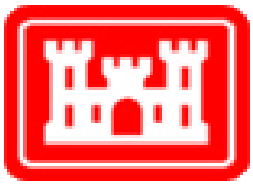
2022 WATER QUALITY MONITORING
PROMPTON RESERVOIR
PROMPTON, PENNSYLVANIA



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

May 2023

2022 Water Quality Monitoring
Prompton Reservoir
Prompton, Pennsylvania

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Executive Summary

The United States Army Corps of Engineers, Philadelphia District, implemented a water quality monitoring program during the mid-1970s to evaluate how its dam and reservoir civil works projects may be affecting water resources. Data collected during this initial effort and annually thereafter serves as an invaluable tool for evaluating the significance of annual water quality measurements and tracking long-term trends. The District's Water Quality Program's area of responsibility includes 4 flood control reservoirs and is utilized to evaluate changes in operations and their potential effects on water quality, the environment, and public use and safety.

While water quality in the Philadelphia District's reservoirs is generally good overall, several water quality issues exist at each project and need to be closely monitored. Prompton Reservoir is a relatively shallow lake (35 feet deep at its greatest depths) with a watershed that is predominantly agriculture land use based with nutrient loads that directly affects the water quality of the lake. Water quality conditions experienced within the lake and release waters are directly affected by the watershed and in lake environmental chemical and biological processes. The project does not have a selective withdrawal tower that could be used to potentially mitigate water quality concerns in lake and downstream. As it relates to Prompton Reservoir water quality conditions during the May through September 2022 sampling season, the following observations were made:

- Monthly water quality profile monitoring at all four fixed stations was conducted once a month from May through September 2022. The reservoir developed temperature stratification that was evident as early as May and continued through September. The shallow depths of the reservoir and meteorological conditions experienced in any given year dictate the onset of stratification that is observed annually.

- Dissolved oxygen levels remained above the minimum Pennsylvania state water quality criteria for the epilimnion (surface waters) of stratified lakes. The Pennsylvania water quality standard for DO is a minimum concentration of 5 mg/L within the epilimnion of stratified lakes. However, the reservoir experienced severe low oxygen conditions throughout the sampling season. There are no state criteria established for deep water dissolved oxygen levels. Stratification development was apparent in May with bottom water DO levels approaching 0.0 mg/L and persisting through September, with low DO concentrations most severe in August and September. Hypoxia, or conditions of DO concentrations less than 2 mg/L, is generally accepted as the threshold at which the most severe effects on biota occur. In all months sampled except May, the water column of Prompton Reservoir was affected by hypoxia. Hypoxic water occupied up to 50% of the water column in August. Low dissolved oxygen conditions were transferred downstream in release waters. Release waters are re-aerated as they pass through the outlet system of the reservoir during releases downstream and subsequently dissolved oxygen levels downstream did remain above Pennsylvania state surface water quality criteria.

- The pH profile in the water column of Prompton Reservoir was consistent with a stratified lake during 2022. Increased surface water productivity (algae blooms) in Prompton Reservoir result in lake surface waters being slightly higher in pH than deeper waters. Lake surface waters exceeded the PADEP water quality standard maximum pH level of 9.0 during the month of July.

- Apart from total phosphorus, nutrient samples collected in 2022 (including samples from reservoir, tailwater, and tributary sites), remained consistent with United States Environmental Protection Agency (EPA) or Pennsylvania state water quality criteria and recommended levels during the May through September sampling season. EPA guidance for nutrient criteria in lakes and reservoirs suggests a maximum concentration for total phosphorus of 0.01 mg/L. Lakes and reservoirs exceeding this concentration are more likely to experience algal bloom and

Executive Summary

eutrophication challenges. Total phosphorus in the watershed and lake body of Prompton Reservoir was frequently measured at concentrations well above the recommended standard. Tributary surface waters (external loading) and phosphorus bound to bottom sediments released when oxygen levels are depleted in lake bottom waters (internal loading) are the prime contributing factors to eutrophic conditions in Prompton Reservoir. This phosphorus is available for plant growth and facilitates the algal blooms experienced in Prompton Reservoir.

- In 2022, surface water bacteria samples were collected at all four fixed stations in the watershed and reservoir and data results are used as a bacterial contamination monitoring tool. Bacteria contamination was low in Prompton Reservoir but elevated in its upstream tributary during 2022. Two samples did exceed the EPA single water sample threshold at upstream tributary station PR-1S on 17 May and 13 September. Primary water contact recreation is not permitted at Prompton Reservoir.

- Algal blooms have historically been observed at Prompton Reservoir as the watershed contains agriculture-based land uses and reservoir tributary inflows often contain elevated levels of sediments and nutrients. These nutrients along with those released from bottom sediments under low oxygen conditions support the growth of algae and cyanobacteria in Prompton Reservoir. A significant algal bloom was observed in August. The Philadelphia District initiated coordination with the Pennsylvania Department of Environmental Protection regarding response and monitoring in addition to maintaining posted public notices at lake access points (additional social media postings with links to Centers for Disease Control and Prevention cyanobacteria website) highlighting the presence and risks of potential harmful toxic algae and to pursue lake recreation at your own risk. No reservoir recreational closures were initiated because of algal blooms or toxin production. The entire lake remained in a public warning condition for much of the recreational season.

1.0 INTRODUCTION

1.1 DESCRIPTION OF PROMPTON RESERVOIR

The U.S. Army Corps of Engineers (USACE) manages Prompton Reservoir located in northeastern Pennsylvania within the Delaware River Basin. Prompton Reservoir was designed to provide flood control to downstream communities along the Lackawaxen River and provide limited recreational opportunities for the area. The reservoir is located approximately 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.

1.2 PURPOSE OF THE MONITORING PROGRAM

The United States Army Corps of Engineers commitment to environmental compliance and protection of estuaries, rivers, lakes, and navigable waters arises from the national policy and directives expressed in Federal Statutes, Executive Orders, and internal regulations. These regulations were designed to minimize pollution, maximize recreation, protect aesthetics, preserve natural resources, and promote the comprehensive planning and use of water bodies to enhance the public interest; therefore, USACE, in the design, construction, management, operation, and maintenance of its facilities, exerts leadership within existing authorities and appropriations in the nationwide effort to protect, enhance, and sustain the quality of the nation's resources. It is USACE's policy to comply with requirements of the Clean Water Act and not to degrade existing water quality conditions to the maximum extent that is practicable, consistent with project authorities, Federal legal and regulatory requirements, the public interest, and water control manuals. The impacts of impounding a free-flowing waterbody can be detrimental, extensive, and enduring. It is the policy of the Corps that the environment be given equal weight, not simply consideration, in all aspects of project management and the operational decision-making process.

The Corps' water quality management authority is founded on the Federal Water Pollution Control Act of 1948 and its amendments. Several Corps policies support operating Corps projects in an environmentally responsible manner. These include Engineer Regulations, Engineer Manuals, and the Environmental Operating Principles. U.S. Army Corps of Engineers policy necessitates the development and implementation of a holistic watershed monitoring plan designed to protect resources and execute an environmentally sound water quality management strategy for each project. The activities of the District's Water Quality Program are driven by the guidance and requirements set forth in ER 1110-2-8154, titled "Water Quality and Environmental Management for Corps Civil Works Projects". ER 1110-2-8154 states, "The Corps operates a water quality management program to ensure that all applicable state and federal water quality standards are met, water quality degradation of Corps resources is avoided or minimized, and project responsibilities are attained."

Foremost, Prompton Reservoir provides flood risk management 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 and other

aspects of reservoir health to ensure user safety and protection of the environmental resources at the reservoir and downstream along the Lackawaxen River. Water quality monitoring results are compared to state and federal water quality standards when applicable and used to diagnose problems that commonly effect reservoir health such as nutrient enrichment and toxic loadings. This report summarizes the results of water quality monitoring at Prompton Reservoir and its tributaries from May through September 2022.

1.3 ELEMENTS OF THE STUDY

The USACE, Philadelphia District, has been monitoring the water quality of Prompton Reservoir since 1975. Over this time, the yearly monitoring program designs evolve to address new areas of concern such as human health aspects of drinking water at the project, assessments of potential sediment contaminants within the reservoir basin, and consideration of harmful algal bloom management strategies. The 2022 monitoring program is similar to those in recent years. The major element of the monitoring includes monthly physical and chemical water quality and bacteria monitoring from May through September to evaluate compliance with water quality standards and to monitor the overall health of the reservoir.

2.0 METHODS

2.1 PHYSICAL STRATIFICATION MONITORING

Physical stratification monitoring at four fixed stations located throughout the reservoir watershed and reservoir was conducted five times between 17 May and 13 September 2022 (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 monitoring was conducted with a calibrated YSI 6600 V2-4 water quality sonde.

In this report, when applicable, water quality monitoring results were compared to water quality standards established by the United States Environmental Protection Agency (USEPA) and the Pennsylvania Department of Environmental Protection (PADEP). The standard for DO is a minimum concentration of 5 mg/L in the epilimnion of a stratified lake and an acceptable range of pH from 6 to 9. Temperature criteria are based on seasonal guidelines. All the water quality data collected during physical stratification monitoring is summarized in Appendix A.

2.2 WATER COLUMN CHEMISTRY MONITORING

Water column chemistry monitoring was conducted five times between 17 May and 13 September 2022 (Table 2-1). Water samples were collected at four fixed stations within the reservoir and reservoir drainage area (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. All samples were placed on ice in a cooler and delivered to a certified laboratory for testing. Laboratory water sample analysis was conducted by M.J. Reider Associates, Inc Environmental Testing Laboratory located in Reading, Pennsylvania (U.S. EPA/PA DEP #06-00003).

Water samples collected from surface, middle, and bottom depths were analyzed for ammonia, nitrite, nitrate, total kjeldahl nitrogen, soluble dissolved phosphorus, total phosphorus, total dissolved solids, total suspended solids, biochemical oxygen demand, alkalinity, and total organic carbon. Table 2-2 summarizes the water quality parameters, laboratory method detection limits, laboratory required reporting limits, state water quality standards, and allowable maximum hold times for each during the 2022 monitoring period. Laboratory reporting and custody sheets are provided in Appendix B.

Table 2-1. Prompton Reservoir water quality monitoring schedule for 2022

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)
17 May	X	X	X	X
14 June	X	X	X	X
12 July	X	X	X	X
16 August	X	X	X	X
13 September	X	X	X	X

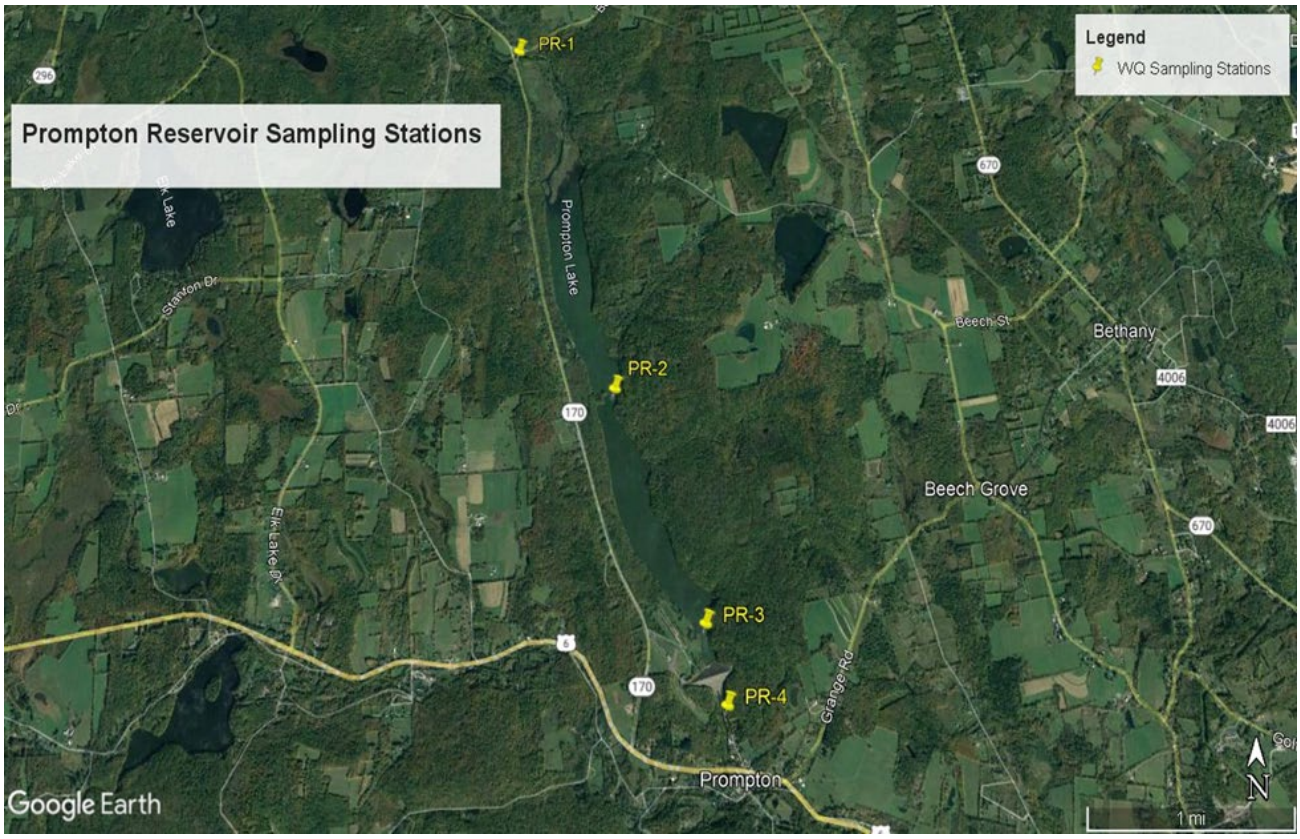

Figure 2-1. Four fixed water quality sampling stations at the USACE Philadelphia District Prompton Reservoir located in Prompton, Pennsylvania.

