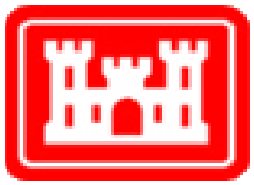
2020 WATER QUALITY MONITORING PROMPTON RESERVOIR PROMPTON, PENNSYLVANIA



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

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2020 Water Quality Monitoring
Prompton Reservoir
Prompton, Pennsylvania

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1.0 INTRODUCTION

1.1 PURPOSE OF THE MONITORING PROGRAM

The U.S. Army Corps of Engineers (USACE) manages Prompton Reservoir located in northeastern Pennsylvania within the Delaware River Basin. Prompton Reservoir provides flood control to downstream communities on the Lackawaxen River. Additionally, the reservoir provides important habitat for fish, waterfowl, and other wildlife, and recreational opportunities through fishing and boating. Because of the broad range of uses and demands that Prompton 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 monthly water quality monitoring at Prompton Reservoir for May to September 2020.

1.2 DESCRIPTION OF PROMPTON RESERVOIR

Prompton Reservoir was designed to provide flood control to downstream communities along the Lackawaxen River. A second authorized project purpose is recreation. The reservoir is located about 3 miles northwest of Honesdale, Pennsylvania, and dams a drainage area of 59.7 square miles. The primary surface water input to Prompton Reservoir originates from the West Branch of the Lackawaxen River. The reservoir is approximately 3 miles long with a maximum of 30-35 feet deep at the face of the dam near the township of Prompton, Pennsylvania.

1.3 ELEMENTS OF THE STUDY

The USACE, Philadelphia District, has been monitoring water quality of Prompton Reservoir since 1975. Over this time, the yearly monitoring designs have evolved to address new concerns such as health of public drinking water and contamination of sediments. The 2020 monitoring program follows that in most recent years and includes the following major elements:

- Monthly water quality monitoring of reservoir and tributaries - to evaluate compliance with Pennsylvania state water quality standards and potential public health concerns; and

- Monthly profile samples for temperature, dissolved oxygen, chlorophyll, pH, turbidity, and conductivity at all stations in the reservoir and watershed.

2.0 METHODS

2.1 PHYSICAL STRATIFICATION MONITORING

Physical stratification monitoring of the water column at Prompton Reservoir was conducted five times between 19 May and 01 September 2020 (Table 2-1). Physical stratification parameters included temperature, dissolved oxygen (DO), pH, turbidity, and conductivity. Monitoring was conducted at four fixed stations located throughout the Prompton Reservoir watershed (Fig. 2-1). Surface water quality was monitored upstream of the lake at station PR-1S and downstream of the dam at station PR-4S (Fig. 2-1). Stations within the reservoir, PR-2 and PR-3, were monitored at 5-foot intervals from the surface to the bottom. All water quality parameters were measured with a calibrated YSI 6600 V2-4 water quality meter.

The results of stratification monitoring were compared to water quality standards authorized by the Pennsylvania Department of Environmental Protection (PADEP: Chapter 93 Water Quality Standards, 2000), where applicable. The water quality standard for DO is a minimum concentration of 5 mg/L and that for pH is an acceptable range from 6 to 9. All of the water quality data collected during physical stratification monitoring is summarized in Appendix A.

2.2 WATER COLUMN CHEMISTRY MONITORING

Water column chemistry monitoring of the water column at Prompton Reservoir was conducted five times between 19 May and 01 September 2020 (Table 2-1). Water samples were collected at four fixed stations within the reservoir watershed (Fig. 2-1). Surface water samples were collected at stations upstream (PR-1S) and downstream (PR-4S) of the reservoir. Surface, middle, and bottom water samples were collected at main reservoir body stations (PR-2 and PR-3). Surface water samples were collected by opening the sample containers approximately 1 foot below the water's surface. Middle and bottom water samples were collected with a Van Dorn design horizontal water sampler.

Water samples from all depths were analyzed for ammonia (NH3), nitrite (NO2), nitrate (NO3), total kjeldahl nitrogen (TKN), soluble dissolved phosphorus (DP), total phosphorus (TP), total dissolved solids (TDS), total suspended solids (TSS), biochemical oxygen demand (BOD), alkalinity (ALK) and total organic carbon (TOC). Table 2-2 summarizes the water quality parameters, laboratory methods and reporting detection limits, state water quality standards, and allowable maximum hold times for each during the 2020 monitoring period. Laboratory reporting and custody sheets are provided in Appendix B.

Table 2-1. Prompton Reservoir water quality monitoring schedule for 2020

Date of Sample Collection	Physical Stratification Monitoring (All Stations)	Water Column Chemistry Monitoring (All Stations)	Trophic State Determination (PR-3)	Coliform Bacteria Monitoring (All Surface Stations)
19 May	X	X	X	X
16 June	X	X	X	X
07 July	X	X	X	X
11 August	X	X	X	X
01 September	X	X	X	X

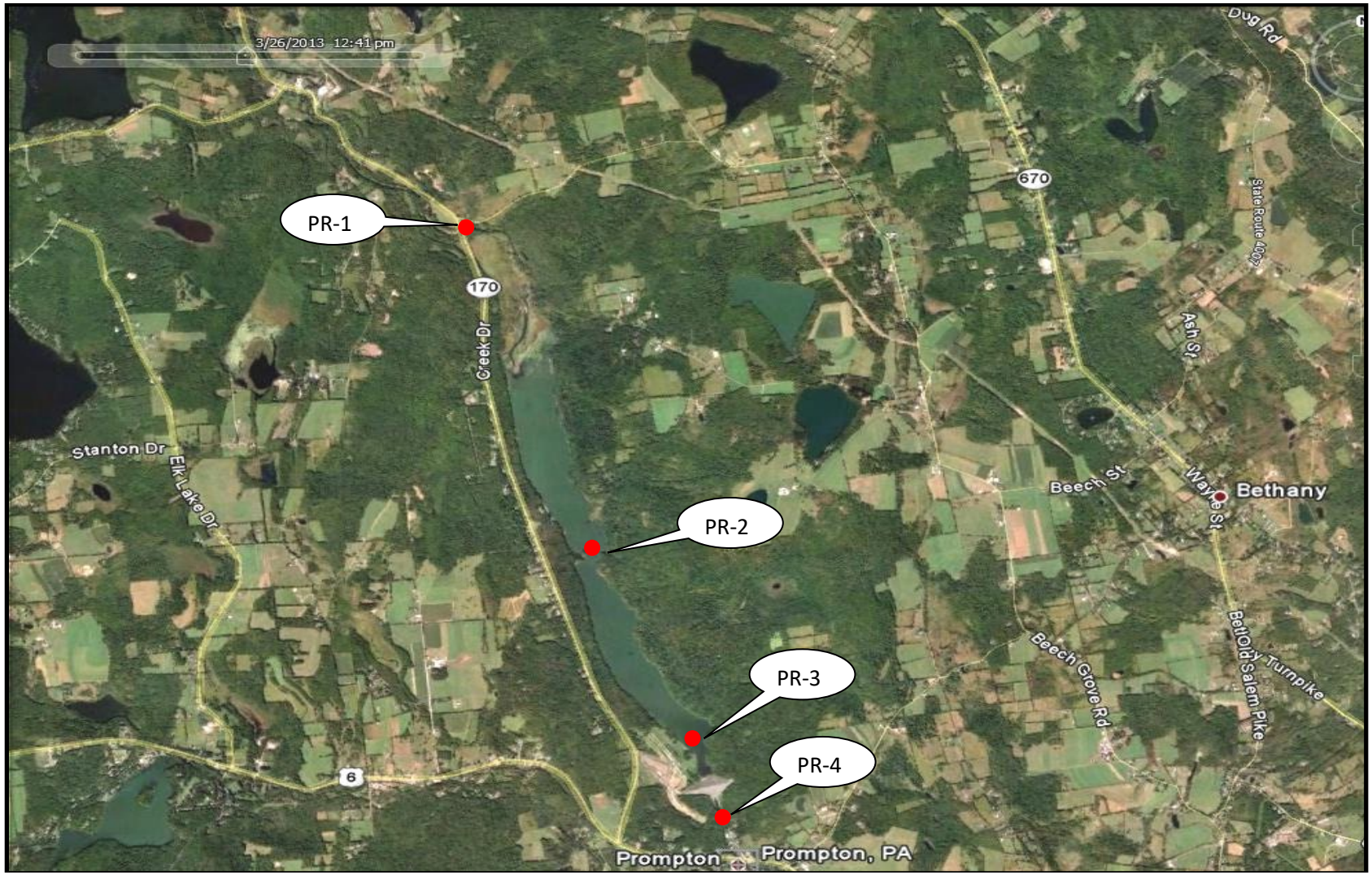

Figure 2-1. Location map for Prompton Reservoir and water quality monitoring stations in 2020.

Table 2-2. Water quality test methods, detection limits, state regulatory criteria, and sample holding times for water quality parameters monitored at Prompton Reservoir in 2020.

Parameter	(2) Method	Laboratory Limit of Reporting	PADEP Surface Water Quality Criteria	Allowable Hold Times (Days)
Total Alkalinity	SM20 2320 B	2.0 mg/L	Min. 20 mg/L $CaCO_3$	14
Biochemical Oxygen Demand (BOD)	SM5210 B	2.0 mg/L	None	2
Total Phosphorus	SM4500-P E	0.01 mg/L	None	28
Diss./Ortho-Phosphate	NA	NA	None	28
Soluble Phosphorus	SM4500-P F	0.05 mg/L	None	28
Total Organic Carbon (TOC)	SM5310 C	0.5 mg/L	None	28
Total Inorganic Carbon (TIC) *	NA	NA	None	28
Total Carbon (TOC + TIC) *	NA	NA	None	28
(1) Chlorophyll *a*	YSI Probe	----	None	In Situ
Total Kjeldahl Nitrogen	EPA 351.2	0.50 mg/L	None	28
Ammonia	ASTM D6919-03	0.10 mg/L	Temp. and pH dependent	28
Nitrate	EPA 300.0 Rev 2.1	1.0 mg/L	Maximum 10 mg/L (nitrate + nitrite)	28
Nitrite	EPA 300.0 Rev 2.1	0.10 mg/L		28
Total Dissolved Solids	SM2540 C	5.0 mg/L	Maximum 750 mg/L	7
Total Suspended Solids	SM2540 D	1.0 mg/L	None	7

(1) Chlorophyll *a* samples were recorded using a YSI 6600 with a chlorophyll sensor.
(2) Laboratory Methods Reference:
EPA- "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.
SM- "Standard Methods for the Examination of Water and Wastewater", 22nd Edition, 2012.
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 2020

2.3 TROPHIC STATE DETERMINATION

The trophic state of Prompton Reservoir was determined by methods outlined by Carlson (1977) and EPA (1983). In general, these methods calculate 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 calculations of monthly TSIs (Table-2-1). Secchi disk depth was measured monthly at station PR-3 and used for the TSI calculation. Trophic state determinations were calculated only for Station PR-3 within the reservoir.

2.4 RESERVOIR BACTERIA MONITORING

Monitoring for coliform bacteria contaminants was conducted at Prompton Reservoir five times between 19 May and 01 September 2020. Surface water samples were collected in the same manner as for chemical parameter samples and analyzed for total coliform and Escherichia coliform contamination. Table 2-3 presents the test methods, detection limits, EPA/PADEP standards, and sample holding times for the bacteria parameters monitored at Prompton Reservoir in 2020. The bacteria analytical method was based on a membrane filtration technique. All the samples were analyzed within their maximum allowable hold times unless otherwise noted in laboratory reporting sheets (Appendix B).

Monthly coliform bacteria counts were compared to the EPA/PADEP single sample and primary contact water quality standard for bacteria. This recreational sample recommended standard is defined as a maximum geometric mean of 126 colonies/100-ml based on five samples collected on different days within a 30-day period and a single sample standard of 235 colonies/100-ml. Application of this standard is not necessary at Prompton reservoir because swimming and other human/water contact recreation is prohibited in the reservoir. However, it is used in evaluating the bacteria conditions found within the reservoir and associated with overall water quality conditions.

Table 2-3. Water quality test methods, detection limits, PADEP standards, and sample holding times for bacteria parameters monitored at Prompton Reservoir in 2020.

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

3.0 RESULTS AND DISCUSSION

3.1 STRATIFICATION MONITORING

The following sections summarize the results of water quality monitoring for physical and chemical parameters: temperature, dissolved oxygen (DO), and pH. For each parameter, seasonal and spatial patterns of surface water quality measured throughout the watershed, and seasonal and depth related patterns of the lake water column based on measures from the deepest portion of the reservoir (station PR-3) are described. The discussion on stratification is focused on station PR-3 as water quality problems related to depth are generally most severe in deeper water habitats, thus the evaluation will be a conservative one. All of the physical/chemical parameters were measured with a calibrated YSI 6600 V2-4 water quality monitoring 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.

Temperature of the tributary and downstream surface waters of Prompton Reservoir were influenced by seasonal weather patterns and in lake thermal warming patterns during 2020. Maximum temperatures were recorded in tributary surface waters during the 01 September sampling event and in the downstream release waters during the 11 August sampling event (Fig. 3-1). Upstream tributary temperatures at station PR-1S remained cooler than downstream release temperatures throughout the sampling season with an average temperature of 16.42°C and ranged from 12.5°C in May to 19.55°C in August. Downstream temperatures at station PR-4S averaged 19.02°C and ranged from 13.16°C in May to 21.82°C in September. The warmer downstream temperatures likely result from thermally warmed waters being released from the reservoir.

The surface water temperatures (0-5 feet) within the reservoir were generally greater than the upstream tributary station PR-1S as a result of in-lake thermal warming. Surface temperatures for the sampling period at reservoir body station PR-3, near the outlet works of the dam, averaged 22.23°C and ranged from 15.04°C in May to 27.02°C in July. Prompton Reservoir experienced weak stratification with respect to temperature in 2020 (Fig. 3-2). In May, the onset of stratification was observed with the surface

temperature (15.2°C) approximately 5.5°C warmer than the lower water column (9.7°C). The onset of de-stratification was evident in August and into September.

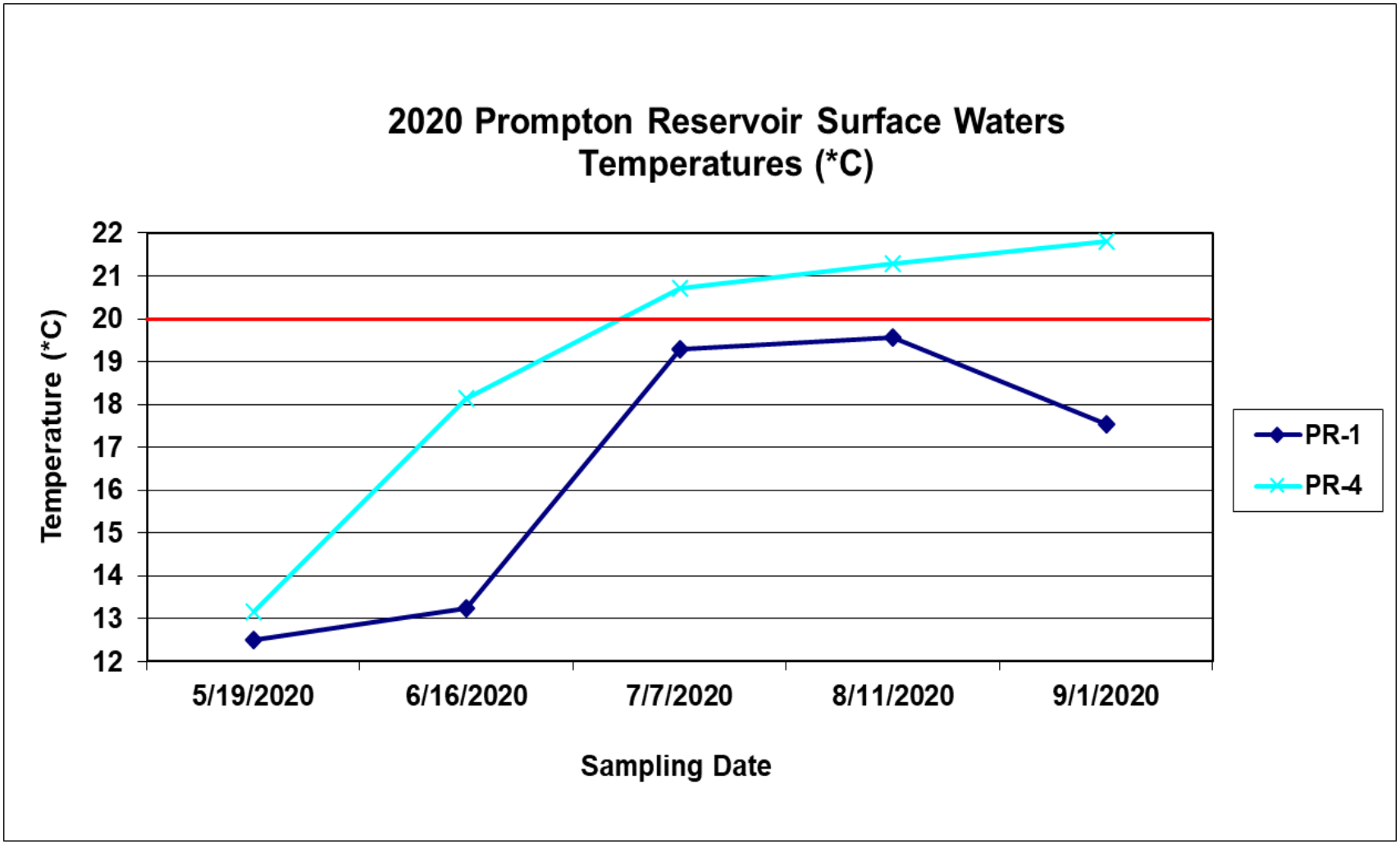

Figure 3-1. Temperature in tributary and outflow surface waters of Prompton Reservoir during 2020. See Appendix A for a summary of plotted values. The cold-water species preference temperature of 20°C is shown as a red line comparison.

