2021 WATER QUALITY MONITORING BELTZVILLE RESERVOIR LEHIGHTON, PENNSYLVANIA

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

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2021 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 13 May to 19 August 2021.

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 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 2021 monitoring program included the following major elements:

- Monthly water quality and bacteria surface water monitoring of reservoir and upstream tributaries to evaluate compliance with Pennsylvania state water quality standards and to evaluate the health of the reservoir ecosystem starting on 13 May and ending on 19 August 2021.

- Monthly profile samples for temperature, dissolved oxygen, chlorophyll a, pH, turbidity, and conductivity at all stations in the reservoir and watershed starting on 13 May and ending on 19 August 2021.

2.0 METHODS

2.1 STRATIFICATION MONITORING

Physical stratification monitoring of the water column was conducted five times at Beltzville Reservoir between 13 May and 19 August 2021 (Table 2-1). 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 tributary waters (BZ-2S on Pine Run, BZ-4S on Wild Creek, and BZ-5S on Pohopoco Creek) and one station (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 sonde. When applicable, water quality data recorded from monitoring was compared to water quality standards set forth by the Pennsylvania Department of Environmental Protection (PADEP Chapter 93). All the water quality data collected during physical stratification monitoring is summarized in Appendix A.

2.2 WATER COLUMN CHEMISTRY MONITORING

Water column chemistry monitoring was conducted five times at Beltzville Reservoir between 13 May and 19 August 2021 (Table 2-1). Water samples were collected at the seven fixed stations in the reservoir and watershed (Fig. 2-1). Surface water samples were collected in release waters downstream of the reservoir (BZ-1S) and on upstream tributary source waters 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. Laboratory water sample analysis was conducted by M.J. Reider Associates, Inc Environmental Testing Laboratory located in Reading, Pennsylvania (U.S. EPA/PA DEP #06-00003).

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 2021

Date of Sample Collection	Physical Stratification Monitoring (All Stations)	Water Column Chemistry Monitoring (All Stations)	BTEX Monitoring[1] (BZ-3 and -6)	Trophic State Assessment (BZ-6)	Bacteria Monitoring (All Surface Stations)	Drinking Water Monitoring[2]
13 May	X	X	-	X	X	-
10 June	X	X	-	X	X	-
01 July	X	X	-	X	X	-
22 July	X	X	-	X	X	-
19 August	X	X	-	X	X	-

(1) BTEX sampling was not conducted in 2021 based on historically low and non-detectable levels of these parameters.

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

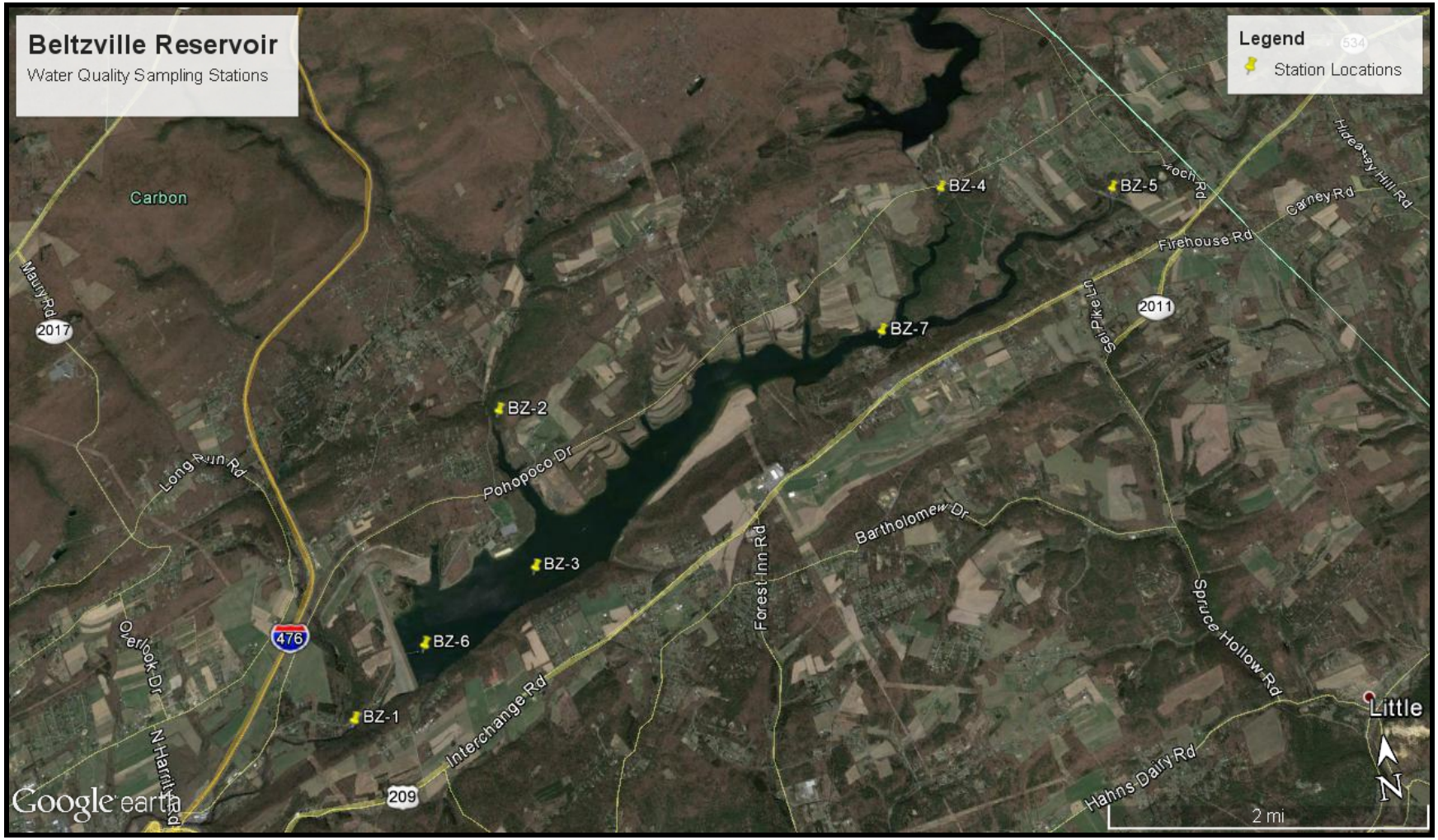

Figure 2-1. Water quality monitoring stations in 2021 at the U.S. Army Corps of Engineers Beltzville Reservoir located in Lehighton, Pennsylvania.

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 2021

Parameter	(2) Method	Laboratory Limit of Reporting	PADEP Surface Water Quality Criteria	Allowable Hold Times (Days)
Total Alkalinity	SM20 2320 B	2.0 mg/L	Min. 20 mg/L $CaCO_3$	14
Biochemical Oxygen Demand (BOD)	SM5210 B	2.0 mg/L	None	2
Total Phosphorus	SM4500-P F	0.01 mg/L	None	28
Diss./Ortho-Phosphate	NA	NA	None	28
Soluble Phosphorus	SM4500-P F	0.01 mg/L	None	28
Total Organic Carbon (TOC)	SM5310 C	0.5 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	0.50 mg/L	None	28
Ammonia	ASTM D6919-03	0.10 mg/L	Temp. and pH dependent	28
Nitrate	EPA 300.0 Rev 2.1	1.0 mg/L	Maximum 10 mg/L (nitrate + nitrite)	28
Nitrite	EPA 300.0 Rev 2.1	0.10 mg/L		28
Total Dissolved Solids	SM2540 C	5.0 mg/L	Maximum 750 mg/L	7
Total Suspended Solids	SM2540 D	1.0 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.
ASTM International- Formerly American Society for Testing and Materials
* Total Inorganic Carbon and Total Carbon were not sampled for in 2021

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 at reservoir-body station BZ-6. Trophic state determinations were made using criteria defined by Carlson and EPA (1983) and calculated for the deepest portion of the reservoir (Station BZ-6).

2.4 RESERVOIR BACTERIA MONITORING

Monitoring for coliform bacteria contaminants was conducted five times at Beltzville Reservoir between 13 May and 19 August 2021 (Table 2-1). Surface water samples were collected at all seven stations and analyzed for total coliform and escherichia coliform contamination as indicators of risk. 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, United States Environmental Protection Agency (EPA) and Pennsylvania Department of Environmental Protection (PADEP) standards, and sample holding times for the bacteria parameters monitored at Beltzville Reservoir in 2021. The bacteria analytical method was based on a membrane filtration technique. All the samples were analyzed within their maximum allowable hold times. Laboratory analysis was conducted by M.J. Reider Associates, Inc Environmental Testing Laboratory located in Reading, Pennsylvania (U.S. EPA/PA DEP #06-00003).

Table 2-3. Water quality test methods, detection limits, PADEP standards, and sample holding times for bacteria parameters monitored at Beltzville Reservoir in 2021.

Parameter	Total Coliform	Escherichia Coliform
Test method	SM 9223 B	SM 9223 B
Limit of Quantification	1 mpn/100-mls	1 mpn/100-mls
PADEP/EPA standard	None	Geometric mean < 126 mpn/100-mls or a single sample reading of < 235 mpn/100-mls
Max. allowable holding time	30 hours	30 hours
Holding time	< 30 hours	< 30 hours

Monthly bacteria counts were compared to the EPA primary recreation water quality single sample standard for escherichia coli bacteria. Application of this standard

applies to Beltzville Reservoir because swimming and other primary and secondary human/water contact recreation is permitted in the reservoir. Beltzville State Park maintains a bathing beach at Beltzville Reservoir and conducts bacteria sampling of that area. Given logistical limitations (all sampling conducted on one day) and because 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 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 May to August 2021. All the parameters were measured with a calibrated YSI 6600 V2-4 water quality sonde and are presented in Appendix A.

3.1.1 Temperature

Temperature is the primary influencing factor on water density, affects the solubility of many chemical compounds, and can therefore influence the effect of pollutants on aquatic life. Increased temperatures elevate the metabolic oxygen demand, in conjunction with reduced oxygen solubility, and can impact many species. Vertical temperature 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 2021 with maximum surface water temperatures seen in late July and August (Fig. 3-1). The maximum upstream tributary temperature of 25.23 °C was seen at station BZ-4S in early July. The maximum downstream release (BZ-1S) surface water temperature was 17.89 °C on 22 July. 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 are pulled from various locations in the water column and is dictated by reservoir release operations. Downstream release temperatures are managed to meet Chapter 93 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 has consistently maintained the yearly highest average tributary surface water temperatures throughout the sampling seasons. 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 2021 (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 May, the onset of stratification was apparent at Station BZ-6 with lake surface temperatures (13.87°C) approximately 7.50°C warmer than the lower water column (6.37°C). A strong

stratification pattern was evident from June into August. In most years, cooling surface temperatures and erosion of the epilimnion in September mark the onset of fall turnover and destratification within the reservoir.

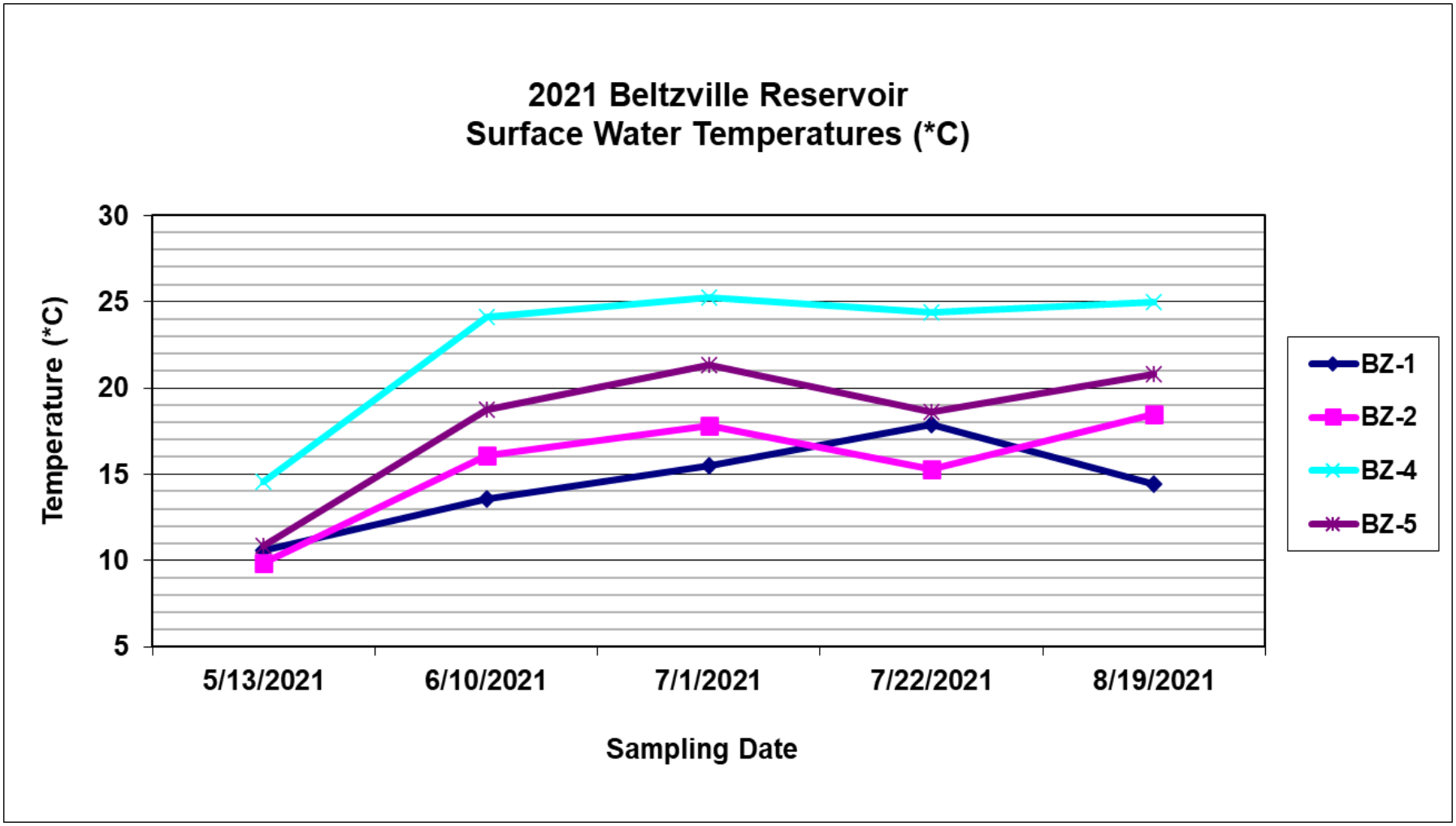

Figure 3-1. Tributary and downstream surface water temperature (°C) measured at Beltzville Reservoir in 2021. See Appendix A for Summary of plotted values. Station BZ-1 reflects releases surface water temperatures downstream of Beltzville Reservoir.

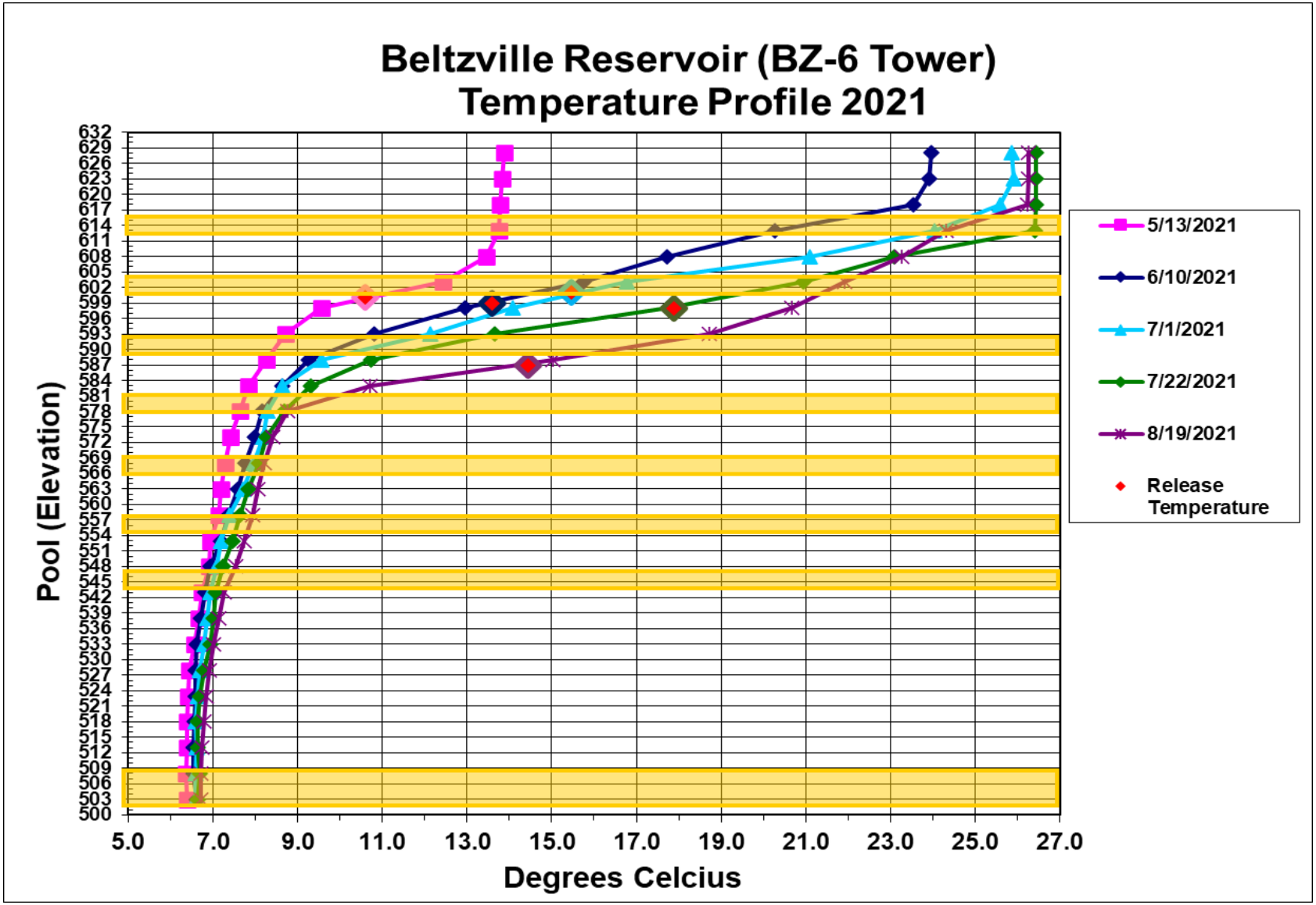

Figure 3-2. Lake temperature profile at station BZ-6 of Beltzville Reservoir in 2021. See Appendix A for summary of plotted values. The yellow bars represent the locations of water control gates in the Beltzville Reservoir control tower. Corresponding downstream release water temperatures at Station 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 within an 7.85-11.26 mg/L value range and followed a similar seasonal pattern throughout the watershed of Beltzville Reservoir during 2021 (Fig. 3-3). Dissolved oxygen concentrations downstream of the reservoir (BZ-1S) averaged 9.89 mg/L for the sampling season. The maximum DO reading of 11.26 mg/L occurred at BZ-5S on 13 May and a minimum reading of 7.85 mg/L occurred at BZ-4S on 01 July.

Dissolved Oxygen in the water column at station BZ-6 of Beltzville Reservoir from July through August, 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). The most severe occurrence of these conditions was seen in August. This DO 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, temperature related water density changes, respiratory oxygen consumption, lake topography or some other factor or combination of factors. No visible or reported impacts on the in-lake fishery has occurred because of these low oxygen conditions.

The state water quality standard for DO is a minimum concentration of 5-mg/L in the epilimnion of stratified lakes. Dissolved oxygen concentrations in the epilimnion of the water column of Beltzville Reservoir remained above the PADEP water quality standards during 2021. As shown in Figure 3-4, concentrations falling below the standard were not encountered in the epilimnion in 2021 but did occur at greater depths. DO concentrations measured in all surface waters of the reservoir remained above the criteria.

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 2021, these conditions were not seen in the water column at station BZ-6 (Appendix A).

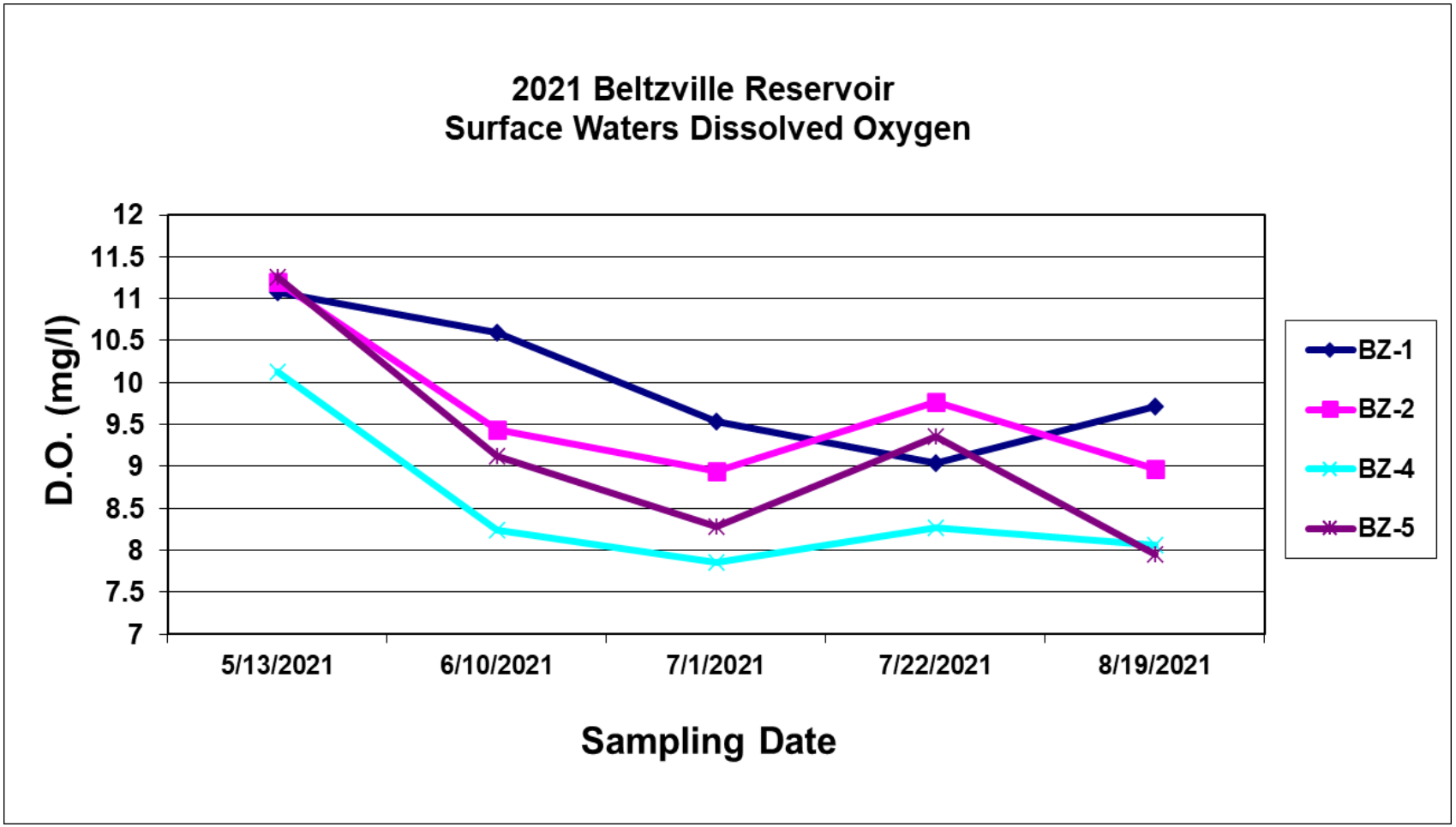

Figure 3-3. Dissolved oxygen concentrations measured in tributary and downstream surface waters at Beltzville Reservoir in 2021. (The PADEP water quality standard for dissolved oxygen is a minimum concentration of 5 mg/L.) See Appendix A for summary of plotted values. Station BZ-1S reflects reservoir release surface waters downstream of Beltzville Reservoir.

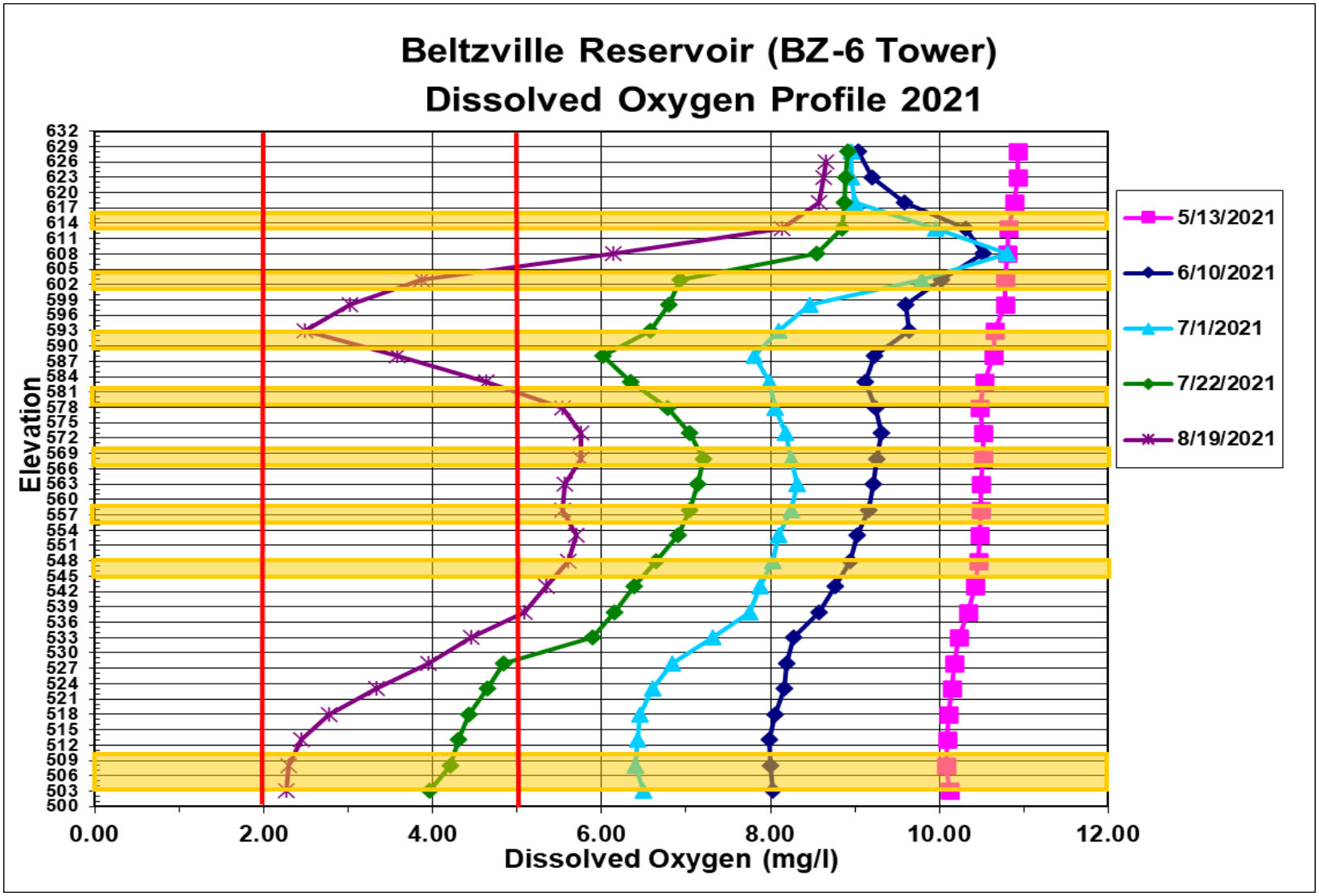

Figure 3-4. Dissolved oxygen profile at station BZ-6 of Beltzville Reservoir in 2021. The PADEP water quality standard for DO is a minimum concentration of 5 mg/L in epilimnion. Start of hypoxia is shown as 2 mg/L. See Appendix A for summary of plotted values.

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 throughout the sampling season stayed within an acceptable range of values (6.26-7.02) and followed a similar seasonal pattern across all surface water stations at Beltzville Reservoir during 2021 (Fig. 3-5).

In all months sampled in 2021, 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. On 10 June and 01 July, a spike in pH readings was witnessed near the surface waters of the lake near pool elevations 608′ and 613′. This spike may be attributed to an algal bloom occurring at that time and depth. 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 near the sediment and water interphase. During the 2021 sampling season, the pH measures throughout most of the water column during the 19 August sampling were not in compliance with PADEP pH criteria. The standard for pH is a range of acceptable measures between 6 and 9.

