic Carbon		1.1	1.0	1.0	mg/l	SM5310 B-11
JC71016-3F	**BZ-3S**					
No hits reported in this sample.						

Summary of Hits

Job Number: JC71016
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 07/31/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
JC71016-4	**BZ-3M**					
Nitrogen, Nitrate [c]		0.93	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.93	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.17 J	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		47.0	10	4.0	mg/l	SM2540 C-11
JC71016-4F	**BZ-3M**					
No hits reported in this sample.						
JC71016-5	**BZ-3D**					
Alkalinity, Total as CaCO3 [a]		8.8	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate [c]		0.78	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.78	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.15 J	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		55.7	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		6.8	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		1.3	1.0	1.0	mg/l	SM5310 B-11
JC71016-5F	**BZ-3D**					
No hits reported in this sample.						
JC71016-6	**BZ-4S**					
Coliform, Fecal		132	4	[b]	col/100ml	SM9222 D-06
Coliform, Total [d]		151	10	[b]	col/100ml	SM9222 B-06
Nitrogen, Nitrate [c]		0.14	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.14	0.10	0.10	mg/l	EPA 353.2/LACHAT
Solids, Total Dissolved		20.0	10	4.0	mg/l	SM2540 C-11
Total Organic Carbon		1.6	1.0	1.0	mg/l	SM5310 B-11
JC71016-6F	**BZ-4S**					
No hits reported in this sample.						
JC71016-7	**BZ-5S**					
Alkalinity, Total as CaCO3 [a]		9.8	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal		320	10	[b]	col/100ml	SM9222 D-06
Coliform, Total [d]		530	10	[b]	col/100ml	SM9222 B-06
Nitrogen, Nitrate [c]		1.3	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		1.3	0.10	0.10	mg/l	EPA 353.2/LACHAT

Summary of Hits

Job Number: JC71016
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 07/31/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
Nitrogen, Total Kjeldahl		0.19 J	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		78.6	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		29.3	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		1.0	1.0	1.0	mg/l	SM5310 B-11
JC71016-7F	**BZ-5S**					
Phosphorus, Total		0.10	0.050	0.050	mg/l	EPA 365.3
JC71016-8	**BZ-6S**					
Alkalinity, Total as CaCO3 [a]		8.8	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate [c]		0.44	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.45	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite		0.0065 J	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl		0.20	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		59.0	10	4.0	mg/l	SM2540 C-11
Total Organic Carbon		1.1	1.0	1.0	mg/l	SM5310 B-11
JC71016-8F	**BZ-6S**					
No hits reported in this sample.						
JC71016-9	**BZ-6M**					
Alkalinity, Total as CaCO3 [a]		7.8	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate [c]		0.94	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.94	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.15 J	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		55.0	10	4.0	mg/l	SM2540 C-11
JC71016-9F	**BZ-6M**					
No hits reported in this sample.						
JC71016-10	**BZ-6D**					
Alkalinity, Total as CaCO3 [a]		9.3	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate [c]		0.85	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.85	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.19 J	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		22.9	10	4.0	mg/l	SM2540 C-11

Summary of Hits

Job Number: JC71016
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 07/31/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
JC71016-10F	**BZ-6D**					
Phosphorus, Total		0.22	0.050	0.050	mg/l	EPA 365.3
JC71016-11	**BZ-7S**					
Nitrogen, Nitrate [c]		0.21	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.22	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		0.18 J	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		33.0	10	4.0	mg/l	SM2540 C-11
Total Organic Carbon		1.0	1.0	1.0	mg/l	SM5310 B-11
JC71016-11F	**BZ-7S**					
Phosphorus, Total		0.082	0.050	0.050	mg/l	EPA 365.3
JC71016-12	**BZ-7M**					
Alkalinity, Total as CaCO3 [a]		7.8	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate [c]		0.89	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.90	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite		0.0060 J	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl		0.24	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		58.8	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		2.1 J	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		1.0	1.0	1.0	mg/l	SM5310 B-11
JC71016-12F	**BZ-7M**					
Phosphorus, Total		0.056	0.050	0.050	mg/l	EPA 365.3
JC71016-13	**BZ-7D**					
Alkalinity, Total as CaCO3 [a]		8.3	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate [c]		0.95	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.95	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.19 J	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		50.0	10	4.0	mg/l	SM2540 C-11
Total Organic Carbon		1.1	1.0	1.0	mg/l	SM5310 B-11
JC71016-13F	**BZ-7D**					
Phosphorus, Total		1.8	0.50	0.50	mg/l	EPA 365.3

Summary of Hits

Job Number: JC71016
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 07/31/18

Lab Sample ID	Client Sample ID	Result/				
Analyte		Qual	LOQ	LOD	Units	Method

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)
(d) Analysis done out of holding time.

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID: BZ-1S
Lab Sample ID: JC71016-1
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/31/18
Date Received: 07/31/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.7 J	5.0	4.0	mg/l	1	08/06/18 09:55	CD	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	07/31/18 23:25	SA	SM5210 B-11
Coliform, Fecal	43	10		col/100ml	10	07/31/18 23:48	SA	SM9222 D-06
Coliform, Total	84	4		col/100ml	4	07/31/18 23:41	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	08/09/18 14:05	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.84	0.11	0.11	mg/l	1	08/08/18 14:12	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.86	0.10	0.10	mg/l	1	08/08/18 14:12	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.016	0.010	0.0050	mg/l	1	07/31/18 22:25	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.34	0.20	0.15	mg/l	1	08/13/18 11:01	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/13/18 17:55	LS	EPA 365.3
Solids, Total Dissolved	65.7	10	4.0	mg/l	1	08/02/18 10:50	RC	SM2540 C-11
Solids, Total Suspended	3.3 J	4.0	2.0	mg/l	1	08/02/18 11:03	RC	SM2540 D-11
Total Organic Carbon	2.0	1.0	1.0	mg/l	1	08/14/18 05:02	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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
U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	BZ-1S		
Lab Sample ID:	JC71016-1F	**Date Sampled:**	07/31/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/31/18
		Percent Solids:	n/a
Project:	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	08/13/18 21:06	LS	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID: BZ-2S
Lab Sample ID: JC71016-2
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/31/18
Date Received: 07/31/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.0 U	5.0	4.0	mg/l	1	08/06/18 09:55	CD	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	07/31/18 23:29	SA	SM5210 B-11
Coliform, Fecal	160	10		col/100ml	10	07/31/18 23:48	SA	SM9222 D-06
Coliform, Total [c]	214	10		col/100ml	10	07/31/18 23:41	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	08/09/18 14:06	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.31	0.11	0.11	mg/l	1	08/13/18 09:31	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.31	0.10	0.10	mg/l	1	08/13/18 09:31	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	mg/l	1	07/31/18 22:25	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.15 U	0.20	0.15	mg/l	1	08/13/18 11:02	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/13/18 17:55	LS	EPA 365.3
Solids, Total Dissolved	35.0	10	4.0	mg/l	1	08/02/18 10:50	RC	SM2540 C-11
Solids, Total Suspended	2.3 J	4.0	2.0	mg/l	1	08/02/18 11:03	RC	SM2540 D-11
Total Organic Carbon	1.0 U	1.0	1.0	mg/l	1	08/14/18 06:07	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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
LOD = Limit of Detection B = Analyte found in associated blank
U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	BZ-2S		
Lab Sample ID:	JC71016-2F	**Date Sampled:**	07/31/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/31/18
		Percent Solids:	n/a
Project:	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	08/13/18 21:06	LS	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID: BZ-3S
Lab Sample ID: JC71016-3
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/31/18
Date Received: 07/31/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.0 U	5.0	4.0	mg/l	1	08/06/18 09:55	CD	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	07/31/18 23:31	SA	SM5210 B-11
Coliform, Fecal [c]	0 J	4		col/100ml	4	07/31/18 23:48	SA	SM9222 D-06
Coliform, Total [c]	0 J	4		col/100ml	4	07/31/18 23:41	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	08/09/18 14:08	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.32	0.11	0.11	mg/l	1	08/13/18 09:32	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.33	0.10	0.10	mg/l	1	08/13/18 09:32	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0051 J	0.010	0.0050	mg/l	1	07/31/18 22:25	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.18 J	0.20	0.15	mg/l	1	08/13/18 11:03	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/13/18 17:55	LS	EPA 365.3
Solids, Total Dissolved	43.0	10	4.0	mg/l	1	08/02/18 10:50	RC	SM2540 C-11
Solids, Total Suspended	2.0 U	4.0	2.0	mg/l	1	08/02/18 11:03	RC	SM2540 D-11
Total Organic Carbon	1.1	1.0	1.0	mg/l	1	08/14/18 06:29	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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
LOD = Limit of Detection B = Analyte found in associated blank
U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	BZ-3S		
Lab Sample ID:	JC71016-3F	**Date Sampled:**	07/31/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/31/18
		Percent Solids:	n/a
Project:	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	08/13/18 21:06	LS	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID: BZ-3M
Lab Sample ID: JC71016-4
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/31/18
Date Received: 07/31/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.0 U	5.0	4.0	mg/l	1	08/06/18 09:55	CD	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	07/31/18 23:34	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	08/09/18 14:09	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.93	0.11	0.11	mg/l	1	08/13/18 09:33	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.93	0.10	0.10	mg/l	1	08/13/18 09:33	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	mg/l	1	07/31/18 22:25	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.17 J	0.20	0.15	mg/l	1	08/13/18 11:03	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/13/18 17:55	LS	EPA 365.3
Solids, Total Dissolved	47.0	10	4.0	mg/l	1	08/02/18 10:50	RC	SM2540 C-11
Solids, Total Suspended	2.0 U	4.0	2.0	mg/l	1	08/02/18 11:03	RC	SM2540 D-11
Total Organic Carbon	1.0 U	1.0	1.0	mg/l	1	08/14/18 06:40	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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
U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	BZ-3M		
Lab Sample ID:	JC71016-4F	**Date Sampled:**	07/31/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/31/18
		Percent Solids:	n/a
Project:	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	08/13/18 21:06	LS	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID: BZ-3D
Lab Sample ID: JC71016-5
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/31/18
Date Received: 07/31/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	8.8	5.0	4.0	mg/l	1	08/06/18 09:55	CD	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	07/31/18 23:36	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	08/09/18 14:11	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.78	0.11	0.11	mg/l	1	08/13/18 09:34	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.78	0.10	0.10	mg/l	1	08/13/18 09:34	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	mg/l	1	07/31/18 22:25	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.15 J	0.20	0.15	mg/l	1	08/13/18 11:04	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/13/18 17:55	LS	EPA 365.3
Solids, Total Dissolved	55.7	10	4.0	mg/l	1	08/02/18 10:50	RC	SM2540 C-11
Solids, Total Suspended	6.8	4.0	2.0	mg/l	1	08/02/18 11:03	RC	SM2540 D-11
Total Organic Carbon	1.3	1.0	1.0	mg/l	1	08/14/18 06:52	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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
U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	BZ-3D		
Lab Sample ID:	JC71016-5F	**Date Sampled:**	07/31/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/31/18
		Percent Solids:	n/a
Project:	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	08/13/18 21:06	LS	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	BZ-4S		
Lab Sample ID:	JC71016-6	**Date Sampled:**	07/31/18
Matrix:	AQ - Surface Water	**Date Received:**	07/31/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.0 U	5.0	4.0	mg/l	1	08/06/18 09:55	CD	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	07/31/18 23:37	SA	SM5210 B-11
Coliform, Fecal	132	4		col/100ml	4	07/31/18 23:48	SA	SM9222 D-06
Coliform, Total [c]	151	10		col/100ml	10	07/31/18 23:41	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	08/09/18 14:12	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.14	0.11	0.11	mg/l	1	08/13/18 09:36	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.14	0.10	0.10	mg/l	1	08/13/18 09:36	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	mg/l	1	07/31/18 22:25	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.15 U	0.20	0.15	mg/l	1	08/13/18 11:05	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/13/18 17:55	LS	EPA 365.3
Solids, Total Dissolved	20.0	10	4.0	mg/l	1	08/02/18 10:50	RC	SM2540 C-11
Solids, Total Suspended	2.0 U	4.0	2.0	mg/l	1	08/02/18 11:03	RC	SM2540 D-11
Total Organic Carbon	1.6	1.0	1.0	mg/l	1	08/14/18 07:04	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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
LOD = Limit of Detection B = Analyte found in associated blank
U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	BZ-4S		
Lab Sample ID:	JC71016-6F	**Date Sampled:**	07/31/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/31/18
		Percent Solids:	n/a
Project:	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	08/13/18 21:06	LS	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	BZ-5S		
Lab Sample ID:	JC71016-7	**Date Sampled:**	07/31/18
Matrix:	AQ - Surface Water	**Date Received:**	07/31/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	9.8	5.0	4.0	mg/l	1	08/06/18 10:11	CD	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	07/31/18 23:39	SA	SM5210 B-11
Coliform, Fecal	320	10		col/100ml	10	07/31/18 23:48	SA	SM9222 D-06
Coliform, Total [c]	530	10		col/100ml	10	07/31/18 23:41	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	08/09/18 14:14	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	1.3	0.11	0.11	mg/l	1	08/13/18 09:39	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	1.3	0.10	0.10	mg/l	1	08/13/18 09:39	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	mg/l	1	07/31/18 22:25	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.19 J	0.20	0.15	mg/l	1	08/13/18 11:08	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/13/18 18:00	LS	EPA 365.3
Solids, Total Dissolved	78.6	10	4.0	mg/l	1	08/02/18 10:50	RC	SM2540 C-11
Solids, Total Suspended	29.3	4.0	2.0	mg/l	1	08/02/18 11:03	RC	SM2540 D-11
Total Organic Carbon	1.0	1.0	1.0	mg/l	1	08/14/18 07:15	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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
LOD = Limit of Detection B = Analyte found in associated blank U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	BZ-5S		
Lab Sample ID:	JC71016-7F	**Date Sampled:**	07/31/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/31/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.10	0.050	0.050	mg/l	1	08/13/18 21:20	LS	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	BZ-6S		
Lab Sample ID:	JC71016-8	**Date Sampled:**	07/31/18
Matrix:	AQ - Surface Water	**Date Received:**	07/31/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	8.8	5.0	4.0	mg/l	1	08/06/18 10:11	CD	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	07/31/18 23:41	SA	SM5210 B-11
Coliform, Fecal [c]	0 J	4		col/100ml	4	07/31/18 23:48	SA	SM9222 D-06
Coliform, Total [c]	0 J	4		col/100ml	4	07/31/18 23:41	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	08/09/18 14:15	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.44	0.11	0.11	mg/l	1	08/13/18 09:40	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.45	0.10	0.10	mg/l	1	08/13/18 09:40	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0065 J	0.010	0.0050	mg/l	1	07/31/18 23:00	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.20	0.20	0.15	mg/l	1	08/13/18 11:08	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/13/18 18:00	LS	EPA 365.3
Solids, Total Dissolved	59.0	10	4.0	mg/l	1	08/02/18 10:50	RC	SM2540 C-11
Solids, Total Suspended	2.0 U	4.0	2.0	mg/l	1	08/02/18 11:03	RC	SM2540 D-11
Total Organic Carbon	1.1	1.0	1.0	mg/l	1	08/14/18 07:28	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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
LOD = Limit of Detection B = Analyte found in associated blank
U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	BZ-6S		
Lab Sample ID:	JC71016-8F	**Date Sampled:**	07/31/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/31/18
		Percent Solids:	n/a
Project:	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	08/13/18 21:20	LS	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID: BZ-6M
Lab Sample ID: JC71016-9
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/31/18
Date Received: 07/31/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	7.8	5.0	4.0	mg/l	1	08/06/18 10:11	CD	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	07/31/18 23:43	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	08/09/18 14:17	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.94	0.11	0.11	mg/l	1	08/13/18 09:41	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.94	0.10	0.10	mg/l	1	08/13/18 09:41	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	mg/l	1	07/31/18 23:00	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.15 J	0.20	0.15	mg/l	1	08/13/18 11:09	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/13/18 18:00	LS	EPA 365.3
Solids, Total Dissolved	55.0	10	4.0	mg/l	1	08/02/18 10:50	RC	SM2540 C-11
Solids, Total Suspended	2.0 U	4.0	2.0	mg/l	1	08/02/18 11:03	RC	SM2540 D-11
Total Organic Carbon	1.0 U	1.0	1.0	mg/l	1	08/14/18 07:39	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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
U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	BZ-6M		
Lab Sample ID:	JC71016-9F	**Date Sampled:**	07/31/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/31/18
		Percent Solids:	n/a
Project:	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	08/13/18 21:20	LS	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	BZ-6D		
Lab Sample ID:	JC71016-10	**Date Sampled:**	07/31/18
Matrix:	AQ - Surface Water	**Date Received:**	07/31/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	9.3	5.0	4.0	mg/l	1	08/06/18 10:11	CD	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	07/31/18 23:45	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	08/09/18 14:18	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.85	0.11	0.11	mg/l	1	08/13/18 09:42	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.85	0.10	0.10	mg/l	1	08/13/18 09:42	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	mg/l	1	07/31/18 23:00	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.19 J	0.20	0.15	mg/l	1	08/13/18 11:10	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/13/18 18:00	LS	EPA 365.3
Solids, Total Dissolved	22.9	10	4.0	mg/l	1	08/02/18 10:50	RC	SM2540 C-11
Solids, Total Suspended	2.0 U	4.0	2.0	mg/l	1	08/02/18 11:03	RC	SM2540 D-11
Total Organic Carbon	1.0 U	1.0	1.0	mg/l	1	08/14/18 08:18	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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 U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	BZ-6D		
Lab Sample ID:	JC71016-10F	**Date Sampled:**	07/31/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/31/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.22	0.050	0.050	mg/l	1	08/13/18 21:20	LS	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	BZ-7S		
Lab Sample ID:	JC71016-11	**Date Sampled:**	07/31/18
Matrix:	AQ - Surface Water	**Date Received:**	07/31/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.0 U	5.0	4.0	mg/l	1	08/06/18 10:11	CD	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	07/31/18 23:47	SA	SM5210 B-11
Coliform, Fecal [c]	0 J	4		col/100ml	4	07/31/18 23:48	SA	SM9222 D-06
Coliform, Total [c]	0 J	4		col/100ml	4	07/31/18 23:41	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	08/09/18 14:22	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.21	0.11	0.11	mg/l	1	08/13/18 09:43	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.22	0.10	0.10	mg/l	1	08/13/18 09:43	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0051 J	0.010	0.0050	mg/l	1	07/31/18 23:00	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.18 J	0.20	0.15	mg/l	1	08/13/18 11:11	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/13/18 18:00	LS	EPA 365.3
Solids, Total Dissolved	33.0	10	4.0	mg/l	1	08/02/18 10:50	RC	SM2540 C-11
Solids, Total Suspended	2.0 U	4.0	2.0	mg/l	1	08/02/18 11:03	RC	SM2540 D-11
Total Organic Carbon	1.0	1.0	1.0	mg/l	1	08/13/18 16:41	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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
LOD = Limit of Detection B = Analyte found in associated blank
U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	BZ-7S		
Lab Sample ID:	JC71016-11F	**Date Sampled:**	07/31/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/31/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.082	0.050	0.050	mg/l	1	08/13/18 21:20	LS	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	BZ-7M		
Lab Sample ID:	JC71016-12	**Date Sampled:**	07/31/18
Matrix:	AQ - Surface Water	**Date Received:**	07/31/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	7.8	5.0	4.0	mg/l	1	08/06/18 10:11	CD	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	07/31/18 23:49	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	08/09/18 14:24	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.89	0.11	0.11	mg/l	1	08/13/18 09:45	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.90	0.10	0.10	mg/l	1	08/13/18 09:45	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0060 J	0.010	0.0050	mg/l	1	07/31/18 23:00	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.24	0.20	0.15	mg/l	1	08/13/18 11:12	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/13/18 18:00	LS	EPA 365.3
Solids, Total Dissolved	58.8	10	4.0	mg/l	1	08/02/18 10:50	RC	SM2540 C-11
Solids, Total Suspended	2.1 J	4.0	2.0	mg/l	1	08/02/18 11:03	RC	SM2540 D-11
Total Organic Carbon	1.0	1.0	1.0	mg/l	1	08/13/18 17:55	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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
U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	BZ-7M		
Lab Sample ID:	JC71016-12F	**Date Sampled:**	07/31/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/31/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.056	0.050	0.050	mg/l	1	08/13/18 21:20	LS	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID: BZ-7D
Lab Sample ID: JC71016-13
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 07/31/18
Date Received: 07/31/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	8.3	5.0	4.0	mg/l	1	08/06/18 10:11	CD	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	mg/l	1	07/31/18 23:50	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	mg/l	1	08/09/18 14:25	RP	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.95	0.11	0.11	mg/l	1	08/13/18 09:46	BM	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.95	0.10	0.10	mg/l	1	08/13/18 09:46	BM	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	mg/l	1	07/31/18 23:00	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.19 J	0.20	0.15	mg/l	1	08/13/18 11:13	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	mg/l	1	08/13/18 18:00	LS	EPA 365.3
Solids, Total Dissolved	50.0	10	4.0	mg/l	1	08/02/18 10:50	RC	SM2540 C-11
Solids, Total Suspended	2.0 U	4.0	2.0	mg/l	1	08/02/18 11:03	RC	SM2540 D-11
Total Organic Carbon	1.1	1.0	1.0	mg/l	1	08/13/18 18:09	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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
U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Report of Analysis