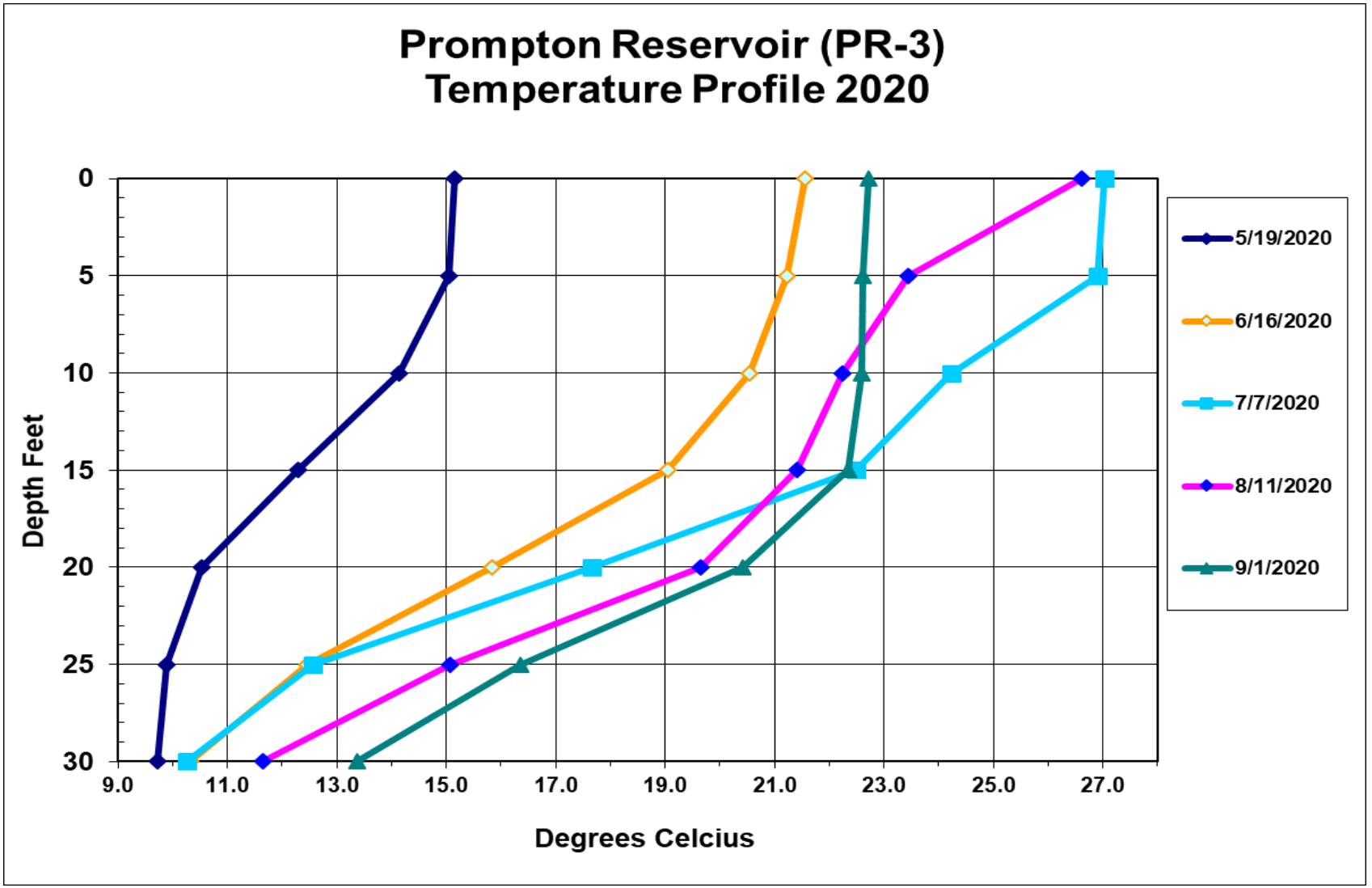

Figure 3-2. Temperature stratification of Prompton Reservoir during 2020 from water quality measured at station PR-3. See Appendix A for a summary of plotted values.

3.1.2 Dissolved Oxygen

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

Dissolved oxygen (DO) in the inflow and outflow surface waters of Prompton Reservoir generally followed a similar seasonal pattern throughout most of the 2020 sampling season (Fig. 3-3). Waters released from the reservoir and measured at station PR-4S had consistently lower dissolved oxygen levels then reservoir inflows at tributary station PR-1S because of the release of low oxygen waters from deeper in the reservoir. The greatest difference of DO readings was recorded on 01 September when inflow (PR-1S) DO was 9.05 mg/L and outflow (PR-4S) DO was 6.50 mg/L. Dissolved oxygen concentrations upstream (PR-1S) ranged from 10.25 mg/L in June to 8.79 mg/L in August with an average seasonal reading of 9.37 mg/L. Dissolved oxygen concentrations downstream (PR-4S) ranged from 6.44 mg/L in August to 10.23 mg/L in May with a seasonal average of 7.59 mg/L.

The stratification of Prompton Reservoir influenced the distribution of DO in the water column during 2020 (Fig. 3-4). In June, the influence of the onset of stratification was apparent, as DO concentrations decreased from 9.50 mg/L at the surface to 0.43 mg/L at the lake bottom. For most of the sampling season, the lower water column from approximately 15 feet depth to the lake bottom was severely depleted of oxygen with concentrations less than 5 mg/L. The release of waters downstream containing lower DO concentrations had some lowering effect on DO levels recorded at downstream station PR-4S. However, the re-aeration of the released waters through the dam conduit system elevated DO concentrations above state criteria downstream.

DO concentrations in the water column of Prompton Reservoir were not in compliance with PADEP lake water quality standards in August. The Pennsylvania water quality standard for DO is a minimum concentration of 5 mg/L in the epilimnion of stratified lakes. The health of aquatic ecosystems can be impaired by low DO concentrations in the water column. Hypoxia, or conditions of DO concentrations less than 2 mg/L, is generally accepted as the threshold at which the most severe effects on biota occur. In 2020, the lower water column of Prompton was most affected by hypoxia. Hypoxic water was encountered in all months sampled, with the exception of May, and commonly occupied the lower half of the water column from a 15-foot depth continuing to the bottom. Hypoxia in the lower water column is a symptom of eutrophication. Nutrients in the water column feed explosive algal growth at the surface photic zone. Dead and decaying algae sink to lower levels of the water column and during the process of decay; oxygen is removed from the water.

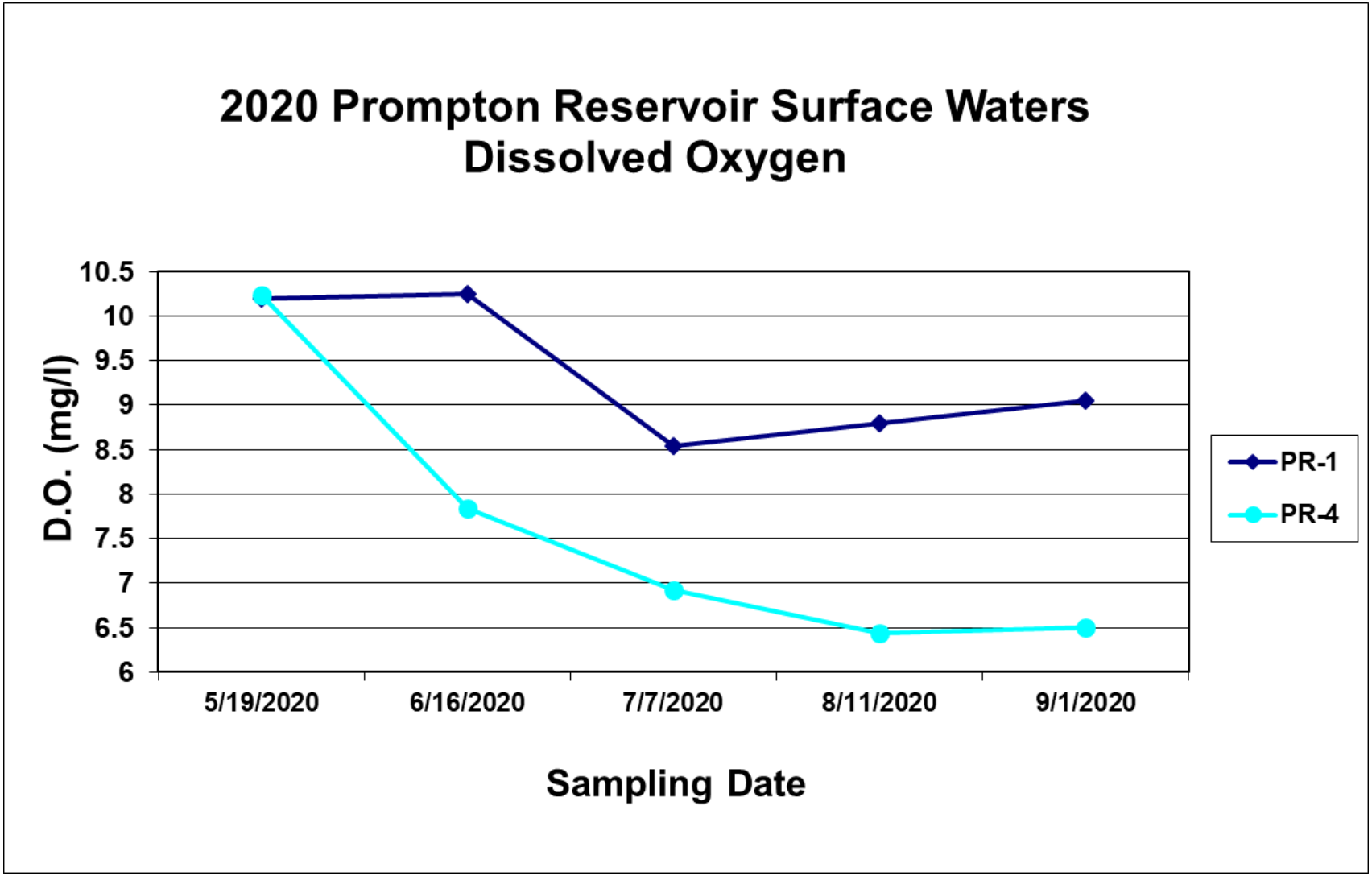

Figure 3-3. Dissolved oxygen in tributary surface waters of Prompton Reservoir during 2020. PADEP minimum DO standard is 5 mg/L. See Appendix A for a summary of plotted values.

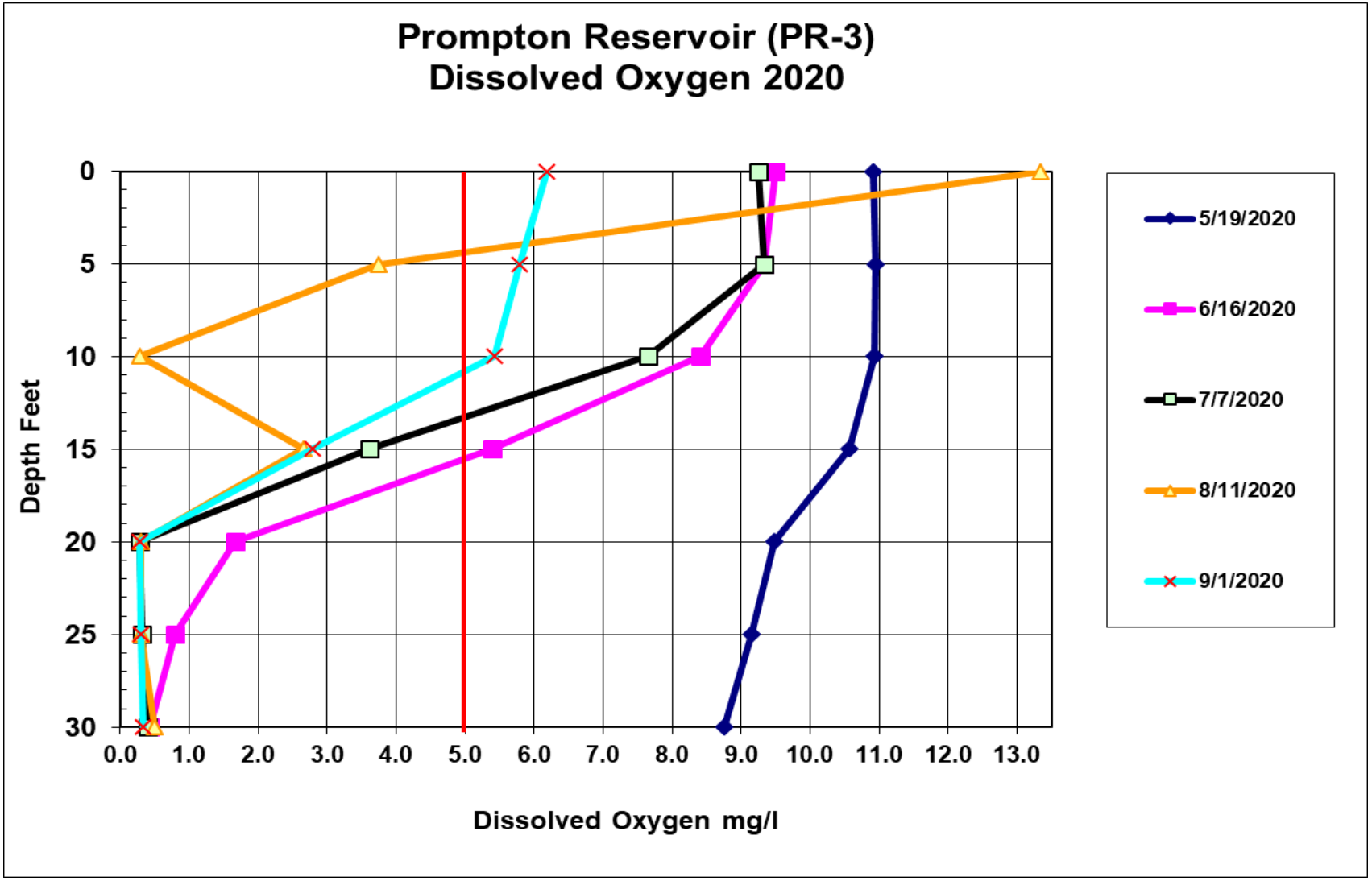

Figure 3-4. Dissolved oxygen stratification of Prompton Reservoir during 2020 from water quality measured at station PR-3. The PADEP minimum DO standard is 5 mg/L. See Appendix A for a summary of plotted value

3.1.3 pH

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

Measures of pH in the surface waters at tributary station PR-1S and downstream release waters at station PR-4S ranged from 7.11 in September to 7.97 in May (Fig. 3-5). The seasonal pH average for PR-1S and PR-4S were 7.66 and 7.48, respectively.

The water column of Prompton Reservoir maintained a relatively stable pH through most of the sampling season in 2020 with higher lake surface water pH seen in most months sampled (Fig. 3-6). In general, the development of stratification and increase in surface temperatures during this time is reflected with an increase in pH at the surface while the lower water column remained relatively constant. This was recorded in all months sampled. The elevated pH in surface waters of the reservoir during summer periods is most likely due to algal blooms. Blooms were observed at the lake in 2020. As a function of increased productivity, algae remove CO_2 from the water column. Since dissolved CO_2 is slightly acidic, its reduction in the water column is manifested by an increase in pH near the surface waters.

The surface waters of the Prompton Reservoir lake stations were not in compliance with PADEP standards for pH during 2020. The water quality standard for pH is a range of acceptability from 6.0 to 9.0 pH units. Near surface water readings in August exceeded the pH 9.0 criteria.

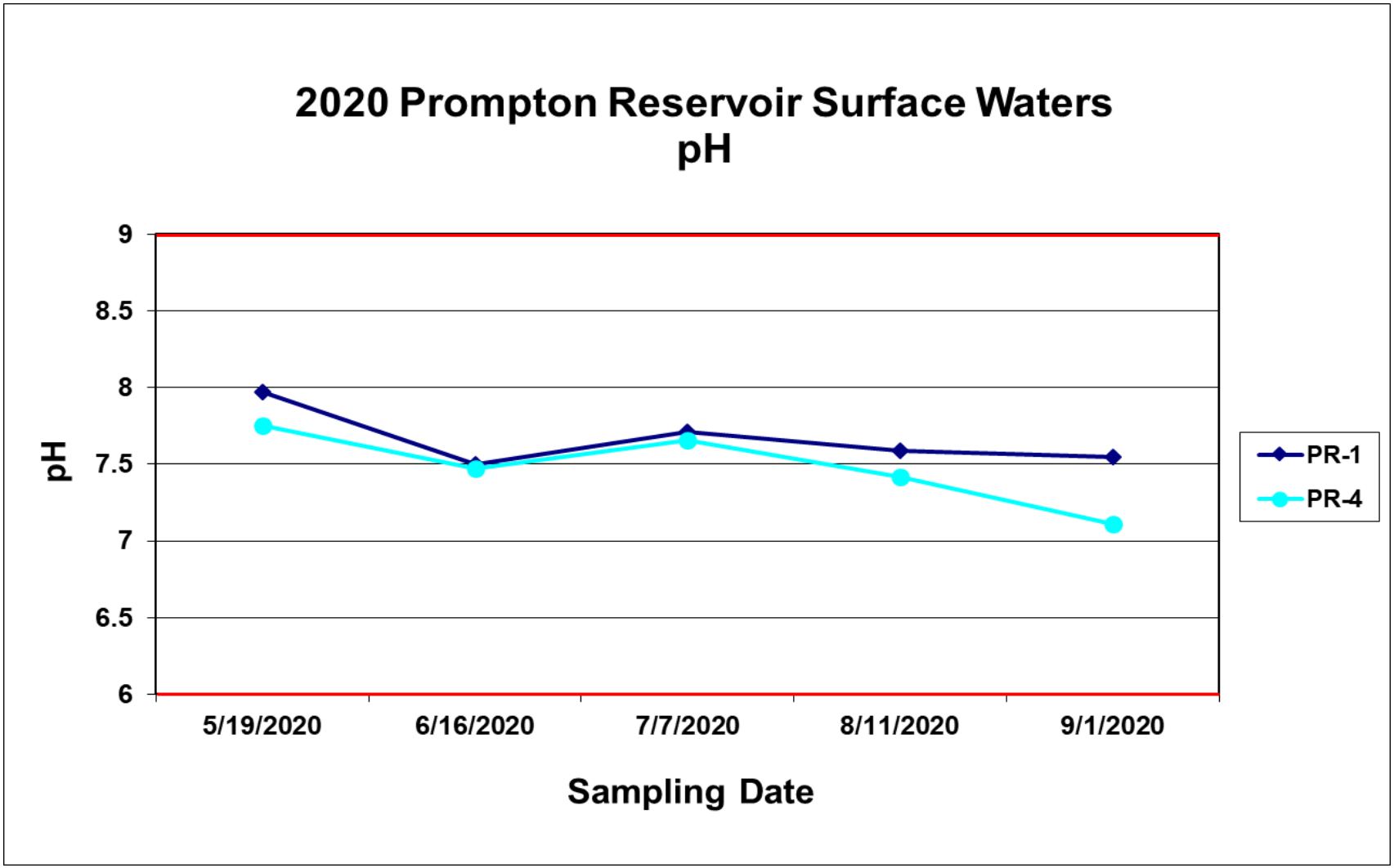

Figure 3-5. Measures of pH in tributary and outflow surface waters of Prompton Reservoir during 2020. PADEP minimum and maximum pH standards are 6 and 9, respectively. See Appendix A for a summary of plotted values.