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 2022.

Parameter	(2) Method	Laboratory Limit of Reporting	PADEP Surface Water Quality Criteria	Allowable Hold Times (Days)
Total Alkalinity	SM 2320 B	2.0 mg/L	Min. 20 mg/L $CaCO_3$	14
Biochemical Oxygen Demand (BOD)	SM 5210 B	2.0 mg/L	None	2
Total Phosphorus	SM 4500-P F	0.01 mg/L	None	28
Diss./Ortho-Phosphate	NA	NA	None	28
Soluble Phosphorus	SM 4500-P F	0.01 mg/L	None	28
Total Organic Carbon (TOC)	SM 5310 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 Rev 2.0	0.50 mg/L	None	28
Ammonia	EPA 350.1	0.02 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	SM 2540 C	5.0 mg/L	Maximum 750 mg/L	7
Total Suspended Solids	SM 2540 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.

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 May and September 2022. 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, USEPA and PADEP standards, and sample holding times for the bacteria parameters monitored at Prompton Reservoir in 2022. 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). Laboratory analysis was conducted by M.J. Reider Associates, Inc Environmental Testing Laboratory located in Reading, Pennsylvania (U.S. EPA/PA DEP #06-00003).

Monthly coliform bacteria counts were compared to the USEPA and PADEP primary contact recreation water quality single sample standard for Escherichia coli bacteria. Application of this standard is not directly applicable at Prompton Reservoir because swimming and other primary human/water contact recreation is prohibited in the reservoir. However, it is useful in evaluating the bacteria conditions in the lake and watershed as it relates to secondary contact recreation.

Table 2-3. Water quality test methods, detection limits, PADEP standards, and sample holding times for bacteria parameters monitored at Prompton Reservoir in 2022.

Parameter	Total Coliform	Escherichia Coliform
Test method	SM 9223 B	SM 9223 B
Limit of Quantification	1 mpn/100-mls	1 mpn/100-mls
EPA/PADEP standard	None	Geometric mean < 126 mpn/100-mls or a single sample reading of < 235 mpn/100-mls
Max. allowable holding time	30 hours	30 hours
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 the physical/chemical parameters were measured with a calibrated YSI 6600 V2-4 water quality monitoring sonde and are presented in Appendix A.

3.1.1 Temperature

Temperature is the primary influencing factor on water density, affects the solubility of many 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 2022. Maximum temperatures were recorded in tributary surface waters during the 12 July sampling event and in the downstream release waters during the 16 August sampling event (Fig. 3-1). Upstream tributary temperatures at station PR-1S maintained a seasonal average temperature of 16.58°C and ranged from 13.19°C in May to 18.31°C in mid-July. Downstream temperatures at station PR-4S averaged 18.48°C and ranged from 15.71°C in May to 20.39°C in August. The warmer downstream release temperatures result from thermally warmed surface lake waters being released from the reservoir during various periods of the year.

The surface water temperatures (0-5 feet) within the reservoir were generally greater than the upstream tributary station PR-1S because 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 22.25°C and ranged from 19.25°C in May to 24.74°C in August. Prompton Reservoir experienced stratification profile patterns with respect to temperature in 2022 (Fig. 3-2).

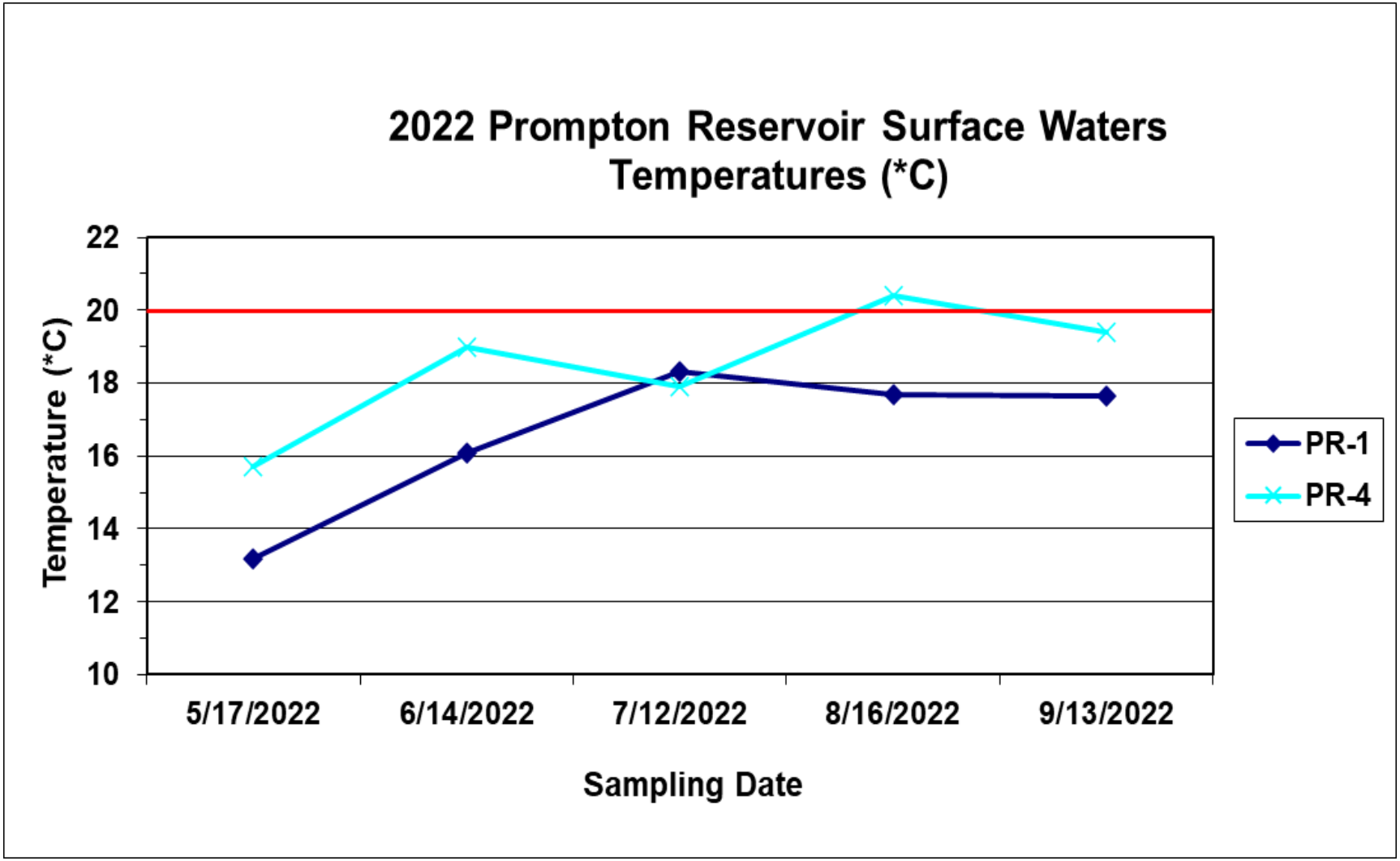

Figure 3-1. Temperature in tributary and outflow surface waters of Prompton Reservoir during 2022. See Appendix A for a summary of plotted values. The cold-water species preference temperature of 20°C is shown as a red line reference.

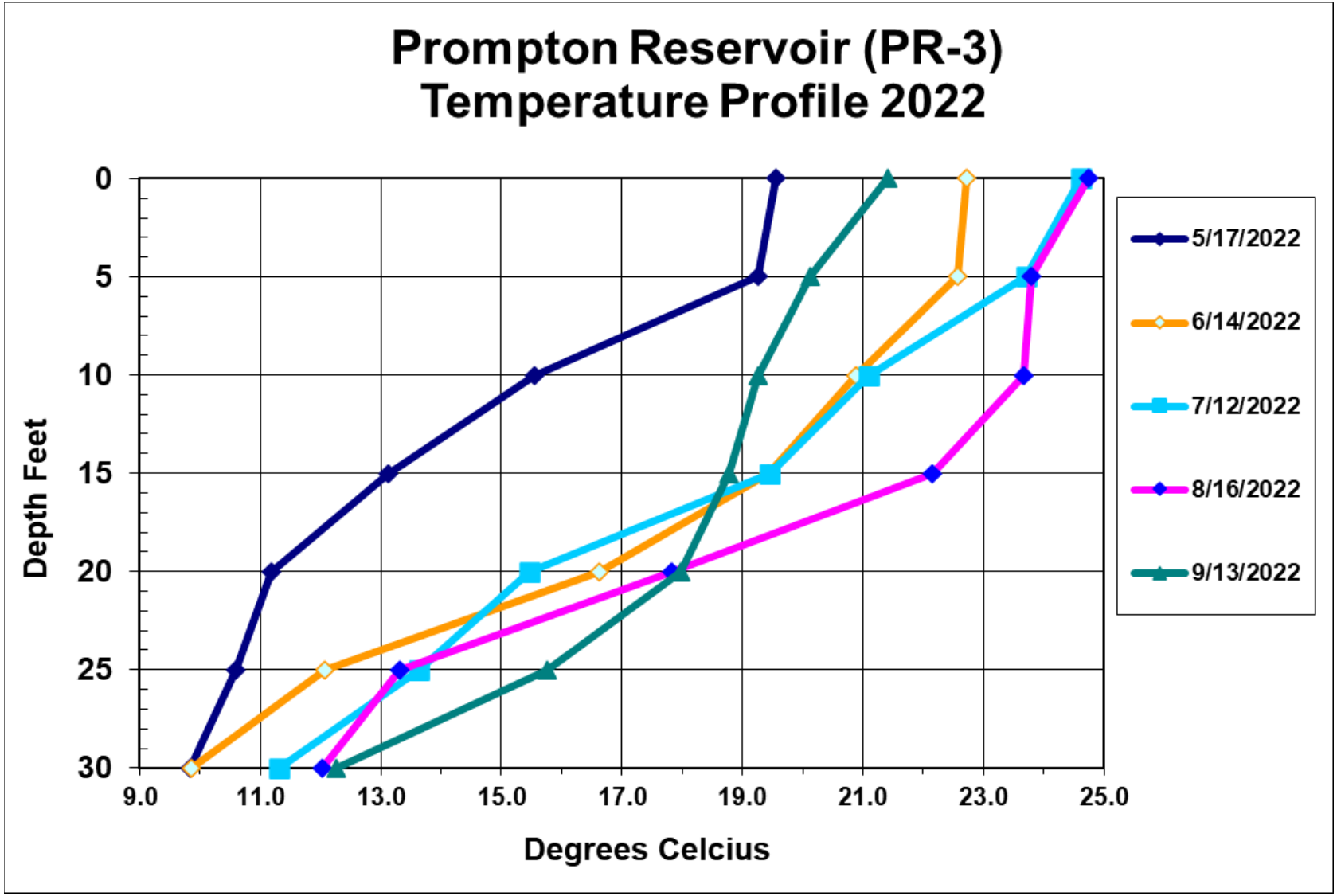

Figure 3-2. Temperature stratification of Prompton Reservoir during 2022 from water quality measured at station PR-3. See Appendix A for a summary of plotted values.

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 the 2022 sampling season (Fig. 3-3). Waters released from the reservoir and measured at station PR-4S had lower dissolved oxygen levels then reservoir inflows at tributary station PR-1S because of the release of low oxygen waters from the reservoir downstream. The greatest difference of DO readings between the upstream and downstream stations was recorded on 16 August when inflow (PR-1S) DO was 8.63 mg/L and outflow (PR-4S) DO was 5.42 mg/L. Dissolved oxygen concentrations upstream (PR-1S) ranged from 9.83 mg/L in May to 8.63 mg/L in August with an average seasonal reading of 9.23 mg/L. Dissolved oxygen concentrations downstream (PR-4S) ranged from 9.3 mg/L in May to 5.42 mg/L in August with a seasonal average of 7.43 mg/L.

The stratification of Prompton Reservoir influenced the distribution of DO in the water column during 2022 (Fig. 3-4). For most of the sampling season, the lower water column from approximately 10-15 feet of depth from the water surface 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. The re-aeration of the released waters through the dam conduit system maintained DO concentrations above state criteria downstream. Dissolved oxygen concentrations in the water column of Prompton Reservoir were in compliance with PADEP lake water quality standards. 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 2022, the lower water column of Prompton was most affected by hypoxia. Hypoxic water was encountered in all months sampled, except for May and commonly occupied the lower half of the water column from a 15-foot depth and continuing to the lake 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.