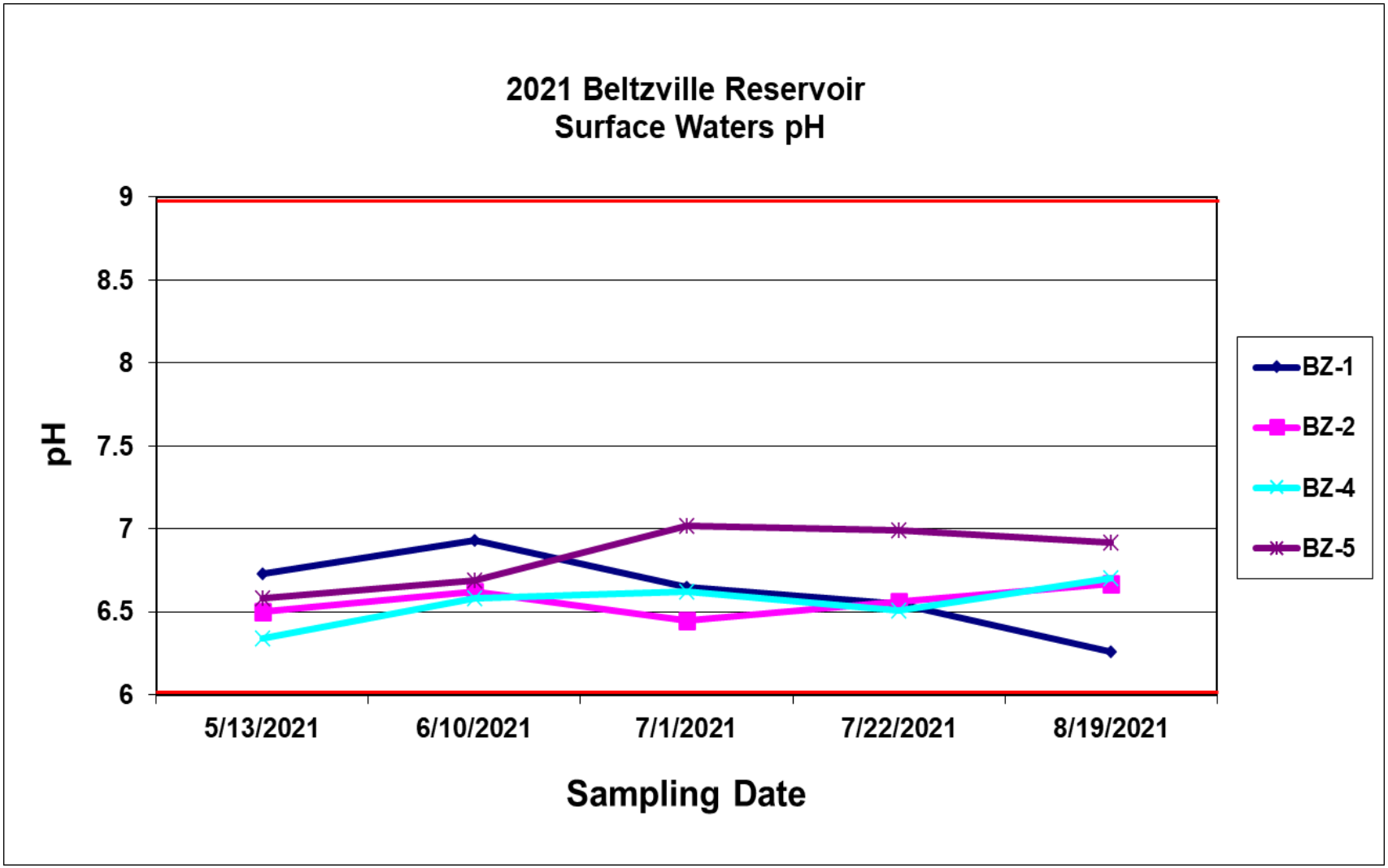

Figure 3-5. pH concentrations measured in tributary and downstream surface waters at Beltzville Reservoir in 2021. (The PADEP water quality standard for pH is between 6 and 9). See Appendix A for summary of plotted values.

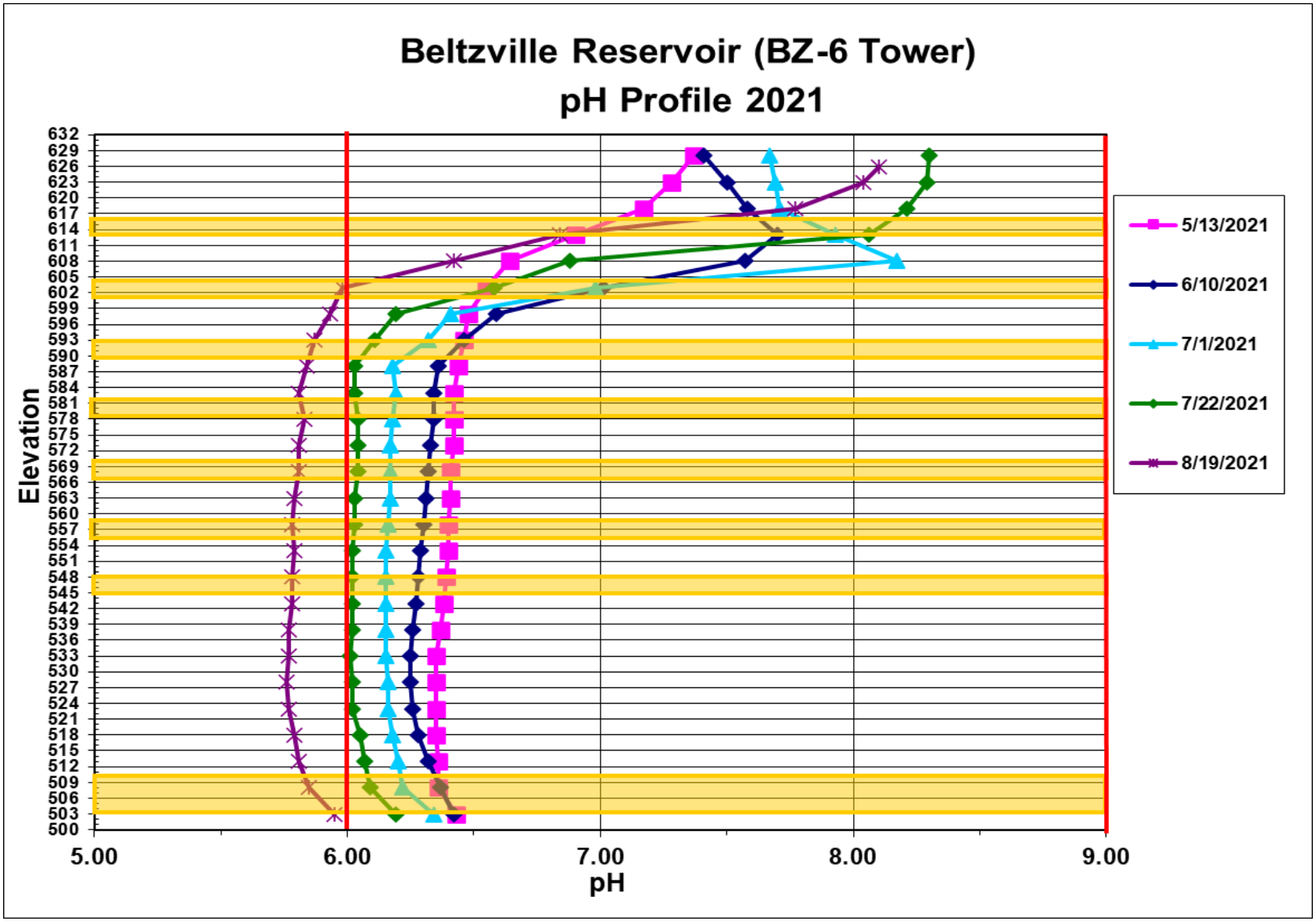

Figure 3-6. pH profile at station BZ-6 of Beltzville Reservoir in 2021. (The PADEP water quality standard for pH is between 6 and 9) See Appendix A for summary of plotted value

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 2021 (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 and 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). This water quality criteria is adopted by the State of Pennsylvania. 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 criterion over a wide range of pH and temperature values and can be utilized to evaluate field collected samples.

Ammonia concentrations were low in Beltzville Reservoir during 2021. Ammonia concentrations among all stations and depths remained below the laboratory minimum detection limit of 0.05 mg/L. Ammonia measured at Beltzville Reservoir remained below the EPA freshwater criteria during 2021.

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.

Table 3.2. Summary of surface, middle, and bottom water quality monitoring data for Beltzville Reservoir in 2021

Station	Date	ALK	BOD5	DISS-P	NH3	NO2	NO3	NO3-NO2	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	5/13/2021	11	<2.0	<0.05	<0.05	<0.01	0.89	0.9	58	<0.48	1.9	<0.01	4
	6/10/2021	11	<2.0	<0.01	<0.05	<0.01	0.84	0.85	54	<0.48	1.5	<0.01	<1
	7/1/2021	12	<2.0	<0.01	<0.05	<0.01	0.81	0.82	40	<0.43	2.3	<0.01	2
	7/22/2021	13	<2.0	0.01	<0.05	<0.01	0.84	0.85	58	<0.43	1.7	0.01	<1
	8/19/2021	13	<2.0	<0.01	<0.05	<0.01	0.92	0.93	73	<0.43	1.3	<0.01	<1
	Mean	12	2.0	0.02	0.05	0.01	0.86	0.87	57	0.45	1.7	0.01	2
	Stdev	1	0.0	0.02	0	0	0.04	0.04	12	0.03	0.4	0.00	1
	Max	13	2	0.05	0.05	0.01	0.92	0.93	73	0.48	2.3	0.01	4
	Min	11	2	0.01	0.05	0.01	0.81	0.82	40	0.43	1.3	0.01	1
	No. of Det.	5	0	1	0	0	5	5	5	0	5	1	2
BZ-2S	5/13/2021	8	<2.0	<0.05	<0.05	<0.01	0.32	0.33	60	<0.48	0.6	<0.01	3
	6/10/2021	10	<2.0	<0.01	<0.05	<0.01	0.39	0.40	72	<0.48	1	<0.01	6
	7/1/2021	9	<2.0	<0.01	<0.05	<0.01	0.42	0.43	25	<0.43	0.9	<0.01	3
	7/22/2021	9	<2.0	<0.01	<0.05	<0.01	0.42	0.43	38	<0.43	0.9	0.01	3
	8/19/2021	14	<2.0	<0.01	<0.05	<0.01	0.47	0.48	66	<0.43	4	0.02	22
	Mean	10	2	0.02	0.05	0.01	0.40	0.41	52	0.45	1.5	0.01	7
	Stdev	2	0	0.02	0	0	0.06	0.06	20	0.03	1.4	0.00	8
	Max	14	2	0.05	0.05	0.01	0.47	0.48	72	0.48	4	0.02	22
	Min	8	2	0.01	0.05	0.01	0.32	0.33	25	0.43	0.6	0.01	3
	No. of Det.	5	0	0	0	0	5	5	5	0	5	2	5

Table 3.2 Continued. Summary of surface, middle, and bottom water quality monitoring data for Beltzville Reservoir in 2021

Station	Date	ALK mg/L	BOD5 mg/L	DISS-P mg/L	NH3 mg/L	NO2 mg/L	NO3 mg/L	NO3-NO2 mg/L	TDS mg/L	TKN mg/L	TOC mg/L	TP mg/L	TSS mg/L
BZ-3S	5/13/2021	12	<2.0	<0.05	<0.05	<0.01	0.85	0.86	57	<0.48	1.5	<0.01	<1
	6/10/2021	11	<2.0	<0.01	<0.05	<0.01	0.75	0.76	80	<0.48	1.5	<0.01	1
	7/1/2021	11	<2.0	0.02	<0.05	<0.01	0.66	0.67	50	<0.43	1.7	<0.01	<1
	7/22/2021	10	<2.0	<0.01	<0.05	<0.01	0.58	0.59	36	<0.43	1.8	<0.01	3
	8/19/2021	10	2.9	<0.01	<0.05	<0.01	0.44	0.45	45	<0.43	1.6	<0.01	2
	Mean	11	2.18	0.02	0.05	0.01	0.66	0.67	54	0.45	1.6	0.01	2
	Stdev	1	0.40	0.02	0	0	0.16	0.16	17	0.03	0.1	0.00	1
	Max	12	2.9	0.05	0.05	0.01	0.85	0.86	80	0.48	1.8	0.01	3
	Min	10	2	0.01	0.05	0.01	0.44	0.45	36	0.43	1.5	0.01	1
	No. of Det.	5	1	1	0	0	5	5	5	0	5	0	3
BZ-3M	5/13/2021	11	<2.0	<0.05	<0.05	<0.01	0.95	0.96	92	<0.48	1.1	<0.01	1
	6/10/2021	11	<2.0	<0.01	<0.05	<0.01	0.92	0.93	80	<0.48	1.2	<0.01	1
	7/1/2021	12	<2.0	<0.01	<0.05	<0.01	0.91	0.92	62	<0.43	1.3	0.01	<1
	7/22/2021	12	<2.0	<0.01	<0.05	<0.01	1	1.01	56	<0.43	1.2	<0.01	<1
	8/19/2021	11	4	<0.01	<0.05	<0.01	0.59	0.60	72	<0.43	1.5	<0.01	5
	Mean	11	2.4	0.02	0.05	0.01	0.87	0.88	72	0.45	1.3	0.01	2
	Stdev	1	0.9	0.02	0	0	0.16	0.16	14	0.03	0.2	0.00	2
	Max	12	4	0.05	0.05	0.01	1	1.01	92	0.48	1.5	0.01	5
	Min	11	2	0.01	0.05	0.01	0.59	0.6	56	0.43	1.1	0.01	1
	No. of Det.	5	1	0	0	0	5	5	5	0	5	1	3

Table 3.2 Continued. Summary of surface, middle, and bottom water quality monitoring data for Beltzville Reservoir in 2021

Station	Date	ALK mg/L	BOD5 mg/L	DISS-P mg/L	NH3 mg/L	NO2 mg/L	NO3 mg/L	NO3-NO2 mg/L	TDS mg/L	TKN mg/L	TOC mg/L	TP mg/L	TSS mg/L
BZ-3D	5/13/2021	12	<2.0	<0.05	<0.05	<0.01	0.97	0.98	76	<0.48	1.1	0.12	53
	6/10/2021	11	<2.0	<0.01	<0.05	<0.01	0.95	0.96	89	<0.48	1.1	<0.01	<1
	7/1/2021	13	<2.0	<0.01	<0.05	<0.01	0.85	0.86	67	<0.43	1.3	<0.01	1
	7/22/2021	12	3.6	<0.01	<0.05	<0.01	0.98	0.99	80	<0.43	1.1	0.08	<1
	8/19/2021	12	<2.0	<0.01	<0.05	<0.01	0.91	0.92	41	<0.43	1.2	<0.01	1
	Mean	12	2.32	0.02	0.05	0.01	0.93	0.94	71	0.45	1.2	0.05	11
	Stdev	1	0.72	0.02	0	0	0.05	0.05	18	0.03	0.1	0.05	23
	Max	13	3.6	0.05	0.05	0.01	0.98	0.99	89	0.48	1.3	0.12	53
	Min	11	2	0.01	0.05	0.01	0.85	0.86	41	0.43	1.1	0.01	1
	No. of Det.	5	1	0	0	0	5	5	5	0	5	2	3
BZ-4S	5/13/2021	7	<2.0	<0.05	<0.05	<0.01	0.14	0.15	<5	<0.48	1.2	<0.01	<1
	6/10/2021	7	<2.0	<0.01	<0.05	<0.01	0.16	0.17	46	<0.48	1.3	<0.01	6
	7/1/2021	7	<2.0	<0.01	<0.05	<0.01	0.29	0.3	26	<0.43	1.3	<0.01	<1
	7/22/2021	7	<2.0	<0.01	<0.05	<0.01	0.21	0.22	28	<0.43	1.3	<0.01	1
	8/19/2021	7	<2.0	<0.01	<0.05	<0.01	0.18	0.19	59	<0.43	1.3	<0.01	<1
	Mean	7	2	0.02	0.05	0.01	0.20	0.21	33	0.45	1.3	0.01	2
	Stdev	0	0	0.02	0	0	0.06	0.06	21	0.03	0.0	0.00	2
	Max	7	2	0.05	0.05	0.01	0.29	0.3	59	0.48	1.3	0.01	6
	Min	7	2	0.01	0.05	0.01	0.14	0.15	5	0.43	1.2	0.01	1
	No. of Det.	5	0	0	0	0	5	5	4	0	5	0	2

Table 3.2 Continued. Summary of surface, middle, and bottom water quality monitoring data for Beltzville Reservoir in 2021

Station	Date	ALK mg/L	BOD5 mg/L	DISS-P mg/L	NH3 mg/L	NO2 mg/L	NO3 mg/L	NO3-NO2 mg/L	TDS mg/L	TKN mg/L	TOC mg/L	TP mg/L	TSS mg/L
BZ-5S	5/13/2021	14	<2.0	<0.05	<0.05	<0.01	1.25	1.26	66	<0.48	1	<0.01	2
	6/10/2021	18	<2.0	0.02	<0.05	<0.01	1.34	1.35	85	<0.48	1.8	0.02	1
	7/1/2021	14	<2.0	0.02	<0.05	<0.01	1.26	1.27	51	<0.43	1.5	0.02	1
	7/22/2021	14	<2.0	<0.01	<0.05	<0.01	1.27	1.28	69	<0.43	1.3	<0.01	7
	8/19/2021	15	2.3	0.02	<0.05	<0.01	0.77	0.78	94	<0.43	7.1	0.04	32
	Mean	15	2	0.02	0.05	0.01	1.18	1.19	73	0.45	2.5	0.02	9
	Stdev	2	0	0.02	0	0	0.23	0.23	17	0.03	2.6	0.01	13
	Max	18	2.3	0.05	0.05	0.01	1.34	1.35	94	0.48	7.1	0.04	32
	Min	14	2	0.01	0.05	0.01	0.77	0.78	51	0.43	1	0.01	1
	No. of Det.	5	1	3	0	0	5	5	5	0	5	3	5
BZ-6S	5/13/2021	11	<2.0	<0.05	<0.05	<0.01	0.85	0.86	83	<0.48	1.5	<0.01	<1
	6/10/2021	10	<2.0	<0.01	<0.05	<0.01	0.74	0.75	67	<0.48	1.7	<0.01	<1
	7/1/2021	10	<2.0	<0.01	<0.05	<0.01	0.67	0.68	42	<0.43	1.6	<0.01	<1
	7/22/2021	11	<2.0	<0.01	<0.05	<0.01	0.59	0.60	71	<0.43	1.8	<0.01	<1
	8/19/2021	10	2.7	<0.01	<0.05	<0.01	0.45	0.46	49	<0.43	1.7	<0.01	6
	Mean	10	2.1	0.02	0.05	0.01	0.66	0.67	62	0.45	1.66	0.01	2
	Stdev	1	0.3	0.02	0	0	0.15	0.15	17	0.03	0.1	0.00	2
	Max	11	2.7	0.05	0.05	0.01	0.85	0.86	83	0.48	1.8	0.01	6
	Min	10	2	0.01	0.05	0.01	0.45	0.46	42	0.43	1.5	0.01	1
	No. of Det.	5	1	0	0	0	5	5	5	0	5	0	1

Table 3.2 Continued. Summary of surface, middle, and bottom water quality monitoring data for Beltzville Reservoir in 2021

Station	Date	ALK mg/L	BOD5 mg/L	DISS-P mg/L	NH3 mg/L	NO2 mg/L	NO3 mg/L	NO3-NO2 mg/L	TDS mg/L	TKN mg/L	TOC mg/L	TP mg/L	TSS mg/L
BZ-6M	5/13/2021	11	<2.0	<0.05	<0.05	<0.01	0.96	0.97	83	<0.48	1.2	<0.01	<1
	6/10/2021	12	<2.0	<0.01	<0.05	<0.01	0.94	0.95	76	<0.48	1.1	<0.01	<1
	7/1/2021	11	2.7	<0.01	<0.05	<0.01	0.92	0.93	57	<0.43	1.2	<0.01	1
	7/22/2021	10	<2.0	<0.01	<0.05	<0.01	0.95	0.96	80	<0.43	1.3	<0.01	<1
	8/19/2021	12	<2.0	<0.01	<0.05	<0.01	0.94	0.95	88	<0.43	1.2	<0.01	6
	Mean	11	2.14	0.02	0.05	0.01	0.94	0.95	76.8	0.45	1.2	0.01	2
	Stdev	1	0.3	0.02	0	0	0.01	0.01	12	0.03	0.1	0.00	2
	Max	12	2.7	0.05	0.05	0.01	0.96	0.97	88	0.48	1.3	0.01	6
	Min	10	2	0.01	0.05	0.01	0.92	0.93	57	0.43	1.1	0.01	1
	No. of Det.	5	1	0	0	0	5	5	5	0	5	0	2
BZ-6D	5/13/2021	12	<2.0	<0.05	<0.05	<0.01	0.97	0.98	75	<0.48	1.2	<0.01	<1
	6/10/2021	12	<2.0	<0.01	<0.05	<0.01	0.92	0.93	69	<0.48	1.2	<0.01	<1
	7/1/2021	13	<2.0	<0.01	<0.05	<0.01	0.83	0.84	69	<0.43	1.4	0.02	3
	7/22/2021	14	<2.0	<0.01	<0.05	<0.01	0.99	1.00	83	<0.43	1.3	0.05	1
	8/19/2021	11	<2.0	<0.01	<0.05	<0.01	0.94	0.95	56	<0.43	1.2	<0.01	5
	Mean	12	2.0	0.02	0.05	0.01	0.93	0.94	70	0.45	1.3	0.02	2
	Stdev	1	0.0	0.02	0	0	0.06	0.06	10	0.03	0.1	0.02	2
	Max	14	2	0.05	0.05	0.01	0.99	1	83	0.48	1.4	0.05	5
	Min	11	2	0.01	0.05	0.01	0.83	0.84	56	0.43	1.2	0.01	1
	No. of Det.	5	0	0	0	0	5	5	5	0	5	2	3

Table 3.2 Continued. Summary of surface, middle, and bottom water quality monitoring data for Beltzville Reservoir in 2021

Station	Date	ALK mg/L	BOD5 mg/L	DISS-P mg/L	NH3 mg/L	NO2 mg/L	NO3 mg/L	NO3-NO2 mg/L	TDS mg/L	TKN mg/L	TOC mg/L	TP mg/L	TSS mg/L
BZ-7S	5/13/2021	11	2.8	<0.05	<0.05	<0.01	0.68	0.69	62	<0.48	1.9	<0.01	1
	6/10/2021	10	<2.0	<0.01	<0.05	<0.01	0.71	0.72	56	<0.48	1.5	<0.01	<1
	7/1/2021	10	<2.0	<0.01	<0.05	<0.01	0.64	0.65	44	<0.43	1.9	<0.01	<1
	7/22/2021	10	<2.0	<0.01	<0.05	<0.01	0.51	0.52	79	<0.43	1.6	<0.01	<1
	8/19/2021	10	2.5	<0.01	<0.05	<0.01	0.43	0.44	71	<0.43	1.5	<0.01	5
	Mean	10	2.3	0.02	0.05	0.01	0.59	0.60	62	0.45	1.7	0.01	2
	Stdev	0	0.4	0.02	0	0	0.12	0.12	14	0.03	0.2	0.00	2
	Max	11	2.8	0.05	0.05	0.01	0.71	0.72	79	0.48	1.9	0.01	5
	Min	10	2	0.01	0.05	0.01	0.43	0.44	44	0.43	1.5	0.01	1
	No. of Det.	5	2	0	0	0	5	5	5	0	5	0	2
BZ-7M	5/13/2021	12	<2.0	<0.05	<0.05	<0.01	0.89	0.9	71	<0.48	1.5	<0.01	<1
	6/10/2021	12	<2.0	<0.01	<0.05	<0.01	0.95	0.96	67	<0.48	1.5	<0.01	1
	7/1/2021	13	<2.0	<0.01	<0.05	<0.01	0.99	1.00	58	<0.43	1.4	<0.01	<1
	7/22/2021	10	<2.0	<0.01	<0.05	<0.01	0.51	0.52	76	<0.43	1.6	<0.01	<1
	8/19/2021	10	2.5	<0.01	<0.05	<0.01	0.44	0.45	82	<0.43	1.4	1.23	7
	Mean	11	2.1	0.02	0.05	0.01	0.76	0.77	71	0.45	1.5	0.25	2
	Stdev	1	0.2	0.02	0	0	0.26	0.26	9	0.03	0.1	0.55	3
	Max	13	2.5	0.05	0.05	0.01	0.99	1	82	0.48	1.6	1.23	7
	Min	10	2	0.01	0.05	0.01	0.44	0.45	58	0.43	1.4	0.01	1
	No. of Det.	5	1	0	0	0	5	5	5	0	5	1	2

Table 3.2 Continued. Summary of surface, middle, and bottom water quality monitoring data for Beltzville Reservoir in 2021

Station	Date	ALK mg/L	BOD5 mg/L	DISS-P mg/L	NH3 mg/L	NO2 mg/L	NO3 mg/L	NO3-NO2 mg/L	TDS mg/L	TKN mg/L	TOC mg/L	TP mg/L	TSS mg/L
BZ-7D	5/13/2021	12	2.9	<0.05	<0.05	<0.01	0.76	0.77	98	0.49	1.6	0.03	337
	6/10/2021	12	<2.0	<0.01	<0.05	<0.01	0.92	0.93	74	<0.48	1.2	<0.01	<1
	7/1/2021	12	<2.0	<0.01	<0.05	<0.01	0.87	0.88	47	<0.43	1.3	<0.01	1
	7/22/2021	13	2.6	<0.01	<0.05	<0.01	0.86	0.87	84	<0.43	1.6	<0.01	1
	8/19/2021	12	2.3	<0.01	<0.05	<0.01	0.61	0.62	33	<0.43	1.3	<0.01	1
	Mean	12	2.4	0.02	0.05	0.01	0.80	0.81	67	0.45	1.4	0.01	68
	Stdev	0	0.4	0.02	0	0	0.12	0.12	27	0.03	0.2	0.01	150
	Max	13	2.9	0.05	0.05	0.01	0.92	0.93	98	0.49	1.6	0.03	337
	Min	12	2	0.01	0.05	0.01	0.61	0.62	33	0.43	1.2	0.01	1
	No. of Det.	5	3	0	0	0	5	5	5	1	5	1	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. Concentrations measured at all stations and depths remained below the laboratory reporting limit of 0.01 mg/L during the 2021 sampling season.

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 and watershed of Beltzville Reservoir during 2021 with sample results ranging from 0.14 mg/L to 1.34 mg/L (Table 3-2). The highest recorded single nitrate measure of 1.34 mg/L was measured on 10 June at upstream tributary station BZ-5S. Station BZ-5S maintained the highest seasonal mean concentration of 1.18 mg/L of all stations. Elevated readings at this tributary station can be attributed to watershed inputs.

Beltzville Reservoir remained below the PADEP water quality standard for nitrite and nitrate during 2021. 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 1.35 mg/L was measured at station BZ-5S on 10 June.

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 was low in the water column of Beltzville Reservoir during 2021 with single sample concentrations ranging from less than the 0.43 mg/L minimum laboratory reporting limit to 0.49 mg/L (Table 3-2).

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 2021, 10 of the 65 samples measured for total phosphorus were greater than the EPA suggested maximum concentration and minimum laboratory reporting limit of 0.01 mg/L (Table 3-2). The 10 elevated samples ranged in concentrations from 0.01 mg/L to 1.23 mg/L with higher concentrations predominantly seen in deep and mid depth samples across all stations and at upstream tributary station BZ-5S. Elevated TP readings in deep reservoir waters are typically associated with phosphorus release from bottom sediments during low oxygen conditions. Beltzville Reservoir experienced these conditions in 2021. Upstream tributary station BZ-5S (Pohopoco Creek) exceeded the EPA 0.01 mg/L suggested concentration through much of the sampling season. Land use or other watershed factors contribute to nutrient loading in this tributary.

3.2.5 Dissolved Phosphorus

Dissolved phosphorus (Diss P) is a measure of the fraction of total phosphorus which is in solution in the water. This form is mobile in the water column and can be readily available to aquatic plants including algae. Land use or other watershed factors contribute to nutrient loading. During the 2021 sampling season, concentrations measured at all stations and depths in the water column and tributaries of Beltzville Reservoir were less than the reporting limit of 0.01 and 0.05 mg/L (Table 3-2).

3.2.6 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 2021 (Table 3-2). Concentrations among all stations and depths ranged from less than the minimum reporting limit of 0.05 mg/L to 98 mg/L. Total dissolved solids measured at Beltzville Reservoir in 2021 remained below PADEP water quality standards. The state water quality standard for TDS is a maximum concentration of 500 mg/L.

3.2.7 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 2021 (Table 3-2). Concentrations measured at all stations and depths ranged from less than the minimum laboratory reporting limit of 1.0 mg/L to a maximum of 337.0 mg/L collected at Station BZ-7D in May. High measures of TSS can be the result of sample collection error

associated with capturing disturbed fine sediments in the lake bottom or stream sample during field sampling. This sampling error may appear as unusually elevated, or unexplained high TSS water samples collected for those samples.

3.2.8 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 set laboratory method 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; and
- 10+ mg/L is associated with very polluted water and large amounts of biodegradable wastes.

Biochemical oxygen demand concentrations in the waters of Beltzville Reservoir were consistently low in all months and stations sampled (Table 3-2). Twelve samples throughout the sampling season were greater than the laboratory minimum reporting limit of 2.0 mg/L with the highest concentration of 4.0 mg/L measured in the middle waters of the reservoir at station BZ-03M on 19 August. Based on the seasonal sampling results, it is inferred that in 2021, Beltzville Reservoir and its associated tributaries had predominantly very clean water with little biodegradable organic wastes.

3.2.9 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 2021 ranged from 18.0 mg/L to 7.0 mg/L (Table 3-2). All reservoir and tributary samples measured were below the state minimum criteria (20 mg/L) during 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 comply with the PADEP alkalinity criteria, due to the regional natural conditions.

3.2.10 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 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 2021 (Table 3-2). Concentrations of TOC at all stations and depths ranged from 0.6 mg/L to 7.1 mg/L.

3.2.11 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 concentration increases in relation to algal densities in a water body and can be affected by wind, sunlight, and other factors. Chlorophyll *a* in the surface waters (0-10 feet) of Beltzville Reservoir were low and similar throughout the reservoir during 2021 (Appendix A). Concentrations measured in surface waters at all lake body stations ranged between 0.7 ug/L and 5.9 ug/L with an average seasonal concentration across all lake stations of 2.79 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 approximately monthly during the 2021 sampling season collected at station BZ-6 (Figure 3-7).

TSIs calculated for measures of total phosphorus classified Beltzville Reservoir as oligotrophic in May (37.35), June (37.35), early July (37.35), late July (37.35) and August (37.35). TSIs calculated for measures of secchi disk depth classified Beltzville Reservoir as mesotrophic in May (40.39), early July (40.95), late July (40.95) and August (43.70), and oligotrophic in June (36.81). TSIs calculated for measures of chlorophyll *a* classified

Beltzville Reservoir as oligotrophic in May (39.86) and June (34.11) and mesotrophic in early July (41.15), late July (42.31) and August (42.97).

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. Considering this and historic sampling results, the trophic state of the reservoir, based on TSI's, was mesotrophic/oligotrophic throughout the 2021 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). Considering the general agreement between the EPA classifications with that of the Carlson TSI's, the trophic condition of Beltzville Reservoir was predominantly oligotrophic in 2021.

Table 3-3. EPA trophic classification criteria and average monthly measures for Beltzville Reservoir in 2021.

Water Quality Variable	Oligo-trophic	Meso-trophic	Eutrophic	13 May	10 June	01 July	22 July	19 August
Total phosphorus (ppb)	<10	10-20	>20	<10	<10	<10	<10	<10
Chlorophyll a (ppb)	<4	4-10	>10	2.57	1.43	2.93	3.3	3.53
Secchi disk depth (meters)	>4	2-4	<2	3.90	5.00	3.75	3.75	3.10

3.4 RESERVOIR BACTERIA MONITORING

Total coliform bacteria include *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. With respect to EPA and PADEP water quality standards, fecal coliform bacteria standards have been replaced with a recommended E. coli criterion. Bacteria contamination was monitored in the tributary and lake surface waters at Beltzville Reservoir from May through August during 2021 (Table 3-4). Beltzville surface water samples were not analyzed for fecal coliform bacteria in 2021.

