2016 WATER QUALITY MONITORING BELTZVILLE RESERVOIR LEHIGHTON, PENNSYLVANIA



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

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1.0 INTRODUCTION

1.1 PURPOSE OF THE MONITORING PROGRAM

The U.S. Army Corps of Engineers (USACE) manages 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 12 May to 14 September 2016.

1.2 DESCRIPTION OF BELTZVILLE RESERVOIR

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

1.3 ELEMENTS OF THE STUDY

The USACE, Philadelphia District, has been monitoring the water quality of Beltzville Reservoir since 1975. Over this time, the yearly monitoring designs have evolved to address new concerns such as the health of public drinking water and contamination of reservoir bottom sediments. The 2016 monitoring program included the following major elements:

- Monthly water quality and bacteria surface water monitoring of reservoir and upstream sources to evaluate compliance with Pennsylvania state water quality standards and to evaluate the health of the reservoir ecosystem starting on 12 May and ending on 14 September 2016; and
- Monthly profile samples for temperature, dissolved oxygen, chlorophyll a, pH, turbidity, and conductivity at all stations in the reservoir and watershed.

2.0 METHODS

2.1 STRATIFICATION MONITORING

Physical stratification monitoring of the water column was conducted five times at Beltzville Reservoir between 12 May and 14 September 2016 (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 source waters (BZ-2S on Pine Run, BZ-4S on Wild Creek, and BZ-5S on Pohopoco Creek) and BZ-1S downstream of the reservoir on Pohopoco Creek. The physical water quality parameters were measured with a calibrated YSI 6600 V2-4 water quality probe. For this report, all of the stratification monitoring results were summarized and compared to water quality standards enacted by the Pennsylvania Department of Environmental Protection (PADEP), where applicable.

2.2 WATER COLUMN CHEMISTRY MONITORING

Water column chemistry monitoring was conducted five times (once a month) at Beltzville Reservoir between 12 May and 14 September 2016 (Table 2-1). Water samples were collected at the seven fixed stations in the reservoir watershed (Fig. 2-1). Surface water samples were collected in release waters downstream of the reservoir (BZ-1S) and on upstream tributary sources Pine Run (BZ-2S), Wild Creek (BZ-4S), and Pohopoco Creek (BZ-5S). Surface, middle, and bottom water samples were collected at three reservoir stations (BZ-3, BZ-6, and BZ-7). Surface water samples were collected by opening sample containers approximately 1 foot below the water's surface. Middle and bottom water samples were collected with a Van Dorn design horizontal water bottle. MJ Reider Associates in Reading, Pennsylvania conducted the laboratory water sample analysis for 2016.

Water samples from all depths were analyzed for ammonia, nitrite, nitrate, total Kjeldahl nitrogen, total phosphorus, ortho-phosphate, 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.

Date of Sample Collection	Physical Stratification Monitoring (All Stations)	Water Column Chemistry Monitoring (All Stations)	BTEX Monitoring ⁽²⁾ (BZ-3 and -6)	Trophic State Assessment ⁽³⁾ (BZ-6)	Coliform Bacteria Monitoring (All Surface Stations)	Drinking Water Monitoring ⁽¹⁾
12 May	Х	Х		Insufficient data	Х	
08 June	х	Х		Insufficient data	Х	
20 July	х	х		Х	Х	
18 August	х	Х		Х	Х	
14 September	Х	Х		Х	Х	

(3) Equipment failure. Chlorophyll a was not collected in two sampling events and is needed for trophic state calculation.

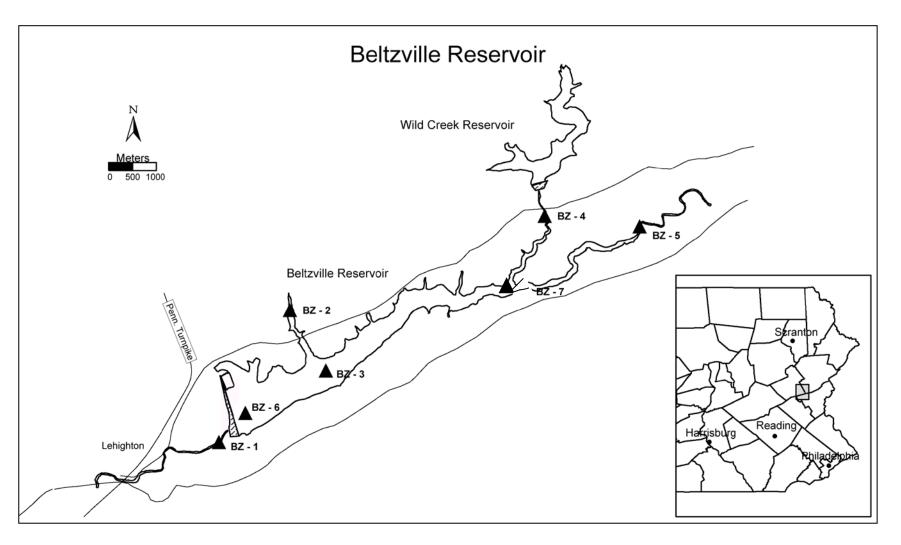


Figure 2-1. Beltzville Reservoir and the location of water quality monitoring stations in 2016.

			, state regulatory ci monitored at Beltzv	
Parameter	(2) Method	Reporting Limit	PADEP Surface Water Quality Criteria	Allowable Hold Times (Days)
Total Alkalinity	SM20 2320B	1.0 mg/L	Min. 20 mg/L CaCO₃	14
Biochemical Oxygen Demand (BOD)	SM20 5210B	2.0 mg/L	None	2
Total Phosphorus	SM20 4500-PE	0.01 mg/L	None	28
Diss./Ortho-Phosphate	SM20 4500-PE	0.01 mg/L	None	28
Soluble Phosphorus	SM-20 4500-PE	0.05 mg/L	None	28
Total Organic Carbon (TOC)	SM-20 5310C	1.0 mg/L	None	28
Total Inorganic Carbon (TIC) *	SM-20 5310B	NA	None	28
Total Carbon (TOC + TIC) *	SM-20 5310B	NA	None	28
(1) Chlorophyll a	YSI Probe		None	In Sltu
Total Kjeldahl Nitrogen	351.2 MCAWW	0.25 mg/L	None	28
Ammonia	D6919-03	0.05 mg/L	Temp. and pH dependent	28
Nitrate	MCAWW 353.2	0.05 mg/L	Maximum	28
Nitrite	MCAWW 353.2	0.05 mg/L	10 mg/L (nitrate + nitrite)	28
Total Dissolved Solids	SM20 2540C	5.0 mg/L	Maximum 750 mg/L	7
Total Suspended Solids	SM20 2540D	3.0 mg/L	None	7

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

(2) Laboratory Methods Reference:

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

SM-20- "Standard Methods for the Examination of Water and Wastewater", 22nd Edition, 2012. **SW846**- "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods", 3rd. Edition,

November 1986 and updates.

* Total Inorganic Carbon and Total Carbon were not sampled for in 2016

2.3 TROPHIC STATE DETERMINATION

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

2.4 RESERVOIR BACTERIA MONITORING

Monitoring for coliform bacteria contaminants was conducted five times at Beltzville Reservoir between 12 May and 14 September 2016 (Table 2-1). Surface water samples were collected at all seven stations and analyzed for total coliform and fecal coliform. The samples were collected in the same manner as the chemistry samples or approximately 1-foot below the surface of the water. Table 2-3 presents the test methods, detection limits, PADEP standards, and sample holding times for the bacteria parameters monitored at Beltzville Reservoir in 2016. The bacteria analytical method was based on a membrane filtration technique. All of the samples were analyzed within their maximum allowable hold times.

Table 2-3. Water quality test methods, detection limits, PADEP standards, and sample holding times for bacteria parameters monitored at Beltzville Reservoir in 2016.												
Parameter	Total Coliform/E-coli	Fecal Coliform										
Test method	SM 9223B	SM9222D										
Detection limit	1 clns/100-mls	2 clns/100-mls										
PADEP standard	None	Geometric mean < 200 clns/100-mls or a single sample reading of < 1000 clns/100-mls										
Maximum allowable holdir time	ig 30 hours	30 hours										
Achieved holding time	< 30 hours	< 30 hours										

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

3.0 RESULTS AND DISCUSSION

3.1 STRATIFICATION MONITORING

The following sections summarize the water quality monitoring results of the physical and chemical parameters: temperature, dissolved oxygen, and pH. Seasonal and spatial patterns of surface water quality measured throughout the reservoir watershed, and seasonal and depth related patterns of the stratified lake water column based on measures from the deepest portion of the reservoir (station BZ-6 or the "Tower") are described. The discussion of stratification is focused on this station as water quality problems related to depth are generally most severe in deeper water habitats. Corps personnel collected the physical and chemical water quality data discussed herein over the monitoring period from May to September 2016. All of the parameters were measured with a calibrated YSI 6600 V2-4 water quality probe and are presented in Appendix A.

3.1.1 Temperature

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

Temperatures of the tributary and downstream release surface waters generally followed a similar seasonal pattern throughout the watershed of Beltzville Reservoir during 2016 with maximum surface water temperatures seen in July and August (Fig. 3-1). The maximum upstream tributary station temperature of 25.50 °C was seen at station BZ-4S on 18 August and station BZ-5S on 20 July. The maximum downstream release (BZ-1S) surface water temperature was 13.54 °C on 18 August. Upstream and downstream waters have a variety of environmental and anthropogenic factors potentially influencing surface water temperature. Station BZ-1S is directly influenced by Beltzville Reservoir releases that come from various locations in the water column and is dictated by reservoir release operations. Downstream release temperatures are managed to meet Pennsylvania State High Quality Cold Water Fishery standards. Station BZ-2S is a small well vegetated cold water tributary. Station BZ-4S is influenced by Wild Creek Reservoir releases upstream of Beltzville Reservoir and maintained the highest average tributary surface water temperatures throughout the sampling season. Station BZ-5S is located in an open water area were Pohopoco Creek enters Beltzville Reservoir. These factors, amongst others, result in the temperature variations in surface water temperatures at each tributary station shown in Figure 3.1.

Beltzville Reservoir was stratified with respect to temperature in 2016 (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 with surface temperatures (13.38°C) approximately 6.37°C warmer than the lower water column (7.01°C). A strong stratification pattern was evident from early June into September. In September, cooling surface temperatures and erosion of the epiliminion marked the onset of fall turnover within the reservoir.

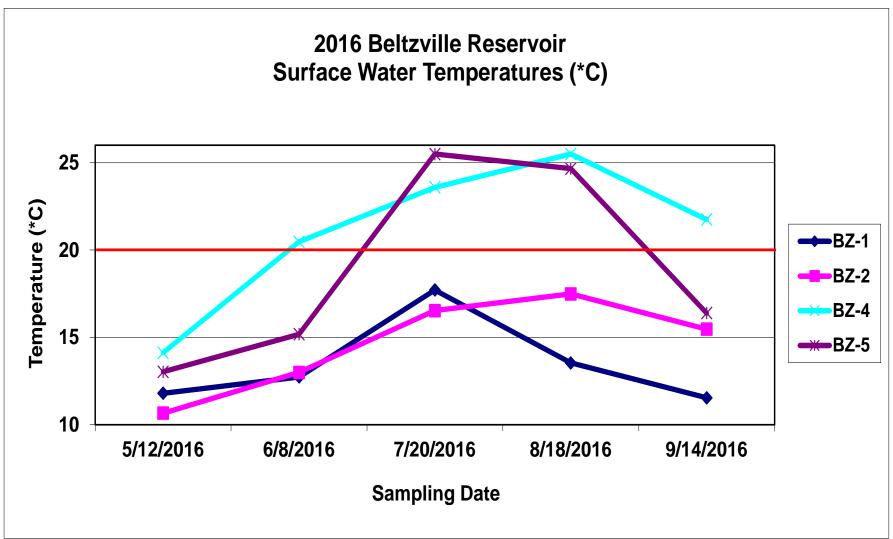


Figure 3-1. Tributary and downstream surface water temperature (°C) measured at Beltzville Reservoir in 2016. See Appendix A for Summary of plotted values. Station BZ-1 reflects releases surface water temperatures downstream of Beltzville Reservoir. The coldwater species preference temperature of 20°C is shown as a red line reference.

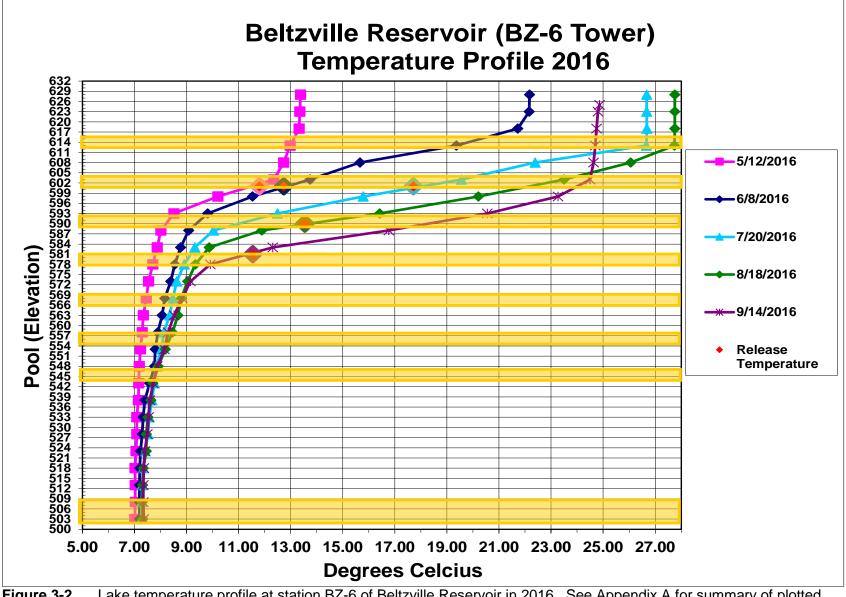


Figure 3-2. Lake temperature profile at station BZ-6 of Beltzville Reservoir in 2016. See Appendix A for summary of plotted values. The yellow bars represent the locations of water control gates in the Beltzville Reservoir control tower. Corresponding downstream release water temperatures at Station BZ-1S on each sampling date is also presented.

3.1.2 Dissolved Oxygen

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

Dissolved oxygen (DO) in the tributary and release surface waters remained primarily within an 8-11 mg/L range of values and followed a similar seasonal pattern throughout the watershed of Beltzville Reservoir during 2016 (Fig. 3-3). The exception to this pattern was seen at station BZ-5S. A greater swing in DO levels was seen at this station as a potential result of low flow conditions during the summer with an increase in algal productivity in July and subsequent algal die off in August. Dissolved oxygen concentrations downstream of the reservoir (BZ-1S) and at the upstream tributary stations (BZ-2S, -4S, -5S) averaged 9.56 mg/L for the sampling season. The maximum DO reading of 12.71 mg/L occurred at BZ-5S on 20 July and a minimum reading of 7.15 mg/L occurred at BZ-5S on 18 August.

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

DO concentrations in the water column of Beltzville Reservoir were in compliance with PADEP water quality standards during 2016. The state water quality standard for DO is a minimum concentration of 5-mg/L in the epilimnion of stratified lakes. As shown in Figure 3-4, concentrations falling below the standard were encountered in August and September, but were located below the epilimnion. DO concentrations measured in all surface waters of the reservoir were in compliance with the standard.

The health of aquatic ecosystems is impaired by low DO concentrations in the water column. Hypoxia, or conditions of DO less than 2 mg/L, is generally accepted as the threshold at which the most severe effects on biota occur. Bottom waters that are not mixed during stratification are depleted of oxygen primarily through biological respiration. In 2016, these conditions were seen in the water column at station BZ-6 in September (Appendix A).

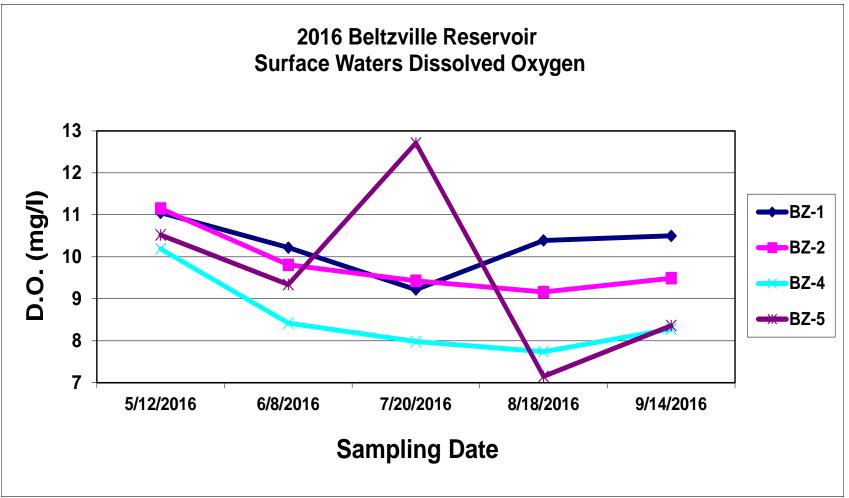


Figure 3-3. Dissolved oxygen concentrations measured in tributary and downstream surface waters at Beltzville Reservoir in 2016. (The PADEP water quality standard for dissolved oxygen is a minimum concentration of 5 mg/L.) See Appendix A for summary of plotted values. Station BZ-1S reflects reservoir release surface waters downstream of Beltzville Reservoir.

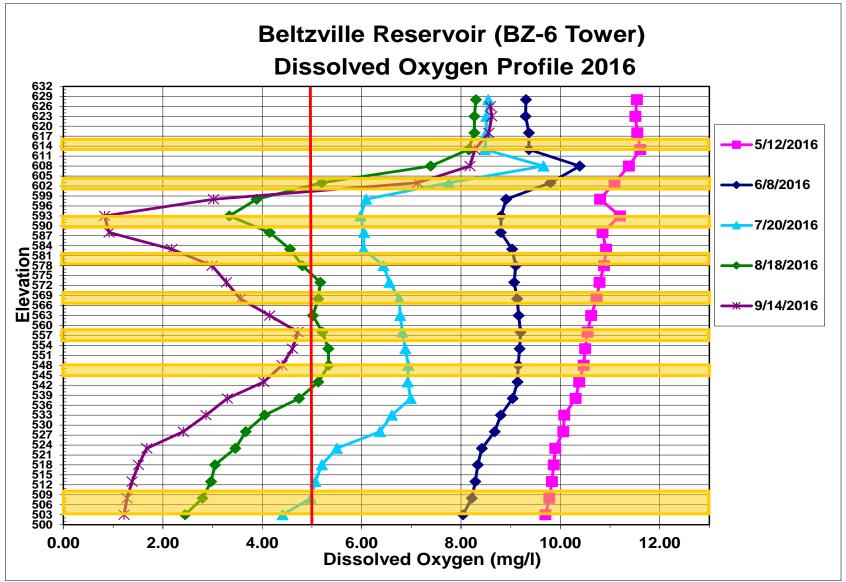


Figure 3-4. Dissolved oxygen profile at station BZ-6 of Beltzville Reservoir in 2016. (The PADEP water quality standard for DO is a minimum concentration of 5 mg/L.) See Appendix A for summary of plotted values.

3.1.3 pH

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

Measures of pH at upstream tributary (BZ-2S, BZ-4S and BZ-5S) and release (BZ-1S) surface water stations primarily stayed within a tight range of values and followed a similar seasonal pattern at Beltzville Reservoir during 2016 (Fig. 3-5). A spike in pH (9.49) at station BZ-5S on 20 July was likely the result of low flow conditions and increased algal productivity at that time. The minimum pH value of 6.41 was recorded at station BZ-1S on 14 September.

In all months sampled in 2016, pH values in the lake water column were slightly higher near the water surface, declined rapidly, and remained relatively constant or slightly increasing throughout most of the remaining water column (Fig. 3-6). The higher pH readings near the surface can be attributed to algal productivity in the trophic zone of the lake. A slight increase in pH in bottom waters occurred in the portions of the water column experiencing anoxic or low oxygen conditions. This increase in pH may be attributed to anaerobic oxidation processes in the bottom waters of the lake. The pH measures at all but one lake and tributary station at Beltzville Reservoir during 2016 were in compliance with PADEP pH criteria. A spike in pH (9.49) at station BZ-5S on 20 July was likely the result of low flow conditions and increased algal productivity at that time. The standard for pH is a range of acceptable measures between 6 and 9.

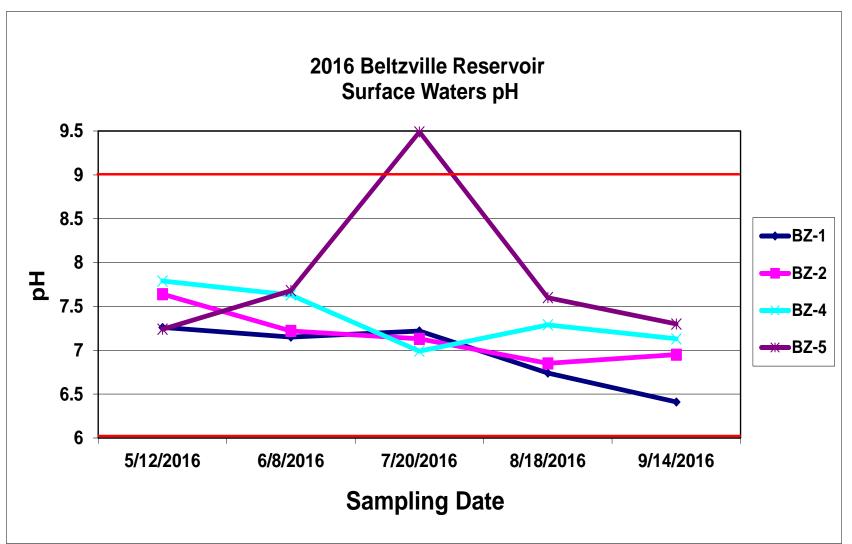


Figure 3-5. pH concentrations measured in tributary and downstream surface waters at Beltzville Reservoir in 2016. (The PADEP water quality standard for pH is between 6 and 9) See Appendix A for summary of plotted values.

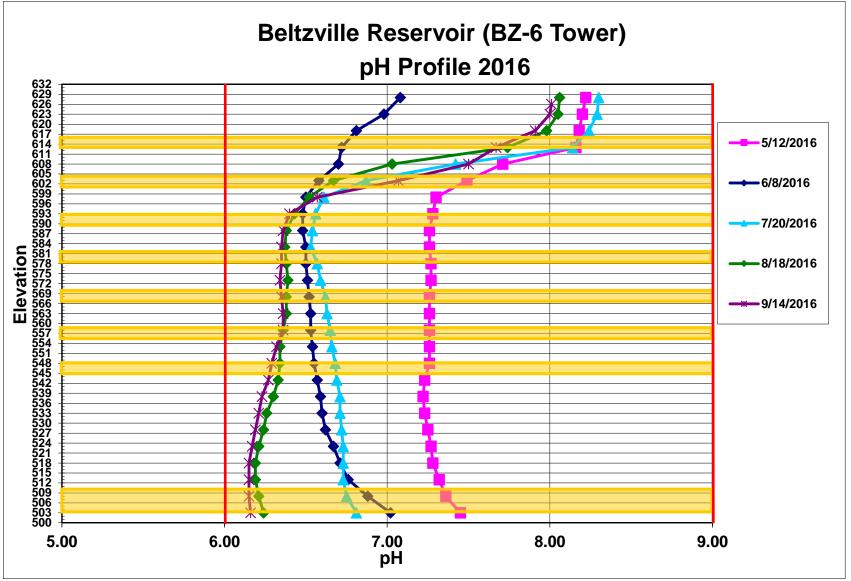


Figure 3-6. pH profile at station BZ-6 of Beltzville Reservoir in 2016. (The PADEP water quality standard for pH is between 6 and 9) See Appendix A for summary of plotted value

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 2016 (Table 3-2).

3.2.1 Ammonia

Total Ammonia (NH3) is a measure of the most reduced inorganic form of nitrogen in water and includes dissolved ammonia and the ammonium ion. Ammonia is a small component of the nitrogen cycle but as an essential plant nutrient, it contributes to the trophic status of a water body. Elevated ammonia in the lower water column of deep, stratified lakes and reservoirs usually results in those that are affected by eutrophication. Excess ammonia contributes to eutrophication of water bodies. This can result in excessive algal growths and impacts on recreation and drinking water supplies. In high concentrations, ammonia is toxic to aquatic life.

Ammonia concentrations were low in Beltzville Reservoir during 2016. With the exception of one sample, concentrations measured at all stations and depths were less than the laboratory reporting limit of 0.05 mg/L during the entire sampling season and at all stations and depths. The single recorded sample of 0.12 mg/L was collected from station BZ-7B on 14 September. Concentrations of ammonia measured at Beltzville Reservoir were in compliance with the PADEP water quality standards during 2016. The state water quality standard for ammonia is dependent on temperature and pH (Table 3-1).

Table 3-1. P	Table 3-1. PADEP ammonia nitrogen criteria (Pennsylvania Code, Title 25, Chapter 93,											
19	996). Specific amr	nonia criteria dep	pendent on tempe	erature and pH	(mg/L)							
PH	10 °C	15 °C	20 °C	25 °C	30 °C							
6.50	25.5	17.4	12.0	8.4	5.9							
6.75	23.6	16.0	11.1	7.7	5.5							
7.00	20.6	14.0	9.7	6.8	4.8							
7.25	16.7	11.4	7.8	5.5	3.9							
7.50	12.4	8.5	5.9	4.1	2.9							
7.75	8.5	5.8	4.0	2.8	2.0							
8.00	5.5	5.8	4.0	2.8	2.0							
8.25	3.4	2.3	1.6	1.2	0.9							
8.50	2.0	1.4	1.0	0.7	0.6							
8.75	1.2	0.9	0.6	0.5	0.4							
9.00	0.8	0.5	0.4	0.3	0.3							
9.25	0.36	0.24	0.17	0.12	0.08							
9.50	0.20	0.13	0.10	0.07	0.05							

Table 3.2.	Summary of s	urface, n	niddle, an	d bottom	water qu	ality mo	nitoring	data for]	Beltzville	Reservo	ir in 201	6	
Station	Date	ALK	BOD5	DISS-P	NH3	NO2	NO3	PO4	TDS	TKN	TOC	TP	TSS
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	5/12/2016	11	<2	<.05	<.05	<.05	0.64	<.01	126	0.3	2	<.01	<3
	6/8/2016	10	<2	<.05	<.05	<.05	0.56	<.01	24	0.55	1.5	<.01	<3
	7/20/2016	53	<2	<.05	<.05	<.05	0.63	<.01	56	0.45	1.7	<.01	102
BZ-1S	8/18/2016	12	<2	0.2	<.05	<.05	0.69	<.01	47	0.32	1.6	0.2	<3
_	9/14/2016	12	<2	<.05	<.05	<.05	0.66	<.01	36	<.25	1.1	<.01	<3
	Mean	20	2	0.08	0.05	0.05	0.64	0.01	58	0.37	1.6	0.05	23
	Stdev	19	0	0.07	0	0	0.05	0.00	40	0.12	0.3	0.08	44
	Max	53	2	0.2	0.05	0.05	0.69	0.01	126	0.55	2	0.2	102
	Min	10	2	0.05	0.05	0.05	0.56	0.01	24	0.25	1.1	0.01	3
	No. of Det	5	0	1	0	0	5	0	5	4	5	1	1
	5/12/2016	7	<2	<.05	<.05	<.05	0.14	<.01	144	<.25	<1	<.01	3
	6/8/2016	7	<2	<.05	<.05	<.05	0.22	<.01	17	0.37	1	<.01	57
	7/20/2016	51	<2	<.05	<.05	<.05	0.24	0.01	49	<.25	<1	<.01	<3
	8/18/2016	11	<2	0.37	<.05	<.05	0.45	<.01	33	<.25	<1	0.4	<3
D7 19	9/14/2016	12	<2	<.05	<.05	<.05	0.28	<.01	30	<.25	<1	<.01	<3
BZ-2S	Mean	18	2	0.11	0.05	0.05	0.27	0.01	55	0.27	1	0.09	14
	Stdev	19	0	0.14	0	0	0.11	0.00	51	0.05	0.0	0.17	24
	Max	51	2	0.37	0.05	0.05	0.45	0.01	144	0.37	1	0.4	57
	Min	7	2	0.05	0.05	0.05	0.14	0.01	17	0.25	1	0.01	3
	No. of Det	5	0	1	0	0	5	1	5	1	1	1	2

Table 3.2 (Continued. Su	mmary o	f surface	, middle, a	nd botto	m water	quality n	nonitorin	i <mark>g data f</mark> o	or Beltzvi	lle Rese	rvoir in 20)16
		ALK	BOD5	DISS-P	NH3	NO2	NO3	PO4	TDS	TKN	TOC	TP	TSS
Station	Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	5/12/2016	12	<2	<.05	<.05	<.05	0.61	<.01	169	0.29	1.3	0.02	<3
	6/8/2016	13	<2	<.05	<.05	<.05	0.51	<.01	25	0.41	1.8	<.01	<3
	7/20/2016	45	<2	<.05	<.05	<.05	0.36	<.01	54	0.4	2.1	0.02	<3
	8/18/2016	15	<2	0.41	<.05	<.05	0.23	<.01	41	0.37	2	0.46	<3
D7 28	9/14/2016	14	<2	<.05	<.05	<.05	0.19	<.01	31	0.31	1.8	<.01	<3
BZ-3S	Mean	20	2	0.12	0.05	0.05	0.38	0.01	64	0.36	1.8	0.10	3
	Stdev	14	0	0.16	0	0	0.18	0	60	0.05	0.3	0.20	0
	Max	45	2	0.41	0.05	0.05	0.61	0.01	169	0.41	2.1	0.46	3
	Min	12	2	0.05	0.05	0.05	0.19	0.01	25	0.29	1.3	0.01	3
	No. of Det	5	0	1	0	0	5	0	5	5	5	3	0
	5/12/2016	9	<2	<.05	<.05	<.05	0.69	<.01	133	<.25	1	<.01	<3
	6/8/2016	10	<2	0.11	<.05	<.05	0.64	<.01	40	0.54	<1	0.05	<3
	7/20/2016	67	<2	<.05	<.05	<.05	0.71	<.01	62	0.27	1.2	<.01	<3
	8/18/2016	11	<2	0.4	<.05	<.05	0.75	<.01	30	0.28	1	0.46	<3
$\mathbf{D}7$ $2\mathbf{M}$	9/14/2016	13	<2	<.05	<.05	<.05	0.62	<.01	43	<.25	1.1	<.01	<3
BZ-3M	Mean	22	2	0.13	0.05	0.05	0.68	0.01	62	0.32	1.1	0.11	3
	Stdev	25	0	0.15	0	0	0.05	0.00	42	0.12	0.1	0.20	0
	Max	67	2	0.4	0.05	0.05	0.75	0.01	133	0.54	1.2	0.46	3
	Min	9	2	0.05	0.05	0.05	0.62	0.01	30	0.25	1	0.01	3
	No. of Det	5	0	2	0	0	5	0	5	3	4	2	0