Client Sample ID:	BZ-7D		
Lab Sample ID:	JC71016-13F	**Date Sampled:**	07/31/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	07/31/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	Units	DF	Analyzed	By	Method
Phosphorus, Total	1.8	0.50	0.50	mg/l	10	08/13/18 21:25	LS	EPA 365.3

LOQ = Limit of Quantitation
LOD = Limit of Detection B = Analyte found in associated blank

U = Indicates a result < LOD
J = Indicates a result > = LOD but < LOQ

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

SGS

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/ehsusa

PAGE 1 OF 2

E F PN

FED-EX Tracking #: | Bottle Order Control #:
SGS Quote #: | SGS Job #: JC71016

Client / Reporting Information

Company Name: USACE- Phila District
Street Address: 100 Penn Sq. East
City: Philadelphia State: PA Zip: 19107
Project Contact: Joe Loeper E-mail:
Phone #: 215-656-6545 Fax #:
Sampler(s) Name(s): Greg Wacik Phone #: 610-597-9780

Project Information

Project Name: USACE - Beltzville Reservoir
Street: 2145 Pohopoco DR.
City: Lehighton State: PA
Project #: PD-07918-122
Client Purchase Order #:
Project Manager:

Billing Information (if different from Report to)

Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis (see TEST CODE sheet)

Matrix Codes: 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

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	Preserved: HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	NO3 $203	AIK, AMM, BOD, TDS	TOC, TSS, TP04 (Phosphorus)	TKN, XN030 (TKN/TP04 Bottle)	TP04 (dissolved lab filter)	FCF, TCF	LAB USE ONLY
1F	BZ-1S		7/31/18	3:50	MW	SW	10	X			X					X	X	X	X	X	X	GJ
2F	BZ-2S			3:55		SW	10	X			X					X	X	X	X	X	X	G3874
3F	BZ-3S			1:10		SW	10	X			X					X	X	X	X	X	X	19K2
4F	BZ-3M			1:10		SW	8	X			X						X	X	X	X		
5F	BZ-3D			1:10		SW	8	X			X						X	X	X	X		
6F	BZ-4S			3:20		SW	10	X			X					X	X	X	X	X	X		
7F	BZ-5S			3:10		SW	10	X			X					X	X	X	X	X	X		
8F	BZ-6S			12:15		SW	10	X			X					X	X	X	X	X	X		
9F	BZ-6M			12:15		SW	8	X			X						X	X	X	X		
10F	BZ-6D			1215	MW	SW	8	X			X						X	X	X	X		

ADD 38 (K)

INITIAL ASESSMENT SB

LABEL VERIFICATION

Turnaround Time (Business days)

Approved by (SGS Project Manager)/Date:

- [ ] Std. 10 Business Days
- [ ] 5 Day RUSH
- [ ] 3 Day RUSH
- [ ] 2 Day RUSH
- [ ] 1 Day RUSH
- [ ] other

Emergency & Rush T/A data available via LabLink

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NJ Data of Known Quality Protocol Reporting
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [ ] EDD Format
- [ ] Other

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

one TSS bottle not filled. one XN030 bottle not used. TP04 dissolved lab filter. XN030 combined with TP04/TKN bottle.

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:	Date/Time:	Received By:	Relinquished By:	Date Time:	Received By:
1		7/31/18 1415	1	2	7/31/18 1930	2
2	Relinquished by Sampler:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
	3		3	4		4
3	Relinquished by:	Date Time:	Received By:	Custody Seal #	Intact / Not intact	Preserved where applicable	On Ice	Cooler Temp.
	5		5					

2.1, 2.3, 3.3, 2.9, 2.4 °C

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions.

SGS

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 #: JC71016

Client / Reporting Information

Company Name: USACE-Phila. District
Street Address: 100 Penn Sq. East
City, State, Zip: Philadelphia, PA 19107
Project Contact: Joe Loeper | E-mail:
Phone #: 215-656-6545 | Fax #:
Sampler(s) Name(s): Greg Wacik | Phone #: 610-597-9780

Project Information

Project Name: USACE-Beltzville Reservoir
Street: 2145 Pohopoco DR
City: Lehighton | State: PA
Project #: PD-07918-122
Client Purchase Order #:
Project Manager:

Billing Information (if different from Report to)
Company Name:
Street Address:
City: | State: | Zip:
Attention:

Requested Analysis (see TEST CODE sheet): NO2NO3; AIK, AMN, BOD, TDS; TOC, TSS, TPO4 (Total Phosphorus); TKN, XW030 (TKN/TPO4 Bottle); TPO4 (dissolved lab filter); FCE, TCE

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Date	Time	Sampled by	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	NO2NO3	AIK, AMN, BOD, TDS	TOC, TSS, TPO4 (Total Phosphorus)	TKN, XW030 (TKN/TPO4 Bottle)	TPO4 (dissolved lab filter)	FCE, TCE	LAB USE ONLY
11F	BZ-7S		7/31/18	2:00	[signature]	SW	10	X			X					X	X	X	X	X	X	
12F	BZ-7M		7/31/18	2:00	[signature]	SW	8	X			X						X	X	X	X		
13F	BZ-7D		7/31/18	2:00	[signature]	SW	8	X			X						X	X	X	X		

Matrix Codes: 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

Turnaround Time (Business days)

- ☐ Std. 10 Business Days
- ☐ 5 Day RUSH
- ☐ 3 Day RUSH
- ☐ 2 Day RUSH
- ☐ 1 Day RUSH
- ☐ other

Approved by (SGS Project Manager)/Date:

Emergency & Rush T/A data available via LabLink

Data Deliverable Information

- ☐ Commercial "A" (Level 1)
- ☐ Commercial "B" (Level 2)
- ☐ FULLT1 (Level 3+4)
- ☐ NJ Reduced
- ☐ Commercial "C"
- ☐ NYASP Category A
- ☐ NYASP Category B
- ☐ State Forms
- ☐ EDD Format
- ☐ Other
- ☐ *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 filled. one XW030 bottle not used. TPO4 dissolved lab filter. XW030 combined with TPO4/TKN bottle.

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:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1 [signature]	7/31/18 4:45	1 [signature]	2 [signature]	7/31/18 1930	2 [signature]
3		3	4		4
Relinquished by: 5	Date Time:	Received By: 5	Custody Seal #	☐ Intact ☐ Not intact	Preserved where applicable ☐ / On Ice ☐ / Cooler Temp.

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions.