Escherichia coli is the most reliable indicator of fecal bacterial contamination of surface waters in the United States according to water quality standards set by the EPA (2000). The EPA recommendation for recreational water quality standards for E. coli is based on two criteria: a geometric mean of 126 organisms/100 ml (geometric mean of five samples collected over not more than a 30 consecutive day period) threshold and 235 organisms/100 ml (single water sample) threshold.

Total coliform values for all stations ranged from 5 colonies/100-ml to greater than the detection limit of >2420 colonies/100-ml. Bacteria in natural waters are common and their presence in the sample is not necessarily a human health concern. Given that Corps regular monitoring was completed utilizing single day grab samples, single sample results were compared to the EPA e. coli single sample criteria in 2021. The E. coli samples collected at Beltzville Reservoir did exceed the 235 organisms/100 ml single water sample threshold on four occasions with 3 samples collected from upstream tributary stations. Upstream tributary Station BZ-5S consistently maintained the highest bacteria readings and may be a result of upstream watershed activities or land use. Water contact recreation is permitted at Beltzville Reservoir. The recreational swimming beach is monitored for bacteria and managed independently 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.

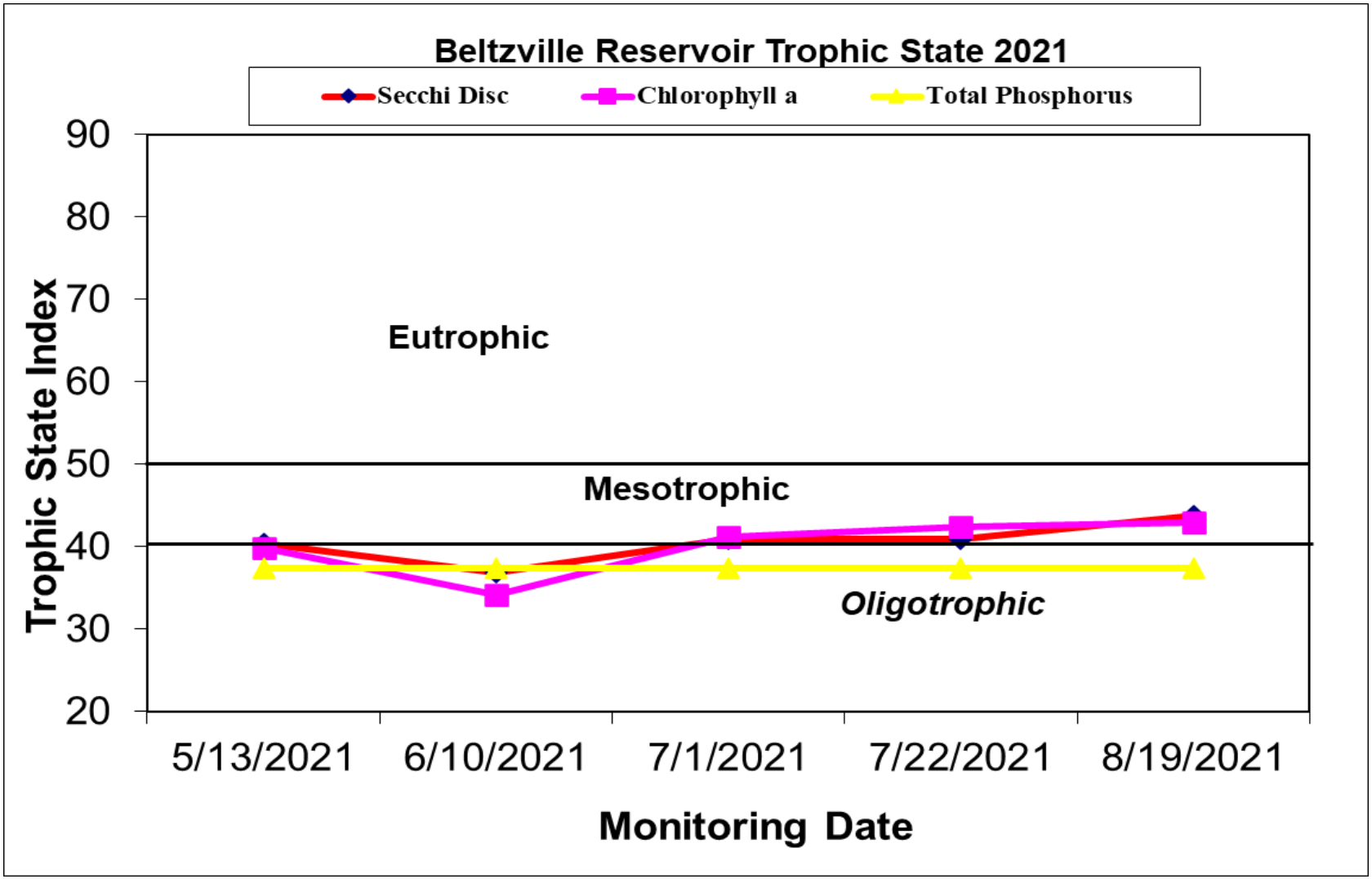

Figure 3-7. Trophic state indices calculated from secchi disk depth and concentrations of total phosphorus and chlorophyll *a* at reservoir Station BZ-6 for Beltzville Reservoir in 2021.

Table 3-4 Bacteria counts (colonies/100ml) at Beltzville Reservoir and tributaries during 2021.

STATION	DATE	Total Coliform (TC)		Fecal Coliform (FC)		Escherichia coli	
BZ-1S	5/13/2021		488		NS		1
	6/10/2021		770		NS		17
	7/1/2021	>	2420		NS		727
	7/22/2021		2420		NS		6
	8/19/2021	>	2420		NS		41
BZ-2S	5/13/2021		345		NS		11
	6/10/2021		1990		NS		50
	7/1/2021		2420		NS		63
	7/22/2021		1990		NS		25
	8/19/2021	>	2420		NS		461
BZ-3S	5/13/2021		5		NS	<	1
	6/10/2021		60		NS		3
	7/1/2021		178		NS		1
	7/22/2021		130		NS	<	1
	8/19/2021		272		NS		1
BZ-4S	5/13/2021		517		NS		53
	6/10/2021	>	2420		NS		17
	7/1/2021	>	2420		NS		13
	7/22/2021	>	2420		NS		14
	8/19/2021	>	2420		NS		39
BZ-5S	5/13/2021		2420		NS		19
	6/10/2021		2420		NS		345
	7/1/2021	>	2420		NS		142
	7/22/2021	>	2420		NS		96
	8/19/2021	>	2420		NS	>	2420
BZ-6S	5/13/2021		7		NS	<	1
	6/10/2021		138		NS	<	1
	7/1/2021		91		NS		4
	7/22/2021		131		NS		1
	8/19/2021		365		NS	<	1
BZ-7S	5/13/2021		16		NS	<	1
	6/10/2021		291		NS		4
	7/1/2021		276		NS		1
	7/22/2021		345		NS		1
	8/19/2021		649		NS		7

-Highlighted counts exceed single sample EPA contact recreation criteria (235 Escherichia Coliform colonies/100ml).
-NS = Not Sampled in 2021

4.0 REFERENCES

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APPENDIX A

BELTZVILLE RESERVOIR 2021
STRATIFICATION DATA TABLES

2021 Beltzville Reservoir Summary 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	5/13/2021	6:42:05	0.5	10.6	99.6	11.08	6.73	-26.2	144.6	0.0	4.6	0.074
	6/10/2021	6:41:32	0.5	13.6	102	10.6	6.93	-37	137.7	0.0	4.4	0.079
	7/1/2021	10:44:05	0.5	15.47	95.5	9.54	6.65	-21.3	189.9	0.0	3.6	0.083
	7/22/2021	6:40:58	0.5	17.89	95.2	9.04	6.55	-15.5	200.9	0.0	3.6	0.089
	8/19/2021	6:44:21	0.5	14.45	95.3	9.72	6.26	0.9	204.9	0.0	1.1	0.085
BZ-2S Pine Run Trib.	5/13/2021	11:53:47	0.5	9.84	98.8	11.2	6.5	-13.1	180.5	0.0	0.0	0.052
	6/10/2021	11:44:47	0.5	16.11	95.9	9.44	6.62	-19.8	199.6	0.8	0.7	0.068
	7/1/2021	10:30:15	0.5	17.81	94.1	8.94	6.45	-9.8	196.6	3.3	0.3	0.069
	7/22/2021	11:16:36	0.5	15.3	97.5	9.77	6.56	-16	213.1	0.1	0.1	0.067
	8/19/2021	11:13:27	0.5	18.46	95.6	8.97	6.67	-22.2	183.7	3.6	2.5	0.071
BZ-3 Bouy/Beach												
		9:13:03	0.5	14.08	106	10.93	7.53	-70.8	130.4	0.0	0.7	0.079
		9:11:32	5	13.94	106	10.95	7.45	-66.6	132.6	0.0	3.6	0.079
		9:10:19	10	13.91	105	10.88	7.33	-59.7	134.7	0.0	3.4	0.079
		9:09:01	15	13.85	105	10.81	7.08	-45.7	138.7	0.0	4.4	0.079
		9:08:25	20	13.4	103	10.73	6.94	-37.7	140.7	0.0	4.1	0.078
		9:06:42	25	12.26	97.7	10.47	6.47	-11.6	158.4	0.1	4.8	0.074
		9:06:01	30	10.05	93.7	10.56	6.45	-10.5	159.4	0.0	5.6	0.072
		9:05:17	35	9.14	92.3	10.63	6.42	-9.2	160.8	0.0	3.2	0.072
		9:04:11	40	8.45	90.5	10.59	6.39	-7.3	162.6	0.0	2	0.071
	5/13/2021	9:03:11	45	8.03	89.2	10.56	6.37	-6.4	163.8	0.0	1.6	0.070
		9:02:19	50	7.74	87.8	10.46	6.36	-5.7	165	0.0	1.5	0.070
		9:01:32	55	7.5	87.6	10.5	6.35	-5.5	165.9	0.0	1.6	0.069
		9:00:55	60	7.24	87.2	10.52	6.35	-5.4	166.6	0.0	1.5	0.069
		9:00:03	65	7.14	86.4	10.45	6.34	-4.9	168	0.0	0.8	0.069
		8:59:05	70	6.98	86.1	10.45	6.34	-4.7	169.5	0.0	0.2	0.069
		8:58:16	75	6.82	85.5	10.42	6.33	-4.5	171	0.0	0.3	0.068
		8:55:40	80	6.72	85.4	10.44	6.36	-5.9	174.6	0.0	0.5	0.068
		8:54:49	85	6.67	84.9	10.39	6.38	-7.2	175.8	0.0	1.1	0.068
		8:53:33	90	6.62	84.8	10.39	6.42	-9.5	177.3	0.0	0.8	0.068
		8:52:47	95	6.59	84.2	10.33	6.41	-8.7	180.8	0.0	0.5	0.068
		8:51:54	100	6.48	83.5	10.27	6.44	-10.1	184.2	0.0	0.5	0.068
		8:51:06	105	6.41	83.6	10.3	6.58	-17.9	183	0.0	0.4	0.068

2021 Beltzville Reservoir Summary 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	6/10/2021	9:20:06	0.5	24.16	110	9.26	7.53	-72.3	103.5	0.0	1	0.095
		9:19:40	5.0	24.12	112	9.39	7.58	-74.9	102.1	0.0	1.3	0.095
		9:18:55	10.0	21.9	114	10	7.69	-81	98.1	0.0	1.9	0.091
		9:17:22	15.0	19.91	114	10.4	7.74	-84	92	0.0	2.2	0.087
		9:17:03	20.0	19.91	114	10.4	7.74	-83.9	92	0.0	2.3	0.087
		9:15:49	25.0	17.25	108	10.34	7.22	-53.5	106.4	0.0	3.5	0.083
		9:14:51	30.0	15.49	99.4	9.92	6.97	-39.4	113.6	0.0	4.6	0.082
		9:12:46	35.0	13.17	86.7	9.1	6.32	-3.1	143.4	0.8	5.9	0.079
		9:11:42	40.0	10.9	79.3	8.76	6.26	0.1	143.6	0.0	5.5	0.076
		9:10:47	45.0	9.36	75.5	8.65	6.24	1.3	143	0.0	2.8	0.074
		9:09:47	50.0	8.63	76.5	8.92	6.24	0.8	141	0.0	1.7	0.072
		9:08:34	55.0	8.09	77.3	9.14	6.25	0.1	138.3	0.0	0.9	0.071
		9:06:52	60.0	7.88	78	9.26	6.27	-0.7	133.5	0.0	0.0	0.070
		9:05:51	65.0	7.69	77.8	9.28	6.28	-1.3	130	0.0	0.1	0.070
		9:04:43	70.0	7.52	76.4	9.16	6.29	-1.8	125.8	0.0	0.8	0.070
		9:03:43	75.0	7.32	75	9.03	6.3	-2.6	120.8	0.0	0.4	0.069
		9:02:36	80.0	7.28	71.3	8.59	6.31	-3.3	114.2	2.4	0.0	0.069
		8:59:44	85.0	7.8	41.9	4.99	6.26	-0.2	96.3	2.8	2.1	0.070
BZ-3 Bouy/Beach	7/1/2021	09:10:56	0.5	26.39	109	8.79	7.46	-68.2	112.3	0.0	3	0.097
		9:10:11	5	26.41	110	8.82	7.09	-46.6	132.7	0.0	2.9	0.097
		9:09:10	10	26.3	111	8.99	6.88	-33.8	142.1	0.0	3.4	0.097
		9:08:21	15	24.1	115	9.62	6.95	-38.4	138.3	0.0	4.2	0.093
		9:07:48	20	21.41	104	9.18	6.4	-6.6	148.4	0.2	6.9	0.092
		9:07:20	25	18.15	91.5	8.63	6.24	2.2	150.7	0.1	5.0	0.091
		9:06:26	30	13.97	78.8	8.13	6.15	6.7	150	0.3	7.7	0.081
		9:05:18	35	10.9	64.1	7.08	6.07	10.8	148.3	0.0	1.7	0.077
		9:04:48	40	9.3	62.6	7.18	6.08	10	146.3	0.0	0.1	0.074
		9:04:04	45	8.88	63.7	7.39	6.09	9.2	144	0.0	0.3	0.073
		9:03:29	50	8.52	65	7.6	6.1	8.6	142.1	0.0	0.1	0.073
		9:02:54	55	8.19	66.7	7.86	6.13	7.2	140	0.0	0.1	0.072
		9:01:58	60	7.96	68.3	8.09	6.14	6.3	136.8	0.0	0.4	0.071
		9:00:58	65	7.75	69.6	8.29	6.16	5.1	132.8	0.0	0.6	0.070
		9:00:34	70	7.65	69.5	8.3	6.17	4.6	130.8	0.0	0.0	0.070
		8:59:31	75	7.57	69.2	8.28	6.22	1.9	123.6	0.0	0.4	0.070
		8:57:52	80	7.25	67.7	8.16	6.3	-2.5	109.7	0.0	0.5	0.070
		8:57:19	85	7.07	67.2	8.14	6.32	-3.9	104.3	0.0	0.4	0.069
		8:55:47	90	6.86	67.9	8.27	6.4	-8.2	84.4	0.0	0.0	0.069
		8:54:27	95	6.78	64.1	7.83	6.4	-8.2	76.8	0.0	1.0	0.069

2021 Beltzville Reservoir Summary 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	7/22/2021	9:15:57	0.5	26.38	110	8.89	8.27	-115.8	155.2	0.0	2.3	0.094
		9:14:49	5	26.41	110	8.89	8.2	-111.6	158.8	0.0	3.2	0.094
		9:14:14	10	26.38	109	8.82	8.1	-105.7	159.7	0.0	5.1	0.094
		9:13:28	15	26.33	108	8.7	7.65	-79.6	170.8	0.0	4.5	0.094
		9:12:46	20	23.28	99	8.44	6.66	-21.5	193.9	0.0	6.9	0.096
		9:11:37	25	21.27	71.5	6.34	6.29	0.1	210.4	0.0	2.5	0.101
		9:10:24	30	18.01	64.8	6.14	6.09	11.1	219.6	0.0	2.2	0.092
		9:09:33	35	14.18	58.5	6	6.08	10.9	219.4	0.1	1.3	0.083
		9:08:21	40	10.48	51.4	5.73	6.06	11.2	219.9	0.0	1.5	0.077
		9:06:33	45	9.15	51	5.87	6.08	10	219.3	0.0	0.1	0.074
		9:06:06	50	8.73	51.7	6.02	6.09	9.1	219.1	0.0	0.0	0.073
		9:04:31	55	8.39	59.2	6.94	6.14	6.5	218.2	0.0	0.7	0.072
		9:03:54	60	8.24	60.8	7.16	6.16	5.2	217.8	0.0	0.4	0.072
		9:03:11	65	7.98	61.9	7.33	6.18	4	217.4	0.0	0.2	0.071
		9:02:20	70	7.75	62.1	7.4	6.19	3.6	217.6	0.0	0.1	0.07
		9:01:31	75	7.51	63.3	7.59	6.19	3.5	218.4	0.0	0.0	0.07
		8:59:45	80	7.4	59.8	7.18	6.22	1.7	217.3	0.0	0.8	0.07
		8:58:56	85	7.13	58.6	7.09	6.24	0.6	216.9	0.0	0.2	0.069
		8:57:46	90	6.95	58.1	7.06	6.27	-0.7	216.8	0.0	0.1	0.069
		8:56:41	95	6.86	57.4	6.99	6.28	-1.3	217.6	0.0	0.0	0.069
		8:53:24	100	6.75	46.9	5.72	6.35	-5.6	217.5	0.1	0.7	0.069
		8:52:23	105	6.72	45.9	5.61	6.38	-7.2	218.5	0.3	0.8	0.07
BZ-3 Bouy/Beach	8/19/2021	9:09:16	0.5	26.18	107	8.69	8.18	-110.3	159.3	0.0	2.6	0.094
		9:08:08	5	26.19	107	8.67	8.14	-108	161.3	0.0	4.1	0.094
		9:06:54	10	26.2	107	8.65	8.04	-102.3	166.1	0.0	3.7	0.094
		9:05:51	15	26.16	107	8.63	7.91	-94.5	170.6	0.0	3.9	0.094
		9:02:44	20	24.84	84.9	7.03	6.28	0.8	216.3	0.0	2.3	0.094
		9:02:04	25	23.29	61.6	5.25	6.07	12.8	223.7	0.0	1.5	0.094
		9:00:15	30	20.58	41	3.69	6.03	14.8	225.4	0.0	0.9	0.102
		8:58:33	35	19.35	32	2.95	6.05	13.3	224.4	0.0	0.6	0.1
		8:56:52	40	13.83	36.4	3.77	6.11	9.3	221.7	0.0	0.8	0.083
		8:56:03	45	11.08	38.9	4.28	6.16	6	220.3	0.0	1.0	0.078
		8:55:14	50	9.12	42.7	4.92	6.22	2.2	218.8	0.0	0.4	0.074
		8:53:53	55	8.62	45.3	5.29	6.31	-3	217.3	0.0	0.3	0.073
		8:54:17	60	8.59	44	5.14	6.28	-1.5	217.7	0.0	0.7	0.073
		8:52:28	65	8.15	50.6	5.97	6.41	-8.4	217.1	0.0	0.6	0.072
		8:51:45	70	8.11	53	6.26	6.4	-7.8	220.6	0.0	0.2	0.071
		8:51:12	75	7.92	52.4	6.22	6.36	-5.6	224.5	0.0	0.0	0.071
		8:50:39	80	7.71	51.8	6.17	6.43	-9.6	221.9	0.0	0.2	0.07

2021 Beltzville Reservoir Summary 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	5/13/2021	11:36:14	0.5	14.53	99.5	10.13	6.34	-3.8	173.4	0.0	8.1	0.031
	6/10/2021	11:28:30	0.5	24.14	98.2	8.24	6.58	-16.7	183.4	0.0	0.1	0.041
	7/1/2021	10:15:51	0.5	25.23	95.4	7.85	6.62	-18.8	167.5	0.0	0.5	0.040
	7/22/2021	11:01:52	0.5	24.37	98.9	8.27	6.51	-12.7	209.1	0.0	0.4	0.04
	8/19/2021	10:59:01	0.5	24.95	97.5	8.07	6.7	-23.3	182.2	0.0	1.0	0.042
BZ-5S Pohopoco Upstream	5/13/2021	11:18:44	0.5	10.82	102	11.26	6.58	-17.5	162.5	2	0.6	0.088
	6/10/2021	11:15:30	0.5	18.73	97.8	9.12	6.69	-23.2	160.6	4.9	1	0.113
	7/1/2021	10:01:48	0.5	21.36	93.6	8.29	7.02	-42.1	158.9	2.5	0.7	0.122
	7/22/2021	10:49:19	0.5	18.64	100	9.36	6.99	-40.4	191.9	1.3	0.0	0.119
	8/19/2021	10:47:32	0.5	20.77	88.7	7.95	6.92	-36.6	165.9	42.5	6.1	0.091
BZ-6 In-Lake Tower **Secchi 3.90 M**	5/13/2021	8:32:16	0.5	13.87	106	10.92	7.37	-61.8	123.6	0.0	1.6	0.079
		8:31:16	5	13.82	106	10.92	7.28	-56.8	124.5	0.0	2.3	0.079
		8:30:17	10	13.77	105	10.88	7.17	-50.8	125.1	0.0	3.8	0.079
		8:29:11	15	13.75	104	10.82	6.9	-35.4	133.4	0.0	5	0.079
		8:28:32	20	13.46	104	10.8	6.64	-21	143.8	0.0	4.2	0.078
		8:27:43	25	12.42	101	10.77	6.55	-15.7	146	0.0	6.8	0.075
		8:26:47	30	9.55	94.5	10.78	6.48	-12.3	147.5	0.0	16.8	0.072
		8:25:49	35	8.71	91.5	10.65	6.46	-11.3	147.7	0.0	3.2	0.071
		8:24:56	40	8.27	90.5	10.64	6.44	-10.1	148.3	0.0	2	0.07
		8:23:59	45	7.84	88.6	10.53	6.42	-9.2	148.9	0.0	1.6	0.07
		8:23:22	50	7.63	87.7	10.48	6.42	-9.1	149	0.0	1.3	0.069
		8:22:38	55	7.42	87.5	10.52	6.42	-9.1	149.1	0.0	1.5	0.069
		8:20:37	60	7.28	87.3	10.52	6.41	-8.4	149.7	0.0	0.9	0.069
		8:19:43	65	7.18	86.8	10.49	6.41	-8.4	149.7	0.0	1.4	0.069
		8:18:49	70	7.13	86.7	10.49	6.4	-8	150	0.0	0.5	0.069
		8:17:55	75	6.95	86.2	10.48	6.4	-7.9	150.2	0.0	0.9	0.069
		8:16:45	80	6.91	86	10.46	6.39	-7.6	150.5	0.0	1	0.068
		8:15:06	85	6.75	85.3	10.42	6.38	-7.1	151.1	0.0	1	0.068
		8:13:00	90	6.67	84.5	10.34	6.37	-6.7	151.3	0.0	0	0.068
		8:11:20	95	6.57	83.4	10.23	6.35	-5.5	152.7	0.0	0.6	0.068
		8:10:28	100	6.44	82.7	10.18	6.35	-5.3	153.3	0.0	0.7	0.068
		8:09:42	105	6.41	82.4	10.15	6.35	-5.4	153.7	0.0	0.4	0.068
		8:08:42	110	6.39	82	10.1	6.35	-5.5	154.3	0.0	0.7	0.068
		8:07:08	115	6.38	81.8	10.09	6.36	-5.9	155.1	0.0	0.5	0.068
		8:06:17	120	6.37	81.8	10.08	6.36	-6	156.3	0.0	0.8	0.068
		8:04:59	125	6.38	82.1	10.12	6.43	-9.8	154.7	0.0	1	0.068

2021 Beltzville Reservoir Summary 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 5.0 M	6/10/2021	8:30:01	0.5	23.97	107	9.04	7.41	-65.3	120.8	0.0	1.2	0.094
		8:29:12	5	23.92	109	9.2	7.5	-70.5	118	0.0	1.2	0.094
		8:28:32	10	23.54	113	9.59	7.58	-74.8	115.8	0.0	1.9	0.094
		8:27:21	15	20.28	114	10.31	7.7	-81.4	111.3	0.0	1.8	0.088
		8:26:28	20	17.73	110	10.51	7.57	-73.9	111.7	0.1	2.6	0.083
		8:24:52	25	15.76	101	10.02	7.01	-41.5	126.5	0.0	4.6	0.081
		8:23:21	30	12.95	91	9.6	6.59	-18.1	146	0.0	5.3	0.078
		8:22:26	35	10.82	87.1	9.64	6.46	-10.9	152.4	0.0	6.4	0.074
		8:21:12	40	9.26	80.4	9.23	6.36	-5.6	156.1	0.0	3.3	0.072
		8:19:56	45	8.63	78.2	9.12	6.34	-4.5	156.5	0.0	2.2	0.071
		8:18:57	50	8.17	78.4	9.25	6.34	-4.6	156.5	0.0	1.6	0.071
		8:17:50	55	7.99	78.6	9.31	6.33	-4.2	156.7	0.0	1	0.07
		8:16:52	60	7.77	77.7	9.26	6.32	-3.5	156.9	0.0	1.1	0.07
		8:16:06	65	7.58	77	9.21	6.31	-3	157.1	0.0	1.2	0.07
		8:15:02	70	7.36	76.1	9.16	6.3	-2.5	157.3	0.0	0.9	0.069
		8:13:53	75	7.19	74.8	9.03	6.29	-1.8	157.4	0.0	0.3	0.069
		8:13:05	80	6.95	73.6	8.94	6.28	-1.3	157.8	0.0	0.2	0.069
		8:11:41	85	6.82	71.8	8.76	6.27	-0.8	157.8	0.0	0	0.069
		8:10:48	90	6.71	70.1	8.57	6.26	-0.4	158	0.0	0.5	0.069
		8:09:33	95	6.61	67.5	8.27	6.25	0	158.2	0.0	0.7	0.069
		8:08:49	100	6.58	66.8	8.19	6.25	0	158.3	0.0	0.4	0.069
		8:07:55	105	6.58	66.5	8.16	6.26	-0.3	158.1	0.0	1.1	0.069
		8:05:58	110	6.56	65.7	8.06	6.28	-1.7	156.9	0.0	1	0.069
		8:04:38	115	6.53	65.1	7.99	6.32	-3.5	155.6	0.0	1	0.069
		8:03:26	120	6.53	65.1	8	6.37	-6.3	153	11.6	2.9	0.069
		8:02:29	125	6.62	65.5	8.02	6.42	-9.5	152.5	5.7	3	0.069
BZ-6 In-Lake Tower Secchi 3.75 M	7/1/2021	7:35:04	0.5	25.87	110	8.96	7.67	-80.5	169.2	0.0	3.4	0.096
		7:34:10	5.0	25.9	110	8.96	7.69	-81.4	169.2	0.0	2.9	0.097
		7:32:45	10	25.58	110	9	7.71	-82.7	169.3	0.0	2.5	0.096
		7:31:26	15	24.05	118	9.95	7.93	-95.5	165.1	0.0	3.3	0.093
		7:30:29	20	21.09	121	10.8	8.17	-108.9	160.6	0.0	7.5	0.091
		7:28:49	25	16.78	101	9.79	6.98	-40.1	184.5	0.0	5.7	0.085
		7:26:59	30	14.07	82.2	8.46	6.41	-7.9	208	0.0	6.6	0.080
		7:26:07	35	12.13	75.3	8.09	6.32	-3	211.5	0.0	5.2	0.078
		7:23:32	40	9.55	68.4	7.81	6.18	4.2	216.9	0.0	0.9	0.074
		7:22:33	45	8.63	68.6	7.99	6.19	3.6	217	0.0	0.8	0.072
		7:20:46	50	8.29	68.5	8.06	6.18	4	217.8	0.0	0.7	0.071
		7:18:42	55	8.2	69.4	8.18	6.17	4.7	218.8	0.0	1.0	0.071
		7:18:09	60	7.97	69.6	8.25	6.17	4.6	219	0.0	0.9	0.071
		7:16:57	65	7.71	69.8	8.32	6.17	4.8	219.4	0.0	0.8	0.070
		7:15:38	70	7.39	68.6	8.24	6.16	5	219.9	0.0	0.0	0.070
		7:14:38	75	7.18	66.9	8.09	6.15	5.5	220.3	0.0	0.4	0.069
		7:13:34	80	7.1	66.2	8.02	6.15	5.6	220.5	0.0	0.0	0.069
		7:12:31	85	6.95	64.7	7.87	6.15	5.7	220.9	0.0	0.0	0.069
		7:11:24	90	6.86	63.7	7.75	6.15	5.6	221.3	0.0	0.6	0.069
		7:09:32	95	6.78	59.9	7.32	6.15	5.4	221.7	0.0	0.0	0.069
		7:08:18	100	6.68	55.9	6.84	6.16	5.2	222.2	0.0	0.0	0.070
		7:07:09	105	6.63	54	6.61	6.16	4.8	222.7	0.0	0.0	0.070
		7:06:09	110	6.6	52.6	6.45	6.18	4.1	223	0.0	8.1	0.070
		7:05:01	115	6.61	52.4	6.43	6.2	3.1	222.8	0.0	1.6	0.070
		7:03:52	120	6.6	52.2	6.4	6.22	1.8	222.6	0.0	7.4	0.070
		7:00:34	125	6.59	53	6.5	6.34	-4.6	220.5	0.0	1.6	0.070