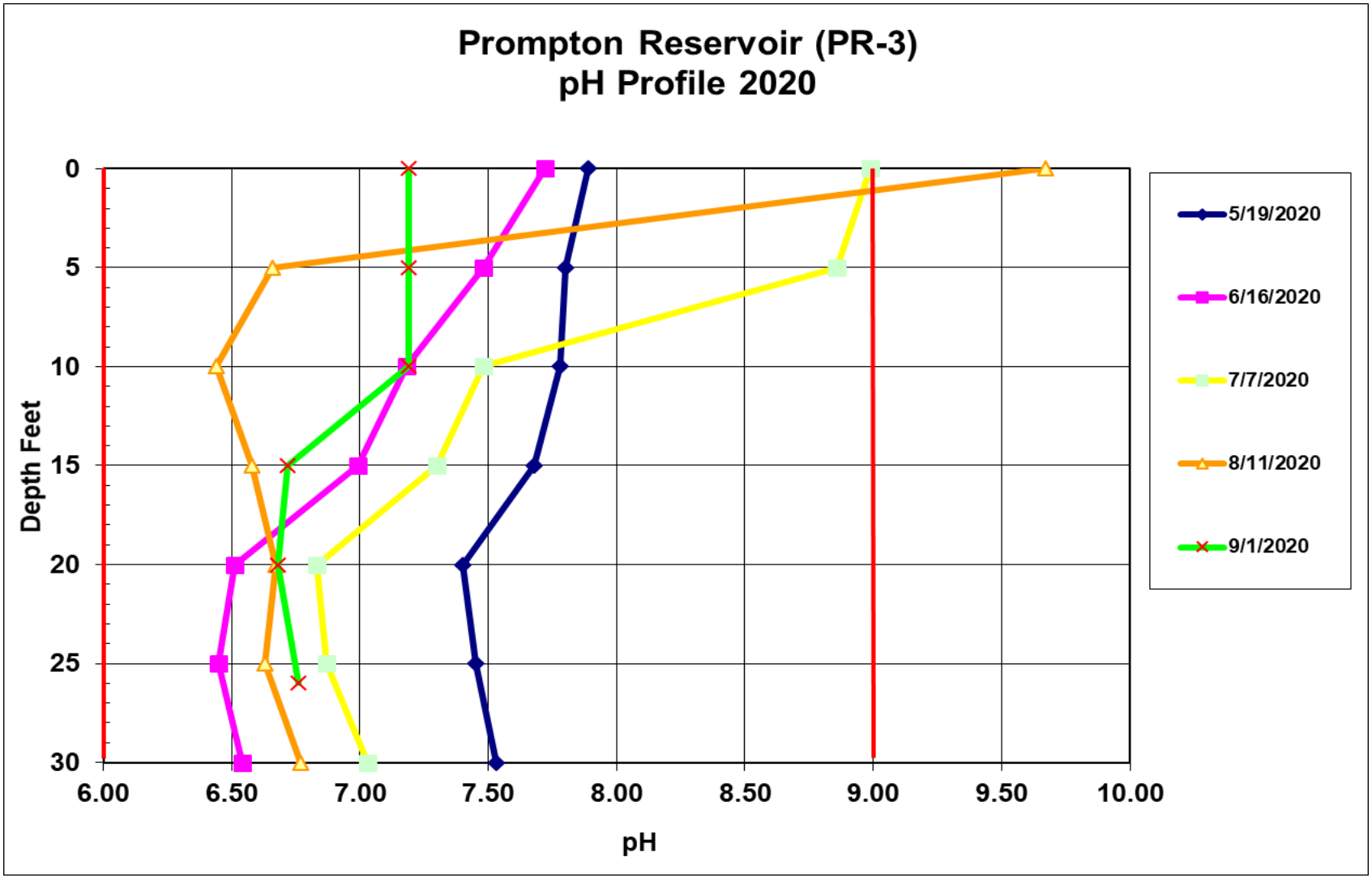

Figure 3-6. Stratification of pH at Prompton Reservoir during 2020, from water quality measured at station PR-3. PADEP minimum and maximum pH standards are 6 and 9, respectively. See Appendix A for a summary of plotted values.

3.2 WATER COLUMN CHEMISTRY MONITORING

The following sections describe temporal, spatial, and depth related patterns for water quality parameters measured at Prompton Reservoir during 2020 (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. Excess ammonia contributes to eutrophication of water bodies. This can result in excessive algal growths and impacts on recreation and drinking water supplies. In high concentrations, ammonia is toxic to aquatic life.

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

Table 3.1 Environmental Protection Agency Ammonia Freshwater Criteria 2013

2013 Final Aquatic Life Criteria for Ammonia (Magnitude, Frequency, and Duration) (mg TAN/L) pH 7.0, T=20°C	
Acute (1-hour average)	17
Chronic (30-day rolling average)	1.9*

*Not to exceed 2.5 times the CCC as a 4-day average within the 30-days, i.e. 4.8 mg TAN/L at pH 7 and 20°C, more than once in three years on average.
Criteria frequency: Not to be exceeded more than once in three years on average.

Ammonia in the watershed and lake of Prompton Reservoir was low during 2020 (Table 3-2). Concentrations measured at all surface and middle water column stations shown 14 detectable readings with 26 readings less than the reporting limit (0.01 mg/L). The highest concentration of 1.89 mg/L was measured in September in the bottom waters of the deepest portion of the reservoir located at station PR-3D. Concentrations in the bottom waters at station PR-3D throughout the sampling season averaged 0.65 mg/L. Increased ammonia is characteristic of low dissolved oxygen environments in stratified lakes resulting from the decomposition of organic materials. Prompton Reservoir experienced these conditions in 2020 resulting in higher levels of Ammonia in the deeper areas of the reservoir. In 2020, Prompton Reservoir followed the EPA water quality standard for ammonia, which is dependent on temperature and pH (Table 3-1).

Table 3-2. Summary of surface, middle, and bottom water quality monitoring data for Prompton Reservoir in 2020

Station	Date	ALK	BOD5	DISS-P	NH3	NO2	NO3	NO3-NO2	TDS	TKN	TOC	TP	TSS
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
PR-1S	5/19/2020	20	16.2	<0.05	<0.01	<0.01	0.42	0.43	48	0.52	2.8	0.03	<1
	6/16/2020	25	<2.0	0.07	<0.01	<0.01	0.47	0.48	53	<0.37	2.9	<0.01	2
	7/7/2020	29	<2.0	0.05	<0.01	<0.01	0.48	0.49	104	<0.47	4.1	0.18	3
	8/11/2020	28	<2.0	0.07	<0.01	<0.01	0.37	0.38	58	<0.47	3	0.02	1
	9/1/2020	28	<2.0	<0.05	<0.01	<0.01	0.28	0.29	66	<0.47	2.3	0.02	1
	Mean	26	4.8	0.06	0.01	0.009	0.40	0.41	66	0.46	3.0	0.05	2
	Stdev	3.7	6.4	0.01	0	0.001	0.08	0.082	22	0.05	0.7	0.07	1
	Max	29	16.2	0.07	0.01	0.01	0.48	0.49	104	0.52	4.1	0.18	3
	Min	20	2	0.05	0.01	0.007	0.28	0.29	48	0.37	2.3	0.01	1
	No. of Det.	5	1	3	0	0	5	5	5	1	5	4	4
PR-2S	5/19/2020	18	11.2	<0.05	<0.01	<0.01	0.32	0.33	50	0.63	3.1	0.02	4
	6/16/2020	21	<2.0	0.05	<0.01	<0.01	0.2	0.21	62	<0.37	4.4	<0.01	3
	7/7/2020	22	<2.0	<0.05	<0.01	<0.01	<0.11	<0.12	98	<0.47	4.2	0.17	3
	8/11/2020	28	7.4	<0.05	<0.01	<0.01	<0.11	<0.12	58	1.32	5	0.04	12
	9/1/2020	25	4.7	<0.05	<0.01	<0.01	<0.11	<0.12	54	0.62	4.6	0.03	7
	Mean	22.8	5.5	0.05	0.01	0.009	0.17	0.18	64	0.68	4.3	0.05	6
	Stdev	4	3.9	0.00	0	0.001	0.09	0.09	19	0.37	0.7	0.07	4
	Max	28	11.2	0.05	0.01	0.01	0.32	0.327	98	1.32	5	0.17	12
	Min	18	2.0	0.05	0.01	0.007	0.11	0.12	50	0.37	3.1	0.01	3
	No. of Det.	5	3	1	0	0	2	2	5	3	5	4	5

Table 3-2 continued. Summary of surface, middle, and bottom water quality monitoring data for Prompton Reservoir in 2020

Station	Date	ALK mg/L	BOD5 mg/L	DISS-P mg/L	NH3 mg/L	NO2 mg/L	NO3 mg/L	PO4 mg/L	TDS mg/L	TKN mg/L	TOC mg/L	TP mg/L	TSS mg/L
PR-2M	5/19/2020	17	11	<0.05	<0.01	<0.01	0.34	0.35	39	1.2	3.2	0.16	20
	6/16/2020	21	<2.0	0.05	<0.01	<0.01	0.21	0.22	48	<0.37	4.1	<0.01	4
	7/7/2020	23	2.4	<0.05	<0.01	<0.01	<0.11	<0.12	73	<0.47	3.8	0.18	3
	8/11/2020	25	4.8	0.05	<0.01	<0.01	0.23	0.24	61	0.99	4.7	0.03	10
	9/1/2020	25	3.5	<0.05	<0.01	<0.01	<0.11	<0.12	63	0.8	4.4	0.04	6
	Mean	22	4.7	0.05	0.01	0.009	0.20	0.21	57	0.77	4.0	0.08	9
	Stdev	3	3.7	0	0	0.001	0.10	0.09	13	0.35	0.6	0.08	7
	Max	25	11.0	0.05	0.01	0.01	0.34	0.347	73	1.2	4.7	0.18	20
	Min	17	2.0	0.05	0.01	0.007	0.11	0.12	39	0.37	3.2	0.01	3
	No. of Det.	5	4	2	0	0	3	3	5	3	5	4	5
PR-2D	5/19/2020	17	16.4	0.06	<0.01	<0.01	0.35	0.36	58	0.68	3.1	0.03	5
	6/16/2020	23	<2.0	0.05	0.03	<0.01	0.25	0.26	77	<0.37	4.4	<0.01	3
	7/7/2020	27	<2.0	0.05	0.06	<0.01	0.27	0.28	70	<0.47	3.4	0.12	5
	8/11/2020	23	<2.0	<0.05	0.12	<0.01	0.29	0.3	56	0.66	5.3	0.03	3
	9/1/2020	25	3.1	<0.05	<0.01	<0.01	<0.11	<0.12	81	0.62	4.4	0.04	8
	Mean	23	5.1	0.05	0.05	0.009	0.25	0.26	68	0.56	4.1	0.05	5
	Stdev	4	6	0.004	0.05	0.001	0.09	0.09	11	0.13	0.9	0.04	2
	Max	27	16.4	0.06	0.12	0.01	0.35	0.357	81	0.68	5.3	0.12	8
	Min	17	2	0.05	0.01	0.007	0.11	0.12	56	0.37	3.1	0.01	3
	No. of Det.	5	2	3	3	0	4	4	5	3	5	4	5

Table 3-2 continued. Summary of surface, middle, and bottom water quality monitoring data for Prompton Reservoir in 2020

Station	Date	ALK mg/L	BOD5 mg/L	DISS-P mg/L	NH3 mg/L	NO2 mg/L	NO3 mg/L	PO4 mg/L	TDS mg/L	TKN mg/L	TOC mg/L	TP mg/L	TSS mg/L
PR-3S	5/19/2020	17	15.3	<0.05	<0.01	<0.01	0.31	0.32	24	0.54	3.3	0.02	<1
	6/16/2020	21	<2.0	<0.05	<0.01	<0.01	0.2	0.21	69	<0.37	4	<0.01	1
	7/7/2020	22	<2.0	<0.05	<0.01	<0.01	<0.11	<0.12	59	<0.47	4.4	0.13	<1
	8/11/2020	25	4.8	<0.05	<0.01	<0.01	<0.11	<0.12	57	1.27	5	<0.01	6
	9/1/2020	26	3.3	<0.05	0.01	<0.01	<0.11	<0.12	60	0.56	4.8	0.05	3
	Mean	22	5.5	0.05	0.01	0.009	0.17	0.18	54	0.64	4.3	0.04	2
	Stdev	4	5.6	0	0	0.001	0.09	0.09	17	0.36	0.7	0.05	2
	Max	26	15.3	0.05	0.01	0.01	0.31	0.317	69	1.27	5	0.13	6
	Min	17	2	0.05	0.01	0.007	0.11	0.12	24	0.37	3.3	0.01	1
	No. of Det.	5	3	0	1	0	2	2	5	3	5	3	3
PR-3M	5/19/2020	17	9.6	<0.05	<0.01	<0.01	0.32	0.33	15	0.61	3.1	0.02	4
	6/16/2020	24	<2.0	0.06	0.04	<0.01	0.27	0.28	71	<0.37	4.2	<0.01	2
	7/7/2020	23	<2.0	<0.05	<0.01	<0.01	<0.11	<0.12	70	<0.47	3.8	0.08	1
	8/11/2020	24	2.6	<0.05	0.15	<0.01	0.25	0.26	53	0.83	4.7	0.02	6
	9/1/2020	25	2.6	<0.05	0.12	<0.01	<0.11	<0.12	67	0.6	4.6	0.02	2
	Mean	23	3.8	0.052	0.07	0.009	0.21	0.22	55	0.58	4.1	0.03	3
	Stdev	3	3.3	0.004	0.07	0.001	0.10	0.10	24	0.17	0.7	0.03	2
	Max	25	9.6	0.06	0.15	0.01	0.32	0.327	71	0.83	4.7	0.08	6
	Min	17	2	0.05	0.01	0.007	0.11	0.12	15	0.37	3.1	0.01	1
	No. of Det.	5	3	1	3	0	3	3	5	3	5	4	5

Table 3-2 continued. Summary of surface, middle, and bottom water quality monitoring data for Prompton Reservoir in 2020

Station	Date	ALK mg/L	BOD5 mg/L	DISS-P mg/L	NH3 mg/L	NO2 mg/L	NO3 mg/L	PO4 mg/L	TDS mg/L	TKN mg/L	TOC mg/L	TP mg/L	TSS mg/L
PR-3D	5/19/2020	17	10.7	<0.05	<0.01	<0.01	0.35	0.36	24	0.68	3.1	0.03	7
	6/16/2020	26	2.6	0.06	0.5	<0.01	0.22	0.23	61	1.27	3.9	0.16	252
	7/7/2020	38	2.4	<0.05	0.53	<0.01	<0.11	<0.12	87	0.77	4.4	0.13	14
	8/11/2020	23	<2.0	<0.05	0.3	<0.01	0.31	0.32	58	1.04	5.9	0.04	4
	9/1/2020	53	8.2	0.07	1.89	<0.01	<0.11	<0.12	96	1.92	7.4	0.15	5
	Mean	31	5	0.06	0.646	0.009	0.22	0.23	65	1.14	4.9	0.10	56
	Stdev	14	4	0.01	0.726	0.001	0.11	0.11	28	0.50	1.7	0.06	109
	Max	53	10.7	0.07	1.89	0.01	0.35	0.357	96	1.92	7.4	0.16	252
	Min	17	2	0.05	0.01	0.007	0.11	0.12	24	0.68	3.1	0.03	4
	No. of Det.	5	4	2	4	0	3	3	5	5	5	5	5
PR-4S	5/19/2020	17	13	<0.05	<0.01	<0.01	0.32	0.33	42	0.69	3.3	0.02	2
	6/16/2020	23	<2.0	0.06	0.06	<0.01	0.29	0.3	72	<0.37	4.3	<0.01	2
	7/7/2020	26	<2.0	<0.05	0.02	<0.01	0.32	0.33	73	<0.47	4	<0.01	2
	8/11/2020	21	6	0.06	0.18	<0.01	0.38	0.39	60	0.94	6.6	0.07	1
	9/1/2020	25	2.3	<0.05	0.14	<0.01	0.36	0.37	57	0.51	4.5	0.04	4
	Mean	22.4	5.06	0.054	0.08	0.009	0.33	0.34	61	0.60	4.5	0.03	2.2
	Stdev	4	4.8	0.01	0.07	0.001	0.04	0.04	13	0.22	1.2	0.03	1
	Max	26	13	0.06	0.18	0.01	0.38	0.39	73	0.94	6.6	0.07	4
	Min	17	2	0.05	0.01	0.007	0.29	0.3	42	0.37	3.3	0.01	1
	No. of Det.	5	3	2	4	0	5	5	5	3	5	3	5

< Indicates a result less than the limit of quantification or limit of detection.
NS – Not Sampled

3.2.2 Nitrite and Nitrate

Nitrite (NO2) is a measure of a form of nitrogen that occurs as an intermediate in the nitrogen cycle. It is unstable and can rapidly be oxidized to nitrate or reduced to nitrogen gas. Nitrite is a source of nutrients for plants and can be toxic to aquatic life in relatively low concentrations. In 2020, nitrite concentrations in the waters of Prompton Reservoir measured at all stations and depths were less than the reporting limit of 0.01 mg/L (Table 3-2).

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. In 2020, concentrations measured at all stations and depths ranged from less than the laboratory reporting limit of 0.11 mg/L to 0.38 mg/L throughout the monitoring period (Table 3-2). Higher readings were seen in the lake release flows (PR-4S) and tributary inflow waters (PR-1S). The maximum nitrate measure of 0.48 mg/L was collected at station PR-1S in July. This upstream tributary station also maintained the highest seasonal mean concentration of 0.40 mg/L.

Prompton Reservoir followed the PADEP water quality standard for nitrite and nitrate during 2020. The standard is a summed concentration of nitrite and nitrate of less than 10 mg/L. Throughout the monitoring period, a maximum summed concentration for all stations and depths of 0.49 mg/L was measured at the upstream tributary surface water station PR-1S on 07 July.

3.2.3 Total Kjeldahl Nitrogen

Total Kjeldahl Nitrogen (TKN) is a measure of organic nitrogen that includes ammonia. Organic nitrogen is not immediately available for biological activity and is therefore not available for plant growth until decomposition to inorganic form occurs. Total Kjeldahl Nitrogen was uniformly low in the water column of Prompton Reservoir during 2020 (Table 3-2). The highest single sample concentration of 1.92 mg/L and seasonal mean concentration of 1.14 mg/L were measured in the bottom water samples at station PR-3D.

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 minimum 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. Samples collected throughout the Prompton watershed and reservoir routinely exceeded this concentration in 2020. The highest measures of total phosphorus were seen in the deep bottom waters of the lake (Table 3-2). The highest single concentration of 0.18 mg/L TP was measured in the lake mid-depth water sample at station PR-2M on 07 July and in the upstream tributary surface water sample at station PR-1S on 07 July. Station PR-3D maintained the highest seasonal mean concentration of 0.10 mg/L. Higher concentrations of phosphorus in the lower water column are characteristic of temperature-stratified lakes. Low DO conditions in deeper waters create a reducing chemical environment that can mobilize phosphorus from bottom sediment. Prompton Reservoir experiences these conditions annually. Lower measurements of TP in lake surface waters at Prompton Reservoir are likely a product of algal phosphorus uptake during photosynthesis.

3.2.5 Dissolved Phosphorus

Dissolved phosphorus (Diss P) is a measure of the fraction of total phosphorus which is in solution in the water. This form is mobile in the water column and can be readily available to aquatic plants including algae. concentrations measured at most stations and depths in the water column of Prompton Reservoir were less than the reporting limit of 0.05 mg/L (Table 3-2). The highest single sample concentration of 0.07 mg/L was measured at stations PR-1S and PR-3D. The highest station seasonal mean concentration of 0.06 mg/L were also measured at stations PR-1S and PR-3D.

3.2.6 Total Dissolved Solids

Total dissolved solids (TDS) is a measure of the amount of non-filterable dissolved material in the water. Dissolved salts such as sulfate, magnesium, chloride, and sodium contribute to elevated levels. Total dissolved solids in the water column of Prompton Reservoir stayed consistently low during 2020. Concentrations measured at all stations and depths ranged from 15 mg/L to 104 mg/L throughout the monitoring period (Table 3-2). Total dissolved solids measured at Prompton Reservoir in 2020 complied with PADEP water quality standards. The Pennsylvania standard for TDS is concentrations less than 500 mg/L as a monthly average with a maximum concentration of 750 mg/L.

3.2.7 Total Suspended Solids

Total suspended solids (TSS) is 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). During 2020, total suspended solids (TSS) concentrations at all stations and depths ranged between less than the reporting limit of 1.0 mg/L to 252 mg/L (Table 3-2). The highest single sample measure of

252 mg/L was measured in the lake bottom water sample at station PR-3D on 16 June. Uncharacteristically higher readings in water samples can be attributed to sample collection error caused by disturbing bottom sediments inadvertently during sampling and those suspended materials being included in the sample. Higher TSS sample results may reflect this sampling error.

3.2.8 Biochemical Oxygen Demand

Five-day biochemical oxygen demand (BOD5) is a measure of the oxygen-depleting burden imposed by organic material present in water. It measures the rate of oxygen uptake by organisms in the water sample over a laboratory established period. 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.