5.1
5

JC71016: Chain of Custody
Page 2 of 5

SGS Sample Receipt Summary

Job Number: JC71016 **Client:** USACE-PHILADELPHIA DISTRICT **Project:** PHILADELPHIA DISTRICT, RESERVOIR SAMPL

Date / Time Received: 7/31/2018 7:30:00 PM **Delivery Method:** Accutest Courier **Airbill #'s:**

Cooler Temps (Raw Measured) °C: Cooler 1: (2.1); Cooler 2: (2.3); Cooler 3: (3.3); Cooler 4: (2.9); Cooler 5: (2.4);

Cooler Temps (Corrected) °C: Cooler 1: (2.0); Cooler 2: (2.2); Cooler 3: (3.2); Cooler 4: (2.8); Cooler 5: (2.3);

Cooler Security	Y	or	N		Y	or	N
1. Custody Seals Present:	☑		☐	3. COC Present:	☑		☐
2. Custody Seals Intact:	☑		☐	4. Smpl Dates/Time OK	☑		☐

Cooler Temperature	Y	or	N
1. Temp criteria achieved:	☑		☐
2. Cooler temp verification:	IR Gun		
3. Cooler media:	Ice (Bag)		
4. No. Coolers:	5		

Quality Control Preservation	Y	or	N	N/A
1. Trip Blank present / cooler:	☐		☑	☐
2. Trip Blank listed on COC:	☐		☑	☐
3. Samples preserved properly:	☑		☐	
4. VOCs headspace free:	☐		☐	☑

Sample Integrity - Documentation	Y	or	N
1. Sample labels present on bottles:	☑		☐
2. Container labeling complete:	☑		☐
3. Sample container label / COC agree:	☑		☐

Sample Integrity - Condition	Y	or	N
1. Sample recvd within HT:	☑		☐
2. All containers accounted for:	☑		☐
3. Condition of sample:	Intact		

Sample Integrity - Instructions	Y	or	N	N/A
1. Analysis requested is clear:	☑		☐	
2. Bottles received for unspecified tests	☐		☑	
3. Sufficient volume recvd for analysis:	☑		☐	
4. Compositing instructions clear:	☐		☐	☑
5. Filtering instructions clear:	☐		☐	☑

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

Comments
1) -2 Collection time on labels is 15:35, not 15:55. ID and date is ok.
2) Lab to verify which samples made 8 hour hold time for TCF and FCF.

SM089-02 Rev. Date 12/1/16

Responded to by: Tammy Esposito McCloskey Response Date: 8/2/18

1) collect time is 15:35 per Gregory Wacik
2) Proceed as noted, client is following 30 day hold time for TCF / FCF on this project.

JC71016: Chain of Custody
Page 4 of 5

Job Change Order: JC71016

Requested Date:	8/13/2018	**Received Date:**	7/31/2018
Account Name:	USACE-Philadelphia District	**Due Date:**	8/14/2018
Project Description:	Philadelphia District, Reservoir Sampling	**Deliverable:**	FULT1
C/O Initiated By:	TAMMY **PM:** TM	**TAT (Days):**	14

==========

Sample #: JC71016-all

Dept:

TAT: 14

Change:
revise deliverables to REDT2

==========

Above Changes Per: Joseph Loeper **Date/Time:** 8/13/2018 12:38:58 PM

To Client: This Change Order is confirmation of the revisions, previously discussed with the Client Service Representative.

Page 1 of 1

JC71016: Chain of Custody
Page 5 of 5

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: JC71959

Sampling Date: 08/15/18

Report to:

Army Corps of Engineers

joseph.m.loeper@usace.army.mil

ATTN: Joseph Loeper

Total number of pages in report: 44

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)

Sections: 1 2 3 4 5

Table of Contents

Sample Summary

USACE-Philadelphia District

Job No: JC71959

Philadelphia District, Reservoir Sampling
Project No: W25PHS81145379

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
JC71959-1	08/15/18	15:45	GW	08/15/18	AQ	Surface Water	BZ-1S
JC71959-1F	08/15/18	15:45	GW	08/15/18	AQ	Surface H2O Filtered	BZ-1S
JC71959-2	08/15/18	15:35	GW	08/15/18	AQ	Surface Water	BZ-2S
JC71959-2F	08/15/18	15:35	GW	08/15/18	AQ	Surface H2O Filtered	BZ-2S
JC71959-3	08/15/18	13:05	GW	08/15/18	AQ	Surface Water	BZ-3S
JC71959-3F	08/15/18	13:05	GW	08/15/18	AQ	Surface H2O Filtered	BZ-3S
JC71959-4	08/15/18	13:05	GW	08/15/18	AQ	Surface Water	BZ-3M
JC71959-4F	08/15/18	13:05	GW	08/15/18	AQ	Surface H2O Filtered	BZ-3M
JC71959-5	08/15/18	15:25	GW	08/15/18	AQ	Surface Water	BZ-3D
JC71959-5F	08/15/18	15:25	GW	08/15/18	AQ	Surface H2O Filtered	BZ-3D
JC71959-6	08/15/18	15:10	GW	08/15/18	AQ	Surface Water	BZ-4S
JC71959-6F	08/15/18	15:10	GW	08/15/18	AQ	Surface H2O Filtered	BZ-4S
JC71959-7	08/15/18	12:10	GW	08/15/18	AQ	Surface Water	BZ-5S

Sample Summary
(continued)

USACE-Philadelphia District

Job No: JC71959

Philadelphia District, Reservoir Sampling
Project No: W25PHS81145379

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
JC71959-7F	08/15/18	12:10	GW	08/15/18	AQ	Surface H2O Filtered	BZ-5S
JC71959-8	08/15/18	12:10	GW	08/15/18	AQ	Surface Water	BZ-6S
JC71959-8F	08/15/18	12:10	GW	08/15/18	AQ	Surface H2O Filtered	BZ-6S
JC71959-9	08/15/18	12:10	GW	08/15/18	AQ	Surface Water	BZ-6M
JC71959-9F	08/15/18	12:10	GW	08/15/18	AQ	Surface H2O Filtered	BZ-6M
JC71959-10	08/15/18	12:10	GW	08/15/18	AQ	Surface Water	BZ-6D
JC71959-10F	08/15/18	12:10	GW	08/15/18	AQ	Surface H2O Filtered	BZ-6D
JC71959-11	08/15/18	13:55	GW	08/15/18	AQ	Surface Water	BZ-7S
JC71959-11F	08/15/18	13:55	GW	08/15/18	AQ	Surface H2O Filtered	BZ-7S
JC71959-12	08/15/18	13:55	GW	08/15/18	AQ	Surface Water	BZ-7M
JC71959-12F	08/15/18	13:55	GW	08/15/18	AQ	Surface H2O Filtered	BZ-7M
JC71959-13	08/15/18	13:55	GW	08/15/18	AQ	Surface Water	BZ-7D
JC71959-13F	08/15/18	13:55	GW	08/15/18	AQ	Surface H2O Filtered	BZ-7D

CASE NARRATIVE / CONFORMANCE SUMMARY

Client:	USACE-Philadelphia District	**Job No**	JC71959
Site:	Philadelphia District, Reservoir Sampling	**Report Date**	8/29/2018 4:27:44 PM

On 08/15/2018, 26 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at SGS North America Inc. at a maximum corrected temperature of 3.7 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. Job Number of JC71959 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:** GP15412

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71959-1MS, JC71959-1DUP were used as the QC samples for Nitrogen, Total Kjeldahl.
- RPD(s) for Duplicate for Nitrogen, Total Kjeldahl are outside control limits for sample GP15412-D1. RPD acceptable due to low duplicate and sample concentrations.

General Chemistry By Method EPA 353.2/LACHAT

Matrix: AQ **Batch ID:** GP15495

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71959-1DUP, JC71959-2MS, JC71959-1MS 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:** GP15438

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71959-1DUP, JC71959-1MS were used as the QC samples for Phosphorus, Total.

Matrix: AQ **Batch ID:** GP15474

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71959-8FDUP, JC71959-8FMS were used as the QC samples for Phosphorus, Total.

General Chemistry By Method EPA353.2/SM4500NO2B

Matrix: AQ **Batch ID:** R172343

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71959-9 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172364

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71959-1 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172365

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71959-2 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172366

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71959-3 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172367

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71959-4 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172368

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71959-5 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172369

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71959-6 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172370

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71959-7 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172371

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71959-8 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172372

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71959-10 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172373

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71959-11 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172374

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71959-12 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172375

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC71959-13 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

General Chemistry By Method SM2320 B-11

Matrix: AQ **Batch ID:** GN84701

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71959-1DUP were used as the QC samples for Alkalinity, Total as CaCO3.
- JC71959-8 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71959-1 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71959-10 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71959-12 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71959-13 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71959-2 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71959-3 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71959-4 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71959-5 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71959-6 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71959-11 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71959-9 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC71959-7 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.5.

General Chemistry By Method SM2540 C-11

Matrix: AQ **Batch ID:** GN84415

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71959-1DUP were used as the QC samples for Solids, Total Dissolved.

General Chemistry By Method SM2540 D-11

Matrix: AQ **Batch ID:** GN84414

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71959-1DUP were used as the QC samples for Solids, Total Suspended.
- JC71959-1 for Solids, Total Suspended: Reported sample aliquot obtained from filtration of 550 mL of sample. Volume was reduced from 1 liter due to limited volume.

General Chemistry By Method SM4500NH3 H-11LACHAT

Matrix: AQ **Batch ID:** GP15448

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71959-2DUP, JC71959-2MS, JC71959-2MSD were used as the QC samples for Nitrogen, Ammonia.

General Chemistry By Method SM4500NO2 B-11

Matrix: AQ **Batch ID:** GN84347

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71959-2DUP, JC71959-2MS were used as the QC samples for Nitrogen, Nitrite.

General Chemistry By Method SM5210 B-11

Matrix: AQ	Batch ID: GP15315

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71959-1DUP were used as the QC samples for BOD, 5 Day.

General Chemistry By Method SM5310 B-11

Matrix: AQ	Batch ID: GP15463

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71959-1MS, JC71959-1MSD were used as the QC samples for Total Organic Carbon.

Matrix: AQ	Batch ID: GP15505

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71959-11MS, JC71959-11MSD were used as the QC samples for Total Organic Carbon.

General Chemistry By Method SM9222 B-06

Matrix: AQ	Batch ID: MB5343

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71959-1DUP were used as the QC samples for Coliform, Total.
- JC71959-8 for Coliform, Total: Analysis done out of holding time.
- JC71959-7 for Coliform, Total: Analysis done out of holding time.
- JC71959-3 for Coliform, Total: Analysis done out of holding time.
- JC71959-11 for Coliform, Total: Analysis done out of holding time.

General Chemistry By Method SM9222 D-06

Matrix: AQ	Batch ID: MB5344

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC71959-1DUP were used as the QC samples for Coliform, Fecal.
- JC71959-3 for Coliform, Fecal: Analysis done out of holding time.
- JC71959-7 for Coliform, Fecal: Analysis done out of holding time.
- JC71959-8 for Coliform, Fecal: Analysis done out of holding time.
- JC71959-11 for Coliform, Fecal: Analysis done out of holding time.

Summary of Hits

Job Number: JC71959
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 08/15/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
JC71959-1	**BZ-1S**					
Alkalinity, Total as CaCO3 [a]		11.9	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal		160	4	[b]	col/100ml	SM9222 D-06
Coliform, Total		580	10	[b]	col/100ml	SM9222 B-06
Nitrogen, Nitrate [c]		0.92	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.93	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite		0.0074 J	0.010	0.0050	mg/l	SM4500NO2 B-11
Solids, Total Dissolved		82.9	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended [d]		3.1 J	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		1.9	1.0	1.0	mg/l	SM5310 B-11
JC71959-1F	**BZ-1S**					
No hits reported in this sample.						
JC71959-2	**BZ-2S**					
Alkalinity, Total as CaCO3 [a]		6.2	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal		183	10	[b]	col/100ml	SM9222 D-06
Coliform, Total		231	10	[b]	col/100ml	SM9222 B-06
Nitrogen, Nitrate [c]		0.23	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.23	0.10	0.10	mg/l	EPA 353.2/LACHAT
Solids, Total Dissolved		31.3	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		2.5 J	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		1.1	1.0	1.0	mg/l	SM5310 B-11
JC71959-2F	**BZ-2S**					
No hits reported in this sample.						
JC71959-3	**BZ-3S**					
Alkalinity, Total as CaCO3 [a]		10.9	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal [e]		4	4	[b]	col/100ml	SM9222 D-06
Nitrogen, Nitrate [c]		0.26	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.26	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite		0.0045 J	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl		0.15 J	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		35.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		1.7 J	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		1.8	1.0	1.0	mg/l	SM5310 B-11

Summary of Hits

Job Number: JC71959
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 08/15/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
JC71959-3F	**BZ-3S**					
No hits reported in this sample.						
JC71959-4	**BZ-3M**					
Alkalinity, Total as CaCO3 [a]		14.0	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate [c]		0.86	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.87	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite		0.0057 J	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl		0.16 J	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		66.3	10	4.0	mg/l	SM2540 C-11
Total Organic Carbon		2.2	1.0	1.0	mg/l	SM5310 B-11
JC71959-4F	**BZ-3M**					
No hits reported in this sample.						
JC71959-5	**BZ-3D**					
Alkalinity, Total as CaCO3 [a]		12.9	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate [c]		0.84	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.84	0.10	0.10	mg/l	EPA 353.2/LACHAT
Solids, Total Dissolved		54.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		1.5 J	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		1.4	1.0	1.0	mg/l	SM5310 B-11
JC71959-5F	**BZ-3D**					
No hits reported in this sample.						
JC71959-6	**BZ-4S**					
Alkalinity, Total as CaCO3 [a]		3.6 J	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal		92	4	[b]	col/100ml	SM9222 D-06
Coliform, Total		140	4	[b]	col/100ml	SM9222 B-06
Solids, Total Dissolved		22.2	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		3.3 J	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		1.7	1.0	1.0	mg/l	SM5310 B-11
JC71959-6F	**BZ-4S**					
No hits reported in this sample.						