2021 Beltzville Reservoir Summary 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 3.75 M	7/22/2021	8:36:43	0.5	26.43	111	8.91	8.3	-117.7	144.6	0.0	2.6	0.095
		8:35:59	5	26.43	111	8.89	8.29	-117.1	144.6	0.0	2.9	0.095
		8:34:29	10	26.44	110	8.88	8.21	-112.6	145.4	0.0	4.4	0.095
		8:32:58	15	26.4	110	8.85	8.06	-103.4	146.1	0.0	4.7	0.095
		8:30:25	20	23.09	99.8	8.55	6.88	-34	165.6	0.0	9.0	0.098
		8:28:23	25	20.95	77.7	6.93	6.58	-17.1	175.1	0.0	5.3	0.098
		8:26:05	30	17.75	71.5	6.8	6.19	5.4	196	0.0	3.4	0.09
		8:24:47	35	13.65	63.4	6.58	6.11	9	197.6	0.0	2.7	0.081
		8:22:08	40	10.73	54.2	6.01	6.03	12.9	198.2	0.0	1.9	0.076
		8:20:31	45	9.32	55.3	6.34	6.03	12.6	197.4	0.0	1.8	0.074
		8:18:14	50	8.68	58.2	6.78	6.04	12.2	196.2	0.0	0.8	0.072
		8:16:59	55	8.27	59.9	7.04	6.04	11.8	195.4	0.0	0.7	0.071
		8:15:16	60	8.1	61	7.21	6.04	11.8	194.4	0.0	0.8	0.071
		8:13:47	65	7.84	60	7.14	6.03	12.1	193.5	0.0	0.8	0.07
		8:13:03	70	7.63	59	7.04	6.03	12.4	193.2	0.0	0.0	0.07
		8:12:05	75	7.47	57.6	6.91	6.02	12.7	192.7	0.0	0.7	0.07
		8:10:06	80	7.23	55.1	6.64	6.02	13	191.2	0.0	0.3	0.069
		8:08:30	85	7.07	52.8	6.39	6.02	13	189.6	0.0	0.0	0.069
		8:07:37	90	7.02	50.7	6.15	6.02	12.9	188.7	0.0	0.4	0.069
		8:06:47	95	6.93	48.4	5.89	6.01	13.1	187.9	0.0	0.2	0.069
		8:04:36	100	6.78	39.6	4.84	6.02	12.8	184.6	0.0	0.9	0.069
		8:04:01	105	6.7	38	4.65	6.02	12.5	183.6	0.3	0.6	0.069
		8:02:43	110	6.65	36.2	4.43	6.05	11.3	180.7	0.1	0.2	0.069
		8:01:48	115	6.64	35.1	4.3	6.07	10.3	178.2	0.5	0.1	0.07
		8:00:44	120	6.68	34.4	4.21	6.09	8.8	174.5	0.5	0.0	0.07
		7:58:05	125	6.64	32.4	3.97	6.19	3.3	167.7	1.1	1.0	0.07
BZ-6 In-Lake Tower Secchi 3.10 M	8/19/2021	8:36:49	0	26.26	107	8.65	8.1	-105.6	154.6	0.0	2.0	0.094
		8:35:47	5	26.26	107	8.63	8.04	-102.5	154.5	0.0	4.3	0.094
		8:33:44	10	26.24	106	8.57	7.77	-86.1	157.8	0.0	4.3	0.094
		8:32:11	15	24.3	97.3	8.14	6.84	-31.9	177.2	0.0	2.9	0.095
		8:29:22	20	23.26	72	6.14	6.42	-7.5	192.2	0.0	3.4	0.099
		8:26:49	25	21.91	44.2	3.87	5.98	18.2	216.1	0.0	3.6	0.101
		8:25:53	30	20.68	33.6	3.02	5.93	20.7	217.7	0.0	1.9	0.101
		8:23:52	35	18.72	26.7	2.49	5.87	23.8	219.8	0.0	1.5	0.095
		8:20:43	40	15.03	35.6	3.58	5.84	24.5	220.8	0.0	0.9	0.085
		8:17:56	45	10.71	41.8	4.64	5.81	25	221.1	0.0	0.7	0.076
		8:15:57	50	8.77	47.6	5.53	5.83	23.9	220.7	0.0	0.1	0.073
		8:13:45	55	8.4	49	5.75	5.81	24.5	221.1	0.0	0.3	0.072
		8:11:57	60	8.22	48.9	5.76	5.81	24.9	221.5	0.0	0.3	0.071
		8:10:50	65	8.07	47	5.56	5.79	25.6	222	0.0	0.6	0.071
		8:09:39	70	7.94	46.6	5.53	5.78	26	222.3	0.0	0.5	0.07
		8:08:37	75	7.75	47.8	5.7	5.79	25.7	222.1	0.0	0.0	0.07
		8:07:20	80	7.53	46.7	5.6	5.78	26	222.3	0.0	0.7	0.07
		8:05:51	85	7.26	44.3	5.34	5.78	26.3	222.5	0.0	0.2	0.07
		8:04:26	90	7.14	42.1	5.09	5.77	26.4	222.5	0.0	0.3	0.07
		8:02:34	95	7.02	36.7	4.45	5.77	26.7	222.7	0.0	0.0	0.069
		8:01:23	100	6.91	32.5	3.95	5.76	26.9	222.9	0.0	0.1	0.07
		7:59:31	105	6.84	27.3	3.33	5.77	26.3	222.6	0.0	0.0	0.07
		7:58:01	110	6.8	22.8	2.78	5.79	25.4	222.1	0.0	0.2	0.07
		7:56:49	115	6.75	20	2.44	5.81	24.2	221.5	0.0	0.8	0.07
		7:55:40	120	6.71	18.8	2.3	5.85	22.4	220.7	0.5	1.1	0.07
		7:53:05	125	6.71	18.6	2.27	5.95	16.4	216.9	0.7	0.8	0.071

2021 Beltzville Reservoir Summary 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
		9:57:27	0.5	15.51	111	11.04	7.44	-66	149.7	0.7	3.3	0.072
		9:56:13	5	14.86	109	11.06	7.4	-64	143.6	0.8	5.9	0.07
		9:53:48	10	14.1	101	10.35	6.71	-24.7	164.8	0.9	3.7	0.074
BZ-7		9:52:56	15	13.58	97.8	10.17	6.45	-10.2	177.6	0.6	3	0.076
Upper Lake		9:52:15	20	12.83	95.2	10.07	6.41	-8.1	179.5	1.1	2	0.079
No-Wake	5/13/2021	9:51:00	25	11.47	89.7	9.78	6.35	-4.6	183.2	1.1	1.3	0.081
		9:50:03	30	10.81	87.1	9.64	6.3	-2.1	186.1	1	1.4	0.079
		9:49:20	35	9.6	84.3	9.6	6.3	-2.5	187	0.5	1.2	0.075
		9:48:22	40	8.67	83.2	9.69	6.3	-2.6	188.8	0	0.4	0.072
		9:47:13	45	8.3	82.2	9.67	6.31	-3.1	191.1	0	0.8	0.072
		9:46:26	50	8.22	81.7	9.62	6.33	-4.2	192.3	0	1.2	0.071
		9:44:00	55	8.35	77	9.04	6.68	-23.2	193.8	4.5	3.5	0.072
		10:02:04	0.5	25.21	110	9.07	7.31	-59.1	161.1	0.0	1	0.094
		10:01:30	5	25.12	110	9.09	7.28	-57.3	162	0.0	1.5	0.094
BZ-7		9:59:37	10	20.89	90.3	8.07	6.33	-2.5	210	4.3	5.8	0.105
Upper Lake		9:58:49	15	17.28	84.8	8.15	6.29	-0.4	212.1	3.4	2.1	0.091
No-Wake	6/10/2021	9:58:13	20	15.02	81.5	8.21	6.28	-0.5	212.2	1.2	2.8	0.087
		9:57:23	25	13.52	74.7	7.78	6.24	1.8	213	0.6	2.9	0.085
		9:56:37	30	11.32	68.7	7.51	6.21	2.8	213.1	0.0	1.3	0.08
		9:55:51	35	9.59	65.3	7.45	6.22	2.4	212.6	0.0	1	0.076
		9:54:38	40	8.64	64.8	7.55	6.24	0.7	210.3	0.5	1	0.073
		9:53:16	45	8.54	63.8	7.46	6.28	-1.1	206.4	0.0	0.8	0.073
		9:51:16	50	8.29	59.5	6.99	6.29	-1.8	220.8	0.0	1	0.072
		8:20:35	0.5	27.84	109	8.59	7.38	-63.6	152.3	0.0	1.5	0.098
		8:19:23	5	27.85	109	8.56	7.35	-61.9	152.1	0.0	1.4	0.098
		8:17:29	10	27.84	108	8.49	7.2	-52.7	154.9	0.0	1.5	0.098
BZ-7		8:16:45	15	25.95	102	8.25	6.87	-33.8	163.2	0.0	1.7	0.090
Upper Lake	7/1/2021	8:15:41	20	19.73	84.3	7.7	6.66	-21.4	172.9	0.0	2.2	0.102
No-Wake		8:13:46	25	17.39	68.4	6.56	6.17	6.1	195.8	0.0	0.8	0.097
		8:12:39	30	16.17	60.1	5.91	6.09	10.5	197.5	0.1	0.4	0.093
		8:11:09	35	10.26	50.3	5.65	6.04	12.4	197	0.0	0.3	0.077
		8:10:25	40	9.59	50.5	5.75	6.05	11.8	196.3	0.0	0.7	0.076
		8:09:06	45	9.07	51.1	5.89	6.07	10.3	194.5	0.0	0.5	0.074
		8:08:21	50	8.81	51.6	5.99	6.09	9.3	193.4	0.0	0.2	0.074
		8:05:53	55	8.55	52.2	6.09	6.17	4.6	186.7	0.0	0.0	0.073

2021 Beltzville Reservoir Summary 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-7 Upper Lake No-Wake	7/22/2021	9:54:15	0.5	26.86	110	8.82	7.92	-95.3	148.8	0.0	1.5	0.087
		9:52:25	5	26.86	110	8.77	7.83	-90	149.6	0.0	2.3	0.087
		9:50:30	10	26.79	105	8.37	7.37	-62.8	160.3	0.0	2.6	0.086
		9:49:51	15	25.78	92.1	7.51	6.58	-16.4	182.9	0.0	5.1	0.081
		9:49:00	20	23.72	84.6	7.16	6.51	-12.3	187.7	0.0	1.7	0.111
		9:47:48	25	21.44	61.8	5.46	6.12	9.8	205.7	1.1	0.9	0.112
		9:47:07	30	18.11	44.5	4.2	6	16.1	207.4	0.8	1.1	0.097
		9:45:58	35	13.06	37.4	3.94	5.98	16.1	206	0.3	0.5	0.083
		9:44:20	40	9.99	35.7	4.03	6.01	13.7	202.4	0.0	0.1	0.076
		9:40:47	45	8.93	37.8	4.38	6.09	9.5	194.3	0.0	0.5	0.074
		9:40:03	50	8.65	38	4.43	6.11	8	190.8	0.0	0.7	0.073
		9:38:49	55	8.58	37.6	4.4	6.15	5.7	182.9	8.1	0.9	0.073
		9:37:24	60	8.56	36.4	4.26	6.24	0.9	190.8	0.0	0.8	0.073
BZ-7 Upper Lake No-Wake	8/19/2021	9:49:54	0.5	25.96	111	8.99	8.17	-110	127.6	0.0	3.1	0.091
		9:49:03	5	25.97	111	8.98	8	-99.8	134.6	0.0	3.6	0.091
		9:48:22	10	25.94	110	8.93	7.92	-95.4	128.1	0.0	3.5	0.091
		9:47:07	15	25.73	105	8.53	7.15	-50.2	142	0.0	4.0	0.086
		9:46:05	20	24.91	84.4	6.99	6.54	-13.9	163	0.0	1.7	0.062
		9:43:28	25	23.83	71.8	6.06	6.23	3.7	182.4	0.0	1.6	0.106
		9:42:28	30	22.62	74.1	6.4	6.25	2.4	180.7	0.0	1.4	0.113
		9:41:14	35	21.66	66.6	5.86	6.19	5.6	181.1	0.9	0.6	0.112
		9:39:33	40	18.76	24.5	2.28	6.08	11.6	177.7	0.0	0.9	0.098
		9:38:51	45	10.12	14.4	1.62	6.11	8.4	174.9	0.0	0.4	0.077
		9:37:19	50	9.25	15.4	1.77	6.22	2.3	167.7	0.3	0.4	0.075

APPENDIX B

BELTZVILLE RESERVOIR 2021
LABORATORY CUSTODY SHEETS

Certificate of Analysis

M.J. Reider Associates, Inc.
ENVIRONMENTAL TESTING LABORATORY
U.S. EPA/PA DEP #06-00003

Laboratory No.: 2114818
Report: 05/24/21
Lab Contact: Richard A Wheeler

Attention: David Wertz
Reported To: Tetra Tech
USACE, Phila Dist. Env.Resources Branch 100 Penn Square E.
Arlington, VA 22201

Project: 2021 - Beltzville Reservoir

Lab ID: 2114818-01 **Collected By:** Client **Sampled:** 05/13/21 06:30 **Received:** 05/13/21 14:20
Sample Desc: BZ-1S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/15/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	11	mg CaCO3/L		2	SM 2320 B	05/19/21	C-51	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	05/17/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/14/21 11:44		ENM
Nitrate as N	0.89	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	05/14/21 3:53	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/14/21 3:53	U	JAF
Nitrate+Nitrite as N	<0.90	mg/l	0.108	1.10	CALCULATED	05/14/21 3:53		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	05/18/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/14/21		TML
Solids, Total Dissolved	58	mg/l	4	5	SM 2540 C	05/14/21		SLP
Total Organic Carbon	1.9	mg/l	0.3	0.5	SM 5310 C	05/14/21		ALD
Solids, Total Suspended	4	mg/l	1	1	SM 2540 D	05/14/21		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	2	mpn/100ml	1	SM 9223 B/Quantitray	5/13/21 15:33	5/14/21 15:37	M-08	JMW
Total Coliform	488	mpn/100ml	1	SM 9223 B/Quantitray	5/13/21 15:33	5/14/21 15:37	M-08	JMW

Lab ID: 2114818-02 **Collected By:** Client **Sampled:** 05/13/21 11:50 **Received:** 05/13/21 14:20
Sample Desc: BZ-2S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/15/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO3/L		2	SM 2320 B	05/19/21	C-51d	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	05/17/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/14/21 11:44		ENM
Nitrate as N	0.32	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	05/13/21 23:58	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/13/21 23:58	U	JAF
Nitrate+Nitrite as N	<0.33	mg/l	0.108	1.10	CALCULATED	05/13/21 23:58		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	05/18/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/14/21		TML
Solids, Total Dissolved	60	mg/l	4	5	SM 2540 C	05/14/21		SLP
Total Organic Carbon	0.6	mg/l	0.3	0.5	SM 5310 C	05/14/21		ALD
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	05/14/21		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	11	mpn/100ml	1	SM 9223 B/Quantitray	5/13/21 15:33	5/14/21 15:37		JMW
Total Coliform	345	mpn/100ml	1	SM 9223 B/Quantitray	5/13/21 15:33	5/14/21 15:37		JMW

Lab ID: 2114818-03 **Collected By:** Client **Sampled:** 05/13/21 09:00 **Received:** 05/13/21 14:20
Sample Desc: BZ-3S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/15/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	12	mg CaCO3/L		2	SM 2320 B	05/19/21	C-51a	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	05/17/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/14/21 11:44		ENM
Nitrate as N	0.85	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	05/14/21 3:20	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/14/21 3:20	U	JAF
Nitrate+Nitrite as N	<0.86	mg/l	0.108	1.10	CALCULATED	05/14/21 3:20		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	05/18/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/14/21		TML
Solids, Total Dissolved	57	mg/l	4	5	SM 2540 C	05/14/21		SLP
Total Organic Carbon	1.5	mg/l	0.3	0.5	SM 5310 C	05/14/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	05/14/21		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	<1	mpn/100ml	1	SM 9223 B/Quantitray	5/13/21 15:33	5/14/21 15:37		JMW
Total Coliform	5	mpn/100ml	1	SM 9223 B/Quantitray	5/13/21 15:33	5/14/21 15:37		JMW

Lab ID: 2114818-04 **Collected By:** Client **Sampled:** 05/13/21 09:00 **Received:** 05/13/21 14:20
Sample Desc: BZ-3M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/15/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	11	mg CaCO3/L		2	SM 2320 B	05/19/21	C-51	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	05/17/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/14/21 11:44		ENM
Nitrate as N	0.95	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	05/14/21 1:22	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/14/21 1:22	U	JAF
Nitrate+Nitrite as N	<0.96	mg/l	0.108	1.10	CALCULATED	05/14/21 1:22		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	05/18/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/14/21		TML
Solids, Total Dissolved	92	mg/l	4	5	SM 2540 C	05/14/21		SLP
Total Organic Carbon	1.1	mg/l	0.3	0.5	SM 5310 C	05/14/21		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	05/14/21		ALD

Lab ID: 2114818-05 **Collected By:** Client **Sampled:** 05/13/21 09:00 **Received:** 05/13/21 14:20
Sample Desc: BZ-3D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/15/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	12	mg CaCO3/L		2	SM 2320 B	05/19/21	C-51a	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	05/17/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/14/21 11:44		ENM
Nitrate as N	0.97	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	05/14/21 11:05	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/14/21 11:05	U	JAF
Nitrate+Nitrite as N	<0.98	mg/l	0.108	1.10	CALCULATED	05/14/21 11:05		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	05/18/21	U	TML
Phosphorus as P, Total	0.12	mg/l	0.01	0.01	SM 4500-P F	05/14/21		TML
Solids, Total Dissolved	76	mg/l	4	5	SM 2540 C	05/14/21		SLP
Total Organic Carbon	1.1	mg/l	0.3	0.5	SM 5310 C	05/14/21		ALD
Solids, Total Suspended	53	mg/l	1	1	SM 2540 D	05/14/21		ALD

Lab ID: 2114818-06 **Collected By:** Client **Sampled:** 05/13/21 11:30 **Received:** 05/13/21 14:20
Sample Desc: BZ-4S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/15/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO3/L		2	SM 2320 B	05/19/21	C-51c	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	05/17/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/14/21 11:44		ENM
Nitrate as N	0.14	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	05/13/21 23:41	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/13/21 23:41	U	JAF
Nitrate+Nitrite as N	<0.15	mg/l	0.108	1.10	CALCULATED	05/13/21 23:41		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	05/18/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/14/21		TML
Solids, Total Dissolved	<5	mg/l	4	5	SM 2540 C	05/14/21		SLP
Total Organic Carbon	1.2	mg/l	0.3	0.5	SM 5310 C	05/14/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	05/14/21		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	53	mpn/100ml	1	SM 9223 B/Quantitray	5/13/21 15:33	5/14/21 15:37		JMW
Total Coliform	517	mpn/100ml	1	SM 9223 B/Quantitray	5/13/21 15:33	5/14/21 15:37		JMW

Lab ID: 2114818-07 **Collected By:** Client **Sampled:** 05/13/21 11:15 **Received:** 05/13/21 14:20
Sample Desc: BZ-5S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/15/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	14	mg CaCO3/L		2	SM 2320 B	05/19/21	C-51b	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	05/17/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/14/21 11:44		ENM
Nitrate as N	1.25	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	05/14/21 0:48		JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/14/21 0:48	U	JAF
Nitrate+Nitrite as N	<1.26	mg/l	0.108	1.10	CALCULATED	05/14/21 0:48		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	05/18/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/14/21		TML
Solids, Total Dissolved	66	mg/l	4	5	SM 2540 C	05/14/21		SLP
Total Organic Carbon	1.0	mg/l	0.3	0.5	SM 5310 C	05/14/21		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	05/14/21		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	19	mpn/100ml	1	SM 9223 B/Quantitray	5/13/21 15:33	5/14/21 15:37		JMW
Total Coliform	2420	mpn/100ml	1	SM 9223 B/Quantitray	5/13/21 15:33	5/14/21 15:37		JMW

Lab ID: 2114818-08 **Collected By:** Client **Sampled:** 05/13/21 08:00 **Received:** 05/13/21 14:20
Sample Desc: BZ-6S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/15/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	11	mg CaCO3/L		2	SM 2320 B	05/19/21	C-51	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	05/17/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/14/21 11:44		ENM
Nitrate as N	0.85	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	05/14/21 3:37	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/14/21 3:37	U	JAF
Nitrate+Nitrite as N	<0.86	mg/l	0.108	1.10	CALCULATED	05/14/21 3:37		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	05/18/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/14/21		TML
Solids, Total Dissolved	83	mg/l	4	5	SM 2540 C	05/14/21		SLP
Total Organic Carbon	1.5	mg/l	0.3	0.5	SM 5310 C	05/14/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	05/14/21		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	<1	mpn/100ml	1	SM 9223 B/Quantitray	5/13/21 15:33	5/14/21 15:37		JMW
Total Coliform	7	mpn/100ml	1	SM 9223 B/Quantitray	5/13/21 15:33	5/14/21 15:37		JMW

Lab ID: 2114818-09 **Collected By:** Client **Sampled:** 05/13/21 08:00 **Received:** 05/13/21 14:20
Sample Desc: BZ-6M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/20/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	11	mg CaCO3/L		2	SM 2320 B	05/19/21	C-51	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	05/17/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/14/21 11:44		ENM
Nitrate as N	0.96	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	05/14/21 2:46	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/14/21 2:46	U	JAF
Nitrate+Nitrite as N	<0.97	mg/l	0.108	1.10	CALCULATED	05/14/21 2:46		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	05/18/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/20/21		TML
Solids, Total Dissolved	83	mg/l	4	5	SM 2540 C	05/14/21		SLP
Total Organic Carbon	1.2	mg/l	0.3	0.5	SM 5310 C	05/14/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	05/14/21		ALD

Lab ID: 2114818-10 **Collected By:** Client **Sampled:** 05/13/21 08:00 **Received:** 05/13/21 14:20
Sample Desc: BZ-6D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/15/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	12	mg CaCO3/L		2	SM 2320 B	05/19/21	C-51a	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	05/17/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/14/21 11:44		ENM
Nitrate as N	0.97	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	05/14/21 3:03	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/14/21 3:03	U	JAF
Nitrate+Nitrite as N	<0.98	mg/l	0.108	1.10	CALCULATED	05/14/21 3:03		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	05/18/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/14/21		TML
Solids, Total Dissolved	75	mg/l	4	5	SM 2540 C	05/14/21		SLP
Total Organic Carbon	1.2	mg/l	0.3	0.5	SM 5310 C	05/14/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	05/14/21		ALD

Lab ID: 2114818-11 **Collected By:** Client **Sampled:** 05/13/21 09:45 **Received:** 05/13/21 14:20
Sample Desc: BZ-7S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/15/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	11	mg CaCO3/L		2	SM 2320 B	05/19/21	C-51	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	05/17/21	U	APR
Biochemical Oxygen Demand	2.8	mg/l	2.0	2.0	SM 5210 B	05/14/21 11:44		ENM
Nitrate as N	0.68	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	05/14/21 1:39	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/14/21 1:39	U	JAF
Nitrate+Nitrite as N	<0.69	mg/l	0.108	1.10	CALCULATED	05/14/21 1:39		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	05/18/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/14/21		TML
Solids, Total Dissolved	62	mg/l	4	5	SM 2540 C	05/14/21		SLP
Total Organic Carbon	1.9	mg/l	0.3	0.5	SM 5310 C	05/14/21		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	05/14/21		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	<1	mpn/100ml	1	SM 9223 B/Quantitray	5/13/21 15:33	5/14/21 15:37		JMW
Total Coliform	16	mpn/100ml	1	SM 9223 B/Quantitray	5/13/21 15:33	5/14/21 15:37		JMW

Lab ID: 2114818-12 **Collected By:** Client **Sampled:** 05/13/21 09:45 **Received:** 05/13/21 14:20
Sample Desc: BZ-7M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/15/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	12	mg CaCO3/L		2	SM 2320 B	05/19/21	C-51a	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	05/17/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/14/21 11:44		ENM
Nitrate as N	0.89	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	05/14/21 1:56	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/14/21 1:56	U	JAF
Nitrate+Nitrite as N	<0.90	mg/l	0.108	1.10	CALCULATED	05/14/21 1:56		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	05/18/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/14/21		TML
Solids, Total Dissolved	71	mg/l	4	5	SM 2540 C	05/14/21		SLP
Total Organic Carbon	1.5	mg/l	0.3	0.5	SM 5310 C	05/14/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	05/14/21		ALD

Lab ID: 2114818-13 **Collected By:** Client **Sampled:** 05/13/21 09:45 **Received:** 05/13/21 14:20
Sample Desc: BZ-7D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/15/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	12	mg CaCO3/L		2	SM 2320 B	05/19/21	C-51a	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	05/17/21	U	APR
Biochemical Oxygen Demand	2.9	mg/l	2.0	2.0	SM 5210 B	05/14/21 11:44		ENM
Nitrate as N	0.76	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	05/14/21 1:05	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/14/21 1:05	U	JAF
Nitrate+Nitrite as N	<0.77	mg/l	0.108	1.10	CALCULATED	05/14/21 1:05		JAF
Nitrogen, Total Kjeldahl (TKN)	0.49	mg/l	0.48	0.50	EPA 351.2	05/18/21	J	TML
Phosphorus as P, Total	0.03	mg/l	0.01	0.01	SM 4500-P F	05/14/21		TML
Solids, Total Dissolved	98	mg/l	4	5	SM 2540 C	05/14/21	Q-19	SLP
Total Organic Carbon	1.6	mg/l	0.3	0.5	SM 5310 C	05/14/21		ALD
Solids, Total Suspended	337	mg/l	1	1	SM 2540 D	05/14/21		ALD

Preparation Methods

Specific Method	Preparation Method	Prep Batch	Prepared Date	Prepared By
2114818-01				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1E0754	05/14/2021	SNF
General Chemistry				
SM 4500-P F	SM 4500-P B	B1E0738	05/14/2021	TML
2114818-02				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1E0754	05/14/2021	SNF
General Chemistry				
SM 4500-P F	SM 4500-P B	B1E0738	05/14/2021	TML
2114818-03				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1E0754	05/14/2021	SNF
General Chemistry				
SM 4500-P F	SM 4500-P B	B1E0738	05/14/2021	TML
2114818-04				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1E0754	05/14/2021	SNF
General Chemistry				
SM 4500-P F	SM 4500-P B	B1E0738	05/14/2021	TML
2114818-05				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1E0754	05/14/2021	SNF
General Chemistry				
SM 4500-P F	SM 4500-P B	B1E0738	05/14/2021	TML
2114818-06				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1E0754	05/14/2021	SNF
General Chemistry				
SM 4500-P F	SM 4500-P B	B1E0738	05/14/2021	TML
2114818-07				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1E0754	05/14/2021	SNF
General Chemistry				
SM 4500-P F	SM 4500-P B	B1E0738	05/14/2021	TML
2114818-08				
Dissolved General Chemistry				

SM 4500-P F	SM 4500-P B	B1E0754	05/14/2021	SNF
General Chemistry				
SM 4500-P F	SM 4500-P B	B1E0738	05/14/2021	TML
2114818-09				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1E0910	05/18/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1E0909	05/18/2021	TML
2114818-10				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1E0754	05/14/2021	SNF
General Chemistry				
SM 4500-P F	SM 4500-P B	B1E0738	05/14/2021	TML
2114818-11				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1E0754	05/14/2021	SNF
General Chemistry				
SM 4500-P F	SM 4500-P B	B1E0738	05/14/2021	TML
2114818-12				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1E0754	05/14/2021	SNF
General Chemistry				
SM 4500-P F	SM 4500-P B	B1E0738	05/14/2021	TML
2114818-13				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1E0754	05/14/2021	SNF
General Chemistry				
SM 4500-P F	SM 4500-P B	B1E0738	05/14/2021	TML

Notes and Definitions

C-51	The alkalinity to pH 4.2 = 11 mg CaCO3/L.
C-51a	The alkalinity to pH 4.2 = 12 mg CaCO3/L.
C-51b	The alkalinity to pH 4.2 = 13 mg CaCO3/L.
C-51c	The alkalinity to pH 4.2 = 7 mg CaCO3/L.
C-51d	The alkalinity to pH 4.2 = 8 mg CaCO3/L.
G-11	The sample was filtered after it was received at the laboratory.
G-17	The sample was preserved in the laboratory.
J	Estimated value
M-08	The analysis hold time of 8 hours was exceeded by 1 hour.
Q-19	The duplicate RPD was greater than 10% at 42%.
U	Analyte was not detected above the indicated value.

M.J. Reider Associates, Inc.
107 Angelica St, Reading PA, 19611
610-374-5129 www.mjreider.com

WORK ORDER
Chain of Custody

2114818

Client Code: 3157
Client: Tetra Tech
Project Manager: Richard A Wheeler
Project: 2021 - Beltzville Reservoir
Report To: Tetra Tech - David Wertz - USACE, Phila Dist. Env.Resources Branch 100 Penn Square E., Arlington, VA 22201
Invoice To: Tetra Tech - David Wertz - USACE, Phila Dist. Env.Resources Branch 100 Penn Square E., Arlington, VA 22201

Comments:

Collected By : (Full Name) Gregory Wacik

2114818-01 BZ-1S

Matrix: Non-Potable Water
Type: Grab
Date: 5/13/21
Time: 0630

BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B
Alk SM 2320B, NH3-N D6919-03, PO4 SM 4500P-E, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
~~I - Vial Amber 40ml H3PO4, minimal hdspc~~

BSW 543-21
Broken in transit

2114818-02 BZ-2S

Matrix: Non-Potable Water
Type: Grab
Date: 5/13/21
Time: 1150

BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B
Alk SM 2320B, NH3-N D6919-03, TDS SM 2540C, TOC SM 5310C, TSS SM 2540D, TKN EPA 351.2, PO4 SM 4500P-E

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

Relinquished By	Date/Time	Received By	Date/Time
GW	5/13/21 1200	Bay Bath	5-13-21 1210
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	Date/Time
		Bay Bath	5-13-21 1420

Sample Kit Prepared By: JSV	Date/Time 4-28-21
Sample Temp (°C): 5	
Samples on Ice? Yes No NA	
Approved By: BSW	
Entered By:	

Printed: 4/28/2021 9:14:47AM

Report Template: wco WorkOrder COC ls

2114818

M.J. Reider Associates, Inc.