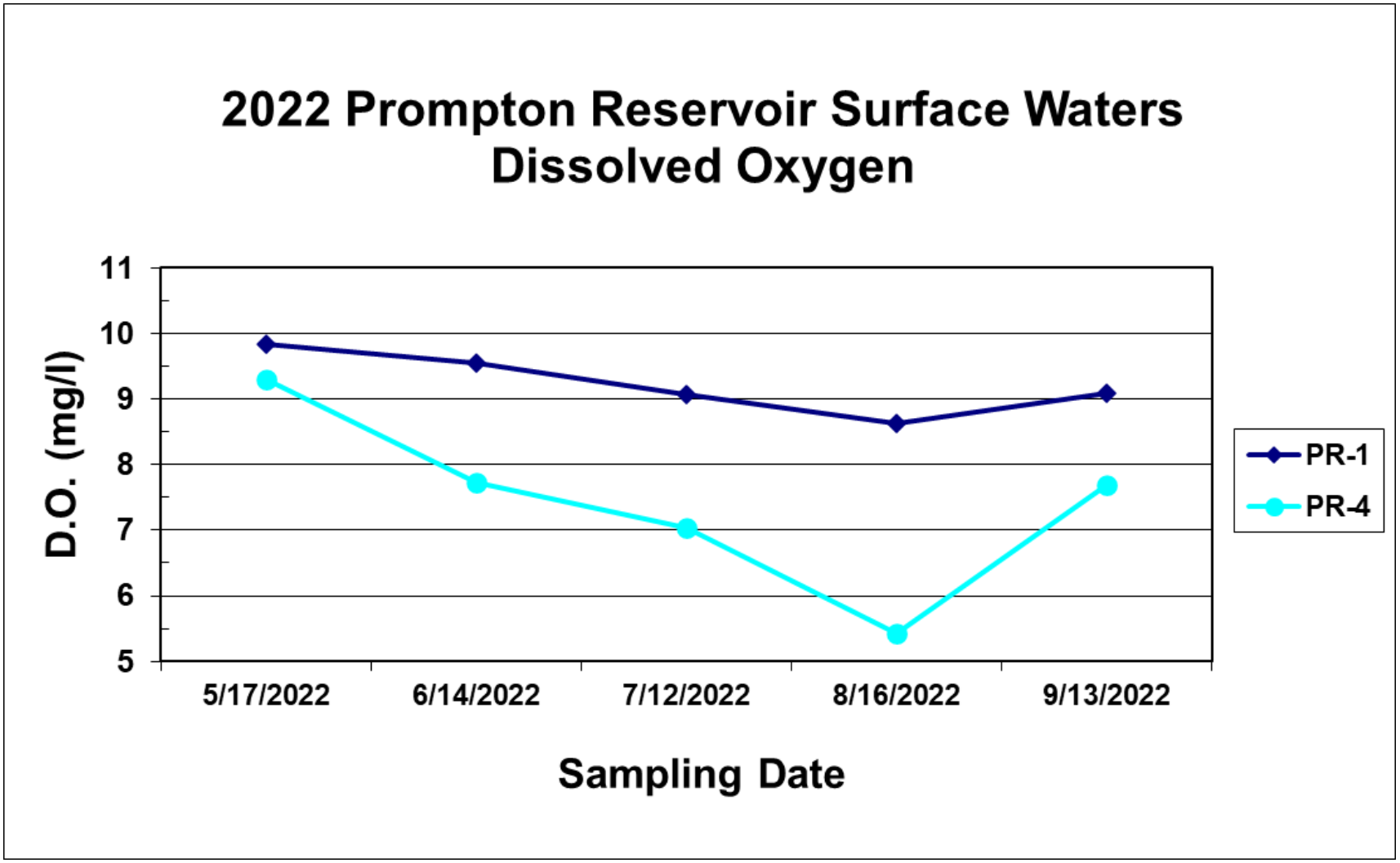

Figure 3-3. Dissolved oxygen in tributary surface waters of Prompton Reservoir during 2022. PADEP minimum DO standard is 5 mg/L. See Appendix A for a summary of plotted values.

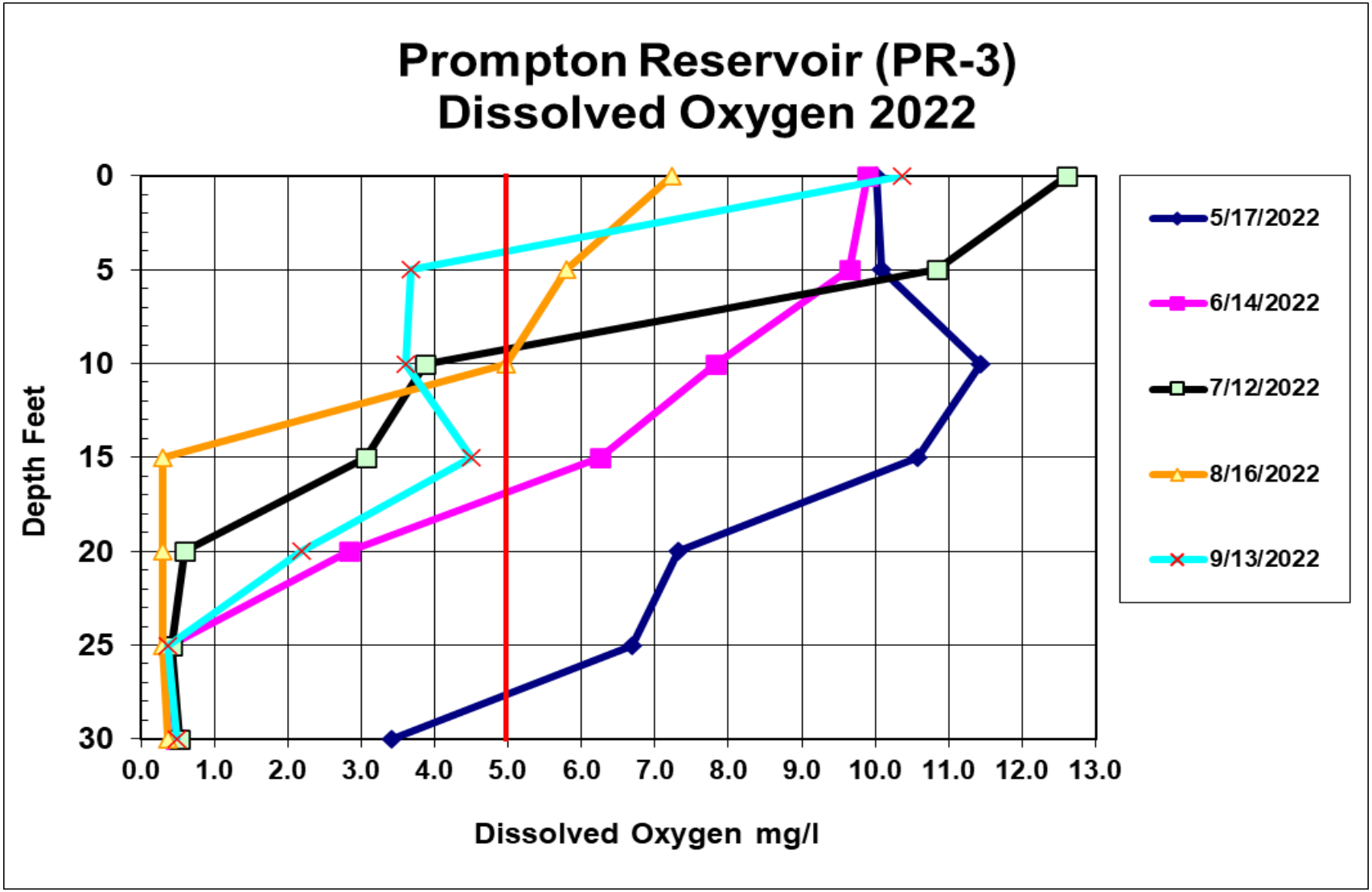

Figure 3-4. Dissolved oxygen stratification of Prompton Reservoir during 2022 from water quality measured at station PR-3. The PADEP minimum DO standard is 5 mg/L. See Appendix A for a summary of plotted value

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 7.24 in July to 7.87 in June (Fig. 3-5). The seasonal pH average for PR-1S and PR-4S were 7.65 and 7.51, respectively.

The water column of Prompton Reservoir maintained a relatively stable pH through most of the sampling season in 2022 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 is reflected with an increase in pH at the surface while the lower water column remained relatively constant. This was recorded in most months sampled. The elevated pH in surface waters of the reservoir during summer periods can be attributed to algal productivity at the surface. Algal blooms were observed at the lake in 2022 with a high-density bloom noted in July. 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 July 2022. The water quality standard for pH is a range of acceptability from 6.0 to 9.0 pH units. Near surface water readings on 12 July exceeded the pH 9.0 criteria because of high levels of algal productivity during an observed algae bloom.

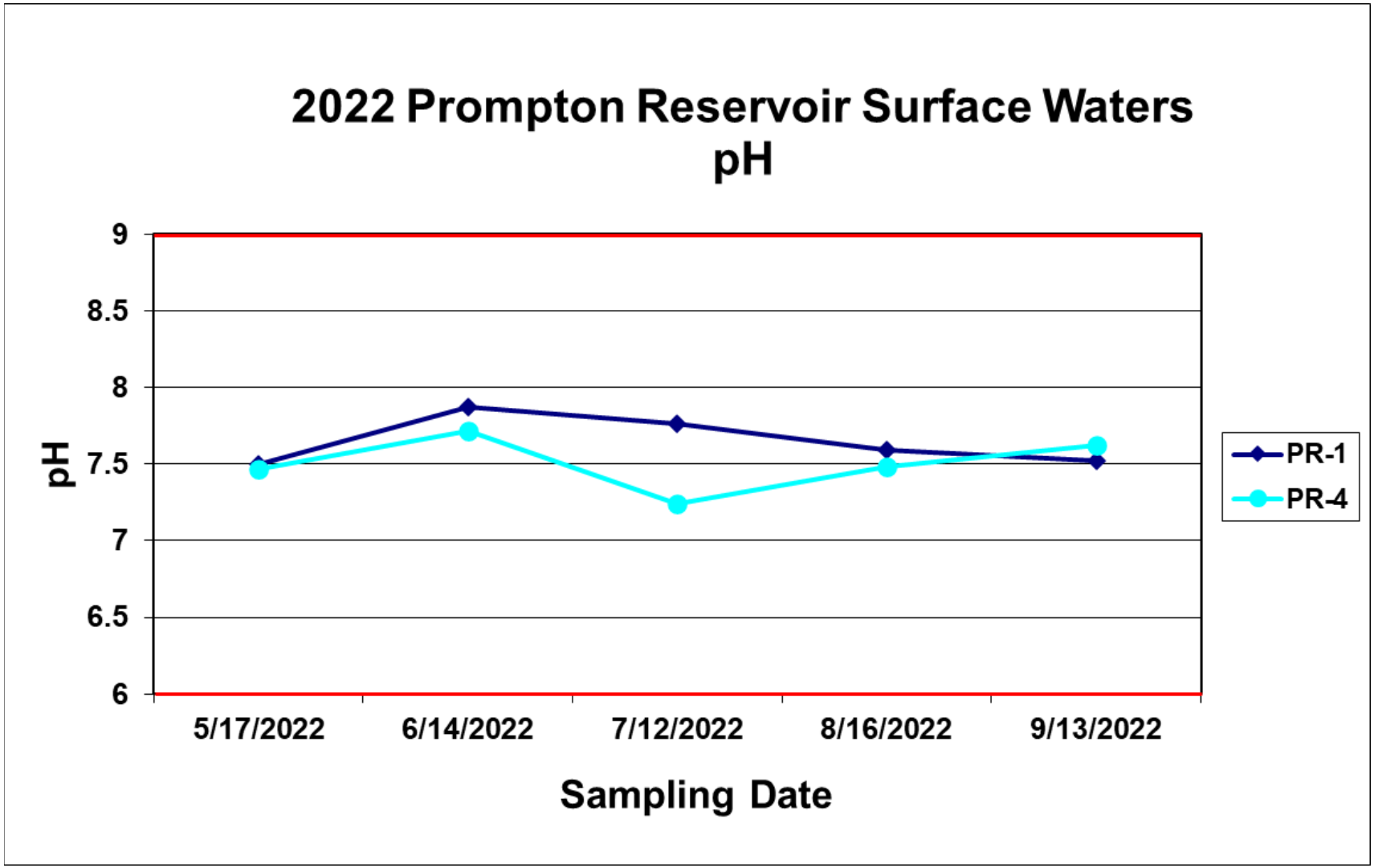

Figure 3-5. Measures of pH in tributary and outflow surface waters of Prompton Reservoir during 2022. PADEP minimum and maximum pH standards are 6 and 9, respectively. See Appendix A for a summary of plotted values.