In 2020, biochemical oxygen demand concentrations in the waters and watershed of Prompton Reservoir ranged in values from less than the laboratory reporting limits 2.0 mg/L to 16.4 mg/L (Table 3-2). Values recorded in May at all stations were elevated with concentrations ranging from 9.6 mg/L to 16.4 mg/L. May results are not consistent with historic sampling data or with the remainder of the 2020 sampling season. However, no errors were found in field sampling methodology or laboratory processing. This samples do not appear to reflect site and sampling conditions and have been removed from the 2020 BOD evaluation. Sample results (May samples removed) ranged from <2.0 mg/L to 8.2 mg/L with most sample results less than the laboratory reporting limit of 2.0 mg/L. Considering historic sampling result and the overall infrequency of 2020 samples showing higher readings, it is inferred that Prompton Reservoir and its associated tributaries contain moderately clean waters with some biodegradable wastes in 2020.

3.2.9 Alkalinity

Alkalinity (Alk) is a measure of the acid-neutralizing capacity of water. Waters that have high alkalinity values are considered undesirable because of excessive hardness and high concentrations of sodium salts. Water with low alkalinity has little capacity to buffer acidic inputs and is susceptible to acidification (low pH). The PADEP standard is a minimum concentration of 20-mg/L $CaCO_3$ except where natural conditions are less.

Alkalinity of the water's in Prompton Reservoir remained near or greater than the state minimum standard during the 2020 sampling season (Table 3-2). Concentrations

measured at all stations and depths during the monitoring period ranged from 17.0 mg/L to 53.0 mg/L. The highest measure was taken at station PR-3D on 01 September. The natural alkalinity of water is largely dependent on the underlying geology and soils within the surrounding watershed. The alkalinity measured at Prompton Reservoir is likely a result of the regional geology and primary productivity. The reservoir waters and surrounding tributaries followed the PADEP alkalinity criteria in 2020.

3.2.10 Total Organic Carbon

Total organic carbon (TOC) is a measure of the dissolved and particulate organic carbon in water. The bulk of organic carbon in water is composed of humic substances and partly degraded animal and plant materials. High levels of organic carbon coincide with a lowering of dissolved oxygen concentrations. Carbon is a nutrient required for biological processes. Total organic carbon in the water column of Prompton Reservoir was present in low concentrations during 2020 (Table 3-2). Concentrations of TOC at all stations and depths ranged from 2.3 mg/L to 7.4 mg/L.

3.2.11 Chlorophyll *a*

Chlorophyll a is the measure of the plant chlorophyll a primary pigment which helps plants get energy from light. It is found in most plants, algae, and cyanobacteria. Chlorophyll a measure increases in relation to algal densities in a water body. In all months sampled in 2020, chlorophyll *a* concentrations in the upstream tributary surface waters were less than in-lake surface water concentrations where algal productivity would be expected to also be higher (Appendix A). Concentrations measured in upstream surface waters had seasonal average of 2.86 ug/L. Concentrations at lake station PR-3S, from 0-10 feet of depth, ranged between 3.0 ug/L and 11.7 ug/L with a seasonal average of 5.35 ug/L. Chlorophyll a readings were collected using a YSI 6600 V2-4 chlorophyll sensor.

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 Prompton Reservoir was based on a single sample taken each month at station PR-3 during the sampling season (Figure 3-7).

TSIs calculated for measures of total phosphorus classified Beltzville Reservoir as mesotrophic in May (47.35), oligotrophic in June (37.35) and August (37.35), and eutrophic in July (74.34) and September (60.56). TSIs calculated for measures of secchi disk depth classified Prompton Reservoir as eutrophic in August (64.14) and September (60), and mesotrophic in May (47.69), June (41.95) and July (49.66). TSIs calculated for

measures of chlorophyll *a* classified Prompton Reservoir as mesotrophic in May (49.41), June (49.26), July (44.61), August (46.77) and September (43.95). Chlorophyll a was measured with a YSI 6600 V2-4 chlorophyll sensor.

Carlson (1977) warned against averaging TSI values estimated for different parameters, and instead suggested giving priority to chlorophyll *a* in the summer and to phosphorus in the spring, fall, and winter. Considering this approach, the trophic state of the reservoir based on TSI's was in the mesotrophic range during most of the 2020 sampling period.

The EPA (1983) also provides criteria for defining the trophic conditions of lakes of the north-temperate zone based on concentrations of total phosphorus, chlorophyll *a*, and secchi depth (Table 3-3). Considering the general agreement between the EPA classifications with that of the Carlson (1977) calculated TSI values, the trophic condition of Prompton Reservoir would be considered mesotrophic during most of the 2020 sampling season.

Table 3-3. EPA trophic classification criteria and monthly measures for Prompton Reservoir in 2020.

Water Quality Variable	Oligo-trophic	Meso-trophic	Eutrophic	19 May	16 June	07 July	11 August	01 September
Total phos. (ppb)	<10	10-20	>20	20	<10	130	<10	50
Chlorophyll (ppb)	<4	4-10	>10	6.8	6.7	4.17	5.2	3.9
Secchi depth (m)	>4	2-4	<2	2.35	3.5	2.05	0.75	1.00

3.4 RESERVOIR BACTERIA MONITORING

Total coliform bacteria include *Escherica coliform* (*E. coli*) and related bacteria that are associated with fecal discharges. Fecal coliform bacteria are a subgroup of the total coliform and are normally associated with waste derived from human and other warm-blooded animals and indicate the presence of fecal contamination but not the associated risk. With respect to EPA and PADEP water quality standards, fecal coliform bacteria has been replaced with a recommended e-coli criteria. Bacteria contamination was monitored in the tributary and lake surface waters at Prompton Reservoir once monthly (May-September) during 2020 (Table 3-4). Prompton surface water samples were not analyzed for fecal coliform bacteria in 2020.

Escherichia coli is the most reliable indicator of fecal bacterial contamination of surface waters in the United States according to water quality standards set by the EPA (2000). The EPA recommendation for recreational water quality standards for E. coli is based on two criteria: a geometric mean of 126 organisms/100 ml (geometric mean of five

samples collected over not more than a 30 consecutive day period) threshold and 235 organisms/100 ml (single water sample) threshold.

Total coliform values for all stations and dates ranged from 52 colonies/100-ml to >2420 colonies/100-ml. Bacteria in natural waters are common and their presence in the sample is not necessarily a human health concern. Given that Corps regular monitoring was completed utilizing single day grab samples, single sample results were compared to the EPA e-coli single sample criteria in 2020. Bacteria contamination was low in Prompton Reservoir and its upstream tributaries during 2020 with one sample exceeding the single sample criteria at upstream tributary station PR-1S on 07 July. Water contact recreation is not permitted at F.E. Walter Reservoir.

Table 3-4. Bacteria counts (colonies/100 ml) at Prompton Reservoir during 2020. Shaded values exceed the Pennsylvania Department of Health single sample water quality standard for bathing beaches. NS = Not Sampled in 2020

STATION	DATE	Total Coliform (TC)		Fecal Coliform (FC)		Escherichia coli	
PR-1S	5/19/2020		1730		NS		15
	6/16/2020		1550		NS		58
	7/7/2020	>	2420		NS		2420
	8/11/2020	>	2420		NS		111
	9/1/2020	>	2420		NS		40
PR-2S	5/19/2020		135		NS		1
	6/16/2020		1410		NS	<	1
	7/7/2020		1050		NS	<	1
	8/11/2020		326		NS	<	1
	9/1/2020	>	2420		NS		1
PR-3S	5/19/2020		52		NS		1
	6/16/2020	>	2420		NS		1
	7/7/2020		1410		NS		1
	8/11/2020		816		NS		1
	9/1/2020	>	2420		NS	<	1
PR-4S	5/19/2020		326		NS	<	1
	6/16/2020	>	2420		NS		10
	7/7/2020	>	2420		NS		1
	8/11/2020	>	2420		NS		77
	9/1/2020	>	2420		NS		11

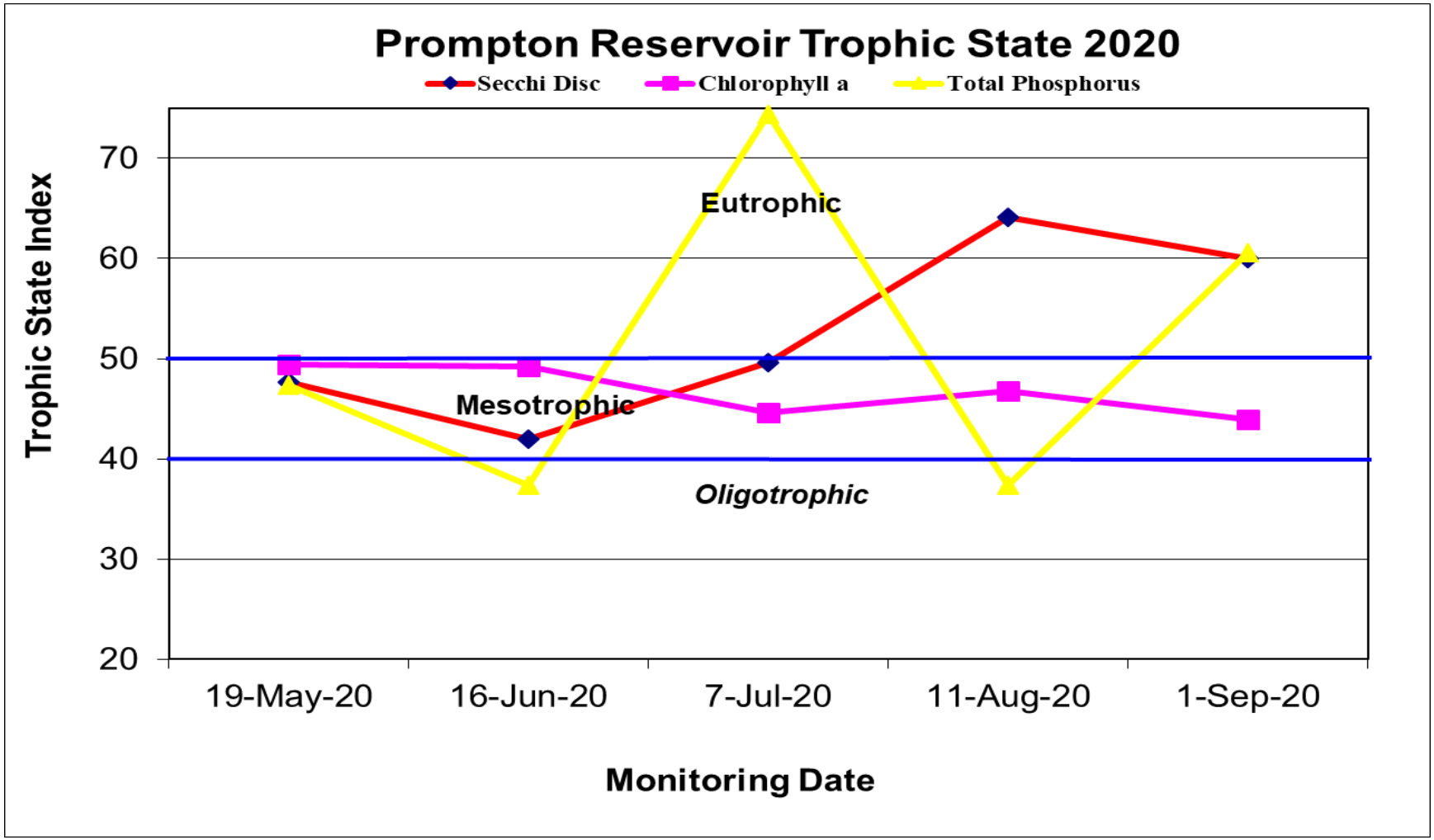

Figure 3-7. Trophic state indices calculated from secchi disk depth, concentrations of chlorophyll *a*, and total phosphorus measured in surface waters of Prompton Reservoir during 2020.

4.0 REFERENCES

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APPENDIX A

STRATIFICATION DATA TABLES

2020 Prompton WQ Profile Summary

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
PR-1S Upstream	5/19/2020	ERROR	0.5	12.5	95.7	10.2	7.97	-79	99.1	39.1	1.9	0.053
	6/16/2020	8:41:25	0.5	13.23	97.8	10.25	7.5	-52.5	171.1	36.1	2.8	0.062
	7/7/2020	8:30:44	0.5	19.28	92.6	8.54	7.71	-65.5	164.9	37.2	4.4	0.081
	8/11/2020	8:37:25	0.5	19.55	95.9	8.79	7.59	-58.1	185	34.8	2.6	0.079
	9/1/2020	8:43:46	0.5	17.54	94.7	9.05	7.55	-55.6	163.5	25.9	2.6	0.078
PR-2 Mid-Lake	5/19/2020	ERROR	0.5	15.89	108.9	10.77	7.85	-72.5	168.1	34.8	4.4	0.052
		ERROR	5	15.62	108.1	10.76	7.77	-68.1	170.9	33.5	5.1	0.051
		ERROR	10	14.5	102.3	10.43	7.6	-58	175.6	33.7	10.5	0.048
		ERROR	15	12.24	95.4	10.23	7.43	-48.4	187.8	33.8	6	0.047
		ERROR	19	10.67	86.3	9.59	7.58	-56.6	188.3	51.4	6.3	0.045
PR-2 Mid-Lake	6/16/2020	9:59:34	0.5	22.22	110.4	9.61	7.85	-73.8	54	27.5	3.8	0.064
		9:58:33	5	21.59	107.5	9.47	7.46	-51.2	57.4	28.5	6.1	0.063
		9:57:18	10	20.01	80.8	7.34	7.03	-25.8	71.5	29.7	7.9	0.062
		9:55:57	15	18.81	69.8	6.5	7	-23.9	61.5	29.4	3.5	0.062
		9:54:43	20	17.96	70.6	6.69	7.08	-28.6	42.2	30	3.7	0.063
PR-2 Mid-Lake	7/7/2020	9:39:36	0.5	27.28	119.5	9.47	9.12	-151	64.2	35.7	4.2	0.077
		9:38:23	5	27	125.3	9.98	8.88	-136	75	37.2	5.5	0.077
		9:36:15	10	23.91	45.9	3.87	7.01	-24.7	87.5	36.2	3.1	0.079
		9:33:28	15	22.22	18.1	1.58	7.29	-41.1	61.7	39.7	5.7	0.081
PR-2 Mid-Lake	8/11/2020	9:55:32	0.5	26.99	188.4	15.02	9.61	-179	36.9	45.2	8.5	0.098
		9:53:35	5	23.76	72.8	6.15	6.99	-23.5	45.8	38.5	4.9	0.071
		9:51:59	10	22.5	31	2.69	6.98	-22.8	-3.9	34.2	4.1	0.068
		9:50:59	15	21.62	24	2.12	7.12	-31.3	-39.7	48.1	3.8	0.069
		9:49:04	18	21.26	9.7	0.86	7.22	-36.7	-220	38	0	0.076
PR-2 Mid-Lake	9/1/2020	9:50:26	0.5	23.07	88.5	7.58	7.2	-35.9	64.5	38.8	6.7	0.073
		9:49:20	5	23	85.4	7.33	7.16	-33.4	60.9	38.4	6.2	0.073
		9:47:59	10	22.84	79.4	6.84	6.9	-18.2	66.4	38.1	6.1	0.073
		9:46:04	15	22.35	58.2	5.06	6.84	-14.8	50.5	36	4.8	0.074

2020 Prompton WQ Profile Summary

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
PR-3 Upstream of Dam	5/19/2020	ERROR	0.5	15.16	108.7	10.92	7.89	-74.8	111.4	33.4	5.1	0.049
		ERROR	5	15.04	108.6	10.94	7.8	-69.9	113.3	33.7	6.2	0.049
		ERROR	10	14.13	106.4	10.93	7.78	-68.3	112.4	34	9.1	0.048
		ERROR	15	12.29	98.6	10.56	7.68	-62.7	116.2	34.1	7.6	0.046
Secchi 2.35 M		ERROR	20	10.53	85	9.48	7.4	-46.4	130.1	33.3	5	0.043
		ERROR	25	9.89	80.9	9.15	7.45	-49.4	127.7	33	4.3	0.043
		ERROR	30	9.72	77	8.75	7.53	-53.6	124.6	33.7	4.7	0.043
PR-3 Upstream of Dam	6/16/2020	9:37:30	0.5	21.56	107.8	9.5	7.72	-65.9	62.4	28.3	3	0.064
		9:36:21	5	21.23	105.1	9.33	7.48	-52	60.9	27.8	5.4	0.063
		9:35:18	10	20.55	93.4	8.4	7.18	-34.4	65.8	29.1	11.7	0.063
		9:33:33	15	19.05	58.3	5.4	6.99	-23.6	57.4	29.2	7.7	0.063
Secchi 3.50 M		9:30:49	20	15.84	16.8	1.67	6.51	4	46	32.5	4.3	0.063
		9:29:20	25	12.45	7.5	0.8	6.45	6.8	28.4	30.5	3.3	0.058
		9:27:29	30	10.33	3.8	0.43	6.54	1.8	-4.1	29.3	3.5	0.065
PR-3 Upstream of Dam	7/7/2020	9:20:42	0.5	27.02	116.1	9.25	8.99	-142	49.9	35	3.8	0.075
		9:19:40	5	26.91	116.9	9.33	8.86	-135	45.4	35.5	3.2	0.075
		9:16:47	10	24.24	91.2	7.65	7.48	-52.6	30.7	39.8	5.5	0.072
		9:14:26	15	22.49	41.8	3.62	7.3	-41.7	-17	37	3.6	0.072
Secchi 2.05 M		9:12:34	20	17.66	3	0.29	6.83	-14.4	-99.6	34.8	2.6	0.082
		9:11:09	25	12.57	2.9	0.31	6.87	-16.9	-117	32.9	1.6	0.076
		9:09:35	30	10.26	3.6	0.4	7.03	-25.5	-129	31.3	2.2	0.117
PR-3 Upstream of Dam	8/11/2020	9:39:10	0.5	26.61	166.1	13.33	9.67	-183	34.9	43.2	7.4	0.088
		9:37:09	5	23.45	44.1	3.75	6.66	-3.8	72.8	35.1	4.6	0.07
		9:35:00	10	22.23	3.2	0.28	6.44	8.8	59.8	33.2	3.6	0.07
		9:29:43	15	21.42	30	2.65	6.58	0.5	49.7	33	3.6	0.062
Secchi 0.75 M		9:25:52	20	19.65	3.3	0.3	6.67	-4.8	-43.1	33.6	4.4	0.071
		9:24:54	25	15.07	3	0.3	6.63	-3.1	-91	29.1	2.6	0.108
		9:21:44	30	11.65	4.6	0.5	6.77	-11	-93.3	64.5	2.9	0.142
PR-3 Upstream of Dam	9/1/2020	9:23:27	0.5	22.72	71.7	6.19	7.19	-35	45.8	36.9	3.5	0.073
		9:22:10	5	22.62	67	5.79	7.19	-35.3	36.1	36.8	4.1	0.073
		9:20:50	10	22.6	62.8	5.43	7.19	-35.3	23.4	37	4.1	0.073
		9:18:43	15	22.35	32.2	2.79	6.72	-7.4	5.1	32.6	2.4	0.075
Secchi 1.0 M		9:16:49	20	20.42	3.3	0.29	6.68	-5.4	-105	28.2	2.2	0.096
		9:14:59	25	16.35	3.1	0.3	6.76	-10.1	-124	27	2.7	0.118
		9:13:19	30	13.36	3.2	0.33	6.81	-13.1	-126	27.9	2.8	0.145
PR-4S Dam Outfall	5/19/2020	ERROR	0.5	13.16	97.5	10.23	7.75	-66.5	144.3	42	6.1	0.047
	6/16/2020	8:28:24	0.5	18.13	83.1	7.84	7.47	-51.5	166.6	53.5	5	0.063
	7/7/2020	8:17:33	0.5	20.7	77.2	6.92	7.66	-62.5	162.8	31.5	3.3	0.075
	8/11/2020	8:22:28	0.5	21.28	72.7	6.44	7.42	-48.8	197.8	37.2	4.4	0.064
	9/1/2020	8:29:34	0.5	21.82	74.1	6.5	7.11	-30.8	169.3	30.1	3.7	0.075