Client Code: 3157 **Client:** Tetra Tech

Project Manager: Richard A Wheeler **Project:** 2021 - Beltzville Reservoir

Comments:

Collected By : (Full Name) Gregory Wacik

2114818-03 BZ-3S

Matrix: Non-Potable Water Date: 5/13/21
Type: Grab Time: 0900

BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B
Alk SM 2320B, NH3-N D6919-03, PO4 SM 4500P-E, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

2114818-04 BZ-3M

Matrix: Non-Potable Water Date: 5/13/21
Type: Grab Time: 0900

BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F
Alk SM 2320B, NH3-N D6919-03, PO4 SM 4500P-E, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Pl 500ml H2SO4
D - Pl 250ml NP
E - Pl 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

2114818-05 BZ-3D

Matrix: Non-Potable Water Date: 5/13/21
Type: Grab Time: 0900

BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F
Alk SM 2320B, NH3-N D6919-03, TSS SM 2540D, PO4 SM 4500P-E, TDS SM 2540C, TOC SM 5310C, TKN EPA 351.2

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Pl 500ml H2SO4
D - Pl 250ml NP
E - Pl 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

	Date/Time		Date/Time
Relinquished By	5/13/21 1200	Received By	5-13-21 1210
Relinquished By		Received By	
Relinquished By		Received at Laboratory By	5-13-21 1420

Sample Kit Prepared By: JSV	Date/Time 4-28-21
Sample Temp (°C): 5	
Samples on Ice? Yes No NA	
Approved By:	
Entered By: BSW	

Printed: 4/28/2021 9:14:47AM

Report Template: wko WorkOrderCOC ls

M.J. Reider Associates, Inc.

Client Code: 3157
Project Manager: Richard A Wheeler

Client: Tetra Tech
Project: 2021 - Beltzville Reservoir

Comments:

Collected By : (Full Name) Gregory Wacik

2114818-06 BZ-4S

Matrix: Non-Potable Water
Type: Grab
Date: 5/13/21
Time: 1130

BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B
Alk SM 2320B, NH3-N D6919-03, PO4 SM 4500P-E, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

2114818-07 BZ-5S

Matrix: Non-Potable Water
Type: Grab
Date: 5/13/21
Time: 1115

NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B, BOD SM 5210B, EC (#) SM 9223B Confirmation
TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D, NH3-N D6919-03, PO4 SM 4500P-E, TDS SM 2540C, Alk SM 2320B

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

2114818-08 BZ-6S

Matrix: Non-Potable Water
Type: Grab
Date: 5/13/21
Time: 0800

NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B, BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N EPA 300.0
Alk SM 2320B, NH3-N D6919-03, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D, PO4 SM 4500P-E

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

	Date/Time		Date/Time
Relinquished By	5/13/21 1200	Received By	5-13-21 1210
Relinquished By		Received By	
Relinquished By		Received at Laboratory By	5-13-21 1220

Sample Kit Prepared By:	Date/Time
JSV	4-28-21
Sample Temp (°C):	5
Samples on Ice?	Yes No NA
Approved By:	BSW
Entered By:	

Printed: 4/28/2021 9:14:47AM

Report Template: wko WorkOrder 6.01_15

2114818

M.J. Reider Associates, Inc.

Client Code: 3157
Project Manager: Richard A Wheeler

Client: Tetra Tech
Project: 2021 - Beltzville Reservoir

Comments:

Collected By : (Full Name) Gregory Wacik

2114818-09 BZ-6M

Matrix: Non-Potable Water
Type: Grab
Date: 5/13/21
Time: 0800

BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F
Alk SM 2320B, NH3-N D6919-03, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D, PO4 SM 4500P-E

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Pl 500ml H2SO4
D - Pl 250ml NP
E - Pl 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

2114818-10 BZ-6D

Matrix: Non-Potable Water
Type: Grab
Date: 5/13/21
Time: 0850

BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F
Alk SM 2320B, NH3-N D6919-03, PO4 SM 4500P-E, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Pl 500ml H2SO4
D - Pl 250ml NP
E - Pl 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

2114818-11 BZ-7S

Matrix: Non-Potable Water
Type: Grab
Date: 5/13/21
Time: 0945

PO4-D SM 4500P-F, TC (#) SM 9223B, BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2
TSS SM 2540D, TDS SM 2540C, Alk SM 2320B, NH3-N D6919-03, TOC SM 5310C, PO4 SM 4500P-E, TKN EPA 351.2

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

Relinquished By	5/13/21 1200 Date/Time	Received By	5-13-21 1210 Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	5-13-21 1420 Date/Time

Sample Kit Prepared By: JVC	Date/Time 4-28-21
Sample Temp (°C):	5
Samples on Ice?	Yes No NA
Approved By:	
Entered By:	BSW

Printed: 4/28/2021 9:14:47AM

Report Template: wko WorkOrder COC ls

M.J. Reider Associates, Inc.

Client Code: 3157 **Client:** Tetra Tech

Project Manager: Richard A Wheeler **Project:** 2021 - Beltzville Reservoir

Comments:

Collected By : (Full Name) Gregory Wacik

2114818-12 BZ-7M

Matrix: Non-Potable Water Date: 5/13/21
Type: Grab Time: 0945

NO2-N EPA 300.0, BOD SM 5210B, NO2-N, NO3-N, Combined NO3+NO2, NO3-N EPA 300.0, PO4-D SM 4500P-F
Alk SM 2320B, PO4 SM 4500P-E, NH3-N D6919-03, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D, TDS SM 2540C

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Pl 500ml H2SO4
D - Pl 250ml NP
E - Pl 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

2114818-13 BZ-7D

Matrix: Non-Potable Water Date: 5/13/21
Type: Grab Time: 0945

BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F
TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D, Alk SM 2320B, NH3-N D6919-03, PO4 SM 4500P-E, TDS SM 2540C

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Pl 500ml H2SO4
D - Pl 250ml NP
E - Pl 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

Relinquished By	5/13/21 1200 Date/Time	Received By	5-13-21 1210 Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	5/13/21 1420 Date/Time

Sample Kit Prepared By: JSV	Date/Time 4-28-21
Sample Temp (°C):	3
Samples on Ice?	Yes No NA
Approved By:	JSW
Entered By:	

Printed: 4/28/2021 9:14:47AM

Report Template: with WorkOrder COC is

MJRA Terms & Conditions

All samples submitted must be accompanied by signed documentation representing a Chain of Custody (COC). The COC Record acts as a contract between the client and MJRA. Signing the COC form gives approval for MJRA to perform the requested analyses and is an agreement to pay for the cost of such analyses**.** COC Records must be completed in black or blue indelible ink (must not run when wet). COC documentation begins at the time of sample collection. Client is required to document all sample details prior to releasing samples to MJRA. All samples must be placed on ice immediately after sampling and shipped or delivered to the laboratory in a manner that will maintain the sample temperature above freezing and below 6C (loose ice is preferred)**.**

Sample Submission, Sample Acceptance & Sampling Containers

Included on the COC must be the sample description, date and time of collection (including start and stop for composites), container size and type, preservative information, sample matrix, indication of whether the sample is a grab or composite, number of containers & a list of the tests to be performed. Poor sample collection technique, inappropriate sampling containers and/or improper sample preservation may lead to sample rejection. Suitable sample containers, labels, and preservatives (as applicable), along with blank COCs are provided at no additional cost.

Turnaround Times (TAT)

Average TAT for test results range from 5 to 15 working days depending on the specific analyses and time of year submitted. Faster turnaround times (*RUSH TAT) may be available depending on the current workload in a particular department and the nature of the analyses requested. We encourage you to verify requests for expedited sample results with one of our Technical Directors prior to sample submittal. Without confirmation from a Technical Director, your results may not be completed by your deadline. *RUSH TAT Surcharges are applied for expedited turnaround times.

Analytical Results, Sample Collection Integrity & Subcontracting

Analytical values are for the sample as submitted and relate only to the item tested. The value indicates a snapshot of the constituent content of the sample at the time of sample collection. Analytical results can be impacted by poor sample collection technique and/or improper preservation. All sample collection completed by MJRA was performed in accordance with applicable regulatory protocols or as specified in customer specific sampling plans. Constituent content will vary over time based on the matrix of the sample and the physical and chemical changes to its environment. All sample results and laboratory reports are strictly confidential. Results will not be available to anyone except the primary client or authorized party representing the client unless MJRA receives additional permissions from the client. When necessary, MJRA will subcontract certain analyses to a third party accredited laboratory. If client prohibits subcontracting, it must be provided in writing and include instruction on how to proceed with client samples that require third party analyses.

Payment Terms

Payment Terms are Net 30 days. Prices are subject to change without notice. A standing monthly charge of 1.5% of the clients over-30-day-unpaid balance may be added to the balance after 30 days and each month thereafter (day 31, 61, 91 etc.). The laboratory accepts all major credit cards, ACH transactions, checks and cash. New clients must pay for all services rendered prior to sample collection and/or in some cases report processing. Clients must contact the MJRA accounting department to pursue a credit-based account. MJRA reserves the right to terminate the client's credit account and to refuse to perform additional services on a credit basis if any balance is outstanding for more than 60 days.

Warranty & Litigation

MJRA does not guarantee any results of its services but has agreed to use its best efforts, in accordance with the standards and practices of the industry, to cause such results to be accurate and complete. We disclaim any other warranties, expressed or implied, including a warranty of fitness for a particular purpose and warranty of merchantability. Clients agree that they shall reimburse MJRA for any and all fees, cost and litigation expenses, including reasonable attorney fees incurred by MJRA in obtaining payment for the services rendered. All costs associated with compliance with any subpoena for documents, testimony, or any other purpose relating to work performed by MJRA, for a client, shall be paid by that client. MJRA's aggregate liability for negligent acts and omissions and of an intentional breach by MJRA will not exceed the fee paid for the services. Client agrees to indemnify and hold MJRA harmless for any and all liabilities in excess of said amount. Neither MJRA nor the client shall be liable to the other for special, incidental consequential or punitive liability or damages included but not limited to those arising from delay, loss of use, loss of profits or revenues. MJRA will not be liable to the client unless the client has notified MJRA of the discovery of the alleged negligent act, error, omissions or breach within 30 days of the day of its discovery and within one year of the date of invoice.

Reviewed and Approved by:

Richard A Wheeler
Director of Field Services

Certificate of Analysis

M.J. Reider Associates, Inc.
ENVIRONMENTAL TESTING LABORATORY
U.S. EPA/PA DEP #06-00003

Laboratory No.: 2116072
Report: 06/21/21
Lab Contact: Richard A Wheeler

Attention: David Wertz
Reported To: Tetra Tech
USACE, Phila Dist. Env.Resources Branch 100 Penn Square E.
Arlington, VA 22201

Project: 2021 - Beltzville Reservoir

Lab ID: 2116072-01 **Collected By:** Client **Sampled:** 06/10/21 06:35 **Received:** 06/10/21 14:00
Sample Desc: BZ-1S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	06/16/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	11	mg CaCO3/L		2	SM 2320 B	06/15/21	C-51b	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	06/11/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/10/21 17:45	C-40	ASD
Nitrate as N	0.84	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/10/21 22:40	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/10/21 22:40	U	JAF
Nitrate+Nitrite as N	<0.85	mg/l	0.108	1.10	CALCULATED	06/10/21 22:40		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	06/16/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	06/15/21		TML
Solids, Total Dissolved	54	mg/l	4	5	SM 2540 C	06/11/21		TMH
Total Organic Carbon	1.5	mg/l	0.3	0.5	SM 5310 C	06/11/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	06/11/21		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	17	mpn/100ml	1	SM 9223 B/Quantitray	6/10/21 14:34	6/11/21 15:12		DRW
Total Coliform	770	mpn/100ml	1	SM 9223 B/Quantitray	6/10/21 14:34	6/11/21 15:12		DRW

Lab ID: 2116072-02 **Collected By:** Client **Sampled:** 06/10/21 11:40 **Received:** 06/10/21 14:00
Sample Desc: BZ-2S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	06/16/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	10	mg CaCO3/L		2	SM 2320 B	06/15/21	C-51	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	06/11/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/10/21 17:45	C-40	ASD
Nitrate as N	0.39	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/10/21 22:23	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/10/21 22:23	U	JAF
Nitrate+Nitrite as N	<0.40	mg/l	0.108	1.10	CALCULATED	06/10/21 22:23		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	06/16/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	06/15/21		TML
Solids, Total Dissolved	72	mg/l	4	5	SM 2540 C	06/11/21		TMH
Total Organic Carbon	1.0	mg/l	0.3	0.5	SM 5310 C	06/11/21		ALD
Solids, Total Suspended	6	mg/l	1	1	SM 2540 D	06/11/21		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	50	mpn/100ml	1	SM 9223 B/Quantitray	6/10/21 15:03	6/11/21 15:12		DRW
Total Coliform	1990	mpn/100ml	1	SM 9223 B/Quantitray	6/10/21 15:03	6/11/21 15:12		DRW

Lab ID: 2116072-03 **Collected By:** Client **Sampled:** 06/10/21 09:00 **Received:** 06/10/21 14:00
Sample Desc: BZ-3S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	06/16/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	11	mg CaCO3/L		2	SM 2320 B	06/15/21	C-51a	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	06/11/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/11/21 12:11		SWA
Nitrate as N	0.75	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/11/21 0:04	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/11/21 0:04	U	JAF
Nitrate+Nitrite as N	<0.76	mg/l	0.108	1.10	CALCULATED	06/11/21 0:04		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	06/16/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	06/15/21		TML
Solids, Total Dissolved	80	mg/l	4	5	SM 2540 C	06/11/21		TMH
Total Organic Carbon	1.5	mg/l	0.3	0.5	SM 5310 C	06/11/21		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	06/11/21		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	3	mpn/100ml	1	SM 9223 B/Quantitray	6/10/21 15:03	6/11/21 15:12		DRW
Total Coliform	60	mpn/100ml	1	SM 9223 B/Quantitray	6/10/21 15:03	6/11/21 15:12		DRW

Lab ID: 2116072-04 **Collected By:** Client **Sampled:** 06/10/21 09:00 **Received:** 06/10/21 14:00
Sample Desc: BZ-3M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	06/16/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	11	mg CaCO3/L		2	SM 2320 B	06/15/21	C-51c	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	06/11/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/10/21 17:45	C-40	ASD
Nitrate as N	0.92	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/11/21 0:21	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/11/21 0:21	U	JAF
Nitrate+Nitrite as N	<0.93	mg/l	0.108	1.10	CALCULATED	06/11/21 0:21		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	06/16/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	06/15/21		TML
Solids, Total Dissolved	80	mg/l	4	5	SM 2540 C	06/11/21		TMH
Total Organic Carbon	1.2	mg/l	0.3	0.5	SM 5310 C	06/11/21		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	06/11/21		ALD

Lab ID: 2116072-05 **Collected By:** Client **Sampled:** 06/10/21 09:00 **Received:** 06/10/21 14:00
Sample Desc: BZ-3D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	06/16/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	11	mg CaCO3/L		2	SM 2320 B	06/15/21	C-51d	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	06/11/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/10/21 17:45	C-40	ASD
Nitrate as N	0.95	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/11/21 0:38	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/11/21 0:38	U	JAF
Nitrate+Nitrite as N	<0.96	mg/l	0.108	1.10	CALCULATED	06/11/21 0:38		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	06/16/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	06/15/21		TML
Solids, Total Dissolved	89	mg/l	4	5	SM 2540 C	06/11/21		TMH
Total Organic Carbon	1.1	mg/l	0.3	0.5	SM 5310 C	06/11/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	06/11/21		ALD

Lab ID: 2116072-06 **Collected By:** Client **Sampled:** 06/10/21 11:25 **Received:** 06/10/21 14:00
Sample Desc: BZ-4S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	06/16/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO3/L		2	SM 2320 B	06/15/21	C-51j	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	06/11/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/11/21 12:50		ASD
Nitrate as N	0.16	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/10/21 21:16	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/10/21 21:16	U	JAF
Nitrate+Nitrite as N	<0.17	mg/l	0.108	1.10	CALCULATED	06/10/21 21:16		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	06/16/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	06/15/21		TML
Solids, Total Dissolved	46	mg/l	4	5	SM 2540 C	06/11/21		TMH
Total Organic Carbon	1.3	mg/l	0.3	0.5	SM 5310 C	06/11/21		ALD
Solids, Total Suspended	6	mg/l	1	1	SM 2540 D	06/11/21		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	17	mpn/100ml	1	SM 9223 B/Quantitray	6/10/21 15:03	6/11/21 15:12		DRW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	6/10/21 15:03	6/11/21 15:12		DRW

Lab ID: 2116072-07 **Collected By:** Client **Sampled:** 06/10/21 11:10 **Received:** 06/10/21 14:00
Sample Desc: BZ-5S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.02	mg/l		0.01	SM 4500-P F	06/16/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	18	mg CaCO3/L		2	SM 2320 B	06/15/21	C-51i	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	06/11/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/10/21 17:45	C-40	ASD
Nitrate as N	1.34	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/11/21 1:45		JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/11/21 1:45	U	JAF
Nitrate+Nitrite as N	<1.35	mg/l	0.108	1.10	CALCULATED	06/11/21 1:45		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	06/16/21	U	TML
Phosphorus as P, Total	0.02	mg/l	0.01	0.01	SM 4500-P F	06/15/21		TML
Solids, Total Dissolved	85	mg/l	4	5	SM 2540 C	06/11/21		TMH
Total Organic Carbon	1.8	mg/l	0.3	0.5	SM 5310 C	06/11/21		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	06/11/21		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	345	mpn/100ml	1	SM 9223 B/Quantitray	6/10/21 15:03	6/11/21 15:12		DRW
Total Coliform	2420	mpn/100ml	1	SM 9223 B/Quantitray	6/10/21 15:03	6/11/21 15:12		DRW

M.J. Reider Associates, Inc.

Lab ID: 2116072-08 **Collected By:** Client **Sampled:** 06/10/21 08:00 **Received:** 06/10/21 14:00
Sample Desc: BZ-6S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	06/16/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	10	mg CaCO3/L		2	SM 2320 B	06/15/21	C-51	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	06/11/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/10/21 17:45	C-40	ASD
Nitrate as N	0.74	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/10/21 23:14	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/10/21 23:14	U	JAF
Nitrate+Nitrite as N	<0.75	mg/l	0.108	1.10	CALCULATED	06/10/21 23:14		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	06/17/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	06/15/21		TML
Solids, Total Dissolved	67	mg/l	4	5	SM 2540 C	06/11/21		TMH
Total Organic Carbon	1.7	mg/l	0.3	0.5	SM 5310 C	06/11/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	06/11/21		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	<1	mpn/100ml	1	SM 9223 B/Quantitray	6/10/21 15:03	6/11/21 15:12		DRW
Total Coliform	138	mpn/100ml	1	SM 9223 B/Quantitray	6/10/21 15:03	6/11/21 15:12		DRW

Lab ID: 2116072-09 **Collected By:** Client **Sampled:** 06/10/21 08:00 **Received:** 06/10/21 14:00
Sample Desc: BZ-6M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	06/16/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	12	mg CaCO3/L		2	SM 2320 B	06/15/21	C-51e	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	06/11/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/10/21 17:45	C-40	ASD
Nitrate as N	0.94	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/10/21 22:57	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/10/21 22:57	U	JAF
Nitrate+Nitrite as N	<0.95	mg/l	0.108	1.10	CALCULATED	06/10/21 22:57		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	06/17/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	06/15/21		TML
Solids, Total Dissolved	76	mg/l	4	5	SM 2540 C	06/11/21		TMH
Total Organic Carbon	1.1	mg/l	0.3	0.5	SM 5310 C	06/11/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	06/11/21		ALD

Lab ID: 2116072-10 **Collected By:** Client **Sampled:** 06/10/21 08:00 **Received:** 06/10/21 14:00
Sample Desc: BZ-6D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	06/16/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	12	mg CaCO3/L		2	SM 2320 B	06/15/21	C-51g	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	06/11/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/10/21 17:45	C-40	ASD
Nitrate as N	0.92	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/10/21 21:33	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/10/21 21:33	U	JAF
Nitrate+Nitrite as N	<0.93	mg/l	0.108	1.10	CALCULATED	06/10/21 21:33		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	06/17/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	06/15/21		TML
Solids, Total Dissolved	69	mg/l	4	5	SM 2540 C	06/11/21		TMH
Total Organic Carbon	1.2	mg/l	0.3	0.5	SM 5310 C	06/11/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	06/11/21		ALD

Lab ID: 2116072-11 **Collected By:** Client **Sampled:** 06/10/21 10:00 **Received:** 06/10/21 14:00
Sample Desc: BZ-7S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	06/16/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	10	mg CaCO3/L		2	SM 2320 B	06/15/21	C-51k	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	06/11/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/10/21 17:45	C-40	ASD
Nitrate as N	0.71	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/10/21 22:07	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/10/21 22:07	U	JAF
Nitrate+Nitrite as N	<0.72	mg/l	0.108	1.10	CALCULATED	06/10/21 22:07		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	06/17/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	06/15/21		TML
Solids, Total Dissolved	56	mg/l	4	5	SM 2540 C	06/11/21		TMH
Total Organic Carbon	1.5	mg/l	0.3	0.5	SM 5310 C	06/11/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	06/11/21		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	4	mpn/100ml	1	SM 9223 B/Quantitray	6/10/21 15:03	6/11/21 15:12		DRW
Total Coliform	291	mpn/100ml	1	SM 9223 B/Quantitray	6/10/21 15:03	6/11/21 15:12		DRW

Lab ID: 2116072-12 **Collected By:** Client **Sampled:** 06/10/21 10:00 **Received:** 06/10/21 14:00
Sample Desc: BZ-7M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	06/16/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	12	mg CaCO3/L		2	SM 2320 B	06/15/21	C-51h	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	06/11/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/10/21 17:45	C-40	ASD
Nitrate as N	0.95	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/11/21 1:28	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/11/21 1:28	U	JAF
Nitrate+Nitrite as N	<0.96	mg/l	0.108	1.10	CALCULATED	06/11/21 1:28		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	06/17/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	06/15/21		TML
Solids, Total Dissolved	67	mg/l	4	5	SM 2540 C	06/11/21		TMH
Total Organic Carbon	1.5	mg/l	0.3	0.5	SM 5310 C	06/11/21		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	06/11/21		ALD

Lab ID: 2116072-13 **Collected By:** Client **Sampled:** 06/10/21 10:00 **Received:** 06/10/21 14:00
Sample Desc: BZ-7D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	06/16/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	12	mg CaCO3/L		2	SM 2320 B	06/15/21	C-51f	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	06/11/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/10/21 17:45	C-40	ASD
Nitrate as N	0.92	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	06/10/21 21:50	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/10/21 21:50	U	JAF
Nitrate+Nitrite as N	<0.93	mg/l	0.108	1.10	CALCULATED	06/10/21 21:50		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.48	mg/l	0.48	0.50	EPA 351.2	06/17/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	06/15/21		TML
Solids, Total Dissolved	74	mg/l	4	5	SM 2540 C	06/11/21		TMH
Total Organic Carbon	1.2	mg/l	0.3	0.5	SM 5310 C	06/11/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	06/11/21		ALD

Preparation Methods

Specific Method	Preparation Method	Prep Batch	Prepared Date	Prepared By
2116072-01				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1F0761	06/11/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1F0757	06/11/2021	TML
2116072-02				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1F0761	06/11/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1F0757	06/11/2021	TML
2116072-03				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1F0761	06/11/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1F0757	06/11/2021	TML
2116072-04				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1F0761	06/11/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1F0757	06/11/2021	TML
2116072-05				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1F0761	06/11/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1F0757	06/11/2021	TML
2116072-06				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1F0761	06/11/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1F0757	06/11/2021	TML
2116072-07				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1F0761	06/11/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1F0757	06/11/2021	TML
2116072-08				
Dissolved General Chemistry				

SM 4500-P F	SM 4500-P B	B1F0761	06/11/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1F0757	06/11/2021	TML
2116072-09				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1F0761	06/11/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1F0757	06/11/2021	TML
2116072-10				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1F0761	06/11/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1F0757	06/11/2021	TML
2116072-11				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1F0761	06/11/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1F0757	06/11/2021	TML
2116072-12				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1F0761	06/11/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1F0757	06/11/2021	TML
2116072-13				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1F0761	06/11/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1F0757	06/11/2021	TML

Notes and Definitions

C-40	The Glucose-Glutamic Acid check was outside of the acceptable criteria of 198 ± 30.5 mg/L at 157 mg/L.
C-51	The alkalinity to pH 4.2 = 10.2 mg CaCO3/L.
C-51a	The alkalinity to pH 4.2 = 10.6 mg CaCO3/L.
C-51b	The alkalinity to pH 4.2 = 10.8 mg CaCO3/L.
C-51c	The alkalinity to pH 4.2 = 11.1 mg CaCO3/L.
C-51d	The alkalinity to pH 4.2 = 11.3 mg CaCO3/L.
C-51e	The alkalinity to pH 4.2 = 11.5 mg CaCO3/L.
C-51f	The alkalinity to pH 4.2 = 11.7 mg CaCO3/L.
C-51g	The alkalinity to pH 4.2 = 11.9 mg CaCO3/L.
C-51h	The alkalinity to pH 4.2 = 12.2 mg CaCO3/L.
C-51i	The alkalinity to pH 4.2 = 17.6 mg CaCO3/L.
C-51j	The alkalinity to pH 4.2 = 7.1 mg CaCO3/L.
C-51k	The alkalinity to pH 4.2 = 9.5 mg CaCO3/L.
G-11	The sample was filtered after it was received at the laboratory.
G-17	The sample was preserved in the laboratory.
J	Estimated value
U	Analyte was not detected above the indicated value.

M.J. Reider Associates, Inc.
107 Angelica St, Reading PA, 19611
610-374-5129 www.mjreider.com

WORK ORDER
Chain of Custody

2116072

Client Code: 3157
Client: Tetra Tech
Project Manager: Richard A Wheeler
Project: 2021 - Beltzville Reservoir
Report To: Tetra Tech - David Wertz - USACE, Phila Dist. Env.Resources Branch 100 Penn Square E., Arlington, VA 22201
Invoice To: Tetra Tech - David Wertz - USACE, Phila Dist. Env.Resources Branch 100 Penn Square E., Arlington, VA 22201

Collected By : (Full Name) Gregory Wacik

Comments:

2116072-01 BZ-1S

Matrix: Non-Potable Water
Type: Grab
Date: 6/10/21
Time: 0035

BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B
Alk SM 2320B, NH3-N D6919-03, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

2116072-02 BZ-2S

Matrix: Non-Potable Water
Type: Grab
Date: 6/10/21
Time: 1140

BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B
Alk SM 2320B, NH3-N D6919-03, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

	Date/Time		Date/Time
Relinquished By	6/10/21 1200	Received By	6-10-21 1200
Relinquished By		Received By	
Relinquished By		Received at Laboratory By	6-10-21 1400

Sample Kit Prepared By:	Date/Time
CML	5/7

Sample Temp (°C): 6
Samples on Ice? Yes No N/A
Approved By: BSM
Entered By:

Printed: 5/7/2021 8:28:51AM

Report Template: wkb WorkOrder COC 1s

M.J. Reider Associates, Inc.

Client Code: 3157 **Client:** Tetra Tech

Project Manager: Richard A Wheeler **Project:** 2021 - Beltzville Reservoir

Comments:

Collected By : (Full Name) Gregory Wacik

2116072-03 BZ-3S

Matrix: Non-Potable Water Date: 6/10/21
Type: Grab Time: 0900

NO2-N EPA 300.0, BOD SM 5210B, EC (#) SM 9223B Confirmation, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B
Alk SM 2320B, NH3-N D6919-03, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

2116072-04 BZ-3M

Matrix: Non-Potable Water Date: 6/10/21
Type: Grab Time: 0900

BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F
Alk SM 2320B, NH3-N D6919-03, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Pl 500ml H2SO4
D - Pl 250ml NP
E - Pl 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

2116072-05 BZ-3D

Matrix: Non-Potable Water Date: 6/10/21
Type: Grab Time: 0900

BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F
Alk SM 2320B, NH3-N D6919-03, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D, PO4 SM 4500P-F

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Pl 500ml H2SO4
D - Pl 250ml NP
E - Pl 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

	Date/Time		Date/Time
Relinquished By	6/10/21 1200	Received By	6-10-21 1200
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	6-10-21 1400 Date/Time

Sample Kit Prepared By:	Date/Time
CML	5/7
Sample Temp (°C):	6
Samples on Ice?	Yes No NA
Approved By:	BSW
Entered By:	

Printed: 5/7/2021 8:28:51AM

Report Template: wko WorkOrder COC 1s

M.J. Reider Associates, Inc.

2116072

Client Code: 3157 **Client:** Tetra Tech

Project Manager: Richard A Wheeler **Project:** 2021 - Beltzville Reservoir

Comments:

Collected By : (Full Name) Gregory Wacik

2116072-06 BZ-4S

Matrix: Non-Potable Water Date: 6/10/21
Type: Grab Time: 1125

NO3-N EPA 300.0, PO4-D SM 4500P-F, NO2-N, NO3-N, Combined NO3+NO2, TC (#) SM 9223B, BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N EPA 300.0
PO4 SM 4500P-F, TSS SM 2540D, Alk SM 2320B, NH3-N D6919-03, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

2116072-07 BZ-5S

Matrix: Non-Potable Water Date: 6/10/21
Type: Grab Time: 1110

BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B, NO2-N EPA 300.0, NO3-N EPA 300.0
Alk SM 2320B, PO4 SM 4500P-F, NH3-N D6919-03, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

Relinquished By	Date/Time	Received By	Date/Time
[signature]	6/10/21 1200	[signature]	6-10-21 1200
Relinquished By	Date/Time	Received By	Date/Time
		[signature]	6-10-21 1400
Relinquished By	Date/Time	Received at Laboratory By	Date/Time

Sample Kit Prepared By:	Date/Time
CML	5\7
Sample Temp (°C):	6
Samples on Ice?	Yes No NA
Approved By:	
Entered By:	BSM

Printed: 5/7/2021 8:28:51AM

Report Template: wkd WorkOrder COC is

M.J. Reider Associates, Inc.

Client Code: 3157 **Client:** Tetra Tech

Project Manager: Richard A Wheeler **Project:** 2021 - Beltzville Reservoir

Comments:

Collected By : (Full Name) Gregory Wacik

2116072-08 BZ-6S

Matrix: Non-Potable Water Date: 6/10/21
Type: Grab Time: 0800

BOD SM 5210B, EC (#) SM 9223B Confirmation, PO4-D SM 4500P-F, TC (#) SM 9223B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2
Alk SM 2320B, NH3-N D6919-03, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

2116072-09 BZ-6M

Matrix: Non-Potable Water Date: 6/10/21
Type: Grab Time: 0800

BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F
Alk SM 2320B, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D, NH3-N D6919-03

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Pl 500ml H2SO4
D - Pl 250ml NP
E - Pl 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

2116072-10 BZ-6D

Matrix: Non-Potable Water Date: 6/10/21
Type: Grab Time: 0800

BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F
Alk SM 2320B, NH3-N D6919-03, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Pl 500ml H2SO4
D - Pl 250ml NP
E - Pl 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

Relinquished By	Date/Time	Received By	Date/Time
	6/10/21 1200		6-10-21 1200
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	Date/Time
			6-10-21 1400

Sample Kit Prepared By:	Date/Time
CmL	5\7
Sample Temp (°C):	6
Samples on Ice?	Yes No NA
Approved By:	BSW
Entered By:	

Printed: 5/7/2021 8:28:51AM

Report Template: WO WorkOrder COC Is

M.J. Reider Associates, Inc.