Table 3.2	Table 3.2 Continued. Summary of surface, middle, and bottom water quality monitoring data for Beltzville Reservoir in 2016										lle Rese	rvoir in 2()16
		ALK	BOD5	DISS-P	NH3	NO2	NO3	PO4	TDS	TKN	TOC	TP	TSS
Station	Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	5/12/2016	9	<2	<.05	<.05	<.05	0.68	<.01	109	<.25	1	<.01	<3
	6/8/2016	11	<2	<.05	<.05	<.05	0.61	<.01	35	0.42	<1	0.03	<3
	7/20/2016	51	<2	<.05	<.05	<.05	0.66	<.01	50	0.3	1.2	<.01	4
	8/18/2016	13	<2	0.48	<.05	<.05	0.59	<.01	43	0.33	1.2	0.47	9
D7 2D	9/14/2016	15	2	<.05	<.05	<.05	0.41	0.01	51	0.73	1.8	<.01	77
BZ-3B	Mean	20	2	0.14	0.05	0.05	0.59	0.01	58	0.41	1.2	0.11	19
	Stdev	18	0	0.19	0	0	0.11	0.00	29	0.19	0.3	0.20	32
	Max	51	2	0.48	0.05	0.05	0.68	0.01	109	0.73	1.8	0.47	77
	Min	9	2	0.05	0.05	0.05	0.41	0.01	35	0.25	1	0.01	3
	No. of Det	5	1	1	0	0	5	1	5	4	4	2	3
	5/12/2016	6	<2	<.05	<.05	<.05	2.45	<.01	70	<.25	1.4	<.01	<3
	6/8/2016	7	<2	0.07	<.05	<.05	1.34	0.01	60	0.69	1.3	0.08	4
	7/20/2016	46	<2	<.05	<.05	<.05	0.19	<.01	17	0.37	1.5	<.01	<3
	8/18/2016	8	<2	0.39	<.05	<.05	0.36	<.01	19	0.29	1.4	0.4	<3
D7 49	9/14/2016	7	<2	<.05	<.05	<.05	0.08	<.01	18	<.25	1.2	<.01	<3
BZ-4S	Mean	15	2	0.12	0.05	0.05	0.88	0.01	37	0.37	1.4	0.10	3
	Stdev	17	0	0.15	0	0	1.01	0	26	0.19	0.1	0.17	0
	Max	46	2	0.39	0.05	0.05	2.45	0.01	70	0.69	1.5	0.4	4
	Min	6	2	0.05	0.05	0.05	0.08	0.01	17	0.25	1.2	0.01	3
	No. of Det	5	0	2	0	0	5	1	5	3	5	2	1

Table 3.2	Table 3.2 Continued. Summary of surface, middle, and bottom water quality monitoring data for Beltzville Reservoir in 2016												
		ALK	BOD5	DISS-P	NH3	NO2	NO3	PO4	TDS	TKN	TOC	TP	TSS
Station	Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	5/12/2016	13	8	<.05	<.05	<.05	0.96	<.01	125	0.38	1.4	<.01	789
	6/8/2016	14	<2	<.05	<.05	<.05	1.14	0.02	66	0.84	1.5	0.04	18
	7/20/2016	41	9	<.05	<.05	<.05	0.22	0.01	60	1.68	4.8	0.05	128
	8/18/2016	21	<2	0.42	<.05	<.05	0.31	<.01	44	1.08	3	0.42	4
D7 59	9/14/2016	21	5	<.05	<.05	<.05	0.95	0.01	58	0.32	1.5	<.01	26
BZ-5S	Mean	22	5	0.12	0.05	0.05	0.72	0.01	71	0.86	2.4	0.11	193
	Stdev	11	3	0.17	0	0	0.42	0.00	31	0.56	1.5	0.18	337
	Max	41	9	0.42	0.05	0.05	1.14	0.02	125	1.68	4.8	0.42	789
	Min	13	2	0.05	0.05	0.05	0.22	0.01	44	0.32	1.4	0.01	4
	No. of Det	5	3	1	0	0	5	3	5	5	5	3	5
	5/12/2016	10	<2	<.05	<.05	<.05	0.6	<.01	55	0.29	1.3	<.01	<3
	6/8/2016	11	<2	<.05	<.05	<.05	0.52	0.01	45	0.44	1.7	0.01	<3
	7/20/2016	45	<2	<.05	<.05	<.05	0.37	<.01	49	0.35	2.8	0.01	<3
	8/18/2016	14	<2	0.4	<.05	<.05	0.25	<.01	45	0.41	2	0.4	<3
D7 (9	9/14/2016	14	<2	<.05	<.05	<.05	0.19	<.01	35	<.25	1.7	<.01	<3
BZ-6S	Mean	19	2	0.12	0.05	0.05	0.39	0.01	46	0.35	1.9	0.09	3
	Stdev	15	0	0.16	0	0	0.17	0.00	7	0.08	0.6	0.17	0
	Max	45	2	0.4	0.05	0.05	0.6	0.01	55	0.44	2.8	0.4	3
	Min	10	2	0.05	0.05	0.05	0.19	0.01	35	0.25	1.3	0.01	3
	No. of Det	5	0	1	0	0	5	1	5	4	5	3	0

Table 3.2	Table 3.2 Continued. Summary of surface, middle, and bottom water quality monitoring data for Beltzville Reservoir in 2016												
		ALK	BOD5	DISS-P	NH3	NO2	NO3	PO4	TDS	TKN	TOC	TP	TSS
Station	Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	5/12/2016	9	<2	<.05	<.05	<.05	0.68	<.01	105	0.31	1.1	0.06	<3
	6/8/2016	10	<2	<.05	<.05	<.05	0.62	<.01	40	<.25	<1	<.01	<3
	7/20/2016	41	<2	<.05	<.05	<.05	0.71	<.01	59	<.25	1.2	<.01	<3
	8/18/2016	11	<2	0.34	<.05	<.05	0.73	<.01	50	0.27	1	0.36	<3
BZ-6M	9/14/2016	13	<2	<.05	<.05	<.05	0.67	<.01	46	<.25	1	<.01	<3
DZ-0M	Mean	17	2	0.11	0.05	0.05	0.68	0.01	60	0.27	1.1	0.09	3
	Stdev	14	0	0.13	0	0	0.04	0.00	26	0.03	0.1	0.15	0
	Max	41	2	0.34	0.05	0.05	0.73	0.01	105	0.31	1.2	0.36	3
	Min	9	2	0.05	0.05	0.05	0.62	0.01	40	0.25	1	0.01	3
	No. of Det	5	0	1	0	0	5	0	5	2	4	2	0
	5/12/2016	9	<2	<.05	<.05	<.05	0.68	<.01	124	<.25	1	<.01	<3
	6/8/2016	10	<2	<.05	<.05	<.05	0.61	0.01	60	0.36	<1	0.02	<3
	7/20/2016	51	<2	<.05	<.05	<.05	0.62	<.01	55	0.28	1.3	0.01	<3
	8/18/2016	14	<2	0.26	<.05	<.05	0.59	<.01	48	0.28	1.2	0.25	<3
	9/14/2016	16	<2	<.05	<.05	<.05	0.47	<.01	60	<.25	1.3	<.01	63
BZ-6B	Mean	20	2	0.09	0.05	0.05	0.59	0.01	69	0.28	1.2	0.06	15
	Stdev	18	0	0.09	0	0	0.08	0.00	31	0.05	0.2	0.11	27
	Max	51	2	0.26	0.05	0.05	0.68	0.01	124	0.36	1.3	0.25	63
	Min	9	2	0.05	0.05	0.05	0.47	0.01	48	0.25	1	0.01	3
	No. of Det	5	0	1	0	0	5	1	5	3	4	3	1

Table 3.2 Continued. Summary of surface, middle, and bottom water quality monitoring data for Beltzville Reservoir in 2016)16
		ALK	BOD5	DISS-P	NH3	NO2	NO3	PO4	TDS	TKN	TOC	TP	TSS
Station	Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	5/12/2016	11	<2	<.05	<.05	<.05	0.61	<.01	110	0.32	1.4	<.01	<3
	6/8/2016	12	<2	0.05	<.05	<.05	0.44	0.01	56	0.44	1.6	0.02	<3
	7/20/2016	45	<2	<.05	<.05	<.05	0.3	<.01	56	0.3	2.5	<.01	<3
	8/18/2016	13	<2	0.24	<.05	<.05	0.19	<.01	43	0.47	2.1	0.25	<3
D7 75	9/14/2016	11	<2	<.05	<.05	<.05	0.18	<.01	43	<.25	1.7	<.01	<3
BZ-7S	Mean	18	2	0.09	0.05	0.05	0.34	0.01	62	0.36	1.9	0.06	3
	Stdev	15	0	0.08	0	0	0.18	0	28	0.09	0.4	0.11	0
	Max	45	2	0.24	0.05	0.05	0.61	0.01	110	0.47	2.5	0.25	3
	Min	11	2	0.05	0.05	0.05	0.18	0.01	43	0.25	1.4	0.01	3
	No. of Det	5	0	2	0	0	5	1	5	4	5	2	0
	5/12/2016	11	<2	<.05	<.05	<.05	0.74	<.01	102	<.25	1.2	<.01	<3
	6/8/2016	12	<2	0.08	<.05	<.05	0.73	0.01	56	0.53	1.8	0.02	<3
	7/20/2016	54	<2	<.05	<.05	<.05	0.7	<.01	66	0.27	1.5	<.01	<3
	8/18/2016	15	<2	0.19	<.05	<.05	0.61	<.01	53	0.38	1.2	0.05	<3
D7 7M	9/14/2016	12	<2	<.05	<.05	<.05	0.13	<.01	23	0.31	1.5	<.01	<3
BZ-7M	Mean	21	2	0.08	0.05	0.05	0.58	0.01	60	0.35	1.4	0.02	3
	Stdev	19	0	0.06	0	0	0.26	0.00	28	0.11	0.3	0.02	0.0
	Max	54	2	0.19	0.05	0.05	0.74	0.01	102	0.53	1.8	0.05	3
	Min	11	2	0.05	0.05	0.05	0.13	0.01	23	0.25	1.2	0.01	3
	No. of Det	5	0	2	0	0	5	1	5	4	5	2	0

Table 3.2	Continued. Su	mmary o	of surface	e, middle,	and botte	om water	[•] quality	monitori	ng data f	or Beltzv	ille Rese	rvoir in 2	016
		ALK	BOD5	DISS-P	NH3	NO2	NO3	PO4	TDS	TKN	TOC	TP	TSS
Station	Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	5/12/2016	10	<2	<.05	<.05	<.05	0.69	<.01	61	0.28	1.1	<.01	49
	6/8/2016	10	<2	<.05	<.05	<.05	0.62	0.01	55	0.5	<1	0.03	<3
	7/20/2016	46	<2	<.05	<.05	<.05	0.68	<.01	59	0.33	1.3	<.01	4
	8/18/2016	12	<2	0.5	<.05	<.05	0.58	<.01	55	0.93	1.4	0.54	40
D7 7D	9/14/2016	19	<2	<.05	0.12	<.05	0.21	<.01	48	0.29	1.4	<.01	15
BZ-7B	Mean	19	2	0.14	0.06	0.05	0.56	0.01	56	0.47	1.2	0.12	22
	Stdev	15	0	0.20	0.03	0	0.20	0.00	5	0.27	0.2	0.23	21
	Max	46	2	0.5	0.12	0.05	0.69	0.01	61	0.93	1.4	0.54	49
	Min	10	2	0.05	0.05	0.05	0.21	0.01	48	0.28	1	0.01	3
	No. of Det	5	0	1	1	0	5	1	5	5	4	2	4

< Laboratory analysis result was less than the method or reporting limit.

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. Nitrite concentrations in the waters of Beltzville Reservoir measured at all stations and depths never exceeded the laboratory reporting limit of 0.05 mg/L during the 2016 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 of Beltzville Reservoir during 2016 with sample results ranging from 0.08 mg/L to 2.45 mg/L (Table 3-2). The highest recorded single nitrate measure of 2.45 mg/L was measured on 12 May at station BZ-4S. Station BZ-4S maintained the highest seasonal mean concentration (0.88 mg/L) of all stations.

Beltzville Reservoir was in compliance with the PADEP water quality standard for nitrite and nitrate during 2016. 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 2.50 mg/L was measured at station BZ-4S on 12 May.

3.2.3 Total Kjeldahl Nitrogen

Total Kjeldahl nitrogen (TKN) is a measure of organic nitrogen that includes ammonia. Organic nitrogen is not immediately available for biological activity and is therefore not available for plant growth until decomposition to inorganic form occurs. Total kjeldahl nitrogen (TKN) was low in the water column of Beltzville Reservoir during 2016 with sample concentrations ranging from less than the 0.25 mg/L laboratory reporting limit to 1.68 mg/L (Table 3-2). The highest concentration of 1.68 mg/L was recorded at station BZ-5S on 20 July.

3.2.4 Total Phosphorus

Total phosphorus (TP) is a measure of both organic and inorganic forms of phosphorus. It is an essential plant nutrient and is often the most limiting nutrient to plant growth in freshwater systems. Inputs of phosphorus are the prime contributing factors to eutrophication in most freshwater systems. Phosphorus bound to bottom sediments in lakes can be released when oxygen levels are depleted in bottom waters. This phosphorus then becomes available for plant growth.

EPA guidance for nutrient criteria in lakes and reservoirs suggests a maximum concentration for total phosphorus of 0.01-mg/L (EPA 2000). Lakes and reservoirs exceeding this concentration are more likely to experience algal bloom problems during the growing season. In 2016, less than half of the samples measured for total phosphorus were less than or slightly exceeding the EPA suggested maximum concentration and laboratory reporting limit of

0.01 mg/L (Table 3-2). The highest single sample concentration of 0.54 mg/L was measured in the reservoir bottom waters at Station BZ-7B on 18 August. Elevated TP readings in deep reservoir waters are typically associated with phosphorus release from bottom sediments during low oxygen conditions. Upstream tributary station BZ-5S (Pohopoco Creek) exceeded the EPA 0.01 mg/L suggested concentration throughout much of the sampling season. Land use or some other watershed factors contribute to nutrient loading in this tributary.

3.2.5 Dissolved Phosphorus

In 2016, all but one dissolved phosphorus (Diss. P) concentration measured at all stations and depths in the water column of Beltzville Reservoir were less than or equal to the reporting limit of 0.05 mg/L (Table 3-2). The single sample concentration (0.02 mg/L) exceeding the reporting limit was seen at station BZ-5S during the 8 June sampling event.

3.2.6 Dissolved Phosphate

Orthophosphate (PO4) is a measure of the inorganic oxidized form of soluble phosphorus. This form of phosphorus is the most readily available for uptake during photosynthesis. In freshwater environments, dissolved phosphate is usually a limiting nutrient and is readily taken up by freshwater plants and algae. In 2016, dissolved phosphate concentrations were low with all but one (0.02 mg/L) sample concentration remaining below the laboratory reporting limit of 0.01 mg/L. The highest concentration of 0.02 mg/L was measured at station BZ-5S on 08 June.

3.2.7 Total Dissolved Solids

Total dissolved solids (TDS) is a measure of the amount of non-filterable dissolved material in the water. Dissolved salts such as sulfate, magnesium, chloride, and sodium contribute to elevated levels. Concentrations of TDS in the water column of Beltzville Reservoir were consistently low during 2016 (Table 3-2). Concentrations among all stations and depths ranged from 17 to 169 mg/L. Total dissolved solids measured at Beltzville Reservoir in 2016 were in compliance with PADEP water quality standards. The state water quality standard for TDS is a maximum concentration of 500 mg/L.

3.2.8 Total Suspended Solids

Total suspended solids (TSS) are a measure of the amount of filterable particulate matter that is suspended within the water column. High concentrations increase the turbidity of the water and can hinder photosynthetic activity, result in damage to fish gills, and cause impairment to spawning habitat (smothering). Total suspended solids concentrations in the waters of Beltzville Reservoir were low during 2016 (Table 3-2). Many concentrations measured at all stations and depths were less than or near the laboratory reporting limit of 3.0 mg/L. The maximum concentration of 789 mg/L was measured in tributary surface waters at station BZ-5S on 12 May. This spike in TSS at Station BZ-5S may be attributed to stormwater runoff experienced in that tributary watershed. High measures of TSS can also be the result of

sample collection error associated with capturing disturbed fine sediments in the lake bottom sample during field sampling. This sample error particularly applies to any elevated or unexplained high TSS water samples collected at bottom water sampling stations BZ-6B, BZ-3B, and BZ-7B.

3.2.9 Biochemical Oxygen Demand

Five-day biochemical oxygen demand (BOD5) is a measure of the oxygen-depleting burden imposed by organic material present in water. It measures the rate of oxygen uptake by organisms in the water sample over a period of time. It is an indicator of the quality of a water body and the degree of pollution by biodegradable organic matter can therefore be inferred. The five-day biochemical oxygen demand and commonly accepted water quality inferences are as follows:

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

Biochemical oxygen demand concentrations in the water column of Beltzville Reservoir were consistently low in all months and stations sampled (Table 3-2). All but three samples were below the laboratory reporting limit of 2.0 mg/L for the entire sampling season. The three elevated samples were collected at station BZ-5S and correlated with high TSS readings on those dates. Based on the seasonal sampling results, it is inferred that in 2016 Beltzville Reservoir and its associated tributaries contain very clean water with little biodegradable organic wastes.

3.2.10 Alkalinity

Alkalinity (ALK) is a measure of the acid-neutralizing capacity of water. Waters that have high alkalinity values are considered undesirable because of excessive hardness and high concentrations of sodium salts. Water with low alkalinity has little capacity to buffer acidic inputs and is susceptible to acidification (low pH). The PADEP standard is a minimum concentration of 20-mg/L CaCO₃ except where natural conditions are less.

Alkalinity in the waters of Beltzville Reservoir was relatively low during 2016 (Table 3-2). For all sampling stations and depths, alkalinity measures ranged from 67.0 mg/L to 6.0 mg/L. All stations experienced a spike in alkalinity measure during the 20 July sampling event. This spike may be attributed to storm water flow and a precipitation event during the sampling date. All other samples remained below the state minimum criteria for the sampling season. The natural alkalinity of water is largely dependent on the underlying geology and soils within the surrounding watershed. The typically low alkalinity measured at Beltzville Reservoir results from the regional geology, which is primarily sandstone and shale. Based on this, the reservoir

waters and surrounding tributaries are in compliance with the PADEP alkalinity criteria, due to the regional natural conditions.

3.2.11 Total Organic Carbon

Total organic carbon (TOC) is a measurement of the amount of dissolved and particulate carbon that is bound in organic compounds. TOC can be derived from decaying vegetation, bacterial growth, and metabolic activities of living organisms. The bulk of organic carbon in water is composed of humic substances and partly degraded animal and plant materials. Other sources of TOC can include agricultural chemicals such as herbicides and insecticides and also wastewater treatment plant discharges. The amount of carbon in a freshwater stream is an indicator of the organic character of the stream or water body. High organic content can increase the growth of microorganisms which contribute to the depletion of oxygen. Total organic carbon concentrations in the water column and tributaries of Beltzville Reservoir were low during 2016 (Table 3-2). Concentrations of TOC at all stations and depths in 2016 ranged from 4.80 mg/L to <1.0 mg/L (laboratory reporting limit).

3.2.12 Chlorophyll a

Chlorophyll a is the measure of the plant chlorophyll a primary pigment which helps plants get energy from light. It is found in most plants, algae, and cyanobacteria. Chlorophyll a measures increase in relation to algal densities in a water body. As a result of equipment failure in the sampling months of May and June, no chlorophyll a measures were taken during those sampling events. For the remainder of the 2016 season, chlorophyll *a* concentrations in the surface waters (0-15 feet) of Beltzville Reservoir remained low (Appendix A). Concentrations measured in surface waters at all lake body stations ranged between 0.0 and 4.9 ug/L with an average concentration of 2.22 ug/L.

3.3 TROPHIC STATE DETERMINATION

Carlson's (1977) trophic state index (TSI) is a method of quantitatively expressing the magnitude of eutrophication for a lake. The trophic state analysis calculates separate indices for eutrophication based on measures of total phosphorus, chlorophyll *a*, and secchi disk. Index values for each parameter range on the same scale from 0 (least enriched) to 100 (most enriched). The resulting indices can also be compared to qualitative threshold values that correspond to levels of eutrophication. Classification of Beltzville Reservoir was based on a single sample each month during the sampling season taken at station BZ-6 (Figure 3-7).

TSIs calculated for measures of total phosphorus (Figure 3-7) classified Beltzville Reservoir as eutrophic in August (57.34) and oligotrophic in May (37.35), June (37.35), July (37.35) and September (37.35). TSIs calculated for measures of secchi disk depth (Figure 3-7) classified Beltzville Reservoir as mesotrophic in June (47.32), July (43.28), and August (41.42) and oligotrophic in May (37.16) and September (38.01). TSIs calculated for measures of chlorophyll *a* (Figure 3-7) classified Beltzville Reservoir as oligotrophic in July (23.80) and

September (38.02) and mesotrophic in August (40.94). Chlorophyll sampling equipment failure prevented the measure of chlorophyll during the May and June 2016 sampling events.

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. With this in mind, the trophic state of the reservoir, based on TSI's, was mesotrophic/oligotrophic throughout the 2016 sampling season.

The EPA (1983) also provides criteria for defining the trophic conditions of lakes of the north-temperate zone based on concentrations of total phosphorus, chlorophyll *a*, and secchi depth (Table 3-3). Taking into account the general agreement between the EPA classifications with that of the Carlson TSI's, the trophic condition of Beltzville Reservoir was predominantly mesotrophic/oligotrophic in 2016.

Table 3-3.EPA trophic classification criteria and average monthly measures for Beltzville Reservoir in 2016. "EF"- Equipment Failure												
Water Quality Variable	Oligo- trophic	Meso- trophic	Eutrophic	12 May	08 June	20 July	18 August	14 September				
Total phos. (ppb)	<10	10-20	>20	<10	<10	<10	40	<10				
Chlorophyll a (ppb)	<4	4-10	>10	EF	EF	0.5	2.87	2.13				
Secchi depth (meters)	>4	2-4	<2	4.88	2.41	3.19	3.63	4.6				

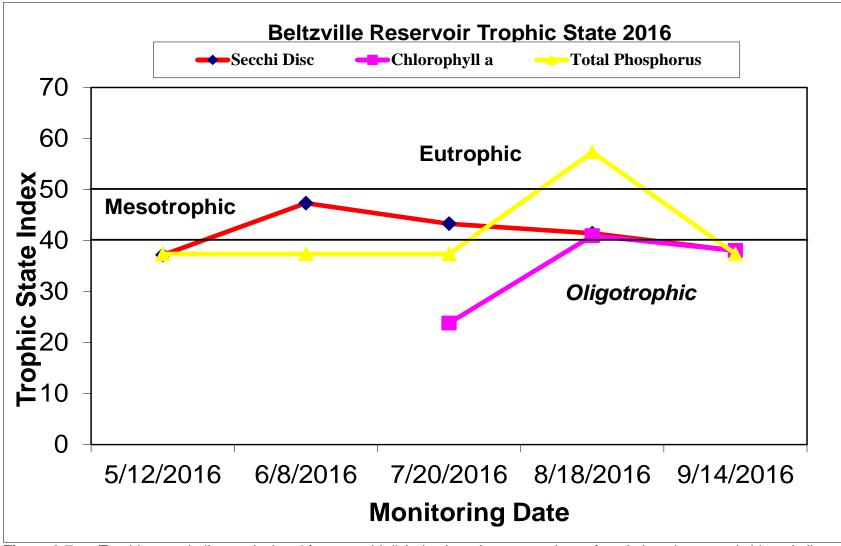


Figure 3-7. Trophic state indices calculated from secchi disk depth and concentrations of total phosphorus and chlorophyll *a* at reservoir Station BZ-6 for Beltzville Reservoir in 2016.

3.4 RESERVOIR BACTERIA MONITORING

Two forms of coliform bacteria contamination were monitored in the tributary and lake surface waters at Beltzville Reservoir during 2016 including total and fecal coliform (Table 3-4). Total coliform includes *escherica coliform* (*E. coli*) and related bacteria that are associated with fecal discharges. Fecal coliform bacteria are a subgroup of the total coliform and are normally associated with waste derived from human and other warm-blooded animals and indicate the presence of fecal contamination but not the associated risk.

Total coliform values for all stations ranged from 34 colonies/100-ml to greater than the detection limit of 2400 colonies/100-ml. Bacteria in natural waters are common and their presence in the sample is not necessarily a human health concern.

With respect to PADEP water quality standards, fecal coliform bacteria contamination was low in Beltzville Reservoir and its tributaries during 2016. The PADEP standard for fecal coliform bacteria during the swimming season (from 1 May to 30 September) is a geometric mean not greater than 200 colonies/100-ml calculated for not less than five fecal coliform samples collected over a consecutive thirty day period. Given that our regular monitoring was completed on one day as grab samples, single sample results were then compared to the Pennsylvania Department of Health single sample standard of <1000 colonies/100-ml. The fecal coliform samples collected at Beltzville Reservoir did not exceed this standard in 2016. Fecal coliform values for all tributary and lake stations ranged from less than the detection limit of 2 colonies/100ml to 240 colonies/100ml at upstream tributary station BZ-2S on 08 June. The elevated sample results occurred primarily in upstream tributary stations and is reflective of the watershed and the land use types upstream that directly influence the water quality of the reservoir and its tributaries. Water contact recreation is permitted at Beltzville Reservoir. However, the recreational swimming beach is monitored and managed by the Commonwealth of Pennsylvania. No long term elevated bacteria counts were recorded in the main reservoir body where public water recreation is also permitted.

able 3-4 Bacteri 2016. NS = Not S			00ml) at Beltzvil	le R	eservoir and tr	ibutaries during		
STATION	DATE	То	tal Coliform (TC)	F	ecal Coliform (FC)	Escherichia coli		
	5/12/16		220	<	2	NS		
	6/8/16	<	2400		230	NS		
BZ-1S	7/20/16	<	2400		23	NS		
	8/18/16	>	2400		58	NS		
	9/14/16		1200		13	NS		
	5/12/16		730		13	NS		
	6/8/16	>	2400		240	NS		
BZ-2S	7/20/16		2000		15	NS		
	8/18/16	>	2400		210	NS		
	9/14/16		920		50	NS		
	5/12/16		34	<	2	NS		
	6/8/16		75		3	NS		
BZ-3S	7/20/16		110	<	2	NS		
	8/18/16		2000		2	NS		
	9/14/16		820	<	2	NS		
	5/12/16		2000	<	2	NS		
	6/8/16	>	2400		34	NS		
BZ-4S	7/20/16		2400		13	NS		
	8/18/16	>	2400		64	NS		
	9/14/16		2400		16	NS		
	5/12/16		1400		60	NS		
	6/8/16	>	2400		230	NS		
BZ-5S	7/20/16		120		5	NS		
	8/18/16	>	2400		46	NS		
	9/14/16	>	2400		54	NS		
	5/12/16		77	<	2	NS		
	6/8/16		170		2	NS		
BZ-6S	7/20/16		360		2	NS		
	8/18/16		1700	<	2	NS		
	9/14/16		1600	<	2	NS		
	5/12/16		76	<	2	NS		
	6/8/16		390		5	NS		
BZ-7S	7/20/16		440	<	2	NS		
	8/18/16		2000	<	2	NS		
	9/14/16	>	2400	<	2	NS		

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

4.0 **REFERENCES**

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APPENDIX A

STRATIFICATION DATA TABLES

2016 Beltzville	Reservoir	Water	Column	Profile

Station	Date	Time	Depth	Temp	DO	DO	pН	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
	5/12/2016	10:42:03	0.5	11.8	102	11.05	7.26	-67.2	202.8	NA	NA	NA
BZ-1S	6/8/2016	10:59:31	0.5	12.73	96.4	10.22	7.15	-61	159.9	NA	NA	NA
Outfall	7/20/2016	11:00:30	0.5	17.71	104	9.92	7.22	-33.8	186.6	0.9	3.8	0.107
Pohopoco	8/18/2016	8:25:31	0.5	13.54	99.9	10.39	6.74	-6.7	167.4	0	2.2	0.083
•	9/14/2016	8:21:40	0.5	11.54	96.4	10.5	6.41	12.3	186.5	0.2	0.9	0.078
			•					-				
	5/12/2016	10:32:15	0.5	10.66	100	11.15	7.64	-88.5	194.7	NA	NA	NA
BZ-2S	6/8/2016	10:48:39	0.5	12.99	93.1	9.81	7.22	-65	194.5	NA	NA	NA
Pine Run	7/20/2016	10:48:53	0.5	16.53	96.6	9.43	7.13	-28.7	182	1.4	0.8	0.086
Trib.	8/18/2016	8:13:17	0.5	17.49	95.7	9.16	6.85	-12.6	159.4	2.7	1.1	0.083
	9/14/2016	8:07:31	0.5	15.47	95.1	9.49	6.95	-18.3	161.8	4	0	0.072
			•									
		8:45:21	0.5	13.77	111	11.51	8.05	-112.2	138.1	NA	NA	NA
		8:44:52	5	13.71	111	11.51	7.99	-108.6	137.7	NA	NA	NA
		8:44:00	10	13.07	109	11.44	7.83	-99.2	136.7	NA	NA	NA
		8:43:10	15	12.85	107	11.26	7.57	-84.5	138.4	NA	NA	NA
		8:42:26	20	12.49	103	11.02	7.42	-76.2	141.6	NA	NA	NA
BZ-3		8:41:38	25	11.36	97.1	10.62	7.32	-70.8	145.6	NA	NA	NA
Bouy/Beach		8:40:56	30	9.34	93.3	10.69	7.31	-70	146.5	NA	NA	NA
_		8:40:05	35	8.61	93.2	10.88	7.32	-70.5	145.5	NA	NA	NA
		8:39:30	40	8.01	91.8	10.87	7.33	-70.7	145	NA	NA	NA
	5/12/2016	8:38:41	45	7.75	91.9	10.96	7.34	-71.2	143.7	NA	NA	NA
		8:38:07	50	7.6	89.9	10.75	7.33	-71.2	143.2	NA	NA	NA
		8:37:35	55	7.52	89.3	10.7	7.34	-71.6	142.1	NA	NA	NA
		8:36:50	60	7.46	89.3	10.71	7.36	-72.3	140.5	NA	NA	NA
		8:34:27	65	7.37	87.3	10.5	7.38	-73.9	135.8	NA	NA	NA
		8:33:55	70	7.27	86.4	10.42	7.39	-74.2	134.7	NA	NA	NA
		8:33:21	75	7.22	85.7	10.35	7.4	-74.8	133.1	NA	NA	NA
		8:32:45	80	7.19	84.9	10.25	7.41	-75	131.5	NA	NA	NA
		8:32:02	85	7.11	83.2	10.06	7.41	-75.2	129.7	NA	NA	NA
		8:31:24	90	7.09	81.6	9.88	7.42	-75.6	127.6	NA	NA	NA
		8:30:19	95	7.07	75.2	9.11	7.46	-77.8	121.5	NA	NA	NA
		8:29:12	100	7.13	53	6.41	7.38	-73.5	116.3	NA	NA	NA