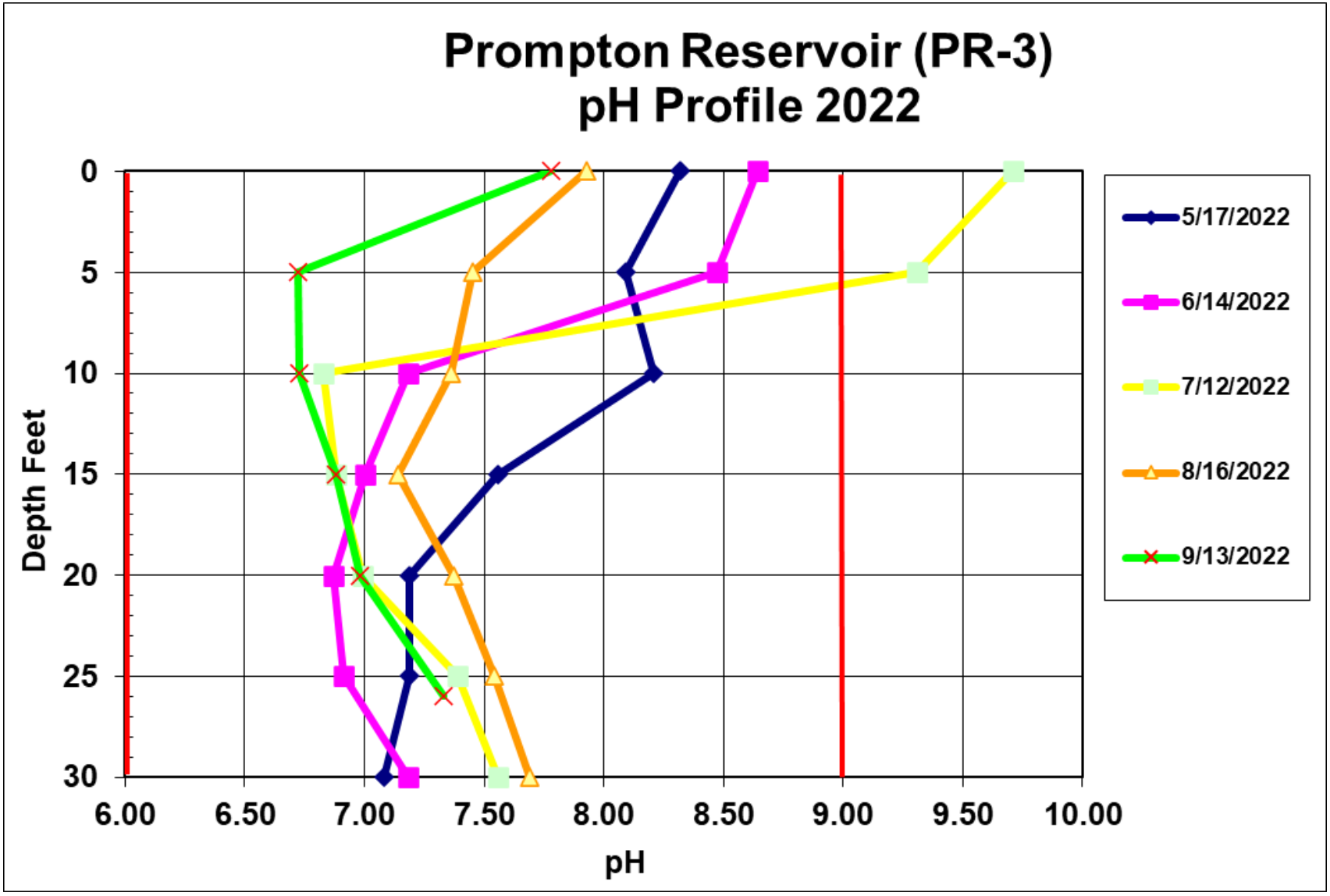

Figure 3-6. Stratification of pH at Prompton Reservoir during 2022, from water quality measured at station PR-3. PADEP minimum and maximum pH standards are 6 and 9, respectively. See Appendix A for a summary of plotted values.

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 2022 (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 levels in the watershed and lake of Prompton Reservoir were low during 2022 (Table 3-2). Concentrations measured at all surface and middle water column stations shown 15 detectable readings with 25 readings less than the laboratory reporting limit (0.02 mg/L). Deep bottom water levels routinely recorded the highest concentrations. The highest concentration of 2.42 mg/L was measured on 16 August in the bottom waters of the deepest portion of the reservoir located at station PR-3D. Increased ammonia concentrations are characteristic of low dissolved oxygen environments in stratified lakes resulting from the decomposition of organic materials. Prompton Reservoir experienced these conditions in 2022 resulting in higher levels of ammonia in the deeper areas of the reservoir. In 2022, Prompton Reservoir remained below the EPA water quality criteria 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 2022

Station	Date	ALK mg/L	BOD5 mg/L	DISS-P mg/L	NH3 mg/L	NO2 mg/L	NO3 mg/L	NO3-NO2 mg/L	TDS mg/L	TKN mg/L	TOC mg/L	TP mg/L	TSS mg/L
PR-1S	5/17/2022	20	<2.0	0.02	<0.02	<0.01	0.37	0.38	70	<0.43	5.2	0.02	4
	6/14/2022	25	<2.0	0.03	<0.02	<0.01	0.42	0.43	55	<0.43	3.3	0.02	1
	7/12/2022	29	<2.0	<0.01	<0.02	<0.01	0.36	0.37	45	<0.43	2.4	0.02	<1
	8/16/2022	29	<2.0	0.04	<0.02	<0.01	0.26	0.27	44	<0.43	1.8	0.01	2
	9/13/2022	23	<2.0	0.05	<0.02	<0.01	0.38	0.39	47	0.63	4.2	0.04	10
	Mean	25	2	0.03	0.02	0.0	0.36	0.37	52	0.47	3.4	0.02	4
	Stdev	3.9	0	0.02	0.00	0.0	0.06	0.06	11	0.09	1.4	0.01	4
	Max	29	2	0.05	0.02	0.0	0.42	0.43	70	0.63	5.2	0.04	10
	Min	20	2	0.01	0.02	0.0	0.26	0.27	44	0.43	1.8	0.01	1
	No. of Det.	5	0	4	0	0	5	5	5	1	5	5	4
PR-2S	5/17/2022	19	<2.0	0.03	<0.02	<0.01	0.25	0.26	71	<0.43	3.2	<0.01	1
	6/14/2022	23	2	<0.01	<0.02	<0.01	<0.11	<0.12	45	<0.43	3.6	<0.01	2
	7/12/2022	32	9.7	<0.01	<0.02	<0.01	<0.11	<0.12	45	1.14	5.4	0.02	13
	8/16/2022	27	5.9	0.03	<0.02	<0.01	<0.18	<0.19	42	0.51	4.1	0.02	13
	9/13/2022	22	3.4	0.04	<0.02	<0.01	<0.18	<0.19	52	0.98	5.4	0.04	12
	Mean	25	5	0.02	0.02	0.0	0.17	0.18	51	0.70	4.3	0.02	8
	Stdev	5.0	3	0.01	0.00	0.0	0.06	0.06	12	0.34	1.0	0.01	6
	Max	32	9.7	0.04	0.02	0.0	0.25	0.26	71	1.14	5.4	0.04	13
	Min	19	2	0.01	0.02	0.0	0.11	0.12	42	0.43	3.2	0.01	1
	No. of Det.	5	4	3	0	0	1	1	5	3	5	3	5

Table 3-2 continued. Summary of surface, middle, and bottom water quality monitoring data for Prompton Reservoir in 2022

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	5/17/2022	22	<2.0	<0.01	<0.02	<0.01	0.36	0.37	84	<0.43	3.5	0.04	5
	6/14/2022	23	<2.0	<0.01	<0.02	<0.01	<0.11	<0.12	46	<0.43	3.3	<0.01	3
	7/12/2022	24	<2.0	0.03	<0.02	<0.01	0.17	0.18	33	<0.43	3.8	0.01	1
	8/16/2022	28	2.7	0.01	0.03	<0.01	<0.18	<0.19	67	0.52	4.1	0.03	13
	9/13/2022	21	<2.0	0.02	0.04	<0.01	0.27	0.28	42	0.82	5.2	0.02	7
	Mean	24	2	0.02	0.03	0.0	0.22	0.23	54	0.53	4.0	0.02	6
	Stdev	2.7	0	0.01	0.01	0.0	0.10	0.10	21	0.17	0.7	0.01	5
	Max	28	2.7	0.03	0.04	0.0	0.36	0.37	84	0.82	5.2	0.04	13
	Min	21	2	0.01	0.02	0.0	0.11	0.12	33	0.43	3.3	0.01	1
	No. of Det.	5	1	3	2	0	3	3	5	2	5	4	5
PR-2D	5/17/2022	19	<2.0	<0.01	<0.02	<0.01	0.33	0.34	49	0.59	2.9	0.06	47
	6/14/2022	25	2.2	0.07	0.03	<0.01	0.24	0.25	62	<0.43	3.5	0.04	68
	7/12/2022	27	<2.0	<0.01	0.05	<0.01	0.18	0.19	22	<0.43	3.9	0.01	4
	8/16/2022	27	2.3	0.05	0.11	<0.01	<0.18	<0.19	57	2.64	6.2	0.44	23
	9/13/2022	24	2.1	0.04	0.1	<0.01	0.28	0.29	39	<0.43	4.8	0.04	16
	Mean	24	2	0.04	0.06	0.0	0.24	0.25	46	0.90	4.3	0.12	32
	Stdev	3.3	0	0.03	0.04	0.0	0.06	0.06	16	0.97	1.3	0.18	26
	Max	27	2.3	0.07	0.11	0.0	0.33	0.34	62	2.64	6.2	0.44	68
	Min	19	2	0.01	0.02	0.0	0.18	0.19	22	0.43	2.9	0.01	4
	No. of Det.	5	3	3	4	0	4	4	5	2	5	5	5

Table 3-2 continued. Summary of surface, middle, and bottom water quality monitoring data for Prompton Reservoir in 2022

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	5/17/2022	18	<2.0	<0.01	<0.02	<0.01	0.25	0.26	58	<0.43	3.2	<0.01	1
	6/14/2022	22	<2.0	<0.01	<0.02	<0.01	<0.11	<0.12	59	<0.43	4.1	<0.01	2
	7/12/2022	27	6.2	<0.01	<0.02	<0.01	<0.11	<0.12	30	1.12	5.3	0.02	11
	8/16/2022	26	6.0	0.01	<0.02	<0.01	<0.89	<0.9	48	0.64	4.4	0.03	10
	9/13/2022	23	6.7	0.04	<0.02	<0.01	<0.18	<0.19	44	0.89	5.3	0.02	8
	Mean	23	5	0.02	0.02	0.0	0.31	0.32	48	0.70	4.5	0.02	6
	Stdev	3.6	2	0.01	0.00	0.0	0.33	0.33	12	0.30	0.9	0.01	5
	Max	27	6.7	0.04	0.02	0.0	0.89	0.90	59	1.12	5.3	0.03	11
	Min	18	2	0.01	0.02	0.0	0.11	0.12	30	0.43	3.2	0.01	1
	No. of Det.	5	3	2	0	0	1	1	5	3	5	3	5
PR-3M	5/17/2022	18	2	0.01	<0.02	<0.01	0.32	0.33	57	<0.43	2.8	<0.01	7
	6/14/2022	23	<2.0	<0.01	<0.02	<0.01	0.26	0.27	48	<0.43	4.3	0.08	1
	7/12/2022	21	2.1	<0.01	<0.02	<0.01	0.2	0.21	18	<0.43	4.5	<0.01	<1
	8/16/2022	33	3.5	0.02	0.29	<0.01	<0.89	<0.9	34	0.78	4.3	0.06	4
	9/13/2022	19	<2.0	0.03	0.04	<0.01	0.27	0.28	37	0.59	6.4	0.02	2
	Mean	23	2	0.02	0.08	0.0	0.39	0.40	39	0.53	4.5	0.04	3
	Stdev	6.0	1	0.01	0.12	0.0	0.28	0.28	15	0.15	1.3	0.03	3
	Max	33	3.5	0.03	0.29	0.0	0.89	0.90	57	0.78	6.4	0.08	7
	Min	18	2	0.01	0.02	0.0	0.20	0.21	18	0.43	2.8	0.01	1
	No. of Det.	5	3	3	2	0	4	4	5	2	5	3	4

Table 3-2 continued. Summary of surface, middle, and bottom water quality monitoring data for Prompton Reservoir in 2022

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	5/17/2022	22	3	<0.01	0.18	<0.01	0.36	0.37	67	0.99	7.7	0.17	121
	6/14/2022	40	4	<0.01	0.78	<0.01	<0.11	<0.12	62	1.03	4.5	0.01	5
	7/12/2022	36	4.3	0.01	0.6	<0.01	0.13	0.14	37	1.13	6.4	0.07	23
	8/16/2022	51	12.5	0.26	2.42	<0.01	<0.18	<0.19	75	3.43	18.5	0.43	84
	9/13/2022	44	9.8	0.09	1.54	<0.01	<0.18	<0.19	51	2.11	7.5	0.09	12
	Mean	39	7	0.08	1.10	0.0	0.19	0.20	58	1.74	8.9	0.15	49
	Stdev	10.8	4	0.11	0.89	0.0	0.10	0.10	15	1.05	5.5	0.16	51
	Max	51	12.5	0.26	2.42	0.0	0.36	0.37	75	3.43	18.5	0.43	121
	Min	22	3	0.01	0.18	0.0	0.11	0.12	37	0.99	4.5	0.01	5
	No. of Det.	5	5	3	5	0	2	2	5	5	5	5	5
PR-4S	5/17/2022	19	<2.0	<0.01	<0.02	<0.01	0.3	0.31	74	<0.43	3	<0.01	7
	6/14/2022	24	2.3	<0.01	<0.02	<0.01	0.25	0.26	53	<0.43	4.2	<0.01	1
	7/12/2022	21	<2.0	<0.01	<0.02	<0.01	0.28	0.29	45	0.48	5.1	0.02	4
	8/16/2022	31	2.5	0.05	0.27	0.03	0.36	0.39	62	2.18	4.5	0.3	8
	9/13/2022	19	<2.0	0.03	0.02	<0.01	0.28	0.29	58	0.56	5.9	0.03	10
	Mean	23	2	0.02	0.07	0.0	0.29	0.31	58	0.82	4.5	0.07	6
	Stdev	5.0	0	0.02	0.11	0.0	0.04	0.05	11	0.76	1.1	0.13	4
	Max	31	2.5	0.05	0.27	0.0	0.36	0.39	74	2.18	5.9	0.30	10
	Min	19	2	0.01	0.02	0.0	0.25	0.26	45	0.43	3.0	0.01	1
	No. of Det.	5	2	2	2	1	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 2022, except for one sample (0.03 mg/L) 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 2022, concentrations measured at all stations and depths ranged from less than the laboratory reporting limit of 0.11 mg/L to 0.42 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 0.42 mg/L was collected at station PR-1S on 14 June. This upstream tributary station also maintained the highest seasonal mean concentration of 0.36 mg/L.