2116072

Client Code: 3157 **Client:** Tetra Tech

Project Manager: Richard A Wheeler **Project:** 2021 - Beltzville Reservoir

Comments:

Collected By : (Full Name) Gregory Wacik

2116072-11 BZ-7S

BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B

Alk SM 2320B, NH3-N D6919-03, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water Date: 6/10/21
Type: Grab Time: 1000

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

2116072-12 BZ-7M

PO4-D SM 4500P-F, BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2

TDS SM 2540C, TOC SM 5310C, TSS SM 2540D, Alk SM 2320B, PO4 SM 4500P-F, TKN EPA 351.2, NH3-N D6919-03

Matrix: Non-Potable Water Date: 6/10/21
Type: Grab Time: 1000

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Pl 500ml H2SO4
D - Pl 250ml NP
E - Pl 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

2116072-13 BZ-7D

NO2-N EPA 300.0, NO3-N EPA 300.0, BOD SM 5210B, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F

Alk SM 2320B, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D, NH3-N D6919-03

Matrix: Non-Potable Water Date: 6/10/21
Type: Grab Time: 1000

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Pl 500ml H2SO4
D - Pl 250ml NP
E - Pl 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

Relinquished By	6/10/21 1200 Date/Time	Received By	6-10-21 1200 Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	6-10-21 1400 Date/Time

Sample Kit Prepared By:	Date/Time
CML	5/7
Sample Temp (°C):	6
Samples on Ice?	(Yes) No NA
Approved By:	BSL
Entered By:	

Printed: 5/7/2021 8:28:51AM

Report Template: wko WorkOrder COC ls

MJRA Terms & Conditions

All samples submitted must be accompanied by signed documentation representing a Chain of Custody (COC). The COC Record acts as a contract between the client and MJRA. Signing the COC form gives approval for MJRA to perform the requested analyses and is an agreement to pay for the cost of such analyses**.** COC Records must be completed in black or blue indelible ink (must not run when wet). COC documentation begins at the time of sample collection. Client is required to document all sample details prior to releasing samples to MJRA. All samples must be placed on ice immediately after sampling and shipped or delivered to the laboratory in a manner that will maintain the sample temperature above freezing and below 6C (loose ice is preferred)**.**

Sample Submission, Sample Acceptance & Sampling Containers

Included on the COC must be the sample description, date and time of collection (including start and stop for composites), container size and type, preservative information, sample matrix, indication of whether the sample is a grab or composite, number of containers & a list of the tests to be performed. Poor sample collection technique, inappropriate sampling containers and/or improper sample preservation may lead to sample rejection. Suitable sample containers, labels, and preservatives (as applicable), along with blank COCs are provided at no additional cost.

Turnaround Times (TAT)

Average TAT for test results range from 5 to 15 working days depending on the specific analyses and time of year submitted. Faster turnaround times (*RUSH TAT) may be available depending on the current workload in a particular department and the nature of the analyses requested. We encourage you to verify requests for expedited sample results with one of our Technical Directors prior to sample submittal. Without confirmation from a Technical Director, your results may not be completed by your deadline. *RUSH TAT Surcharges are applied for expedited turnaround times.

Analytical Results, Sample Collection Integrity & Subcontracting

Analytical values are for the sample as submitted and relate only to the item tested. The value indicates a snapshot of the constituent content of the sample at the time of sample collection. Analytical results can be impacted by poor sample collection technique and/or improper preservation. All sample collection completed by MJRA was performed in accordance with applicable regulatory protocols or as specified in customer specific sampling plans. Constituent content will vary over time based on the matrix of the sample and the physical and chemical changes to its environment. All sample results and laboratory reports are strictly confidential. Results will not be available to anyone except the primary client or authorized party representing the client unless MJRA receives additional permissions from the client. When necessary, MJRA will subcontract certain analyses to a third party accredited laboratory. If client prohibits subcontracting, it must be provided in writing and include instruction on how to proceed with client samples that require third party analyses.

Payment Terms

Payment Terms are Net 30 days. Prices are subject to change without notice. A standing monthly charge of 1.5% of the clients over-30-day-unpaid balance may be added to the balance after 30 days and each month thereafter (day 31, 61, 91 etc.). The laboratory accepts all major credit cards, ACH transactions, checks and cash. New clients must pay for all services rendered prior to sample collection and/or in some cases report processing. Clients must contact the MJRA accounting department to pursue a credit-based account. MJRA reserves the right to terminate the client's credit account and to refuse to perform additional services on a credit basis if any balance is outstanding for more than 60 days.

Warranty & Litigation

MJRA does not guarantee any results of its services but has agreed to use its best efforts, in accordance with the standards and practices of the industry, to cause such results to be accurate and complete. We disclaim any other warranties, expressed or implied, including a warranty of fitness for a particular purpose and warranty of merchantability. Clients agree that they shall reimburse MJRA for any and all fees, cost and litigation expenses, including reasonable attorney fees incurred by MJRA in obtaining payment for the services rendered. All costs associated with compliance with any subpoena for documents, testimony, or any other purpose relating to work performed by MJRA, for a client, shall be paid by that client. MJRA's aggregate liability for negligent acts and omissions and of an intentional breach by MJRA will not exceed the fee paid for the services. Client agrees to indemnify and hold MJRA harmless for any and all liabilities in excess of said amount. Neither MJRA nor the client shall be liable to the other for special, incidental consequential or punitive liability or damages included but not limited to those arising from delay, loss of use, loss of profits or revenues. MJRA will not be liable to the client unless the client has notified MJRA of the discovery of the alleged negligent act, error, omissions or breach within 30 days of the day of its discovery and within one year of the date of invoice.

Reviewed and Approved by:

Richard A Wheeler
Director of Field Services

Certificate of Analysis

M.J. Reider Associates, Inc.
ENVIRONMENTAL TESTING LABORATORY
U.S. EPA/PA DEP #06-00003

Laboratory No.: 2119107
Report: 07/09/21
Lab Contact: Richard A Wheeler

Attention: David Wertz
Reported To: Tetra Tech
USACE, Phila Dist. Env.Resources Branch 100 Penn Square E.
Arlington, VA 22201

Project: 2021 - Beltzville Reservoir

Lab ID: 2119107-01 **Collected By:** Client **Sampled:** 07/01/21 10:45 **Received:** 07/01/21 14:16
Sample Desc: BZ-1S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/03/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	12	mg CaCO3/L		2	SM 2320 B	07/07/21	C-51c	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/02/21	U	RCE
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/01/21 17:35		ASD
Nitrate as N	0.81	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/02/21 0:09	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/02/21 0:09	U	JAF
Nitrate+Nitrite as N	<0.82	mg/l	0.119	1.10	CALCULATED	07/02/21 0:09		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/06/21	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/02/21		TML
Solids, Total Dissolved	40	mg/l	4	5	SM 2540 C	07/02/21		TMH
Total Organic Carbon	2.3	mg/l	0.3	0.5	SM 5310 C	07/02/21		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	07/02/21		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	727	mpn/100ml	1	SM 9223 B/Quantitray	7/1/21 14:43	7/2/21 10:08		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	7/1/21 14:43	7/2/21 10:08		JMW

Lab ID: 2119107-02 **Collected By:** Client **Sampled:** 07/01/21 10:30 **Received:** 07/01/21 14:16
Sample Desc: BZ-2S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/03/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	9	mg CaCO3/L		2	SM 2320 B	07/07/21	C-51j	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/02/21	U	RCE
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/01/21 17:35		ASD
Nitrate as N	0.42	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/01/21 23:52	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/01/21 23:52	U	JAF
Nitrate+Nitrite as N	<0.43	mg/l	0.119	1.10	CALCULATED	07/01/21 23:52		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/06/21	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/02/21		TML
Solids, Total Dissolved	25	mg/l	4	5	SM 2540 C	07/02/21		TMH
Total Organic Carbon	0.9	mg/l	0.3	0.5	SM 5310 C	07/02/21		ALD
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	07/02/21		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	63	mpn/100ml	1	SM 9223 B/Quantitray	7/1/21 14:43	7/2/21 10:08		JMW
Total Coliform	2420	mpn/100ml	1	SM 9223 B/Quantitray	7/1/21 14:43	7/2/21 10:08		JMW

Lab ID: 2119107-03 **Collected By:** Client **Sampled:** 07/01/21 08:45 **Received:** 07/01/21 14:16
Sample Desc: BZ-3S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.02	mg/l		0.01	SM 4500-P F	07/03/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	11	mg CaCO3/L		2	SM 2320 B	07/07/21	C-51a	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/02/21	U	RCE
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/01/21 17:35		ASD
Nitrate as N	0.66	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/01/21 23:35	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/01/21 23:35	U	JAF
Nitrate+Nitrite as N	<0.67	mg/l	0.119	1.10	CALCULATED	07/01/21 23:35		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/06/21	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/02/21		TML
Solids, Total Dissolved	50	mg/l	4	5	SM 2540 C	07/02/21		TMH
Total Organic Carbon	1.7	mg/l	0.3	0.5	SM 5310 C	07/02/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/02/21		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	1	mpn/100ml	1	SM 9223 B/Quantitray	7/1/21 14:43	7/2/21 10:08		JMW
Total Coliform	178	mpn/100ml	1	SM 9223 B/Quantitray	7/1/21 14:43	7/2/21 10:08		JMW

Lab ID: 2119107-04 **Collected By:** Client **Sampled:** 07/01/21 08:45 **Received:** 07/01/21 14:16
Sample Desc: BZ-3M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/03/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	12	mg CaCO3/L		2	SM 2320 B	07/07/21	C-51d	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/02/21	U	RCE
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/01/21 17:30		ASD
Nitrate as N	0.91	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/01/21 23:18	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/01/21 23:18	U	JAF
Nitrate+Nitrite as N	<0.92	mg/l	0.119	1.10	CALCULATED	07/01/21 23:18		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/06/21	U	SNF
Phosphorus as P, Total	0.01	mg/l	0.01	0.01	SM 4500-P F	07/02/21		TML
Solids, Total Dissolved	62	mg/l	4	5	SM 2540 C	07/02/21		TMH
Total Organic Carbon	1.3	mg/l	0.3	0.5	SM 5310 C	07/02/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/02/21		ALD

Lab ID: 2119107-05 **Collected By:** Client **Sampled:** 07/01/21 08:45 **Received:** 07/01/21 14:16
Sample Desc: BZ-3D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/03/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	13	mg CaCO3/L		2	SM 2320 B	07/07/21	C-51e	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/02/21	U	RCE
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/01/21 17:35		ASD
Nitrate as N	0.85	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/01/21 22:28	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/01/21 22:28	U	JAF
Nitrate+Nitrite as N	<0.86	mg/l	0.119	1.10	CALCULATED	07/01/21 22:28		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/06/21	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/02/21		TML
Solids, Total Dissolved	67	mg/l	4	5	SM 2540 C	07/02/21		TMH
Total Organic Carbon	1.3	mg/l	0.3	0.5	SM 5310 C	07/02/21		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	07/02/21		ALD

Lab ID: 2119107-06 **Collected By:** Client **Sampled:** 07/01/21 10:10 **Received:** 07/01/21 14:16
Sample Desc: BZ-4S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/03/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO3/L		2	SM 2320 B	07/07/21	C-51i	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/02/21	U	RCE
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/01/21 17:35		ASD
Nitrate as N	0.29	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/01/21 21:37	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/01/21 21:37	U	JAF
Nitrate+Nitrite as N	<0.30	mg/l	0.119	1.10	CALCULATED	07/01/21 21:37		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/06/21	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/02/21		TML
Solids, Total Dissolved	26	mg/l	4	5	SM 2540 C	07/02/21		TMH
Total Organic Carbon	1.3	mg/l	0.3	0.5	SM 5310 C	07/02/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/02/21		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	13	mpn/100ml	1	SM 9223 B/Quantitray	7/1/21 14:43	7/2/21 10:08		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	7/1/21 14:43	7/2/21 10:08		JMW

Lab ID: 2119107-07 **Collected By:** Client **Sampled:** 07/01/21 10:10 **Received:** 07/01/21 14:16
Sample Desc: BZ-5S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.02	mg/l		0.01	SM 4500-P F	07/03/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	14	mg CaCO3/L		2	SM 2320 B	07/07/21	C-51h	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/02/21	U	RCE
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/01/21 17:35		ASD
Nitrate as N	1.26	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/01/21 21:20		JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/01/21 21:20	U	JAF
Nitrate+Nitrite as N	<1.27	mg/l	0.119	1.10	CALCULATED	07/01/21 21:20		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/06/21	U	SNF
Phosphorus as P, Total	0.02	mg/l	0.01	0.01	SM 4500-P F	07/02/21		TML
Solids, Total Dissolved	51	mg/l	4	5	SM 2540 C	07/02/21		TMH
Total Organic Carbon	1.5	mg/l	0.3	0.5	SM 5310 C	07/02/21		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	07/02/21		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	142	mpn/100ml	1	SM 9223 B/Quantitray	7/1/21 14:43	7/2/21 10:08		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	7/1/21 14:43	7/2/21 10:08		JMW

Lab ID: 2119107-08 **Collected By:** Client **Sampled:** 07/01/21 06:55 **Received:** 07/01/21 14:16
Sample Desc: BZ-6S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/03/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	10	mg CaCO3/L		2	SM 2320 B	07/07/21	C-51	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/02/21	U	RCE
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/01/21 17:30		ASD
Nitrate as N	0.67	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/01/21 21:03	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/01/21 21:03	U	JAF
Nitrate+Nitrite as N	<0.68	mg/l	0.119	1.10	CALCULATED	07/01/21 21:03		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/06/21	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/02/21		TML
Solids, Total Dissolved	42	mg/l	4	5	SM 2540 C	07/02/21		TMH
Total Organic Carbon	1.6	mg/l	0.3	0.5	SM 5310 C	07/02/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/02/21		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	4	mpn/100ml	1	SM 9223 B/Quantitray	7/1/21 14:43	7/2/21 10:08		JMW
Total Coliform	91	mpn/100ml	1	SM 9223 B/Quantitray	7/1/21 14:43	7/2/21 10:08		JMW

Lab ID: 2119107-09 **Collected By:** Client **Sampled:** 07/01/21 06:55 **Received:** 07/01/21 14:16
Sample Desc: BZ-6M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/03/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	11	mg CaCO3/L		2	SM 2320 B	07/07/21	C-51b	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/02/21	U	RCE
Biochemical Oxygen Demand	2.7	mg/l	2.0	2.0	SM 5210 B	07/01/21 17:35		ASD
Nitrate as N	0.92	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/01/21 20:47	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/01/21 20:47	U	JAF
Nitrate+Nitrite as N	<0.93	mg/l	0.119	1.10	CALCULATED	07/01/21 20:47		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/06/21	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/02/21		TML
Solids, Total Dissolved	57	mg/l	4	5	SM 2540 C	07/02/21		TMH
Total Organic Carbon	1.2	mg/l	0.3	0.5	SM 5310 C	07/02/21		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	07/02/21		ALD

Lab ID: 2119107-10 **Collected By:** Client **Sampled:** 07/01/21 06:55 **Received:** 07/01/21 14:16
Sample Desc: BZ-6D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/03/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	13	mg CaCO3/L		2	SM 2320 B	07/07/21	C-51g	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/02/21	U	RCE
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/01/21 17:35		ASD
Nitrate as N	0.83	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/01/21 20:30	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/01/21 20:30	U	JAF
Nitrate+Nitrite as N	<0.84	mg/l	0.119	1.10	CALCULATED	07/01/21 20:30		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/06/21	U	SNF
Phosphorus as P, Total	0.02	mg/l	0.01	0.01	SM 4500-P F	07/02/21		TML
Solids, Total Dissolved	69	mg/l	4	5	SM 2540 C	07/02/21		TMH
Total Organic Carbon	1.4	mg/l	0.3	0.5	SM 5310 C	07/02/21		ALD
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	07/02/21		ALD

Lab ID: 2119107-11 **Collected By:** Client **Sampled:** 07/01/21 08:00 **Received:** 07/01/21 14:16
Sample Desc: BZ-7S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/03/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	10	mg CaCO3/L		2	SM 2320 B	07/07/21	C-51	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/02/21	U	RCE
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/01/21 17:35		ASD
Nitrate as N	0.64	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/02/21 0:59	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/02/21 0:59	U	JAF
Nitrate+Nitrite as N	<0.65	mg/l	0.119	1.10	CALCULATED	07/02/21 0:59		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/06/21	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/02/21		TML
Solids, Total Dissolved	44	mg/l	4	5	SM 2540 C	07/02/21		TMH
Total Organic Carbon	1.9	mg/l	0.3	0.5	SM 5310 C	07/02/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/02/21		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	1	mpn/100ml	1	SM 9223 B/Quantitray	7/1/21 14:43	7/2/21 10:08		JMW
Total Coliform	276	mpn/100ml	1	SM 9223 B/Quantitray	7/1/21 14:43	7/2/21 10:08		JMW

Lab ID: 2119107-12 **Collected By:** Client **Sampled:** 07/01/21 08:00 **Received:** 07/01/21 14:16
Sample Desc: BZ-7M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/03/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	13	mg CaCO3/L		2	SM 2320 B	07/07/21	C-51f	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/02/21	U	RCE
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/01/21 17:35		ASD
Nitrate as N	0.99	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/02/21 0:42	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/02/21 0:42	U	JAF
Nitrate+Nitrite as N	<1.00	mg/l	0.119	1.10	CALCULATED	07/02/21 0:42		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/06/21	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/02/21		TML
Solids, Total Dissolved	58	mg/l	4	5	SM 2540 C	07/02/21		TMH
Total Organic Carbon	1.4	mg/l	0.3	0.5	SM 5310 C	07/02/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/02/21		ALD

Lab ID: 2119107-13 **Collected By:** Client **Sampled:** 07/01/21 08:00 **Received:** 07/01/21 14:16
Sample Desc: BZ-7D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/03/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	12	mg CaCO3/L		2	SM 2320 B	07/07/21	C-51d	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/02/21	U	RCE
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/01/21 17:30		ASD
Nitrate as N	0.87	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/02/21 0:25	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/02/21 0:25	U	JAF
Nitrate+Nitrite as N	<0.88	mg/l	0.119	1.10	CALCULATED	07/02/21 0:25		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/06/21	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/02/21		TML
Solids, Total Dissolved	47	mg/l	4	5	SM 2540 C	07/02/21		TMH
Total Organic Carbon	1.3	mg/l	0.3	0.5	SM 5310 C	07/02/21		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	07/02/21		ALD

Preparation Methods

Specific Method	Preparation Method	Prep Batch	Prepared Date	Prepared By
2119107-01				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1G0101	07/02/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1G0120	07/02/2021	TML
2119107-02				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1G0101	07/02/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1G0120	07/02/2021	TML
2119107-03				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1G0101	07/02/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1G0120	07/02/2021	TML
2119107-04				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1G0101	07/02/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1G0120	07/02/2021	TML
2119107-05				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1G0101	07/02/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1G0120	07/02/2021	TML
2119107-06				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1G0101	07/02/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1G0120	07/02/2021	TML
2119107-07				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1G0101	07/02/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1G0120	07/02/2021	TML
2119107-08				
Dissolved General Chemistry				

SM 4500-P F	SM 4500-P B	B1G0101	07/02/2021	TML

General Chemistry

SM 4500-P F	SM 4500-P B	B1G0120	07/02/2021	TML

2119107-09

Dissolved General Chemistry

SM 4500-P F	SM 4500-P B	B1G0101	07/02/2021	TML

General Chemistry

SM 4500-P F	SM 4500-P B	B1G0120	07/02/2021	TML

2119107-10

Dissolved General Chemistry

SM 4500-P F	SM 4500-P B	B1G0101	07/02/2021	TML

General Chemistry

SM 4500-P F	SM 4500-P B	B1G0120	07/02/2021	TML

2119107-11

Dissolved General Chemistry

SM 4500-P F	SM 4500-P B	B1G0101	07/02/2021	TML

General Chemistry

SM 4500-P F	SM 4500-P B	B1G0120	07/02/2021	TML

2119107-12

Dissolved General Chemistry

SM 4500-P F	SM 4500-P B	B1G0101	07/02/2021	TML

General Chemistry

SM 4500-P F	SM 4500-P B	B1G0120	07/02/2021	TML

2119107-13

Dissolved General Chemistry

SM 4500-P F	SM 4500-P B	B1G0101	07/02/2021	TML

General Chemistry

SM 4500-P F	SM 4500-P B	B1G0120	07/02/2021	TML

Notes and Definitions

C-51	The alkalinity to pH 4.2 = 10.0 mg CaCO3/L.
C-51a	The alkalinity to pH 4.2 = 10.6 mg CaCO3/L.
C-51b	The alkalinity to pH 4.2 = 10.9 mg CaCO3/L.
C-51c	The alkalinity to pH 4.2 = 11.5 mg CaCO3/L.
C-51d	The alkalinity to pH 4.2 = 12.2 mg CaCO3/L.
C-51e	The alkalinity to pH 4.2 = 12.7 mg CaCO3/L.
C-51f	The alkalinity to pH 4.2 = 13.3 mg CaCO3/L.
C-51g	The alkalinity to pH 4.2 = 13.4 mg CaCO3/L.
C-51h	The alkalinity to pH 4.2 = 14.5 mg CaCO3/L.
C-51i	The alkalinity to pH 4.2 = 7.0 mg CaCO3/L.
C-51j	The alkalinity to pH 4.2 = 9.0 mg CaCO3/L.
G-11	The sample was filtered after it was received at the laboratory.
G-17	The sample was preserved in the laboratory.
J	Estimated value
U	Analyte was not detected above the indicated value.

M.J. Reider Associates, Inc.
107 Angelica St, Reading PA, 19611
610-374-5129 www.mjreider.com

WORK ORDER
Chain of Custody

2119107

Client Code: 3157 **Client:** Tetra Tech
Project Manager: Richard A Wheeler **Project:** 2021 - Beltzville Reservoir
Report To: Tetra Tech - David Wertz - USACE, Phila Dist. Env.Resources Branch 100 Penn Square E., Arlington, VA 22201
Invoice To: Tetra Tech - David Wertz - USACE, Phila Dist. Env.Resources Branch 100 Penn Square E., Arlington, VA 22201

Collected By : (Full Name) Gregory Wacik

Comments:

2119107-01 BZ-1S

BOD SM 5210B, EC (#) SM 9223B Confirmation, TC (#) SM 9223B, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, NO2-N EPA 300.0, NO3-N EPA 300.0
Alk SM 2320B, NH3-N D6919-03, PO4 SM 4500P-F, TKN EPA 351.2, TDS SM 2540C, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water Date: 7/1/21
Type: Grab Time: 1045

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

2119107-02 BZ-2S

NO2-N EPA 300.0, NO3-N EPA 300.0, EC (#) SM 9223B Confirmation, PO4-D SM 4500P-F, NO2-N, NO3-N, Combined NO3+NO2, BOD SM 5210B, TC (#) SM 9223B
NH3-N D6919-03, PO4 SM 4500P-F, Alk SM 2320B, TKN EPA 351.2, TOC SM 5310C, TDS SM 2540C, TSS SM 2540D

Matrix: Non-Potable Water Date: 7/1/21
Type: Grab Time: 1030

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

	Date/Time		Date/Time
Relinquished By	7/1/21 1360	Received By	7/1/21 1300
Relinquished By		Received By	
Relinquished By		Received at Laboratory By	7/1/21 1416

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	1.5
Samples on Ice?	Yes No NA
Approved By:	
Entered By:	

The Client, by signing (or having the client's agent sign), agrees to MJRA's Terms and Conditions and to pay for the above requested services including any additional associated fees incurred.

Printed: 6/1/2021 11:00:58AM

Report Template: w

M.J. Reider Associates, Inc.

Client Code: 3157
Project Manager: Richard A Wheeler

Client: Tetra Tech
Project: 2021 - Beltzville Reservoir

Comments:

Collected By : (Full Name) Gregory WacikK

2119107-03 BZ-3S

BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B, NO3-N EPA 300.0
Alk SM 2320B, TOC SM 5310C, TSS SM 2540D, TDS SM 2540C, TKN EPA 351.2, NH3-N D6919-03, PO4 SM 4500P-F

Matrix: Non-Potable Water
Type: Grab
Date: 7/1/21
Time: 0845

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

2119107-04 BZ-3M

NO2-N EPA 300.0, NO3-N EPA 300.0, PO4-D SM 4500P-F, BOD SM 5210B, NO2-N, NO3-N, Combined NO3+NO2
Alk SM 2320B, TDS SM 2540C, TOC SM 5310C, TSS SM 2540D, NH3-N D6919-03, TKN EPA 351.2, PO4 SM 4500P-F

Matrix: Non-Potable Water
Type: Grab
Date: 7/1/21
Time: 0845

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Pl 500ml H2SO4
D - Pl 250ml NP
E - Pl 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

2119107-05 BZ-3D

BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F
Alk SM 2320B, NH3-N D6919-03, TDS SM 2540C, TOC SM 5310C, TSS SM 2540D, TKN EPA 351.2, PO4 SM 4500P-F

Matrix: Non-Potable Water
Type: Grab
Date: 7/1/21
Time: 0845

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Pl 500ml H2SO4
D - Pl 250ml NP
E - Pl 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

Relinquished By	Date/Time 7/1/21 1300	Received By	Date/Time 7/1/21 1300
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	Date/Time 7/1/21 1416

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	1.6
Samples on Ice?	Yes No NA
Approved By:	
Entered By:	

Printed: 6/1/2021 11:00:58AM

Report Template: ~~MJR WetWorks COC 15~~

M.J. Reider Associates, Inc.

Client Code: 3157 **Client:** Tetra Tech

Project Manager: Richard A Wheeler **Project:** 2021 - Beltzville Reservoir

Comments:

Collected By : (Full Name) Gregory Wacik

2119107-06 BZ-4S

Matrix: Non-Potable Water Date: 7/1/21
Type: Grab Time: 1010

TC (#) SM 9223B, EC (#) SM 9223B Confirmation, BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, PO4-D SM 4500P-F, NO2-N, NO3-N, Combined NO3+NO2
Alk SM 2320B, TOC SM 5310C, TDS SM 2540C, TSS SM 2540D, TKN EPA 351.2, PO4 SM 4500P-F, NH3-N D6919-03

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

2119107-07 BZ-5S

Matrix: Non-Potable Water Date: 7/1/21
Type: Grab Time: 1000

NO2-N EPA 300.0, NO3-N EPA 300.0, PO4-D SM 4500P-F, TC (#) SM 9223B, BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N, NO3-N, Combined NO3+NO2
Alk SM 2320B, TDS SM 2540C, TOC SM 5310C, TSS SM 2540D, TKN EPA 351.2, PO4 SM 4500P-F, NH3-N D6919-03

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

Relinquished By	Date/Time 7/1/21 1300	Received By	Date/Time 7/1/21 1300
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	Date/Time 7/1/21 1416

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	1°C
Samples on Ice?	Yes No NA
Approved By:	
Entered By:	

Printed: 6/1/2021 11:00:58AM

Report Template: wko WorkOrder COC ls

M.J. Reider Associates, Inc.

2119107

Client Code: 3157 **Client:** Tetra Tech

Project Manager: Richard A Wheeler **Project:** 2021 - Beltzville Reservoir

Comments:

Collected By : (Full Name) Gregory Wasik

2119107-08 BZ-6S

BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, PO4-D SM 4500P-F, EC (#) SM 9223B Confirmation, TC (#) SM 9223B, NO2-N, NO3-N, Combined NO3+NO2
NH3-N D6919-03, Alk SM 2320B, TDS SM 2540C, TOC SM 5310C, TSS SM 2540D, TKN EPA 351.2, PO4 SM 4500P-F

Matrix: Non-Potable Water Date: 7/1/21
Type: Grab Time: 0655

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

2119107-09 BZ-6M

BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, PO4-D SM 4500P-F, NO2-N, NO3-N, Combined NO3+NO2
Alk SM 2320B, TDS SM 2540C, TOC SM 5310C, TSS SM 2540D, PO4 SM 4500P-F, NH3-N D6919-03, TKN EPA 351.2

Matrix: Non-Potable Water Date: 7/1/21
Type: Grab Time: 0655

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Pl 500ml H2SO4
D - Pl 250ml NP
E - Pl 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

2119107-10 BZ-6D

BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, PO4-D SM 4500P-F, NO2-N, NO3-N, Combined NO3+NO2
Alk SM 2320B, NH3-N D6919-03, TDS SM 2540C, TOC SM 5310C, TSS SM 2540D, TKN EPA 351.2, PO4 SM 4500P-F

Matrix: Non-Potable Water Date: 7/1/21
Type: Grab Time: 0655

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Pl 500ml H2SO4
D - Pl 250ml NP
E - Pl 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

Relinquished By	7/1/21 1300 Date/Time	Received By	7/1/21 1300 Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	7/1/21 1416 Date/Time

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	2.°C
Samples on Ice?	Yes No NA
Approved By:	
Entered By:	

The Client, by signing (or having the client's agent sign), agrees to MJRA's Terms and Conditions and to pay for the above requested services including any additional associated fees incurred.

Printed: 6/1/2021 11:00:58AM

Report Template: wko WorkOrder COC Is

M.J. Reider Associates, Inc.