APPENDIX B

LABORATORY CUSTODY SHEETS

Certificate of Analysis

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

Laboratory No.: 2015559
Report: 05/27/20
Lab Contact: Richard A Wheeler

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

Project: 2020 - Prompton Reservoir

Lab ID: 2015559-01 **Collected By:** Client **Sampled:** 05/19/20 08:40 **Received:** 05/19/20 14:00
Sample Desc: PR-1S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/21/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	20	mg CaCO3/L		2	SM 2320 B	05/22/20		APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	05/20/20	U	APR
Biochemical Oxygen Demand	16.2	mg/l	2.0	2.0	SM 5210 B	05/19/20 16:10		ARG
Nitrate as N	0.42	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	05/19/20 16:00	J	TML
Nitrite as N	<0.007	mg/l	0.007	0.10	EPA 300.0 Rev 2.1	05/19/20 16:00	U	TML
Nitrate+Nitrite as N	<0.43	mg/l	0.182	1.10	CALCULATED	05/19/20 16:00		TML
Nitrogen, Total Kjeldahl (TKN)	0.52	mg/l	0.37	0.50	EPA 351.2	05/26/20		TML
Phosphorus as P, Total	0.03	mg/l	0.01	0.05	SM 4500-P E	05/21/20	J	RCE
Solids, Total Dissolved	48	mg/l	4	5	SM 2540 C	05/20/20		TMH
Total Organic Carbon	2.8	mg/l	0.3	0.5	SM 5310 C	05/20/20		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	05/20/20		ARG

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	15	mpn/100ml	1	SM 9223 B/Quantitray	5/19/20 14:49	5/20/20 14:59		JMW
Total Coliform	1730	mpn/100ml	1	SM 9223 B/Quantitray	5/19/20 14:49	5/20/20 14:59		JMW

Lab ID: 2015559-02 **Collected By:** Client **Sampled:** 05/19/20 10:20 **Received:** 05/19/20 14:00
Sample Desc: PR-2S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/21/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	18	mg CaCO3/L		2	SM 2320 B	05/22/20	C-51e	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	05/20/20	U	APR
Biochemical Oxygen Demand	11.2	mg/l	2.0	2.0	SM 5210 B	05/19/20 16:10		ARG
Nitrate as N	0.32	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	05/19/20 16:16	J	TML
Nitrite as N	<0.007	mg/l	0.007	0.10	EPA 300.0 Rev 2.1	05/19/20 16:16	U	TML
Nitrate+Nitrite as N	<0.33	mg/l	0.182	1.10	CALCULATED	05/19/20 16:16		TML
Nitrogen, Total Kjeldahl (TKN)	0.63	mg/l	0.37	0.50	EPA 351.2	05/26/20	Q-10	TML
Phosphorus as P, Total	0.02	mg/l	0.01	0.05	SM 4500-P E	05/21/20	J	RCE
Solids, Total Dissolved	50	mg/l	4	5	SM 2540 C	05/20/20		TMH
Total Organic Carbon	3.1	mg/l	0.3	0.5	SM 5310 C	05/20/20		ALD
Solids, Total Suspended	4	mg/l	1	1	SM 2540 D	05/20/20		ARG

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	1	mpn/100ml	1	SM 9223 B/Quantitray	5/19/20 14:49	5/20/20 14:59		JMW
Total Coliform	135	mpn/100ml	1	SM 9223 B/Quantitray	5/19/20 14:49	5/20/20 14:59		JMW

Lab ID: 2015559-03 **Collected By:** Client **Sampled:** 05/19/20 10:20 **Received:** 05/19/20 14:00
Sample Desc: PR-2M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/21/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	17	mg CaCO3/L		2	SM 2320 B	05/22/20	C-51c	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	05/20/20	U	APR
Biochemical Oxygen Demand	11.0	mg/l	2.0	2.0	SM 5210 B	05/19/20 16:10		ARG
Nitrate as N	0.34	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	05/19/20 16:33	J	TML
Nitrite as N	<0.007	mg/l	0.007	0.10	EPA 300.0 Rev 2.1	05/19/20 16:33	U	TML
Nitrate+Nitrite as N	<0.35	mg/l	0.182	1.10	CALCULATED	05/19/20 16:33		TML
Nitrogen, Total Kjeldahl (TKN)	1.20	mg/l	0.37	0.50	EPA 351.2	05/26/20		TML
Phosphorus as P, Total	0.16	mg/l	0.01	0.05	SM 4500-P E	05/21/20		RCE
Solids, Total Dissolved	39	mg/l	4	5	SM 2540 C	05/20/20		TMH
Total Organic Carbon	3.2	mg/l	0.3	0.5	SM 5310 C	05/20/20		ALD
Solids, Total Suspended	20	mg/l	1	1	SM 2540 D	05/20/20		ARG

Lab ID: 2015559-04 **Collected By:** Client **Sampled:** 05/19/20 10:20 **Received:** 05/19/20 14:00
Sample Desc: PR-2D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.06	mg/l		0.05	SM 4500-P F	05/21/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	17	mg CaCO3/L		2	SM 2320 B	05/22/20	C-51a	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	05/20/20	U	APR
Biochemical Oxygen Demand	16.4	mg/l	2.0	2.0	SM 5210 B	05/19/20 16:10		ARG
Nitrate as N	0.35	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	05/19/20 17:24	J	TML
Nitrite as N	<0.007	mg/l	0.007	0.10	EPA 300.0 Rev 2.1	05/19/20 17:24	U	TML
Nitrate+Nitrite as N	<0.36	mg/l	0.182	1.10	CALCULATED	05/19/20 17:24		TML
Nitrogen, Total Kjeldahl (TKN)	0.68	mg/l	0.37	0.50	EPA 351.2	05/26/20		TML
Phosphorus as P, Total	0.03	mg/l	0.01	0.05	SM 4500-P E	05/21/20	J	RCE
Solids, Total Dissolved	58	mg/l	4	5	SM 2540 C	05/20/20		TMH
Total Organic Carbon	3.1	mg/l	0.3	0.5	SM 5310 C	05/20/20		ALD
Solids, Total Suspended	5	mg/l	1	1	SM 2540 D	05/20/20		ARG

Lab ID: 2015559-05 **Collected By:** Client **Sampled:** 05/19/20 09:30 **Received:** 05/19/20 14:00
Sample Desc: PR-3S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/21/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	17	mg CaCO3/L		2	SM 2320 B	05/22/20	C-51d	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	05/20/20	U	APR
Biochemical Oxygen Demand	15.3	mg/l	2.0	2.0	SM 5210 B	05/19/20 16:10		ARG
Nitrate as N	0.31	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	05/19/20 18:14	J	TML
Nitrite as N	<0.007	mg/l	0.007	0.10	EPA 300.0 Rev 2.1	05/19/20 18:14	U	TML
Nitrate+Nitrite as N	<0.32	mg/l	0.182	1.10	CALCULATED	05/19/20 18:14		TML
Nitrogen, Total Kjeldahl (TKN)	0.54	mg/l	0.37	0.50	EPA 351.2	05/26/20		TML
Phosphorus as P, Total	0.02	mg/l	0.01	0.05	SM 4500-P E	05/21/20	J	RCE
Solids, Total Dissolved	24	mg/l	4	5	SM 2540 C	05/20/20		TMH
Total Organic Carbon	3.3	mg/l	0.3	0.5	SM 5310 C	05/20/20		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	05/20/20		ARG

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	1	mpn/100ml	1	SM 9223 B/Quantitray	5/19/20 14:49	5/20/20 14:59		JMW
Total Coliform	52	mpn/100ml	1	SM 9223 B/Quantitray	5/19/20 14:49	5/20/20 14:59		JMW

Lab ID: 2015559-06 **Collected By:** Client **Sampled:** 05/19/20 09:30 **Received:** 05/19/20 14:00
Sample Desc: PR-3M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/21/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	17	mg CaCO3/L		2	SM 2320 B	05/22/20	C-51b	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	05/20/20	U	APR
Biochemical Oxygen Demand	9.6	mg/l	2.0	2.0	SM 5210 B	05/19/20 16:10		ARG
Nitrate as N	0.32	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	05/19/20 21:36	J	TML
Nitrite as N	<0.007	mg/l	0.007	0.10	EPA 300.0 Rev 2.1	05/19/20 21:36	U	TML
Nitrate+Nitrite as N	<0.33	mg/l	0.182	1.10	CALCULATED	05/19/20 21:36		TML
Nitrogen, Total Kjeldahl (TKN)	0.61	mg/l	0.37	0.50	EPA 351.2	05/26/20		TML
Phosphorus as P, Total	0.02	mg/l	0.01	0.05	SM 4500-P E	05/21/20	J	RCE
Solids, Total Dissolved	15	mg/l	4	5	SM 2540 C	05/20/20		TMH
Total Organic Carbon	3.1	mg/l	0.3	0.5	SM 5310 C	05/20/20		ALD
Solids, Total Suspended	4	mg/l	1	1	SM 2540 D	05/20/20		ARG

Lab ID: 2015559-07 **Collected By:** Client **Sampled:** 05/19/20 09:30 **Received:** 05/19/20 14:00
Sample Desc: PR-3D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/21/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	17	mg CaCO3/L		2	SM 2320 B	05/22/20	C-51	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	05/20/20	U	APR
Biochemical Oxygen Demand	10.7	mg/l	2.0	2.0	SM 5210 B	05/19/20 16:10		ARG
Nitrate as N	0.35	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	05/19/20 21:53	J	TML
Nitrite as N	<0.007	mg/l	0.007	0.10	EPA 300.0 Rev 2.1	05/19/20 21:53	U	TML
Nitrate+Nitrite as N	<0.36	mg/l	0.182	1.10	CALCULATED	05/19/20 21:53		TML
Nitrogen, Total Kjeldahl (TKN)	0.68	mg/l	0.37	0.50	EPA 351.2	05/26/20		TML
Phosphorus as P, Total	0.03	mg/l	0.01	0.05	SM 4500-P E	05/21/20	J	RCE
Solids, Total Dissolved	24	mg/l	4	5	SM 2540 C	05/20/20		TMH
Total Organic Carbon	3.1	mg/l	0.3	0.5	SM 5310 C	05/20/20		ALD
Solids, Total Suspended	7	mg/l	1	1	SM 2540 D	05/20/20		ARG

Lab ID: 2015559-08 **Collected By:** Client **Sampled:** 05/19/20 08:00 **Received:** 05/19/20 14:00
Sample Desc: PR-4S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/21/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	17	mg CaCO3/L		2	SM 2320 B	05/22/20	C-51b	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	05/20/20	U	APR
Biochemical Oxygen Demand	13.0	mg/l	2.0	2.0	SM 5210 B	05/19/20 16:10		ARG
Nitrate as N	0.32	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	05/19/20 18:31	J	TML
Nitrite as N	<0.007	mg/l	0.007	0.10	EPA 300.0 Rev 2.1	05/19/20 18:31	U	TML
Nitrate+Nitrite as N	<0.33	mg/l	0.182	1.10	CALCULATED	05/19/20 18:31		TML
Nitrogen, Total Kjeldahl (TKN)	0.69	mg/l	0.37	0.50	EPA 351.2	05/26/20		TML
Phosphorus as P, Total	0.02	mg/l	0.01	0.05	SM 4500-P E	05/21/20	J	RCE
Solids, Total Dissolved	42	mg/l	4	5	SM 2540 C	05/20/20		TMH
Total Organic Carbon	3.3	mg/l	0.3	0.5	SM 5310 C	05/20/20		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	05/20/20		ARG

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	<1	mpn/100ml	1	SM 9223 B/Quantitray	5/19/20 14:48	5/20/20 9:05		JMW
Total Coliform	326	mpn/100ml	1	SM 9223 B/Quantitray	5/19/20 14:48	5/20/20 9:05		JMW

Preparation Methods

Specific Method	Preparation Method	Prep Batch	Prepared Date	Prepared By
2015559-01				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0E1112	05/20/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0E1220	05/21/2020	RCE
2015559-02				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0E1112	05/20/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0E1220	05/21/2020	RCE
2015559-03				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0E1112	05/20/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0E1220	05/21/2020	RCE
2015559-04				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0E1112	05/20/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0E1220	05/21/2020	RCE
2015559-05				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0E1112	05/20/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0E1220	05/21/2020	RCE
2015559-06				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0E1112	05/20/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0E1220	05/21/2020	RCE
2015559-07				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0E1112	05/20/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0E1220	05/21/2020	RCE
2015559-08				
Dissolved General Chemistry				

SM 4500-P F	SM 4500-P B	B0E1112	05/20/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0E1220	05/21/2020	RCE

Notes and Definitions

C-51	The alkalinity to pH 4.2 = 16.6 mg CaCO3/L.
C-51a	The alkalinity to pH 4.2 = 16.9 mg CaCO3/L.
C-51b	The alkalinity to pH 4.2 = 17.0 mg CaCO3/L.
C-51c	The alkalinity to pH 4.2 = 17.1 mg CaCO3/L.
C-51d	The alkalinity to pH 4.2 = 17.4 mg CaCO3/L.
C-51e	The alkalinity to pH 4.2 = 17.6 mg CaCO3/L.
G-11	The sample was filtered after it was received at the laboratory.
J	Estimated value
Q-10	The matrix spike(s) were outside acceptable limits of 90-110% recovery at 111%.
U	Analyte was not detected above the indicated value.

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

WORK ORDER
Chain of Custody

2015559

Client Code: 3157
Client: Tetra Tech
Project Manager: Richard A Wheeler
Project: 2020 - Prompton Reservoir
Report To: Tetra Tech - David Wertz - USACE, Phila Dist. Env.Resources Branch 100 Penn Square E., Arlington, VA 22201
Invoice To: Tetra Tech - David Wertz - USACE, Phila Dist. Env.Resources Branch 100 Penn Square E., Arlington, VA 22201

Collected By : (Full Name) Gregory Dacik
Comments:

2015559-01 PR-1S

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

Matrix: Non-Potable Water
Type: Grab
Date: 5/19/20
Time: 0840

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

2015559-02 PR-2S

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

Matrix: Non-Potable Water
Type: Grab
Date: 5/19/20
Time: 1020

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

	Date/Time		Date/Time
Relinquished By	5/19/20 12:50	Received By	5-19-20 1300
Relinquished By		Received By	
Relinquished By		Received at Laboratory By	5-19-20 1400

Sample Kit Prepared By: VBJ TJV QMS	Date/Time 5/11/20
Sample Temp (°C):	5
Samples on Ice?	Yes No NA
Approved By:	BSL
Entered By:	

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

Printed: 5/7/2020 2:05:02PM

Report Template: wko WorkOrder COC is

M.J. Reider Associates, Inc.

2015559

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

Project Manager: Richard A Wheeler **Project:** 2020 - Prompton Reservoir

Comments:

Collected By : (Full Name) Gregory Wacik

2015559-03 PR-2M

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

Matrix: Non-Potable Water Date: 5/19/20
Type: Grab Time: 1020
A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Pl 500ml H2SO4
D - Pl 250ml NP
E - Pl 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

2015559-04 PR-2D

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

Matrix: Non-Potable Water Date: 5/19/20
Type: Grab Time: 1020
A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Pl 500ml H2SO4
D - Pl 250ml NP
E - Pl 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

2015559-05 PR-3S

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

Matrix: Non-Potable Water Date: 5/19/20
Type: Grab Time: 0930
A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

	Date/Time		Date/Time
Relinquished By	5/19/20 1250	Received By	5-19-20 1300
Relinquished By		Received By	
Relinquished By		Received at Laboratory By	5-19-20 1400

Sample Kit Prepared By: LBW JSV QMS	Date/Time 5/11/20
Sample Temp (°C):	5
Samples on Ice?	Yes No NA
Approved By:	BSW
Entered By:	

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

Printed: 5/7/2020 2:05:02PM

Report Template: wko WorkOrder COC ls

M.J. Reider Associates, Inc.

2015559

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

Project Manager: Richard A Wheeler **Project:** 2020 - Prompton Reservoir

Collected By : (Full Name) Gregory Wacik

Comments: * Bottles renumbered to match sample Description UBW 5/19/20

2015559-06 PR-3M ~~PR-3D*~~

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

Wrong Bottles Filled. Labels changed

Matrix: Non-Potable Water Date: 5/19/20
Type: Grab Time: 0930
A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Pl 500ml H2SO4
D - Pl 250ml NP
E - Pl 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

2015559-07 PR-3D ~~PR-3M*~~

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

Matrix: Non-Potable Water Date: 5/19/20
Type: Grab Time: 0930
A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Pl 500ml H2SO4
D - Pl 250ml NP
E - Pl 500ml Lab Filtered
F - Vial Amber 40ml H3PO4, minimal hdspc
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc

2015559-08 PR-4S

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

Matrix: Non-Potable Water Date: 5/19/20
Type: Grab Time: 0800
A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
C - Sterile Pl 125ml NaThio
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

Relinquished By	5/19/20 12:50 Date/Time	Received By	5-19-20 1300 Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	5-19-20 1400 Date/Time

Sample Kit Prepared By:	Date/Time
UBW JSV QMS	5/11/20
Sample Temp (°C):	5
Samples on Ice?	Yes No NA
Approved By:	BSW
Entered By:	

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

Printed: 5/7/2020 2:05:02PM

Report Template: wko WorkOrder COC ls

MJRA Terms & Conditions

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

Sample Submission, Sample Acceptance & Sampling Containers

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

Turnaround Times (TAT)

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

Analytical Results, Sample Collection Integrity & Subcontracting

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

Payment Terms

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

Warranty & Litigation

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

Reviewed and Approved by:

Richard A Wheeler
Director of Field Services

Certificate of Analysis

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

Laboratory No.: 2016281
Report: 06/24/20
Lab Contact: Richard A Wheeler

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

Project: 2020 - Prompton Reservoir

Lab ID: 2016281-01 **Collected By:** Client **Sampled:** 06/16/20 08:45 **Received:** 06/16/20 13:50
Sample Desc: PR-1S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.07	mg/l		0.05	SM 4500-P F	06/19/20	G-11	TML
General Chemistry								
Alkalinity, Total to pH 4.5	25	mg CaCO3/L		2	SM 2320 B	06/19/20		APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	06/17/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/16/20 16:00		JMK
Nitrate as N	0.47	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/16/20 17:55	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/16/20 17:55	U	MRW
Nitrate+Nitrite as N	<0.48	mg/l	0.125	1.10	CALCULATED	06/16/20 17:55		MRW
Nitrogen, Total Kjeldahl (TKN)	<0.37	mg/l	0.37	0.50	EPA 351.2	06/18/20	U	RCE
Phosphorus as P, Total	<0.01	mg/l	0.01	0.05	SM 4500-P E	06/18/20	U	RCE
Solids, Total Dissolved	53	mg/l	4	5	SM 2540 C	06/17/20		TMH
Total Organic Carbon	2.9	mg/l	0.3	0.5	SM 5310 C	06/17/20		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	06/17/20		TMH

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	58	mpn/100ml	1	SM 9223 B/Quantitray	6/16/20 15:12	6/17/20 9:16		JMW
Total Coliform	1550	mpn/100ml	1	SM 9223 B/Quantitray	6/16/20 15:12	6/17/20 9:16		JMW