Summary of Hits

Job Number: JC71959
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 08/15/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
JC71959-7	**BZ-5S**					
Alkalinity, Total as CaCO3 [f]		24.3	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal [e]		350	10	[b]	col/100ml	SM9222 D-06
Coliform, Total [e]		963.6	10	[b]	col/100ml	SM9222 B-06
Nitrogen, Nitrate [c]		1.2	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		1.2	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.23	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		71.3	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		3.4 J	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		2.2	1.0	1.0	mg/l	SM5310 B-11
JC71959-7F	**BZ-5S**					
No hits reported in this sample.						
JC71959-8	**BZ-6S**					
Alkalinity, Total as CaCO3 [a]		11.4	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal [e]		4	4	[b]	col/100ml	SM9222 D-06
Nitrogen, Nitrate [c]		0.33	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.34	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite		0.0054 J	0.010	0.0050	mg/l	SM4500NO2 B-11
Solids, Total Dissolved		35.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		2.0 J	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		1.7	1.0	1.0	mg/l	SM5310 B-11
JC71959-8F	**BZ-6S**					
No hits reported in this sample.						
JC71959-9	**BZ-6M**					
Alkalinity, Total as CaCO3 [a]		11.9	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate [c]		0.75	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.78	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		0.13 J	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		50.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		1.5 J	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		2.3	1.0	1.0	mg/l	SM5310 B-11
JC71959-9F	**BZ-6M**					
No hits reported in this sample.						

Summary of Hits

Job Number: JC71959
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 08/15/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
JC71959-10	**BZ-6D**					
Alkalinity, Total as CaCO3 [a]		14.5	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate [c]		0.72	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.72	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.14 J	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		60.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		3.2 J	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		1.3	1.0	1.0	mg/l	SM5310 B-11
JC71959-10F	**BZ-6D**					
No hits reported in this sample.						
JC71959-11	**BZ-7S**					
Alkalinity, Total as CaCO3 [a]		9.3	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate [c]		0.26	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.26	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.18 J	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		26.7	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		2.0 J	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		2.6	1.0	1.0	mg/l	SM5310 B-11
JC71959-11F	**BZ-7S**					
No hits reported in this sample.						
JC71959-12	**BZ-7M**					
Alkalinity, Total as CaCO3 [a]		8.8	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate [c]		0.16	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.16	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.12 J	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		37.8	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		1.8 J	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		1.8	1.0	1.0	mg/l	SM5310 B-11
JC71959-12F	**BZ-7M**					
No hits reported in this sample.						

Summary of Hits

Job Number: JC71959
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 08/15/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
JC71959-13	**BZ-7D**					
Alkalinity, Total as CaCO3 [a]		14.0	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate [c]		0.94	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.94	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.21	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		50.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		4.4	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		2.5	1.0	1.0	mg/l	SM5310 B-11
JC71959-13F	**BZ-7D**					

No hits reported in this sample.

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)
(d) Reported sample aliquot obtained from filtration of 550 mL of sample. Volume was reduced from 1 liter due to limited volume.
(e) Analysis done out of holding time.
(f) Sample was titrated to a final pH of 4.5.

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	BZ-1S		
Lab Sample ID:	JC71959-1	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface Water	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	11.9	5.0	4.0	3.6	mg/l	1	08/23/18 12:00	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	08/15/18 23:14	SA	SM5210 B-11
Coliform, Fecal	160	4			col/100ml	4	08/15/18 23:02	SA	SM9222 D-06
Coliform, Total	580	10			col/100ml	10	08/15/18 22:53	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/22/18 12:14	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.92	0.11	0.11	0.046	mg/l	1	08/23/18 16:45	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.93	0.10	0.10	0.043	mg/l	1	08/23/18 16:45	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0074 J	0.010	0.0050	0.0030	mg/l	1	08/15/18 21:00	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.15 U	0.20	0.15	0.12	mg/l	1	08/22/18 09:58	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/24/18 15:41	MP	EPA 365.3
Solids, Total Dissolved	82.9	10	4.0	1.8	mg/l	1	08/17/18 14:36	RC	SM2540 C-11
Solids, Total Suspended [d]	3.1 J	4.0	2.0	1.5	mg/l	1	08/17/18 11:02	RC	SM2540 D-11
Total Organic Carbon	1.9	1.0	1.0	0.72	mg/l	1	08/23/18 09:48	HP	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(b) Value reported is laboratory DL (MDL).
(c) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)
(d) Reported sample aliquot obtained from filtration of 550 mL of sample. Volume was reduced from 1 liter due to limited volume.

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

Client Sample ID:	BZ-1S		
Lab Sample ID:	JC71959-1F	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	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	08/24/18 15:49	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

Client Sample ID:	BZ-2S		
Lab Sample ID:	JC71959-2	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface Water	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	6.2	5.0	4.0	3.6	mg/l	1	08/23/18 12:00	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	08/15/18 23:18	SA	SM5210 B-11
Coliform, Fecal	183	10			col/100ml	10	08/15/18 23:02	SA	SM9222 D-06
Coliform, Total	231	10			col/100ml	10	08/15/18 22:53	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/22/18 12:16	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.23	0.11	0.11	0.046	mg/l	1	08/23/18 16:46	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.23	0.10	0.10	0.043	mg/l	1	08/23/18 16:46	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	08/15/18 21:00	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.15 U	0.20	0.15	0.12	mg/l	1	08/22/18 09:59	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/24/18 15:41	MP	EPA 365.3
Solids, Total Dissolved	31.3	10	4.0	1.8	mg/l	1	08/17/18 14:36	RC	SM2540 C-11
Solids, Total Suspended	2.5 J	4.0	2.0	1.5	mg/l	1	08/17/18 11:02	RC	SM2540 D-11
Total Organic Carbon	1.1	1.0	1.0	0.72	mg/l	1	08/23/18 10:45	HP	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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

Client Sample ID:	BZ-2S		
Lab Sample ID:	JC71959-2F	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	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	08/24/18 15:49	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

Client Sample ID: BZ-3S
Lab Sample ID: JC71959-3
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 08/15/18
Date Received: 08/15/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	10.9	5.0	4.0	3.6	mg/l	1	08/23/18 12:00	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	08/15/18 23:19	SA	SM5210 B-11
Coliform, Fecal [c]	4	4			col/100ml	4	08/15/18 23:02	SA	SM9222 D-06
Coliform, Total [c]	0 J	4			col/100ml	1	08/15/18 22:53	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/22/18 12:17	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.26	0.11	0.11	0.046	mg/l	1	08/23/18 16:47	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.26	0.10	0.10	0.043	mg/l	1	08/23/18 16:47	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0045 J	0.010	0.0050	0.0030	mg/l	1	08/15/18 21:00	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.15 J	0.20	0.15	0.12	mg/l	1	08/22/18 10:00	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/24/18 15:41	MP	EPA 365.3
Solids, Total Dissolved	35.0	10	4.0	1.8	mg/l	1	08/17/18 14:36	RC	SM2540 C-11
Solids, Total Suspended	1.7 J	4.0	2.0	1.5	mg/l	1	08/17/18 11:02	RC	SM2540 D-11
Total Organic Carbon	1.8	1.0	1.0	0.72	mg/l	1	08/23/18 10:56	HP	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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

Client Sample ID:	BZ-3S		
Lab Sample ID:	JC71959-3F	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	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	08/24/18 15:49	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

Client Sample ID:	BZ-3M		
Lab Sample ID:	JC71959-4	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface Water	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	14.0	5.0	4.0	3.6	mg/l	1	08/23/18 12:00	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	08/15/18 23:20	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/22/18 12:21	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.86	0.11	0.11	0.046	mg/l	1	08/23/18 16:48	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.87	0.10	0.10	0.043	mg/l	1	08/23/18 16:48	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0057 J	0.010	0.0050	0.0030	mg/l	1	08/15/18 21:00	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.16 J	0.20	0.15	0.12	mg/l	1	08/22/18 10:01	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/24/18 15:41	MP	EPA 365.3
Solids, Total Dissolved	66.3	10	4.0	1.8	mg/l	1	08/17/18 14:36	RC	SM2540 C-11
Solids, Total Suspended	2.0 U	4.0	2.0	1.5	mg/l	1	08/17/18 11:02	RC	SM2540 D-11
Total Organic Carbon	2.2	1.0	1.0	0.72	mg/l	1	08/23/18 11:08	HP	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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

Client Sample ID:	BZ-3M		
Lab Sample ID:	JC71959-4F	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	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	08/24/18 15:57	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

Client Sample ID: BZ-3D
Lab Sample ID: JC71959-5
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 08/15/18
Date Received: 08/15/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	12.9	5.0	4.0	3.6	mg/l	1	08/23/18 12:00	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	08/15/18 23:22	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/22/18 12:23	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.84	0.11	0.11	0.046	mg/l	1	08/23/18 16:53	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.84	0.10	0.10	0.043	mg/l	1	08/23/18 16:53	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	08/15/18 21:00	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.15 U	0.20	0.15	0.12	mg/l	1	08/22/18 10:02	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/24/18 15:41	MP	EPA 365.3
Solids, Total Dissolved	54.0	10	4.0	1.8	mg/l	1	08/17/18 14:36	RC	SM2540 C-11
Solids, Total Suspended	1.5 J	4.0	2.0	1.5	mg/l	1	08/17/18 11:02	RC	SM2540 D-11
Total Organic Carbon	1.4	1.0	1.0	0.72	mg/l	1	08/23/18 11:22	HP	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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

Client Sample ID:	BZ-3D		
Lab Sample ID:	JC71959-5F	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	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	08/24/18 15:57	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

Client Sample ID:	BZ-4S		
Lab Sample ID:	JC71959-6	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface Water	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	3.6 J	5.0	4.0	3.6	mg/l	1	08/23/18 12:00	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	08/15/18 23:24	SA	SM5210 B-11
Coliform, Fecal	92	4			col/100ml	4	08/15/18 23:02	SA	SM9222 D-06
Coliform, Total	140	4			col/100ml	4	08/15/18 22:53	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/22/18 12:24	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.11 U	0.11	0.11	0.046	mg/l	1	08/23/18 16:54	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.10 U	0.10	0.10	0.043	mg/l	1	08/23/18 16:54	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	08/15/18 21:00	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.15 U	0.20	0.15	0.12	mg/l	1	08/22/18 10:02	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/24/18 15:41	MP	EPA 365.3
Solids, Total Dissolved	22.2	10	4.0	1.8	mg/l	1	08/17/18 14:36	RC	SM2540 C-11
Solids, Total Suspended	3.3 J	4.0	2.0	1.5	mg/l	1	08/17/18 11:02	RC	SM2540 D-11
Total Organic Carbon	1.7	1.0	1.0	0.72	mg/l	1	08/23/18 11:35	HP	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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

Client Sample ID:	BZ-4S		
Lab Sample ID:	JC71959-6F	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	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	08/24/18 15:57	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

Client Sample ID:	BZ-5S		
Lab Sample ID:	JC71959-7	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface Water	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	24.3	5.0	4.0	3.6	mg/l	1	08/23/18 12:00	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	08/15/18 23:25	SA	SM5210 B-11
Coliform, Fecal [c]	350	10			col/100ml	10	08/15/18 23:02	SA	SM9222 D-06
Coliform, Total [c]	963.6	10			col/100ml	100	08/15/18 22:53	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/22/18 12:26	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	1.2	0.11	0.11	0.046	mg/l	1	08/23/18 16:55	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	1.2	0.10	0.10	0.043	mg/l	1	08/23/18 16:55	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	08/15/18 21:10	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.23	0.20	0.15	0.12	mg/l	1	08/22/18 10:05	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/24/18 15:49	MP	EPA 365.3
Solids, Total Dissolved	71.3	10	4.0	1.8	mg/l	1	08/17/18 14:36	RC	SM2540 C-11
Solids, Total Suspended	3.4 J	4.0	2.0	1.5	mg/l	1	08/17/18 11:02	RC	SM2540 D-11
Total Organic Carbon	2.2	1.0	1.0	0.72	mg/l	1	08/23/18 11:48	HP	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

Client Sample ID:	BZ-5S		
Lab Sample ID:	JC71959-7F	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	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	08/24/18 15:57	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

Client Sample ID:	BZ-6S		
Lab Sample ID:	JC71959-8	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface Water	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	11.4	5.0	4.0	3.6	mg/l	1	08/23/18 12:00	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	08/15/18 23:27	SA	SM5210 B-11
Coliform, Fecal [c]	4	4			col/100ml	4	08/15/18 23:02	SA	SM9222 D-06
Coliform, Total [c]	0 J	4			col/100ml	1	08/15/18 22:53	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/22/18 12:27	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.33	0.11	0.11	0.046	mg/l	1	08/23/18 16:56	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.34	0.10	0.10	0.043	mg/l	1	08/23/18 16:56	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0054 J	0.010	0.0050	0.0030	mg/l	1	08/15/18 21:10	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.15 U	0.20	0.15	0.12	mg/l	1	08/22/18 10:06	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/24/18 15:49	MP	EPA 365.3
Solids, Total Dissolved	35.0	10	4.0	1.8	mg/l	1	08/17/18 14:36	RC	SM2540 C-11
Solids, Total Suspended	2.0 J	4.0	2.0	1.5	mg/l	1	08/17/18 11:02	RC	SM2540 D-11
Total Organic Carbon	1.7	1.0	1.0	0.72	mg/l	1	08/23/18 11:59	HP	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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

Client Sample ID:	BZ-6S		
Lab Sample ID:	JC71959-8F	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	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	08/25/18 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

Client Sample ID:	BZ-6M		
Lab Sample ID:	JC71959-9	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface Water	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	11.9	5.0	4.0	3.6	mg/l	1	08/23/18 12:00	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	08/15/18 23:28	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/22/18 12:29	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.75	0.11	0.11	0.046	mg/l	1	08/23/18 16:57	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.78	0.10	0.10	0.043	mg/l	1	08/23/18 16:57	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.027	0.010	0.0050	0.0030	mg/l	1	08/15/18 21:10	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.13 J	0.20	0.15	0.12	mg/l	1	08/22/18 10:07	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/24/18 15:49	MP	EPA 365.3
Solids, Total Dissolved	50.0	10	4.0	1.8	mg/l	1	08/17/18 14:36	RC	SM2540 C-11
Solids, Total Suspended	1.5 J	4.0	2.0	1.5	mg/l	1	08/17/18 11:02	RC	SM2540 D-11
Total Organic Carbon	2.3	1.0	1.0	0.72	mg/l	1	08/23/18 12:11	HP	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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

Client Sample ID:	BZ-6M		
Lab Sample ID:	JC71959-9F	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	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	08/25/18 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