Station	Date	Time	Depth	Temp	DO	DO	pН	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	Ċ	%	mg/L		mV	mV	NTU	ug/L	mS/cm
	·———	9:01:40	0.5	22.58	106	9.19	7.38	-74.7	196	NA	NA	NA
		8:59:51	5	22.52	106	9.21	7.04	-55.1	199.9	NA	NA	NA
Station BZ-3 Bouy/Beach BZ-3 Bouy/Beach		8:59:03	10	22.47	106	9.19	6.87	-44.8	202.5	NA	NA	NA
		8:57:59	15	19.8	102	9.27	6.65	-32.3	210.2	NA	NA	NA
		8:57:06	20	16.06	100	9.87	6.62	-31	212.2	NA	NA	NA
		8:56:23	25	13.6	97.3	10.12	6.57	-28.6	214.9	NA	NA	NA
BZ-3		8:54:50	30	11.66	80.3	8.72	6.43	-20.7	220.1	NA	NA	NA
Bouy/Beach		8:54:07	35	10.15	76.2	8.57	6.41	-19.8	221.6	NA	NA	NA
-		8:53:24	40	9.12	72.9	8.41	6.4	-19.6	222.4	NA	NA	NA
	6/8/2016	8:52:53	45	8.8	73.3	8.51	6.41	-20.2	222.3	NA	NA	NA
		8:52:14	50	8.39	74.8	8.77	6.43	-21.2	221.9	NA	NA	NA
		8:51:46	55	8.27	75.2	8.85	6.44	-21.8	221.4	NA	NA	NA
		8:51:03	60	8.15	76.6	9.04	6.46	-22.8	220.8	NA	NA	NA
		8:50:26	65	7.95	77.2	9.15	6.48	-23.6	220.3	NA	NA	NA
		8:49:51	70	7.83	77.4	9.21	6.49	-24.3	219.8	NA	NA	NA
		8:49:13	75	7.7	77.1	9.2	6.5	-25.1	219.1	NA	NA	NA
		8:48:32	80	7.55	75.3	9.02	6.51	-25.5	218.9	NA	NA	NA
		8:47:47	85	7.46	75.1	9.01	6.53	-26.5	218.2	NA	NA	NA
		8:46:38	90	7.35	72	8.66	6.55	-27.9	217.3	NA	NA	NA
		8:46:06	95	7.25	69.7	8.41	6.56	-28.6	216.9	NA	NA	NA
		8:44:53	100	7.24	68.7	8.29	6.62	-31.5	214.7	NA	NA	NA
		8:45:14	105	7.23	68.7	8.28	6.6	-30.6	215.6	NA	NA	NA
					_							
		9:03:21	0.5	26.98	106	8.46	8.27	-96.9	162.4	1.5	0	0.104
		9:02:43	5	26.99	106	8.44	8.23	-94.3	165.4	1.2	0.2	0.104
		9:01:39	10	26.95	106	8.47	8.05	-83.5	167.3	0.6	1	0.104
		9:00:44	15	24.8	111	9.24	7.52	-52.2	171.3	2.2	4.3	0.104
		8:59:52	20	22.25	96.9	8.43	6.94	-17.6	181	1.3	6.4	0.110
		8:58:55	25	19.22	70.7	6.53	6.68	-2.7	185.3	1.2	5.5	0.111
		8:57:56	30	16.14	58.2	5.73	6.56	4.2	185.5	0.6	2.9	0.108
Bouy/Beach	7/20/2016	8:56:54	35	12.22		6.04	6.54	5.1	184.5	0.4	3.6	0.103
		8:56:16	40	10.19	55.2	6.2	6.52	5.6	184.5	0.3	3	0.103
		8:55:23	45	9.27	55.4	6.36	6.53	5.4	183.8	0	2.6	0.103
		8:54:21	50	8.96	56.2	6.5	6.54	4.4	182.6	1	1.9	0.102
		8:53:14	55	8.76	57.3	6.66	6.56	3.4	181.3	0	1.9	0.103
		8:52:27	60	8.65	57.6	6.71	6.57	2.8	180.5	0	1.6	0.103
		8:51:17	65	8.47	60.1	7.04	6.6	1.2	178.9	0	1.9	0.102
		8:49:22	70	8.22	59.3	6.98	6.61	0.8	176.9	0	1.9	0.103
		8:48:16	75	8	59.5	7.05	6.62	0.1	176	0	1.5	0.102
		8:47:14	80	7.79	58.5	6.97	6.61	0.3	175.4	0	2.2	0.103
		8:45:54	85	7.69	59.1	7.05	6.62	0	174.6	0	1.8	0.103
		8:44:34	90	7.55	58.5	7	6.63	-0.7	173.8	0	1.7	0.102
		8:43:38	95	7.49	56.7	6.8	6.65	-1.7	173	0	2.2	0.102
		8:42:12	100	7.32	45.4	5.46	6.67	-3.1	172.2	1.9	2.4	0.106
느ᅳᅳᅴ	[[]		╘╺╸╸╸	╘╺╼╸╼╸┙			I	L	╘╺╼╸╺╼╸┙	╘╼╼╼┙		L

Station	Date	Time	Depth	Temp	DO	DO	pН	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		·mV	mV	NTU	ug/L	mS/cm
		10:07:04	0.5	27.78	107	8.38	8.24	-95.2	139.5	1.2	2.3	0.107
		10:04:35	5	27.83	106	8.32	8.21	-93.4	143.7	0.9	3.9	0.107
		10:03:48	10	27.83	105	8.23	8.08	-85.6	145.3	1.5	3.2	0.107
		10:02:46	15	27.77	103	8.09	7.68	-61.6	148.8	1.2	3.9	0.107
		10:01:48	20	25.47	85.3	6.98	6.89	-14.8	161.4	1.5	4.3	0.105
BZ-3		10:00:54	25	23.07	58.4	5	6.63	0.8	169.2	1.1	3.3	0.107
Bouy/Beach		9:59:51	30	19.98	41.7	3.8	6.51	7.2	168.9	1.6	3.1	0.102
-		9:58:27	35	16.28	30.3	2.97	6.37	15.1	170.4	0.5	2	0.092
		9:57:49	40	12.33	30.4	3.25	6.35	15.6	170.3	0.6	2.7	0.08
		9:57:00	45	9.94	24.3	2.75	6.33	16.6	170.2	0.1	1.9	0.075
	8/18/2016	9:56:02	50	9.42	28.1	3.22	6.34	15.9	169.3	0	1.7	0.074
		9:54:39	55	9.07	36.1	4.17	6.36	14.4	168.7	0	1.9	0.072
		9:53:48	60	8.88	40.8	4.73	6.38	13.3	168.1	0	2.2	0.072
		9:52:49	65	8.69	44.2	5.15	6.4	12.4	167.5	0.8	1.6	0.071
		9:51:48	70	8.54	46.5	5.43	6.39	12.8	167.5	0	2	0.071
		9:50:59	75	8.3	50	5.88	6.4	12	166.8	0	2	0.07
		9:49:58	80	8.07	52.6	6.22	6.41	11.4	166.3	0.1	2.2	0.07
		9:44:07	85	7.85	46.5	5.53	6.29	18.5	166.4	0.3	2.5	0.07
		9:42:42	90	7.74	45.1	5.37	6.26	20.2	166.3	0.4	2.6	0.07
		9:41:11	95	7.55	42.6	5.1	6.27	19.2	164	0	2.1	0.069
		9:40:20	100	7.46	34.5	4.14	6.27	19.3	163.2	0.5	2.3	0.07
		9:39:32	105	7.43	32	3.84	6.31	17.4	161.1	1.9	2.4	0.07
		9:38:42	110	7.4	30.2	3.63	6.38	13.3	155.5	3.1	2.5	0.071
	•						 					
		10:28:58	0.5	25.12	106	8.75	8.28	-96.8	139.5	00	1.1	0.102
		10:27:22	0.5 5	23.12	106	8.78	8.4	-90.0	139.5	00	2.5	0.102
		10:27:22	10	24.97	105	8.7	8.33	-104.3	140.1	0.9	3.3	0.102
		10:23:58	15	24.86	103	8.49	8.03	-82.1	140.1	0.8	2.5	0.102
		10:23:07	20	24.81	98.9	8.2	7.63	-58.4	146.7	1.3	2.3	0.101
		10:22:01	25	24.41	72.3	6.04	6.89	-15	157.3	0.8	<u> </u>	0.101
BZ-3		10:20:15	30	22.88	28.9	2.48	6.54	5.5	162.2	1	0.7	0.102
Bouy/Beach		10:19:09	35	20.84	5.9	0.52	6.4	13.8	162.5	0.8	1	0.100
Bouy/Bouon	9/14/2016	10:17:41	40	16.23	8.2	0.81	6.35	16.2	160.4	0.0	2	0.092
	0,11,2010	10:16:49	45	11.88	12	1.29	6.29	18.9	160.9	0	1.5	0.079
		10:16:07	50	9.88	10.7	1.21	6.3	18.1	158.9	0.1	2.3	0.075
		10:14:50	55	9.27	23.6	2.71	6.3	18	157.9	0	2	0.073
		10:14:11	60	8.9	31.4	3.63	6.34	15.7	156.4	0.2	2.6	0.072
		10:13:05	65	8.68	36.6	4.27	6.35	15	154	0.2	1.4	0.072
		10:11:35	70	8.45	39.2	4.59	6.33	16.4	152.2	0	2.7	0.071
		10:10:42	75	8.17	40.7	4.79	6.33	16.1	150.1	0	2.3	0.07
		10:09:00	80	7.96	36.2	4.29	6.29	18.4	146.5	0.2	2.7	0.07
		10:07:47	85	7.84	36.8	4.37	6.27	19.4	143.3	0	1.7	0.07
		10:06:10	90	7.63	34.3	4.1	6.24	21	137.9	0.3	1.4	0.07
		10:05:02	95	7.54	32.3	3.87	6.23	21.4	132.9	0.2	2.5	0.07
		10:03:31	100	7.47	20.8	2.49	6.22	22.3	123.2	6.5	2.3	0.071
		10:02:00	105	7.44	14.7	1.77	6.22	22.4	105.9	479.1	27	0.072

Station	Date	Time	Depth	Temp	DO	DO	pН	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	С	%	mg/L		mV	mV	NTU	ug/L	mS/cm
BZ-4S	5/12/2016	10:19:47	0.5	14.12	99.1	10.19	7.79	-97.4	168.5	NA	NA	NA
Wild Creek	6/8/2016	10:37:03	0.5	20.47	93.5	8.42	7.63	-88.9	170.7	NA	NA	NA
Upstream	7/20/2016	10:36:53	0.5	23.59	94	7.98	6.99	-20.9	169.1	0	0	0.049
	8/18/2016	7:59:30	0.5	25.5	94.6	7.74	7.29	-38.7	125	0	0.4	0.048
	9/14/2016	7:49:52	0.5	21.75	94.2	8.28	7.13	-29	121.9	0	0	0.046
BZ-5S	5/12/2016	10:09:47	0.5	13.03	99.9	10.52	7.24	-66.4	180	NA	NA	NA
Pohopoco	6/8/2016	10:27:37	0.5	15.18	93	9.34	7.68	-91.3	175.5	NA	NA	NA
Upstream	7/20/2016	10:19:32	0.5	25.5	155	12.71	9.49	-168.8	120.5	19.6	22.4	0.115
	8/18/2016	7:49:25	1	24.66	86	7.15	7.6	-57	129.2	11.3	56.5	0.121
	9/14/2016	7:34:46	0.5	16.39	85.4	8.36	7.3	-38.2	76.1	6	0.5	0.119
		8:18:17	0.5	13.38	111	11.54	8.22	-121.2	158.1	NA	NA	NA
		8:17:40	5	13.35	110	11.51	8.2	-120	158	NA	NA	NA
		8:17:06	10	13.32	110	11.55	8.18	-119.4	158	NA	NA	NA
		8:16:29	15	12.98	110	11.61	8.16	-117.9	157.1	NA	NA	NA
		8:14:53	20	12.73	107	11.38	7.71	-92.8	156.6	NA	NA	NA
		8:14:12	25	12.35	104	11.09	7.49	-80	160.7	NA	NA	NA
		8:12:47	30	10.2	96.1	10.8	7.3	-69.1	166.5	NA	NA	NA
BZ-6		8:11:30	35	8.51	95.7	11.2	7.28	-68.4	167.5	NA	NA	NA
In-Lake		8:10:10	40	8.01	91.6	10.85	7.26	-67	168.3	NA	NA	NA
Tower		8:08:54	45	7.87	91.9	10.92	7.26	-67.2	168	NA	NA	NA
	5/12/2016	8:07:55	50	7.7	91.2	10.88	7.27	-67.4	167.6	NA	NA	NA
Secchi		8:07:10	55	7.54	90.1	10.79	7.27	-67.3	167.5	NA	NA	NA
4.88 M	[8:06:27	60	7.45	89.4	10.73	7.26	-67.2	167.5	NA	NA	NA
	[8:05:26	65	7.34	88.3	10.62	7.26	-67	167.4	NA	NA	NA
	[8:04:05	70	7.3	87.6	10.55	7.26	-66.8	167.5	NA	NA	NA
	[8:03:24	75	7.23	87	10.5	7.26	-66.9	167.4	NA	NA	NA
	[8:02:38	80	7.18	86.7	10.47	7.26	-66.8	167.4	NA	NA	NA
		8:01:25	85	7.16	85.9	10.38	7.23	-65.3	168.8	NA	NA	NA
		8:00:23	90	7.15	85.3	10.31	7.22	-64.8	169.1	NA	NA	NA
		7:59:16	95	7.09	83.3	10.08	7.23	-65.2	168.8	NA	NA	NA
		7:58:22	100	7.09	83	10.06	7.25	-66.3	167.9	NA	NA	NA
		7:57:25	105	7.06	81.7	9.9	7.27	-67.4	167.2	NA	NA	NA
	[7:56:39	110	7.02	81.3	9.87	7.28	-68.4	166.6	NA	NA	NA
	[7:55:50	115	7.03	81	9.83	7.32	-70.2	165.1	NA	NA	NA
	[7:55:13	120	7.03	80.6	9.78	7.36	-72.4	163.3	NA	NA	NA
		7:54:26	125	7.01	79.9	9.7	7.45	-77.3	157.7	NA	NA	NA

Station	Date	Time	Depth	Temp	DO	DO	рΗ	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	С	%	mg/L		mV	mV	NTU	ug/L	mS/cm
		8:34:06	0.5	22.17	107	9.31	7.08	-57.2	196.5	NA	NA	NA
		8:33:12	5	22.16	107	9.3	6.98	-51.5	195.9	NA	NA	NA
Station BZ-6 In-Lake Tower Secchi 2.41 M BZ-6 In-Lake Tower Secchi 3.19 M		8:32:26	10	21.72	107	9.37	6.81	-41.7	200.6	NA	NA	NA
		8:31:23	15	19.36	102	9.37	6.72	-36.3	204.2	NA	NA	NA
		8:30:08	20	15.66	105	10.39	6.7	-35.6	205.2	NA	NA	NA
		8:28:57	25	13.74	94.6	9.8	6.58	-28.8	209.6	NA	NA	NA
		8:27:58	30	11.53	81.8	8.91	6.5	-24.6	213.3	NA	NA	NA
		8:26:59	35	9.81	77.7	8.81	6.48	-23.6	214.9	NA	NA	NA
BZ-6		8:26:08	40	9.08	76.3	8.8	6.48	-23.9	214.9	NA	NA	NA
In-Lake		8:25:01	45	8.77	77.7	9.03	6.5	-24.8	214.3	NA	NA	NA
Tower	6/8/2016	8:24:20	50	8.55	77.9	9.1	6.5	-25.2	214	NA	NA	NA
		8:23:35	55	8.39	77.3	9.07	6.51	-25.5	213.8	NA	NA	NA
		8:22:31	60	8.16	77.4	9.13	6.52	-26	213.5	NA	NA	NA
Secchi		8:21:46	65	8.06	77.5	9.16	6.53	-26.6	212.9	NA	NA	NA
2.41 M		8:20:47	70	7.9	77.5	9.2	6.53	-26.9	212.6	NA	NA	NA
		8:20:02	75	7.8	77.2	9.18	6.54	-27.2	212.4	NA	NA	NA
		8:19:07	80	7.77	76.8	9.15	6.55	-27.8	211.9	NA	NA	NA
		8:17:52	85	7.58	76.4	9.14	6.57	-29.1	210.5	NA	NA	NA
		8:17:17	90	7.4	75.2	9.04	6.59	-29.8	209.9	NA	NA	NA
		8:16:30	95	7.33	73.1	8.8	6.6	-30.8	209.1	NA	NA	NA
		8:15:53	100	7.3	72	8.68	6.62	-31.9	208	NA	NA	NA
		8:14:59	105	7.23	69.7	8.42	6.67	-34.4	205.9	NA	NA	NA
		8:14:16	110	7.2	69.1	8.34	6.71	-36.8	203.6	NA	NA	NA
		8:13:39	115	7.19	68.7	8.29	6.76	-39.4	201.1	NA	NA	NA
		8:12:21	120	7.19	68	8.22	6.88	-45.8	194.9	NA	NA	NA
L		8:10:47	125	7.19	66.6	8.04	7.02	-53.5	186.5	NA	NA	NA
		8:32:25	0.5	26.67	107	8.55	8.3	-98.6	149.9	0.9	0	0.104
		8:31:54	5	26.67	106	8.51	8.29	-97.8	150.8	0.9	0.3	0.104
		8:30:47	10	26.68	106	8.51	8.24	-94.8	152.6	1.1	1.2	0.104
		8:30:05	15	26.66	106	8.48	8.14	-88.9	154.4	1.6	0.6	0.104
		8:28:31	20	22.39	111	9.66	7.42	-46.1	164	1.8	8.4	0.108
		8:26:22	25	19.56	84.6	7.76	6.87	-13.5	172.3	1.8	5.7	0.109
		8:24:05	30	15.78	61.5	6.09	6.61	1.3	173.6	1.8	3.2	0.106
		8:22:52	35	12.49		5.98	6.56		172.4		2.7	0.102
	_ / / / / _	8:21:43	40	10.03	53.7	6.05	6.54	4.7	172.3	0.3	2.9	0.104
Tower	7/20/2016	8:20:50	45	9.32	52.6	6.04	6.53	4.8	171.9	0.7	2.2	0.103
		8:19:47	50	8.91	55.6	6.44	6.57	2.9	170.8	0	2.1	0.103
		8:18:24	55	8.62	56.2	6.56	6.59	1.7	169.6	0.1	2	0.103
		8:17:25	60	8.47	57.7	6.76	6.62	0.2	168.6	0	1.5	0.102
3.19 M		8:16:22	65	8.35	57.8	6.78	6.63	-0.5	167.5	0	1.7	0.103
		8:15:10	70	8.13	57.8	6.82	6.65	-1.5	166.4	0	1.4	0.103
		8:14:17	75	8.04	58.2	6.88	6.66	-2.4	165.4	0	1.5	0.102
		8:13:11	80	7.84	58.4	6.94	6.68	-3.4	164.2	0	1.6	0.103
		8:12:18	85	7.76	58.2	6.93	6.69	-4	163.1	0	1.7	0.103
		8:10:49	90	7.67	58.6	6.99	6.71	-4.9	161.5	0	1.4	0.102
		8:09:14	95	7.57	55.2	6.61	6.71	-5	159.9	0	1.8	0.102
		8:08:01	100	7.52	53.2	6.37	6.72	-5.6	158.5	0.8	2	0.102
		8:05:51	105	7.41	45.8	5.5	6.73	-6.1	156.2	0.6	1.8	0.104
		8:04:55	110	7.34	43.2	5.2	6.73	-6.1	155.4	0.7	2	0.104
		8:03:55	115	7.3	42.1	5.07	6.73	-6.5	154.3	2.4	2.5	0.104
		8:02:48	120	7.28	41.3	4.98	6.75	-7.6	152.9	3.5	2.8	0.104
		8:01:15	125	7.26	36.6	4.41	6.81	-11	147.8	3.6	18.4	0.104

Station	Date	Time	Depth	Temp	DO	DO	pН	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
		9:30:43	0.5	27.75	106	8.3	8.06	-84.8	137.9	0.5	2.7	0.065
		9:30:07	5	27.75	105	8.27	8.05	-83.7	138.2	0.7	2.8	0.107
		9:29:16	10	27.75	105	8.27	7.98	-79.6	140	0.8	3.1	0.107
		9:28:04	15	27.74	104	8.15	7.74	-65.5	142.2	1.3	3.1	0.107
		9:27:08	20	26.06	91.1	7.39	7.03	-22.9	152.9	1.6	3.4	0.106
		9:25:52	25	23.5	61.2	5.2	6.67	-1.7	160	0.5	2.3	0.107
		9:24:08	30	20.21	42.9	3.89	6.52	6.5	161.7	1.4	2.6	0.102
BZ-6		9:22:44	35	16.42	34.1	3.34	6.43	11.6	162.7	1.2	1.9	0.091
In-Lake		9:21:20	40	11.89	38.4	4.15	6.38	13.8	162.4	0	2.4	0.078
Tower		9:20:05	45	9.87	40.3	4.56	6.37	14	162.2	0	2.6	0.074
	8/18/2016	9:18:53	50	9.34	42	4.81	6.38	13.6	161.3	0	1.9	0.073
		9:17:10	55	9.04	44.7	5.17	6.39	12.8	159.8	1	2	0.072
Secchi		9:15:59	60	8.8	44.2	5.13	6.38	13.2	159.3	0	2.5	0.071
3.63 M		9:15:17	65	8.67	43.1	5.02	6.38	13.3	158.8	0	1.7	0.071
		9:13:52	70	8.46	44.5	5.21	6.36	14.3	158.5	0.5	2	0.071
		9:12:57	75	8.18	45.2	5.33	6.34	15.4	158.7	0.4	2.4	0.07
		9:12:14	80	7.91	45	5.34	6.34	15.5	158.3	0.1	2	0.07
		9:11:13	85	7.7	43	5.13	6.33	16.3	158.1	0	1.8	0.069
		9:09:07	90	7.63	39.7	4.74	6.3	17.9	156.5	0	2.6	0.069
		9:07:31	95	7.51	33.8	4.05	6.26	19.9	156.2	1.2	1.8	0.07
		9:06:26	100	7.45	30.5	3.67	6.24	21.1	155.5	0.8	1.8	0.07
		9:05:21	105	7.45	28.9	3.46	6.21	22.5	155	0.3	2.2	0.07
		9:03:56	110	7.34	25.4	3.05	6.19	23.7	153.8	1.8	2.5	0.071
		9:02:59	115	7.31	24.6	2.97	6.19	23.8	152	0.3	2.3	0.071
		9:01:35	120	7.3	23.3	2.8	6.21	22.8	145.8	3.2	2.5	0.071
	!	9:00:41	125	7.32	20.3	2.45	6.24	21.3	135.3	15.2	3	0.072
		9:48:14	0.5	24.86	104	8.59	8.01	-80.8	167.1	0.2	1.1	0.101
		9:46:55	5	24.8	104	8.62	8	-80.1	169.7	1.3	3	0.101
		9:45:57	10	24.75	103	8.56	7.91	-75.2	171.3	0.7	2.3	0.101
		9:44:04	15	24.7	99.6	8.28	7.67	-60.8	174.4	1.2	3.2	0.101
		9:42:38	20	24.63	98.3	8.18	7.5	-50.9	175.6	1.1	1.6	0.101
		9:41:35	25	24.5	85.5	7.13	7.07	-25.2	181.1	0.7	1.6	0.101
		9:39:49	30	23.27	35.4	3.02	6.57	3.9	189.2	0.3	1.5	0.105
BZ-6		9:37:17	35	20.55		0.83	6.4	13.7	192.3		0	0.103
In-Lake		9:35:55	40	16.77	9.5	0.92	6.36	15.3	192.5	0.3	0.9	0.093
Tower		9:33:39	45	12.31	20.4	2.18	6.35	15.5	191	0	1.5	0.079
0	0/4 4/004 0	9:30:12	50	9.91	26.4	2.99	6.35	15.3	188.8	0	1	0.074
Secchi	9/14/2016	9:28:04	55	9.15	28.5	3.28	6.34	15.8	188.3	0	1.7	0.073
4.60 M		9:27:07	60	8.83	30.7	3.56	6.35	14.9	187	0.6	1.6	0.072
		9:25:13	65 70	8.52 8.29	35.5	4.15	6.36	14.8	186.3	0.8	2.1	0.071
		9:23:58			40.1	4.72	6.36	14.4	185.5	0 0.2	1.6	
		9:22:49 9:21:45	75 80	8.15 7.88	39.1 37.1	4.61	6.32 6.29	16.5 18.1	186.1 186		1.8	0.07
		9:21:45	80 85	7.00	33.8	4.4 4.03	6.29	19.6	185.9	0	2.3 2	0.07
		9:20:30	90	7.59	27.6	4.03 3.3	6.23	21.5	184.8	0	 1.7	0.07
		9:17:42	90 95	7.59	23.9	2.87	6.21	21.5	184.1	0	1.6	0.07
		9:17:42	100	7.49	20.1	2.07	6.19	23.9	183	0.9	1.8	0.07
		9:15:15	105	7.49	14	1.68	6.17	25.9	182.2	1.2	2	0.07
		9:13:13	110	7.36	12.6	1.51	6.15	25.9	180.9	2.2	1.8	0.071
		9:14:09	115	7.34	11.4	1.38	6.15	23.9	178.7	2.2	1.8	0.072
		9:13:00	120	7.34	10.6	1.38	6.15	25.8	170.8	7.3	4.2	0.072
		9:11:02	120	7.34	10.0	1.20	6.16		166.4	139.4	4.2 34.9	0.072
		3.11.UZ	123	1.30	10.2	1.22	0.10	2J.4	100.4	159.4	54.9	0.072

Station Date Time Depth Temp DO DO PH PH/W ORP Turbidity Chloro. M/D/Y hh:mm:ss ft C % mg/L mV mV mV mV mV mV ug/L ug/L BZ-7 .9:12:03 5 14:66 113 11:44 7.82 -98.9 14.48 NA NA 9:10:59 10 14:67 110 11.22 7.64 -89 14.9 NA NA 9:00:01 20 12:53 97.4 10.77 7.38 7.33 15.5 NA NA 9:00:15 30 8.82 85.4 9.96 7.44 -77.6 15.51 NA NA 9:00:15 40 8.33 85 9.98 7.48 -73.4 15.8 NA NA 9:04:03 50 8.11 84.7 10 7.55 -82.9 15.37 NA NA	SpCond
BZ-7 Upper Lake No-Wake 9:12:55 0.5 14.86 113 11.41 7.91 -104 149.4 NA NA 9:12:03 5 14.86 113 11.44 7.82 98.9 148.8 NA NA 9:10:059 10 14.57 110 11.44 7.82 98.9 149. NA NA 9:00:01 20 12.53 97.4 10.37 7.38 155.1 NA NA 9:00:15 35 8.45 85.1 99.6 7.44 7.78 155.8 NA NA 9:00:15 35 8.45 85.1 99.6 7.44 7.71 157.2 NA NA 9:00:16 40 8.33 85 9.98 7.48 7.73.8 17.48 NA NA 9:04:36 45 8.12 84.7 10 7.61 -86.6 150.6 NA NA 9:02:39 55 8.11 84.7 10	mS/cm
BZ-7 Upper Lake No-Wake 9:12:03 5 14.68 113 11.44 7.82 -98.9 148.8 NA NA 9:10:05 10 14.57 110 11.22 7.64 -88 149 NA NA 9:00:01 20 12.53 97.4 10.92 7.44 -77.6 155.1 NA NA 9:00:01 20 12.53 97.4 10.37 7.38 73.8 157.5 NA NA 9:00:01 20 12.53 97.4 10.37 73.8 75.7 NA NA 9:00:15 30 8.45 85.1 9.96 7.44 -77 157.2 NA NA 9:00:30 55 8.11 84.7 10 7.55 82.9 153.7 NA NA 9:02:39 55 8.11 84.7 10 7.55 82.9 153.7 NA NA 9:02:30 0.5 23.59 103 8.74	
BZ-7 Upper Lake No-Wake 9:12:03 5 14.68 113 11.44 7.82 -98.9 148.8 NA NA 9:10:05 10 14.57 110 11.22 7.64 -88 149 NA NA 9:00:01 20 12.53 97.4 10.92 7.44 -77.6 155.1 NA NA 9:00:01 20 12.53 97.4 10.37 7.38 73.8 157.5 NA NA 9:00:01 20 12.53 97.4 10.37 73.8 75.7 NA NA 9:00:15 30 8.45 85.1 9.96 7.44 -77 157.2 NA NA 9:00:30 55 8.11 84.7 10 7.55 82.9 153.7 NA NA 9:02:39 55 8.11 84.7 10 7.55 82.9 153.7 NA NA 9:02:30 0.5 23.59 103 8.74	NA
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9:19:01 60 8.84 30.4 3.53 6.61 0.3 200.7 1.1 2.2 10:38:08 0.5 28.51 110 8.54 8.63 -119 135.9 1.1 4 10:37:22 5 28.49 109 8.48 8.62 -118 137.8 1 4.9	0.104
10:38:08 0.5 28.51 110 8.54 8.63 -119 135.9 1.1 4 10:37:22 5 28.49 109 8.48 8.62 -118 137.8 1 4.9	0.104
10:37:22 5 28.49 109 8.48 8.62 -118 137.8 1 4.9	0.104
	0.104
	0.104
10:35:43 15 26.38 71.9 5.8 6.77 -7.4 162.7 1.8 2.7	0.101
10:34:51 20 24.86 62 5.13 6.71 -4.1 165.3 2 2.5	0.111
BZ-7 8/18/2016 10:32:54 25 23.21 41.1 3.51 6.56 4.5 167.5 2.2 2.1	0.11
Upper Lake 10:31:36 30 20.89 17.2 1.53 6.42 12.4 168.2 2.1 2.2	0.106
No-Wake 10:30:29 35 17.47 5.9 0.56 6.36 15.7 167.4 1.2 2.1	0.099
10:29:26 40 12.16 3.6 0.39 6.19 24.8 173.2 1.2 2.5	0.083
10:28:13 45 10.14 4.8 0.54 6.1 29.5 174.7 324.4 81.4	0.078
10:27:02 50 9.48 7.8 0.89 6.08 30.3 176.7 26.9 13	0.075
10:25:22 55 9.33 8.6 0.99 6.14 26.8 172.4 11.2 17.1	0.075

Station	Date	Time	Depth	Temp	DO	DO	рΗ	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	С	%	mg/L		mV	mV	NTU	ug/L	mS/cm
		10:59:25	0.5	25.35	104	8.51	7.73	-64.5	141.8	1.1	1.2	0.1
		10:58:25	5	25.24	104	8.56	7.77	-67.1	140.7	0.6	2	0.1
		10:57:10	10	25.14	104	8.53	7.76	-66	140.5	3.5	2.9	0.1
		10:55:31	15	25.1	101	8.35	7.59	-56.2	141.4	1.4	1.8	0.099
		10:54:01	20	25.07	98.7	8.15	7.4	-45	142.8	1.2	2.2	0.099
BZ-7		10:52:10	25	24.34	81.6	6.82	6.87	-13.7	149.3	1.3	1.1	0.085
Upper Lake	9/14/2016	10:50:47	30	22.77	57.9	4.99	6.68	-2.6	150.9	3.5	1.6	0.103
No-Wake		10:49:40	35	18.88	2.9	0.27	6.42	12.1	153.2	2.2	0.6	0.102
		10:48:09	40	16.98	2	0.19	6.27	21.1	151.9	1.9	1.7	0.098
		10:47:00	45	14.97	2.2	0.22	6.22	23.2	142.9	7	2.2	0.095
		10:45:33	48	13.02	2.9	0.31	6.27	20.4	138.9	9.1	1	0.09

APPENDIX B

LABORATORY CUSTODY SHEETS





Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., St	e. 600				Date of F Lab ID:	Report:	05/24 3157	+/16 7–16–0016769
Arlington VA 22201					Date Coll Collected		05/12 Clier	2/16 10:50 ht
Sample Desc: BZ-1 Surface	,				Date Rece	ived:	05/12	2/16 13:00
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI					وي ويور بعد عد عد عد نظامت الله وي			
MICROBIOLOGY								
Fecal Coliform	<2	/100ml	2	1	SM 9222D	05/12	14:00	RES
Total Coliform	220	mpn/100ml	1	1	SM 9223B		11:30	
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	05/13	15:50	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	05/16	17:30	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	05/16	17:05	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	05/12	22:29	JCL
Nitrogen, Nitrate	0.64	mg/l	.05	1	EPA 353.2	05/12	17:37	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	05/12	16:07	JCL
Nitrogen, Total Kjeldahl	0.30	mg/l	.25	1	EPA 351.2	05/18	17:08	JCL
OTHER	_							
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B		11:45	
Total Organic Carbon	2.0	mg/l	1	1	SM5310 C	05/13	23:19	ALD
RESIDUES		_						
Solids, Total Dissolved	126	mg/L	5	1	SM 2540C	05/16	12:35	ALD
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	05/16	11:15	ALD
TITRATIONS								
Alkalinity, Total to pH 4.5	11	mg/l	1	1	SM 2320 B	05/16	12:05	AEH