Client Code: 3157 **Client:** Tetra Tech

Project Manager: Richard A Wheeler **Project:** 2021 - Beltzville Reservoir

Comments:

Collected By : (Full Name) Gregory Wacik

2119107-11 BZ-7S

NO2-N, NO3-N, Combined NO3+NO2, NO2-N EPA 300.0, NO3-N EPA 300.0, BOD SM 5210B, EC (#) SM 9223B Confirmation, PO4-D SM 4500P-F, TC (#) SM 9223B
Alk SM 2320B, PO4 SM 4500P-F, TKN EPA 351.2, NH3-N D6919-03, TDS SM 2540C, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water Date: 7/1/21
Type: Grab Time: 0800

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

2119107-12 BZ-7M

NO2-N, NO3-N, Combined NO3+NO2, BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, PO4-D SM 4500P-F
PO4 SM 4500P-F, NH3-N D6919-03, TKN EPA 351.2, TDS SM 2540C, TOC SM 5310C, TSS SM 2540D, Alk SM 2320B

Matrix: Non-Potable Water Date: 7/1/21
Type: Grab Time: 0800

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Pl 500ml H2SO4
D - Pl 250ml NP
E - Pl 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

2119107-13 BZ-7D

NO2-N, NO3-N, Combined NO3+NO2, BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, PO4-D SM 4500P-F
NH3-N D6919-03, PO4 SM 4500P-F, TKN EPA 351.2, TSS SM 2540D, Alk SM 2320B, TDS SM 2540C, TOC SM 5310C

Matrix: Non-Potable Water Date: 7/1/21
Type: Grab Time: 0800

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Pl 500ml H2SO4
D - Pl 250ml NP
E - Pl 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

Relinquished By	7/1/21 1300 Date/Time	Received By	7/1/21 1300 Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	7/1/21 1416 Date/Time

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	1.6
Samples on Ice?	Yes No NA
Approved By:	
Entered By:	

Printed: 6/1/2021 11:00:58AM

Report Template: wko WorkOrder COC ls

MJRA Terms & Conditions

All samples submitted must be accompanied by signed documentation representing a Chain of Custody (COC). The COC Record acts as a contract between the client and MJRA. Signing the COC form gives approval for MJRA to perform the requested analyses and is an agreement to pay for the cost of such analyses**.** COC Records must be completed in black or blue indelible ink (must not run when wet). COC documentation begins at the time of sample collection. Client is required to document all sample details prior to releasing samples to MJRA. All samples must be placed on ice immediately after sampling and shipped or delivered to the laboratory in a manner that will maintain the sample temperature above freezing and below 6C (loose ice is preferred)**.**

Sample Submission, Sample Acceptance & Sampling Containers

Included on the COC must be the sample description, date and time of collection (including start and stop for composites), container size and type, preservative information, sample matrix, indication of whether the sample is a grab or composite, number of containers & a list of the tests to be performed. Poor sample collection technique, inappropriate sampling containers and/or improper sample preservation may lead to sample rejection. Suitable sample containers, labels, and preservatives (as applicable), along with blank COCs are provided at no additional cost.

Turnaround Times (TAT)

Average TAT for test results range from 5 to 15 working days depending on the specific analyses and time of year submitted. Faster turnaround times (*RUSH TAT) may be available depending on the current workload in a particular department and the nature of the analyses requested. We encourage you to verify requests for expedited sample results with one of our Technical Directors prior to sample submittal. Without confirmation from a Technical Director, your results may not be completed by your deadline. *RUSH TAT Surcharges are applied for expedited turnaround times.

Analytical Results, Sample Collection Integrity & Subcontracting

Analytical values are for the sample as submitted and relate only to the item tested. The value indicates a snapshot of the constituent content of the sample at the time of sample collection. Analytical results can be impacted by poor sample collection technique and/or improper preservation. All sample collection completed by MJRA was performed in accordance with applicable regulatory protocols or as specified in customer specific sampling plans. Constituent content will vary over time based on the matrix of the sample and the physical and chemical changes to its environment. All sample results and laboratory reports are strictly confidential. Results will not be available to anyone except the primary client or authorized party representing the client unless MJRA receives additional permissions from the client. When necessary, MJRA will subcontract certain analyses to a third party accredited laboratory. If client prohibits subcontracting, it must be provided in writing and include instruction on how to proceed with client samples that require third party analyses.

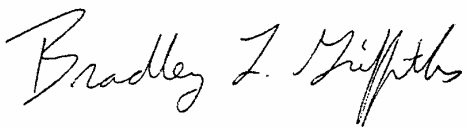
Payment Terms

Payment Terms are Net 30 days. Prices are subject to change without notice. A standing monthly charge of 1.5% of the clients over-30-day-unpaid balance may be added to the balance after 30 days and each month thereafter (day 31, 61, 91 etc.). The laboratory accepts all major credit cards, ACH transactions, checks and cash. New clients must pay for all services rendered prior to sample collection and/or in some cases report processing. Clients must contact the MJRA accounting department to pursue a credit-based account. MJRA reserves the right to terminate the client's credit account and to refuse to perform additional services on a credit basis if any balance is outstanding for more than 60 days.

Warranty & Litigation

MJRA does not guarantee any results of its services but has agreed to use its best efforts, in accordance with the standards and practices of the industry, to cause such results to be accurate and complete. We disclaim any other warranties, expressed or implied, including a warranty of fitness for a particular purpose and warranty of merchantability. Clients agree that they shall reimburse MJRA for any and all fees, cost and litigation expenses, including reasonable attorney fees incurred by MJRA in obtaining payment for the services rendered. All costs associated with compliance with any subpoena for documents, testimony, or any other purpose relating to work performed by MJRA, for a client, shall be paid by that client. MJRA's aggregate liability for negligent acts and omissions and of an intentional breach by MJRA will not exceed the fee paid for the services. Client agrees to indemnify and hold MJRA harmless for any and all liabilities in excess of said amount. Neither MJRA nor the client shall be liable to the other for special, incidental consequential or punitive liability or damages included but not limited to those arising from delay, loss of use, loss of profits or revenues. MJRA will not be liable to the client unless the client has notified MJRA of the discovery of the alleged negligent act, error, omissions or breach within 30 days of the day of its discovery and within one year of the date of invoice.

Reviewed and Approved by:



Bradley T Griffiths For Richard A Wheeler
Director of Field Services

NELAP accredited by PA. (PADEP #06-00003) Visit our website to view our current
NELAC accreditations for various drinking water, wastewater and solid & chemical materials analytes.
Additional accreditations by MD (261), NY(12094)

Certificate of Analysis

M.J. Reider Associates, Inc.
ENVIRONMENTAL TESTING LABORATORY
U.S. EPA/PA DEP #06-00003

Laboratory No.: 2122139
Report: 08/05/21
Lab Contact: Richard A Wheeler

Attention: David Wertz
Reported To: Tetra Tech
USACE, Phila Dist. Env.Resources Branch 100 Penn Square E.
Arlington, VA 22201

Project: 2021 - Beltzville Reservoir

Lab ID: 2122139-01 **Collected By:** Client **Sampled:** 07/22/21 06:45 **Received:** 07/22/21 14:00
Sample Desc: BZ-1S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.01	mg/l		0.01	SM 4500-P F	07/28/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	13	mg CaCO3/L		2	SM 2320 B	07/27/21	C-51e	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/23/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/22/21 18:17	C-37	ASD
Nitrate as N	0.84	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/22/21 18:43	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/22/21 18:43	U	JAF
Nitrate+Nitrite as N	<0.85	mg/l	0.119	1.10	CALCULATED	07/22/21 18:43		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/27/21	U	TML
Phosphorus as P, Total	0.01	mg/l	0.01	0.01	SM 4500-P F	07/24/21		SNF
Solids, Total Dissolved	58	mg/l	4	5	SM 2540 C	07/23/21		TMH
Total Organic Carbon	1.7	mg/l	0.3	0.5	SM 5310 C	07/23/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/23/21		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	6	mpn/100ml	1	SM 9223 B/Quantitray	7/22/21 14:45	7/23/21 9:21		DRW
Total Coliform	2420	mpn/100ml	1	SM 9223 B/Quantitray	7/22/21 14:45	7/23/21 9:21		DRW

Lab ID: 2122139-02 **Collected By:** Client **Sampled:** 07/22/21 11:15 **Received:** 07/22/21 14:00
Sample Desc: BZ-2S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/28/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	9	mg CaCO3/L		2	SM 2320 B	07/27/21	C-51j	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/23/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/22/21 18:17	C-37	ASD
Nitrate as N	0.42	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/22/21 19:00	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/22/21 19:00	U	JAF
Nitrate+Nitrite as N	<0.43	mg/l	0.119	1.10	CALCULATED	07/22/21 19:00		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/27/21	U	TML
Phosphorus as P, Total	0.01	mg/l	0.01	0.01	SM 4500-P F	07/24/21		SNF
Solids, Total Dissolved	38	mg/l	4	5	SM 2540 C	07/23/21		TMH
Total Organic Carbon	0.9	mg/l	0.3	0.5	SM 5310 C	07/23/21		ALD
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	07/23/21		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	25	mpn/100ml	1	SM 9223 B/Quantitray	7/22/21 14:45	7/23/21 9:21		DRW
Total Coliform	1990	mpn/100ml	1	SM 9223 B/Quantitray	7/22/21 14:45	7/23/21 9:21		DRW

Lab ID: 2122139-03 **Collected By:** Client **Sampled:** 07/22/21 08:45 **Received:** 07/22/21 14:00
Sample Desc: BZ-3S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/28/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	10	mg CaCO3/L		2	SM 2320 B	07/27/21	C-51	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/23/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/22/21 18:17	C-37	ASD
Nitrate as N	0.58	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/22/21 15:38	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/22/21 15:38	U	JAF
Nitrate+Nitrite as N	<0.59	mg/l	0.119	1.10	CALCULATED	07/22/21 15:38		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/27/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/24/21		SNF
Solids, Total Dissolved	36	mg/l	4	5	SM 2540 C	07/23/21		TMH
Total Organic Carbon	1.8	mg/l	0.3	0.5	SM 5310 C	07/23/21		ALD
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	07/23/21		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	<1	mpn/100ml	1	SM 9223 B/Quantitray	7/22/21 14:45	7/23/21 9:21		DRW
Total Coliform	130	mpn/100ml	1	SM 9223 B/Quantitray	7/22/21 14:45	7/23/21 9:21		DRW

Lab ID: 2122139-04 **Collected By:** Client **Sampled:** 07/22/21 08:45 **Received:** 07/22/21 14:00
Sample Desc: BZ-3M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/28/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	12	mg CaCO3/L		2	SM 2320 B	07/27/21	C-51c	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/23/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/22/21 18:17	C-37	ASD
Nitrate as N	1.00	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/22/21 17:36	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/22/21 17:36	U	JAF
Nitrate+Nitrite as N	<1.01	mg/l	0.119	1.10	CALCULATED	07/22/21 17:36		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/27/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/24/21		SNF
Solids, Total Dissolved	56	mg/l	4	5	SM 2540 C	07/23/21		TMH
Total Organic Carbon	1.2	mg/l	0.3	0.5	SM 5310 C	07/23/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/23/21		ALD

Lab ID: 2122139-05 **Collected By:** Client **Sampled:** 07/22/21 08:45 **Received:** 07/22/21 14:00
Sample Desc: BZ-3D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/28/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	12	mg CaCO3/L		2	SM 2320 B	07/27/21	C-51d	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/23/21	U	APR
Biochemical Oxygen Demand	3.6	mg/l	2.0	2.0	SM 5210 B	07/22/21 18:17	C-37	ASD
Nitrate as N	0.98	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/22/21 14:48	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/22/21 14:48	U	JAF
Nitrate+Nitrite as N	<0.99	mg/l	0.119	1.10	CALCULATED	07/22/21 14:48		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/27/21	U	TML
Phosphorus as P, Total	0.08	mg/l	0.01	0.01	SM 4500-P F	07/24/21		SNF
Solids, Total Dissolved	80	mg/l	4	5	SM 2540 C	07/23/21		TMH
Total Organic Carbon	1.1	mg/l	0.3	0.5	SM 5310 C	07/23/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/23/21		ALD

Lab ID: 2122139-06 **Collected By:** Client **Sampled:** 07/22/21 11:05 **Received:** 07/22/21 14:00
Sample Desc: BZ-4S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/28/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO3/L		2	SM 2320 B	07/27/21	C-51i	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/23/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/22/21 18:17	C-37	ASD
Nitrate as N	0.21	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/22/21 18:27	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/22/21 18:27	U	JAF
Nitrate+Nitrite as N	<0.22	mg/l	0.119	1.10	CALCULATED	07/22/21 18:27		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/27/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/24/21		SNF
Solids, Total Dissolved	28	mg/l	4	5	SM 2540 C	07/23/21		TMH
Total Organic Carbon	1.3	mg/l	0.3	0.5	SM 5310 C	07/23/21		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	07/23/21		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	14	mpn/100ml	1	SM 9223 B/Quantitray	7/22/21 14:45	7/23/21 9:21		DRW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	7/22/21 14:45	7/23/21 9:21		DRW

Lab ID: 2122139-07 **Collected By:** Client **Sampled:** 07/22/21 10:45 **Received:** 07/22/21 14:00
Sample Desc: BZ-5S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/28/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	14	mg CaCO3/L		2	SM 2320 B	07/27/21	C-51h	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/23/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/22/21 18:17	C-37	ASD
Nitrate as N	1.27	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/22/21 19:17		JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/22/21 19:17	U	JAF
Nitrate+Nitrite as N	<1.28	mg/l	0.119	1.10	CALCULATED	07/22/21 19:17		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/27/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/24/21		SNF
Solids, Total Dissolved	69	mg/l	4	5	SM 2540 C	07/23/21		TMH
Total Organic Carbon	1.3	mg/l	0.3	0.5	SM 5310 C	07/23/21		ALD
Solids, Total Suspended	7	mg/l	1	1	SM 2540 D	07/23/21		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	96	mpn/100ml	1	SM 9223 B/Quantitray	7/22/21 14:45	7/23/21 9:21		DRW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	7/22/21 14:45	7/23/21 9:21		DRW

Lab ID: 2122139-08 **Collected By:** Client **Sampled:** 07/22/21 07:45 **Received:** 07/22/21 14:00
Sample Desc: BZ-6S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/28/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	11	mg CaCO3/L		2	SM 2320 B	07/27/21	C-51b	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/23/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/23/21 12:36	C-37a	SWA
Nitrate as N	0.59	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/22/21 15:05	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/22/21 15:05	U	JAF
Nitrate+Nitrite as N	<0.60	mg/l	0.119	1.10	CALCULATED	07/22/21 15:05		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/27/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/24/21		SNF
Solids, Total Dissolved	71	mg/l	4	5	SM 2540 C	07/23/21		TMH
Total Organic Carbon	1.8	mg/l	0.3	0.5	SM 5310 C	07/23/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/23/21		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	1	mpn/100ml	1	SM 9223 B/Quantitray	7/22/21 14:45	7/23/21 9:21		DRW
Total Coliform	131	mpn/100ml	1	SM 9223 B/Quantitray	7/22/21 14:45	7/23/21 9:21		DRW

Lab ID: 2122139-09 **Collected By:** Client **Sampled:** 07/22/21 07:45 **Received:** 07/22/21 14:00
Sample Desc: BZ-6M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/28/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	10	mg CaCO3/L		2	SM 2320 B	07/27/21	C-51a	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/23/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/22/21 18:17	C-37	ASD
Nitrate as N	0.95	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/22/21 15:21	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/22/21 15:21	U	JAF
Nitrate+Nitrite as N	<0.96	mg/l	0.119	1.10	CALCULATED	07/22/21 15:21		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/27/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/24/21		SNF
Solids, Total Dissolved	80	mg/l	4	5	SM 2540 C	07/23/21		TMH
Total Organic Carbon	1.3	mg/l	0.3	0.5	SM 5310 C	07/23/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/23/21		ALD

Lab ID: 2122139-10 **Collected By:** Client **Sampled:** 07/22/21 07:45 **Received:** 07/22/21 14:00
Sample Desc: BZ-6D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/28/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	14	mg CaCO3/L		2	SM 2320 B	07/27/21	C-51g	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/23/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/22/21 18:17	C-37	ASD
Nitrate as N	0.99	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/22/21 18:10	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/22/21 18:10	U	JAF
Nitrate+Nitrite as N	<1.00	mg/l	0.119	1.10	CALCULATED	07/22/21 18:10		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/27/21	U	TML
Phosphorus as P, Total	0.05	mg/l	0.01	0.01	SM 4500-P F	07/24/21		SNF
Solids, Total Dissolved	83	mg/l	4	5	SM 2540 C	07/23/21		TMH
Total Organic Carbon	1.3	mg/l	0.3	0.5	SM 5310 C	07/23/21		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	07/23/21		ALD

Lab ID: 2122139-11 **Collected By:** Client **Sampled:** 07/22/21 09:45 **Received:** 07/22/21 14:00
Sample Desc: BZ-7S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/28/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	10	mg CaCO3/L		2	SM 2320 B	07/27/21	C-51k	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/23/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/22/21 18:17	C-37	ASD
Nitrate as N	0.51	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/22/21 16:29	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/22/21 16:29	U	JAF
Nitrate+Nitrite as N	<0.52	mg/l	0.119	1.10	CALCULATED	07/22/21 16:29		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/27/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/24/21		SNF
Solids, Total Dissolved	79	mg/l	4	5	SM 2540 C	07/23/21		TMH
Total Organic Carbon	1.6	mg/l	0.3	0.5	SM 5310 C	07/23/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/23/21		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	1	mpn/100ml	1	SM 9223 B/Quantitray	7/22/21 14:45	7/23/21 9:21		DRW
Total Coliform	345	mpn/100ml	1	SM 9223 B/Quantitray	7/22/21 14:45	7/23/21 9:21		DRW

Lab ID: 2122139-12 **Collected By:** Client **Sampled:** 07/22/21 09:45 **Received:** 07/22/21 14:00
Sample Desc: BZ-7M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/28/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	10	mg CaCO3/L		2	SM 2320 B	07/27/21	C-51l	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/23/21	Q-11, U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/22/21 18:17	C-37	ASD
Nitrate as N	0.51	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/22/21 17:53	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/22/21 17:53	U	JAF
Nitrate+Nitrite as N	<0.52	mg/l	0.119	1.10	CALCULATED	07/22/21 17:53		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/27/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/24/21		SNF
Solids, Total Dissolved	76	mg/l	4	5	SM 2540 C	07/23/21		TMH
Total Organic Carbon	1.6	mg/l	0.3	0.5	SM 5310 C	07/23/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/23/21		ALD

Lab ID: 2122139-13 **Collected By:** Client **Sampled:** 07/22/21 09:45 **Received:** 07/22/21 14:00
Sample Desc: BZ-7D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/28/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	13	mg CaCO3/L		2	SM 2320 B	07/27/21	C-51f	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	07/23/21	U	APR
Biochemical Oxygen Demand	2.6	mg/l	2.0	2.0	SM 5210 B	07/22/21 18:17	C-37	ASD
Nitrate as N	0.86	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	07/22/21 17:19	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/22/21 17:19	U	JAF
Nitrate+Nitrite as N	<0.87	mg/l	0.119	1.10	CALCULATED	07/22/21 17:19		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	07/27/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/24/21		SNF
Solids, Total Dissolved	84	mg/l	4	5	SM 2540 C	07/23/21		TMH
Total Organic Carbon	1.6	mg/l	0.3	0.5	SM 5310 C	07/23/21		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	07/23/21		ALD

Preparation Methods

Specific Method	Preparation Method	Prep Batch	Prepared Date	Prepared By
2122139-01				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1G1441	07/27/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1G1274	07/23/2021	SNF
2122139-02				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1G1441	07/27/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1G1274	07/23/2021	SNF
2122139-03				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1G1441	07/27/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1G1274	07/23/2021	SNF
2122139-04				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1G1441	07/27/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1G1274	07/23/2021	SNF
2122139-05				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1G1441	07/27/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1G1274	07/23/2021	SNF
2122139-06				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1G1441	07/27/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1G1274	07/23/2021	SNF
2122139-07				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1G1441	07/27/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1G1274	07/23/2021	SNF
2122139-08				
Dissolved General Chemistry				

SM 4500-P F	SM 4500-P B	B1G1441	07/27/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1G1274	07/23/2021	SNF
2122139-09				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1G1441	07/27/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1G1274	07/23/2021	SNF
2122139-10				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1G1441	07/27/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1G1274	07/23/2021	SNF
2122139-11				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1G1441	07/27/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1G1274	07/23/2021	SNF
2122139-12				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1G1441	07/27/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1G1274	07/23/2021	SNF
2122139-13				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1G1441	07/27/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1G1274	07/23/2021	SNF

Notes and Definitions

C-37	The dissolved oxygen depletion for the dilution water blank was greater than 0.20mg/L at 0.29mg/L.
C-37a	The dissolved oxygen depletion for the dilution water blank was greater than 0.20mg/L at 0.47mg/L.
C-51	The alkalinity to pH 4.2 = 10.4 mg CaCO3/L.
C-51a	The alkalinity to pH 4.2 = 10.5 mg CaCO3/L.
C-51b	The alkalinity to pH 4.2 = 10.6 mg CaCO3/L.
C-51c	The alkalinity to pH 4.2 = 11.8 mg CaCO3/L.
C-51d	The alkalinity to pH 4.2 = 12.1 mg CaCO3/L.
C-51e	The alkalinity to pH 4.2 = 12.6 mg CaCO3/L.
C-51f	The alkalinity to pH 4.2 = 12.8 mg CaCO3/L.
C-51g	The alkalinity to pH 4.2 = 13.6 mg CaCO3/L.
C-51h	The alkalinity to pH 4.2 = 14.3 mg CaCO3/L.
C-51i	The alkalinity to pH 4.2 = 7.1 mg CaCO3/L.
C-51j	The alkalinity to pH 4.2 = 9.4 mg CaCO3/L.
C-51k	The alkalinity to pH 4.2 = 9.6 mg CaCO3/L.
C-51l	The alkalinity to pH 4.2 = 9.8 mg CaCO3/L.
G-11	The sample was filtered after it was received at the laboratory.
G-17	The sample was preserved in the laboratory.
J	Estimated value
Q-11	The matrix spike(s) were outside acceptable limits of 85-115% recovery at 83.7 and 81.7%.
U	Analyte was not detected above the indicated value.

M.J. Reider Associates, Inc.
107 Angelica St, Reading PA, 19611
610-374-5129 www.mjreider.com

WORK ORDER
Chain of Custody

2122139

Client Code: 3157 **Client:** Tetra Tech
Project Manager: Richard A Wheeler **Project:** 2021 - Beltzville Reservoir
Report To: Tetra Tech - David Wertz - USACE, Phila Dist. Env.Resources Branch 100 Penn Square E., Arlington, VA 22201
Invoice To: Tetra Tech - David Wertz - USACE, Phila Dist. Env.Resources Branch 100 Penn Square E., Arlington, VA 22201

Collected By : (Full Name) Gregory Wacik

Comments:

2122139-01 BZ-1S

Matrix: Non-Potable Water Date: 7/22/21
Type: Grab Time: 0645

ASD
BOD SM 5210B, EC (#) SM 9223B Confirmation, TC (#) SM 9223B, NO2-N, NO3-N, Combined NO3+NO2, NO2-N EPA 300.0, NO3-N EPA 300.0, PO4-D SM 4500P-F
Alk SM 2320B, NH3-N D6919-03, TDS SM 2540C, TKN EPA 351.2, PO4 SM 4500P-F, TOC SM 5310C, TSS SM 2540D

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

2122139-02 BZ-2S

Matrix: Non-Potable Water Date: 7/22/21
Type: Grab Time: 1115

ASD
BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B
Alk SM 2320B, NH3-N D6919-03, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

	Relinquished By	Date/Time	Received By	Date/Time
1		7/22/21 1215		7-22-21 1220
2				
3				7-22-21 1400

Received at Laboratory By

Sample Kit Prepared By:	Date/Time
JSV	6-23-21
Sample Temp (°C):	8
Samples on Ice?	Yes No NA
Approved By:	
Entered By:	

Printed: 6/22/2021 1:37:02PM

Report Template: wko WorkOrder COC ls

M.J. Reider Associates, Inc.

Client Code: 3157 **Client:** Tetra Tech

Project Manager: Richard A Wheeler **Project:** 2021 - Beltzville Reservoir

Comments:

Collected By : (Full Name) Gregory Wacik

2122139-03 BZ-3S

Matrix: Non-Potable Water Date: 7/22/21
Type: Grab Time: 0845

PO4-D SM 4500P-F, TC (#) SM 9223B, BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2

TDS SM 2540C, Alk SM 2320B, NH3-N D6919-03, PO4 SM 4500P-F, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

2122139-04 BZ-3M

Matrix: Non-Potable Water Date: 7/22/21
Type: Grab Time: 0845

BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F

Alk SM 2320B, NH3-N D6919-03, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Pl 500ml H2SO4
D - Pl 250ml NP
E - Pl 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

2122139-05 BZ-3D

Matrix: Non-Potable Water Date: 7/22/21
Type: Grab Time: 0845

BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, PO4-D SM 4500P-F, NO2-N, NO3-N, Combined NO3+NO2

Alk SM 2320B, NH3-N D6919-03, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Pl 500ml H2SO4
D - Pl 250ml NP
E - Pl 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

Relinquished By	7/22/21 1215 Date/Time	Received By	7-22-21 1225 Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	7-22-21 1400 Date/Time

Sample Kit Prepared By: JSV	Date/Time 6-23-21
Sample Temp (°C):	8
Samples on Ice?	Yes No NA
Approved By:	
Entered By:	

M.J. Reider Associates, Inc.

Client Code: 3157 **Client:** Tetra Tech

Project Manager: Richard A Wheeler **Project:** 2021 - Beltzville Reservoir

Comments:

Collected By : (Full Name) Gregory Wacik

2122139-06 BZ-4S

Matrix: Non-Potable Water Date: 7/22/21
Type: Grab Time: 1105

EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, NO3-N EPA 300.0, BOD SM 5210B, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B
NH3-N D6919-03, TOC SM 5310C, TKN EPA 351.2, PO4 SM 4500P-F, TSS SM 2540D, Alk SM 2320B, TDS SM 2540C

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

2122139-07 BZ-5S

Matrix: Non-Potable Water Date: 7/22/21
Type: Grab Time: 1045

EC (#) SM 9223B Confirmation, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B, BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0
PO4 SM 4500P-F, Alk SM 2320B, NH3-N D6919-03, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

Relinquished By	7/22/21 1215 Date/Time	Received By	7-22-21 1220 Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	7-22-21 1400 Date/Time

Sample Kit Prepared By: JV	Date/Time 6-23-21
Sample Temp (°C):	8
Samples on Ice?	Yes No NA
Approved By:	BSW
Entered By:	

Printed: 6/22/2021 1:37:02PM

Report Template: wko WorkOrder_COC ls

M.J. Reider Associates, Inc.

Client Code: 3157 **Client:** Tetra Tech

Project Manager: Richard A Wheeler **Project:** 2021 - Beltzville Reservoir

Comments:

Collected By : (Full Name) Gregory Wacik

2122139-08 BZ-6S

BOD SM 5210B, EC (#) SM 9223B Confirmation, PO4-D SM 4500P-F, TC (#) SM 9223B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2

Alk SM 2320B, NH3-N D6919-03, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water Date: 7/22/21
Type: Grab Time: 0745

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

2122139-09 BZ-6M

BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F

Alk SM 2320B, NH3-N D6919-03, TOC SM 5310C, TSS SM 2540D, TDS SM 2540C, TKN EPA 351.2, PO4 SM 4500P-F

Matrix: Non-Potable Water Date: 7/22/21
Type: Grab Time: 0745

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Pl 500ml H2SO4
D - Pl 250ml NP
E - Pl 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

2122139-10 BZ-6D

BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F

Alk SM 2320B, NH3-N D6919-03, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water Date: 7/22/21
Type: Grab Time: 0745

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Pl 500ml H2SO4
D - Pl 250ml NP
E - Pl 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

Relinquished By	7/22/21 1215 Date/Time	Received By	7-22-21 1220 Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	7-22-21 1400 Date/Time

Sample Kit Prepared By: JSV	Date/Time 6-23-21
Sample Temp (°C): 8	
Samples on Ice? Yes No NA	
Approved By:	
Entered By: RSW	

2122139

M.J. Reider Associates, Inc.

Client Code: 3157 **Client:** Tetra Tech

Project Manager: Richard A Wheeler **Project:** 2021 - Beltzville Reservoir

Comments:

Collected By : (Full Name) Gregory Wacik

2122139-11 BZ-7S

BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B
Alk SM 2320B, NH3-N D6919-03, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water Date: 7/22/21
Type: Grab Time: 0945

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

2122139-12 BZ-7M

BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F
Alk SM 2320B, NH3-N D6919-03, TDS SM 2540C, TOC SM 5310C, TSS SM 2540D, TKN EPA 351.2, PO4 SM 4500P-F

Matrix: Non-Potable Water Date: 7/22/21
Type: Grab Time: 0945

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Pl 500ml H2SO4
D - Pl 250ml NP
E - Pl 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

2122139-13 BZ-7D

PO4-D SM 4500P-F, BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2
TDS SM 2540C, TOC SM 5310C, TSS SM 2540D, Alk SM 2320B, PO4 SM 4500P-F, NH3-N D6919-03, TKN EPA 351.2

Matrix: Non-Potable Water Date: 7/22/21
Type: Grab Time: 0945

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Pl 500ml H2SO4
D - Pl 250ml NP
E - Pl 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

Relinquished By	7/22/21 1815 Date/Time	Received By	7-22-21 1220 Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	7-22-21 1400 Date/Time

Sample Kit Prepared By: JSV Date/Time: 6-23-21
Sample Temp (°C): 8
Samples on Ice? Yes No NA
Approved By:
Entered By: BSW

'The Client, by signing (or having the client's agent sign), agrees to MJRA's Terms and Conditions and to pay for the above requested services including any additional associated fees incurred.

Printed: 6/22/2021 1:37:02PM

Report Template: wko Workorder COC 18

MJRA Terms & Conditions

All samples submitted must be accompanied by signed documentation representing a Chain of Custody (COC). The COC Record acts as a contract between the client and MJRA. Signing the COC form gives approval for MJRA to perform the requested analyses and is an agreement to pay for the cost of such analyses**.** COC Records must be completed in black or blue indelible ink (must not run when wet). COC documentation begins at the time of sample collection. Client is required to document all sample details prior to releasing samples to MJRA. All samples must be placed on ice immediately after sampling and shipped or delivered to the laboratory in a manner that will maintain the sample temperature above freezing and below 6C (loose ice is preferred)**.**

Sample Submission, Sample Acceptance & Sampling Containers

Included on the COC must be the sample description, date and time of collection (including start and stop for composites), container size and type, preservative information, sample matrix, indication of whether the sample is a grab or composite, number of containers & a list of the tests to be performed. Poor sample collection technique, inappropriate sampling containers and/or improper sample preservation may lead to sample rejection. Suitable sample containers, labels, and preservatives (as applicable), along with blank COCs are provided at no additional cost.

Turnaround Times (TAT)

Average TAT for test results range from 5 to 15 working days depending on the specific analyses and time of year submitted. Faster turnaround times (*RUSH TAT) may be available depending on the current workload in a particular department and the nature of the analyses requested. We encourage you to verify requests for expedited sample results with one of our Technical Directors prior to sample submittal. Without confirmation from a Technical Director, your results may not be completed by your deadline. *RUSH TAT Surcharges are applied for expedited turnaround times.