Client Sample ID:	BZ-6D		
Lab Sample ID:	JC71959-10	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface Water	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	14.5	5.0	4.0	3.6	mg/l	1	08/23/18 12:00	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	08/15/18 23:29	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/22/18 12:30	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.72	0.11	0.11	0.046	mg/l	1	08/23/18 16:58	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.72	0.10	0.10	0.043	mg/l	1	08/23/18 16:58	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	08/15/18 21:10	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.14 J	0.20	0.15	0.12	mg/l	1	08/22/18 10:07	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/24/18 15:49	MP	EPA 365.3
Solids, Total Dissolved	60.0	10	4.0	1.8	mg/l	1	08/17/18 14:36	RC	SM2540 C-11
Solids, Total Suspended	3.2 J	4.0	2.0	1.5	mg/l	1	08/17/18 11:02	RC	SM2540 D-11
Total Organic Carbon	1.3	1.0	1.0	0.72	mg/l	1	08/23/18 12:55	HP	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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

Client Sample ID:	BZ-6D		
Lab Sample ID:	JC71959-10F	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	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	08/25/18 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

Client Sample ID:	BZ-7S		
Lab Sample ID:	JC71959-11	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface Water	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	9.3	5.0	4.0	3.6	mg/l	1	08/23/18 12:00	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	08/15/18 23:31	SA	SM5210 B-11
Coliform, Fecal [c]	0 J	4			col/100ml	1	08/15/18 23:02	SA	SM9222 D-06
Coliform, Total [c]	0 J	4			col/100ml	1	08/15/18 22:53	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/22/18 12:32	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.26	0.11	0.11	0.046	mg/l	1	08/23/18 17:00	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.26	0.10	0.10	0.043	mg/l	1	08/23/18 17:00	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	08/15/18 21:10	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.18 J	0.20	0.15	0.12	mg/l	1	08/22/18 10:08	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/24/18 15:49	MP	EPA 365.3
Solids, Total Dissolved	26.7	10	4.0	1.8	mg/l	1	08/17/18 14:36	RC	SM2540 C-11
Solids, Total Suspended	2.0 J	4.0	2.0	1.5	mg/l	1	08/17/18 11:02	RC	SM2540 D-11
Total Organic Carbon	2.6	1.0	1.0	0.72	mg/l	1	08/24/18 02:55	JO	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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

Client Sample ID:	BZ-7S		
Lab Sample ID:	JC71959-11F	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	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	08/25/18 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

Client Sample ID:	BZ-7M		
Lab Sample ID:	JC71959-12	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface Water	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	8.8	5.0	4.0	3.6	mg/l	1	08/23/18 12:00	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	08/15/18 23:32	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/22/18 12:33	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.16	0.11	0.11	0.046	mg/l	1	08/23/18 17:01	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.16	0.10	0.10	0.043	mg/l	1	08/23/18 17:01	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	08/15/18 21:10	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.12 J	0.20	0.15	0.12	mg/l	1	08/22/18 10:09	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/24/18 15:49	MP	EPA 365.3
Solids, Total Dissolved	37.8	10	4.0	1.8	mg/l	1	08/17/18 14:36	RC	SM2540 C-11
Solids, Total Suspended	1.8 J	4.0	2.0	1.5	mg/l	1	08/17/18 11:02	RC	SM2540 D-11
Total Organic Carbon	1.8	1.0	1.0	0.72	mg/l	1	08/24/18 04:03	JO	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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

Client Sample ID:	BZ-7M		
Lab Sample ID:	JC71959-12F	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	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	08/25/18 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

Client Sample ID:	BZ-7D		
Lab Sample ID:	JC71959-13	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface Water	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	14.0	5.0	4.0	3.6	mg/l	1	08/23/18 12:00	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	08/15/18 23:33	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	08/22/18 12:34	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.94	0.11	0.11	0.046	mg/l	1	08/23/18 17:02	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.94	0.10	0.10	0.043	mg/l	1	08/23/18 17:02	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	08/15/18 21:10	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.21	0.20	0.15	0.12	mg/l	1	08/22/18 10:10	BM	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	08/24/18 15:49	MP	EPA 365.3
Solids, Total Dissolved	50.0	10	4.0	1.8	mg/l	1	08/17/18 14:36	RC	SM2540 C-11
Solids, Total Suspended	4.4	4.0	2.0	1.5	mg/l	1	08/17/18 11:02	RC	SM2540 D-11
Total Organic Carbon	2.5	1.0	1.0	0.72	mg/l	1	08/24/18 04:13	JO	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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

Client Sample ID:	BZ-7D		
Lab Sample ID:	JC71959-13F	**Date Sampled:**	08/15/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	08/15/18
		Percent Solids:	n/a
Project:	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	08/25/18 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

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

SGS

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/ehsusa

PAGE 1 OF 2

FED-EX Tracking #
Bottle Order Control # PD-08718-142
SGS Quote #
SGS Job # JC71959

Client / Reporting Information

Company Name: USACE-Philadelphia District
Street Address: 100 Penn Square East
City: Philadelphia State: PA Zip: 19107
Project Contact: Joe Loeper E-mail
Phone #: 215-656-6545 Fax #: —
Sampler(s) Name(s): Greg Wocik Phone #: 610-597-9780

Project Information

Project Name: USACE-Beltzville Reservoir
Street: 2145 Pohopoco Dr.
City: Lehighton State: PA
Project #
Client Purchase Order #: PD=08718-142 / PD-073018-47
Project Manager

Billing Information (if different from Report to)
Company Name
Street Address
City State Zip
Attention:

Requested Analysis (see TEST CODE sheet): NO2SO3 ; Alk, AMN, BOD, TDS ; TOC, TSS, TPO4 (Total Phosphorus) ; TKN, XNO30 (TKN/TPO4 Bottle) ; TPO4 (dissolved lab filter) ; ECF, TCF

Matrix Codes: ~~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

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Date	Time	Sampled by	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	NO2SO3	Alk, AMN, BOD, TDS	TOC, TSS, TPO4	TKN, XNO30	TPO4 (dissolved lab filter)	ECF, TCF	LAB USE ONLY
1F	BZ-1S		8/15/18	3:45	MF	SW	11	X			X					X	X	X	X	X	X	B3
2F	BZ-2S		↓	3:35	↓	SW	11	X			X					X	X	X	X	X	X	B4
3F	BZ-3S			1:05		SW	11	X			X					X	X	X	X	X	X	637
4F	BZ-3M			1:05		SW	9	X			X						X	X	X	X		G62T4
5F	BZ-3D			1:05		SW	9	X			X						X	X	X	X		19C4
6F	BZ-4S			3:25		SW	11	X			X					X	X	X	X	X	X	
7F	BZ-5S			3:10		SW	11	X			X					X	X	X	X	X	X	
8F	BZ-6S			1210		SW	11	X			X					X	X	X	X	X	X	
9F	BZ-6M			1210		SW	9	X			X						X	X	X	X		
10F	BZ-6D			1210		SW	9	X			X						X	X	X	X		

Turnaround Time (Business days)
☐ Std. 10 Business Days
☐ 5 Day RUSH
☐ 3 Day RUSH
☐ 2 Day RUSH
☐ 1 Day RUSH
☐ other
Emergency & Rush T/A data available via Lablink

Approved by (SGS Project Manager)/Date:
INITIAL ASSESSMENT GEZ
LABEL VERIFICATION

Data Deliverable Information
☐ Commercial "A" (Level 1) ☐ NYASP Category A
☐ Commercial "B" (Level 2) ☐ NYASP Category B
☐ FULLT1 (Level 3+4) ☐ State Forms
☐ NJ Reduced ☐ EDD Format
☐ Commercial "C" ☐ Other
☐ 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 filled. One XNO30 Bottle not used. TPO4 dissolved lab filter. XNO30 combined with TPO4/TKN Bottle.
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: 1 [signature]	Date Time: 8/15/18 4:00	Received By: 1 [signature]	Relinquished By: 2 [signature]	Date Time: 8/15/18	Received By: 2 [signature]
Relinquished by Sampler: 3	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
Relinquished by: 5	Date Time:	Received By: 5	Custody Seal #	☑ Intact ☐ Not intact	Preserved where applicable ☐ On Ice ☑ Cooler Temp. 3.3 3.8 3.5 / 2.9 3.4 °C IR

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions.

JC71959: Chain of Custody
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5.1
5

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 # JC71959

Client / Reporting Information

Company Name: USACE-Philadelphia District
Street Address: 100 Penn Square East
City: Philadelphia State: PA Zip: 19107
Project Contact: Joe Geiger E-mail:
Phone #: 215-656-6545 Fax #:
Sampler(s) Name(s): Greg Wacik 610-Phone # 597-9780

Project Information

Project Name: USACE - Beltzville Reservoir
Street: 2145 Pohopoco DR.
City: Lehighton State: PA
Project #:
Client Purchase Order #: PD-08718-142 / PD-073018-47
Project Manager:
Attention:

Billing Information (if different from Report to)

Company Name:
Street Address:
City: State: Zip:

Requested Analysis (see TEST CODE sheet)

Matrix Codes: 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

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	AlK, AMN, BOD, TDS	TOC, TSS, TP04 (Phosphorus)	TKN, XN030 (NutTray Bottle)	TP04 (dissolved lab filter)	FCF, TCF	LAB USE ONLY
11F	BZ-7S		8/15/18	1:55	JLB	SW	11	X			X				X	X	X	X	X	X	
12F	BZ-7M		"	1:55	"	SW	9	X			X					X	X	X	X		
13F	BZ-7D		"	1:55	"	SW	9	X			X					X	X	X	X		

Turnaround Time (Business days)

Approved by (SGS Project Manager)/Date:

- Std. 10 Business Days
- 5 Day RUSH
- 3 Day RUSH
- 2 Day RUSH
- 1 Day RUSH
- other

Emergency & Rush T/A data available via LabLink

Data Deliverable Information

- Commercial "A" (Level 1)
- Commercial "B" (Level 2)
- FULLT1 (Level 3+4)
- NJ Reduced
- Commercial "C"
- NJ Data of Known Quality Protocol Reporting

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

- NYASP Category A
- NYASP Category B
- State Forms
- EDD Format
- Other

Comments / Special Instructions

One T3S Bottle NOT Filed. One XN030 Bottle NOT used. TP04 dissolved lab filter XN030 combined with TP04/TKN Bottle

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:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1	[signature]	8/15/18 4:00	1 [signature]	2 [signature]	8/16/18 1818	2 [signature]
3	Relinquished by Sampler:	Date Time:	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
5	Relinquished by:	Date Time:	Received By: 5	Custody Seal #	Intact / Not intact	Preserved where applicable	On Ice	Cooler Temp. 3.5 3.5 2.9 3.4°F

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions.

SGS Sample Receipt Summary

Job Number: JC71959 **Client:** USACE-PHILADELPHIA DISTRICT **Project:** PHILADELPHIA DISTRICT, RESERVOIR SAMPL

Date / Time Received: 8/15/2018 6:18:00 PM **Delivery Method:** **Airbill #'s:**

Cooler Temps (Raw Measured) °C: Cooler 1: (3.3); Cooler 2: (2.9); Cooler 3: (3.8); Cooler 4: (3.4); Cooler 5: (3.5);

Cooler Temps (Corrected) °C: Cooler 1: (3.2); Cooler 2: (2.8); Cooler 3: (3.7); Cooler 4: (3.3); Cooler 5: (3.4);

Cooler Security	Y	or	N		Y	or	N
1. Custody Seals Present:	☑		☐	3. COC Present:	☑		☐
2. Custody Seals Intact:	☑		☐	4. Smpl Dates/Time OK	☑		☐

Cooler Temperature	Y	or	N
1. Temp criteria achieved:	☑		☐
2. Cooler temp verification:	IR Gun		
3. Cooler media:	Ice (Bag)		
4. No. Coolers:	5		

Quality Control Preservation	Y	or	N	N/A
1. Trip Blank present / cooler:	☐		☑	☐
2. Trip Blank listed on COC:	☐		☑	☐
3. Samples preserved properly:	☑		☐	
4. VOCs headspace free:	☐		☐	☑

Sample Integrity - Documentation	Y	or	N
1. Sample labels present on bottles:	☑		☐
2. Container labeling complete:	☑		☐
3. Sample container label / COC agree:	☑		☐

Sample Integrity - Condition	Y	or	N
1. Sample recvd within HT:	☑		☐
2. All containers accounted for:	☑		☐
3. Condition of sample:	Intact		

Sample Integrity - Instructions	Y	or	N	N/A
1. Analysis requested is clear:	☑		☐	
2. Bottles received for unspecified tests	☐		☑	
3. Sufficient volume recvd for analysis:	☑		☐	
4. Compositing instructions clear:	☐		☐	☑
5. Filtering instructions clear:	☐		☐	☑

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

Comments

SM089-03
Rev. Date 12/7/17

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: JC73277

Sampling Date: 09/06/18

Report to:

Army Corps of Engineers

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Total number of pages in report: **46**

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: JC73277

Philadelphia District, Reservoir Sampling
Project No: W25PHS81145379

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
JC73277-1	09/06/18	07:20	GW	09/06/18	AQ	Surface Water	BZ-1S
JC73277-1F	09/06/18	07:20	GW	09/06/18	AQ	Surface H2O Filtered	BZ-1S
JC73277-2	09/06/18	11:20	GW	09/06/18	AQ	Surface Water	BZ-2S
JC73277-2F	09/06/18	11:20	GW	09/06/18	AQ	Surface H2O Filtered	BZ-2S
JC73277-3	09/06/18	09:15	GW	09/06/18	AQ	Surface Water	BZ-3S
JC73277-3F	09/06/18	09:15	GW	09/06/18	AQ	Surface H2O Filtered	BZ-3S
JC73277-4	09/06/18	09:15	GW	09/06/18	AQ	Surface Water	BZ-3M
JC73277-4F	09/06/18	09:15	GW	09/06/18	AQ	Surface H2O Filtered	BZ-3M
JC73277-5	09/06/18	09:15	GW	09/06/18	AQ	Surface Water	BZ-3D
JC73277-5F	09/06/18	09:15	GW	09/06/18	AQ	Surface H2O Filtered	BZ-3D
JC73277-6	09/06/18	10:10	GW	09/06/18	AQ	Surface Water	BZ-4S
JC73277-6F	09/06/18	10:10	GW	09/06/18	AQ	Surface H2O Filtered	BZ-4S
JC73277-7	09/06/18	10:50	GW	09/06/18	AQ	Surface Water	BZ-5S