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Attention: David Wertz					Date of F	Report:	05/24	¥/16
Reported To: Tetra Tech (Beltzville Dam)					Lab ID:		3157	7–16–0016769
1320 North Courthouse Rd., Ste.	600							
Arlington VA 22201					Date Coll	ected:	05/12	2/16 10:50
					Collected	By:	Clier	nt
Sample Desc: BZ-1 Surface					Date Rece	eived:	05/12	2/16 13:00
	,							
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

COMMENTS

01 The total coliform sample was placed in the incubator on 05/12/2016 at 16:10.

- O2 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.
- 03 The Ammonia matrix spike was low indicating possible sample matrix interference.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam)					Date of R Lab ID:	eport:	•	./16 '-16-0016770
1320 North Courthouse Rd., Ste. Arlington VA 22201	600				Date Coll Collected		05/12 Clien	2/16 10:35 It
Sample Desc: BZ-2 Surface					Date Rece	ived:	05/12	2/16 13:00
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	13	/100ml	2	1	SM 9222D	•	14:00	
Total Coliform	730	mpn/100ml	1	1	SM 9223B	05/13	11:30	KAW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	05/13	15:50	AEH
Phosphorus as P, Dissolved	<.05	mg/l	. 05	1	SM 4500P-E			AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	05/16	17:05	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	'	23:13	
Nitrogen, Nitrate	0.14	mg/l	.05	1	EPA 353.2		17:41	
Nitrogen, Nitrite	<.05	mg/l	. 05	1	EPA 353.2	'	16:12	
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	05/18	17:09	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	•	11:45	
Total Organic Carbon	<1	mg/l	1	1	SM5310 C	05/13	23:31	ALD
RESIDUES								
Solids, Total Dissolved	144	mg/l	5	1	SM 2540C	05/16	12:35	ALD
Solids, Total Suspended	3	mg/l	3	1	SM 2540D	05/16	11:15	ALD
TITRATIONS								
Alkalinity, Total to pH 4.5	7	mg/l	1	1	SM 2320 B	05/16	12:05	AEH

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	David Wertz Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 6	00				Date of F Lab ID:	eport:	05/24 3157	4/16 7-16-0016770
	Arlington VA 22201					Date Coll Collected		05/12 Clier	2/16 10:35 nt
Sample Desc:	BZ-2 Surface					Date Rece	ived:	05/12	2/16 13:00
PWSID: 313084	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

COMMENTS

01 The total coliform sample was placed in the incubator on 05/12/2016 at 16:10.

02 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste	Date of Repor Lab ID:		: 05/24/16 3157-16-001677					
Arlington VA 22201					Date Coll Collected		05/12 Clier	2/16 08:35 nt
Sample Desc: BZ-3 Surface					Date Rece	eived:	05/12	2/16 13:00
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	<2	/100mL	2	1	SM 9222D	05/12	14:00	RES
Total Coliform	34	, mpn/100ml	1	1	SM 9223B	'	11:30	
CHEMISTRY		. ,						1014
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	05/13	15:50	AEH
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	-		
Phosphorus as P, Total	0.02	mg/l	.01	1	SM 4500P-E	05/16	17:05	AEH
NITROGENS						•		
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	05/12	23:28	JCL
Nitrogen, Nitrate	0.61	mg/l	. 05	1	EPA 353.2	05/12	17:42	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	05/12	16:13	JCL
Nitrogen, Total Kjeldahl	0.29	mg/l	.25	1	EPA 351.2	05/18	17:11	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	05/12	11:45	EMW
Total Organic Carbon	1.3	mg/l	1	1	SM5310 C	05/13	23:43	ALD
RESIDUES								
Solids, Total Dissolved	169	mg/l	5	1	SM 2540C	05/16	12:35	ALD
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	05/16	11:15	ALD
TITRATIONS								
Alkalinity, Total to pH 4.5	12	mg/l	1	1	SM 2320 B	05/16	12:05	AEH

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Attention: David Wertz					Date of F	eport:	05/24	4/16
Reported To: Tetra Tech (Beltzvi	ille Dam)				Lab ID:		3157	, 7–16–0016771
1320 North Courthou	use Rd., Ste. 600							
Arlington VA 22201					Date Coll	ected:	05/12	2/16 08:35
					Collected	By:	Clier	nt
Sample Desc: BZ-3 Surface					Date Rece	ived:	05/12	2/16 13:00
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
						_		

COMMENTS

01 The total coliform sample was placed in the incubator on 05/12/2016 at 16:10.

02 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 600						Date of Report: Lab ID:		4/16 7-16-0016772
Arlington VA 22201					Date Coll Collected		05/12 Clier	2/16 08:35 ht
Sample Desc: BZ-3 Mid-Depth					Date Rece	eived:	05/12	2/16 13:00
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	05/13	15:50	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E			
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	05/16	17:05	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	05/12	23:42	JCL
Nitrogen, Nitrate	0.69	mg/l	.05	1	EPA 353.2	05/12	17:43	JCL
Nitrogen, Nitrite	<.05	mg/l	. 05	1	EPA 353.2	05/12	16:14	JCL
Nitrogen, Total Kjeldahl OTHER	<.25	mg/l	.25	1	EPA 351.2	05/18	17:12	JCL
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	05/12	11:45	EMW
Total Organic Carbon	1.0	mg/l	1	1	SM5310 C	•	10:33	
RESIDUES						,		
Solids, Total Dissolved	133	mg/l	5	1	SM 2540C	05/16	12:35	ALD
Solids, Total Suspended TITRATIONS	<3	mg/l	3	1	SM 2540D	•	11:15	
Alkalinity, Total to pH 4.5	9	mg/l	1	1	SM 2320 B	05/16	12:05	AEH

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste Arlington VA 22201	. 600				Date of R Lab ID: Date Coll Collected	.ected:	3157	/16 08:35
Sample Desc: BZ-3 Deep					Date Rece	ived:	05/12	/16 13:00
PWSID: 3130843	Result	Unit 	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	05/13	15:50	AEH
Phosphorus as P, Dissolved	<.05	mg/l	. 05	1	SM 4500P-E	05/16	17:35	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	05/16	17:10	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	05/12	23:57	JCL
Nitrogen, Nitrate	0.68	mg/L	.05	1	EPA 353.2	05/12	17:44	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	05/12	16:15	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	05/18	17:13	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	05/12	11:45	EMW
Total Organic Carbon	1.0	mg/l	1	1	SM5310 C	05/16	10:56	ALD
RESIDUES								
Solids, Total Dissolved	109	mg/l	5	1	SM 2540C	05/16	12:35	ALD
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	05/16	11:15	ALD
TITRATIONS						-		
Alkalinity, Total to pH 4.5	9	mg/l	1	1	SM 2320 B	05/16	12:05	AEH

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: David Wertz Date of Report: 05/24/16 Reported To: Tetra Tech (Beltzville Dam) Lab ID: 3157-16-0016774 1320 North Courthouse Rd., Ste. 600 Arlington VA 22201 Date Collected: 05/12/16 10:25 Collected By: Client Sample Desc: BZ-4 Surface 05/12/16 13:00 Date Received: PWSID: 3130843 Rep Dilutn Test Test Result Unit Limit Factor Procedure Date Time Analyst BACTI MICROBIOLOGY Fecal Coliform <2 /100mL 2 1 SM 9222D 05/12 14:00 TNS 2000 Total Coliform mpn/100ml 1 1 SM 9223B 05/13 11:30 KAW CHEMISTRY COLORMETRIC Phosphate as P, Ortho <.01 .01 1 SM 4500P-E 05/13 15:50 AEH mg/l Phosphorus as P, Dissolved <.05 mg/l .05 1 SM 4500P-E 05/16 17:35 AEH SM 4500P-E 05/16 17:10 AEH Phosphorus as P, Total <.01 .01 1 mg/l NITROGENS Nitrogen, Ammonia < 05 mg/l .05 1 D6919-03 05/13 00:12 JCL Nitrogen, Nitrate 2.45 mg/l .05 1 EPA 353.2 05/12 17:45 JCL <.05 . 05 Nitrogen, Nitrite 1 EPA 353.2 05/12 16:16 mg/l JCL <.25 .25 EPA 351.2 05/18 17:14 Nitrogen, Total Kjeldahl mg/l 1 JCL OTHER <2 1 Biochemical Oxygen Demand mg/l 2 SM 5210B 05/12 11:45 EMW Total Organic Carbon 1.4 mg/l 1 1 SM5310 C 05/16 11:31 ALD RESIDUES 70 5 1 SM 2540C Solids, Total Dissolved mg/l 05/16 12:35 ALD Solids, Total Suspended <3 3 SM 2540D mg/l 1 05/16 12:35 ALD TITRATIONS

6

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Alkalinity, Total to pH 4.5

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SM 2320 B

05/16 12:05 AEH

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mg/l

1

1







Attention:	David Wertz					Date of F	leport:	05/24	¥/16
Reported To:	Tetra Tech (Beltzville Dam)					Lab ID:		3157	'-16-001677 4
	1320 North Courthouse Rd., Ste. 6	00							
	Arlington VA 22201					Date Coll	ected:	05/12	2/16 10:25
			·			Collected	l By:	Clier	nt
Sample Desc:	BZ-4 Surface					Date Rece	eived:	05/12	2/16 13:00
BUOTE - 74700	/ 7				B d Lucia			- .	
PWSID: 313084	45			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

COMMENTS

01 The total coliform sample was placed in the incubator on 05/12/2016 at 16:10.

O2 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., S1 Arlington VA 22201		Date of Report: Lab ID: Date Collected: Collected By:		05/24/16 3157-16-00167 05/12/16 10:10 Client				
Sample Desc: BZ-5 Surface					Date Rece	ived:	05/12	/16 13:00
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	60	/100ml	2	1	SM 9222D	05/12	14:30	TNS
Total Coliform	1400	mpn/100ml	1	1	SM 9223B	05/13	11:30	KAW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	05/13	15:50	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	05/16	17:35	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	05/16	17:10	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	05/13	00:26	JCL
Nitrogen, Nitrate	0.96	mg/l	.05	1	EPA 353.2	05/12	17:46	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	05/12	16:17	JCL
Nitrogen, Total Kjeldahl	0.38	mg/l	.25	1	EPA 351.2	05/18	17:15	JCL
OTHER								
Biochemical Oxygen Demand	8	mg/L	2	1	SM 5210B	05/12	11:45	EMW
Total Organic Carbon	1.4	mg/l	1	1	SM5310 C	05/16	11:43	ALD
RESIDUES								
Solids, Total Dissolved	125	mg/l	5	1	SM 2540C	05/16	12:35	ALD
Solids, Total Suspended	789	mg/l	3	1	SM 2540D	05/16	12:35	ALD
TITRATIONS								
Alkalinity, Total to pH 4.5	13	mg/l	1	1	SM 2320 B	05/16	12:05	AEH

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 600				Date of R Lab ID:	eport:	05/24 3157	/16 7-16-0016775
Arlington VA 22201				Date Coll Collected		05/12 Clier	2/16 10:10 ht
Sample Desc: BZ-5 Surface				Date Rece	ived:	05/12	2/16 13:00
PWSID: 3130843		Rep	Dilutn		Test	Test	
Result	Unit	Limit 	Factor	Procedure	Date	Time	Analyst

COMMENTS

01 The total coliform sample was placed in the incubator on 05/12/2016 at 16:10.

02 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 600						Date of R Lab ID:	eport:	05/24/16 3157-16-0016776	
	Arlington VA 22201					Date Coll Collected		05/12 Clien	/16 08:05 t
	Sample Desc: BZ-6 Surface					Date Rece	ived:	05/12	/16 13:00
	PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
	BACTI								
	MICROBIOLOGY			_	_				
	Fecal Coliform	<2	/100mL	2	1	SM 9222D	05/12		TNS
	Total Coliform	77	mpn/100ml	1	1	SM 9223B	05/13	11:30	KAW
	CHEMISTRY								
	COLORMETRIC	4.04		04		aw (5005 5	05 147	45.50	
	Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E			AEH
	Phosphorus as P, Dissolved	<.05	mg/l	. 05	1	SM 4500P-E			AEH
	Phosphorus as P, Total NITROGENS	<.01	mg/l	.01	1	SM 4500P-E	05/16	17:10	AEH
	Nitrogen, Ammonia	<.05	mg / I	.05	1	D6919-03	05 /17	00.41	JCL
	Nitrogen, Nitrate	0.60	mg/l mg/l	.05	1	EPA 353.2	•	00:41 17:47	JCL
	Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2 EPA 353.2	•	16:18	JCL
	Nitrogen, Total Kjeldahl	0.29	mg/t	.25	1	EPA 351.2		17:18	
	OTHER	0.27	ilig/ c	. 27	'		0)/10	17.10	362
	Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	05/12	11:45	EMW
	Total Organic Carbon	1.3	mg/l	1	1	SM5310 C	'	11:55	
	RESIDUES	1.5			•	3115510 0	05/10	11.55	
	Solids, Total Dissolved	55	mg/l	5	1	SM 2540C	05/16	12:35	ALD
	Solids, Total Suspended	<3	mg/t	3	1	SM 25400	'	12:35	
	TITRATIONS			2	•		52/10		r van br
	Alkalinity, Total to pH 4.5	10	mg/l	1	1	SM 2320 B	05/16	12:05	AFH
				• •	•		327.0		

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	David Wertz Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 6	00				Date of F Lab ID:	Report:	05/24 3157	/16 -16-0016776
	Arlington VA 22201					Date Coll Collected		05/12 Clier	2/16 08:05 It
Sample Desc:	BZ-6 Surface					Date Rece	eived:	05/12	2/16 13:00
PWSID: 31308	43			Rep	Dilutn		Test	Test	
		Result	Unit 	Limit	Factor	Procedure	Date	Time	Analyst

COMMENTS

01 The total coliform sample was placed in the incubator on 05/12/2016 at 16:10.

02 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., St	Date of Report: Lab ID:		05/24 3157	/16 '-16-0016777				
Arlington VA 22201					Date Coll Collected		05/12 Clien	2/16 08:05 It
Sample Desc: BZ-6 Mid-Depth					Date Rece	ived:	05/12	/16 13:00
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY					<u>سم می ایند این می می این این می ایند این می ایند این ا</u>			
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	05/13	15:50	AEH
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	05/16	17:35	AEH
Phosphorus as P, Total	0.06	mg/l	.01	1	SM 4500P-E	05/16	17:10	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	05/13	00:55	JCL
Nitrogen, Nitrate	0.68	mg/l	. 05	1	EPA 353.2	05/12	17:48	JCL
Nitrogen, Nitrite	<.05	mg/l	. 05	1	EPA 353.2	05/12	16:19	JCL
Nitrogen, Total Kjeldahl	0.31	mg/l	.25	1	EPA 351.2	05/18	17:19	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	05/12	11:45	EMW
Total Organic Carbon	1.1	mg/l	1	1	SM5310 C	05/16	12:06	ALD
RESIDUES								
Solids, Total Dissolved	105	mg/l	5	1	SM 2540C	05/16	12:35	ALD
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	05/16	12:35	ALD
TITRATIONS								
Alkalinity, Total to pH 4.5	9	mg/l	1	1	SM 2320 B	05/16	12:05	AEH

COMMENTS

O1 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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CERTIFICATE OF ANALYSIS





Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Sto Arlington VA 22201	e. 600				Date of F Lab ID: Date Coll	.ected:	3157 05/12	, -16-0016778 2/16 08:05
					Collected	l By:	Clien	rt
Sample Desc: BZ-6 Deep	r				Date Rece	ved:	05/12	/16 13:00
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	05/13	15:50	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	05/16	17:35	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	05/16	17:10	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	05/13	01:10	JCL
Nitrogen, Nitrate	0.68	mg/l	.05	1	EPA 353.2	05/12	17:53	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	05/12	16:24	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	05/18	17:20	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	05/12	11:45	EMW
Total Organic Carbon	1.0	mg/l	1	1	SM5310 C	05/16	12:18	ALD
RESIDUES								
Solids, Total Dissolved	124	mg/l	5	1	SM 2540C	05/16	12:35	ALD
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	05/16	12:35	ALD
TITRATIONS								
Alkalinity, Total to pH 4.5	9	mg/l	1	1	SM 2320 B	05/16	12:05	AEH

COMMENTS

The Ortho-phosphate was filtered and the dissolved phosphorous 01 was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., St	e. 600				Date of R Lab ID:	eport:	05/24 3157	/16 160016779
Arlington VA 22201					Date Coll Collected		05/12 Clien	/16 09:05 t
Sample Desc: BZ-7 Surface					Date Rece	ived:	05/12	/16 13:00
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	<2	/100mL	2	1	SM 9222D	05/12	14:30	TNS
Total Coliform	76	mpn/100ml	1	1	SM 9223B	05/13	11:30	KAW
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	05/13	15:50	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E			AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	05/16	17:10	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	05/13	01:25	JCL
Nitrogen, Nitrate	0.61	mg/l	.05	1	EPA 353.2	05/12	17:54	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	05/12	16:25	JCL
Nitrogen, Total Kjeldahl	0.32	mg/l	.25	1	EPA 351.2	05/18	17:21	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	05/12	11:45	EMW
Total Organic Carbon	1.4	mg/l	1	1	SM5310 C	05/16	12:29	ALD
RESIDUES								
Solids, Total Dissolved	110	mg/l	5	1	SM 2540C		12:35	
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	05/16	13:10	ALD
TITRATIONS								
Alkalinity, Total to pH 4.5	11	mg/l	1	1	SM 2320 B	05/16	12:05	AEH

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Attention: David Wertz					Date of F	Report:	05/24	4/16
Reported To: Tetra Tech (Beltzville Dam)					Lab ID:		3157	-16-0016779
1320 North Courthouse Rd., Ste. 6	00							
Arlington VA 22201					Date Coll	ected:	05/12	2/16 09:05
					Collected	By:	Clier	nt
Sample Desc: BZ-7 Surface					Date Rece	eived:	05/12	2/16 13:00
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

COMMENTS

01 The total coliform sample was placed in the incubator on 05/12/2016 at 16:10.

02 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste Arlington VA 22201	e. 600				Date of F Lab ID: Date Coll		3157	/16 -16-0016780 /16 09:05
					Collected		Clien	,
						-		
Sample Desc: BZ-7 Mid-Depth					Date Rece	eived:	05/12	/16 13:00
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	05/13	16:00	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	05/16	17:40	AEH
Phosphorus as P, Total	<.01	mg/L	.01	1	SM 4500P-E			
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	05/13	01:39	JCL
Nitrogen, Nitrate	0.74	mg/l	.05	1	EPA 353.2	05/12	17:55	JCL
Nitrogen, Nitrite	<.05	mg/l	. 05	1	EPA 353.2	05/12	16:26	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	05/18	17:23	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	05/12	11:45	EMW
Total Organic Carbon	1.2	mg/l	1	1	SM5310 C	05/16	12:41	ALD
RESIDUES								
Solids, Total Dissolved	102	mg/l	5	1	SM 2540C	05/16	12:35	ALD
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	05/16	13:10	ALD
TITRATIONS								
Alkalinity, Total to pH 4.5	11	mg/l	1	1	SM 2320 B	05/16	12:05	AEH

COMMENTS

O1 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Sto	e. 600				Date of F Lab ID:	eport:	05/24 3157	/16 -16-0016781
Arlington VA 22201					Date Coll Collected		05/12 Clien	2/16 09:05 ht
Sample Desc: BZ-7 Deep					Date Rece	eived:	05/12	2/16 13:00
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY	<u> </u>				<u> </u>			
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	05/13	16:00	AEH
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	05/16	17:40	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	05/16	17:15	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	05/13	01:54	JCL
Nitrogen, Nitrate	0.69	mg/l	.05	1	EPA 353.2	05/12	17:56	JCL
Nitrogen, Nitrite	<.05	mg/l	. 05	1	EPA 353.2	05/12	16:27	JCL
Nitrogen, Total Kjeldahl	0.28	mg/L	.25	1	EPA 351.2	05/18	17:24	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	05/12	11:45	EMW
Total Organic Carbon	1.1	mg/l	1	1	SM5310 C	05/16	12:52	ALD
RESIDUES								
Solids, Total Dissolved	61	mg/l	5	1	SM 2540C	05/16	12:35	ALD
Solids, Total Suspended	49	mg/l	3	1	SM 2540D	05/16	13:10	ALD
TITRATIONS		-						
Alkalinity, Total to pH 4.5	10	mg/l	1	1	SM 2320 B	05/16	12:05	AEH

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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COFC. Page:					5 (A N	2/12/11		headspac	5203; <1/2/16	5501	headspac	5203; 512/16	0836	headspac	S203;				No
		No: 274496		Bottle Prep bv:	N	rix: o Date: Time.	Pt nh3 p w/ H2SO4 (pH<2); 8oz Alk p w/ Cool to 6 C;	nbervoa g w/ od p w/ Cool 103no2 p w/	lMicro p w/ Sterile/Na2 o Date:	Time: t nh3 p w/ H2SO4 (pH<2); cz alk n w/ Cool to 6 C;	<pre>y w/ H3P04/zero cool to 6 C; w/ Cool to 6 C;</pre>	lMicro p w/ o	H2SO4 (pi	y w/ H3P04/zero Cool to 6 C; w/ Cool to 6 C;	pw/Sterile/		Laboratory by: Parkel Muse	Time: 1300	Sample entered by:
ASSOCIATES, INC.	Custody	Project Leader: rxw Reservoir		na Time (hours).	eipt T App	======================================	чн хх	- 1 1 1 2 2 2 2	- 1 X Mat	~~ ~~ ~	****	- 1 X Mat	 - -	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	4 M _ H H L H		t My Received for laborat	Date: 5/12/16	
M. J. REIDER	Chain of C	Order: 006226 Order Description: Beltzville	Remarks:	600	atory											c	Received by: With M	5/12/16 1130	
24:25 PM		3157 Work Orde Work Orde	David Wertz	Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. Arlington VA 22201	703-387-5516 Ext: WACIK	luton la base : BZ-1 Surface Sample No: 1 Desc: BZ-1 Surface	tkn, alk, tds, tss, po4-p, toc,	no2-n, no3-n, d-po4-p, o-po4, body	0. 2 Desc: BZ-2 Surface	nh3-n, tkn, alk, tds, tss, po4-p, toc,	no2-n, M. d-po4-p, o-po4, bod	0 3 Desc: BZ-3 Surface	.kn, alk, tds,	М В В В В В В В В В В В В В В В В В В В	Ĩ		Annue	Time: //30	
rxw 04/26/16 12:24:25		Account:	Customer: D	Address: 1 1	Phone: 7 Samplers:	======================================	nh3-n, t	№ по2-п, п	16770 fc, tc, Sample No:	nh3-n, t	по2-п, М	Sample No:	nh3-n, t	М по2-п, п	fc, tc,	2	hur behaitmet led	Date: $5/12/16$	

rxw 04/26/16 12:24:26 PM	EIDE
	Chain of Custody
Account: 3157 Work Order: 006226 Work Order Description	Project Leader: rxw 1: Beltzville Reservoir
	Remarks:
Address: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 600	
	Total Sampling Time (hours): Bottle Prep by:
Phone: 703-387-5516 Ext: Samplers: \mathcal{OACK}	Laboratory Receipt Temp: O Deg C. If Temp Unacceptable, On Ice? Y N Approved By: KES
	Matrix: o Date: $\frac{\zeta \mathcal{R} ^{\psi}}{\tau_{1mo}}$
nh3-n, tkn, alk, tds, tss, po4-p, toc,	- 1 X Pt nh3 p w/ H2S04 (pi - 1 x 807 alt $n w' 7001 + 6$
M. A. 102-n, no3-n, d-po4-p, o-po4, bodal	1 X L bod p w/ Cool to 6 C;
	- I X Pt no3no2 p w/ Cool
Sample No: 5 Desc: BZ-3 Deep	trix: o Date: <u>)//~</u> Time: <u>/87</u>
nh3-n, tkn, alk, tds, tss, po4-p, toc,	- 1 X Pt nh3 p w/ H2SO4(pF - 1 X 8oz A1k p w/ Cool to
M. A-po4-p, o-po4, body	2xambervoa g w/ H3P04/zer L bod p w/ Cool to 6 C;
	- I A FT ROJROZ P W/ COOL
Sample No: 6 Desc: BZ-4 Surface	Matrix: o Date: <u>>//*//</u> Time: <u>パワテビ</u>
nh3-n, tkn, alk, tds, tss, po4-p, toc,	- 1 X Pt nh3 p w/ H2SO4(pH - 1 X 8oz Alk p w/ Cool to
\mathcal{M}	1 X 2xambervoa g w/ 1 X L bod p w/ Cool
2	
	IL IN
Relinquished by: //////// Received by:	April 1 A With Received for laboratory by: 7 4
Date: S/12/6 Time: 1/36	5/12/16 1130 Date: 5/12/16 Time: 1300
	Sample entered by: $\gamma \%$

COFC. Page:					(N (Å)	r/ne/14		ıeadspac	3203; <(/2/16	0805	-	headspac		0805		zero headspac ; 6 C;			X	esa
		274496			e Prep by	e, On Ice?	Date: (pH<2); to 6 C;	H3PO4/zero headspac to 6 C; Cool to 6 C;	erile/Na2	Time: Time: T204 (rut/2).		zero , 6 C;	Sterile/Na2S203; z/z	Date: Time:	рН<2); to 6 С;	4,0 t		TI /	MMX	tered by:
		No:			Bottle	Unacceptable,		W/ CO	9 001/2 1001	∫m đ		< 3	9 w/ Cool v/C	/m đ		W/ COC	9 000 1000	Ĩ		1 200	Sample entered by:
						Temp Una	======================================	nh3 pw zAlk p	2xambervoa L bod p w/ Pt no3no2]	lMicro	, , , , ,	goz Alk p v	2xambervoa L bod p w/ Pt no3no2 p	50mlMicrc	ix: o	Pt nh3 p w, 80z Alk p v	2xambervoa L bod p w/ Pf no3no2 1)		laboratory by: 7 6 Time:	
		ГХW				Deg C. If	===== Matr	 	БС 1 1 X Z 1 X Z 1 X Z 7 2 7 2 7 2 7 2 7 2 7 2 7 2 7 2 7 2 7	- 1 X	Mat	4 M H H I I I	888 888	- 1 1	Matrix:	- 1 - 1 - 1	~~~ ~~~	1			y •
s, inc.		Leader:			(hours):	B _Y : 0		Ч	ОЦШ	н	·	ч	0 4 4	-			U H F	•		Received for	
ASSOCIATES,	Custody	Project Reservoir			Time	ceipt Temp: Approved													,	Dat Rec	3
REIDER 1	Chain of Cu	Beltzville R(cks:		l Sampling	Laboratory Receipt Af													71/1	1 20 Meny	
М. Ј.	Cha		щ		Total	Labor	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1													1. 11m/11	
		Order: 006226 Order Description	ı	600			11 12 13 14 14 14 14 14 14 14 14 14 14 14 14													Received by:	
		Work Order: Work Order		Dam) d., Ste.			surface	-p, toc,	Npoq	D	Q.	-p, toc,	pod	Ð	BZ-6 Mid-Depth	-p, toc,	pod	ç,	A	112.0	
		OM MO		Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd.,	- +B F 0 7 7		===== BZ-5	tss, po4-p,	A11. 0, 0-po4, body		BZ-6 Surface	tss, po4-p,	tu , o-po4, body			tss, po4-p,	Au p, o-po4, bod				TTTTE:
PM			Wertz	Tech (Be	TCON VA 2.	WACik	ample No: 7 Desc:	alk, tds,	d-po4-p		Desc:	alk, tds,	№3-п, d-ро4-р,		Desc:	alk, tds,	M A1 no3-n, d-po4-p,		\langle	The	
12:24:26		3157				507	. 7	tkn,	по2-n, по3-n,	ţc,	ω	tkn,		3	6 	ľkn,				shed by:	
rxw 04/26/16 12:24:26		Account:	Customer:	Address:	ī	Fnone: Samplers:	Sample No:	nh3 -n,	no2 - 1	Natal FCAN	Sample No	nh3-n,	no2-n,	AL LILL	Sample No:	nh3-n,	no2-n,			Relinquished by:	Date: 3/10

rxw 04/26/16 12:24:27 PM	M. J. REIDER ASSOCIATES, INC. Page:
	Chain of Custody
Account: 3157 Work Order: 006226 Work Order Description	Project Leader: rxw on: Beltzville Reservoir
Customer: David Wertz	, pa
Address: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 600 Arlington VA 22201	
Phone: 703-387-5516 Ext: Samplers: $\mathcal{M} A C \hat{i} \mathcal{K}$	Total Sampling Time (hours):
Vangle No: 10 Desc: BZ-6 Deep	Matrix: o $\frac{\zeta}{\Lambda^{2}N}$
nh3-n, tkn, alk, tds, tss, po4-p, toc,	- 1 X Pt nh3 p w/ H2SC - 1 X 8oz Alk p w/ Coc
.02-n, M03-n, d-p04-p	C - 1 X 2xambervoa g w/ HJF04/zero headspac D - 1 X L bod p w/ Cool to 6 C; E - 1 X Pt no3no2 p w/ Cool to 6 C;
الارم) الارتفاد المراقع المراقع مراقع المراقع الم	Matrix: o Date: S/hz/hz
nh3-n, tkn, alk, tds, tss, po4-p, toc,	- 1 X Pt nh3 p w/ - 1 X 80z Alk p.w/ 1 V 250mherros
no2-n, no3-n, d-po4-p, o-po4, bod,	1 X L bod P W/ 1 X Pt no3no2 F
) W780 ^{fc, tc} Sample No: 12 Desc: BZ-7 Mid-Depth	Matrix: o Date: 0
alk,	- 1 X Pt nh3 p w/ H2S04(pi - 1 X 802 Alk p w/ Cool to - 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
ηλ no2-n, no3-n, d-po4-p, o-po4, bod,	C - 1 X ZXAMDErVOA G W/ HJFU4/ZEIO MEAUSPAC D - 1 X L bod p W/ Cool to 6 C; E - 1 X Pt no3no2 p W/ Cool to 6 C;
Ø	
Relinquished by: Author Received by:	. With Ming Received for laboratory by: With String
Date: 5/12/16 / Time: // 76	$\int 5/12/16 \frac{1}{1130}$ Date: $5/12/16$ Time: 1300
	Sample entered by:

rxw 04/26/16 12:24:27 PM	M. J. REIDER ASSOCIATES, INC. Page:
	Chain of Custody
Account: 3157 Work Order: 006226 Work Order Description	226 Project Leader: rxw No: 274496 Dtion: Beltzville Reservoir
	Remarks:
Address: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 600 2711400 VA 22201	
Phone: 703-387-5516 Ext: Samplers: $WACiK$	Total Sampling Time (hours):Bottle Frep by: Laboratory Receipt Temp: 0 Deg C. If Temp Unacceptable, On Ice? Y N Approved By: 05
الفراخ المراجعة الم المراجعة المراجعة ال	$\operatorname{Matrix: o } \operatorname{Date: } \frac{\leq/ \mathcal{U} (\mathcal{U}) (\mathcal{U}) }{\operatorname{Matrix: o } \operatorname{Date: } \frac{\leq/ \mathcal{U} (\mathcal{U}) (\mathcal{U}) }{\operatorname{Matrix: o } \operatorname{Matrix: o } Matrix: o $
nh3-n, tkn, alk, tds, tss, po4-p, toc,	- 1 X Pt nh3 p w/ H2SO4 (pH<2 - 1 X 8oz Alk p w/ Cool to 6
h_{Λ}	C - 1 X 2xambervoa g w/ H_3PO4/z ero headspac D - 1 X L bod p w/ Cool to 6 C; E - 1 X Pt no3no2 p w/ Cool to 6 C;
)	
•	
Relinquished by: $hhhh hhh hhh hhh hhh hhh hhh hhh hh hh$	$1 \text{ by: } MMMM \\ MMMM \\ S/12/16 /130 \\ Date: 5/12/16 \\ Date: 5/12/16 \\ Sample entered by: $





Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 600						Date of Report: Lab ID:		06/21/16 3157-16-0018031	
Arlington VA 22201					Date Coll Collected		06/08 Clien	3/16 10:50 nt	
Sample Desc: BZ-1 Surface					Date Rece	eived:	06/08	3/16 12:30	
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst	
BACTI									
MICROBIOLOGY									
Fecal Coliform	230	/100ml	2	1	SM 9222D	06/08	14:00	TNS	
Total Coliform	>2400	, mpn/100ml	1	1	SM 9223B	06/09	11:05	TNS	
CHEMISTRY		• /				00,07		ino	
COLORMETRIC							1		
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	06/08	14:40	AEH	
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E			AEH	
Phosphorus as P, Total	<.01	mg/L	.01	1	SM 4500P-E	06/08	17:25	AEH	
NITROGENS						•			
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/09	11:58	HRG	
Nitrogen, Nitrate	0.56	mg/l	.05	1	EPA 353.2	06/08	16:21	JCL	
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/08	14:46	JCL	
Nitrogen, Total Kjeldahl	0.55	mg/l	.25	1	EPA 351.2	06/16	17:53	JCL	
OTHER									
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/08	13:50	EMW	
Total Organic Carbon	1.5	mg/l	1	1	SM5310 C	06/13	11:23	ALD	
RESIDUES									
Solids, Total Dissolved	24	mg/l	5	1	SM 2540C	06/13	13:10	ТМН	
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/13	13:10	тмн	
TITRATIONS									
Alkalinity, Total to pH 4.5	10	mg/l	1	1	SM 2320 B	06/17	13:30	AEH	

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 6	600				Date of Lab ID:	Report:	06/2 [,] 3157	1/16 716-0018031
Arlington VA 22201					Date Col Collecte		06/08 Clier	8/16 10:50 nt
Sample Desc: BZ-1 Surface					Date Rec	eived:	06/08	3/16 12:30
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total coliform sample was placed in the incubator on 06/08/2016 at 16:45.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste	Date of Report: Lab ID:		06/21/16 3157-16-0018032					
Arlington VA 22201					Date Col Collected		06/08 Clier	3/16 10:35 nt
Sample Desc: BZ-2 Surface					Date Rece	eived:	06/08	3/16 12:30
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI	، عن من بين جبر بعر حد تما من عن عن عن عن عن							
MICROBIOLOGY								
Fecal Coliform	240	/100mL	2	1	SM 9222D	06/08	14:00	TNS
Total Coliform	>2400	, mpn/100ml	1	1	SM 9223B	'	11:05	
CHEMISTRY		• •				,-,		1110
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	06/08	14:40	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	'		AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	, 06/08	17:25	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/09	12:12	HRG
Nitrogen, Nitrate	0.22	mg/l	.05	1	EPA 353.2	06/08	16:26	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/08	14:49	JCL
Nitrogen, Total Kjeldahl	0.37	mg/l	. 25	1	EPA 351.2	06/16	17:54	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/08	13:50	EMW
Total Organic Carbon	1.0	mg/l	1	1	SM5310 C	06/13	11:47	ALD
RESIDUES								
Solids, Total Dissolved	17	mg/l	5	1	SM 2540C	06/13	13:10	тмн
Solids, Total Suspended	57	mg/l	3	1	SM 2540D		13:10	
TITRATIONS						-		
Alkalinity, Total to pH 4.5	7	mg/L	1	1	SM 2320 B	06/17	16:05	AEH

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Attention: David Wertz					Date of R	eport:	06/21	/16
Reported To: Tetra Tech (Beltzville Dam)					Lab ID:		, 3157	, 7–16–0018032
1320 North Courthouse Rd., Ste. 6	00							
Arlington VA 22201					Date Coll	ected:	06/08	8/16 10:35
					Collected	By:	Clier	nt
Sample Desc: BZ-2 Surface					Date Rece	ived:	06/08	8/16 12:30
PWSID: 3130843			_					
FW310. 5150645			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

02 The total coliform sample was placed in the incubator on 06/08/2016 at 16:45.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste.	Date of Report: Lab ID:		•	06/21/16 3157-16-0018033				
Arlington VA 22201					Date Col Collected		06/08 Clier	3/16 08:40 nt
Sample Desc: BZ-3 Surface					Date Rece	eived:	06/08	3/16 12:30
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	3	/100ml	2	1	SM 9222D	06/08	14:00	TNS
Total Coliform	75	mpn/100ml	1	1	SM 9223B	06/09	11:05	
CHEMISTRY		. ,				00/07	11.05	1113
COLORMETRIC								·~····
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	06/08	14:40	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	-		AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	06/08	17:25	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	06/09	12:27	HRG
Nitrogen, Nitrate	0.51	mg/l	.05	1	EPA 353.2	06/08	16:27	JCL
Nitrogen, Nitrite	<.05	mg/l	. 05	1	EPA 353.2	06/08	14:50	JCL
Nitrogen, Total Kjeldahl OTHER	0.41	mg/l	.25	1	EPA 351.2	06/16	17:55	JCL
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/08	13:50	EMW
Total Organic Carbon RESIDUES	1.8	mg/l	1	1	SM5310 C	06/13	12:23	ALD
Solids, Total Dissolved	25	mg/L	5	1	SM 2540C	06/13	13:10	ТМН
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	06/13	13:10	тмн
TITRATIONS		_						
Alkalinity, Total to pH 4.5	13	mg/l	1	1	SM 2320 B	06/17	16:05	AEH

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	David Wertz Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 6	00				Date of F Lab ID:	Report:	06/21 3157	1/16 7-16-0018033
	Arlington VA 22201					Date Coll Collected		06/08 Clier	3/16 08:40 nt
Sample Desc:	BZ-3 Surface					Date Rece	vived:	06/08	3/16 12:30
PWSID: 313084	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
		چے سے سے این کا کے وب پھر جہ سے اسا اس							

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total coliform sample was placed in the incubator on 06/08/2016 at 16:45.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste Arlington VA 22201	. 600				Date of Lab ID: Date Col Collected	lected:	3157	, 7-16-0018034 3/16 08:40
Sample Desc: BZ-3 Mid-Depth					Date Rece	eived:	06/08	3/16 12:30
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	06/08	14.40	AEH
Phosphorus as P, Dissolved	0.11	mg/l	- 05	1	SM 4500P-E			AEH
Phosphorus as P, Total	0.05	mg/L	.01	1	SM 4500P-E			
NITROGENS						00,00	11.50	ALII
Nitrogen, Ammonia	<.05	mg/l	. 05	1	D6919-03	06/09	12:42	HRG
Nitrogen, Nitrate	0.64	mg/l	.05	1	EPA 353.2	06/08	16:28	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	06/08		JCL
Nitrogen, Total Kjeldahl	0.54	mg/l	.25	1	EPA 351.2	'	16:07	
OTHER						,		
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/08	13:50	EMW
Total Organic Carbon	<1	mg/l	1	1	SM5310 C	-	12:34	
RESIDUES						•		
Solids, Total Dissolved	40	mg/l	5	1	SM 2540C	06/13	13:10	ТМН
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	, 06/13	13:10	тмн
TITRATIONS						,	-	
Alkalinity, Total to pH 4.5	10	mg/l	1	1	SM 2320 B	06/17	16:05	AEH

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste	Date of Report: Lab ID:		06/21 3157	/16 7–16–0018035				
Arlington VA 22201					Date Coll Collected		06/08 Clier	3/16 08:40 nt
Sample Desc: BZ-3 Deep					Date Rece	eived:	06/08	3/16 12:30
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY COLORMETRIC				· ····································				
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	06/08	14:50	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	-		AEH
Phosphorus as P, Total	0.03	mg/l	.01	1	SM 4500P-E			
NITROGENS		-,				1		
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/09	12:56	HRG
Nitrogen, Nitrate	0.61	mg/l	.05	1	EPA 353.2	06/08	16:29	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	, 06/08	14:51	JCL
Nitrogen, Total Kjeldahl	0.42	mg/l	.25	1	EPA 351.2	06/20	16:10	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/08	13:50	EMW
Total Organic Carbon	<1	mg/l	1	1	SM5310 C	06/13	12:58	ALD
RESIDUES						•		
Solids, Total Dissolved	35	mg/l	5	1	SM 2540C	06/13	13:10	ТМН
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/13	13:10	тмн
TITRATIONS						-		
Alkalinity, Total to pH 4.5	11	mg/l	1	1	SM 2320 B	06/17	16:05	AEH

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 600						Date of Report: Lab ID:		06/21/16 3157-16-0018036	
Arlington VA 22201					Date Coll Collected		06/08 Clier	3/16 10:25 ht	
Sample Desc: BZ-4 Surface					Date Rece	eived:	06/08	3/16 12:30	
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst	
BACTI									
MICROBIOLOGY									
Fecal Coliform	34	/100mL	2	1	SM 9222D	06/08	14:00	TNS	
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B		11:05	TNS	
CHEMISTRY				•		00/07	11.05	1113	
COLORMETRIC									
Phosphate as P, Ortho	0.01	mg/l	.01	1	SM 4500P-E	06/08	14:50	AEH	
Phosphorus as P, Dissolved	0.07	mg/l	.05	1	SM 4500P-E	•	17:05	AEH	
Phosphorus as P, Total	0.08	mg/l	.01	1	SM 4500P-E	•			
NITROGENS						/			
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/09	13:11	HRG	
Nitrogen, Nitrate	1.34	mg/l	. 05	1	EPA 353.2	, 06/08	16:30	JCL	
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/08	14:52	JCL	
Nitrogen, Total Kjeldahl	0.69	mg/l	.25	1	EPA 351.2	06/20	16:11	JCL	
OTHER						•			
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/08	13:50	EMW	
Total Organic Carbon	1.3	mg/l	1	1	SM5310 C	06/13	13:09	ALD	
RESIDUES									
Solids, Total Dissolved	60	mg/l	5	1	SM 2540C	06/13	13:10	тмн	
Solids, Total Suspended	4	mg/l	3	1	SM 2540D	06/13	13:10	тмн	
TITRATIONS									
Alkalinity, Total to pH 4.5	7	mg/l	1	1	SM 2320 B	06/17	16:05	AEH	

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	David Wertz Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 6	600				Date of I Lab ID:	Report:	06/2 ⁴ 3157	1/16 7-16-0018036
	Arlington VA 22201					Date Coll Collected		06/08 Clier	B/16 10:25 nt
Sample Desc:	BZ-4 Surface					Date Rece	eived:	06/08	3/16 12:30
PWSID: 313084	43	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
									-

COMMENTS

O1 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total coliform sample was placed in the incubator on 06/08/2016 at 16:45.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 600						Date of Report: Lab ID:		06/21/16 3157-16-0018037	
Arlington VA 22201					Date Coll Collected		06/08 Clier	3/16 10:15 ht	
Sample Desc: BZ-5 Surface					Date Rece	eived:	06/08	3/16 12:30	
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst	
BACTI									
MICROBIOLOGY									
Fecal Coliform	230	/100mL	2	1	SM 9222D	06/08	14:00	TNS	
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	•	11:05		
CHEMISTRY						,			
COLORMETRIC									
Phosphate as P, Ortho	0.02	mg/l	.01	1	SM 4500P-E	06/08	14:50	AEH	
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	-		AEH	
Phosphorus as P, Total	0.04	mg/l	.01	1	SM 4500P-E	06/08	17:30	AEH	
NITROGENS									
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	06/09	13:25	HRG	
Nitrogen, Nitrate	1.14	mg/l	.05	1	EPA 353.2	06/08	16:31	JCL	
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/08	14:53	JCL	
Nitrogen, Total Kjeldahl	0.84	mg/l	.25	1	EPA 351.2	06/20	16:12	JCL	
OTHER									
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/08	13:50	EMW	
Total Organic Carbon	1.5	mg/l	1	1	SM5310 C	06/13	13:21	ALD	
RESIDUES									
Solids, Total Dissolved	66	mg/l	5	1	SM 2540C	06/13	13:10	ТМН	
Solids, Total Suspended	18	mg/l	3	1	SM 2540D	06/13	13:10	ТМН	
TITRATIONS									
Alkalinity, Total to pH 4.5	14	mg/l	1	1	SM 2320 B	06/17	16:05	AEH	

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Attention:	David Wertz					Date of F	eport:	06/21	1/16
Reported To:	Tetra Tech (Beltzville Dam)					Lab ID:	•		, 7–16–0018037
	1320 North Courthouse Rd., Ste. 6	00							
	Arlington VA 22201					Date Coll	ected:	06/08	3/16 10:15
						Collected	By:	Clier	,
Sample Desc:	BZ-5 Surface					Date Rece	ived:	06/08	3/16 12:30
								,	1
PWSID: 31308	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total coliform sample was placed in the incubator on 06/08/2016 at 16:45.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste.	600				Date of R Lab ID:	eport:	06/21 3157	/16 7–16–0018038
Arlington VA 22201					Date Coll Collected		06/08 Clien	3/16 08:00 nt
Sample Desc: BZ-6 Surface					Date Rece	ived:	06/08	3/16 12:30
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	2	/100ml	2	1	SM 9222D	06/08	14:00	TNS
Total Coliform	170	mpn/100ml	1	1	SM 9223B	06/09	11:05	TNS
CHEMISTRY						·		
COLORMETRIC								
Phosphate as P, Ortho	0.01	mg/l	.01	1	SM 4500P-E	06/08	14:50	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	06/08	17:05	AEH
Phosphorus as P, Total	0.01	mg/l	.01	1	SM 4500P-E	06/08	17:30	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/09	13:40	HRG
Nitrogen, Nitrate	0.52	mg/l	.05	1	EPA 353.2	06/08	16:32	JCL
Nitrogen, Nitrite	<.05	mg/l	. 05	1	EPA 353.2	06/08	14:54	JCL
Nitrogen, Total Kjeldahl	0.44	mg/l	. 25	1	EPA 351.2	06/20	16:13	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	06/08	13:50	EMW
Total Organic Carbon	1.7	mg/l	1	1	SM5310 C	06/13	13:44	ALD
RESIDUES								
Solids, Total Dissolved	45	mg/l	5	1	SM 2540C	06/13	13:10	ТМН
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/13	13:10	тмн
TITRATIONS								
Alkalinity, Total to pH 4.5	11	mg/l	1	1	SM 2320 B	06/17	16:05	AEH

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	David Wertz Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 6	00				Date of F Lab ID:	eport:	06/2′ 3157	1/16 7-16-0018038
	Arlington VA 22201					Date Coll Collected		06/08 Clier	3/16 08:00 nt
Sample Desc:	BZ-6 Surface					Date Rece	ived:	06/08	3/16 12:30
PWSID: 31308	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total coliform sample was placed in the incubator on 06/08/2016 at 16:45.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste.	600				Date of I Lab ID:	Report:	06/21 3157	1/16 7-16-0018039
Arlington VA 22201					Date Col Collected		06/08 Clier	3/16 08:00 nt
Sample Desc: BZ-6 Mid-Depth					Date Rece	eived:	06/08	3/16 12:30
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY COLORMETRIC						<u> </u>		
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	06/08	14-50	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	•		AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E			
NITROGENS		_,				/		71L11
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/09	13:55	HRG
Nitrogen, Nitrate	0.62	mg/L	.05	1	EPA 353.2		16:33	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2		14:55	
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	•	16:14	
OTHER						,		
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/08	13:50	EMW
Total Organic Carbon	<1	mg/l	1	1	SM5310 C		13:56	
RESIDUES						,		
Solids, Total Dissolved	40	mg/l	5	1	SM 2540C	06/13	13:10	тмн
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/13		
TITRATIONS						, -		••
Alkalinity, Total to pH 4.5	10	mg/l	1	1	SM 2320 B	06/17	16:05	AEH

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., St Arlington VA 22201	e. 600				Date of F Lab ID: Date Coll Collected	ected:		, -16-0018040 8/16 08:00
Sample Desc: BZ-6 Deep					Date Rece	eived:	06/08	3/16 12:30
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.01	mg/l	.01	1	SM 4500P-E	06/08	14:50	AEH
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	'		AEH
Phosphorus as P, Total	0.02	mg/L	.01	1	SM 4500P-E	,		AEH
NITROGENS						,		
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	06/09	14:38	HRG
Nitrogen, Nitrate	0.61	mg/l	.05	1	EPA 353.2	•	16:38	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	'	15:00	JCL
Nitrogen, Total Kjeldahl	0.36	mg/l	.25	1	EPA 351.2		16:15	
OTHER						•		
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/08	13:50	EMW
Total Organic Carbon	<1	mg/l	1	1	SM5310 C	06/13	14:57	ALD
RESIDUES								
Solids, Total Dissolved	60	mg/l	5	1	SM 2540C	06/13	13:10	тмн
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/13	13:10	тмн
TITRATIONS		-				,		
Alkalinity, Total to pH 4.5	10	mg/l	1	1	SM 2320 B	06/17	16:05	AEH

COMMENTS

O1 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. Arlington VA 22201	600				Date of F Lab ID: Date Coll Collected	.ected:		7-16-0018041 3/16 09:05
Sample Desc: BZ-7 Surface					Date Rece	-	06/08	3/16 12:30
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI				••••••••••••••••••••••••••••••••••••••	پسے پید سن من نفت کہ جو دور اس م			
MICROBIOLOGY								
Fecal Coliform	5	/100ml	2	1	SM 9222D	06/08	14:00	TNS
Total Coliform	390	mpn/100ml	1	1	SM 9223B	'		
CHEMISTRY						,		
COLORMETRIC								
Phosphate as P, Ortho	0.01	mg/l	.01	1	SM 4500P-E	06/08	14:50	AEH
Phosphorus as P, Dissolved	0.05	mg/l	.05	1	SM 4500P-E			AEH
Phosphorus as P, Total	0.02	mg/l	.01	1	SM 4500P-E			AEH
NITROGENS						•		
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/09	14:53	HRG
Nitrogen, Nitrate	0.44	mg/l	. 05	1	EPA 353.2		16:39	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/08	15:01	JCL
Nitrogen, Total Kjeldahl	0.44	mg/l	.25	1	EPA 351.2	06/20	16:15	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/08	13:50	EMW
Total Organic Carbon	1.6	mg/l	1	1	SM5310 C	06/13	15:08	ALD
RESIDUES								
Solids, Total Dissolved	56	mg/l	5	1	SM 2540C	06/13	13:35	ТМН
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	06/13	13:35	тмн
TITRATIONS						-		
Alkalinity, Total to pH 4.5	12	mg/l	1	1	SM 2320 B	06/17	16:05	AEH

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	David Wertz Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 6	00				Date of F Lab ID:	Report:	06/21 3157	I/16 7−16−0018041
	Arlington VA 22201					Date Coll Collected		06/08 Clier	3/16 09:05 ht
Sample Desc:	BZ-7 Surface					Date Rece	eived:	06/08	3/16 12:30
PWSID: 31308	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

COMMENTS

01 The total coliform sample was placed in the incubator on 06/08/2016 at 16:45.

O2 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., S1 Arlington VA 22201	te. 600				Date of Lab ID: Date Coll	·	3157	1/16 7-16-0018042 3/16 09:05
					Collected		Clier	•
Sample Desc: BZ-7 Mid-Depth					Date Rece	eived:	06/08	3/16 12:30
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.01	mg/l	.01	1	SM 4500P-E	06/08	14:50	AEH
Phosphorus as P, Dissolved	0.08	mg/l	.05	1	SM 4500P-E	-		
Phosphorus as P, Total	0.02	mg/l	.01	1	SM 4500P-E	06/08	17:35	AEH
NITROGENS	4							
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/09	15:08	HRG
Nitrogen, Nitrate	0.73	mg/l	.05	1	EPA 353.2		16:40	
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	06/08	15:02	JCL
Nitrogen, Total Kjeldahl	0.53	mg/l	.25	1	EPA 351.2	•	16:18	
OTHER						•		
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	06/08	13:50	EMW
Total Organic Carbon	1.8	mg/l	1	1	SM5310 C	-	15:20	
RESIDUES						,		
Solids, Total Dissolved	56	mg/L	5	1	SM 2540C	06/13	13:35	ТМН
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	'	13:35	
TITRATIONS		•				1		
Alkalinity, Total to pH 4.5	12	mg/L	1	1	SM 2320 B	06/17	16:05	AEH

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. Arlington VA 22201	600				Date of L Lab ID: Date Col Collected	Lected:		2-16-0018043 3/16 09:05
Sample Desc: BZ-7 Deep					Date Rece	eived:	06/08	3/16 12:30
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.01	mg/l	.01	1	SM 4500P-E	06/08	14:50	AFH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E			
Phosphorus as P, Total	0.03	mg/L	.01	1	SM 4500P-E	•		
NITROGENS		_ •				/		
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	06/09	15:22	HRG
Nitrogen, Nitrate	0.62	mg/L	.05	1	EPA 353.2		16:40	JCL
Nitrogen, Nitrite	<.05	mg/l	. 05	1	EPA 353.2	,	15:03	
Nitrogen, Total Kjeldahl	0.50	mg/L	.25	1	EPA 351.2		16:19	
OTHER						,		
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	06/08	13:50	EMW
Total Organic Carbon	<1	mg/L	1	1	SM5310 C		15:31	
RESIDUES						,		
Solids, Total Dissolved	55	mg/l	5	1	SM 2540c	06/13	13:35	тмн
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	'	13:35	
TITRATIONS		-,						
Alkalinity, Total to pH 4.5	10	mg/l	1	1	SM 2320 B	06/17	16:05	AEH

COMMENTS

O1 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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rxw 05/10/16	rrw 05/10/16 10:57:27 AM	M. J. REIDER ASSOCIATES, INC. Page: 1
		Chain of Custody
Account: Customer:	3157 David Wertz	Work Order: 006226 Project Leader: rxw Work Order Description: Beltzville Reservoir
Address:	<pre>3: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 600 </pre>	Remarks :
Phone:		Total Sampling Time (hours):Bottle Frep by:
Samplers:	WACK.	Laboratory Receipt Temp: <u>J Deg C. If Temp Unacceptable</u> , On Ice? V N Approved By: 065
	consecutives and the second	Matrix: o Date: $\frac{(c/\delta)/(c)}{c}$
- Edin	n, alk, tó	
по2-	им вуш по2-п, по3-п, d-ро4-р, о-ро4, bogy	X 2xambervoa g w/ X L bod p w/ Cool
fertes		- 1 X FT mosmoz p w/ Cool to 6 C; - 1 X 250mlMicro p w/ Sterile/Na2S203; , 1
/8032 sample N	lo: 2 Desc: BZ-2 Surface	Matrix: o Date: $\frac{0/8/16}{100}$
nh3	kn, alk, td	- 1 X Pt nh3 p w/ - 1 X 80z Alk p w
no2 -:	no2-n, no3-n, d-po4-p, o-po4, body	X 2xambervoa g w/ H3P04/z X L bod p w/ Cool to 6 C;
fo, to		
18033 sample No:	0: 3 Desc: BZ-3 Surface	Matrix: o $\frac{bate:}{d} \frac{\partial /g//l}{\partial d}$
-Edu	nh3-n, tkn, alk, tds, tss, po4-p, toc,	Tin T T T T T T T T T T T T T T T T T T
по2 - 1	И А А И И И И В В В В В В В В В В В В В	X SOZ AIK P W/ COOL TO 6 X 2xambervoa g w/ H3PO4/z X L bod p w/ Cool to 6 C;
, tr	t, tec, VES	- 1 X Pt no3no2 I - 1 X 250mlMicro
rod hada inoni [ad		Mill Mill Million Altren
Date: $\frac{b}{b}$) L Time: //:00	$\frac{1}{10000000000000000000000000000000000$
	·	Sample entered by:

rxw 05/10/16 10:57:27 AM	M. J. REIDER ASSOCIATES, INC. COFC.PRT Page: 2 Page: 2
	Chain of Custody
Account: 3157 Work Order: 006226 Work Order Descriptio	006226 Project Leader: rxw escription: Beltzville Reservoir
	Damarka
Address: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 600 Arlington VA 22201	
Phone: 703-387-5516 R*+.	Total Sampling Time (hours): Bottle Prep by:
WA CK	Laboratory Receipt Temp: <u>3 Deg C. If Temp Unacceptable</u> , On Ice? ON Approved By: <u>065</u>
	ווער
Samp	Matrix: o Date: 0/0/10
nh3-n, tkn, alk, tds, tss, po4-p, toc,	h3 p w/ H2SO4 (pH
по2-п, по3-п, d-ро4-р, o-ро4, bog,	- 1 X I bod p w/ Cool to 6 C;
/80.35 Sample No: 5 Desc: BZ-3 Deen	- I X Pt no3no2 p w/ Cool Matriv. O
	Time: Oct O
nh3-n, tkn, alk, tďs, tss, po4-p, toc, , , ,	
м. <i>Д</i> 4 по2-п, по3-п, d-ро4-р, o-ро4, bogy	- 1 X 2xambervoa g w/ H3P04/zer - 1 X L bod p w/ Cool to 6 C;
:	- 1 X Pt no3no2 p w/ Cool
18056 Sample No: 6 Desc: BZ-4 Surface	Matrix: o Date: */*/
nh3-n, tkn, alk, tds, tss, po4-p, toc,	- 1 X Pt nh3 p w/ H2SO4 (pH
	××
no2-n', no3-n, d-po4-p', o-po4, body	- 1 X L bod p w/ Cool - 1 X Pt no3no2 n w/
fa, tc,	- 1 X 250mlMicro p w/ Sterile/
R	
Relinquished by: The all Received by:	MIM AND Received for laboratory by: MUMU AMUME
Date: 6/8/16 Trime: 11:00	1020 120 1020 1
	Sample entered by:

rxw 05/10/16 10:57:28 AM	M. J. REIDER ASSOCIATES, INC. Page: 3
Account: 3157 Work Order: 006226 Work Order Descriptic Customer: David Wertz	of Custody Project Leader: rxw No: 275163 11e Reservoir
Address: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 600 Arlinton VA 22201	Remarks:
Phone: 703-387-5516 Ext: Samplers: WACK	Total Sampling Time (hours): Bottle Prep by: Bottle Prep by: Approved
/8037 sample No: 7 Desc: BZ-5 Surface	===== Mat
no2-n, no3-n, d-po4-p, o-po4, boal	<pre>- 1 X Ft mh3 p w/ H2SO4(pH<2); - 1 X 80z Alk p w/ Cool to 6 C; - 1 X 2xambervoa g w/ H3P04/zero - 1 X 1. hod n w/ Cool to 6 C;</pre>
fo, no for the for the for the former of the	1 X Pt no3no2 p w/ Cool to 6 C; 1 X 250mlMicro p w/ Sterile/Na2S203;
/b05% sample No: 8 Desc: BZ-6 Surface nh3-n, tkn, alk, tds, tss, po4-p, toc,	2i H
M no2-n, no3-n, d-po4-p, o-po4, body	XXX
fe, fe,	- 1 X Pt no3no2 r - 1 X 250mlMicro
18037 Sample No: 9 Desc: BZ-6 Mid-Depth	Matrix: o Date: $\frac{\mathcal{C}/\mathcal{S}/\mathcal{I}}{\text{Time: } \mathcal{O}(\mathcal{I},\mathcal{L})}$
nh3-n, tkn, alk, tds, tss, po4-p, toc, \mathcal{M} $\mathcal{M}_{\mathbb{A}}$ no2-n, no3-n, d-po4-p, o-po4, bod	<pre>[<2); 6 C; 94/zero h . C;</pre>
Ø	× 1
Relinquished by: Received by: Received by: Date: 6/8/10 Time: 11:00	Mindung Received for laboratory by: Muchul Mumul Date: 0/8/16 Time: 1230
	Sample entered by:

rxw 05/10/16 10:57:28 AM	M. J. REIDER ASSOCIATES, INC. Page: 4
	Chain of Custody
Account: 3157 Work Order: 006226 Work Order Descriptio	006226 Project Leader: rxw No: 275163
Customer: David Wertz	
Address: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 600 Arlington VA 22201	Remarks:
Phone: 703-387-5516 Ext:	Total Sampling Time (hours): Bottle Prep by:
WACIK	Laboratory Receipt Temp: $\sum_{k=1}^{\infty} Deg C.$ If Temp Unacceptable, On Ice? $\begin{bmatrix} x \\ x \end{bmatrix}$ N Approved By: $U \equiv \sum_{k=1}^{\infty} D = U$
18040 Sample No: 10 Desc: BZ-6 Deep	$w_{1} \in \mathcal{M}_{1} = \mathcal$
nh3-n, tkn, alk, tds, tss, po4-p, toc,	
dar All	- 1 X Soz Alk p
по2-п, по3-п, d-ро4-р, о-ро4, род;	X L bod p w/ Cool X Pt no3no2 n w/ C
18041 Sample No: 11 Desc: BZ-7 Surface	fatrix: o Dat
nh3-n, tkn, alk, tds, tss, po4-p, toc,	h3 p w/ H2SO4 (pi
W HH	х х
поz-п, поз-п, а-ро4-р, о-ро4, роа	1 X L bod p w/ 1 X Pf no3no2 r
	- 1 X 250mlMicro p w/ Sterile/Na2S203
18042 Sample No: 12 Desc: BZ-7 Mid-Depth	Matrix: o Date: $\frac{6}{8/16}$
nh3-n, tkn, alk, tds, tss, po4-p, toc,	- 1 X
M AN	- 1 - 1 -
по2-п, по3-п, d-ро4-р, о-ро4, body	C – L X 2xambervoa g w/ H3PO4/zero headspace; D – l X L bod p w/ Cool to 6 C;
Ċ.	- 1 X
ζ.	·
Pellinnished his from the second seco	March March
	HAW ME AND Received for laboratory by: HUUW AND WITH
Date: 0/ 0/ Time: 1.00	Date: 0/10 Time: 1250
	Sample entered by:

ryw 05/10/16 10:57:28 AM	M. J. REIDER ASSOCIATES, INC. Page:	COFC.PRT age: 5
	Chain of Custody	
Account: 3157 Work Order: 006226 Work Order Description	006226 Project Leader: rxw scription: Beltzville Reservoir	
Customer: David Wertz	Remarks.	
Address: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 600 arlingen vz 22201		
10122 22 2002 21 21 22 22 22 22 22 22 22 22 22 22 22		
WA CiX	Laboratory Receipt Temp: <u>S Deg C. If Temp Unacceptable</u> , On Ice?	N
10.043 Sample No: 13 Desc: BZ-7 Deep	6	11/8/
nh3-n, tkn, alk, tds, tss, po4-p, toc,	- 1 X Pt nh3 p w/ H25 - 1 X 8oz Alk p w/ Cc	2
ли по2-п, по3-п, d-ро4-р, о-ро4, bod	<pre>C - 1 X 2xambervoa g w/ H3P04/zero headspace; D - 1 X L bod p w/ Cool to 6 C; E - 1 X Pt no3no2 p w/ Cool to 6 C;</pre>	space;
0		
	INNI I INNI	
Relinquished by: Carped Street by:	Mill When Beceived for laboratory by: MUMU MIMU	
Date: $L/g/lb$ Time: /1.00	Date: 6/8/10 Time: 123	
[C
	Sample entered by:	





Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 600					Date of Report: Lab ID:		08/03/16 3157-16-0018953	
Arlington VA 22201					Date Coll Collected		07/20/16 10:50 Client	
Sample Desc: BZ-1 Surface					Date Rece	eived:	07/20	/16 12:55
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	23	/100mL	2	1	SM 9222D	07/20	13:45	TNS
Total Coliform	>2400	mpn/100mL	1	1	SM 9223B	07/21		TNS
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	07/21	07:00	AEH
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	07/21	17:40	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	07/21	18:10	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	07/21	12:24	JCL
Nitrogen, Nitrate	0.63	mg/l	. 05	1	EPA 353.2	07/20	16:39	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/20	14:44	JCL
Nitrogen, Total Kjeldahl	0.45	mg/l	. 25	1	EPA 351.2	07/28	15:28	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/20	13:50	EMW
Total Organic Carbon	1.7	mg/l	1	1	SM5310 C	07/20	21:59	ALD
RESIDUES								
Solids, Total Dissolved	56	mg/l	5	1	SM 2540C	07/22	13:15	ТМН
Solids, Total Suspended	102	mg/l	3	1	SM 2540D	07/22	13:15	тмн
TITRATIONS								
Alkalinity, Total to pH 4.5	53	mg/l	1	1	SM 2320 B	07/25	11:10	AEH

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Attention:	David Wertz					Date of F	eport:	08/03	3/16
Reported To:	Tetra Tech (Beltzville Dam)					Lab ID:		3157	7-16-0018953
	1320 North Courthouse Rd., Ste. 6	00							
	Arlington VA 22201					Date Coll	ected:	07/20	0/16 10:50
						Collected	By:	Clier	nt
Sample Desc:	BZ-1 Surface					Date Rece	ived:	07/20)/16 12:55
PWSID: 31308	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total coliform sample was placed in the incubator on 07/20/2016 at 17:05.