Prompton Reservoir never exceeded the PADEP water quality standard for nitrite and nitrate during 2022. 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 0.43 mg/L was measured at the upstream tributary surface water station PR-1S on 14 June.

3.2.3 Total Kjeldahl Nitrogen

Total Kjeldahl Nitrogen (TKN) is a measure of organic nitrogen that includes ammonia. Organic nitrogen is not immediately available for biological activity and is therefore not available for plant growth until decomposition to inorganic form occurs. Total Kjeldahl Nitrogen was predominantly low in the water column of Prompton Reservoir during 2022 with many sample concentrations less than the laboratory reporting limit of 0.43 mg/L (Table 3-2). The highest single sample concentration of 3.43 mg/L was measured in the bottom water sample at station PR-3D on 16 August. Higher concentrations in the deep water of the reservoir indicates decomposition conditions are present in the deep-water areas.

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 2022 with elevated measures occurring throughout the sampling period. The highest measures of total phosphorus were

seen in the deep bottom waters of the lake (Table 3-2). The highest single concentration of 0.44 mg/L TP was measured in the lake bottom water sample at station PR-2 on 16 August. 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 all stations and depths in the water column of Prompton Reservoir were measured in values from less than the reporting limit of 0.01 to 0.26 mg/L (Table 3-2). The highest single sample concentration of 0.26 mg/L was measured in the deep bottom waters at station PR-3D on 16 August.

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 2022. Concentrations measured at all stations and depths ranged from 18 mg/L to 84 mg/L throughout the monitoring period (Table 3-2). Total dissolved solids measured at Prompton Reservoir in 2022 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 2022, total suspended solids (TSS) concentrations at all stations and depths ranged between less than the reporting limit of 1.0 mg/L to 121 mg/L (Table 3-2). The highest single sample measure of 121 mg/L was measured in the lake bottom water sample at station PR-3D on 17 May. 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 likely reflect this sampling method 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 2022, biochemical oxygen demand concentrations in the waters and watershed of Prompton Reservoir were measured in values from less than the laboratory reporting limit of 2.0 mg/L up to 12.5 mg/L (Table 3-2). Considering the overall frequency and variability of 2022 sample results, it is inferred that Prompton Reservoir and its associated tributaries contain moderately clean waters with some biodegradable wastes in 2022 that is dependent on seasonal and changing conditions at the reservoir.

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 2022 sampling season (Table 3-2). Concentrations measured at all stations and depths during the monitoring period ranged from 18.0 mg/L to 51.0 mg/L. 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 PADEP alkalinity minimum criteria in 2022.

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 at all stations and depths ranged from 1.8 mg/L to 18.5 mg/L (Table 3-2).

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 2022, chlorophyll *a* measured in upstream surface waters had a seasonal average of 2.38 ug/L. Concentrations at lake station PR-3S, from 0-10 feet of depth, ranged between 3.3 ug/L and 21.1 ug/L with a seasonal average of 9.03 ug/L (Appendix A). Algae production in the reservoir peaked in August with dense blooms observed at and

near the surface waters of the reservoir. The average chlorophyll concentration at lake station PR-3S in August was 9.03 ug/L which reflected the increased algae densities near the water surface. Chlorophyll *a* was collected using a YSI 6600 V2-4 sonde and 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 Prompton Reservoir as eutrophic in August (53.20), mesotrophic in July (47.35) and September (47.35), and oligotrophic in May (37.35) and June (37.35). TSIs calculated for measures of secchi disk depth classified Prompton Reservoir as eutrophic in May (51.14), June (50.75), July (64.15), August (67.36), and September (58.63). TSIs calculated for measures of chlorophyll *a* classified Prompton Reservoir as mesotrophic in May (47.41) and June (44.20), and eutrophic in July (51.99), August (59.28), and September (53.43). Chlorophyll *a* was measured with a YSI 6600 V2-4 sonde and 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/eutrophic range during most of the 2022 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/eutrophic during the 2022 sampling season.

Table 3-3. EPA trophic classification criteria and monthly measures for Prompton Reservoir in 2022.

Water Quality Variable	Oligo-trophic	Meso-trophic	Eutrophic	17 May	14 June	12 July	16 August	13 September
Total phos. (ppb)	<10	10-20	>20	<10	<10	20	30	20
Chlorophyll (ppb)	<4	4-10	>10	5.6	4.0	8.90	18.60	10.25
Secchi depth (m)	>4	2-4	<2	1.85	1.90	0.75	0.60	1.10

3.4 RESERVOIR BACTERIA MONITORING

Total coliform bacteria include *Escherica coliform* (*E. coli*) and related bacteria that are associated with fecal discharges. Fecal coliform bacteria are a subgroup of the total coliform and are normally associated with waste derived from human and other warm-blooded animals and indicate the presence of fecal contamination but not the associated risk. With respect to EPA and PADEP water quality standards, fecal coliform bacteria has been replaced with a recommended E. coli criteria. Bacteria contamination was monitored in the tributary and lake surface waters at Prompton Reservoir from May through September during 2022 (Table 3-4).

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 84 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 2022. Bacteria contamination was low in Prompton Reservoir but elevated in its upstream tributary during 2022. Two samples did exceed the EPA single water sample threshold at upstream tributary station PR-1S on 17 May and 13 September. Water contact recreation is not permitted at Prompton Reservoir.

Table 3-4. Bacteria counts (colonies/100 ml) at Prompton Reservoir during 2022. Shaded values exceed the Pennsylvania Department of Health single sample water quality standard for bathing beaches.

STATION	DATE	Total Coliform		Escherichia coli	
PR-1S	5/17/2022	>	2420		980
	6/14/2022		2420		102
	7/12/2022	>	2420		54
	8/16/2022	>	2420		75
	9/13/2022	>	2420		2420
PR-2S	5/17/2022		112	<	1
	6/14/2022		649		1
	7/12/2022		2420	<	1
	8/16/2022	>	2420		3
	9/13/2022		1990		2
PR-3S	5/17/2022		84		6
	6/14/2022		921		5
	7/12/2022		210	<	1
	8/16/2022	>	2420	<	1
	9/13/2022		1120	<	1
PR-4S	5/17/2022		1050		6
	6/14/2022		1730		11
	7/12/2022	>	2420		10
	8/16/2022	>	2420		5
	9/13/2022	>	2420		118

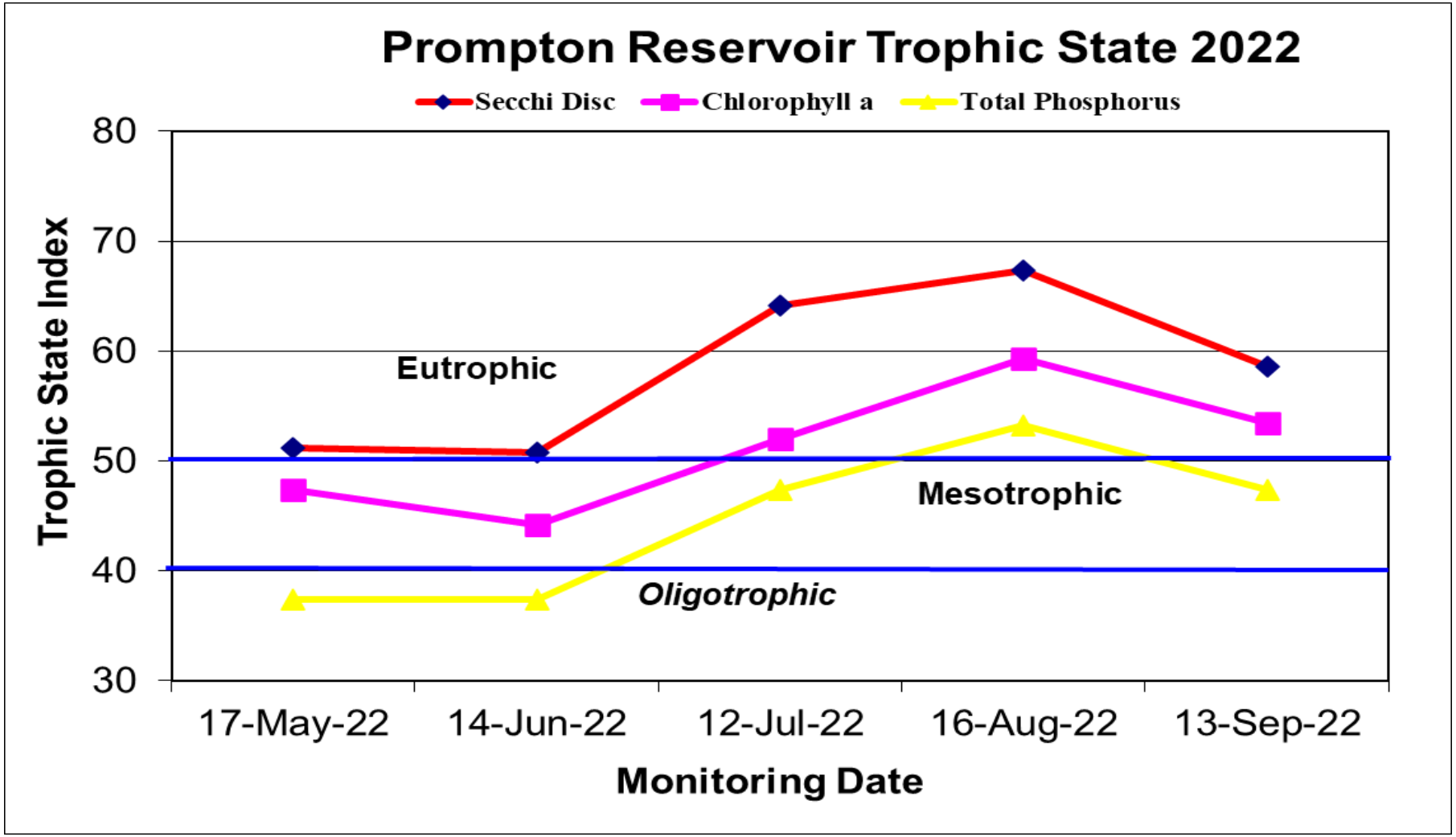

Figure 3-7. Trophic state indices calculated from secchi disk depth, concentrations of chlorophyll *a*, and total phosphorus measured in surface waters of Prompton Reservoir during 2022.

3.5 ALGAE AND CYANOBACTERIA MONITORING

Cyanobacteria and algae are photosynthetic organisms found in aquatic environments. Cyanobacteria, formerly known as blue-green algae, are a group of bacteria. These bacteria were originally called blue-green algae because dense growths often turn the water pea green, brownish-green or blue-green. Dense growths of these organisms are often referred to as a "bloom". They are found in all lakes and are a natural part of a lake ecosystem.

The development and proliferation (intensity) of algal blooms result from a combination of environmental factors including available nutrients (quantity and quality), sunlight, air and water temperature, ecosystem disturbance (stable or wind mixing conditions, turbidity), hydrology (precipitation, river flow and water storage levels) and water chemistry. As photosynthetic organisms, high nutrient and light concentrations can promote a population explosion and result in blooms, especially during warm weather. In high densities, those species of these organisms that can produce potent natural toxins can be a health hazard. Not all blue-green algae or algal blooms produce toxins. Blooms with the potential to harm human health or aquatic ecosystems are referred to as harmful algal blooms or HABs. In freshwater systems, cyanobacteria can produce HABs and toxins that can harm people, animals, aquatic ecosystems, drinking water supplies, and recreational activities including swimming and recreational fishing.

Algal blooms have historically been seen at Prompton Reservoir as the watershed contains agriculture land use and reservoir tributary inflow often contains elevated levels of sediments and nutrients. In the watershed, runoff and soil erosion from fertilized agricultural areas and lawns, runoff from animal husbandry agricultural areas, and erosion from riverbanks and riverbeds are major sources of nutrients entering tributaries of Prompton Reservoir. All these pathways are considered external sources and promote and support the growth of algae and cyanobacteria within the lake. In addition to these external sources, internal origins of nutrients come from the reservoir sediments. Phosphate attaches to sediments. When dissolved oxygen concentrations are low in the water (anoxic conditions), sediments release phosphate into the water column. Anoxic conditions are experienced annually within Prompton Reservoir causing the release of nutrients from bottom sediments. These nutrients are then recycled back into the water column and support the growth of algae and cyanobacteria.

In the interest of public health and safety, the USACE Philadelphia District has worked closely with the Pennsylvania Department of Environmental Protection in its approach to managing and responding to these conditions in USACE Reservoirs. Stakeholders and the public are notified of the risks of potential harmful toxic algae blooms at the project utilizing on site signage and social media and project website notifications and warnings. Potential health risks are considered regarding water contact and other recreation within the lake and as it relates to Pennsylvania draft harmful algal bloom standards and other guidelines including the EPA's Recommended Human Health Recreational Ambient Water Quality Criteria or Swimming Advisories for Microcystins and Cylindrospermopsin EPA 822-F-19-00.

During the 2022 summer season, USACE staff observed varying densities of algal blooms throughout the reservoir with the most severe bloom conditions observed in August. In response to these observations, the Philadelphia District took the following steps:

1. The Philadelphia District USACE initiated coordination with the Pennsylvania Department of Environmental Protection regarding response and monitoring.

2. Philadelphia District USACE maintained posted public notices at lake access points (in addition to social media postings with links to Centers for Disease Control and Prevention cyanobacteria website) highlighting the presence and risks of potential harmful toxic algae and to pursue lake recreation at your own risk.