Sample Summary
(continued)

USACE-Philadelphia District

Job No: JC73277

Philadelphia District, Reservoir Sampling
Project No: W25PHS81145379

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
JC73277-7F	09/06/18	10:50	GW	09/06/18	AQ	Surface H2O Filtered	BZ-5S
JC73277-8	09/06/18	08:15	GW	09/06/18	AQ	Surface Water	BZ-6S
JC73277-8F	09/06/18	08:15	GW	09/06/18	AQ	Surface H2O Filtered	BZ-6S
JC73277-9	09/06/18	08:15	GW	09/06/18	AQ	Surface Water	BZ-6M
JC73277-9F	09/06/18	08:15	GW	09/06/18	AQ	Surface H2O Filtered	BZ-6M
JC73277-10	09/06/18	08:15	GW	09/06/18	AQ	Surface Water	BZ-6D
JC73277-10F	09/06/18	08:15	GW	09/06/18	AQ	Surface H2O Filtered	BZ-6D
JC73277-11	09/06/18	09:45	GW	09/06/18	AQ	Surface Water	BZ-7S
JC73277-11F	09/06/18	09:45	GW	09/06/18	AQ	Surface H2O Filtered	BZ-7S
JC73277-12	09/06/18	09:45	GW	09/06/18	AQ	Surface Water	BZ-7M
JC73277-12F	09/06/18	09:45	GW	09/06/18	AQ	Surface H2O Filtered	BZ-7M
JC73277-13	09/06/18	09:45	GW	09/06/18	AQ	Surface Water	BZ-7D
JC73277-13F	09/06/18	09:45	GW	09/06/18	AQ	Surface H2O Filtered	BZ-7D

CASE NARRATIVE / CONFORMANCE SUMMARY

Client:	USACE-Philadelphia District	**Job No**	JC73277
Site:	Philadelphia District, Reservoir Sampling	**Report Date**	9/20/2018 10:25:48 A

On 09/06/2018, 13 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at SGS North America Inc. at a maximum corrected temperature of 3.2 C. Samples were intact and chemically preserved, unless noted below. A SGS North America Inc. Job Number of JC73277 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:** GP15964

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73277-1DUP, JC73277-1MS 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.

General Chemistry By Method EPA 353.2/LACHAT

Matrix: AQ **Batch ID:** GP16001

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73277-5DUP, JC73277-5MS, JC73277-6MS were used as the QC samples for Nitrogen, Nitrate + Nitrite.

General Chemistry By Method EPA 365.3

Matrix: AQ **Batch ID:** GP15970

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73277-1MS, JC73277-1DUP were used as the QC samples for Phosphorus, Total.
- RPD(s) for Duplicate for Phosphorus, Total are outside control limits. RPD acceptable due to low duplicate and sample concentrations.

Matrix: AQ **Batch ID:** GP16009

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73277-1FDUP, JC73277-1FMS were used as the QC samples for Phosphorus, Total.

General Chemistry By Method EPA353.2/SM4500NO2B

Matrix: AQ **Batch ID:** R172803

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73277-1 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172804

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73277-2 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172805

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73277-3 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172806

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73277-4 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172807

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73277-5 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172808

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73277-6 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172809

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73277-7 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172810

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73277-8 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172811

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73277-9 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172812

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73277-10 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172813

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73277-11 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172814

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73277-12 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

Matrix: AQ **Batch ID:** R172815

- The data for EPA353.2/SM4500NO2B meets quality control requirements.
- JC73277-13 for Nitrogen, Nitrate: Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

General Chemistry By Method SM2320 B-11

Matrix: AQ	Batch ID: GN85778

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73277-1DUP were used as the QC samples for Alkalinity, Total as CaCO3.
- RPD(s) for Duplicate for Alkalinity, Total as CaCO3 are outside control limits. RPD acceptable due to low duplicate and sample concentrations.
- JC73277-6 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC73277-9 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC73277-1 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC73277-3 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC73277-5 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC73277-10 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC73277-11 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC73277-12 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC73277-13 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC73277-7 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC73277-8 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC73277-4 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.
- JC73277-2 for Alkalinity, Total as CaCO3: Sample was titrated to a final pH of 4.2.

General Chemistry By Method SM2540 C-11

Matrix: AQ	Batch ID: GN85465

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73277-1DUP were used as the QC samples for Solids, Total Dissolved.

Matrix: AQ	Batch ID: GN85507

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73414-1DUP were used as the QC samples for Solids, Total Dissolved.

General Chemistry By Method SM2540 D-11

Matrix: AQ	Batch ID: GN85450

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73277-1DUP were used as the QC samples for Solids, Total Suspended.
- JC73277-5 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: GN85503

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73360-1DUP were used as the QC samples for Solids, Total Suspended.

General Chemistry By Method SM4500NH3 H-11LACHAT

Matrix: AQ	Batch ID: GP15893

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73236-5DUP, JC73236-5MS, JC73236-5MSD were used as the QC samples for Nitrogen, Ammonia.

Matrix: AQ	Batch ID: GP15894

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73533-1DUP, JC73533-1MS, JC73533-1MSD were used as the QC samples for Nitrogen, Ammonia.

General Chemistry By Method SM4500NO2 B-11

Matrix: AQ	Batch ID: GN85403

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73277-1DUP, JC73277-1MS were used as the QC samples for Nitrogen, Nitrite.

General Chemistry By Method SM5210 B-11

Matrix: AQ	Batch ID: GP15794

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73201-4DUP were used as the QC samples for BOD, 5 Day.

General Chemistry By Method SM5310 B-11

Matrix: AQ	Batch ID: GP16047

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73277-1MS, JC73277-1MSD were used as the QC samples for Total Organic Carbon.

Matrix: AQ	Batch ID: GP16048

- All samples were prepared within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73277-11MS, JC73277-11MSD were used as the QC samples for Total Organic Carbon.

General Chemistry By Method SM9222 B-06

Matrix: AQ **Batch ID:** MB5375

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73277-1DUP were used as the QC samples for Coliform, Total.
- JC73277-2 for Coliform, Total: Analysis done out of holding time.
- JC73277-8 for Coliform, Total: Analysis done out of holding time.
- JC73277-7 for Coliform, Total: Analysis done out of holding time.
- JC73277-6 for Coliform, Total: Analysis done out of holding time.
- JC73277-3 for Coliform, Total: Analysis done out of holding time.
- JC73277-1 for Coliform, Total: Analysis done out of holding time.
- JC73277-11 for Coliform, Total: Analysis done out of holding time.

General Chemistry By Method SM9222 D-06

Matrix: AQ **Batch ID:** MB5376

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) JC73277-1DUP were used as the QC samples for Coliform, Fecal.
- JC73277-3 for Coliform, Fecal: Analysis done out of holding time.
- JC73277-6 for Coliform, Fecal: Analysis done out of holding time.
- JC73277-7 for Coliform, Fecal: Analysis done out of holding time.
- JC73277-8 for Coliform, Fecal: Analysis done out of holding time.
- JC73277-11 for Coliform, Fecal: Analysis done out of holding time.
- JC73277-1 for Coliform, Fecal: Analysis done out of holding time.
- JC73277-2 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

Summary of Hits

Job Number: JC73277
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 09/06/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
JC73277-1	**BZ-1S**					
Alkalinity, Total as CaCO3 [a]		14.8	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal [b]		96	4	[c]	col/100ml	SM9222 D-06
Coliform, Total [b]		104	4	[c]	col/100ml	SM9222 B-06
Nitrogen, Nitrate [d]		0.81	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.81	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.23	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		95.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		1.6 J	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		4.0	1.0	1.0	mg/l	SM5310 B-11
JC73277-1F	**BZ-1S**					
No hits reported in this sample.						
JC73277-2	**BZ-2S**					
Alkalinity, Total as CaCO3 [a]		8.4	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal [b]		29	4	[c]	col/100ml	SM9222 D-06
Coliform, Total [b]		144	4	[c]	col/100ml	SM9222 B-06
Nitrogen, Nitrate [d]		0.20	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.20	0.10	0.10	mg/l	EPA 353.2/LACHAT
Solids, Total Dissolved		48.8	10	4.0	mg/l	SM2540 C-11
Total Organic Carbon		1.8	1.0	1.0	mg/l	SM5310 B-11
JC73277-2F	**BZ-2S**					
No hits reported in this sample.						
JC73277-3	**BZ-3S**					
Alkalinity, Total as CaCO3 [a]		10.6	5.0	4.0	mg/l	SM2320 B-11
Coliform, Total [b]		8	4	[c]	col/100ml	SM9222 B-06
Nitrogen, Nitrate [d]		0.21	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.21	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.24	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		46.7	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		1.8 J	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		2.9	1.0	1.0	mg/l	SM5310 B-11
JC73277-3F	**BZ-3S**					
No hits reported in this sample.						

Summary of Hits

Job Number: JC73277
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 09/06/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
JC73277-4	**BZ-3M**					
Alkalinity, Total as CaCO3 [a]		12.7	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate [d]		0.74	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.74	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.18 J	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		60.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		1.6 J	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		3.5	1.0	1.0	mg/l	SM5310 B-11
JC73277-4F	**BZ-3M**					
No hits reported in this sample.						
JC73277-5	**BZ-3D**					
Alkalinity, Total as CaCO3 [a]		12.7	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 [d]		0.66	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.67	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite		0.0091 J	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl		0.30	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		77.1	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended [e]		4.1	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		4.7	1.0	1.0	mg/l	SM5310 B-11
JC73277-5F	**BZ-3D**					
No hits reported in this sample.						
JC73277-6	**BZ-4S**					
Alkalinity, Total as CaCO3 [a]		4.2 J	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal [b]		112	4	[c]	col/100ml	SM9222 D-06
Coliform, Total [b]		43	4	[c]	col/100ml	SM9222 B-06
Nitrogen, Nitrate [d]		1.0	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		1.0	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.26	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		57.1	10	4.0	mg/l	SM2540 C-11
Total Organic Carbon		3.3	1.0	1.0	mg/l	SM5310 B-11
JC73277-6F	**BZ-4S**					
No hits reported in this sample.						

Summary of Hits

Job Number: JC73277
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 09/06/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
JC73277-7	**BZ-5S**					
Alkalinity, Total as CaCO3 [a]		13.2	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal [b]		168	4	[c]	col/100ml	SM9222 D-06
Coliform, Total [b]		96	4	[c]	col/100ml	SM9222 B-06
Nitrogen, Nitrate [d]		1.4	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		1.4	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.19 J	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		83.8	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		2.5 J	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		2.4	1.0	1.0	mg/l	SM5310 B-11
JC73277-7F	**BZ-5S**					
Phosphorus, Total		0.078	0.050	0.050	mg/l	EPA 365.3
JC73277-8	**BZ-6S**					
Alkalinity, Total as CaCO3 [a]		11.6	5.0	4.0	mg/l	SM2320 B-11
Coliform, Total [b]		4	4	[c]	col/100ml	SM9222 B-06
Nitrogen, Nitrate [d]		0.19	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.20	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		0.22	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		53.0	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		1.8 J	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		2.8	1.0	1.0	mg/l	SM5310 B-11
JC73277-8F	**BZ-6S**					
No hits reported in this sample.						
JC73277-9	**BZ-6M**					
Alkalinity, Total as CaCO3 [a]		11.6	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate [d]		0.78	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.78	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Total Kjeldahl		0.17 J	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		63.3	10	4.0	mg/l	SM2540 C-11
Total Organic Carbon		3.5	1.0	1.0	mg/l	SM5310 B-11
JC73277-9F	**BZ-6M**					
No hits reported in this sample.						

Summary of Hits

Job Number: JC73277
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 09/06/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
JC73277-10	**BZ-6D**					
Alkalinity, Total as CaCO3 [a]		17.4	5.0	4.0	mg/l	SM2320 B-11
Nitrogen, Nitrate [d]		0.73	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.74	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite		0.0085 J	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl		0.19 J	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		86.7	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		2.2 J	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		4.0	1.0	1.0	mg/l	SM5310 B-11
JC73277-10F	**BZ-6D**					
No hits reported in this sample.						
JC73277-11	**BZ-7S**					
Alkalinity, Total as CaCO3 [a]		11.6	5.0	4.0	mg/l	SM2320 B-11
Coliform, Fecal [b]		4	4	[c]	col/100ml	SM9222 D-06
Coliform, Total [b]		4	4	[c]	col/100ml	SM9222 B-06
Nitrogen, Nitrate [d]		0.48	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.49	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite		0.0062 J	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl		0.18 J	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		64.0	10	4.0	mg/l	SM2540 C-11
Total Organic Carbon		2.6	1.0	1.0	mg/l	SM5310 B-11
JC73277-11F	**BZ-7S**					
No hits reported in this sample.						
JC73277-12	**BZ-7M**					
Alkalinity, Total as CaCO3 [a]		14.8	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 [d]		0.82	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.83	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite		0.0054 J	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl		0.28	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		49.3	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		2.9	1.0	1.0	mg/l	SM5310 B-11

Summary of Hits

Job Number: JC73277
Account: USACE-Philadelphia District
Project: Philadelphia District, Reservoir Sampling
Collected: 09/06/18

Lab Sample ID / Analyte	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
JC73277-12F	**BZ-7M**					
No hits reported in this sample.						
JC73277-13	**BZ-7D**					
Alkalinity, Total as CaCO3 [a]		13.2	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 [d]		0.86	0.11	0.11	mg/l	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite		0.86	0.10	0.10	mg/l	EPA 353.2/LACHAT
Nitrogen, Nitrite		0.0043 J	0.010	0.0050	mg/l	SM4500NO2 B-11
Nitrogen, Total Kjeldahl		0.23	0.20	0.15	mg/l	EPA 351.2/LACHAT
Solids, Total Dissolved		66.3	10	4.0	mg/l	SM2540 C-11
Solids, Total Suspended		45.8	4.0	2.0	mg/l	SM2540 D-11
Total Organic Carbon		2.9	1.0	1.0	mg/l	SM5310 B-11
JC73277-13F	**BZ-7D**					
No hits reported in this sample.						

(a) Sample was titrated to a final pH of 4.2.
(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.