Lab ID: 2016281-02 **Collected By:** Client **Sampled:** 06/16/20 10:00 **Received:** 06/16/20 13:50
Sample Desc: PR-2S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.05	mg/l		0.05	SM 4500-P F	06/19/20	G-11	TML
General Chemistry								
Alkalinity, Total to pH 4.5	21	mg CaCO3/L		2	SM 2320 B	06/19/20		APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	06/17/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/16/20 16:00		JMK
Nitrate as N	0.20	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/16/20 18:46	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/16/20 18:46	U	MRW
Nitrate+Nitrite as N	<0.21	mg/l	0.125	1.10	CALCULATED	06/16/20 18:46		MRW
Nitrogen, Total Kjeldahl (TKN)	<0.37	mg/l	0.37	0.50	EPA 351.2	06/18/20	U	RCE
Phosphorus as P, Total	<0.01	mg/l	0.01	0.05	SM 4500-P E	06/18/20	U	RCE
Solids, Total Dissolved	62	mg/l	4	5	SM 2540 C	06/17/20		TMH
Total Organic Carbon	4.4	mg/l	0.3	0.5	SM 5310 C	06/17/20		ALD
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	06/17/20		TMH

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	<1	mpn/100ml	1	SM 9223 B/Quantitray	6/16/20 15:12	6/17/20 9:16		JMW
Total Coliform	1410	mpn/100ml	1	SM 9223 B/Quantitray	6/16/20 15:12	6/17/20 9:16		JMW

Lab ID: 2016281-03 **Collected By:** Client **Sampled:** 06/16/20 10:00 **Received:** 06/16/20 13:50
Sample Desc: PR-2M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.05	mg/l		0.05	SM 4500-P F	06/19/20	G-11	TML
General Chemistry								
Alkalinity, Total to pH 4.5	21	mg CaCO3/L		2	SM 2320 B	06/19/20		APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	06/17/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/16/20 16:00		JMK
Nitrate as N	0.21	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/16/20 19:03	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/16/20 19:03	U	MRW
Nitrate+Nitrite as N	<0.22	mg/l	0.125	1.10	CALCULATED	06/16/20 19:03		MRW
Nitrogen, Total Kjeldahl (TKN)	<0.37	mg/l	0.37	0.50	EPA 351.2	06/18/20	U	RCE
Phosphorus as P, Total	<0.01	mg/l	0.01	0.05	SM 4500-P E	06/18/20	U	RCE
Solids, Total Dissolved	48	mg/l	4	5	SM 2540 C	06/17/20		TMH
Total Organic Carbon	4.1	mg/l	0.3	0.5	SM 5310 C	06/17/20		ALD
Solids, Total Suspended	4	mg/l	1	1	SM 2540 D	06/17/20		TMH

Lab ID: 2016281-04 **Collected By:** Client **Sampled:** 06/16/20 10:00 **Received:** 06/16/20 13:50
Sample Desc: PR-2D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.05	mg/l		0.05	SM 4500-P F	06/19/20	G-11	TML
General Chemistry								
Alkalinity, Total to pH 4.5	23	mg CaCO3/L		2	SM 2320 B	06/19/20		APR
Ammonia as N	0.03	mg/l	0.01	0.10	ASTM D6919-03	06/17/20	J	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/16/20 16:00		JMK
Nitrate as N	0.25	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/16/20 19:20	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/16/20 19:20	U	MRW
Nitrate+Nitrite as N	<0.26	mg/l	0.125	1.10	CALCULATED	06/16/20 19:20		MRW
Nitrogen, Total Kjeldahl (TKN)	<0.37	mg/l	0.37	0.50	EPA 351.2	06/18/20	U	RCE
Phosphorus as P, Total	<0.01	mg/l	0.01	0.05	SM 4500-P E	06/18/20	U	RCE
Solids, Total Dissolved	77	mg/l	4	5	SM 2540 C	06/17/20		TMH
Total Organic Carbon	4.4	mg/l	0.3	0.5	SM 5310 C	06/17/20		ALD
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	06/17/20		TMH

Lab ID: 2016281-05 **Collected By:** Client **Sampled:** 06/16/20 09:30 **Received:** 06/16/20 13:50
Sample Desc: PR-3S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	06/19/20	G-11	TML
General Chemistry								
Alkalinity, Total to pH 4.5	21	mg CaCO3/L		2	SM 2320 B	06/19/20		APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	06/17/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/16/20 16:00		JMK
Nitrate as N	0.20	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/16/20 19:36	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/16/20 19:36	U	MRW
Nitrate+Nitrite as N	<0.21	mg/l	0.125	1.10	CALCULATED	06/16/20 19:36		MRW
Nitrogen, Total Kjeldahl (TKN)	<0.37	mg/l	0.37	0.50	EPA 351.2	06/18/20	U	RCE
Phosphorus as P, Total	<0.01	mg/l	0.01	0.05	SM 4500-P E	06/18/20	U	RCE
Solids, Total Dissolved	69	mg/l	4	5	SM 2540 C	06/17/20		TMH
Total Organic Carbon	4.0	mg/l	0.3	0.5	SM 5310 C	06/17/20		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	06/17/20		TMH

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	1	mpn/100ml	1	SM 9223 B/Quantitray	6/16/20 15:12	6/17/20 9:16		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	6/16/20 15:12	6/17/20 9:16		JMW

Lab ID: 2016281-06 **Collected By:** Client **Sampled:** 06/16/20 09:30 **Received:** 06/16/20 13:50
Sample Desc: PR-3M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.06	mg/l		0.05	SM 4500-P F	06/19/20	G-11	TML
General Chemistry								
Alkalinity, Total to pH 4.5	24	mg CaCO3/L		2	SM 2320 B	06/19/20		APR
Ammonia as N	0.04	mg/l	0.01	0.10	ASTM D6919-03	06/17/20	J	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/16/20 16:00		JMK
Nitrate as N	0.27	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/16/20 19:53	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/16/20 19:53	U	MRW
Nitrate+Nitrite as N	<0.28	mg/l	0.125	1.10	CALCULATED	06/16/20 19:53		MRW
Nitrogen, Total Kjeldahl (TKN)	<0.37	mg/l	0.37	0.50	EPA 351.2	06/18/20	U	RCE
Phosphorus as P, Total	<0.01	mg/l	0.01	0.05	SM 4500-P E	06/18/20	U	RCE
Solids, Total Dissolved	71	mg/l	4	5	SM 2540 C	06/17/20		TMH
Total Organic Carbon	4.2	mg/l	0.3	0.5	SM 5310 C	06/17/20		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	06/17/20		TMH

Lab ID: 2016281-07 **Collected By:** Client **Sampled:** 06/16/20 09:30 **Received:** 06/16/20 13:50
Sample Desc: PR-3D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.06	mg/l		0.05	SM 4500-P F	06/19/20	G-11	TML
General Chemistry								
Alkalinity, Total to pH 4.5	26	mg CaCO3/L		2	SM 2320 B	06/19/20		APR
Ammonia as N	0.50	mg/l	0.01	0.10	ASTM D6919-03	06/17/20		APR
Biochemical Oxygen Demand	2.6	mg/l	2.0	2.0	SM 5210 B	06/17/20 10:45		KRG
Nitrate as N	0.22	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/16/20 20:10	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/16/20 20:10	U	MRW
Nitrate+Nitrite as N	<0.23	mg/l	0.125	1.10	CALCULATED	06/16/20 20:10		MRW
Nitrogen, Total Kjeldahl (TKN)	1.27	mg/l	0.37	0.50	EPA 351.2	06/18/20		RCE
Phosphorus as P, Total	0.16	mg/l	0.01	0.05	SM 4500-P E	06/18/20		RCE
Solids, Total Dissolved	61	mg/l	4	5	SM 2540 C	06/17/20		TMH
Total Organic Carbon	3.9	mg/l	0.3	0.5	SM 5310 C	06/17/20		ALD
Solids, Total Suspended	252	mg/l	1	1	SM 2540 D	06/17/20		TMH

Lab ID: 2016281-08 **Collected By:** Client **Sampled:** 06/16/20 08:15 **Received:** 06/16/20 13:50
Sample Desc: PR-4S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.06	mg/l		0.05	SM 4500-P F	06/19/20	G-11	TML
General Chemistry								
Alkalinity, Total to pH 4.5	23	mg CaCO3/L		2	SM 2320 B	06/19/20		APR
Ammonia as N	0.06	mg/l	0.01	0.10	ASTM D6919-03	06/17/20	J	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/16/20 16:00		JMK
Nitrate as N	0.29	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/16/20 20:27	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/16/20 20:27	U	MRW
Nitrate+Nitrite as N	<0.30	mg/l	0.125	1.10	CALCULATED	06/16/20 20:27		MRW
Nitrogen, Total Kjeldahl (TKN)	<0.37	mg/l	0.37	0.50	EPA 351.2	06/18/20	U	RCE
Phosphorus as P, Total	<0.01	mg/l	0.01	0.05	SM 4500-P E	06/18/20	U	RCE
Solids, Total Dissolved	72	mg/l	4	5	SM 2540 C	06/17/20		TMH
Total Organic Carbon	4.3	mg/l	0.3	0.5	SM 5310 C	06/17/20		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	06/17/20		TMH

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	10	mpn/100ml	1	SM 9223 B/Quantitray	6/16/20 15:12	6/17/20 9:16		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	6/16/20 15:12	6/17/20 9:16		JMW

Preparation Methods

Specific Method	Preparation Method	Prep Batch	Prepared Date	Prepared By
2016281-01				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0F1088	06/17/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0F1087	06/18/2020	RCE
2016281-02				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0F1088	06/17/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0F1087	06/18/2020	RCE
2016281-03				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0F1088	06/17/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0F1087	06/18/2020	RCE
2016281-04				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0F1088	06/17/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0F1087	06/18/2020	RCE
2016281-05				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0F1088	06/17/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0F1087	06/18/2020	RCE
2016281-06				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0F1088	06/17/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0F1087	06/18/2020	RCE
2016281-07				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0F1088	06/17/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0F1087	06/18/2020	RCE
2016281-08				
Dissolved General Chemistry				

SM 4500-P F	SM 4500-P B	B0F1088	06/17/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0F1087	06/18/2020	RCE

Notes and Definitions

G-11	The sample was filtered after it was received at the laboratory.
J	Estimated value
U	Analyte was not detected above the indicated value.

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

WORK ORDER
Chain of Custody

2016281

Client Code: 3157
Project Manager: Richard A Wheeler

Client: Tetra Tech
Project: 2020 - Prompton Reservoir

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

Comments:

Collected By : (Full Name) Gregory Wacik

2016281-01 PR-1S

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

Matrix: Non-Potable Water
Type: Grab
Date: 6/16/20
Time: 0845

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

2016281-02 PR-2S

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

Matrix: Non-Potable Water
Type: Grab
Date: 6/16/20
Time: 1000

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

Relinquished By	6/16/20 1230 Date/Time	Received By	6-16-20 1240 Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	6-16-20 1350 Date/Time

Sample Kit Prepared By: JSV	Date/Time 5/18/20
Sample Temp (°C):	5
Samples on Ice?	Yes No NA
Approved By:	BSW
Entered By:	AM

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

Printed: 5/14/2020 10:16:45AM

Report Template

M.J. Reider Associates, Inc.

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

Project Manager: Richard A Wheeler **Project:** 2020 - Prompton Reservoir

Comments:

Collected By : (Full Name) Gregory Wacik

2016281-03 PR-2M

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

Matrix: Non-Potable Water Date: 6/16/20
Type: Grab Time: 1000

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

2016281-04 PR-2D

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

Matrix: Non-Potable Water Date: 6/16/20
Type: Grab Time: 1000

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

2016281-05 PR-3S

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

Matrix: Non-Potable Water Date: 6/16/20
Type: Grab Time: 0930

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

Relinquished By	6/16/20 0230 Date/Time	Received By	6-16-20 1240 Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	6-16-20 1350 Date/Time

Sample Kit Prepared By: JSV	Date/Time 5/18/20
Sample Temp (°C):	5
Samples on Ice?	Yes No NA
Approved By:	BSL
Entered By:	

Printed: 5/14/2020 10:16:45AM

Report Template:

M.J. Reider Associates, Inc.

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

Project Manager: Richard A Wheeler **Project:** 2020 - Prompton Reservoir

Comments:

Collected By : (Full Name) Gregory Wacik

2016281-06 PR-3M

JMC

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

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

Matrix: Non-Potable Water Date: 6/16/20
Type: Grab Time: 0930

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

2016281-07 PR-3D

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

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

Matrix: Non-Potable Water Date: 6/16/20
Type: Grab Time: 0930

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

2016281-08 PR-4S

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

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

Matrix: Non-Potable Water Date: 6/16/20
Type: Grab Time: 0815

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

	Date/Time		Date/Time
Relinquished By:	6/16/20 1230	Received By:	6/16/20 1240
Relinquished By:		Received By:	
Relinquished By:		Received at Laboratory By:	6/16/20 1350

Sample Kit Prepared By: VKL JSV	Date/Time 5/18/20
Sample Temp (°C):	5
Samples on Ice?	Yes No NA
Approved By:	JSV
Entered By:	

Report Template:

Printed: 5/14/2020 10:16:45AM

MJRA Terms & Conditions

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

Sample Submission, Sample Acceptance & Sampling Containers

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

Turnaround Times (TAT)

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

Analytical Results, Sample Collection Integrity & Subcontracting

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

Payment Terms

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

Warranty & Litigation

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

Reviewed and Approved by:

Richard A Wheeler
Director of Field Services

Certificate of Analysis

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

Laboratory No.: 2019016
Report: 07/22/20
Lab Contact: Richard A Wheeler

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

Project: 2020 - Prompton Reservoir

Lab ID: 2019016-01 **Collected By:** Client **Sampled:** 07/07/20 08:30 **Received:** 07/07/20 14:09
Sample Desc: PR-1S **Sample Type:** Grab
Notes: L-13

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.05	mg/l		0.05	SM 4500-P F	07/10/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	29	mg CaCO3/L		2	SM 2320 B	07/09/20		APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	07/08/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/07/20 15:00		MRW
Nitrate as N	0.48	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/07/20 19:20	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/07/20 19:20	U	TML
Nitrate+Nitrite as N	<0.49	mg/l	0.125	1.10	CALCULATED	07/07/20 19:20		TML
Nitrogen, Total Kjeldahl (TKN)	<0.47	mg/l	0.47	0.50	EPA 351.2	07/10/20	U	SNF
Phosphorus as P, Total	0.18	mg/l	0.01	0.05	SM 4500-P E	07/13/20		RCE
Solids, Total Dissolved	104	mg/l	4	5	SM 2540 C	07/08/20		TMH
Total Organic Carbon	4.1	mg/l	0.3	0.5	SM 5310 C	07/08/20		ALD
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	07/08/20		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	2420	mpn/100ml	1	SM 9223 B/Quantitray	7/7/20 16:00	7/8/20 10:20		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	7/7/20 16:00	7/8/20 10:20		JMW

107 Angelica Street ❍ Reading, PA 19611 ❍ www.mjreider.com ❍ (610) 374-5129 ❍ fax (610) 374-7234

Lab ID: 2019016-02 **Collected By:** Client **Sampled:** 07/07/20 09:45 **Received:** 07/07/20 14:09
Sample Desc: PR-2S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	07/10/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	22	mg CaCO3/L		2	SM 2320 B	07/09/20		APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	07/08/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/07/20 15:00		MRW
Nitrate as N	<0.11	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/07/20 16:15	U	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/07/20 16:15	U	TML
Nitrate+Nitrite as N	<0.12	mg/l	0.125	1.10	CALCULATED	07/07/20 16:15		TML
Nitrogen, Total Kjeldahl (TKN)	<0.47	mg/l	0.47	0.50	EPA 351.2	07/10/20	U	SNF
Phosphorus as P, Total	0.17	mg/l	0.01	0.05	SM 4500-P E	07/13/20		RCE
Solids, Total Dissolved	98	mg/l	4	5	SM 2540 C	07/08/20		TMH
Total Organic Carbon	4.2	mg/l	0.3	0.5	SM 5310 C	07/08/20		ALD
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	07/08/20		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	<1	mpn/100ml	1	SM 9223 B/Quantitray	7/7/20 16:00	7/8/20 10:20		JMW
Total Coliform	1050	mpn/100ml	1	SM 9223 B/Quantitray	7/7/20 16:00	7/8/20 10:20		JMW

Lab ID: 2019016-03 **Collected By:** Client **Sampled:** 07/07/20 09:45 **Received:** 07/07/20 14:09
Sample Desc: PR-2M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	07/10/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	23	mg CaCO3/L		2	SM 2320 B	07/09/20		APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	07/08/20	U	APR
Biochemical Oxygen Demand	2.4	mg/l	2.0	2.0	SM 5210 B	07/07/20 16:00		MRW
Nitrate as N	<0.11	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/07/20 16:32	U	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/07/20 16:32	U	TML
Nitrate+Nitrite as N	<0.12	mg/l	0.125	1.10	CALCULATED	07/07/20 16:32		TML
Nitrogen, Total Kjeldahl (TKN)	<0.47	mg/l	0.47	0.50	EPA 351.2	07/10/20	U	SNF
Phosphorus as P, Total	0.18	mg/l	0.01	0.05	SM 4500-P E	07/13/20		RCE
Solids, Total Dissolved	73	mg/l	4	5	SM 2540 C	07/08/20		TMH
Total Organic Carbon	3.8	mg/l	0.3	0.5	SM 5310 C	07/08/20		ALD
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	07/08/20		ALD

Lab ID: 2019016-04 **Collected By:** Client **Sampled:** 07/07/20 09:45 **Received:** 07/07/20 14:09
Sample Desc: PR-2D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.05	mg/l		0.05	SM 4500-P F	07/10/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	27	mg CaCO3/L		2	SM 2320 B	07/09/20		APR
Ammonia as N	0.06	mg/l	0.01	0.10	ASTM D6919-03	07/08/20	J	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/07/20 15:00		MRW
Nitrate as N	0.27	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/07/20 17:22	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/07/20 17:22	U	TML
Nitrate+Nitrite as N	<0.28	mg/l	0.125	1.10	CALCULATED	07/07/20 17:22		TML
Nitrogen, Total Kjeldahl (TKN)	<0.47	mg/l	0.47	0.50	EPA 351.2	07/10/20	U	SNF
Phosphorus as P, Total	0.12	mg/l	0.01	0.05	SM 4500-P E	07/13/20		RCE
Solids, Total Dissolved	70	mg/l	4	5	SM 2540 C	07/08/20		TMH
Total Organic Carbon	3.4	mg/l	0.3	0.5	SM 5310 C	07/08/20		ALD
Solids, Total Suspended	5	mg/l	1	1	SM 2540 D	07/08/20		ALD

Lab ID: 2019016-05 **Collected By:** Client **Sampled:** 07/07/20 09:10 **Received:** 07/07/20 14:09
Sample Desc: PR-3S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	07/10/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	22	mg CaCO3/L		2	SM 2320 B	07/09/20		APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	07/08/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/07/20 16:00		MRW
Nitrate as N	<0.11	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/07/20 17:39	U	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/07/20 17:39	U	TML
Nitrate+Nitrite as N	<0.12	mg/l	0.125	1.10	CALCULATED	07/07/20 17:39		TML
Nitrogen, Total Kjeldahl (TKN)	<0.47	mg/l	0.47	0.50	EPA 351.2	07/10/20	U	SNF
Phosphorus as P, Total	0.13	mg/l	0.01	0.05	SM 4500-P E	07/13/20		RCE
Solids, Total Dissolved	59	mg/l	4	5	SM 2540 C	07/08/20		TMH
Total Organic Carbon	4.4	mg/l	0.3	0.5	SM 5310 C	07/08/20		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/08/20		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	1	mpn/100ml	1	SM 9223 B/Quantitray	7/7/20 16:00	7/8/20 10:20		JMW
Total Coliform	1410	mpn/100ml	1	SM 9223 B/Quantitray	7/7/20 16:00	7/8/20 10:20		JMW