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Attention: David Wertz					Date of F	eport:	08/03	5/16
Reported To: Tetra Tech (Beltzville Dam)					Lab ID:		3157	7–16–0018954
1320 North Courthouse Rd., S	te. 600							
Arlington VA 22201					Date Coll	.ected:	07/20)/16 10:30
					Collected	By:	Clier	nt
Sample Desc: BZ-2 Surface					Date Rece	ived:	07/20)/16 12:55
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
BACTI				*				
MICROBIOLOGY								
Fecal Coliform	15	/100mL	2	1	SM 9222D	07/20	13:45	TNS
Total Coliform	2000	mpn/100ml	1	1	SM 9223B	, 07/21	11:20	TNS
CHEMISTRY		•				,		
COLORMETRIC								
Phosphate as P, Ortho	0.01	mg/l	.01	1	SM 4500P-E	07/21	07:00	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/21	17:40	AEH
Phosphorus as P, Total	<.01	mg/L	.01	1	SM 4500P-E	07/21	18:10	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	. 05	1	D6919-03	07/21	12:39	JCL
Nitrogen, Nitrate	0.24	mg/l	. 05	1	EPA 353.2	07/20	16:44	JCL
Nitrogen, Nitrite	<.05	mg/l	. 05	1	EPA 353.2	07/20	14:47	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	07/28	15:29	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/20	13:50	EMW
Total Organic Carbon	<1	mg/l	1	1	SM5310 C	07/20	21:11	ALD
RESIDUES						•	- 	
Solids, Total Dissolved	49	mg/l	5	1	SM 2540C	07/22	13:15	тмн
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	07/22	13:15	ТМН
TITRATIONS						•		
Alkalinity, Total to pH 4.5	51	mg/l	1	1	SM 2320 B	07/25	11:10	AEH

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	David Wertz Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 60	00				Date of R Lab ID:	eport:	08/03 3157	/16 -16-0018954
	Arlington VA 22201					Date Coll Collected		07/20 Clier)/16 10:30 t
Sample Desc:	BZ-2 Surface					Date Rece	ived:	07/20	/16 12:55
PWSID: 31308	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

02 The total coliform sample was placed in the incubator on 07/20/2016 at 17:05.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 600						Date of Report: Lab ID:		;/16 '-16-0018955
Arlington VA 22201					Date Coll Collected		07/20 Clien)/16 08:40 It
Sample Desc: BZ-3 Surface					Date Rece	ived:	07/20	/16 12:55
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	<2	/100ml	2	1	SM 9222D	07/20	13:45	TNS
Total Coliform	110	mpn/100ml	1	1	SM 9223B	07/21	11:20	TNS
CHEMISTRY						•		
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	07/21	07:00	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/21	17:40	AEH
Phosphorus as P, Total	0.02	mg/l	.01	1	SM 4500P-E	07/21	18:10	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	07/21	12:54	JCL
Nitrogen, Nitrate	0.36	mg/l	.05	1	EPA 353.2	07/20	16:45	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/20	14:48	JCL
Nitrogen, Total Kjeldahl	0.40	mg/l	.25	1	EPA 351.2	07/28	15:30	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/20	13:50	EMW
Total Organic Carbon	2.1	mg/l	1	1	SM5310 C	07/20	22:23	ALD
RESIDUES								
Solids, Total Dissolved	54	mg/l	5	1	SM 2540C	07/22	13:15	TMH
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	07/22	13:15	тмн
TITRATIONS								
Alkalinity, Total to pH 4.5	45	mg/l	1	1	SM 2320 B	07/25	12:20	AEH

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Reviewed and Approved by: alm

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	David Wertz Tetra Tech (Beltzville Dam)						Date of R Lab ID:	eport:	08/03 3157	5/16 7–16–0018955
	1320 North Courthouse Rd., Ste	. 600)				Lab IV.		5151	-10-01075
	Arlington VA 22201						Date Coll Collected		07/20 Clier)/16 08:40 nt
Sample Desc:	BZ-3 Surface						Date Rece	ived:	07/20)/16 12:55
PWSID: 31308	43				Rep	Dilutn		Test	Test	
			Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total coliform sample was placed in the incubator on 07/20/2016 at 17:05.

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Attention: David Wertz

CERTIFICATE OF ANALYSIS M.J. Reider Associates, Inc.



08/03/16

Date of Report:

Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 600						Lab ID:		3157-16-0018956	
Arlington VA 22201					Date Coll Collected		07/20 Clien	/16 08:40 t	
Sample Desc: BZ-3 Mid-Depth					Date Rece	ived:	07/20	/16 12:55	
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst	
CHEMISTRY									
COLORMETRIC									
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	07/21	07:00	AEH	
Phosphorus as P, Dissolved	<.05	mg/l	. 05	1	SM 4500P-E	07/21	17:45	AEH	
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	07/21	18:15	АЕН	
NITROGENS									
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	07/21	13:08	JCL	
Nitrogen, Nitrate	0.71	mg/l	.05	1	EPA 353.2	07/20	16:46	JCL	
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/20	14:49	JCL	
Nitrogen, Total Kjeldahl	0.27	mg/l	.25	1	EPA 351.2	07/28	15:35	JCL	
OTHER									
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/20	13:50	EMW	
Total Organic Carbon	1.2	mg/l	1	1	SM5310 C	07/20	22:35	ALD	
RESIDUES									
Solids, Total Dissolved	62	mg/l	5	1	SM 2540C	07/25	13:20	ТМН	
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	07/25	13:20	ТМН	
TITRATIONS		-					•		
Alkalinity, Total to pH 4.5	67	mg/l	1	1	SM 2320 B	07/25	12:20	AEH	

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 600					Date of R Lab ID:	eport:	08/03/16 3157-16-0018957	
Arlington VA 22201					Date Coll Collected		07/20 Clien	/16 08:40 t
Sample Desc: BZ-3 Deep					Date Rece	eived:	07/20	/16 12:55
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	07/21	07:00	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/21	17:45	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	07/21	18:15	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	07/21	13:23	JCL
Nitrogen, Nitrate	0.66	mg/l	.05	1	EPA 353.2	07/20	16:47	JCL
Nitrogen, Nitríte	<.05	mg/l	.05	1	EPA 353.2	07/20	14:50	JCL
Nitrogen, Total Kjeldahl	0.30	mg/l	.25	1	EPA 351.2	07/28	15:36	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/20	13:50	EMW
Total Organic Carbon	1.2	mg/l	1	1	SM5310 C	07/20	23:35	ALD
RESIDUES								
Solids, Total Dissolved	50	mg/l	5	1	SM 2540C	07/25	13:20	ТМН
Solids, Total Suspended	4	mg/l	3	1	SM 2540D	07/25	13:20	ТМН
TITRATIONS								
Alkalinity, Total to pH 4.5	51	mg/l	1	1	SM 2320 B	07/25	12:20	AEH

COMMENTS

O1 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 600						Date of Report: (Lab ID:		08/03/16 3157-16-0018958	
Arlington VA 22201					Date Coll Collected		07/20 Clier)/16 10:20 ht	
Sample Desc: BZ-4 Surface					Date Rece	ived:	07/20)/16 12:55	
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst	
BACTI									
MICROBIOLOGY									
Fecal Coliform	13	/100mL	2	1	SM 9222D	07/20	13:45	TNS	
Total Coliform	2400	mpn/100ml	1	1	SM 9223B	07/21	11:20	TNS	
CHEMISTRY									
COLORMETRIC									
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	07/21	07:10	AEH	
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/21	17:45	AEH	
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	07/21	18:15	AEH	
NITROGENS									
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	07/21	13:37	JCL	
Nitrogen, Nitrate	0.19	mg/l	.05	1	EPA 353.2	07/20	16:48	JCL	
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	,	14:51		
Nitrogen, Total Kjeldahl	0.37	mg/l	.25	1	EPA 351.2	07/28	15:37	JCL	
OTHER									
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	'	13:50		
Total Organic Carbon	1.5	mg/l	1	1	SM5310 C	07/20	23:58	ALD	
RESIDUES	47	<i>,</i> ,	-	_					
Solids, Total Dissolved	17	mg/L	5	1	SM 2540C		13:20	ТМН	
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	07/25	13:20	ТМН	
TITRATIONS									
Alkalinity, Total to pH 4.5	46	mg/l	1	1	SM 2320 B	07/25	12:20	AEH	

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Da 1320 North Courthouse Rd.					Date of F Lab ID:	eport:	08/03 3157	/16 -16-0018958
Arlington VA 22201					Date Coll Collected		07/20 Clien	/16 10:20 t
Sample Desc: BZ-4 Surface					Date Rece	ived:	07/20	/16 12:55
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
	سر بو بو بو بو بر بر بو بو بو بو بو ب							

COMMENTS

01 The total coliform sample was placed in the incubator on 07/20/2016 at 17:05.

O2 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., St	Date of Report: 08/03/ Lab ID: 3157-			/16 -16-0018959				
Arlington VA 22201					Date Coll Collected		07/20/16 10:10 Client	
Sample Desc: BZ-5 Surface					Date Rece	ived:	07/20	/16 12:55
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	5	/100mL	2	1	SM 9222D	07/20	13:45	TNS
Total Coliform	120	mpn/100ml	1	1	SM 9223B	07/21	11:20	TNS
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	0.01	mg/l	.01	1	SM 4500P-E	07/21	07:10	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/21	17:45	AEH
Phosphorus as P, Total	0.05	mg/l	.01	1	SM 4500P-E	07/21	18:15	AEH
NITROGENS		_						
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03		13:52	
Nitrogen, Nitrate	0.22	mg/L	.05	1	EPA 353.2	07/20	16:49	
Nitrogen, Nitrite	<.05	mg/l	. 05	1	EPA 353.2	,	14:52	
Nitrogen, Total Kjeldahl	1.68	mg/l	.25	1	EPA 351.2	07/28	15:38	JCL
OTHER	_					·		
Biochemical Oxygen Demand	9	mg/L	2	1	SM 5210B	07/20	13:50	EMW
Total Organic Carbon	4.8	mg/l	1	1	SM5310 C	07/21	00:35	ALD
RESIDUES	(2		_			/		
Solids, Total Dissolved	60	mg/L	5	1	SM 2540C	07/25	13:20	ТМН
Solids, Total Suspended	128	mg/l	3	1	SM 2540D	07/25	13:20	ТМН
TITRATIONS						a= (a-		
Alkalinity, Total to pH 4.5	41	mg/l	1	1	SM 2320 B	07/25	12:20	AEH

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Attention:	David Wertz					Date of R	eport:	08/03	/16
Reported To:	Tetra Tech (Beltzville Dam)					Lab ID:		3157	-16-0018959
	1320 North Courthouse Rd., Ste. 6	00							
	Arlington VA 22201					Date Coll	ected:	07/20	/16 10:10
						Collected	By:	Clien	it
Sample Desc:	BZ-5 Surface					Date Rece	ived:	07/20	/16 12:55
PWSID: 31308	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

02 The total coliform sample was placed in the incubator on 07/20/2016 at 17:05.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 6	500				Date of R Lab ID:	eport:	08/03 3157	/16 -16-0018960
Arlington VA 22201					Date Coll Collected		07/20 Clien	/16 07:55 t
Sample Desc: BZ-6 Surface					Date Rece	ived:	07/20	/16 12:55
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	2	/100ml	2	1	SM 9222D	07/20	13:45	TNS
Total Coliform	360	mpn/100ml	1	1	SM 9223B	07/21	11:20	TNS
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	07/21	07:10	AEH
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	07/21	17:45	AEH
Phosphorus as P, Total	0.01	mg/l	.01	1	SM 4500P-E	07/21	18:15	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	07/21	15:24	JCL
Nitrogen, Nitrate	0.37	mg/l	.05	1	EPA 353.2	07/20	16:49	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/20	14:53	JCL
Nitrogen, Total Kjeldahl	0.35	mg/l	.25	1	EPA 351.2	07/28	15:40	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/20	13:50	EMW
Total Organic Carbon	2.8	mg/l	1	1	sm5310 c	07/21	00:49	ALD
RESIDUES								4 C 1
Solids, Total Dissolved	49	mg/l	5	1	SM 2540C	07/25	13:20	тмн
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	07/25	13:20	ТМН
TITRATIONS								
Alkalinity, Total to pH 4.5	45	mg/l	1	1	SM 2320 B	07/25	12:20	AEH

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Attention:	David Wertz					Date of R	eport:	08/03	/16
Reported To:	Tetra Tech (Beltzville Dam)					Lab ID:		3157	-16-0018960
	1320 North Courthouse Rd., Ste. 60	00							
	Arlington VA 22201					Date Coll	ected:	07/20	/16 07:55
						Collected	By:	Clien	t
Sample Desc:	BZ-6 Surface					Date Rece	ived:	07/20	/16 12:55
PWSID: 31308	/7			D	B 5 1		- .	- /	
PM210: 21200	45			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
		ر الله الله الله الله الله الله الله الل							

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

02 The total coliform sample was placed in the incubator on 07/20/2016 at 17:05.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste	. 600				Date of R Lab ID:	eport:	08/03 3157	/16 -16-0018961
Arlington VA 22201					Date Coll Collected		07/20 Clien	/16 07:55 t
Sample Desc: BZ-6 Mid-Depth					Date Rece	ived:	07/20	/16 12:55
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	07/21	07:10	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/21	17:45	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	07/21	18:15	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	. 05	1	D6919-03	07/21	15:39	JCL
Nitrogen, Nitrate	0.71	mg/l	.05	1	EPA 353.2	07/20	16:50	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/20	14:54	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	07/28	15:41	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/20	13:50	EMW
Total Organic Carbon	1.2	mg/l	1	1	SM5310 C	07/21	01:01	ALD
RESIDUES								
Solids, Total Dissolved	59	mg/l	5	1	SM 2540C	07/25	13:20	ТМН
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	07/25	13:20	ТМН
TITRATIONS						•		
Alkalinity, Total to pH 4.5	41	mg/l	1	1	SM 2320 B	07/25	12:20	AEH

COMMENTS

O1 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste Arlington VA 22201 Sample Desc: BZ-6 Deep	e. 600				Date of F Lab ID: Date Coll Collected Date Rece	.ected: By:	07/20 Clien	- -16-0018962)/16 07:55
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	07/21	07-10	л с н
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E			AEH
Phosphorus as P, Total	0.01	mg/t	.01	1	SM 4500P-E	,	18:20	
NITROGENS				I		01/21	10.20	ALII
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	07/21	15:53	JCL
Nitrogen, Nitrate	0.62	mg/l	.05	1	EPA 353.2	07/20	16:55	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	07/20	14:59	
Nitrogen, Total Kjeldahl	0.28	mg/L	.25	1	EPA 351.2	'	15:42	
OTHER								
Biochemical Oxygen Demand	<2	. mg/l	2	1	SM 5210B	07/20	13:50	EMW
Total Organic Carbon	1.3	mg/L	1	1	SM5310 C	07/21	01:13	
RESIDUES						,		
Solids, Total Dissolved	55	mg/l	5	1	SM 2540C	07/25	13:20	ТМН
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	07/25	13:20	ТМН
TITRATIONS		-						
Alkalinity, Total to pH 4.5	51	mg/l	1	1	SM 2320 B	07/25	12:20	AEH

COMMENTS

O1 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste.	600				Date of R Lab ID:	eport:	08/03 3157	/16 -16-0018963
Arlington VA 22201					Date Coll Collected		07/20 Clien	1/16 09:05 It
Sample Desc: BZ-7 Surface					Date Rece	ived:	07/20	1/16 12:55
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI							<u> </u>	
MICROBIOLOGY								
Fecal Coliform	<2	/100ml	2	1	SM 9222D	07/20	13:45	TNS
Total Coliform	440	mpn/100ml	1	1	SM 9223B	07/21	11:20	TNS
CHEMISTRY						•		
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	07/21	07:10	AEH
Phosphorus as P, Dissolved	<.05	mg/l	. 05	1	SM 4500P-E	07/21	17:50	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	07/21	18:20	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	07/21	16:08	JCL
Nitrogen, Nitrate	0.30	mg/L	.05	1	EPA 353.2	07/20	16:56	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	07/20	15:00	JCL
Nitrogen, Total Kjeldahl	0.30	mg/l	.25	1	EPA 351.2	07/28	15:43	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/20	13:50	EMW
Total Organic Carbon	2.5	mg/l	1	1	SM5310 C	07/21	01:26	ALD
RESIDUES								
Solids, Total Dissolved	56	mg/l	5	1	SM 2540C	07/25	13:20	ТМН
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	07/25	13:20	ТМН
TITRATIONS								
Alkalinity, Total to pH 4.5	45	mg/l	1	1	SM 2320 B	07/25	12:20	AEH

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Attention: Day Reported To: Tet	vid Wertz tra Tech (Beltzville Dam)					Date of R Lab ID:	eport:	08/03 3157	/16 /-16-0018963
	20 North Courthouse Rd., Ste. 60 Lington VA 22201	0				Date Coll Collected		07/20 Clien	1/16 09:05 t
Sample Desc: BZ-	-7 Surface					Date Rece	ived:	07/20	/16 12:55
PWSID: 3130843		Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst

COMMENTS

01 The total coliform sample was placed in the incubator on 07/20/2016 at 17:05.

02 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., S	te. 600				Date of R Lab ID:	eport:	08/03 3157	;/16 /-16-0018964
Arlington VA 22201					Date Coll Collected		07/20 Clier	0/16 09:05 It
Sample Desc: BZ-7 Mid-Depth					Date Rece	ived:	07/20	/16 12:55
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	07/21	07:10	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/21	17:50	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	07/21	18:20	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	07/21	16:23	JCL
Nitrogen, Nitrate	0.70	mg/l	.05	1	EPA 353.2	07/20	16:57	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/20	15:01	JCL
Nitrogen, Total Kjeldahl	0.27	mg/l	.25	1	EPA 351.2	07/28	15:46	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/20	13:50	EMW
Total Organic Carbon	1.5	mg/l	1	1	SM5310 C	07/22	08:54	ALD
RESIDUES						·		
Solids, Total Dissolved	66	mg/l	5	1	SM 2540C	07/25	13:20	тмн
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	07/25	13:20	тмн
TITRATIONS						•		•
Alkalinity, Total to pH 4.5	54	mg/l	1	1	SM 2320 B	07/25	12:20	AEH

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste.	600				Date of F Lab ID:	eport:	08/03 3157	/16 -16-0018965
Arlington VA 22201					Date Coll Collected		07/20 Clier	/16 09:05 t
Sample Desc: BZ-7 Deep					Date Rece	ived:	07/20	/16 12:55
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	07/21	07:10	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	07/21	17:50	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	07/21	18:20	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	07/21	16:37	JCL
Nitrogen, Nitrate	0.68	mg/l	.05	1	EPA 353.2	07/20	16:58	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	07/20	15:01	JCL
Nitrogen, Total Kjeldahl	0.33	mg/l	.25	1	EPA 351.2	07/28	15:47	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	07/20	13:50	EMW
Total Organic Carbon	1.3	mg/l	1	1	SM5310 C	07/21	01:51	ALD
RESIDUES								
Solids, Total Dissolved	59	mg/l	5	1	SM 2540C	07/25	13:20	ТМН
Solids, Total Suspended	4	mg/l	3	1	SM 2540D	07/25	13:20	тмн
TITRATIONS								
Alkalinity, Total to pH 4.5	46	mg/L	1	1	SM 2320 B	07/25	12:20	AEH

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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	rxw 05/17/16 1:21:47 PM	47 PM	M. J. REIDER ASSOCIATES, INC.	COFC.PRT Page: 1
			Chain of Custody	
	Account: 3157	Work Order: Work Order De	006226 Project Leader: rxw scription: Beltzville Reservoir	
	Customer: Davi	David Wertz	Benarke.	
	Address: Tetr 1320 Arli	Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 600 2011/00000 V2 22201		
	- EOT - enodq	1911 VA 44401 387-5516 RV+.	Total Sampling Time (hours): Bottle Prep by:	
		WACIK	Laboratory Receipt Temp: 6 Deg C. If Temp Unacceptable, On Ice? Approved By: 6 2000 Approved By: 7000000000000000000000000000000000000	И
18953	Sample No: 1	Desc: BZ-1 Surface	Matrix: o Date:	1/20/11
	nh3-n, tkn,	nh3-n, tkn, alk, tds, tss, po4-p, toc,	Pt nh3 p w/ H2SO4 (pF	0 1 01
			- 1 X 2xambervoa g w/ H3P04/z	eadspace;
	- 2011 /11- 2011		L DOG P W/ COOL Pt no3no2 p w/ C	
7 2 0 0 1	For the second		- 1 X 250mIMicro p w/ Sterile/Na2	- 14
10101	Sample No: 2	Desc: BZ-2 Surface	Matrix: o Date: 7	7/20/16
	nh3-n, tkn,	nh3-n, tkn, alk, tds, tss, po4-p, toc,	- 1 X Pt nh3 p w/ H2SO4 (pH<2);	600
		moz-n moz-n d-mod hord hord	X 2xambervoa g w/ H3P04/zero X 1. hod n w/ rool to 6 r.	headspace;
			- 1 X Pt no3no2 p w/ Cout	
2005	fc, tc,)	- 1 X 250mlMicro p w/ Sterile/Na2	(203 <i>;</i>
0000	Sample No: 3	Desc: BZ-3 Surface	Matrix: o Date: 7	7/20/16
	nh3-n, tkn,	nh3-n, tkn, alk, tds, tss, po4-p, toc,	1 X Pt nh3 p w/ H2SO4 (pH<2);	01 00
	M	8 ° V .	х x н н і і	- en
	no2-n, no3-:	no2-n, no3-n, d-po4 b, to-po4, bod,	L bod p w/ Cool	(
	fc, tc,	đ	 	203:
	57			
		000		
	Relinquished by:	: Thy when Received by	Received for laboratory by:	
	Date: 7/20/16	Time: ///5	Date: 7/20/16 Time: 1255	
			Sample entered by:	Ì

	rxw 05/17/16 1:21:47 PM	M. J. REIDER ASSOCIATES, INC. Page: 2
		Chain of Custody
	Account: 3157 Work Order: 006226	Project Leader: rxw No: 275413
		GECTIFICION: DETLEVILLE RESELVOIL Remarks.
	Address: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 600	
	AFLINGTON VA ZZZUL Dhono: 703-307-5516 Wert.	Total Sampling Time (hours): Bottle Prep by:
	WACK	Laboratory Receipt Temp: Deg C. If Temp Unacceptable Approved By:
18956	Sample No: 4 Desc: BZ-3 Mid-Depth	Matrix: o $\frac{7/v\ell}{h_{max}}$
	nh3-n, tkn, alk, tds, tss, po4-p, toc,	A - 1 X Pt nh3 p w/ H2SO4 (pH<2); B - 1 X 80z Alk p w/ Cool to 6 C;
	no2-n, no3-n, d-po4-p 0-po4, bod	
18957	Sample No: 5 Desc: BZ-3 Deep	Matrix: o $\frac{7/20/1}{500}$
	nh3-n, tkn, alk, tds, tss, po4-p, toc,	A = 1 X Pt nh3 p w/ H2SO4 (pH<2); UST()B = 1 Y SOT Alb www/ COOI + 0.6 C.
	М по2-п, по3-п, d-ро4-р, о-ро4, bod	* * * *
18958	Sample No: 6 Desc: BZ-4 Surface	Date:
	mh3-n, tkn, alk, tds, tss, po4-p, toc, \mathcal{W} no2-n, no3-n, d-po4- \mathcal{D} , b-po4, bod, /	X Ft nh3 p w/ H2; X 8oz Alk p w/ C X 2xambervoa g w, X L bod p w/ Coo.
	fe, te, MS	- 1 X X
	H	
	Date: 7/20/16 Time: ///5	Date: $7/2c/(6$ Time: 1255
		Sample entered by:

	rxw 05/17/16	rxw 05/17/16 1:21:48 PM		M. J. REIDER ASSOCIATES, INC.	COFC.PRT Page: 3	. PRT 3
				Chain of Custody		
	Account:	3157	Work Order: 006226 Work Order Description:	006226 Beltzville Reservoir r scription: Beltzville Reservoir	rxw No: 275413	
	Customer:	David Wertz		Remarks.		
	Address:	Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Arlindton VX 22201	lle Dam) se Rd., Ste. 600			
	- orodu			Total Sampling Time (hours):	Bottle Prep by:	
	Samplers:	WACIK	;	Laboratory Receipt Temp: <u>6</u> Deg Approved By:	g C. If Temp Unacceptable, On Ice? Y N	H-
18959	sample No: 7	. 7 Desc: BZ-5 Surface	surface		116	6
	nh3 - n	nh3-n, tkn, alk, tds, tss, po4-p, toc,	po4-p, toc,		Pt nh3 p w/ H2SO4(pH 8oz Alk p w/ Cool to	
	no2-n	W по2-п, по3-п, d-ро4-р, body	14, body	U A 1	хх; ч н н	(de;
8968	Fc, t	fc, tc,	Ø			-
-	Sample No	: 8 Desc: BZ-6	5 Surface		Matrix: o Date: 7/2011	9
	nh3-n	nh3-n, tkn, alk, tds, tss, po4-p, toc,	po4-p, toc,			
	no2-n	по2-п, по3-п, d-ро4-р/ о-ро4, body	14, body	υA	1 X 1 bod p w/ Cool to 6	ice;
	fc, f	<u>ن (</u>	Q ⁴			
19681	Sample No	Sample No: 9 Desc: BZ-6 Mid-Depth	5 Mid-Depth		Matrix: o $\frac{\text{Date: } 7/2 o/16}{\frac{1}{100000000000000000000000000000000$	e
	n-3-n	nh3-n, tkn, alk, tds, tss, po4-p, toc,	po4-p, toc,			-
	ц-00ц	N. d-mod #	م ۲	- τ τ τ 		(e)
	1		No.		4 X H H	
					0	
	Relinquished by: Date: 7/20///		Time: ///S	Received for 1 Date: $\frac{7/30}{}$	Received for laboratory by: <i>Multipleter of the second sec</i>	
					Sample entered by:	

S/17/16 1:21:48 PM Account: 3157 Work or Latomer: David Wertz David Wertz Address: Tetra Tech (Beltzville Dam) Arlington VA 2201 Phone: 703-387-5516 Ext: Implers: WACK Ext: Implers: WACK Ext: Imple No: 10 Desc: BZ-6 Deep nh3-n, tkn, alk, tds, tss, po4-p, t no2-n, no3-n, d-po4 p, o-po4, body no2-n, no3-n, d-po4 p, o-po4, body no2-n, no3-n, d-po4 p, o-po4, body mple No: 11 Desc: BZ-7 Mid-Dep nh3-n, tkn, alk, tds, tss, po4-p, t no2-n, no3-n, d-po4 p, o-po4, body no2-n, no3-n, d-po4 p, o-po4, body no2-n, no3-n, d-po4 p, o-po4, body fc, tg, mple No: 12 Desc: BZ-7 Mid-Dep nh3-n, tkn, alk, tds, tss, po4-p, t no2-n, no3-n, d-po4 p, o-po4, body fc, tg, mple No: 12 Desc: BZ-7 Mid-Dep nh3-n, tkn, alk, tds, tss, po4-p, t nh3-n, tkn, alk, tds, tss, po4-p, t nb4-p, t nb4-p, t nb4-p, t nb5-n, th nb5-n, t	M. J. REIDER ASSOCIATES, INC. Page: 4	Chain of Custody Work Order: 006226 Project Leader: rxw Work Order Description: Beltzville Reservoir	Dam) d., Ste. 600 Total Sampling Time (hours):Bottle Prep by: Laboratory Receipt Temp:Deg C. If Temp Unacceptable, On Ice? Y N Approved By:Approved By:	, τ τ τ τ τ τ τ τ τ τ τ τ τ τ τ τ τ τ τ	К - 1 - X - 1 - X - 1 - X - 1 - X - 1 - X - 1 - X - 1 - 1	Received by: Received for laboratory by: Automatic laboratory by: Autom
	rrw 05/17/16 1:21:48 PM		Tetra Tech (Beltzville Dam 1320 North Courthouse Rd., Arlington VA 22201 703-387-5516 Ext: WACK	<pre>Sample No: 10 Desc: BZ-6 Deep nh3-n, tkn, alk, tds, tss, po4-p, toc,</pre>	fc, tc, Sample No: 12 Desc: BZ-7 Mid-Depth nh3-n, tkn, alk, tds, tss, po4-p, toc, M no2-n, no3-n, d-po4-p, o-po4, bod	Time: 1115

COFC.PRT Page: 5		No: 275413		Bottle Prep by:	Temp Unacceptable, On Ice? Y N	rix: o Date: $7/20/10$ Pt nh3 p w/ H2SO4 (pH<2); 802 Alk p w/ Cool to 6 C; 2xambroa g w/ H3PO4/zero headspace; L bod p w/ Cool to 6 C; Pt no3no2 p w/ Cool to 6 C;	to o of top (a)	Sample entered by:
M. J. REIDER ASSOCIATES, INC.	Chain of Custody	Project Leader: rxw Beltzville Reservoir	Remarks:	rs):	Y Receipt Temp: (p Deg C. If Approved By:	Matrix: o A - 1 X Pt nh3 p w/ B - 1 X 802 Alk p w/ C - 1 X 2xambervoa g D - 1 X L bod p w/ C E - 1 X Pt n03n02 p	Labora	Sam
rxw 05/17/16 1:21:48 PM		Account: 3157 Work Order: 006226 Project Work Order Description: Beltzville Reservoir Customer: David Wertz	ille Dam) use Rd., Ste. 600	Arington VA 22201 Phone: 703-387-5516 Ext:	WACIK	Desc: BZ-7 Deep 1k, tds, tss, po4-p, toc, d-po4-p, o-po4, bod,	Relinquished by Received by Received by Date: 7/20/16	
175W		Ac Cust	Adı	ſ	Sam	18965 sam	Reling Date:	





Attention: David Wertz					Date of F	Report:	08/30)/16
Reported To: Tetra Tech (Beltzville Dam)					Lab ID:		3157	-16-002349
1320 North Courthouse Rd.,	Ste. 600							
Arlington VA 22201					Date Collected: Collected By:		08/18 Clier	3/16 08:20 nt
Sample Desc: BZ-1 Surface					Date Rece	eived:	08/18	8/16 14:10
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	58	/100ml	2	1	SM 9222D	08/18	14:30	TNS
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	, 08/19	09:30	TNS
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	08/18	14:50	AEH
Phosphorus as P, Dissolved	0.20	mg/l	.05	1	SM 4500P-E	08/19	14:15	AEH
Phosphorus as P, Total	0.20	mg/l	.01	1	SM 4500P-E	08/19	15:00	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/18	21:03	JCL
Nitrogen, Nitrate	0.69	mg/l	.05	1	EPA 353.2	08/18	16:52	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	08/18	15:19	JCL
Nitrogen, Total Kjeldahl	0.32	mg/l	.25	1	EPA 351.2	08/24	16:42	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/18	15:15	EMW
Total Organic Carbon	1.6	mg/l	1	1	SM5310 C	08/23	19:52	ALD
RESIDUES								
Solids, Total Dissolved	47	mg/l	5	1	SM 2540C	08/24	13:00	TMH
Solids, Total Suspended	ব	mg/L	3	1	SM 2540D	08/24	13:00	тмн
TITRATIONS						-		
Alkalinity, Total to pH 4.5	12	mg/l	1	1	SM 2320 B	08/26	14:20	AEH
Solids, Total Suspended TITRATIONS	<3	mg/l	3	1	SM 2540D	08/24	13:00	ТМН

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Reviewed and Approved by: Richard Wheeler

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	David Wertz Tetra Tech (Beltzville Dam)					Date of F Lab ID:	eport:	08/30 3157)/16 '- 16-0023499
	1320 North Courthouse Rd., Ste. 60 Arlington VA 22201	00				Date Coll Collected		08/18 Clien	3/16 08:20 it
Sample Desc:	BZ-1 Surface					Date Rece	eived:	08/18	3/16 14:10
PWSID: 31308	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total coliform sample was placed in the incubator on 08/18/2016 at 14:50.