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	BZ-1S		
Lab Sample ID:	JC73277-1	**Date Sampled:**	09/06/18
Matrix:	AQ - Surface Water	**Date Received:**	09/06/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	14.8	5.0	4.0	3.6	mg/l	1	09/17/18 16:16	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	09/06/18 22:25	SA	SM5210 B-11
Coliform, Fecal [c]	96	4			col/100ml	4	09/06/18 21:18	SA	SM9222 D-06
Coliform, Total [c]	104	4			col/100ml	4	09/06/18 21:12	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	09/12/18 10:47	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.81	0.11	0.11	0.093	mg/l	1	09/17/18 15:59	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.81	0.10	0.10	0.090	mg/l	1	09/17/18 15:59	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	09/07/18 14:30	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.23	0.20	0.15	0.12	mg/l	1	09/18/18 10:10	RP	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/18/18 11:08	MP	EPA 365.3
Solids, Total Dissolved	95.0	10	4.0	1.8	mg/l	1	09/10/18 15:30	RC	SM2540 C-11
Solids, Total Suspended	1.6 J	4.0	2.0	1.5	mg/l	1	09/10/18 11:10	RC	SM2540 D-11
Total Organic Carbon	4.0	1.0	1.0	0.72	mg/l	1	09/20/18 02:14	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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

Client Sample ID:	BZ-1S		
Lab Sample ID:	JC73277-1F	**Date Sampled:**	09/06/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	09/06/18
		Percent Solids:	n/a
Project:	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	09/19/18 16:35	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

Client Sample ID: BZ-2S
Lab Sample ID: JC73277-2
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 09/06/18
Date Received: 09/06/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	8.4	5.0	4.0	3.6	mg/l	1	09/17/18 16:16	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	09/06/18 22:26	SA	SM5210 B-11
Coliform, Fecal [c]	29	4			col/100ml	10	09/06/18 21:18	SA	SM9222 D-06
Coliform, Total [c]	144	4			col/100ml	4	09/06/18 21:12	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	09/12/18 10:48	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.20	0.11	0.11	0.093	mg/l	1	09/17/18 16:00	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.20	0.10	0.10	0.090	mg/l	1	09/17/18 16:00	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	09/07/18 14:30	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.15 U	0.20	0.15	0.12	mg/l	1	09/18/18 10:10	RP	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/18/18 11:08	MP	EPA 365.3
Solids, Total Dissolved	48.8	10	4.0	1.8	mg/l	1	09/10/18 15:30	RC	SM2540 C-11
Solids, Total Suspended	2.0 U	4.0	2.0	1.5	mg/l	1	09/10/18 11:10	RC	SM2540 D-11
Total Organic Carbon	1.8	1.0	1.0	0.72	mg/l	1	09/20/18 02:47	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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

Client Sample ID:	BZ-2S		
Lab Sample ID:	JC73277-2F	**Date Sampled:**	09/06/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	09/06/18
		Percent Solids:	n/a
Project:	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	09/19/18 16:35	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

Client Sample ID: BZ-3S
Lab Sample ID: JC73277-3
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 09/06/18
Date Received: 09/06/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	10.6	5.0	4.0	3.6	mg/l	1	09/17/18 16:16	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	09/06/18 22:28	SA	SM5210 B-11
Coliform, Fecal [c]	0	0			col/100ml	1	09/06/18 21:18	SA	SM9222 D-06
Coliform, Total [c]	8	4			col/100ml	4	09/06/18 21:12	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	09/12/18 10:50	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.21	0.11	0.11	0.093	mg/l	1	09/17/18 16:01	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.21	0.10	0.10	0.090	mg/l	1	09/17/18 16:01	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	09/07/18 14:30	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.24	0.20	0.15	0.12	mg/l	1	09/18/18 10:11	RP	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/18/18 11:08	MP	EPA 365.3
Solids, Total Dissolved	46.7	10	4.0	1.8	mg/l	1	09/10/18 15:30	RC	SM2540 C-11
Solids, Total Suspended	1.8 J	4.0	2.0	1.5	mg/l	1	09/10/18 11:10	RC	SM2540 D-11
Total Organic Carbon	2.9	1.0	1.0	0.72	mg/l	1	09/20/18 02:58	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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

Client Sample ID:	BZ-3S		
Lab Sample ID:	JC73277-3F	**Date Sampled:**	09/06/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	09/06/18
		Percent Solids:	n/a
Project:	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	09/19/18 16:35	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

Client Sample ID: BZ-3M
Lab Sample ID: JC73277-4
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 09/06/18
Date Received: 09/06/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	12.7	5.0	4.0	3.6	mg/l	1	09/17/18 16:16	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	09/06/18 22:30	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	09/12/18 10:51	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.74	0.11	0.11	0.093	mg/l	1	09/17/18 16:02	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.74	0.10	0.10	0.090	mg/l	1	09/17/18 16:02	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	09/07/18 14:30	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.18 J	0.20	0.15	0.12	mg/l	1	09/18/18 10:12	RP	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/18/18 11:08	MP	EPA 365.3
Solids, Total Dissolved	60.0	10	4.0	1.8	mg/l	1	09/10/18 15:30	RC	SM2540 C-11
Solids, Total Suspended	1.6 J	4.0	2.0	1.5	mg/l	1	09/10/18 11:10	RC	SM2540 D-11
Total Organic Carbon	3.5	1.0	1.0	0.72	mg/l	1	09/20/18 03:10	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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

Client Sample ID:	BZ-3M		
Lab Sample ID:	JC73277-4F	**Date Sampled:**	09/06/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	09/06/18
		Percent Solids:	n/a
Project:	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	09/19/18 16:35	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

Client Sample ID:	BZ-3D		
Lab Sample ID:	JC73277-5	**Date Sampled:**	09/06/18
Matrix:	AQ - Surface Water	**Date Received:**	09/06/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	12.7	5.0	4.0	3.6	mg/l	1	09/17/18 16:16	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	09/06/18 22:32	SA	SM5210 B-11
Nitrogen, Ammonia	0.11 J	0.20	0.20	0.089	mg/l	1	09/12/18 10:56	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.66	0.11	0.11	0.093	mg/l	1	09/17/18 16:03	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.67	0.10	0.10	0.090	mg/l	1	09/17/18 16:03	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0091 J	0.010	0.0050	0.0030	mg/l	1	09/07/18 14:30	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.30	0.20	0.15	0.12	mg/l	1	09/18/18 10:13	RP	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/18/18 11:08	MP	EPA 365.3
Solids, Total Dissolved	77.1	10	4.0	1.8	mg/l	1	09/10/18 15:30	RC	SM2540 C-11
Solids, Total Suspended [d]	4.1	4.0	2.0	1.5	mg/l	1	09/10/18 11:10	RC	SM2540 D-11
Total Organic Carbon	4.7	1.0	1.0	0.72	mg/l	1	09/20/18 03:21	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.

(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 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

Client Sample ID:	BZ-3D		
Lab Sample ID:	JC73277-5F	**Date Sampled:**	09/06/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	09/06/18
		Percent Solids:	n/a
Project:	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	09/19/18 16:35	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

Client Sample ID: BZ-4S
Lab Sample ID: JC73277-6
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 09/06/18
Date Received: 09/06/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	4.2 J	5.0	4.0	3.6	mg/l	1	09/17/18 16:16	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	09/06/18 22:33	SA	SM5210 B-11
Coliform, Fecal [c]	112	4			col/100ml	4	09/06/18 21:18	SA	SM9222 D-06
Coliform, Total [c]	43	4			col/100ml	10	09/06/18 21:12	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	09/12/18 10:57	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	1.0	0.11	0.11	0.093	mg/l	1	09/17/18 16:07	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	1.0	0.10	0.10	0.090	mg/l	1	09/17/18 16:07	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	09/07/18 14:30	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.26	0.20	0.15	0.12	mg/l	1	09/18/18 10:14	RP	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/18/18 11:08	MP	EPA 365.3
Solids, Total Dissolved	57.1	10	4.0	1.8	mg/l	1	09/10/18 15:30	RC	SM2540 C-11
Solids, Total Suspended	2.0 U	4.0	2.0	1.5	mg/l	1	09/10/18 11:10	RC	SM2540 D-11
Total Organic Carbon	3.3	1.0	1.0	0.72	mg/l	1	09/20/18 03:54	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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

Client Sample ID:	BZ-4S		
Lab Sample ID:	JC73277-6F	**Date Sampled:**	09/06/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	09/06/18
		Percent Solids:	n/a
Project:	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	09/19/18 16:35	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

Client Sample ID: BZ-5S
Lab Sample ID: JC73277-7
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 09/06/18
Date Received: 09/06/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	13.2	5.0	4.0	3.6	mg/l	1	09/17/18 16:55	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	09/06/18 22:35	SA	SM5210 B-11
Coliform, Fecal [c]	168	4			col/100ml	4	09/06/18 21:18	SA	SM9222 D-06
Coliform, Total [c]	96	4			col/100ml	4	09/06/18 21:12	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	09/12/18 10:58	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	1.4	0.11	0.11	0.093	mg/l	1	09/17/18 16:08	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	1.4	0.10	0.10	0.090	mg/l	1	09/17/18 16:08	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	09/07/18 14:55	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.19 J	0.20	0.15	0.12	mg/l	1	09/18/18 10:16	RP	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/18/18 11:25	MP	EPA 365.3
Solids, Total Dissolved	83.8	10	4.0	1.8	mg/l	1	09/10/18 15:30	RC	SM2540 C-11
Solids, Total Suspended	2.5 J	4.0	2.0	1.5	mg/l	1	09/10/18 11:10	RC	SM2540 D-11
Total Organic Carbon	2.4	1.0	1.0	0.72	mg/l	1	09/20/18 04:05	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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

Client Sample ID:	BZ-5S		
Lab Sample ID:	JC73277-7F	**Date Sampled:**	09/06/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	09/06/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Phosphorus, Total	0.078	0.050	0.050	0.027	mg/l	1	09/19/18 16:55	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

Client Sample ID:	BZ-6S		
Lab Sample ID:	JC73277-8	**Date Sampled:**	09/06/18
Matrix:	AQ - Surface Water	**Date Received:**	09/06/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	11.6	5.0	4.0	3.6	mg/l	1	09/17/18 16:55	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	09/06/18 22:37	SA	SM5210 B-11
Coliform, Fecal [c]	0	0			col/100ml	1	09/06/18 21:18	SA	SM9222 D-06
Coliform, Total [c]	4	4			col/100ml	4	09/06/18 21:12	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	09/12/18 11:00	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.19	0.11	0.11	0.093	mg/l	1	09/17/18 16:09	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.20	0.10	0.10	0.090	mg/l	1	09/17/18 16:09	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0051 J	0.010	0.0050	0.0030	mg/l	1	09/07/18 14:55	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.22	0.20	0.15	0.12	mg/l	1	09/18/18 10:17	RP	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/18/18 11:25	MP	EPA 365.3
Solids, Total Dissolved	53.0	10	4.0	1.8	mg/l	1	09/10/18 15:30	RC	SM2540 C-11
Solids, Total Suspended	1.8 J	4.0	2.0	1.5	mg/l	1	09/10/18 11:10	RC	SM2540 D-11
Total Organic Carbon	2.8	1.0	1.0	0.72	mg/l	1	09/20/18 04:16	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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

Client Sample ID:	BZ-6S		
Lab Sample ID:	JC73277-8F	**Date Sampled:**	09/06/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	09/06/18
		Percent Solids:	n/a
Project:	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	09/19/18 16:55	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

Client Sample ID: BZ-6M
Lab Sample ID: JC73277-9
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 09/06/18
Date Received: 09/06/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	11.6	5.0	4.0	3.6	mg/l	1	09/17/18 16:55	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	09/06/18 22:39	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	09/12/18 11:01	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.78	0.11	0.11	0.093	mg/l	1	09/17/18 16:10	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.78	0.10	0.10	0.090	mg/l	1	09/17/18 16:10	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0050 U	0.010	0.0050	0.0030	mg/l	1	09/07/18 14:55	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.17 J	0.20	0.15	0.12	mg/l	1	09/18/18 10:18	RP	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/18/18 11:25	MP	EPA 365.3
Solids, Total Dissolved	63.3	10	4.0	1.8	mg/l	1	09/10/18 15:30	RC	SM2540 C-11
Solids, Total Suspended	2.0 U	4.0	2.0	1.5	mg/l	1	09/10/18 11:10	RC	SM2540 D-11
Total Organic Carbon	3.5	1.0	1.0	0.72	mg/l	1	09/20/18 04:28	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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

Client Sample ID:	BZ-6M		
Lab Sample ID:	JC73277-9F	**Date Sampled:**	09/06/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	09/06/18
		Percent Solids:	n/a
Project:	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	09/19/18 16:55	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

Client Sample ID: BZ-6D
Lab Sample ID: JC73277-10
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 09/06/18
Date Received: 09/06/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	17.4	5.0	4.0	3.6	mg/l	1	09/17/18 16:55	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	09/06/18 22:40	SA	SM5210 B-11
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	09/12/18 11:13	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.73	0.11	0.11	0.093	mg/l	1	09/17/18 16:11	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.74	0.10	0.10	0.090	mg/l	1	09/17/18 16:11	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0085 J	0.010	0.0050	0.0030	mg/l	1	09/07/18 14:55	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.19 J	0.20	0.15	0.12	mg/l	1	09/18/18 10:19	RP	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/18/18 11:25	MP	EPA 365.3
Solids, Total Dissolved	86.7	10	4.0	1.8	mg/l	1	09/10/18 15:30	RC	SM2540 C-11
Solids, Total Suspended	2.2 J	4.0	2.0	1.5	mg/l	1	09/10/18 11:10	RC	SM2540 D-11
Total Organic Carbon	4.0	1.0	1.0	0.72	mg/l	1	09/20/18 04:39	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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

Client Sample ID:	BZ-6D		
Lab Sample ID:	JC73277-10F	**Date Sampled:**	09/06/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	09/06/18
		Percent Solids:	n/a
Project:	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	09/19/18 16:55	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