Algae colony densities were variable in visually identified bloom conditions. Toxin production levels based on Pennsylvania Department of Environmental Protection sampling did not exceed Pennsylvania draft harmful algal bloom standards. No lake/reservoir recreational closures were initiated because of algal blooms or toxin production. However, the entire lake remained in a public warning condition for much of the summer recreational season.

4.0 REFERENCES

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APPENDIX A

PROMPTON RESERVOIR 2022
STRATIFICATION DATA TABLES

2022 Prompton 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	5/17/2022	8:41:33	0.5	13.19	93.7	9.83	7.5	-64	56.3	4.5	5.1	0.056
	6/14/2022	8:44:47	0.5	16.08	97	9.55	7.87	-84.1	74.9	1.3	1.7	0.076
	7/12/2022	8:55:35	0.5	18.31	96.4	9.07	7.76	-78.4	74.8	0	0.8	0.083
	8/16/2022	9:01:12	0.5	17.67	90.5	8.63	7.59	-69.6	124.4	0	1.4	0.084
	9/13/2022	9:04:22	0.5	17.66	95.3	9.08	7.52	-65.8	128.1	14.3	2.9	0.077
PR-2 Mid-Lake	5/17/2022	10:09:02	0.5	19.21	110.5	10.21	8.23	-104	56	0.8	4.2	0.066
		10:06:48	5	18.86	108.4	10.08	8	-91.6	55.8	1.5	7.7	0.066
		10:02:04	10	16.04	83.6	8.24	6.99	-37.5	60.3	9.599999	9.5	0.067
		9:58:30	15	13.81	82.9	8.58	6.92	-33.8	60.4	2.1	10.2	0.06
		9:56:08	18	12.87	77.2	8.15	6.9	-33	61.9	2.7	10.6	0.058
PR-2 Mid-Lake	6/14/2022	10:09:30	0.5	22.41	115.8	10.04	8.64	-127	58.8	2.2	3.9	0.077
		10:07:44	5	22.09	113.5	9.91	8.51	-119	57.4	2.5	4.4	0.077
		10:06:25	10	21.33	98.6	8.73	7.43	-61	63.2	2.9	6.6	0.075
		10:03:59	15	18.98	72.8	6.76	7.02	-39.2	65.7	2.4	5	0.073
		10:01:50	18	17.63	62.3	5.94	7.01	-38.4	67.1	8.4	3.7	0.074
PR-2 Mid-Lake	7/12/2022	10:14:06	0.5	25.44	154.8	12.68	9.59	-179	49.3	16.1	15.9	0.094
		10:11:40	5	23.06	76.1	6.52	7.35	-57.1	72.4	4	6.5	0.073
		10:09:39	10	21.43	44.7	3.96	6.99	-37.8	77.6	2.6	4	0.073
		10:05:47	15	18.66	10.9	1.02	7.06	-41.3	79.6	2.8	2.8	0.076
		10:03:35	18	18.29	8.1	0.76	7.38	-58.5	76.7	3.2	2.7	0.075
PR-2 Mid-Lake	8/16/2022	11:03:35	0.5	25.23	102	8.39	7.96	-90.5	102.6	11.3	18	0.086
		11:01:58	5	24.07	48.5	4.08	7	-38.4	109.9	6.7	8.9	0.084
		10:56:35	10	23.58	12.8	1.08	6.8	-27.1	111.3	4.3	5.7	0.084
		10:51:00	17	21.49	4	0.35	6.8	-27.5	109.8	3.3	6.9	0.088
PR-2 Mid-Lake	9/13/2022	10:39:37	0.5	21.99	129.5	11.32	8.33	-110	106.4	12.4	27.2	0.078
		10:37:15	5	20.35	46.8	4.22	6.89	-32	125.5	3.6	4.1	0.072
		10:35:05	10	19.31	44.1	4.07	6.94	-34.8	125	3.9	3.1	0.07
		10:34:06	15	18.65	45.8	4.28	6.97	-36.5	124.5	4.4	2.8	0.074
		10:32:13	20	18.15	55.4	5.23	7.1	-43.2	117.7	13.1	2.4	0.076

2022 Prompton 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 Secchi 1.85 M	5/17/2022	9:36:32	0.5	19.55	109.3	10.02	8.32	-109	50.7	0.8	4.3	0.066
		9:35:26	5	19.25	109.2	10.08	8.09	-96.1	53.6	1.2	6.8	0.065
		9:33:49	10	15.55	114.7	11.43	8.21	-102	53.7	0.8	11.1	0.058
		9:31:27	15	13.13	100.6	10.57	7.56	-67.5	56.1	1	14.6	0.055
		9:28:16	20	11.19	66.7	7.32	7.19	-48.1	56	0.9	8	0.054
		9:26:45	25	10.6	60.1	6.69	7.19	-47.9	55.7	1.5	5	0.053
		9:21:45	30	9.84	30.1	3.41	7.08	-42.2	54.8	11.9	4.8	0.057
PR-3 Upstream of Dam Secchi 1.90 M	6/14/2022	9:38:13	0.5	22.72	114.7	9.89	8.64	-127	47.1	1.8	3.6	0.078
		9:37:02	5	22.58	111.7	9.65	8.47	-118	46	2	4.4	0.077
		9:34:59	10	20.89	87.6	7.83	7.18	-47.6	49.9	1	6.4	0.074
		9:32:28	15	19.43	68	6.25	7	-38.1	45.3	1.3	6.1	0.072
		9:29:26	20	16.62	29	2.83	6.87	-31	32.7	3.9	2.9	0.073
		9:26:19	25	12.08	3.6	0.39	6.91	-33.2	10.2	1.5	1.5	0.068
		9:24:20	30	9.85	4.3	0.48	7.18	-47.4	-57.6	5.4	1.1	0.122
PR-3 Upstream of Dam Secchi 0.75 M	7/12/2022	9:48:27	0.5	24.62	151.5	12.6	9.71	-185	44.6	14.5	10.2	0.090
		9:46:19	5	23.71	128	10.83	9.31	-163	45.9	11.4	7.5	0.079
		9:42:59	10	21.1	43.4	3.86	6.83	-28.8	63	0.9	4	0.066
		9:39:48	15	19.45	33.4	3.07	6.88	-31.7	58.4	1	3.8	0.063
		9:36:06	20	15.47	6	0.6	6.99	-37.7	44.6	2.7	3.5	0.056
		9:32:32	25	13.64	4	0.42	7.39	-58.6	-11.6	2.4	3.2	0.069
		9:30:59	30	11.31	4.8	0.52	7.56	-67.3	-94.5	8.5	1.9	0.150
PR-3 Upstream of Dam Secchi 0.60 M	8/16/2022	10:31:16	0.5	24.74	87.1	7.23	7.93	-88.9	64.3	10.9	21.1	0.083
		10:29:33	5	23.79	68.6	5.79	7.45	-62.5	57.1	11.3	16.1	0.081
		10:28:02	10	23.67	58.8	4.98	7.36	-57.4	50.6	9.2	16.1	0.081
		10:23:13	15	22.15	3.3	0.29	7.14	-45.6	-75.4	1	3.4	0.098
		10:20:42	20	17.83	3.1	0.3	7.37	-57.7	-89.2	0.2	2.5	0.106
		10:17:33	25	13.32	2.9	0.3	7.54	-66.5	-82.7	1	2.8	0.122
		10:13:59	29	12.02	3.3	0.36	7.69	-74	-98.2	2	2.6	0.168
PR-3 Upstream of Dam Secchi 1.10 M	9/13/2022	10:07:45	0.5	21.41	117.2	10.36	7.78	-79.9	117.1	20.5	17.2	0.075
		10:03:53	5	20.13	40.6	3.68	6.72	-23.1	116.1	14.2	3.3	0.074
		9:59:37	10	19.26	39.1	3.61	6.73	-23.9	106.3	34.7	3.3	0.069
		9:56:03	15	18.77	48.3	4.5	6.88	-32	85	50	2.8	0.067
		9:53:01	20	17.97	23	2.18	6.98	-37	47	40.6	2.7	0.07
		9:50:14	25	15.77	3.6	0.36	7.33	-55.8	-73.3	30.4	2.5	0.128
		9:46:07	30	12.27	4.6	0.49	7.77	-78	-119	41.8	3.7	0.21
PR-4S Dam Outfall	5/17/2022	8:29:28	0.5	15.71	93.6	9.3	7.47	-62.8	56	1	6.9	0.06
	6/14/2022	8:32:20	0.5	18.97	83.2	7.72	7.72	-76.3	81	1.5	3.4	0.072
	7/12/2022	8:41:45	0.5	17.92	74.2	7.04	7.24	-51	80.3	0	3.3	0.060
	8/16/2022	8:40:30	0.5	20.39	60.1	5.42	7.48	-63.9	109	0.8	2.1	0.089
	9/13/2022	8:49:27	0.5	19.39	83.4	7.68	7.62	-71.2	138.4	13.5	4.6	0.07

APPENDIX B

PROMPTON RESERVOIR 2022
LABORATORY CUSTODY SHEETS

Certificate of Analysis

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

Laboratory No.: 2216592
Report: 05/24/22
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: 2022 - Prompton Reservoir

Lab ID: 2216592-01 **Collected By:** Client **Sampled:** 05/17/22 08:45 **Received:** 05/17/22 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	0.02	mg/l		0.01	SM 4500-P F	05/19/22	G-23, G-24	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	20	mg CaCO3/L		2	SM 2320 B	05/18/22		APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	05/18/22	U	SNF
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/18/22 11:38		ASD
Nitrate as N	0.37	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	05/17/22 20:53	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/17/22 20:53	U	JAF
Nitrate+Nitrite as N	<0.38	mg/l	0.122	1.10	CALCULATED	05/17/22 20:53		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	05/20/22	U	SNF
Phosphorus as P, Total	0.02	mg/l	0.01	0.01	SM 4500-P F	05/18/22		SNF
Solids, Total Dissolved	70	mg/l	4	5	SM 2540 C	05/18/22		TMH
Total Organic Carbon	5.2	mg/l	0.3	0.5	SM 5310 C	05/18/22		ALD
Solids, Total Suspended	4	mg/l	1	1	SM 2540 D	05/18/22		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	980	mpn/100ml	1	SM 9223 B/Quantitray	5/17/22 14:47	5/18/22 11:24		JMW
Total Coliform	>2419.6	mpn/100ml	1	SM 9223 B/Quantitray	5/17/22 14:47	5/18/22 11:24		JMW

M.J. Reider Associates, Inc.

Lab ID: 2216592-02 **Collected By:** Client **Sampled:** 05/17/22 09:55 **Received:** 05/17/22 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	0.03	mg/l		0.01	SM 4500-P F	05/19/22	G-23, G-24	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	19	mg CaCO3/L		2	SM 2320 B	05/18/22	C-51b	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	05/18/22	U	SNF
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/18/22 11:38		ASD
Nitrate as N	0.25	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	05/17/22 20:19	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/17/22 20:19	U	JAF
Nitrate+Nitrite as N	<0.26	mg/l	0.122	1.10	CALCULATED	05/17/22 20:19		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	05/20/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/18/22		SNF
Solids, Total Dissolved	71	mg/l	4	5	SM 2540 C	05/18/22		TMH
Total Organic Carbon	3.2	mg/l	0.3	0.5	SM 5310 C	05/18/22		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	05/18/22		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	<1	mpn/100ml	1	SM 9223 B/Quantitray	5/17/22 14:47	5/18/22 11:24		JMW
Total Coliform	112	mpn/100ml	1	SM 9223 B/Quantitray	5/17/22 14:47	5/18/22 11:24		JMW

Lab ID: 2216592-03 **Collected By:** Client **Sampled:** 05/17/22 09:55 **Received:** 05/17/22 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	<0.01	mg/l		0.01	SM 4500-P F	05/19/22	G-23, G-24	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	22	mg CaCO3/L		2	SM 2320 B	05/18/22		APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	05/18/22	U	SNF
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/18/22 12:16		KMS
Nitrate as N	0.36	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	05/17/22 20:03	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/17/22 20:03	U	JAF
Nitrate+Nitrite as N	<0.37	mg/l	0.122	1.10	CALCULATED	05/17/22 20:03		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	05/20/22	U	SNF
Phosphorus as P, Total	0.04	mg/l	0.01	0.01	SM 4500-P F	05/18/22		SNF
Solids, Total Dissolved	84	mg/l	4	5	SM 2540 C	05/18/22		TMH
Total Organic Carbon	3.5	mg/l	0.3	0.5	SM 5310 C	05/18/22		ALD
Solids, Total Suspended	5	mg/l	1	1	SM 2540 D	05/18/22		ALD

Lab ID: 2216592-04 **Collected By:** Client **Sampled:** 05/17/22 09:55 **Received:** 05/17/22 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	<0.01	mg/l		0.01	SM 4500-P F	05/19/22	G-23, G-24	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	19	mg CaCO3/L		2	SM 2320 B	05/18/22	C-51d	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	05/18/22	U	SNF
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/18/22 12:16		KMS
Nitrate as N	0.33	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	05/17/22 19:12	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/17/22 19:12	U	JAF
Nitrate+Nitrite as N	<0.34	mg/l	0.122	1.10	CALCULATED	05/17/22 19:12		JAF
Nitrogen, Total Kjeldahl (TKN)	0.59	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	05/20/22		SNF
Phosphorus as P, Total	0.06	mg/l	0.01	0.01	SM 4500-P F	05/18/22		SNF
Solids, Total Dissolved	49	mg/l	4	5	SM 2540 C	05/18/22		TMH
Total Organic Carbon	2.9	mg/l	0.3	0.5	SM 5310 C	05/18/22		ALD
Solids, Total Suspended	47	mg/l	1	1	SM 2540 D	05/18/22		ALD

M.J. Reider Associates, Inc.