Analytical Results, Sample Collection Integrity & Subcontracting

Analytical values are for the sample as submitted and relate only to the item tested. The value indicates a snapshot of the constituent content of the sample at the time of sample collection. Analytical results can be impacted by poor sample collection technique and/or improper preservation. All sample collection completed by MJRA was performed in accordance with applicable regulatory protocols or as specified in customer specific sampling plans. Constituent content will vary over time based on the matrix of the sample and the physical and chemical changes to its environment. All sample results and laboratory reports are strictly confidential. Results will not be available to anyone except the primary client or authorized party representing the client unless MJRA receives additional permissions from the client. When necessary, MJRA will subcontract certain analyses to a third party accredited laboratory. If client prohibits subcontracting, it must be provided in writing and include instruction on how to proceed with client samples that require third party analyses.

Payment Terms

Payment Terms are Net 30 days. Prices are subject to change without notice. A standing monthly charge of 1.5% of the clients over-30-day-unpaid balance may be added to the balance after 30 days and each month thereafter (day 31, 61, 91 etc.). The laboratory accepts all major credit cards, ACH transactions, checks and cash. New clients must pay for all services rendered prior to sample collection and/or in some cases report processing. Clients must contact the MJRA accounting department to pursue a credit-based account. MJRA reserves the right to terminate the client's credit account and to refuse to perform additional services on a credit basis if any balance is outstanding for more than 60 days.

Warranty & Litigation

MJRA does not guarantee any results of its services but has agreed to use its best efforts, in accordance with the standards and practices of the industry, to cause such results to be accurate and complete. We disclaim any other warranties, expressed or implied, including a warranty of fitness for a particular purpose and warranty of merchantability. Clients agree that they shall reimburse MJRA for any and all fees, cost and litigation expenses, including reasonable attorney fees incurred by MJRA in obtaining payment for the services rendered. All costs associated with compliance with any subpoena for documents, testimony, or any other purpose relating to work performed by MJRA, for a client, shall be paid by that client. MJRA's aggregate liability for negligent acts and omissions and of an intentional breach by MJRA will not exceed the fee paid for the services. Client agrees to indemnify and hold MJRA harmless for any and all liabilities in excess of said amount. Neither MJRA nor the client shall be liable to the other for special, incidental consequential or punitive liability or damages included but not limited to those arising from delay, loss of use, loss of profits or revenues. MJRA will not be liable to the client unless the client has notified MJRA of the discovery of the alleged negligent act, error, omissions or breach within 30 days of the day of its discovery and within one year of the date of invoice.

Reviewed and Approved by:

Richard A Wheeler
Director of Field Services

Certificate of Analysis

M.J. Reider Associates, Inc.
ENVIRONMENTAL TESTING LABORATORY
U.S. EPA/PA DEP #06-00003

Laboratory No.: 2125186
Report: 08/27/21
Lab Contact: Richard A Wheeler

Attention: David Wertz
Reported To: Tetra Tech
USACE, Phila Dist. Env.Resources Branch 100 Penn Square E.
Arlington, VA 22201

Project: 2021 - Beltzville Reservoir

Lab ID: 2125186-01 **Collected By:** Client **Sampled:** 08/19/21 06:40 **Received:** 08/19/21 13:40
Sample Desc: BZ-1S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	08/21/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	13	mg CaCO3/L		2	SM 2320 B	08/24/21	C-51i	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	08/20/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/20/21 11:31	C-37a	SWA
Nitrate as N	0.92	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	08/19/21 17:44	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/19/21 17:44	U	MRW
Nitrate+Nitrite as N	<0.93	mg/l	0.119	1.10	CALCULATED	08/19/21 17:44		MRW
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	08/24/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	08/20/21		TML
Solids, Total Dissolved	73	mg/l	4	5	SM 2540 C	08/20/21		TMH
Total Organic Carbon	1.3	mg/l	0.3	0.5	SM 5310 C	08/20/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	08/20/21		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	41	mpn/100ml	1	SM 9223 B/Quantitray	8/19/21 14:25	8/20/21 10:55		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	8/19/21 14:25	8/20/21 10:55		JMW

Lab ID: 2125186-02 **Collected By:** Client **Sampled:** 08/19/21 11:10 **Received:** 08/19/21 13:40
Sample Desc: BZ-2S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	08/21/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	14	mg CaCO3/L		2	SM 2320 B	08/24/21	C-51j	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	08/20/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/20/21 11:31	C-37a	SWA
Nitrate as N	0.47	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	08/19/21 18:01	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/19/21 18:01	U	MRW
Nitrate+Nitrite as N	<0.48	mg/l	0.119	1.10	CALCULATED	08/19/21 18:01		MRW
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	08/24/21	U	TML
Phosphorus as P, Total	0.02	mg/l	0.01	0.01	SM 4500-P F	08/20/21		TML
Solids, Total Dissolved	66	mg/l	4	5	SM 2540 C	08/20/21		TMH
Total Organic Carbon	4.0	mg/l	0.3	0.5	SM 5310 C	08/20/21		ALD
Solids, Total Suspended	22	mg/l	1	1	SM 2540 D	08/20/21		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	461	mpn/100ml	1	SM 9223 B/Quantitray	8/19/21 14:25	8/20/21 10:55		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	8/19/21 14:25	8/20/21 10:55		JMW

Lab ID: 2125186-03 **Collected By:** Client **Sampled:** 08/19/21 08:00 **Received:** 08/19/21 13:40
Sample Desc: BZ-3S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	08/21/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	10	mg CaCO3/L		2	SM 2320 B	08/24/21	C-51c	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	08/20/21	U	APR
Biochemical Oxygen Demand	2.9	mg/l	2.0	2.0	SM 5210 B	08/19/21 16:25	C-37b	SWA
Nitrate as N	0.44	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	08/19/21 18:18	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/19/21 18:18	U	MRW
Nitrate+Nitrite as N	<0.45	mg/l	0.119	1.10	CALCULATED	08/19/21 18:18		MRW
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	08/24/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	08/20/21		TML
Solids, Total Dissolved	45	mg/l	4	5	SM 2540 C	08/20/21		TMH
Total Organic Carbon	1.6	mg/l	0.3	0.5	SM 5310 C	08/20/21		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	08/20/21		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	1	mpn/100ml	1	SM 9223 B/Quantitray	8/19/21 14:25	8/20/21 10:55		JMW
Total Coliform	272	mpn/100ml	1	SM 9223 B/Quantitray	8/19/21 14:25	8/20/21 10:55		JMW

Lab ID: 2125186-04 **Collected By:** Client **Sampled:** 08/19/21 08:00 **Received:** 08/19/21 13:40
Sample Desc: BZ-3M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	08/21/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	11	mg CaCO3/L		2	SM 2320 B	08/24/21	C-51e	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	08/20/21	U	APR
Biochemical Oxygen Demand	4.0	mg/l	2.0	2.0	SM 5210 B	08/19/21 16:25	C-37b	SWA
Nitrate as N	0.59	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	08/19/21 18:34	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/19/21 18:34	U	MRW
Nitrate+Nitrite as N	<0.60	mg/l	0.119	1.10	CALCULATED	08/19/21 18:34		MRW
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	08/24/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	08/20/21		TML
Solids, Total Dissolved	72	mg/l	4	5	SM 2540 C	08/20/21		TMH
Total Organic Carbon	1.5	mg/l	0.3	0.5	SM 5310 C	08/20/21		ALD
Solids, Total Suspended	5	mg/l	1	1	SM 2540 D	08/20/21		ALD

Lab ID: 2125186-05 **Collected By:** Client **Sampled:** 08/19/21 08:00 **Received:** 08/19/21 13:40
Sample Desc: BZ-3D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	08/21/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	12	mg CaCO3/L		2	SM 2320 B	08/24/21	C-51g	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	08/20/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/19/21 16:25	C-37b	SWA
Nitrate as N	0.91	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	08/19/21 18:51	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/19/21 18:51	U	MRW
Nitrate+Nitrite as N	<0.92	mg/l	0.119	1.10	CALCULATED	08/19/21 18:51		MRW
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	08/24/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	08/20/21		TML
Solids, Total Dissolved	41	mg/l	4	5	SM 2540 C	08/20/21		TMH
Total Organic Carbon	1.2	mg/l	0.3	0.5	SM 5310 C	08/20/21		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	08/20/21		ALD

Lab ID: 2125186-06 **Collected By:** Client **Sampled:** 08/19/21 11:00 **Received:** 08/19/21 13:40
Sample Desc: BZ-4S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	08/21/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO3/L		2	SM 2320 B	08/24/21	C-511	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	08/20/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/19/21 16:25	C-37b	SWA
Nitrate as N	0.18	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	08/19/21 19:08	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/19/21 19:08	U	MRW
Nitrate+Nitrite as N	<0.19	mg/l	0.119	1.10	CALCULATED	08/19/21 19:08		MRW
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	08/24/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	08/20/21		TML
Solids, Total Dissolved	59	mg/l	4	5	SM 2540 C	08/20/21		TMH
Total Organic Carbon	1.3	mg/l	0.3	0.5	SM 5310 C	08/20/21		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	08/20/21		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	39	mpn/100ml	1	SM 9223 B/Quantitray	8/19/21 14:25	8/20/21 10:55		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	8/19/21 14:25	8/20/21 10:55		JMW

Lab ID: 2125186-07 **Collected By:** Client **Sampled:** 08/19/21 10:45 **Received:** 08/19/21 13:40
Sample Desc: BZ-5S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.02	mg/l		0.01	SM 4500-P F	08/21/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	15	mg CaCO3/L		2	SM 2320 B	08/24/21	C-51k	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	08/20/21	U	APR
Biochemical Oxygen Demand	2.3	mg/l	2.0	2.0	SM 5210 B	08/20/21 11:31	C-37a	SWA
Nitrate as N	0.77	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	08/19/21 19:25	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/19/21 19:25	U	MRW
Nitrate+Nitrite as N	<0.78	mg/l	0.119	1.10	CALCULATED	08/19/21 19:25		MRW
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	08/24/21	U	TML
Phosphorus as P, Total	0.04	mg/l	0.01	0.01	SM 4500-P F	08/20/21		TML
Solids, Total Dissolved	94	mg/l	4	5	SM 2540 C	08/20/21		TMH
Total Organic Carbon	7.1	mg/l	0.3	0.5	SM 5310 C	08/20/21		ALD
Solids, Total Suspended	32	mg/l	1	1	SM 2540 D	08/20/21		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	>2420	mpn/100ml	1	SM 9223 B/Quantitray	8/19/21 14:25	8/20/21 10:55		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	8/19/21 14:25	8/20/21 10:55		JMW

Lab ID: 2125186-08 **Collected By:** Client **Sampled:** 08/19/21 07:40 **Received:** 08/19/21 13:40
Sample Desc: BZ-6S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	08/21/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	10	mg CaCO3/L		2	SM 2320 B	08/24/21	C-51b	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	08/20/21	U	APR
Biochemical Oxygen Demand	2.7	mg/l	2.0	2.0	SM 5210 B	08/19/21 16:25	C-37b	SWA
Nitrate as N	0.45	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	08/19/21 14:21	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/19/21 14:21	U	MRW
Nitrate+Nitrite as N	<0.46	mg/l	0.119	1.10	CALCULATED	08/19/21 14:21		MRW
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	08/24/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	08/20/21		TML
Solids, Total Dissolved	49	mg/l	4	5	SM 2540 C	08/20/21		TMH
Total Organic Carbon	1.7	mg/l	0.3	0.5	SM 5310 C	08/20/21		ALD
Solids, Total Suspended	6	mg/l	1	1	SM 2540 D	08/20/21		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	<1	mpn/100ml	1	SM 9223 B/Quantitray	8/19/21 14:25	8/20/21 10:55		JMW
Total Coliform	365	mpn/100ml	1	SM 9223 B/Quantitray	8/19/21 14:25	8/20/21 10:55		JMW

Lab ID: 2125186-09 **Collected By:** Client **Sampled:** 08/19/21 07:40 **Received:** 08/19/21 13:40
Sample Desc: BZ-6M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	08/21/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	12	mg CaCO3/L		2	SM 2320 B	08/24/21	C-51h	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	08/20/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/19/21 16:20	C-37	SWA
Nitrate as N	0.94	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	08/19/21 14:38	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/19/21 14:38	U	MRW
Nitrate+Nitrite as N	<0.95	mg/l	0.119	1.10	CALCULATED	08/19/21 14:38		MRW
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	08/24/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	08/20/21		TML
Solids, Total Dissolved	88	mg/l	4	5	SM 2540 C	08/20/21		TMH
Total Organic Carbon	1.2	mg/l	0.3	0.5	SM 5310 C	08/20/21		ALD
Solids, Total Suspended	6	mg/l	1	1	SM 2540 D	08/20/21		ALD

Lab ID: 2125186-10 **Collected By:** Client **Sampled:** 08/19/21 07:40 **Received:** 08/19/21 13:40
Sample Desc: BZ-6D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	08/21/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	11	mg CaCO3/L		2	SM 2320 B	08/24/21	C-51d	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	08/20/21	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/19/21 16:25	C-37b	SWA
Nitrate as N	0.94	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	08/19/21 14:54	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/19/21 14:54	U	MRW
Nitrate+Nitrite as N	<0.95	mg/l	0.119	1.10	CALCULATED	08/19/21 14:54		MRW
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	08/24/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	08/20/21		TML
Solids, Total Dissolved	56	mg/l	4	5	SM 2540 C	08/20/21		TMH
Total Organic Carbon	1.2	mg/l	0.3	0.5	SM 5310 C	08/20/21		ALD
Solids, Total Suspended	5	mg/l	1	1	SM 2540 D	08/20/21		ALD

Lab ID: 2125186-11 **Collected By:** Client **Sampled:** 08/19/21 09:45 **Received:** 08/19/21 13:40
Sample Desc: BZ-7S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	08/21/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	10	mg CaCO3/L		2	SM 2320 B	08/24/21	C-51a	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	08/20/21	U	APR
Biochemical Oxygen Demand	2.5	mg/l	2.0	2.0	SM 5210 B	08/19/21 16:25	C-37b	SWA
Nitrate as N	0.43	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	08/19/21 15:11	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/19/21 15:11	U	MRW
Nitrate+Nitrite as N	<0.44	mg/l	0.119	1.10	CALCULATED	08/19/21 15:11		MRW
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	08/24/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	08/20/21		TML
Solids, Total Dissolved	71	mg/l	4	5	SM 2540 C	08/20/21		TMH
Total Organic Carbon	1.5	mg/l	0.3	0.5	SM 5310 C	08/20/21		ALD
Solids, Total Suspended	5	mg/l	1	1	SM 2540 D	08/20/21		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	7	mpn/100ml	1	SM 9223 B/Quantitray	8/19/21 14:25	8/20/21 10:55		JMW
Total Coliform	649	mpn/100ml	1	SM 9223 B/Quantitray	8/19/21 14:25	8/20/21 10:55		JMW

Lab ID: 2125186-12 **Collected By:** Client **Sampled:** 08/19/21 09:45 **Received:** 08/19/21 13:40
Sample Desc: BZ-7M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	08/21/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	10	mg CaCO3/L		2	SM 2320 B	08/24/21	C-51	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	08/20/21	U	APR
Biochemical Oxygen Demand	2.5	mg/l	2.0	2.0	SM 5210 B	08/19/21 16:20	C-37	SWA
Nitrate as N	0.44	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	08/19/21 15:28	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/19/21 15:28	U	MRW
Nitrate+Nitrite as N	<0.45	mg/l	0.119	1.10	CALCULATED	08/19/21 15:28		MRW
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	08/24/21	U	TML
Phosphorus as P, Total	1.23	mg/l	0.01	0.01	SM 4500-P F	08/20/21		TML
Solids, Total Dissolved	82	mg/l	4	5	SM 2540 C	08/20/21		TMH
Total Organic Carbon	1.4	mg/l	0.3	0.5	SM 5310 C	08/20/21		ALD
Solids, Total Suspended	7	mg/l	1	1	SM 2540 D	08/20/21		ALD

Lab ID: 2125186-13 **Collected By:** Client **Sampled:** 08/19/21 09:45 **Received:** 08/19/21 13:40
Sample Desc: BZ-7D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	08/21/21	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	12	mg CaCO3/L		2	SM 2320 B	08/24/21	C-51f	APR
Ammonia as N	<0.05	mg/l	0.05	0.10	ASTM D6919-03	08/20/21	U	APR
Biochemical Oxygen Demand	2.3	mg/l	2.0	2.0	SM 5210 B	08/19/21 16:20	C-37	SWA
Nitrate as N	0.61	mg/l	0.10	1.00	EPA 300.0 Rev 2.1	08/19/21 15:45	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/19/21 15:45	U	MRW
Nitrate+Nitrite as N	<0.62	mg/l	0.119	1.10	CALCULATED	08/19/21 15:45		MRW
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2	08/24/21	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	08/20/21		TML
Solids, Total Dissolved	33	mg/l	4	5	SM 2540 C	08/20/21		TMH
Total Organic Carbon	1.3	mg/l	0.3	0.5	SM 5310 C	08/20/21		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	08/20/21		ALD

Preparation Methods

Specific Method	Preparation Method	Prep Batch	Prepared Date	Prepared By
2125186-01				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1H1142	08/19/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1H1195	08/20/2021	TML
2125186-02				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1H1142	08/19/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1H1195	08/20/2021	TML
2125186-03				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1H1142	08/19/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1H1195	08/20/2021	TML
2125186-04				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1H1142	08/19/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1H1195	08/20/2021	TML
2125186-05				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1H1142	08/19/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1H1195	08/20/2021	TML
2125186-06				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1H1142	08/19/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1H1195	08/20/2021	TML
2125186-07				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1H1142	08/19/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1H1195	08/20/2021	TML
2125186-08				
Dissolved General Chemistry				

SM 4500-P F	SM 4500-P B	B1H1142	08/19/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1H1195	08/20/2021	TML
2125186-09				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1H1142	08/19/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1H1195	08/20/2021	TML
2125186-10				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1H1142	08/19/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1H1195	08/20/2021	TML
2125186-11				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1H1142	08/19/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1H1195	08/20/2021	TML
2125186-12				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1H1142	08/19/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1H1195	08/20/2021	TML
2125186-13				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B1H1142	08/19/2021	TML
General Chemistry				
SM 4500-P F	SM 4500-P B	B1H1195	08/20/2021	TML

Notes and Definitions

C-37	The dissolved oxygen depletion for the dilution water blank was greater than 0.20mg/L at 0.27 mg/L.
C-37a	The dissolved oxygen depletion for the dilution water blank was greater than 0.20mg/L at 0.35mg/L.
C-37b	The dissolved oxygen depletion for the dilution water blank was greater than 0.20mg/L at 0.57 mg/L.
C-51	The alkalinity to pH 4.2 = 10.2 mg CaCO3/L.
C-51a	The alkalinity to pH 4.2 = 10.3 mg CaCO3/L.
C-51b	The alkalinity to pH 4.2 = 10.4 mg CaCO3/L.
C-51c	The alkalinity to pH 4.2 = 10.5 mg CaCO3/L.
C-51d	The alkalinity to pH 4.2 = 10.8 mg CaCO3/L.
C-51e	The alkalinity to pH 4.2 = 11.4 mg CaCO3/L.
C-51f	The alkalinity to pH 4.2 = 11.7 mg CaCO3/L.
C-51g	The alkalinity to pH 4.2 = 11.8 mg CaCO3/L.
C-51h	The alkalinity to pH 4.2 = 12.0 mg CaCO3/L.
C-51i	The alkalinity to pH 4.2 = 12.7 mg CaCO3/L.
C-51j	The alkalinity to pH 4.2 = 14.2 mg CaCO3/L.
C-51k	The alkalinity to pH 4.2 = 14.9 mg CaCO3/L.
C-51l	The alkalinity to pH 4.2 = 6.6 mg CaCO3/L.
G-11	The sample was filtered after it was received at the laboratory.
G-17	The sample was preserved in the laboratory.
J	Estimated value
U	Analyte was not detected above the indicated value.

M.J. Reider Associates, Inc.
107 Angelica St, Reading PA, 19611
610-374-5129 www.mjreider.com

WORK ORDER
Chain of Custody

2125186

Client Code: 3157
Client: Tetra Tech
Project Manager: Richard A Wheeler
Project: 2021 - Beltzville Reservoir
Report To: Tetra Tech - David Wertz - USACE, Phila Dist. Env.Resources Branch 100 Penn Square E., Arlington, VA 22201
Invoice To: Tetra Tech - David Wertz - USACE, Phila Dist. Env.Resources Branch 100 Penn Square E., Arlington, VA 22201

Collected By : (Full Name) Gregory Wacik

Comments:

2125186-01 BZ-1S

Matrix: Non-Potable Water
Type: Grab
Date: 8/19/21
Time: 0640

BOD SM 5210B, EC (#) SM 9223B Confirmation, NO3-N EPA 300.0, NO2-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, TC (#) SM 9223B, PO4-D SM 4500P-F
Alk SM 2320B, NH3-N D6919-03, TDS SM 2540C, TKN EPA 351.2, PO4 SM 4500P-F, TOC SM 5310C, TSS SM 2540D

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

2125186-02 BZ-2S

Matrix: Non-Potable Water
Type: Grab
Date: 8/19/21
Time: 1110

EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B, BOD SM 5210B
NH3-N D6919-03, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D, Alk SM 2320B

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

Relinquished By	8/19/21 1130 Date/Time	Received By	8/19/21 1135 Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	8/19-21 1340 Date/Time

Sample Kit Prepared By:	Date/Time
JBW	7/19/21
Sample Temp (°C):	4
Samples on Ice?	Yes No NA
Approved By:	JBS
Entered By:	

The Client, by signing (or having the client's agent sign), agrees to MJRA's Terms and Conditions and to pay for the above requested services including any additional associated fees incurred.

Printed: 7/15/2021 9:32:04AM

Report Template: wko WorkOrder COC 1s

M.J. Reider Associates, Inc.

2125186

Client Code: 3157 **Client:** Tetra Tech

Project Manager: Richard A Wheeler **Project:** 2021 - Beltzville Reservoir

Comments:

Collected By : (Full Name) Gregory Wacik

2125186-03 BZ-3S

PO4-D SM 4500P-F, BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, TC (#) SM 9223B
Alk SM 2320B, NH3-N D6919-03, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water Date: 8/19/21
Type: Grab Time: 0800

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

2125186-04 BZ-3M

BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F
Alk SM 2320B, NH3-N D6919-03, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water Date: 8/19/21
Type: Grab Time: 0800

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Pl 500ml H2SO4
D - Pl 250ml NP
E - Pl 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

2125186-05 BZ-3D

BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F
Alk SM 2320B, NH3-N D6919-03, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D, PO4 SM 4500P-F

Matrix: Non-Potable Water Date: 8/19/21
Type: Grab Time: 0800

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Pl 500ml H2SO4
D - Pl 250ml NP
E - Pl 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

	Date/Time		Date/Time
Relinquished By	8/19/21 1130	Received By	8-19-21 1135
Relinquished By		Received By	
Relinquished By		Received at Laboratory By	8-19-21 1340

Sample Kit Prepared By:	Date/Time
VBW	7/19/21
Sample Temp (°C):	4
Samples on Ice?	Yes No NA
Approved By:	
Entered By:	

The Client, by signing (or having the client's agent sign), agrees to MJRA's Terms and Conditions and to pay for the above requested services including any additional associated fees incurred.

Printed: 7/15/2021 9:32:04AM

Report Template: wko WorkOrder COC ls

M.J. Reider Associates, Inc.

2125186

Client Code: 3157 **Client:** Tetra Tech

Project Manager: Richard A Wheeler **Project:** 2021 - Beltzville Reservoir

Collected By : (Full Name) Gregory Wacik **Comments:**

2125186-06 BZ-4S

NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, BOD SM 5210B, EC (#) SM 9223B Confirmation, TC (#) SM 9223B
PO4 SM 4500P-F, TSS SM 2540D, Alk SM 2320B, NH3-N D6919-03, TDS SM 2540C, TOC SM 5310C, TKN EPA 351.2

Matrix: Non-Potable Water Date: 8/19/21
Type: Grab Time: 1100

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

2125186-07 BZ-5S

BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B, NO2-N EPA 300.0, NO3-N EPA 300.0
Alk SM 2320B, PO4 SM 4500P-F, NH3-N D6919-03, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water Date: 8/19/21
Type: Grab Time: 1045

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

Relinquished By	8/19/21 1130 Date/Time	Received By	81921 1135 Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	819-21 1340 Date/Time

Sample Kit Prepared By:	Date/Time
VBa	7/9/21
Sample Temp (°C):	4
Samples on Ice?	Yes No NA
Approved By:	
Entered By:	

The Client, by signing (or having the client's agent sign), agrees to MJRA's Terms and Conditions and to pay for the above requested services including any additional associated fees incurred.

Printed: 7/15/2021 9:32:04AM

Report Template: wko WorkOrder COC ls

M.J. Reider Associates, Inc.

2125186

Client Code: 3157 **Client:** Tetra Tech

Project Manager: Richard A Wheeler **Project:** 2021 - Beltzville Reservoir

Comments:

Collected By : (Full Name) Gregory Wacik

2125186-11 BZ-7S

BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B
Alk SM 2320B, NH3-N D6919-03, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water Date: 8/19/21
Type: Grab Time: 0945

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

2125186-12 BZ-7M

BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F
Alk SM 2320B, NH3-N D6919-03, TDS SM 2540C, TOC SM 5310C, TSS SM 2540D, TKN EPA 351.2, PO4 SM 4500P-F

Matrix: Non-Potable Water Date: 8/19/21
Type: Grab Time: 0945

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Pl 500ml H2SO4
D - Pl 250ml NP
E - Pl 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

2125186-13 BZ-7D

PO4-D SM 4500P-F, BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2
TDS SM 2540C, Alk SM 2320B, PO4 SM 4500P-F, NH3-N D6919-03, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water Date: 8/19/21
Type: Grab Time: 0945

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Pl 500ml H2SO4
D - Pl 250ml NP
E - Pl 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

Relinquished By	8/19/21 1130 Date/Time	Received By	8-19-21 1135 Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	8-19-21 1340 Date/Time

Sample Kit Prepared By:	Date/Time
VB	7/19/21
Sample Temp (°C):	4
Samples on Ice?	Yes No NA
Approved By:	
Entered By:	

Printed: 7/15/2021 9:32:04AM

Report Template: wko_WorkOrder_COC_ts

MJRA Terms & Conditions

All samples submitted must be accompanied by signed documentation representing a Chain of Custody (COC). The COC Record acts as a contract between the client and MJRA. Signing the COC form gives approval for MJRA to perform the requested analyses and is an agreement to pay for the cost of such analyses**.** COC Records must be completed in black or blue indelible ink (must not run when wet). COC documentation begins at the time of sample collection. Client is required to document all sample details prior to releasing samples to MJRA. All samples must be placed on ice immediately after sampling and shipped or delivered to the laboratory in a manner that will maintain the sample temperature above freezing and below 6C (loose ice is preferred)**.**

Sample Submission, Sample Acceptance & Sampling Containers

Included on the COC must be the sample description, date and time of collection (including start and stop for composites), container size and type, preservative information, sample matrix, indication of whether the sample is a grab or composite, number of containers & a list of the tests to be performed. Poor sample collection technique, inappropriate sampling containers and/or improper sample preservation may lead to sample rejection. Suitable sample containers, labels, and preservatives (as applicable), along with blank COCs are provided at no additional cost.

Turnaround Times (TAT)

Average TAT for test results range from 5 to 15 working days depending on the specific analyses and time of year submitted. Faster turnaround times (*RUSH TAT) may be available depending on the current workload in a particular department and the nature of the analyses requested. We encourage you to verify requests for expedited sample results with one of our Technical Directors prior to sample submittal. Without confirmation from a Technical Director, your results may not be completed by your deadline. *RUSH TAT Surcharges are applied for expedited turnaround times.

Analytical Results, Sample Collection Integrity & Subcontracting

Analytical values are for the sample as submitted and relate only to the item tested. The value indicates a snapshot of the constituent content of the sample at the time of sample collection. Analytical results can be impacted by poor sample collection technique and/or improper preservation. All sample collection completed by MJRA was performed in accordance with applicable regulatory protocols or as specified in customer specific sampling plans. Constituent content will vary over time based on the matrix of the sample and the physical and chemical changes to its environment. All sample results and laboratory reports are strictly confidential. Results will not be available to anyone except the primary client or authorized party representing the client unless MJRA receives additional permissions from the client. When necessary, MJRA will subcontract certain analyses to a third party accredited laboratory. If client prohibits subcontracting, it must be provided in writing and include instruction on how to proceed with client samples that require third party analyses.

Payment Terms

Payment Terms are Net 30 days. Prices are subject to change without notice. A standing monthly charge of 1.5% of the clients over-30-day-unpaid balance may be added to the balance after 30 days and each month thereafter (day 31, 61, 91 etc.). The laboratory accepts all major credit cards, ACH transactions, checks and cash. New clients must pay for all services rendered prior to sample collection and/or in some cases report processing. Clients must contact the MJRA accounting department to pursue a credit-based account. MJRA reserves the right to terminate the client's credit account and to refuse to perform additional services on a credit basis if any balance is outstanding for more than 60 days.

Warranty & Litigation

MJRA does not guarantee any results of its services but has agreed to use its best efforts, in accordance with the standards and practices of the industry, to cause such results to be accurate and complete. We disclaim any other warranties, expressed or implied, including a warranty of fitness for a particular purpose and warranty of merchantability. Clients agree that they shall reimburse MJRA for any and all fees, cost and litigation expenses, including reasonable attorney fees incurred by MJRA in obtaining payment for the services rendered. All costs associated with compliance with any subpoena for documents, testimony, or any other purpose relating to work performed by MJRA, for a client, shall be paid by that client. MJRA's aggregate liability for negligent acts and omissions and of an intentional breach by MJRA will not exceed the fee paid for the services. Client agrees to indemnify and hold MJRA harmless for any and all liabilities in excess of said amount. Neither MJRA nor the client shall be liable to the other for special, incidental consequential or punitive liability or damages included but not limited to those arising from delay, loss of use, loss of profits or revenues. MJRA will not be liable to the client unless the client has notified MJRA of the discovery of the alleged negligent act, error, omissions or breach within 30 days of the day of its discovery and within one year of the date of invoice.

Reviewed and Approved by:

Richard A Wheeler
Director of Field Services