Client Sample ID: BZ-7S
Lab Sample ID: JC73277-11
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 09/06/18
Date Received: 09/06/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	11.6	5.0	4.0	3.6	mg/l	1	09/17/18 16:55	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	09/06/18 22:42	SA	SM5210 B-11
Coliform, Fecal [c]	4	4			col/100ml	4	09/06/18 21:18	SA	SM9222 D-06
Coliform, Total [c]	4	4			col/100ml	4	09/06/18 21:12	SA	SM9222 B-06
Nitrogen, Ammonia	0.20 U	0.20	0.20	0.089	mg/l	1	09/12/18 11:14	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [d]	0.48	0.11	0.11	0.093	mg/l	1	09/17/18 16:12	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.49	0.10	0.10	0.090	mg/l	1	09/17/18 16:12	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0062 J	0.010	0.0050	0.0030	mg/l	1	09/07/18 14:55	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.18 J	0.20	0.15	0.12	mg/l	1	09/18/18 10:20	RP	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/18/18 11:25	MP	EPA 365.3
Solids, Total Dissolved	64.0	10	4.0	1.8	mg/l	1	09/10/18 15:30	RC	SM2540 C-11
Solids, Total Suspended	2.0 U	4.0	2.0	1.5	mg/l	1	09/10/18 11:10	RC	SM2540 D-11
Total Organic Carbon	2.6	1.0	1.0	0.72	mg/l	1	09/20/18 05:12	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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

Client Sample ID:	BZ-7S		
Lab Sample ID:	JC73277-11F	**Date Sampled:**	09/06/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	09/06/18
		Percent Solids:	n/a
Project:	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	09/19/18 16:55	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

Client Sample ID:	BZ-7M		
Lab Sample ID:	JC73277-12	**Date Sampled:**	09/06/18
Matrix:	AQ - Surface Water	**Date Received:**	09/06/18
		Percent Solids:	n/a
Project:	Philadelphia District, Reservoir Sampling		

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	14.8	5.0	4.0	3.6	mg/l	1	09/17/18 16:55	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	09/06/18 22:43	SA	SM5210 B-11
Nitrogen, Ammonia	0.14 J	0.20	0.20	0.089	mg/l	1	09/12/18 11:16	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.82	0.11	0.11	0.093	mg/l	1	09/17/18 16:13	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.83	0.10	0.10	0.090	mg/l	1	09/17/18 16:13	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0054 J	0.010	0.0050	0.0030	mg/l	1	09/07/18 14:55	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.28	0.20	0.15	0.12	mg/l	1	09/18/18 10:20	RP	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/18/18 11:25	MP	EPA 365.3
Solids, Total Dissolved	70.0	10	4.0	1.8	mg/l	1	09/11/18 14:40	RC	SM2540 C-11
Solids, Total Suspended	49.3	4.0	2.0	1.5	mg/l	1	09/10/18 11:10	RC	SM2540 D-11
Total Organic Carbon	2.9	1.0	1.0	0.72	mg/l	1	09/20/18 06:16	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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

Client Sample ID:	BZ-7M		
Lab Sample ID:	JC73277-12F	**Date Sampled:**	09/06/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	09/06/18
		Percent Solids:	n/a
Project:	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	09/19/18 16:55	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

Client Sample ID: BZ-7D
Lab Sample ID: JC73277-13
Matrix: AQ - Surface Water
Project: Philadelphia District, Reservoir Sampling

Date Sampled: 09/06/18
Date Received: 09/06/18
Percent Solids: n/a

General Chemistry

Analyte	Result	LOQ	LOD	DL	Units	DF	Analyzed	By	Method
Alkalinity, Total as CaCO3 [a]	13.2	5.0	4.0	3.6	mg/l	1	09/17/18 16:55	ST	SM2320 B-11
BOD, 5 Day	3.4 U	3.4	3.4 [b]	3.4	mg/l	1	09/06/18 22:45	SA	SM5210 B-11
Nitrogen, Ammonia	0.11 J	0.20	0.20	0.089	mg/l	1	09/12/18 11:17	BM	SM4500NH3 H-11LACHAT
Nitrogen, Nitrate [c]	0.86	0.11	0.11	0.093	mg/l	1	09/17/18 16:14	RP	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.86	0.10	0.10	0.090	mg/l	1	09/17/18 16:14	RP	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.0043 J	0.010	0.0050	0.0030	mg/l	1	09/07/18 14:55	LS	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.23	0.20	0.15	0.12	mg/l	1	09/18/18 10:21	RP	EPA 351.2/LACHAT
Phosphorus, Total	0.050 U	0.050	0.050	0.027	mg/l	1	09/18/18 11:25	MP	EPA 365.3
Solids, Total Dissolved	66.3	10	4.0	1.8	mg/l	1	09/11/18 14:40	RC	SM2540 C-11
Solids, Total Suspended	45.8	4.0	2.0	1.5	mg/l	1	09/11/18 11:00	RC	SM2540 D-11
Total Organic Carbon	2.9	1.0	1.0	0.72	mg/l	1	09/20/18 06:27	CD	SM5310 B-11

(a) Sample was titrated to a final pH of 4.2.
(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

Client Sample ID:	BZ-7D		
Lab Sample ID:	JC73277-13F	**Date Sampled:**	09/06/18
Matrix:	AQ - Surface H2O Filtered	**Date Received:**	09/06/18
		Percent Solids:	n/a
Project:	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	09/19/18 16:55	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

Includes the following where applicable:

- Chain of Custody

SGS

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/ehsusa

PAGE 1 OF 2

FED-EX Tracking # | Bottle Order Control #
SGS Quote # | SGS Job # JC73277

Client / Reporting Information
Company Name: USACE-Philadelphia District
Street Address: 100 Penn Square East
City: Philadelphia State: PA Zip: 19107
Project Contact: Joe Loeper
E-mail:
Phone #: 215-656-6545
Fax #:
Sampler(s) Name(s): Greg Wacik
Phone #: 610-597-9780

Project Information
Project Name: USACE-Beltzville Reservoir
Street: 2145 Pohopoco DR.
City: Lehighton State: PA
Project #: PD-08318-113
Client Purchase Order #:
Project Manager:

Billing Information (If different from Report to)
Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis (see TEST CODE sheet): Na2S2O3; Alk, AMN, BOD, TDS; TOC, TSS, TPO4 (Total Phosphorus); TKN, XN030 (TKN/TPO4 Bottle); TPO4 (dissolved lab filter); FCF, TCF

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Date	Time	Sampled by	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	Na2S2O3	Alk, AMN, BOD, TDS	TOC, TSS, TPO4	TKN, XN030	TPO4 (dissolved lab filter)	FCF, TCF	LAB USE ONLY
1F	BZ-1S		9/6/18	0720	RO	SW	11	X			X					X	X	X	X	X	X	B11
2F	BZ-2S		↓	1120	↓	↓	11	X			X					X	X	X	X	X	X	B21
3F	BZ-3S		↓	0915	↓	↓	11	X			X					X	X	X	X	X	X	B27
4F	BZ-3M		↓	0915	↓	↓	9	X			X						X	X	X	X		G37
5F	BZ-3D		↓	0915	↓	↓	9	X			X						X	X	X	X		G54TZ
6F	BZ-4S		↓	1010	↓	↓	11	X			X					X	X	X	X	X	X	19E1
7F	BZ-5S		↓	1050	↓	↓	11	X			X					X	X	X	X	X	X	
8F	BZ-6S		↓	0815	↓	↓	11	X			X					X	X	X	X	X	X	
9F	BZ-6M		↓	0815	↓	↓	9	X			X						X	X	X	X		
10F	BZ-6D		↓	0815	↓	↓	9	X			X						X	X	X	X		

Matrix Codes: 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

Turnaround Time (Business days)
- ☐ Std. 10 Business Days
- ☐ 5 Day RUSH
- ☐ 3 Day RUSH
- ☐ 2 Day RUSH
- ☐ 1 Day RUSH
- ☐ other

Approved by (SGS Project Manager)/Date:

Emergency & Rush T/A data available via LabLink

Data Deliverable Information
- ☐ Commercial "A" (Level 1)
- ☐ Commercial "B" (Level 2)
- ☐ FULLT1 (Level 3+4)
- ☐ NJ Reduced
- ☐ Commercial "C"
- ☐ NYASP Category A
- ☐ NYASP Category B
- ☐ State Forms
- ☐ EDD Format
- ☐ Other
- ☐ *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 filled. One XN030 bottle not used. TPO4 dissolved lab filter. XN030 combined with TPO4/TKN Bottle.

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:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1 [signature]	9/6/18 1240	1 [signature]	2 [signature]	9/6/18 1548	2 [signature]
Relinquished by Sampler: 3 [signature]	9/6/18 1835	Received By: 3 [signature]	Relinquished By: 4	Date Time:	Received By: 4
Relinquished by: 5	Date Time:	Received By: 5	Custody Seal #	☑ Intact ☐ Not intact	Preserved where applicable ☐

On Ice ☑ Cooler Temp. 3.1°C IR; 3.7°C/1; 3.6°C IR; 3.8°C IR

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions

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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

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FED-EX Tracking # | Bottle Order Control #
SGS Quote # | SGS Job # JC73277

Client / Reporting Information

Company Name: USACE-Philadelphia District
Street Address: 100 Penn Square East
City: Philadelphia State: PA Zip: 19107
Project Contact: Joe Looper E-mail:
Phone #: 215-656-6545 Fax #:
Sampler(s) Name(s): Greg Wacik 610 597-9780

Project Information

Project Name: USACE-Beltzville Reservoir
Street: 2145 Pohopoco DR.
City: Lehighton State: PA
Project #: PD-08318-113
Client Purchase Order #:
Project Manager:

Billing Information (if different from Report to)

Company Name:
Street Address:
City: State: Zip:
Attention:

Requested Analysis (see TEST CODE sheet)

Lab Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Collection Date	Collection Time	Sampled by	Matrix	# of bottles	Number of preserved bottles: HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	NA2S2O3	Alk, Amm, BoD, TDS	TOC, TSS, TP04 (total Phosphorus)	TKN, xw030 (TKN/TP04 bottle)	TP04 (dissolved lab filter)	FCF, TCF	LAB USE ONLY
11F	BZ-7S		9/6/18	0945	GW	SW	11	X			X					X	X	X	X	X	X	
12F	BZ-7M		9/6/18	0945	GW	SW	9	X			X						X	X	X	X		
13F	BZ-7D		9/6/18	0945	GW	SW	9	X			V						X	X	X	X		

Matrix Codes: 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

Turnaround Time (Business days)

Approved by (SGS Project Manager)/Date:

- [ ] Std. 10 Business Days
- [ ] 5 Day RUSH
- [ ] 3 Day RUSH
- [ ] 2 Day RUSH
- [ ] 1 Day RUSH
- [ ] other

Emergency & Rush T/A data available via LabLink

Data Deliverable Information

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] FULLT1 (Level 3+4)
- [ ] NJ Reduced
- [ ] Commercial "C"
- [ ] NJ Data of Known Quality Protocol Reporting
- [ ] NYASP Category A
- [ ] NYASP Category B
- [ ] State Forms
- [ ] EDD Format
- [ ] Other

Commercial "A" = Results Only; Commercial "B" = Results + QC Summary
NJ Reduced = Results + QC Summary + Partial Raw data

Comments / Special Instructions

One TSS Bottle NOT Filled. One xw030 Bottle NOT used. TP04 dissolved lab filter. xw030 combined with TP04/TKN Bottle.

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:	Date Time:	Received By:	Relinquished By:	Date Time:	Received By:
1		9/6/18 1240	1	2	9/6/18 1545	2
3	Relinquished by Sampler:	Date Time: 9/6/18 1835	Received By: 3	Relinquished By: 4	Date Time:	Received By: 4
5	Relinquished by:	Date Time:	Received By: 5	Custody Seal #	Intact / Not intact	Preserved where applicable

On Ice: ☐ Cooler Temp: 3.7°C IR 3.6°C FP 3.6°C FP

Form:SM088-03C (revised 2/12/18)

http://www.sgs.com/en/terms-and-conditions.

SGS Sample Receipt Summary

Job Number: JC73277 **Client:** USACE-PHILADELPHIA DISTRICT **Project:** PHILADELPHIA DISTRICT, RESERVOIR SAMPL

Date / Time Received: 9/6/2018 6:35:00 PM **Delivery Method:** FedEx **Airbill #'s:**

Cooler Temps (Raw Measured) °C: Cooler 1: (3.7); Cooler 2: (3.4); Cooler 3: (3.6); Cooler 4: (3.6); Cooler 5: (3.8);

Cooler Temps (Corrected) °C: Cooler 1: (3.1); Cooler 2: (2.8); Cooler 3: (3.0); Cooler 4: (3.0); Cooler 5: (3.2);

Cooler Security	Y	N		Y	N
1. Custody Seals Present:	☑	☐	3. COC Present:	☑	☐
2. Custody Seals Intact:	☑	☐	4. Smpl Dates/Time OK	☑	☐

Cooler Temperature	Y	N
1. Temp criteria achieved:	☑	☐
2. Cooler temp verification:	IR Gun	
3. Cooler media:	Ice (Bag)	
4. No. Coolers:	5	

Quality Control Preservation	Y	N	N/A
1. Trip Blank present / cooler:	☐	☑	☐
2. Trip Blank listed on COC:	☐	☑	☐
3. Samples preserved properly:	☑	☐	
4. VOCs headspace free:	☐	☐	☑

Sample Integrity - Documentation	Y	N
1. Sample labels present on bottles:	☐	☑
2. Container labeling complete:	☑	☐
3. Sample container label / COC agree:	☑	☐

Sample Integrity - Condition	Y	N
1. Sample recvd within HT:	☑	☐
2. All containers accounted for:	☑	☐
3. Condition of sample:	Intact	

Sample Integrity - Instructions	Y	N	N/A
1. Analysis requested is clear:	☑	☐	
2. Bottles received for unspecified tests	☐	☑	
3. Sufficient volume recvd for analysis:	☑	☐	
4. Compositing instructions clear:	☐	☐	☑
5. Filtering instructions clear:	☐	☐	☑

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

Comments
-1,-3,-6 thru -8,-11: Received and processed TCF/FCF volumes outside of hold time.
-2: Received TCF/FCF volume within hold, processed outside of hold.

SM089-02 Rev. Date 12/1/16

Responded to by: Pete Dobi Response Date: 9/7/18

Please proceed with analysis. TCF and FCF have 30 hour hold time for this project per Joseph Loeper.

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