Lab ID: 2019016-06 **Collected By:** Client **Sampled:** 07/07/20 09:10 **Received:** 07/07/20 14:09
Sample Desc: PR-3M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	07/10/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	23	mg CaCO3/L		2	SM 2320 B	07/09/20		APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	07/08/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/07/20 15:00		MRW
Nitrate as N	<0.11	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/07/20 18:30	U	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/07/20 18:30	U	TML
Nitrate+Nitrite as N	<0.12	mg/l	0.125	1.10	CALCULATED	07/07/20 18:30		TML
Nitrogen, Total Kjeldahl (TKN)	<0.47	mg/l	0.47	0.50	EPA 351.2	07/10/20	U	SNF
Phosphorus as P, Total	0.08	mg/l	0.01	0.05	SM 4500-P E	07/13/20		RCE
Solids, Total Dissolved	70	mg/l	4	5	SM 2540 C	07/08/20		TMH
Total Organic Carbon	3.8	mg/l	0.3	0.5	SM 5310 C	07/08/20		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	07/08/20		ALD

Lab ID: 2019016-07 **Collected By:** Client **Sampled:** 07/07/20 09:10 **Received:** 07/07/20 14:09
Sample Desc: PR-3D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	07/10/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	38	mg CaCO3/L		2	SM 2320 B	07/09/20		APR
Ammonia as N	0.53	mg/l	0.01	0.10	ASTM D6919-03	07/08/20		APR
Biochemical Oxygen Demand	2.4	mg/l	2.0	2.0	SM 5210 B	07/14/20 11:00	C-34	RCE
Nitrate as N	<0.11	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/07/20 18:46	U	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/07/20 18:46	U	TML
Nitrate+Nitrite as N	<0.12	mg/l	0.125	1.10	CALCULATED	07/07/20 18:46		TML
Nitrogen, Total Kjeldahl (TKN)	0.77	mg/l	0.47	0.50	EPA 351.2	07/10/20		SNF
Phosphorus as P, Total	0.13	mg/l	0.01	0.05	SM 4500-P E	07/13/20		RCE
Solids, Total Dissolved	87	mg/l	4	5	SM 2540 C	07/08/20		TMH
Total Organic Carbon	4.4	mg/l	0.3	0.5	SM 5310 C	07/08/20		ALD
Solids, Total Suspended	14	mg/l	1	1	SM 2540 D	07/08/20		ALD

Lab ID: 2019016-08 **Collected By:** Client **Sampled:** 07/07/20 08:20 **Received:** 07/07/20 14:09
Sample Desc: PR-4S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	07/10/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	26	mg CaCO3/L		2	SM 2320 B	07/09/20		APR
Ammonia as N	0.02	mg/l	0.01	0.10	ASTM D6919-03	07/08/20	J	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/07/20 15:00		MRW
Nitrate as N	0.32	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/07/20 19:03	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/07/20 19:03	U	TML
Nitrate+Nitrite as N	<0.33	mg/l	0.125	1.10	CALCULATED	07/07/20 19:03		TML
Nitrogen, Total Kjeldahl (TKN)	<0.47	mg/l	0.47	0.50	EPA 351.2	07/10/20	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.05	SM 4500-P E	07/13/20	U	RCE
Solids, Total Dissolved	73	mg/l	4	5	SM 2540 C	07/08/20		TMH
Total Organic Carbon	4.0	mg/l	0.3	0.5	SM 5310 C	07/08/20		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	07/08/20		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	1	mpn/100ml	1	SM 9223 B/Quantitray	7/7/20 16:00	7/8/20 10:20		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	7/7/20 16:00	7/8/20 10:20		JMW

Preparation Methods

Specific Method	Preparation Method	Prep Batch	Prepared Date	Prepared By
2019016-01				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0G0464	07/08/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0G0719	07/13/2020	RCE
2019016-02				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0G0464	07/08/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0G0719	07/13/2020	RCE
2019016-03				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0G0464	07/08/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0G0719	07/13/2020	RCE
2019016-04				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0G0464	07/08/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0G0719	07/13/2020	RCE
2019016-05				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0G0464	07/08/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0G0719	07/13/2020	RCE
2019016-06				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0G0464	07/08/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0G0719	07/13/2020	RCE
2019016-07				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0G0464	07/08/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0G0719	07/13/2020	RCE
2019016-08				
Dissolved General Chemistry				

SM 4500-P F	SM 4500-P B	B0G0464	07/08/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0G0719	07/13/2020	RCE

Notes and Definitions

C-34	The sample was reanalyzed outside of the required 48-hour hold time by 122 hours. The original dilutions were not appropriate for this sample.
G-11	The sample was filtered after it was received at the laboratory.
J	Estimated value
L-13	Container C filled with Container A per clients request
U	Analyte was not detected above the indicated value.

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

WORK ORDER
Chain of Custody

2019016

Client Code: 3157
Client: Tetra Tech
Project Manager: Richard A Wheeler
Project: 2020 - Prompton Reservoir
Report To: Tetra Tech - David Wertz - USACE, Phila Dist. Env.Resources Branch 100 Penn Square E., Arlington, VA 22201
Invoice To: Tetra Tech - David Wertz - USACE, Phila Dist. Env.Resources Branch 100 Penn Square E., Arlington, VA 22201

Comments: told Client that 20190601 C was empty. 7-7-20 - ECC filled with A and relabeled - ecc 7.7.20

Collected By : (Full Name) Gregory Wacik

2019016-01 PR-1S

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

Matrix: Non-Potable Water Date: 7/2/20
Type: Grab Time: 0830

A - Pl 500ml NP, minimal hdspc
B - Pl Liter NP
~~C - Sterile Pl 125ml NaThio~~ ← Client said Fill with "A" Container per RAW - ecc 7.7.20
D - Pl 500ml H2SO4
E - Pl 250ml NP
F - Pl 500ml Lab Filtered
G - Vial Amber 40ml H3PO4, minimal hdspc
H - Vial Amber 40ml H3PO4, minimal hdspc
I - Vial Amber 40ml H3PO4, minimal hdspc

2019016-02 PR-2S

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

Matrix: Non-Potable Water Date: 7/7/20
Type: Grab Time: 0945

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

Relinquished By	Date/Time 7/7/20 1250	Received By	Date/Time 7.7.20 1301
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	Date/Time 7-7-20 1409

Sample Kit Prepared By: JSV	Date/Time 6-10-20
Sample Temp (°C):	
Samples on Ice?	Yes No NA
Approved By:	
Entered By:	

Printed: 6/5/2020 8:28:34AM

Report Template: wko WorkOrder COC ls

2019016

M.J. Reider Associates, Inc.

Client Code: 3157
Project Manager: Richard A Wheeler

Client: Tetra Tech
Project: 2020 - Prompton Reservoir

Comments:

Collected By : (Full Name) Gregory Wacik

2019016-03 PR-2M

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

Matrix: Non-Potable Water Date: 7/7/20
Type: Grab Time: 0945

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

2019016-04 PR-2D

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

Matrix: Non-Potable Water Date: 7/7/20
Type: Grab Time: 0945

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

2019016-05 PR-3S

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

Matrix: Non-Potable Water Date: 7/7/20
Type: Grab Time: 0910

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

Relinquished By	7/7/20 1250 Date/Time	Received By	7-7-20 1301 Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	7-7-20 1409 Date/Time

Sample Kit Prepared By: JSV	Date/Time: 6-10-20
Sample Temp (°C): 5	
Samples on Ice? Yes No NA	
Approved By:	
Entered By:	

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

Printed: 6/5/2020 8:28:34AM

Report Template: wko WorkOrder COC ls

2019016

M.J. Reider Associates, Inc.

Client Code: 3157
Project Manager: Richard A Wheeler

Client: Tetra Tech
Project: 2020 - Prompton Reservoir

Comments:

Collected By : (Full Name) Gregory Wacik

2019016-06 PR-3M

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

Matrix: Non-Potable Water
Type: Grab
Date: 7/7/20
Time: 0910

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

2019016-07 PR-3D

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

Matrix: Non-Potable Water
Type: Grab
Date: 7/7/20
Time: 0910

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

2019016-08 PR-4S

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

Matrix: Non-Potable Water
Type: Grab
Date: 7/7/20
Time: 0820

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

Relinquished By	Date/Time 7/7/20 1250	Received By	Date/Time 7.7.20 1301
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	Date/Time 7.7-20 1409

Sample Kit Prepared By: JSV	Date/Time 6-10-20
Sample Temp (°C):	
Samples on Ice?	Yes No NA
Approved By:	
Entered By:	

Printed: 6/5/2020 8:28:34AM

Report Template: wko WorkOrder COC ls

MJRA Terms & Conditions

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

Sample Submission, Sample Acceptance & Sampling Containers

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

Turnaround Times (TAT)

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

Analytical Results, Sample Collection Integrity & Subcontracting

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

Payment Terms

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

Warranty & Litigation

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

Reviewed and Approved by:

Richard A Wheeler
Director of Field Services

Certificate of Analysis

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

Laboratory No.: 2021819
Report: 08/19/20
Lab Contact: Richard A Wheeler

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

Project: 2020 - Prompton Reservoir

Lab ID: 2021819-01 **Collected By:** Client **Sampled:** 08/11/20 08:40 **Received:** 08/11/20 14:21
Sample Desc: PR-1S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.07	mg/l		0.05	SM 4500-P F	08/14/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	28	mg CaCO3/L		2	SM 2320 B	08/12/20		APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	08/12/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/12/20 11:30		SLM
Nitrate as N	0.37	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	08/11/20 21:12	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/11/20 21:12	U	MRW
Nitrate+Nitrite as N	<0.38	mg/l	0.125	1.10	CALCULATED	08/11/20 21:12		MRW
Nitrogen, Total Kjeldahl (TKN)	<0.47	mg/l	0.47	0.50	EPA 351.2	08/14/20	U	SNF
Phosphorus as P, Total	0.02	mg/l	0.01	0.05	SM 4500-P E	08/13/20	J	RCE
Solids, Total Dissolved	58	mg/l	4	5	SM 2540 C	08/12/20		TMH
Total Organic Carbon	3.0	mg/l	0.3	0.5	SM 5310 C	08/13/20		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	08/12/20		TMH

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	111	mpn/100ml	1	SM 9223 B/Quantitray	8/11/20 15:59	8/12/20 10:30		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	8/11/20 15:59	8/12/20 10:30		JMW

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Lab ID: 2021819-02 **Collected By:** Client **Sampled:** 08/11/20 10:00 **Received:** 08/11/20 14:21
Sample Desc: PR-2S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	08/14/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	28	mg CaCO3/L		2	SM 2320 B	08/12/20		APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	08/12/20	U	APR
Biochemical Oxygen Demand	7.4	mg/l	2.0	2.0	SM 5210 B	08/12/20 12:30		SLM
Nitrate as N	<0.11	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	08/11/20 16:53	U	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/11/20 16:53	U	MRW
Nitrate+Nitrite as N	<0.12	mg/l	0.125	1.10	CALCULATED	08/11/20 16:53		MRW
Nitrogen, Total Kjeldahl (TKN)	1.32	mg/l	0.47	0.50	EPA 351.2	08/14/20		SNF
Phosphorus as P, Total	0.04	mg/l	0.01	0.05	SM 4500-P E	08/13/20	J	RCE
Solids, Total Dissolved	58	mg/l	4	5	SM 2540 C	08/12/20		TMH
Total Organic Carbon	5.0	mg/l	0.3	0.5	SM 5310 C	08/13/20		ALD
Solids, Total Suspended	12	mg/l	1	1	SM 2540 D	08/12/20		TMH

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	<1	mpn/100ml	1	SM 9223 B/Quantitray	8/11/20 15:59	8/12/20 10:30		JMW
Total Coliform	326	mpn/100ml	1	SM 9223 B/Quantitray	8/11/20 15:59	8/12/20 10:30		JMW

Lab ID: 2021819-03 **Collected By:** Client **Sampled:** 08/11/20 10:00 **Received:** 08/11/20 14:21
Sample Desc: PR-2M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.05	mg/l		0.05	SM 4500-P F	08/14/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	25	mg CaCO3/L		2	SM 2320 B	08/12/20		APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	08/12/20	U	APR
Biochemical Oxygen Demand	4.8	mg/l	2.0	2.0	SM 5210 B	08/12/20 12:30		SLM
Nitrate as N	0.23	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	08/11/20 17:10	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/11/20 17:10	U	MRW
Nitrate+Nitrite as N	<0.24	mg/l	0.125	1.10	CALCULATED	08/11/20 17:10		MRW
Nitrogen, Total Kjeldahl (TKN)	0.99	mg/l	0.47	0.50	EPA 351.2	08/14/20		SNF
Phosphorus as P, Total	0.03	mg/l	0.01	0.05	SM 4500-P E	08/13/20	J	RCE
Solids, Total Dissolved	61	mg/l	4	5	SM 2540 C	08/12/20		TMH
Total Organic Carbon	4.7	mg/l	0.3	0.5	SM 5310 C	08/13/20		ALD
Solids, Total Suspended	10	mg/l	1	1	SM 2540 D	08/12/20		TMH

Lab ID: 2021819-04 **Collected By:** Client **Sampled:** 08/11/20 10:00 **Received:** 08/11/20 14:21
Sample Desc: PR-2D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	08/14/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	23	mg CaCO3/L		2	SM 2320 B	08/12/20		APR
Ammonia as N	0.12	mg/l	0.01	0.10	ASTM D6919-03	08/12/20		APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/12/20 11:30		SLM
Nitrate as N	0.29	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	08/11/20 18:34	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/11/20 18:34	U	MRW
Nitrate+Nitrite as N	<0.30	mg/l	0.125	1.10	CALCULATED	08/11/20 18:34		MRW
Nitrogen, Total Kjeldahl (TKN)	0.66	mg/l	0.47	0.50	EPA 351.2	08/14/20		SNF
Phosphorus as P, Total	0.03	mg/l	0.01	0.05	SM 4500-P E	08/13/20	J	RCE
Solids, Total Dissolved	56	mg/l	4	5	SM 2540 C	08/12/20		TMH
Total Organic Carbon	5.3	mg/l	0.3	0.5	SM 5310 C	08/13/20		ALD
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	08/12/20		TMH

Lab ID: 2021819-05 **Collected By:** Client **Sampled:** 08/11/20 09:20 **Received:** 08/11/20 14:21
Sample Desc: PR-3S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	08/14/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	25	mg CaCO3/L		2	SM 2320 B	08/12/20		APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	08/12/20	U	APR
Biochemical Oxygen Demand	4.8	mg/l	2.0	2.0	SM 5210 B	08/12/20 12:30		SLM
Nitrate as N	<0.11	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	08/11/20 17:27	U	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/11/20 17:27	U	MRW
Nitrate+Nitrite as N	<0.12	mg/l	0.125	1.10	CALCULATED	08/11/20 17:27		MRW
Nitrogen, Total Kjeldahl (TKN)	1.27	mg/l	0.47	0.50	EPA 351.2	08/14/20		SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.05	SM 4500-P E	08/13/20	U	RCE
Solids, Total Dissolved	57	mg/l	4	5	SM 2540 C	08/12/20		TMH
Total Organic Carbon	5.0	mg/l	0.3	0.5	SM 5310 C	08/13/20		ALD
Solids, Total Suspended	6	mg/l	1	1	SM 2540 D	08/12/20		TMH

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	1	mpn/100ml	1	SM 9223 B/Quantitray	8/11/20 15:59	8/12/20 10:30		JMW
Total Coliform	816	mpn/100ml	1	SM 9223 B/Quantitray	8/11/20 15:59	8/12/20 10:30		JMW

Lab ID: 2021819-06 **Collected By:** Client **Sampled:** 08/11/20 09:20 **Received:** 08/11/20 14:21
Sample Desc: PR-3M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	08/14/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	24	mg CaCO3/L		2	SM 2320 B	08/12/20		APR
Ammonia as N	0.15	mg/l	0.01	0.10	ASTM D6919-03	08/12/20		APR
Biochemical Oxygen Demand	2.6	mg/l	2.0	2.0	SM 5210 B	08/12/20 11:30		SLM
Nitrate as N	0.25	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	08/11/20 17:44	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/11/20 17:44	U	MRW
Nitrate+Nitrite as N	<0.26	mg/l	0.125	1.10	CALCULATED	08/11/20 17:44		MRW
Nitrogen, Total Kjeldahl (TKN)	0.83	mg/l	0.47	0.50	EPA 351.2	08/14/20		SNF
Phosphorus as P, Total	0.02	mg/l	0.01	0.05	SM 4500-P E	08/13/20	J	RCE
Solids, Total Dissolved	53	mg/l	4	5	SM 2540 C	08/12/20		TMH
Total Organic Carbon	4.7	mg/l	0.3	0.5	SM 5310 C	08/13/20		ALD
Solids, Total Suspended	6	mg/l	1	1	SM 2540 D	08/12/20		TMH

Lab ID: 2021819-07 **Collected By:** Client **Sampled:** 08/11/20 09:20 **Received:** 08/11/20 14:21
Sample Desc: PR-3D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	08/14/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	23	mg CaCO3/L		2	SM 2320 B	08/12/20		APR
Ammonia as N	0.30	mg/l	0.01	0.10	ASTM D6919-03	08/12/20		APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/12/20 11:30		SLM
Nitrate as N	0.31	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	08/11/20 18:01	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/11/20 18:01	U	MRW
Nitrate+Nitrite as N	<0.32	mg/l	0.125	1.10	CALCULATED	08/11/20 18:01		MRW
Nitrogen, Total Kjeldahl (TKN)	1.04	mg/l	0.47	0.50	EPA 351.2	08/14/20		SNF
Phosphorus as P, Total	0.04	mg/l	0.01	0.05	SM 4500-P E	08/13/20	J	RCE
Solids, Total Dissolved	58	mg/l	4	5	SM 2540 C	08/12/20		TMH
Total Organic Carbon	5.9	mg/l	0.3	0.5	SM 5310 C	08/13/20		ALD
Solids, Total Suspended	4	mg/l	1	1	SM 2540 D	08/12/20		TMH

Lab ID: 2021819-08 **Collected By:** Client **Sampled:** 08/11/20 08:20 **Received:** 08/11/20 14:21
Sample Desc: PR-4S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.06	mg/l		0.05	SM 4500-P F	08/14/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	21	mg CaCO3/L		2	SM 2320 B	08/12/20		APR
Ammonia as N	0.18	mg/l	0.01	0.10	ASTM D6919-03	08/12/20		APR
Biochemical Oxygen Demand	6.0	mg/l	2.0	2.0	SM 5210 B	08/12/20 12:30		SLM
Nitrate as N	0.38	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	08/11/20 18:18	J	MRW
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/11/20 18:18	U	MRW
Nitrate+Nitrite as N	<0.39	mg/l	0.125	1.10	CALCULATED	08/11/20 18:18		MRW
Nitrogen, Total Kjeldahl (TKN)	0.94	mg/l	0.47	0.50	EPA 351.2	08/14/20		SNF
Phosphorus as P, Total	0.07	mg/l	0.01	0.05	SM 4500-P E	08/13/20		RCE
Solids, Total Dissolved	60	mg/l	4	5	SM 2540 C	08/12/20		TMH
Total Organic Carbon	6.6	mg/l	0.3	0.5	SM 5310 C	08/13/20		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	08/12/20		TMH

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	77	mpn/100ml	1	SM 9223 B/Quantitray	8/11/20 15:59	8/12/20 10:30		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	8/11/20 15:59	8/12/20 10:30		JMW

Preparation Methods

Specific Method	Preparation Method	Prep Batch	Prepared Date	Prepared By
2021819-01				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0H0643	08/13/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0H0740	08/13/2020	RCE
2021819-02				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0H0643	08/13/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0H0740	08/13/2020	RCE
2021819-03				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0H0643	08/13/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0H0740	08/13/2020	RCE
2021819-04				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0H0643	08/13/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0H0740	08/13/2020	RCE
2021819-05				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0H0643	08/13/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0H0740	08/13/2020	RCE
2021819-06				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0H0643	08/13/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0H0740	08/13/2020	RCE
2021819-07				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0H0643	08/13/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0H0740	08/13/2020	RCE
2021819-08				
Dissolved General Chemistry				

SM 4500-P F	SM 4500-P B	B0H0643	08/13/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0H0740	08/13/2020	RCE

Notes and Definitions

G-11	The sample was filtered after it was received at the laboratory.
J	Estimated value
U	Analyte was not detected above the indicated value.