Lab ID: 2216592-05 **Collected By:** Client **Sampled:** 05/17/22 09:15 **Received:** 05/17/22 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	<0.01	mg/l		0.01	SM 4500-P F	05/19/22	G-23, G-24	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	18	mg CaCO3/L		2	SM 2320 B	05/18/22	C-51a	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	05/18/22	U	SNF
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/18/22 11:38		ASD
Nitrate as N	0.25	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	05/17/22 18:22	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/17/22 18:22	U	JAF
Nitrate+Nitrite as N	<0.26	mg/l	0.122	1.10	CALCULATED	05/17/22 18:22		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	05/20/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/18/22		SNF
Solids, Total Dissolved	58	mg/l	4	5	SM 2540 C	05/18/22		TMH
Total Organic Carbon	3.2	mg/l	0.3	0.5	SM 5310 C	05/18/22		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	05/18/22		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	6	mpn/100ml	1	SM 9223 B/Quantitray	5/17/22 14:47	5/18/22 11:24		JMW
Total Coliform	84	mpn/100ml	1	SM 9223 B/Quantitray	5/17/22 14:47	5/18/22 11:24		JMW

Lab ID: 2216592-06 **Collected By:** Client **Sampled:** 05/17/22 09:15 **Received:** 05/17/22 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	0.01	mg/l		0.01	SM 4500-P F	05/19/22	G-23, G-24	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	18	mg CaCO3/L		2	SM 2320 B	05/18/22	C-51	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	05/18/22	U	SNF
Biochemical Oxygen Demand	2.0	mg/l	2.0	2.0	SM 5210 B	05/18/22 11:38		ASD
Nitrate as N	0.32	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	05/17/22 19:29	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/17/22 19:29	U	JAF
Nitrate+Nitrite as N	<0.33	mg/l	0.122	1.10	CALCULATED	05/17/22 19:29		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	05/20/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/18/22		SNF
Solids, Total Dissolved	57	mg/l	4	5	SM 2540 C	05/18/22		TMH
Total Organic Carbon	2.8	mg/l	0.3	0.5	SM 5310 C	05/18/22		ALD
Solids, Total Suspended	7	mg/l	1	1	SM 2540 D	05/18/22		ALD

Lab ID: 2216592-07 **Collected By:** Client **Sampled:** 05/17/22 09:15 **Received:** 05/17/22 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	<0.01	mg/l		0.01	SM 4500-P F	05/19/22	G-23, G-24	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	22	mg CaCO3/L		2	SM 2320 B	05/18/22		APR
Ammonia as N	0.18	mg/l	0.02	0.02	EPA 350.1	05/18/22		SNF
Biochemical Oxygen Demand	3.0	mg/l	2.0	2.0	SM 5210 B	05/18/22 11:38		ASD
Nitrate as N	0.36	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	05/17/22 19:46	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/17/22 19:46	U	JAF
Nitrate+Nitrite as N	<0.37	mg/l	0.122	1.10	CALCULATED	05/17/22 19:46		JAF
Nitrogen, Total Kjeldahl (TKN)	0.99	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	05/20/22		SNF
Phosphorus as P, Total	0.17	mg/l	0.01	0.01	SM 4500-P F	05/18/22		SNF
Solids, Total Dissolved	67	mg/l	4	5	SM 2540 C	05/18/22		TMH
Total Organic Carbon	7.7	mg/l	0.3	0.5	SM 5310 C	05/18/22		ALD
Solids, Total Suspended	121	mg/l	1	1	SM 2540 D	05/18/22		ALD

M.J. Reider Associates, Inc.

Lab ID: 2216592-08 **Collected By:** Client **Sampled:** 05/17/22 08:20 **Received:** 05/17/22 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	<0.01	mg/l		0.01	SM 4500-P F	05/19/22	G-23, G-24	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	19	mg CaCO3/L		2	SM 2320 B	05/18/22	C-51c	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	05/18/22	U	SNF
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/18/22 11:38		ASD
Nitrate as N	0.30	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	05/17/22 20:36	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/17/22 20:36	U	JAF
Nitrate+Nitrite as N	<0.31	mg/l	0.122	1.10	CALCULATED	05/17/22 20:36		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	05/20/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/18/22		SNF
Solids, Total Dissolved	74	mg/l	4	5	SM 2540 C	05/18/22		TMH
Total Organic Carbon	3.0	mg/l	0.3	0.5	SM 5310 C	05/18/22		ALD
Solids, Total Suspended	7	mg/l	1	1	SM 2540 D	05/18/22		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	6	mpn/100ml	1	SM 9223 B/Quantitray	5/17/22 14:47	5/18/22 11:24		JMW
Total Coliform	1050	mpn/100ml	1	SM 9223 B/Quantitray	5/17/22 14:47	5/18/22 11:24		JMW

Preparation Methods

Specific Method	Preparation Method	Prep Batch	Prepared Date	Prepared By
2216592-01				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2E1020	05/18/2022	SNF
General Chemistry				
SM 4500-P F	SM 4500-P B	B2E1032	05/18/2022	AXM
2216592-02				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2E1020	05/18/2022	SNF
General Chemistry				
SM 4500-P F	SM 4500-P B	B2E1032	05/18/2022	AXM
2216592-03				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2E1020	05/18/2022	SNF
General Chemistry				
SM 4500-P F	SM 4500-P B	B2E1032	05/18/2022	AXM
2216592-04				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2E1020	05/18/2022	SNF
General Chemistry				
SM 4500-P F	SM 4500-P B	B2E1032	05/18/2022	AXM
2216592-05				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2E1020	05/18/2022	SNF
General Chemistry				
SM 4500-P F	SM 4500-P B	B2E1032	05/18/2022	AXM
2216592-06				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2E1020	05/18/2022	SNF
General Chemistry				
SM 4500-P F	SM 4500-P B	B2E1032	05/18/2022	AXM
2216592-07				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2E1020	05/18/2022	SNF
General Chemistry				
SM 4500-P F	SM 4500-P B	B2E1032	05/18/2022	AXM
2216592-08				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2E1020	05/18/2022	SNF
General Chemistry				
SM 4500-P F	SM 4500-P B	B2E1032	05/18/2022	AXM

Notes and Definitions

C-51	The alkalinity to pH 4.2 = 18.2 mg CaCO3/L.
C-51a	The alkalinity to pH 4.2 = 18.3 mg CaCO3/L.
C-51b	The alkalinity to pH 4.2 = 18.6 mg CaCO3/L.
C-51c	The alkalinity to pH 4.2 = 19.0 mg CaCO3/L.
C-51d	The alkalinity to pH 4.2 = 19.2 mg CaCO3/L.
G-23	The sample was filtered after it was received at the laboratory and outside of the 15-minute hold time.
G-24	The sample was preserved in the laboratory and outside of the 15-minute hold time.
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

2216592

Client Code: 3157
Project Manager: Richard A Wheeler
Client: Tetra Tech
Project: 2022 - 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:

2216592-01 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 EPA 350.1, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water
Type: Grab
Date: 5/17/22
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

2216592-02 PR-2S

PO4-D SM 4500P-F, TC (#) SM 9223B, BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2
TDS SM 2540C, Alk SM 2320B, NH3-N EPA 350.1, TSS SM 2540D, TOC SM 5310C, TKN EPA 351.2, PO4 SM 4500P-F

Matrix: Non-Potable Water
Type: Grab
Date: 5/17/22
Time: 0955

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	5/17/22 1240 Date/Time	Received By	5-17-22 1245 Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	5-17-22 1400 Date/Time

Sample Kit Prepared By:	Date/Time
TBS	
Sample Temp (°C):	4.7
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: 5/2/2022 10:40:40AM

Report Template: wko WorkOrder COC ls

M.J. Reider Associates, Inc.

2216592

Client Code: 3157
Project Manager: Richard A Wheeler

Client: Tetra Tech
Project: 2022 - Prompton Reservoir

Collected By : (Full Name) Gregory Wacik

Comments:

2216592-03 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 EPA 350.1, PO4 SM 4500P-F, TOC SM 5310C, TSS SM 2540D, TDS SM 2540C, TKN EPA 351.2

Matrix: Non-Potable Water
Type: Grab
Date: 5/17/22
Time: 0955

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

2216592-04 PR-2D

NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, BOD SM 5210B, NO2-N EPA 300.0, PO4-D SM 4500P-F
Alk SM 2320B, PO4 SM 4500P-F, TOC SM 5310C, TSS SM 2540D, NH3-N EPA 350.1, TDS SM 2540C, TKN EPA 351.2

Matrix: Non-Potable Water
Type: Grab
Date: 5/17/22
Time: 0955

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

2216592-05 PR-3S

NO2-N EPA 300.0, NO3-N EPA 300.0, PO4-D SM 4500P-F, TC (#) SM 9223B, BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N, NO3-N, Combined NO3+NO2
Alk SM 2320B, TDS SM 2540C, NH3-N EPA 350.1, PO4 SM 4500P-F, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water
Type: Grab
Date: 5/17/22
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	Received By	Date/Time
Gregory Wacik	5/17/22 1240	[signature]	5-17-22 1245
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	Date/Time
		[signature]	5-17-22 1400

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	4.7
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: 5/2/2022 10:40:40AM

Report Template: wko WorkOrder COC ls

M.J. Reider Associates, Inc.

2216592

Client Code: 3157
Project Manager: Richard A Wheeler

Client: Tetra Tech
Project: 2022 - Prompton Reservoir

Collected By : (Full Name) Gregory Wacik

Comments:

2216592-06 PR-3M

NO2-N EPA 300.0, PO4-D SM 4500P-F, BOD SM 5210B, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2
Alk SM 2320B, NH3-N EPA 350.1, TDS SM 2540C, TKN EPA 351.2, PO4 SM 4500P-F, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water
Type: Grab
Date: 5/17/22
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

2216592-07 PR-3D

BOD SM 5210B, NO2-N EPA 300.0, PO4-D SM 4500P-F, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2
Alk SM 2320B, NH3-N EPA 350.1, TDS SM 2540C, TOC SM 5310C, TKN EPA 351.2, PO4 SM 4500P-F, TSS SM 2540D

Matrix: Non-Potable Water
Type: Grab
Date: 5/17/22
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

2216592-08 PR-4S

EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, PO4-D SM 4500P-F, TC (#) SM 9223B, BOD SM 5210B, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2
NH3-N EPA 350.1, TDS SM 2540C, Alk SM 2320B, PO4 SM 4500P-F, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water
Type: Grab
Date: 5/17/22
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	5/17/22 1240 Date/Time	Received By	5-17-22 1245 Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	5-17-22 1400 Date/Time

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	4.7
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: 5/2/2022 10:40:40AM

Report Template: wko WorkOrder COC ls

MJRA Terms & Conditions

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

Sample Submission, Sample Acceptance & Sampling Containers

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

Turnaround Times (TAT)

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

Analytical Results, Sample Collection Integrity & Subcontracting

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

Payment Terms

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

Warranty & Litigation

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

Reviewed and Approved by:

Richard A Wheeler
Director of Field Services

Certificate of Analysis

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

Laboratory No.: 2216902
Report: 06/29/22
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: 2022 - Prompton Reservoir

Lab ID: 2216902-01 **Collected By:** Client **Sampled:** 06/14/22 08:40 **Received:** 06/14/22 14:25
Sample Desc: PR-1S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.03	mg/l		0.01	SM 4500-P F	06/21/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	25	mg CaCO3/L		2	SM 2320 B	06/17/22		APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	06/17/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/14/22 16:46	C-37	KMS
Nitrate as N	0.42	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/14/22 17:25	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/14/22 17:25	U	JAF
Nitrate+Nitrite as N	<0.43	mg/l	0.122	1.10	CALCULATED	06/14/22 17:25		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	06/16/22	U	SNF
Phosphorus as P, Total	0.02	mg/l	0.01	0.01	SM 4500-P F	06/17/22		MRW
Solids, Total Dissolved	55	mg/l	4	5	SM 2540 C	06/15/22		TMH
Total Organic Carbon	3.3	mg/l	0.3	0.5	SM 5310 C	06/16/22		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	06/15/22		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	102	mpn/100ml	1	SM 9223 B/Quantitray	6/14/22 14:48	6/15/22 9:55		DRW
Total Coliform	2420	mpn/100ml	1	SM 9223 B/Quantitray	6/14/22 14:48	6/15/22 9:55		DRW

M.J. Reider Associates, Inc.