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Reviewed and Approved by: aln h

Richard Wheeler

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste	600				Date of F Lab ID:	Report:	08/30 3157	/16 /-16-0023500
Arlington VA 22201					Date Coll Collected		08/18 Clien	/16 08:10 t
Sample Desc: BZ-2 Surface					Date Rece	eived:	08/18	/16 14:10
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	210	/100mL	2	1	SM 9222D	08/18	14:30	TNS
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	08/19	09:30	TNS
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	08/18	14:50	AEH
Phosphorus as P, Dissolved	0.37	mg/l	.05	1	SM 4500P-E	08/19	14:15	AEH
Phosphorus as P, Total	0.40	mg/L	.01	1	SM 4500P-E	08/19	15:00	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	.05	1	D6919-03	08/18	21:18	JCL
Nitrogen, Nitrate	0.45	mg/L	. 05	1	EPA 353.2	08/18	16:57	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	08/18	15:22	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	08/24	16:45	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/18	15:15	EMW
Total Organic Carbon	<1	mg/l	1	1	SM5310 C	08/23	20:03	ALD
RESIDUES								
Solids, Total Dissolved	33	mg/l	5	1	SM 2540C	08/24	13:00	ТМН
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	08/24	13:00	ТМН
TITRATIONS								
Alkalinity, Total to pH 4.5	11	mg/l	1	1	SM 2320 B	08/26	14:20	AEH

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam)					Date of I Lab ID:	Report:	08/30 3157)/16 7–16–0023500
1320 North Courthouse Rd., Arlington VA 22201	Ste. 600				Date Coll Collected			3/16 08:10
Sample Desc: BZ-2 Surface					Date Rece	eived:	08/18	3/16 14:10
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

02 The total coliform sample was placed in the incubator on 08/18/2016 at 14:50.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste Arlington VA 22201	. 600				Date of R Lab ID: Date Coll Collected	ected:		- -16-0023501 8/16 09:40
Sample Desc: BZ-3 Surface					Date Rece	ived:	08/18	/16 14:10
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	2	/100ml	2	1	SM 9222D	08/18	14:30	TNS
Total Coliform	2000	mpn/100ml	1	1	SM 9223B	08/19	09:30	TNS
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	08/18	14:50	AEH
Phosphorus as P, Dissolved	0.41	mg/l	.05	1	SM 4500P-E	08/19	14:15	AEH
Phosphorus as P, Total	0.46	mg/l	.01	1	SM 4500P-E	08/19	15:00	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03		21:32	JCL
Nitrogen, Nitrate	0.23	mg/l	.05	1	EPA 353.2	08/18		JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	•	15:23	JCL
Nitrogen, Total Kjeldahl	0.37	mg/l	.25	1	EPA 351.2	08/24	16:46	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/18	15:15	EMW
Total Organic Carbon	2.0	mg/L	1	1	SM5310 C	08/23	20:15	ALD
RESIDUES								
Solids, Total Dissolved	41	mg/l	5	1	SM 2540C	,	13:00	тмн
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	08/24	13:00	ТМН
TITRATIONS								
Alkalinity, Total to pH 4.5	15	mg/l	1	1	SM 2320 B	08/26	14:20	AEH

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Attention:	David Wertz					Date of R	eport:	08/30	/16
Reported To:	Tetra Tech (Beltzville Dam)					Lab ID:		3157	-16-0023501
	1320 North Courthouse Rd., Ste. 6	00							
	Arlington VA 22201					Date Coll	ected:	08/18	/16 09:40
						Collected	By:	Clien	t
Sample Desc:	BZ-3 Surface					Date Rece	ived:	08/18	/16 14:10
PWSID: 31308	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total coliform sample was placed in the incubator on 08/18/2016 at 14:50.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste	. 600	Date of Report: Lab ID:		08/30 3157	/16 -16-0023502			
Arlington VA 22201					Date Coll Collected		08/18 Clien	5/16 09:40 t
Sample Desc: BZ-3 Mid-Depth					Date Rece	eived:	08/18	/16 14:10
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	08/18	14:50	AEH
Phosphorus as P, Dissolved	0.40	mg/L	.05	1	SM 4500P-E	•		AEH
Phosphorus as P, Total	0.46	mg/L	.01	1	SM 4500P-E	•		AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/18	21:47	JCL
Nitrogen, Nitrate	0.75	mg/l	.05	1	EPA 353.2	08/18	16:59	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	08/18	15:24	JCL
Nitrogen, Total Kjeldahl	0.28	mg/l	.25	1	EPA 351.2	08/24	14:47	JCL
OTHER						-		
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/18	15:15	EMW
Total Organic Carbon	1.0	mg/l	1	1	SM5310 C	08/23	20:25	ALD
RESIDUES								
Solids, Total Dissolved	30	mg/l	5	1	SM 2540C	08/24	13:00	тмн
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	08/24	13:00	ТМН
TITRATIONS						-		
Alkalinity, Total to pH 4.5	11	mg/l	1	1	SM 2320 B	08/26	14:20	AEH

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., St Arlington VA 22201	e. 600				Date of R Lab ID: Date Coll Collected	.ected:		-16-0023503 8/16 09:40
Sample Desc: BZ-3 Deep					Date Rece	ived:	08/18	3/16 14:10
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	08/18	14:50	AEH
Phosphorus as P, Dissolved	0.48	mg/l	.05	1	SM 4500P-E	08/19	14:20	AEH
Phosphorus as P, Total	0.47	mg/l	.01	1	SM 4500P-E	08/19	15:05	AEH
NITROGENS						•		
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/18	22:02	JCL
Nitrogen, Nitrate	0.59	mg/l	.05	1	EPA 353.2	08/18	17:00	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	08/18	15:25	JCL
Nitrogen, Total Kjeldahl	0.33	mg/l	.25	1	EPA 351.2	08/24	16:48	JCL
OTHER						•		
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/18	15:15	EMW
Total Organic Carbon	1.2	mg/l	1	1	SM5310 C	08/23	21:00	ALD
RESIDUES						·		
Solids, Total Dissolved	43	mg/l	5	1	SM 2540C	08/24	13:00	тмн
Solids, Total Suspended	9	mg/L	3	1	SM 2540D	08/24	13:00	ТМН
TITRATIONS								
Alkalinity, Total to pH 4.5	13	mg/l	1	1	SM 2320 B	08/26	14:20	AEH

COMMENTS

O1 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste.	600	Date of Report: Lab ID:		08/30 3157)/16 '-16-0023504			
Arlington VA 22201					Date Collected: Collected By:		08/18 Clier	3/16 08:00 nt
Sample Desc: BZ-4 Surface					Date Rece	ived:	08/18	3/16 14:10
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	64	/100ml	2	1	SM 9222D	08/18	14:30	TNS
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	08/19	09:30	TNS
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	08/18	14:50	AEH
Phosphorus as P, Dissolved	0.39	mg/l	.05	1	SM 4500P-E	08/19	14:20	AEH
Phosphorus as P, Total	0.40	mg/l	.01	1	SM 4500P-E	08/19	15:05	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	. 05	1	D6919-03	08/18	22:16	JCL
Nitrogen, Nitrate	0.36	mg/l	.05	1	EPA 353.2	08/18	17:01	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	08/18	15:26	JCL
Nitrogen, Total Kjeldahl	0.29	mg/l	.25	1	EPA 351.2	08/24	16:49	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	'	15:15	EMW
Total Organic Carbon	1.4	mg/l	1	1	SM5310 C	08/23	21:11	ALD
RESIDUES								
Solids, Total Dissolved	19	mg/l	5	1	SM 2540C	08/24	13:00	ТМН
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	08/24	13:00	тмн
TITRATIONS								
Alkalinity, Total to pH 4.5	8	mg/L	1	1	SM 2320 B	08/26	14:20	AEH

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	David Wertz Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 6	00				Date of R Lab ID:	eport:	08/30 3157	9/16 7–16–0023504
	Arlington VA 22201					Date Coll Collected		08/18 Clier	/16 08:00 t
Sample Desc:	BZ-4 Surface					Date Rece	ived:	08/18	6/16 14:10
PWSID: 31308	43	.		Rep	Dilutn		Test	Test	
		Result	Unit	Lîmit 	Factor	Procedure	Date	Time	Analyst

COMMENTS

O1 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total coliform sample was placed in the incubator on 08/18/2016 at 14:50.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste.	600				Date of R Lab ID:	eport:	08/30 3157)/16 '-16-0023505
Arlington VA 22201					Date Coll Collected		08/18 Clien	3/16 07:45 It
Sample Desc: BZ-5 Surface					Date Rece	eived:	08/18	3/16 14:10
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	46	/100mL	2	.1	SM 9222D	08/18	14:45	TNS
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	08/19	09:30	TNS
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	08/18	14:50	AEH
Phosphorus as P, Dissolved	0.42	mg/l	.05	1	SM 4500P-E	08/19	14:20	AEH
Phosphorus as P, Total	0.42	mg/l	.01	1	SM 4500P-E	08/19	15:05	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	. 05	1	D6919-03		23:00	JCL
Nitrogen, Nitrate	0.31	mg/L	. 05	1	EPA 353.2	•	17:01	JCL
Nitrogen, Nitrite	<.05	mg/l	. 05	1	EPA 353.2	'	15:27	
Nitrogen, Total Kjeldahl	1.08	mg/l	.25	1	EPA 351.2	08/24	16:50	JCL
OTHER			-					
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B		15:15	EMW
Total Organic Carbon	3.0	mg/l	1	1	SM5310 C	08/23	21:23	ALD
RESIDUES	.,	11	-					
Solids, Total Dissolved	44	mg/l	5	1	SM 2540C	'	13:00	ТМН
Solids, Total Suspended	4	mg/l	3	1	SM 2540D	08/24	13:00	ТМН
TITRATIONS	04							
Alkalinity, Total to pH 4.5	21	mg/l	1	1	SM 2320 B	08/26	14:20	AEH

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Attention:	David Wertz					Date of R	eport:	08/30	/16
Reported To:	Tetra Tech (Beltzville Dam)					Lab ID:		3157	-16-0023505
	1320 North Courthouse Rd., Ste. 6	00							
	Arlington VA 22201					Date Coll	ected:	08/18	/16 07:45
						Collected	By:	Clien	t
Sample Desc:	BZ-5 Surface					Date Rece	ived:	08/18	/16 14:10
PWSID: 31308	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total coliform sample was placed in the incubator on 08/18/2016 at 14:50.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste	600				Date of Report: Lab ID:		08/30/16 3157-16-0023506	
Arlington VA 22201					Date Collecte Collected By:		d: 08/18/16 09:10 Client	
Sample Desc: BZ-6 Surface					Date Rece	eived:	08/18	/16 14:10
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	<2	/100ml	2	1	SM 9222D	08/18	14:45	TNS
Total Coliform	1700	mpn/100ml	1	1	SM 9223B	08/19	09:30	TNS
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	08/18	14:50	AEH
Phosphorus as P, Dissolved	0.40	mg/l	.05	1	SM 4500P-E	08/19	14:20	AEH
Phosphorus as P, Total	0.40	mg/l	.01	1	SM 4500P-E	08/19	15:05	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/18	23:15	JCL
Nitrogen, Nitrate	0.25	mg/l	.05	1	EPA 353.2	08/18	17:02	JCL
Nitrogen, Nitrite	<.05	mg/l	. 05	1	EPA 353.2	08/18	15:27	JCL
Nitrogen, Total Kjeldahl	0.41	mg/l	.25	1	EPA 351.2	08/24	16:51	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/18	15:15	EMW
Total Organic Carbon	2.0	mg/l	1	1	SM5310 C	08/23	21:35	ALD
RESIDUES								
Solids, Total Dissolved	45	mg/L	5	1	SM 2540C	08/24	13:00	ТМН
Solids, Total Suspended TITRATIONS	<3	mg/l	3	1	SM 2540D	08/24	13:00	ТМН
Alkalinity, Total to pH 4.5	14	mg/l	1	1	SM 2320 B	08/26	14:20	AEH

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	David Wertz Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 6	00				Date of R Lab ID:	eport:	08/30 3157)/16 7-16-0023506
	, Arlington VA 22201					Date Coll Collected		08/18 Clier	3/16 09:10 nt
Sample Desc:	BZ-6 Surface					Date Rece	ived:	08/18	3/16 14:10
PWSID: 31308	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total coliform sample was placed in the incubator on 08/18/2016 at 14:50.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste	600				Date of R Lab ID:	eport:	08/30 3157	/16 -16-0023507
Arlington VA 22201					Date Coll Collected		08/18 Clien	5/16 09:10 t
Sample Desc: BZ-6 Mid-Depth					Date Rece	ived:	08/18	3/16 14:10
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	08/18	14:50	AEH
Phosphorus as P, Dissolved	0.34	mg/l	. 05	1	SM 4500P-E	08/19	14:20	AEH
Phosphorus as P, Total	0.36	mg/l	.01	1	SM 4500P-E	08/19	15:05	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	. 05	1	D6919-03	08/18	23:29	JCL
Nitrogen, Nitrate	0.73	mg/l	.05	1	EPA 353.2	08/18	17:03	JCL
Nitrogen, Nitrite	<.05	mg/l	. 05	1	EPA 353.2	08/18	15:28	JCL
Nitrogen, Total Kjeldahl	0.27	mg/l	.25	1	EPA 351.2	08/24	16:53	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/18	15:15	EMW
Total Organic Carbon	1.0	mg/l	1	1	SM5310 C	08/23	21:46	ALD
RESIDUES								
Solids, Total Dissolved	50	mg/l	5	1	SM 2540C	08/24	13:00	ТМН
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	08/24	13:00	ТМН
TITRATIONS		-				,		
Alkalinity, Total to pH 4.5	11	mg/l	1	1	SM 2320 B	08/26	15:05	AEH

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste.	600				Date of F Lab ID:	eport:	08/30 3157	/16 -16-0023508
Arlington VA 22201					Date Coll Collected		08/18 Clien	/16 09:10 t
Sample Desc: BZ-6 Deep					Date Rece	ived:	08/18	/16 14:10
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY							<u> </u>	
COLORMETRIC	•							
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	08/18	14:50	AEH
Phosphorus as P, Dissolved	0.26	mg/l	.05	1	SM 4500P-E	08/19	14:20	AEH
Phosphorus as P, Total	0.25	mg/l	.01	1	SM 4500P-E	08/19	15:05	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/18	23:44	JCL
Nitrogen, Nitrate	0.59	mg/l	.05	1	EPA 353.2	08/18	17:08	JCL
Nitrogen, Nitrite	<.05	mg/l	. 05	1	EPA 353.2	08/18	15:33	JCL
Nitrogen, Total Kjeldahl	0.28	mg/l	.25	1	EPA 351.2	08/24	16:54	JCL
OTHER						·		
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/18	15:15	EMW
Total Organic Carbon	1.2	mg/L	1	1	SM5310 C	08/23	21:58	ALD
RESIDUES						•		
Solids, Total Dissolved	48	mg/l	5	1	SM 2540C	08/24	13:00	ТМН
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	08/24	13:00	ТМН
TITRATIONS		-				•		
Alkalinity, Total to pH 4.5	14	mg/l	1	1	SM 2320 B	08/26	15:05	AEH

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., St	∍. 600				Date of F Lab ID:	Report:	08/30 3157)/16 '-16-0023509
Arlington VA 22201					Date Coll Collected		08/18 Clier	3/16 10:20 ht
Sample Desc: BZ-7 Surface					Date Rece	eived:	08/18	3/16 14:10
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	<2	/100ml	2	1	SM 9222D	08/18	14:45	TNS
Total Coliform	2000	mpn/100mL	1	1	SM 9223B	08/19	09:30	TNS
CHEMISTRY						•		
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	08/18	14:50	AEH
Phosphorus as P, Dissolved	0.24	mg/l	. 05	1	SM 4500P-E	08/19	14:15	AEH
Phosphorus as P, Total	0.25	mg/l	.01	1	SM 4500P-E	08/19	15:10	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/L	. 05	1	D6919-03		23:59	JCL
Nitrogen, Nitrate	0.19	mg/L	.05	1	EPA 353.2	•	17:09	JCL
Nitrogen, Nitrite	<.05	mg/L	.05	1	EPA 353.2	,	15:34	
Nitrogen, Total Kjeldahl	0.47	mg/l	.25	1	EPA 351.2	08/24	16:55	JCL
OTHER Discharging L. Commun. Downed	<i>(</i> 2)		•					
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	,	15:15	EMW
Total Organic Carbon	2.1	mg/l	1	1	SM5310 C	08/24	12:29	ALD
RESIDUES	/7		5					
Solids, Total Dissolved	43	mg/l	5	1	SM 2540C	•	13:30	TMH
Solids, Total Suspended TITRATIONS	<3	mg/l	3	1	SM 2540D	08/24	13:30	TMH
Alkalinity, Total to pH 4.5	13	ma / 1	4	1	04 0700 5	00/07	45.05	
Ackacinity, locat to pn 4.5	15	mg/l	1	1	SM 2320 B	08/26	15:05	AEH

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Attention:	David Wertz					Date of R	eport:	08/30)/16
Reported To:	Tetra Tech (Beltzville Dam)					Lab ID:		3157	-16-0023509
	1320 North Courthouse Rd., Ste. 60	00							
	Arlington VA 22201					Date Coll	ected:	08/18	3/16 10:20
						Collected	By:	Clier	it
Sample Desc:	BZ-7 Surface					Date Rece	ived:	08/18	3/16 14:10
PWSID: 31308	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total coliform sample was placed in the incubator on 08/18/2016 at 14:50.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste	. 600				Date of F Lab ID:	Report:	08/30 3157)/16 '-16-0023510
Arlington VA 22201					Date Coll Collected		08/18 Clien	3/16 10:20 ht
Sample Desc: BZ-7 Mid-Depth					Date Rece	eived:	08/18	3/16 14:10
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	08/18	14:50	AEH
Phosphorus as P, Dissolved	0.19	mg/l	. 05	1	SM 4500P-E	08/19	14:25	AEH
Phosphorus as P, Total	0.05	mg/l	.01	1	SM 4500P-E	08/19	15:10	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/19	00:13	JCL
Nitrogen, Nitrate	0.61	mg/l	.05	1	EPA 353.2	08/18	17:10	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	08/18	15:35	JCL.
Nitrogen, Total Kjeldahl	0.38	mg/l	.25	1	EPA 351.2	08/24	16:56	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/18	15:15	EMW
Total Organic Carbon	1.2	mg/l	1	1	SM5310 C	08/24	12:41	ALD
RESIDUES								
Solids, Total Dissolved	53	mg/l	5	1	SM 2540C	08/24	13:30	ТМН
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	08/24	13:30	ТМН
TITRATIONS								
Alkalinity, Total to pH 4.5	15	mg/l	1	1	SM 2320 B	08/26	15:05	AEH

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste.	. 600				Date of F Lab ID:	Report:	08/30 3157)/16 7–16–0023511
Arlington VA 22201					Date Coll Collected		08/18 Clier	3/16 10:20 nt
Sample Desc: BZ-7 Deep					Date Rece	eived:	08/18	3/16 14:10
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	08/18	15:00	AEH
Phosphorus as P, Dissolved	0.50	mg/l	.05	1	SM 4500P-E			
Phosphorus as P, Total	0.54	mg/l	.01	1	SM 4500P-E	,		
NITROGENS		-,						
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	08/19	00:28	JCL
Nitrogen, Nitrate	0.58	mg/l	.05	1	EPA 353.2	08/18	17:11	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	•	15:36	JCL
Nitrogen, Total Kjeldahl	0.93	mg/l	.25	1	EPA 351.2	, 08/24	16:57	JCL
OTHER						,		
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	08/18	15:15	EMW
Total Organic Carbon	1.4	mg/l	1	1	SM5310 C	'	12:52	
RESIDUES						'		
Solids, Total Dissolved	55	mg/l	5	1	SM 2540C	08/24	13:30	тмн
Solids, Total Suspended	40	mg/l	3	1	SM 2540D	'	13:30	
TITRATIONS						1		
Alkalinity, Total to pH 4.5	12	mg/l	1	1	SM 2320 B	08/26	15:05	AEH

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Reviewed and Approved by: almed h Richard Wheeler

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M. J. REIDER ASSOCIATES, INC. COFC.PRT Page: 1	Chain of Custody Work Order: 006226 Project Leader: rxw No: 276890 Work Order Description: Beltzville Reservoir Remarks: e Dam) Rd., Ste. 600 Total Sampling Time (hours): Bottle Prep by:	aipt Temp: <u>S</u> Deg C. If Temp Unacceptable, Approved By: <u><u>B</u>S<u>b</u></u>	Matrix: 0 1 - 1 X Ft nh3 p w/ H2SO4 (pH - 1 X 2xambervoa g w/ H3PO4 - 1 X 2xambervoa g w/ H3PO4	- 1 X Pt no3no2 k - 1 X Pt no3no2 k - 1 X 250m1Micro Matrix: o - 1 X Pt nh3 p w/ - 1 X 8oz alk p v	 1 X L bod p w/ Gool to 6 C; 1 X Pt no3no2 p w/ Gool to 6 C; 1 X 250mlMicro p w/ Sterile/Na2 Matrix: o Date: 1 X Pt nh3 p w/ H2SO4 (pH<2); 1 X 802 Alk p w/ Cool to 6 C; 	<pre>C - 1 X 2xambervoa g w/ H3P04/zero headspace; D - 1 X L bod p w/ Cool to 6 C; E - 1 X 2F no3no2 p w/ Cool to 6 C; F - 1 X 250mlMicro p w/ Sterile/Na2S203;</pre>	Ball MA Received for laboratory by: Ball MM Date: 8-18-16 Time: 1410 Sample entered by: 04
rrow 06/24/16 10:05:15 AM	seltzvill vurthouse 22201	Phone: 703-387-5516 Ext: Samplers: $WAci K$	2999 Sample No: 1 Desc: BZ-1 Surface nh3-n, tkn, alk, tds, tss, po4-p, toc, main dimoden dimoden of hod	2 3500 sample No: 2 Desc: BZ-2 Surface mh3-n, tkn, alk, tds, tss, po4-p, toc,	7350 Sample No: 3 Desc: BZ-3 Surface nh3-n, tkn, alk, tds, tss, po4-p, toc,	no2-n, no3-n, d-po4-p, o-po4, bod, fc, tc, MU	Relinquished by: $2 \sqrt{2} \sqrt{2}$ Received by: Date: $\frac{b}{ k }$ Time: $N = 1$

M. J. REIDER ASSOCIATES, INC. COFC.PRT Page: 2 Page: 2	ıstody	Project Leader: rxw Keservoir		<pre>ng Time (hours): Bottle Prep by: aceipt Temp: \$\int_Deg \$\int_F_Temp Unacceptable, On Ice? Y N Approved By: \$\int_S_W\$</pre>	K A XXXX A I	<pre>2 1 X 2002 ALK P W COOL to 6 C; 2 1 X 2 X P OG 0 W COOL to 6 C; 7 1 X P t D O 0 0 W COOL to 6 C; F 1 X P t D O 0 0 0 0 0 0 0 0 0 0 Matrix: 0 Date: Y/18/16 A 1 X P t D 0 0 W H2004 (PH<2); B 1 X B 2 Alk P W COOL to 6 C; C 1 X 2 X A D 0 W COOL to 6 C; F 1 X P t D 0 0 W COOL to 6 C; F 1 X 250mlMicro P W Sterile/Na2S203;</pre>	Received for laboratory by: May MAD Date: X.R.M. Time: 1410 Sample entered by:
M. J. REIDER	Chain of Custody	Projec : Beltzville Reservoir	Remarks:	Total Sampling Time (hou Laboratory Receipt Temp: Approve		· · · · · · · · · · · · · · · · · · ·	Burlins
rxw 06/24/16 10:05:15 AM		Account: 3157 Work Order: 006226 Work Order Description: Customer: David Wertz	Address: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 600 Arlington VA 22201	Phone: 703-387-5516 Ext: Samplers: WACIX	<pre>23502 Sample No: 4 Desc: BZ-3 Mid-Depth nh3-n, tkn, alk, tds, tss, po4-p, toc, w no2-n, no3-n, d-po4-p, o-po4, bod NA4 & NA4 &</pre>	23504 sample No: 6 Desc: BZ-4 Surface nh3-n, thn, alk, tds, tss, po4-p, toc, Co2-n, no3-n, d-po4-p, o-po4, bod fc, tc,	Relinquished by: Received by: Date: K/16 Time: 130

15 AM Chain of Custody 7 Work order: 006226 Chain of Custody d Wertz Work order: 006226 Pro- d Wertz Work order: 006226 Chain Selfzville Reserve a Tech (Beltzville Dam) Morth Courthouse Rd., Ste. 600 Total Sampling Time Morth Courthouse Rd., Ste. 600 Total Sampling Time Morth Courthouse Rd., Ste. 600 Total Sampling Time 287-5516 Ext: Laboratory Receipt Age: 5525 Ext: Laboratory Receipt Age: 5525 Ext: Laboratory Receipt Age: 5525 Ext: Laboratory Receipt Morth City tds, tss, po4-p, toc, n, d-po4-p, o-po4, body n, d-po4-p, o-po4, body alk, tds, tss, po4-p, toc, n, d-po4-p, o-po4, body t, d-po4-p, o-po4, body h, d-po4-p, o-po4, body i, d-po4-p, o-po4, body Time. Age: 15-6 Mid-Depth alk, tds, tss, po4-p, toc, n, d-po4-p, o-po4, body Time. Age: 15-6 Mid-Depth Desc: 15-6 Mid-Depth Age: 15-6 Mid-Depth Age: 15-6 Mid-Depth Age: 15-6 Mid-Depth Desc: 15-6 Mid-Depth Age: 15-6 Mid-Depth Desc: 15-6 Mid-Depth Age: 15-6 Mid-Depth Age: 15-6 Mid-Depth Desc: 15-6 Mid-Depth Age: 15-6 Mid-Depth Desc: 15-6 Mid-Depth Desc: 15-6 Mid-Depth Desc: 15-6 Mid-Depth Age: 15-6 Mid-Depth Desc: 15-6 Mid-Depth Desc: 15-6 Mid-Depth Desc: 15-6 Mid-Depth Desc: 15-7 Mid-16 Mid-Depth Desc: 15-6 Mid-Depth Desc: 15-7 Mid-16	INC. COFC.PRT Page: 3		ader: rxw No: 276890			804418 804418	Der G If Remu Hunssnicht Con 100 V	V Deg C. If Temp Unacceptable, On Ice? Y N By: 65 W	"	- 1 X Pt nh3 p w/		- 1 X 250mlMicro	trix: o	Tir - 1 X Pt nh3 p w/ H2SO4(pH<2	х х 	X L bod p w/ X Pt no3no2 1	- 1 X 250mLMicro p w/ Sterile/Na2S20	Matrix: o Date: Y/Y/*	A - 1 X Pt nh3 p w/ H2SO4(pH<2);	- 1 X 2xambervoa g w/ H3P04/z	- 1 X L bod p w/ - 1 X Pt no3no2 F			Received for laboratory by: Conflictory	8-18-16 Time: 440 1410 BSW	
<pre>iJ5 AM id Wertz ra Tech (Beltzvill o North Courthouse ington VA 22201 -387-5516 Ext: ////////////////////////////////////</pre>	J. REIDER ASSOCIATES,	Chain of Custody	5226 ription: Beltzville Reservoir	Remarks.	• CAT TRUNCAT	Sampling Time	Tereint T	кесетр															U . 4	DY: /Jan Ant	Date:	
	rxw 06/24/16 10:05:15 AM		·		Ste.		1	WACIK	======================================	nh3-n, tkn, alk, tds, tss, po4-p, toc,	▲ 103-п, d-ро4-р, o-ро4, bod	the state	Desc:	nh3-n, tkn, alk, tds, tss, po4-p, toc,		роа - род			Ę	, , , , , , , , , , , , , , , , , , ,	no3-n, d-po4-p, o-po4, bod			Relinquished by: August Received	-	

COFC.PRT Page: 4		No: 276890			Bottle Prep by:	eptable, On Ice? Y N	Date: <u>X/W/U</u>	Pt nh3 p w/ H2SO4 (pH<2); 80z Alk p w/ Cool to 6 C;	g w/ H Cool to	r ", cccr cc Dat			Pt no3no2 p w/ Cool to 6 C; 250mlMicro p w/ Sterile/Na2S203;	I	Pt nh3 p w/ H2SO4 (pH<2); 020	ouz Alk p w/ cool to o c; 2xambervoa g w/H3P04/zero headspace;	w/ cool to 6 C; 22 p w/ Cool to 6 C;	~	BARATO	Time: / 14/10	Sample entered by: 2ψ
M. J. REIDER ASSOCIATES, INC.	Chain of Custody	Project Leader: rxw	Deutzville Keservoir		Total Sampling Time (hours):	S Deg C.	Matrix: 0	A - 1 X Pt nh3 B - 1 X 8oz Alk	X X X X X X X X X X X X X X X X X X X	 Mat	$A = 1 \times Pt $	х X X 	ж ж Н Н К К	Matrix: o	, H	4 M F	* * 		Do MM Received for laboratory by:) Date: Eußullo T	
rxw 06/24/16 10:05:16 AM		Account: 3157 Work Order: 006226	work Orger Description: beitzville Keservoir Customer: David Wertz	Address: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 600	•	ł	23508 Sample No: 10 Desc: BZ-6 Deep	nh3-n, tkm, alk, tds, tss, po4-p, toc,	М по2-п, по3-п, d-ро4-р, о-ро4, bod	23509 Sample No: 11 Desc: BZ-7 Surface	nh3-n, tkn, alk, tds, tss, po4-p, toc,	по2-п, по3-п, d-ро4-р, о-ро4, bog	fe, te,	23510 sample No: 12 Desc: BZ-7 Mid-Depth	nh3-n, tkn, alk, tds, tss, po4-p, toc,		иот - по -		Relinquished by a lot with Received by:	Date: <u><u>1</u></u> <u>11</u> <u>11</u> <u>1</u> <u>1</u> <u>1</u> <u>1</u> <u>1</u> <u>2</u> <u>2</u> <u>1</u> <u>1</u> <u>2</u> <u>2</u> <u>1</u> <u>1</u> <u>2</u> <u>2</u> <u>2</u> <u>2</u> <u>2</u> <u>2</u> <u>2</u> <u>2</u> <u>2</u> <u>2</u>	

|--|





Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste.	600				Date of R Lab ID:	eport:	09/26 3157	6/16 -16-0028568
Arlington VA 22201					Date Coll Collected		09/14 Clien	/16 08:20 nt
Sample Desc: BZ-1 Surface					Date Rece	ived:	09/14	/16 13:20
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	13	/100ml	2	1	SM 9222D	09/14	15:00	TNS
Total Coliform	1200	mpn/100ml	1	1	SM 9223B	09/15	11:10	TNS
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/15	14:50	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/19	15:40	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	09/19	15:55	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/14	23:55	JCL
Nitrogen, Nitrate	0.66	mg/l	.05	1	EPA 353.2	09/14	17:15	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	,	15:26	
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	09/22	18:12	JCL
OTHER			_					
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	•	13:40	
Total Organic Carbon	1.1	mg/l	1	1	sm5310 c	09/15	23:00	ALD
RESIDUES								
Solids, Total Dissolved	36	mg/l	5	1	SM 2540C	09/20	12:35	ТМН
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	09/20	12:35	ТМН
TITRATIONS								
Alkalinity, Total to pH 4.5	12	mg/l	1	1	SM 2320 B	09/20	11:20	AEH