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

WORK ORDER
Chain of Custody

2021819

Client Code: 3157 **Client:** Tetra Tech
Project Manager: Richard A Wheeler **Project:** 2020 - Prompton Reservoir
Report To: Tetra Tech - David Wertz - USACE, Phila Dist. Env.Resources Branch 100 Penn Square E., Arlington, VA 22201
Invoice To: Tetra Tech - David Wertz - USACE, Phila Dist. Env.Resources Branch 100 Penn Square E., Arlington, VA 22201

Collected By : (Full Name) Gregory Wacik

Comments:

2021819-01 PR-1S

Matrix: Non-Potable Water Date: 8/11/20
Type: Grab Time: 0840

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

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

2021819-02 PR-2S

Matrix: Non-Potable Water Date: 8/11/20
Type: Grab Time: 1000

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

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

Relinquished By	Date/Time 8/11/20 1250	Received By	Date/Time 8-11-20 1250
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	Date/Time 8-11-20 1421

Sample Kit Prepared By: JBS	Date/Time 6-30
Sample Temp (°C): 8	
Samples on Ice? Yes No NA	
Approved By: JBS	
Entered By:	

Printed: 6/29/2020 9:05:39AM

Report Template: wkc_workorder_COC_is

M.J. Reider Associates, Inc.

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

Project Manager: Richard A Wheeler **Project:** 2020 - Prompton Reservoir

Comments:

Collected By : (Full Name) Gregory Wacik

2021819-03 PR-2M

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

Matrix: Non-Potable Water Date: 8/11/20
Type: Grab Time: 1000

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

2021819-04 PR-2D

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

Matrix: Non-Potable Water Date: 8/11/20
Type: Grab Time: 1000

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

2021819-05 PR-3S

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

Matrix: Non-Potable Water Date: 8/11/20
Type: Grab Time: 0920

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

Relinquished By	8/11/20 1250 Date/Time	Received By	8-11-20 1250 Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	8-11-20 1421 Date/Time

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

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

Printed: 6/29/2020 9:05:39AM

Report Template: [illegible]

M.J. Reider Associates, Inc.

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

Project Manager: Richard A Wheeler **Project:** 2020 - Prompton Reservoir

Comments:

Collected By : (Full Name) Gregory Wack

2021819-06 PR-3M

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

Matrix: Non-Potable Water Date: 8/11/20
Type: Grab Time: 0920

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

2021819-07 PR-3D

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

Matrix: Non-Potable Water Date: 8/11/20
Type: Grab Time: 0920

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

2021819-08 PR-4S

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

Matrix: Non-Potable Water Date: 8/11/20
Type: Grab Time: 0820

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

Relinquished By	Date/Time 8/11/20 1250	Received By	Date/Time 8-11-20 1250
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	Date/Time 8/12 1421

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

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

Printed: 6/29/2020 9:05:39AM

Report Template: v

MJRA Terms & Conditions

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

Sample Submission, Sample Acceptance & Sampling Containers

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

Turnaround Times (TAT)

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

Analytical Results, Sample Collection Integrity & Subcontracting

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

Payment Terms

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

Warranty & Litigation

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

Reviewed and Approved by:

Richard A Wheeler
Director of Field Services

Certificate of Analysis

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

Laboratory No.: 2026761
Report: 09/09/20
Lab Contact: Richard A Wheeler

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

Project: 2020 - Prompton Reservoir

Lab ID: 2026761-01 **Collected By:** Client **Sampled:** 09/01/20 08:40 **Received:** 09/01/20 14:00
Sample Desc: PR-1S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	09/04/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	28	mg CaCO3/L		2	SM 2320 B	09/02/20		APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	09/02/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	09/01/20 16:20		SLM
Nitrate as N	0.28	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	09/01/20 21:37	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/01/20 21:37	U	TML
Nitrate+Nitrite as N	<0.29	mg/l	0.125	1.10	CALCULATED	09/01/20 21:37		TML
Nitrogen, Total Kjeldahl (TKN)	<0.47	mg/l	0.47	0.50	EPA 351.2	09/03/20	U	SNF
Phosphorus as P, Total	0.02	mg/l	0.01	0.05	SM 4500-P E	09/03/20	J	RCE
Solids, Total Dissolved	66	mg/l	4	5	SM 2540 C	09/02/20		TMH
Total Organic Carbon	2.3	mg/l	0.3	0.5	SM 5310 C	09/02/20		HRG
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	09/02/20		TMH

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	40	mpn/100ml	1	SM 9223 B/Quantitray	9/1/20 15:27	9/2/20 11:21		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	9/1/20 15:27	9/2/20 11:21		JMW

Lab ID: 2026761-02 **Collected By:** Client **Sampled:** 09/01/20 09:50 **Received:** 09/01/20 14:00
Sample Desc: PR-2S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	09/04/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	25	mg CaCO3/L		2	SM 2320 B	09/02/20		APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	09/02/20	U	APR
Biochemical Oxygen Demand	4.7	mg/l	2.0	2.0	SM 5210 B	09/01/20 16:20		SLM
Nitrate as N	<0.11	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	09/01/20 21:54	U	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/01/20 21:54	U	TML
Nitrate+Nitrite as N	<0.12	mg/l	0.125	1.10	CALCULATED	09/01/20 21:54		TML
Nitrogen, Total Kjeldahl (TKN)	0.62	mg/l	0.47	0.50	EPA 351.2	09/03/20		SNF
Phosphorus as P, Total	0.03	mg/l	0.01	0.05	SM 4500-P E	09/03/20	J	RCE
Solids, Total Dissolved	54	mg/l	4	5	SM 2540 C	09/02/20		TMH
Total Organic Carbon	4.6	mg/l	0.3	0.5	SM 5310 C	09/02/20		HRG
Solids, Total Suspended	7	mg/l	1	1	SM 2540 D	09/02/20		TMH

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	1	mpn/100ml	1	SM 9223 B/Quantitray	9/1/20 15:27	9/2/20 11:21		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	9/1/20 15:27	9/2/20 11:21		JMW

Lab ID: 2026761-03 **Collected By:** Client **Sampled:** 09/01/20 09:50 **Received:** 09/01/20 14:00
Sample Desc: PR-2M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	09/04/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	25	mg CaCO3/L		2	SM 2320 B	09/02/20		APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	09/02/20	U	APR
Biochemical Oxygen Demand	3.5	mg/l	2.0	2.0	SM 5210 B	09/01/20 16:20		SLM
Nitrate as N	<0.11	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	09/01/20 22:10	U	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/01/20 22:10	U	TML
Nitrate+Nitrite as N	<0.12	mg/l	0.125	1.10	CALCULATED	09/01/20 22:10		TML
Nitrogen, Total Kjeldahl (TKN)	0.80	mg/l	0.47	0.50	EPA 351.2	09/03/20		SNF
Phosphorus as P, Total	0.04	mg/l	0.01	0.05	SM 4500-P E	09/03/20	J	RCE
Solids, Total Dissolved	63	mg/l	4	5	SM 2540 C	09/02/20		TMH
Total Organic Carbon	4.4	mg/l	0.3	0.5	SM 5310 C	09/02/20		HRG
Solids, Total Suspended	6	mg/l	1	1	SM 2540 D	09/02/20		TMH

Lab ID: 2026761-04 **Collected By:** Client **Sampled:** 09/01/20 09:50 **Received:** 09/01/20 14:00
Sample Desc: PR-2D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	09/04/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	25	mg CaCO3/L		2	SM 2320 B	09/02/20		APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	09/02/20	U	APR
Biochemical Oxygen Demand	3.1	mg/l	2.0	2.0	SM 5210 B	09/01/20 16:20		SLM
Nitrate as N	<0.11	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	09/01/20 22:27	U	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/01/20 22:27	U	TML
Nitrate+Nitrite as N	<0.12	mg/l	0.125	1.10	CALCULATED	09/01/20 22:27		TML
Nitrogen, Total Kjeldahl (TKN)	0.62	mg/l	0.47	0.50	EPA 351.2	09/03/20		SNF
Phosphorus as P, Total	0.04	mg/l	0.01	0.05	SM 4500-P E	09/03/20	J	RCE
Solids, Total Dissolved	81	mg/l	4	5	SM 2540 C	09/02/20		TMH
Total Organic Carbon	4.4	mg/l	0.3	0.5	SM 5310 C	09/02/20		HRG
Solids, Total Suspended	8	mg/l	1	1	SM 2540 D	09/02/20		TMH

Lab ID: 2026761-05 **Collected By:** Client **Sampled:** 09/01/20 09:15 **Received:** 09/01/20 14:00
Sample Desc: PR-3S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	09/04/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	26	mg CaCO3/L		2	SM 2320 B	09/02/20		APR
Ammonia as N	0.01	mg/l	0.01	0.10	ASTM D6919-03	09/02/20	J	APR
Biochemical Oxygen Demand	3.3	mg/l	2.0	2.0	SM 5210 B	09/01/20 16:20		SLM
Nitrate as N	<0.11	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	09/01/20 23:18	U	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/01/20 23:18	U	TML
Nitrate+Nitrite as N	<0.12	mg/l	0.125	1.10	CALCULATED	09/01/20 23:18		TML
Nitrogen, Total Kjeldahl (TKN)	0.56	mg/l	0.47	0.50	EPA 351.2	09/03/20		SNF
Phosphorus as P, Total	0.05	mg/l	0.01	0.05	SM 4500-P E	09/03/20		RCE
Solids, Total Dissolved	60	mg/l	4	5	SM 2540 C	09/02/20		TMH
Total Organic Carbon	4.8	mg/l	0.3	0.5	SM 5310 C	09/02/20		HRG
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	09/02/20		TMH

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	<1	mpn/100ml	1	SM 9223 B/Quantitray	9/1/20 15:27	9/2/20 11:21		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	9/1/20 15:27	9/2/20 11:21		JMW

Lab ID: 2026761-06 **Collected By:** Client **Sampled:** 09/01/20 09:15 **Received:** 09/01/20 14:00
Sample Desc: PR-3M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	09/04/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	25	mg CaCO3/L		2	SM 2320 B	09/02/20		APR
Ammonia as N	0.12	mg/l	0.01	0.10	ASTM D6919-03	09/02/20		APR
Biochemical Oxygen Demand	2.6	mg/l	2.0	2.0	SM 5210 B	09/01/20 16:20		SLM
Nitrate as N	<0.11	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	09/01/20 23:35	U	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/01/20 23:35	U	TML
Nitrate+Nitrite as N	<0.12	mg/l	0.125	1.10	CALCULATED	09/01/20 23:35		TML
Nitrogen, Total Kjeldahl (TKN)	0.60	mg/l	0.47	0.50	EPA 351.2	09/03/20		SNF
Phosphorus as P, Total	0.02	mg/l	0.01	0.05	SM 4500-P E	09/03/20	J	RCE
Solids, Total Dissolved	67	mg/l	4	5	SM 2540 C	09/02/20		TMH
Total Organic Carbon	4.6	mg/l	0.3	0.5	SM 5310 C	09/02/20		HRG
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	09/02/20		TMH

Lab ID: 2026761-07 **Collected By:** Client **Sampled:** 09/01/20 09:15 **Received:** 09/01/20 14:00
Sample Desc: PR-3D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.07	mg/l		0.05	SM 4500-P F	09/04/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	53	mg CaCO3/L		2	SM 2320 B	09/02/20		APR
Ammonia as N	1.89	mg/l	0.01	0.10	ASTM D6919-03	09/02/20		APR
Biochemical Oxygen Demand	8.2	mg/l	2.0	2.0	SM 5210 B	09/01/20 16:20		SLM
Nitrate as N	<0.11	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	09/01/20 23:51	U	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/01/20 23:51	U	TML
Nitrate+Nitrite as N	<0.12	mg/l	0.125	1.10	CALCULATED	09/01/20 23:51		TML
Nitrogen, Total Kjeldahl (TKN)	1.92	mg/l	0.47	0.50	EPA 351.2	09/03/20		SNF
Phosphorus as P, Total	0.15	mg/l	0.01	0.05	SM 4500-P E	09/03/20		RCE
Solids, Total Dissolved	96	mg/l	4	5	SM 2540 C	09/02/20		TMH
Total Organic Carbon	7.4	mg/l	0.3	0.5	SM 5310 C	09/02/20		HRG
Solids, Total Suspended	5	mg/l	1	1	SM 2540 D	09/02/20		TMH

M.J. Reider Associates, Inc.

Lab ID: 2026761-08 **Collected By:** Client **Sampled:** 09/01/20 08:20 **Received:** 09/01/20 14:00
Sample Desc: PR-4S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	09/04/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	25	mg CaCO3/L		2	SM 2320 B	09/02/20		APR
Ammonia as N	0.14	mg/l	0.01	0.10	ASTM D6919-03	09/02/20		APR
Biochemical Oxygen Demand	2.3	mg/l	2.0	2.0	SM 5210 B	09/01/20 16:20		SLM
Nitrate as N	0.36	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	09/02/20 0:08	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/02/20 0:08	U	TML
Nitrate+Nitrite as N	<0.37	mg/l	0.125	1.10	CALCULATED	09/02/20 0:08		TML
Nitrogen, Total Kjeldahl (TKN)	0.51	mg/l	0.47	0.50	EPA 351.2	09/03/20		SNF
Phosphorus as P, Total	0.04	mg/l	0.01	0.05	SM 4500-P E	09/03/20	J	RCE
Solids, Total Dissolved	57	mg/l	4	5	SM 2540 C	09/02/20		TMH
Total Organic Carbon	4.5	mg/l	0.3	0.5	SM 5310 C	09/02/20		HRG
Solids, Total Suspended	4	mg/l	1	1	SM 2540 D	09/02/20		TMH

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	11	mpn/100ml	1	SM 9223 B/Quantitray	9/1/20 15:27	9/2/20 11:21		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	9/1/20 15:27	9/2/20 11:21		JMW

Preparation Methods

Specific Method	Preparation Method	Prep Batch	Prepared Date	Prepared By
2026761-01				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0I0182	09/02/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0I0179	09/03/2020	RCE
2026761-02				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0I0182	09/02/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0I0179	09/03/2020	RCE
2026761-03				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0I0182	09/02/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0I0179	09/03/2020	RCE
2026761-04				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0I0182	09/02/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0I0179	09/03/2020	RCE
2026761-05				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0I0182	09/02/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0I0179	09/03/2020	RCE
2026761-06				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0I0182	09/02/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0I0179	09/03/2020	RCE
2026761-07				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0I0182	09/02/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0I0179	09/03/2020	RCE
2026761-08				
Dissolved General Chemistry				

SM 4500-P F	SM 4500-P B	B0I0182	09/02/2020	RCE

General Chemistry

SM 4500-P E	SM 4500-P B	B0I0179	09/03/2020	RCE

Notes and Definitions

G-11	The sample was filtered after it was received at the laboratory.
J	Estimated value
U	Analyte was not detected above the indicated value.

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

WORK ORDER
Chain of Custody

2026761

Client Code: 3157
Project Manager: Richard A Wheeler
Client: Tetra Tech
Project: 2020 - Prompton Reservoir
Report To: Tetra Tech - David Wertz - USACE, Phila Dist. Env.Resources Branch 100 Penn Square E., Arlington, VA 22201
Invoice To: Tetra Tech - David Wertz - USACE, Phila Dist. Env.Resources Branch 100 Penn Square E., Arlington, VA 22201

Collected By : (Full Name) Gregory Wacik

Comments:

2026761-01 PR-1S

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

Matrix: Non-Potable Water
Type: Grab
Date: 9/1/20
Time: 0840

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

2026761-02 PR-2S

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

Matrix: Non-Potable Water
Type: Grab
Date: 9/1/20
Time: 0950

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

	Date/Time		Date/Time
Relinquished By	9/1/20 1230	Received By	9-1-20 1235
Relinquished By		Received By	
Relinquished By		Received at Laboratory By	9-1-20 1400

Sample Kit Prepared By:	Date/Time
	8/7/20
Sample Temp (°C):	6
Samples on Ice?	(Yes) No NA
Approved By:	BSW
Entered By:	

Report Template:

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

Printed: 8/6/2020 12:10:09

M.J. Reider Associates, Inc.

2026761

Client Code: 3157
Project Manager: Richard A Wheeler

Client: Tetra Tech
Project: 2020 - Prompton Reservoir

Collected By : (Full Name) Gregory Wacik

Comments:

2026761-03 PR-2M

JMK KM MW KM

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

Matrix: Non-Potable Water
Type: Grab
Date: 9/1/20
Time: 0950

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

2026761-04 PR-2D

JMK KM MW KM

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

Matrix: Non-Potable Water
Type: Grab
Date: 9/1/20
Time: 0950

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

2026761-05 PR-3S

JMK KM MW MW

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

Matrix: Non-Potable Water
Type: Grab
Date: 9/1/20
Time: 0915

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

Relinquished By	Date/Time 9/1/20 1230	Received By	Date/Time 9-1-20 1235
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	Date/Time 9-1-20 1400

Sample Kit Prepared By:	Date/Time 8/7/20
Sample Temp (°C):	6
Samples on Ice?	Yes No NA
Approved By:	BSW
Entered By:	

Printed: 8/6/2020 12:10:09

Report Template: WO WorkOrder COC 15

M.J. Reider Associates, Inc.

Client Code: 3157
Project Manager: Richard A Wheeler

Client: Tetra Tech
Project: 2020 - Prompton Reservoir
Comments:

Collected By : (Full Name) Gregory Wacik

2026761-06 PR-3M

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

Matrix: Non-Potable Water — Date: 9/1/20
Type: Grab — Time: 0915

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

2026761-07 PR-3D

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

Matrix: Non-Potable Water — Date: 9/1/20
Type: Grab — Time: 0915

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

2026761-08 PR-4S

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

Matrix: Non-Potable Water — Date: 9/1/20
Type: Grab — Time: 0820

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

	Date/Time		Date/Time
Relinquished By	9/1/20 1230	Received By	9-1-20 1235
Relinquished By		Received By	
Relinquished By		Received at Laboratory By	9-1-20 1400

Sample Kit Prepared By:	Date/Time: 8/17/20
Sample Temp (°C):	6
Samples on Ice?	Yes / No / NA
Approved By:	
Entered By:	

Report Temp

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

Printed: 8/6/2020 12:10:09

MJRA Terms & Conditions

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

Sample Submission, Sample Acceptance & Sampling Containers

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

Turnaround Times (TAT)

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

Analytical Results, Sample Collection Integrity & Subcontracting

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

Payment Terms

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

Warranty & Litigation

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

Reviewed and Approved by:

Richard A Wheeler
Director of Field Services