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Attention:	David Wertz					Date of F	Report:	09/26	6/16
Reported To:	Tetra Tech (Beltzville Dam)					Lab ID:		3157	, 7–16–0028568
	1320 North Courthouse Rd., Ste. 6	600							
	Arlington VA 22201					Date Coll	.ected:	09/14	4/16 08:20
						Collected	By:	Clier	nt
Sample Desc:	BZ-1 Surface					Date Rece	eived:	09/14	¥/16 13:20
PWSID: 31308	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

02 The total colifrom sample was placed in the incubator on 09/14/2016 at 16:00.

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Richard Wheeler

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste.	600				Date of R Lab ID:	eport:	09/26 3157	/16 -16-0028569
Arlington VA 22201	000				Date Coll Collected		09/14 Clien	/16 08:00 t
Sample Desc: BZ-2 Surface					Date Rece	ived:	09/14	/16 13:20
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	50	/100mL	2	1	SM 9222D	09/14	15:00	TNS
Total Coliform	920	mpn/100ml	1	1	SM 9223B	09/15	11:10	TNS
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	'		AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/19	15:40	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	09/19	15:55	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03		00:10	JCL
Nitrogen, Nitrate	0.28	mg/l	.05	1	EPA 353.2	•	17:20	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	•	15:29	
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	09/22	18:13	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	'	13:40	EMW
Total Organic Carbon	<1	mg/l	1	1	SM5310 C	09/15	23:11	ALD
RESIDUES								
Solids, Total Dissolved	30	mg/l	5	1	SM 2540C	09/20	12:35	ТМН
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	09/20	12:35	ТМН
TITRATIONS								
Alkalinity, Total to pH 4.5	12	mg/l	1	1	SM 2320 B	09/20	11:20	AEH

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Attention:	David Wertz					Date of F	eport:	09/26	5/16
Reported To:	Tetra Tech (Beltzville Dam)					Lab ID:		3157	-16-0028569
	1320 North Courthouse Rd., Ste. 6	00							
	Arlington VA 22201					Date Coll	ected:	09/14	¥/16 08:00
						Collected	By:	Clier	nt
Sample Desc:	BZ-2 Surface					Date Rece	ived:	09/14	¥/16 13:20
PWSID: 31308	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total colifrom sample was placed in the incubator on 09/14/2016 at 16:00.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste.	600				Date of R Lab ID:	eport:	09/26 3157	/16 -16-0028570
Arlington VA 22201	000				Date Coll Collected		09/14 Clien	/16 09:50 t
Sample Desc: BZ-3 Surface					Date Rece	ived:	09/14	/16 13:20
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	<2	/100ml	2	1	SM 9222D	09/14	15:00	TNS
Total Coliform	820	mpn/100ml	1	1	SM 9223B	09/15	11:10	TNS
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	•		AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	•		AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	09/19	15:55	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	. 05	1	D6919-03	,	00:25	JCL
Nitrogen, Nitrate	0.19	mg/l	.05	1	EPA 353.2	'	17:21	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	'	15:30	
Nitrogen, Total Kjeldahl	0.31	mg/l	.25	1	EPA 351.2	09/22	18:16	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/L	2	1	SM 5210B	'	13:40	
Total Organic Carbon	1.8	mg/L	1	1	SM5310 C	09/15	23:23	ALD
RESIDUES								
Solids, Total Dissolved	31	mg/l	5	1	SM 2540C	'	12:35	ТМН
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	09/20	12:35	ТМН
TITRATIONS								
Alkalinity, Total to pH 4.5	14	mg/l	1	1	SM 2320 B	09/20	11:20	AEH

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 6	500				Date of F Lab ID:	eport:	09/26 3157	5/16 7-16-0028570
Arlington VA 22201					Date Coll Collected		09/14 Clier	4/16 09:50 ht
Sample Desc: BZ-3 Surface					Date Rece	eived:	09/14	4/16 13:20
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total colifrom sample was placed in the incubator on 09/14/2016 at 16:00.

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Attention: David Wertz					Date of F	Report:	09/26	/16
Reported To: Tetra Tech (Beltzville Dam)					Lab ID:		3157	-16-0028571
1320 North Courthouse Rd., Ste.	600							
Arlington VA 22201					Date Coll	.ected:	09/14	/16 09:50
					Collected	l By:	Clien	t
Sample Desc: BZ-3 Mid-Depth					Date Rece	eived:	09/14	/16 13:20
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/L	.01	1	SM 4500P-E	. 09/15	14:50	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/19	15:40	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	09/19	16:00	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/15	00:39	JCL
Nitrogen, Nitrate	0.62	mg/l	.05	1	EPA 353.2	09/14	17:22	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	09/14	15:31	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	09/22	18:17	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	09/14	13:40	EMW
Total Organic Carbon	1.1	mg/l	1	1	SM5310 C	09/15	23:34	ALD
RESIDUES								
Solids, Total Dissolved	43	mg/l	5	1	SM 2540C	09/20	12:35	тмн
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	09/20	12:35	тмн
TITRATIONS						-		
Alkalinity, Total to pH 4.5	13	mg/l	1	1	SM 2320 B	09/20	11:20	AEH

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste.	600				Date of R Lab ID:	eport:	09/26 3157	/16 -16-0028572
Arlington VA 22201					Date Coll Collected		09/14 Clien	/16 09:50 t
Sample Desc: BZ-3 Deep					Date Rece	ived:	09/14	/16 13:20
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY						مسا است خطا الله الله		
COLORMETRIC								
Phosphate as P, Ortho	0.01	mg/l	.01	1	SM 4500P-E	09/15	14:50	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/19	15:40	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	09/19	16:00	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/15	00:54	JCL
Nitrogen, Nitrate	0.41	mg/l	.05	1	EPA 353.2	09/14	17:23	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	09/14	15:32	JCL
Nitrogen, Total Kjeldahl	0.73	mg/l	.25	1	EPA 351.2	09/22	18:18	JCL
OTHER								
Biochemical Oxygen Demand	2	mg/l	2	1	SM 5210B	09/14	13:40	EMW
Total Organic Carbon	1.8	mg/l	1	1	SM5310 C	09/15	23:46	ALD
RESIDUES								
Solids, Total Dissolved	51	mg/l	5	1	SM 2540C	09/20	12:35	ТМН
Solids, Total Suspended	77	mg/l	3	1	SM 2540D	09/20	12:35	ТМН
TITRATIONS								
Alkalinity, Total to pH 4.5	15	mg/l	1	1	SM 2320 B	09/20	11:20	AEH

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention:	David Wertz					Date of R	leport:	09/26	5/16
Reported To:	Tetra Tech (Beltzville Dam)					Lab ID:		3157	-16-0028572
	1320 North Courthouse Rd., Ste. 60	0							
	Arlington VA 22201					Date Coll	ected:	09/14	/16 09:50
						Collected	By:	Clier	nt
Sample Desc:	BZ-3 Deep					Date Rece	ived:	09/14	/16 13:20
PWSID: 31308	43			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
00 T	he CM EQ10D complexited wat have a D	اهم سماد شما سماد ال	-+ 1 +						

O2 The SM 5210B sample did not have a DO depletion of at least 2 mg/L.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. Arlington VA 22201	600				Date of R Lab ID: Date Coll Collected	.ected:		-16-0028573 /16 07:40
Sample Desc: BZ-4 Surface					Date Rece	ived:	09/14	/16 13:20
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	16	/100mL	2	1	SM 9222D	09/14	15:00	TNS
Total Coliform	2400	mpn/100ml	1	1	SM 9223B	'	11:10	TNS
CHEMISTRY						·		
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/15	14:50	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/19	15:45	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	09/19	16:00	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/15	01:08	JCL
Nitrogen, Nitrate	0.08	mg/l	.05	1	EPA 353.2	09/14	15:24	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	09/14	15:33	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	09/22	18:19	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	09/14	13:40	EMW
Total Organic Carbon	1.2	mg/l	1	1	SM5310 C	09/15	23:57	ALD
RESIDUES								
Solids, Total Dissolved	18	mg/l	5	1	SM 2540C	09/20	12:35	ТМН
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	09/20	12:35	тмн
TITRATIONS								
Alkalinity, Total to pH 4.5	7	mg/l	1	1	SM 2320 B	09/20	11:20	AEH

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	David Wertz Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 6	00				Date of F Lab ID:	eport:	09/26 3157	5/16 7-16-0028573
	Arlington VA 22201					Date Coll Collected		09/14 Clier	4/16 07:40 ht
Sample Desc:	BZ-4 Surface					Date Rece	ived:	09/14	·/16 13:20
PWSID: 31308	43	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
							Date		

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total colifrom sample was placed in the incubator on 09/14/2016 at 16:00.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 600						eport:	port: 09/26/16 3157-16-00285		
Arlington VA 22201					Date Coll Collected		09/14 Clien	/16 07:20 t	
Sample Desc: BZ-5 Surface					Date Rece	eived:	09/14	/16 13:20	
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst	
BACTI									
MICROBIOLOGY									
Fecal Coliform	54	/100ml	2	1	SM 9222D	09/14	15:00	TNS	
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	09/15	11:10	TNS	
CHEMISTRY									
COLORMETRIC									
Phosphate as P, Ortho	0.01	mg/l	.01	1	SM 4500P-E	09/15	14:50	AEH	
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/19	15:45	AEH	
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	09/19	16:00	AEH	
NITROGENS									
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/15	01:23	JCL	
Nitrogen, Nitrate	0.95	mg/l	.05	1	EPA 353.2	09/14	17:25	JCL	
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	09/14	15:34	JCL	
Nitrogen, Total Kjeldahl	0.32	mg/l	.25	1	EPA 351.2	09/22	18:20	JCL	
OTHER									
Biochemical Oxygen Demand	5	mg/l	2	1	SM 5210B	09/14	13:40	EMW	
Total Organic Carbon	1.5	mg/l	1	1	SM5310 C	09/21	11:05	ALD	
RESIDUES									
Solids, Total Dissolved	58	mg/l	5	1	SM 2540C	09/20	12:35	ТМН	
Solids, Total Suspended	26	mg/l	3	1	SM 2540D	09/20	12:35	ТМН	
TITRATIONS									
Alkalinity, Total to pH 4.5	21	mg/l	1	1	SM 2320 B	09/20	11:20	AEH	

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Attention:	David Wertz					Date of F	eport:	09/26	5/16
Reported To:	Tetra Tech (Beltzville Dam)					Lab ID:		3157	7–16–0028574
	1320 North Courthouse Rd., Ste. 6	00							
	Arlington VA 22201					Date Coll	ected:	09/14	¥/16 07:20
						Collected	By:	Clier	nt
Sample Desc:	BZ-5 Surface					Date Rece	eived:	09/14	4/16 13:20
BUOTE 24200	17								
PWSID: 31308	45			Rep	Dilutn		Test	Test	
		Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total colifrom sample was placed in the incubator on 09/14/2016 at 16:00.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 600						Date of Report: 09/26/16 Lab ID: 3157-16-		
Arlington VA 22201					Date Coll Collected		09/14 Clien	/16 09:00 t
Sample Desc: BZ-6 Surface					Date Rece	ived:	09/14	/16 13:20
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	<2	/100ml	2	1	SM 9222D	09/14	15:00	TNS
Total Coliform	1600	mpn/100ml	1	1	SM 9223B	09/15	11:10	TNS
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/15	14:50	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/19	15:45	AEH
Phosphorus as P, Total	<.01	mg/L	.01	1	SM 4500P-E	09/19	16:00	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/15	01:38	JCL
Nitrogen, Nitrate	0.19	mg/l	.05	1	EPA 353.2	09/14	17:26	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	09/14	15:35	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	09/22	18:21	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	09/14	13:40	EMW
Total Organic Carbon	1.7	mg/l	1	1	SM5310 C	09/21	11:29	ALD
RESIDUES								
Solids, Total Dissolved	35	mg/l	5	1	SM 2540C	09/20	12:35	ТМН
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	09/20	12:35	ТМН
TITRATIONS								
Alkalinity, Total to pH 4.5	14	mg/l	1	1	SM 2320 B	09/20	11:20	AEH

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00				Date of F Lab ID:	eport:	09/26 3157	5/16 160028575
						09/14 Clien	/16 09:00 nt
				Date Rece	ived:	09/14	/16 13:20
Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
			Rep	Rep Dilutn	Lab ID: DO Date Coll Collected Date Rece Rep Dilutn	DO Date Collected: Collected By: Date Received: Rep Dilutn Test	Lab ID: 3157 DO Date Collected: 09/14 Collected By: Clien Date Received: 09/14 Rep Dilutn Test Test

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

O2 The total colifrom sample was placed in the incubator on 09/14/2016 at 16:00.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., St	Date of Report: 09/26/16 Lab ID: 3157-16-00			/16 '-16-0028576				
Arlington VA 22201					Date Coll Collected		09/14 Clien	/16 09:00 t
Sample Desc: BZ-6 Mid-Depth					Date Rece	ived:	09/14	/16 13:20
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/15	14:50	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/19	15:45	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	09/19	16:00	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/15	02:21	JCL
Nitrogen, Nitrate	0.67	mg/l	.05	1	EPA 353.2	09/14	17:27	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	09/14	15:36	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	09/22	18:22	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	09/14	13:40	EMW
Total Organic Carbon	1.0	mg/l	1	1	SM5310 C	09/21	12:04	ALD
RESIDUES								
Solids, Total Dissolved	46	mg/l	5	1	SM 2540C	09/20	12:35	ТМН
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	09/20	12:35	ТМН
TITRATIONS								
Alkalinity, Total to pH 4.5	13	mg/l	1	1	SM 2320 B	09/20	11:20	AEH

COMMENTS

O1 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 600						Date of Report: 09/26/ Lab ID: 3157-		
Arlington VA 22201					Date Coll Collected		09/14 Clien	/16 09:00 t
Sample Desc: BZ-6 Deep					Date Rece	ived:	09/14	/16 13:20
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/15	14:50	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	•	15:45	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	'	16:00	AEH
NITROGENS		σ,				,		
Nitrogen, Ammonia	<.05	mg/l	.05	1	D6919-03	09/15	02:36	JCL
Nitrogen, Nitrate	0.47	mg/l	.05	1	EPA 353.2	09/14	17:32	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	09/14	15:41	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	.25	1	EPA 351.2	09/22	18:25	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	09/14	13:40	EMW
Total Organic Carbon	1.3	mg/l	1	1	SM5310 C	09/21	12:15	ALD
RESIDUES								
Solids, Total Dissolved	60	mg/l	5	1	SM 2540C	09/20	12:35	тмн
Solids, Total Suspended	63	mg/l	3	1	SM 2540D	09/20	12:35	тмн
TITRATIONS								
Alkalinity, Total to pH 4.5	16	mg/l	1	1	SM 2320 B	09/20	11:20	AEH

COMMENTS

O1 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., S	Date of R Lab ID:	eport:	t: 09/26/16 3157-16-0028578					
Arlington VA 22201					Date Coll Collected		09/14 Clier	/16 10:40 ht
Sample Desc: BZ-7 Surface					Date Rece	eived:	09/14	/16 13:20
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst
BACTI								
MICROBIOLOGY								
Fecal Coliform	<2	/100mL	2	1	SM 9222D	09/14	15:09	TNS
Total Coliform	>2400	mpn/100ml	1	1	SM 9223B	09/15	11:10	TNS
CHEMISTRY		-						
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/15	14:50	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/19	15:45	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	09/19	16:00	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	. 05	1	D6919-03	09/15	02:51	JCL
Nitrogen, Nitrate	0.18	mg/l	. 05	1	EPA 353.2	09/14	17:33	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	09/14	15:42	JCL
Nitrogen, Total Kjeldahl	<.25	mg/l	. 25	1	EPA 351.2	09/22	18:24	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	09/14	13:40	EMW
Total Organic Carbon	1.7	mg/l	1	1	SM5310 C	09/21	12:27	ALD
RESIDUES								
Solids, Total Dissolved	43	mg/l	5	1	SM 2540C	09/20	13:00	тмн
Solids, Total Suspended	<3	mg/l	3	1	SM 2540D	09/20	12:35	ТМН
TITRATIONS								
Alkalinity, Total to pH 4.5	11	mg/l	1	1	SM 2320 B	09/20	13:10	AEH

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Attention: David Wertz					Date of R	eport:	09/26	/16
Reported To: Tetra Tech (Beltzville Dam)					Lab ID:		3157	-16-0028578
1320 North Courthouse Rd., Ste. 60 Arlington VA 22201	JU				Date Coll Collected		09/14 Clien	/16 10:40 t
Sample Desc: BZ-7 Surface					Date Rece	ived:	09/14	/16 13:20
PWSID: 3130843			Rep	Dilutn		Test	Test	
	Result	Unit	Limit	Factor	Procedure	Date	Time	Analyst

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

02 The total colifrom sample was placed in the incubator on 09/14/2016 at 16:00.

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Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste Arlington VA 22201	Date of R Lab ID: Date Coll Collected	ected:		-16-0028579 -/16 10:40				
Sample Desc: BZ-7 Mid-Depth					Date Rece	ived:	09/14	/16 13:20
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY	,							
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/15	14:50	AEH
Phosphorus as P, Dissolved	<.05	mg/l	.05	1	SM 4500P-E	09/19	15:50	AEH
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	09/19	16:05	AEH
NITROGENS								
Nitrogen, Ammonia	<.05	mg/l	. 05	1	D6919-03	09/15	03:05	JCL
Nitrogen, Nitrate	0.13	mg/l	.05	1	EPA 353.2	09/14	17:34	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	09/14	15:43	JCL
Nitrogen, Total Kjeldahl	0.31	mg/l	.25	1	EPA 351.2	09/22	18:24	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	09/14	13:40	EMW
Total Organic Carbon	1.5	mg/l	1	1	SM5310 C	09/21	12:39	ALD
RESIDUES								
Solids, Total Dissolved	23	mg/L	5	1	SM 2540C	09/20	13:00	тмн
Solids, Total Suspended	<3	mg/L	3	1	SM 2540D	09/20	12:35	тмн
TITRATIONS						-		
Alkalinity, Total to pH 4.5	12	mg/l	1	1	SM 2320 B	09/20	13:10	AEH

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

Distribution of Reports: Gregory Wacik - USACE (Beltzville Dam)

Reviewed and Approved by: Richard Wheeler

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Page 1 of 1



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ACIL Seal of Excellence





Attention: David Wertz Reported To: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., St	Date of F Lab ID:	Report: 09/26/16 3157-16-0028580						
Arlington VA 22201					Date Coll Collected		09/14 Clien	4/16 10:40 ht
Sample Desc: BZ-7 Deep					Date Rece	eived:	09/14	·/16 13:20
PWSID: 3130843	Result	Unit	Rep Limit	Dilutn Factor	Procedure	Test Date	Test Time	Analyst
CHEMISTRY								
COLORMETRIC								
Phosphate as P, Ortho	<.01	mg/l	.01	1	SM 4500P-E	09/15	15:00	AEH
Phosphorus as P, Dissolved	<.05	mg/L	.05	1	SM 4500P-E	•		
Phosphorus as P, Total	<.01	mg/l	.01	1	SM 4500P-E	-		
NITROGENS						,		
Nitrogen, Ammonia	0.12	mg/l	.05	1	D6919-03	09/15	03:20	JCL
Nitrogen, Nitrate	0.21	mg/L	. 05	1	EPA 353.2	09/14	17:35	JCL
Nitrogen, Nitrite	<.05	mg/l	.05	1	EPA 353.2	09/14	15:44	JCL
Nitrogen, Total Kjeldahl	0.29	mg/l	.25	1	EPA 351.2	09/22	18:27	JCL
OTHER								
Biochemical Oxygen Demand	<2	mg/l	2	1	SM 5210B	09/14	13:40	EMW
Total Organic Carbon	1.4	mg/L	1	1	SM5310 C	09/21	12:51	ALD
RESIDUES								
Solids, Total Dissolved	48	mg/l	5	1	SM 2540C	09/20	13:00	ТМН
Solids, Total Suspended	15	mg/l	3	1	SM 2540D	09/20	12:35	тмн
TITRATIONS								
Alkalinity, Total to pH 4.5	19	mg/l	1	1	SM 2320 B	09/20	13:10	AEH

COMMENTS

01 The Ortho-phosphate was filtered and the dissolved phosphorous was filtered and preserved w/ H2SO4 to pH <2 after the sample was received at the laboratory.

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Richard Wheeler

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rxw 08/08/16	8:25:17 AM	M. J. REIDER ASSOCIATES, INC. Page: 1
Account:	3157	Work Order: 006226 Project Leader: rxw No: 278490
Customer:	David Wertz	DI: BELLZVILLE RESERVOIY
Address:	Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 600	
. Crodu		Total Sampling Time (hours):Bottle Prep by:
Samplers:		Laboratory Receipt Temp: () Deg C. If Temp Unacceptable, On Ice? Y N Approved By: 05 ()
28568 sample No:	<pre>usussessessessessessessessessessessesses</pre>	
	nh3-n, tkn, alk, tds, tss, po4-p, toc,	Time: 720 A - 1 X Pt nh3 p w/ H2SO4 (pH<2);
		IX 80Z All
no2-n	no2-n, no3-n, d-po4-p, o-po4, bod	1 X L bod p w/
fc, t		E - 1 X Ft no3no2 p w/ Cool to 6 C; F - 1 X 250mlMicro p w/ Sterile/Na2S203; 。
28569 sample No	2 Desc: BZ-2 Surface	Date:
nh3-n	nh3-n, tkn, alk, tds, tss, po4-p, toc,	- 1 X
	· thu ~	- 1 X 8oz Alk p v - 1 X 2xambervoa
no2-n	no2-n, no3-n, d-po4-p, o-po4, body	× ×
fc, t	D V	- 1 X 250mlMicro p w/ Ster
28570 sample No	3 Desc: BZ-3 Surface	Matrix: o Date: 9/14/16
nh3-n	nh3-n. tkn. alk. tds. tss. no4-n. tor.	
		- 1 X 802 Alk p w
no2-n	по2-п, по3-п, d-ро4-р, о-ро4, body	IX IX 2X200 D W/ H3F04/2 IX I bod D W/ Cool to 6 C
fc, t		× × + +
F	9	
	(
		R n/N
Relinquished by:	thed by: Farmer Received by:	10m/1/10 Received for laboratory by: 10m/1/10
Date:	MN/10 Time: 1145	Date: 9-14-16 Time: 1320
•		
		Sample entered by:

÷.

M. J. REIDER ASSOCIATES, INC. Page: 2	Chain of Custody Project Leader: rxw No: 278490	scription: Beltzville Reservoir		Total Sampling Time (hours); Bottle Prep by:	Laboratory Receipt Temp: 🕐 Deg C. If Temp Unacceptable, On Ice? Y N Approved By: 💋 5 🕅	Matrix: 0 Date: 2/1/1	A - 1 X Pt nh3 p w/ H2SO4 (pH<2) ; B - 1 X 802 Alk p w/ Cool to 6 C;	 1 X 2xambervoa g w/ H3P04/; 1 X L bod p w/ Cool to 6 C; 1 X Pt no3no2 p w/ Cool to 	Date	- 1 X Pt nh3 p w/ H2S - 1 X 8oz Alk p w/ Co	C - 1 X 2xambervoa g w/ H3P04/zero headspace; D - 1 X L bod p w/ Cool to 6 C; E - 1 X Pt no3no2 p w/ Cool to 6 C;	Date:	- 1 X Pt nh3 p w/ H2SO4 (pH - 1 X 8cz alk n w/ Cccl fc	r w/ H3PO4 1001 to 6	 1 X Pt no3no2 p w/ Cool t 1 X 250mlMicro p w/ Steri 		By NN Received for laboratory by: By MA	Date: 9-1476 Time: 1320	Sample entered by:
rxw 08/08/16 8:25:17 AM	Account: 3157 Work Order: 006226	Work Order Descripti Customer: David Wertz	Address: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 600	ALILUGCON VA 22201 Phone: 703-387-5516 R¥+·	IA alk	28571 sample No: 4 Desc: BZ-3 Mid-Depth	nh3-n, tkn, alk, tds, tss, po4-p, toc, #11	no2-n, no3-n, d-po4-p, o-po4, bod	29572 Sample No: 5 Desc: BZ-3 Deep	nh3-n, tkn, alk, tds, tss, po4-p, toc, All	по2-п, по3-п, d-ро4-р, о-ро4, роди	28573 sample No: 6 Desc: BZ-4 Surface	nh3-n, tkn, alk, tds, tss, po4-p, toc,	no2-n, no3-n, d-po4-p, d-pod, bod,	fe, te, MS	(Relinquished by Received by:	Date: 9/14/16 Time: 1/45	

J. REIDER ASSOCIATES, INC. Page: 3 hain of Custody	Project Leader: rxw No: 278490 Le Reservoir	Total Sampling Time (hours):Bottle Prep by:Bottle Prep by:Laboratory Receipt Temp:Deg C. If Temp Unacceptable, On Ice? Y N Approved By:BS(W)	Matrix: 0 Date: 7/4/6 A - 1 X Pt nh3 p w/ H2SO4(pH<2); B - 1 X 802 Alk p w/ Cool to 6 C; C - 1 X 2xambervoa g w/ H3PO4/zero headspace; D - 1 X 1 bod p w/ Cool to 6 C; F - 1 X 750n/Morron w/ Storilo/M22033.	Matrix: o Matrix: o - 1 X Pt nh3 p w/ H2SC - 1 X 8oz Alk p w/ Coc - 1 X L bod p w/ Cool - 1 X Pt no3no2 p w/ C	<pre>Matrix: o Date: %//%/c A - 1 X Pt nh3 p w/ H2SO4(pH<2); B - 1 X 80z Alk p w/ Cool to 6 C; C - 1 X 2xambervoa g w/ H3PO4/zero headspace; D - 1 X L bod p w/ Cool to 6 C; E - 1 X Pt no3no2 p w/ Cool to 6 C;</pre>	Received for laboratory by: Ban MA Date: 94416 Time: 1320 Sample entered by:
тжw 08/08/16 8:25:17 AM Chain of	Account: 3157 Work Order: 006226 Project Work Order Description: Beltzville Reservoir Customer: David Wertz Acription: Beltzville Reservoir Address: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 600	ngton VA 22201 387-5516 Ext: しょくが	28574 Sample No: 7 Desc: BZ-5 Surface nh3-n, tkn, alk, tds, tss, po4-p, toc, no2-n, no3-n, d-po4-p, o-po4, bod	29575 sample No: 8 Desc: BZ-6 Surface nh3-n, tkn, alk, tds, tss, po4-p, toc, no2-n, no3-n, d-po4-p, o-po4, bod	28576 sample No. 9 Desc: BZ-6 Mid-Depth nh3-n, tkm, alk, tds, tss, po4-p, toc, NA no2-n, no3-n, d-po4-p, o-po4, bod	Relinquished by: Received by: By MM

rxew 08/08/16 8:25:18 AM	M. J. REIDER ASSOCIATES, INC. Page: 4
	Chain of Custody
Account: 3157 Work Order: 006226 Work Order Description	006226 Project Leader: rxw scrintion: Reltruille Pecernoir
Customer: David Wertz	Demotion of the second s
Address: Tetra Tech (Beltzville Dam) 1320 North Courthouse Rd., Ste. 600	
Arlington VA 22201 Dhone: 703-387-5516 WV+.	Total Sampling Time (hours): Bottle Frep by:
Wheik	Laboratory Receipt Temp: $(\rho$ Deg C. If Temp Unacceptable, On Ice? Y N Approved By: $\beta \leq M$
	Inde
LCC2	Matrix: o Date: //T//6
nh3-n, tkn, alk, tds, tss, po4-p, toc, Au	A - 1 X Pt nh3 p w/ H2SO4 (pH<2); B - 1 X 80z Alk p w/ Cool to 6 C;
ли по2-п, по3-п, d-ро4-р, o-ро4, body	- 1 X 2xambervoa g w/ H3P04/zei - 1 X L bod p w/ Cool to 6 C;
	н 1
していていた。 BZ-1 C Sample No: 11 Desc: BZ-7 Surface	Matrix: o Date: // // 6
nh3-n, tkn, alk, tds, tss, po4-p, toc,	A - 1 X Pt nh3 p w/ H2SO4 (pH<2); B - 1 X Rov all h n w/ Cool to 6 C.
the the second s	- 1 X 2xambervoa g w/ H3
	$\mathbf{E} = 1 \times \mathbf{P} + \mathbf{D} + \mathbf{D} + \mathbf{C} = 0 \times \mathbf{C}$
	- 1 X 250m1Micro p w/ Sterile/Na2S203;
JODY 9 Sample No: 12 Desc: BZ-7 Mid-Depth	Matrix: o Date: 7/14/10 Time: 1000
nh3-n, tkn, alk, tds, tss, po4-p, toc,	- 1 X Pt mh3 p w/ H2SO4 (pt
2n HAN	- 1 X 2xambervoa g w/ H3
по2-п, по3-п, d-ро4-р, о-ро4, роди	D - 1 X L bod p w/ Cool to 6 C; E - 1 X Pt no3no2 p w/ Cool to 6 C;
	-
Relinquished by: / and colf Received by:	10m/N/m/V Received for laboratory by: 15m/1/m/V
Date: 2/14/16 Time: 1/45	Date: 9-14-16 Time: 1320
	Sample entered by:

COFC.PRT Page: 5	No: 278490 Bottle Prep by: Temp Unacceptable, On Ice? Y N	Date: \mathcal{W}_{Time} $Time: Time: \mathcal{W}_{P}$ w' H2SO4 (pH<2); w' Cool to 6 C; a g w' H3SO4/zero headspace; f Cool to 6 C; p w/ Cool to 6 C;	Bample entered by:
M. J. REIDER ASSOCIATES, INC.	t Leader: rxw hours): mp: 0 Deg C. If oved By: Deg C. If	Matrix: o A - 1 X Pt nh3 p w/ B - 1 X 80z Alk p w C - 1 X 2xambervoa D - 1 X pt no3no2 F E - 1 X Pt no3no2 F	$\int_{M} \int_{M} \int_{M} \int_{D} Received for laboratory by:$ Date: $\frac{q_{u}/q_{v}}{q}$ Time:
rxw 08/08/16 8:25:18 AM	Account: 3157 Work Order: 006226 Project Account: 3157 Work Order: 006226 Project Customer: David Wertz Work Order Description: Beltzville Reservoir Address: Tetra Tech (Beltzville Dam) Remarks: Remarks: Address: Tetra Tech (Beltzville Dam) Remarks: Remarks: Address: 1320 North Courthouse Rd., Ste. 600 Total Sampling Time () Phone: 703-387-5516 Ext: Total Sampling Time () Samplers: WMCN Iaboratory Receipt Te	Sample No: 13 Desc: BZ-7 Deep nh3-n, tkm, alk, tds, tss, po4-p, toc, M no2-n, no3-n, d-po4-p, o-po4, bod	Relinquished by Received by: Date: Time: MW
		22 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	