Lab ID: 2216902-02 **Collected By:** Client **Sampled:** 06/14/22 10:00 **Received:** 06/14/22 14:25
Sample Desc: PR-2S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	06/22/22	G-24, G-23	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	23	mg CaCO3/L		2	SM 2320 B	06/17/22		APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	06/17/22	U	MRW
Biochemical Oxygen Demand	2.0	mg/l	2.0	2.0	SM 5210 B	06/14/22 16:46	C-37	KMS
Nitrate as N	<0.11	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/14/22 15:44	U	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/14/22 15:44	U	JAF
Nitrate+Nitrite as N	<0.12	mg/l	0.122	1.10	CALCULATED	06/14/22 15:44		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	06/16/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	06/17/22		MRW
Solids, Total Dissolved	45	mg/l	4	5	SM 2540 C	06/15/22		TMH
Total Organic Carbon	3.6	mg/l	0.3	0.5	SM 5310 C	06/16/22		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	06/15/22		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	1	mpn/100ml	1	SM 9223 B/Quantitray	6/14/22 14:48	6/15/22 9:55		DRW
Total Coliform	649	mpn/100ml	1	SM 9223 B/Quantitray	6/14/22 14:48	6/15/22 9:55		DRW

Lab ID: 2216902-03 **Collected By:** Client **Sampled:** 06/14/22 10:00 **Received:** 06/14/22 14:25
Sample Desc: PR-2M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	06/22/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	23	mg CaCO3/L		2	SM 2320 B	06/17/22		APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	06/17/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/14/22 16:46	C-37	KMS
Nitrate as N	<0.11	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/14/22 16:18	U	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/14/22 16:18	U	JAF
Nitrate+Nitrite as N	<0.12	mg/l	0.122	1.10	CALCULATED	06/14/22 16:18		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	06/16/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	06/17/22		MRW
Solids, Total Dissolved	46	mg/l	4	5	SM 2540 C	06/15/22		TMH
Total Organic Carbon	3.3	mg/l	0.3	0.5	SM 5310 C	06/16/22		ALD
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	06/15/22		ALD

Lab ID: 2216902-04 **Collected By:** Client **Sampled:** 06/14/22 10:00 **Received:** 06/14/22 14:25
Sample Desc: PR-2D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.07	mg/l		0.01	SM 4500-P F	06/22/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	25	mg CaCO3/L		2	SM 2320 B	06/17/22		APR
Ammonia as N	0.03	mg/l	0.02	0.02	EPA 350.1	06/17/22		MRW
Biochemical Oxygen Demand	2.2	mg/l	2.0	2.0	SM 5210 B	06/14/22 16:46	C-37	KMS
Nitrate as N	0.24	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/14/22 16:35	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/14/22 16:35	U	JAF
Nitrate+Nitrite as N	<0.25	mg/l	0.122	1.10	CALCULATED	06/14/22 16:35		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	06/16/22	U	SNF
Phosphorus as P, Total	0.04	mg/l	0.01	0.01	SM 4500-P F	06/17/22		MRW
Solids, Total Dissolved	62	mg/l	4	5	SM 2540 C	06/15/22		TMH
Total Organic Carbon	3.5	mg/l	0.3	0.5	SM 5310 C	06/16/22		ALD
Solids, Total Suspended	68	mg/l	1	1	SM 2540 D	06/15/22		ALD

M.J. Reider Associates, Inc.

Lab ID: 2216902-05 **Collected By:** Client **Sampled:** 06/14/22 09:25 **Received:** 06/14/22 14:25
Sample Desc: PR-3S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	06/21/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	22	mg CaCO3/L		2	SM 2320 B	06/17/22		APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	06/17/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/14/22 16:46	C-37	KMS
Nitrate as N	<0.11	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/14/22 15:28	U	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/14/22 15:28	U	JAF
Nitrate+Nitrite as N	<0.12	mg/l	0.122	1.10	CALCULATED	06/14/22 15:28		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	06/16/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	06/17/22		MRW
Solids, Total Dissolved	59	mg/l	4	5	SM 2540 C	06/15/22		TMH
Total Organic Carbon	4.1	mg/l	0.3	0.5	SM 5310 C	06/14/22		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	06/15/22		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	5	mpn/100ml	1	SM 9223 B/Quantitray	6/14/22 14:48	6/15/22 9:55		DRW
Total Coliform	921	mpn/100ml	1	SM 9223 B/Quantitray	6/14/22 14:48	6/15/22 9:55		DRW

M.J. Reider Associates, Inc.

Lab ID: 2216902-06 **Collected By:** Client **Sampled:** 06/14/22 09:25 **Received:** 06/14/22 14:25
Sample Desc: PR-3M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	06/22/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	23	mg CaCO3/L		2	SM 2320 B	06/17/22		APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	06/17/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/14/22 16:46	C-37	KMS
Nitrate as N	0.26	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/14/22 18:33	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/14/22 18:33	U	JAF
Nitrate+Nitrite as N	<0.27	mg/l	0.122	1.10	CALCULATED	06/14/22 18:33		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	06/16/22	U	SNF
Phosphorus as P, Total	0.08	mg/l	0.01	0.01	SM 4500-P F	06/17/22		MRW
Solids, Total Dissolved	48	mg/l	4	5	SM 2540 C	06/15/22		TMH
Total Organic Carbon	4.3	mg/l	0.3	0.5	SM 5310 C	06/14/22		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	06/15/22		ALD

Lab ID: 2216902-07 **Collected By:** Client **Sampled:** 06/14/22 09:25 **Received:** 06/14/22 14:25
Sample Desc: PR-3D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	06/22/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	40	mg CaCO3/L		2	SM 2320 B	06/17/22		APR
Ammonia as N	0.78	mg/l	0.02	0.02	EPA 350.1	06/17/22		MRW
Biochemical Oxygen Demand	4.0	mg/l	2.0	2.0	SM 5210 B	06/14/22 16:45		KMS
Nitrate as N	<0.11	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/14/22 16:01	U	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/14/22 16:01	U	JAF
Nitrate+Nitrite as N	<0.12	mg/l	0.122	1.10	CALCULATED	06/14/22 16:01		JAF
Nitrogen, Total Kjeldahl (TKN)	1.03	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	06/16/22		SNF
Phosphorus as P, Total	0.01	mg/l	0.01	0.01	SM 4500-P F	06/17/22		MRW
Solids, Total Dissolved	62	mg/l	4	5	SM 2540 C	06/15/22		TMH
Total Organic Carbon	4.5	mg/l	0.3	0.5	SM 5310 C	06/14/22		ALD
Solids, Total Suspended	5	mg/l	1	1	SM 2540 D	06/15/22		ALD

M.J. Reider Associates, Inc.

Lab ID: 2216902-08 **Collected By:** Client **Sampled:** 06/14/22 08:25 **Received:** 06/14/22 14:25
Sample Desc: PR-4S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	06/21/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	24	mg CaCO3/L		2	SM 2320 B	06/17/22		APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	06/17/22	U	MRW
Biochemical Oxygen Demand	2.3	mg/l	2.0	2.0	SM 5210 B	06/14/22 16:46	C-37	KMS
Nitrate as N	0.25	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/14/22 18:16	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/14/22 18:16	U	JAF
Nitrate+Nitrite as N	<0.26	mg/l	0.122	1.10	CALCULATED	06/14/22 18:16		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	06/16/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	06/17/22		MRW
Solids, Total Dissolved	53	mg/l	4	5	SM 2540 C	06/15/22		TMH
Total Organic Carbon	4.2	mg/l	0.3	0.5	SM 5310 C	06/14/22		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	06/15/22		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	11	mpn/100ml	1	SM 9223 B/Quantitray	6/14/22 14:48	6/15/22 9:55		DRW
Total Coliform	1730	mpn/100ml	1	SM 9223 B/Quantitray	6/14/22 14:48	6/15/22 9:55		DRW

Preparation Methods

Specific Method	Preparation Method	Prep Batch	Prepared Date	Prepared By
2216902-01				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2F1186	06/21/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2F0970	06/16/2022	MRW
2216902-02				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2F1186	06/21/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2F0970	06/16/2022	MRW
2216902-03				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2F1186	06/21/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2F0970	06/16/2022	MRW
2216902-04				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2F1186	06/21/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2F0970	06/16/2022	MRW
2216902-05				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2F1186	06/21/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2F0970	06/16/2022	MRW
2216902-06				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2F1186	06/21/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2F0970	06/16/2022	MRW
2216902-07				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2F1186	06/21/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2F1031	06/17/2022	MRW
2216902-08				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2F1186	06/21/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2F1031	06/17/2022	MRW

Notes and Definitions

C-37	The dissolved oxygen depletion for the dilution water blank was greater than 0.20mg/L at 0.61mg/L.
G-23	The sample was filtered after it was received at the laboratory and outside of the 15-minute hold time.
G-24	The sample was preserved in the laboratory and outside of the 15-minute hold time.
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

2216902

Client Code: 3157
Client: Tetra Tech
Project Manager: Richard A Wheeler
Project: 2022 - 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:

2216902-01 PR-1S

Matrix: Non-Potable Water
Type: Grab
Date: 6/14/22
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 EPA 350.1, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

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

2216902-02 PR-2S

Matrix: Non-Potable Water
Type: Grab
Date: 6/14/22
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 EPA 350.1, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

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

Relinquished By	Date/Time 6/14/22 1245	Received By	Date/Time 6-14-22 1245
Relinquished By	Date/Time	Received By	Date/Time JUN 14 2022 14:25
Relinquished By	Date/Time	Received at Laboratory By	Date/Time JSE 6-14-22

Sample Kit Prepared By:	Date/Time
JTS	
Sample Temp (°C):	4.8
Samples on Ice?	Yes No NA
Approved By:	
Entered By:	

Printed: 5/3/2022 1:37:14PM

Report Template: v

M.J. Reider Associates, Inc.

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

Project Manager: Richard A Wheeler **Project:** 2022 - Prompton Reservoir

Comments:

Collected By : (Full Name) Gregory Wacik

2216902-03 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 EPA 350.1, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, PO4 SM 4500P-F, TSS SM 2540D

Matrix: Non-Potable Water Date: 6/14/22
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

2216902-04 PR-2D

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 EPA 350.1, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D, Alk SM 2320B, PO4 SM 4500P-F

Matrix: Non-Potable Water Date: 6/14/22
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

2216902-05 PR-3S

BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, NO3-N EPA 300.0, TC (#) SM 9223B, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F
NH3-N EPA 350.1, TDS SM 2540C, TKN EPA 351.2, Alk SM 2320B, PO4 SM 4500P-F, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water Date: 6/14/22
Type: Grab Time: 0925

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	6/14/22 1245	Received By	6/14/22 1245
Relinquished By		Received By	
Relinquished By		Received at Laboratory By	JUN 14 2022 14:25 JSE 6-14-22

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	4.8
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: 5/3/2022 1:37:14PM

Report Template: v

M.J. Reider Associates, Inc.

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

Project Manager: Richard A Wheeler **Project:** 2022 - Prompton Reservoir

Comments:

Collected By : (Full Name) Gregory Wacik

2216902-06 PR-3M

BOD SM 5210B, NO2-N EPA 300.0, PO4-D SM 4500P-F, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2
NH3-N EPA 350.1, TDS SM 2540C, TKN EPA 351.2, Alk SM 2320B, PO4 SM 4500P-F, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water Date: 6/14/22
Type: Grab Time: 0925

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

2216902-07 PR-3D

BOD SM 5210B, NO2-N EPA 300.0, PO4-D SM 4500P-F, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2
Alk SM 2320B, NH3-N EPA 350.1, TDS SM 2540C, TKN EPA 351.2, PO4 SM 4500P-F, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water Date: 6/14/22
Type: Grab Time: 0925

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

2216902-08 PR-4S

BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, NO3-N EPA 300.0, PO4-D SM 4500P-F, TC (#) SM 9223B, NO2-N, NO3-N, Combined NO3+NO2
TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, NH3-N EPA 350.1, Alk SM 2320B, TSS SM 2540D, PO4 SM 4500P-F

Matrix: Non-Potable Water Date: 6/14/22
Type: Grab Time: 0825

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 6/14/22 1245	Received By	Date/Time 6-14-22 1245
Relinquished By	Date/Time	Received By	Date/Time JUN 14 2022 14:25
Relinquished By	Date/Time	Received at Laboratory By	Date/Time JSE 6-14-22

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	4.8
Samples on Ice?	Yes No NA
Approved By:	JBS
Entered By:	

Report Template: w

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: 5/3/2022 1:37:14PM

MJRA Terms & Conditions

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

Sample Submission, Sample Acceptance & Sampling Containers

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

Turnaround Times (TAT)

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

Analytical Results, Sample Collection Integrity & Subcontracting

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

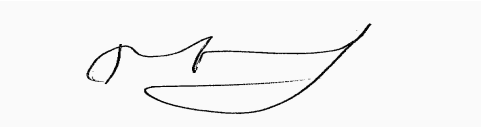
Payment Terms

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

Warranty & Litigation

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

Reviewed and Approved by:



Rafael A Quijada For 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.: 2220749
Report: 07/21/22
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: 2022 - Prompton Reservoir

Lab ID: 2220749-01 **Collected By:** Client **Sampled:** 07/12/22 08:55 **Received:** 07/12/22 14:50
Sample Desc: PR-1S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/16/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	29	mg CaCO3/L		2	SM 2320 B	07/14/22		APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	07/13/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/13/22 16:21		LES
Nitrate as N	0.36	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/12/22 20:51	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/12/22 20:51	U	JAF
Nitrate+Nitrite as N	<0.37	mg/l	0.122	1.10	CALCULATED	07/12/22 20:51		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	07/19/22	U	MRW
Phosphorus as P, Total	0.02	mg/l	0.01	0.01	SM 4500-P F	07/13/22		MRW
Solids, Total Dissolved	45	mg/l	4	5	SM 2540 C	07/13/22		TMH
Total Organic Carbon	2.4	mg/l	0.3	0.5	SM 5310 C	07/14/22		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/13/22		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	54	mpn/100ml	1	SM 9223 B/Quantitray	7/12/22 15:10	7/13/22 9:25		NAK
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	7/12/22 15:10	7/13/22 9:25		NAK

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

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

M.J. Reider Associates, Inc.

Lab ID: 2220749-02 **Collected By:** Client **Sampled:** 07/12/22 10:10 **Received:** 07/12/22 14:50
Sample Desc: PR-2S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/16/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	32	mg CaCO3/L		2	SM 2320 B	07/14/22		APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	07/13/22	U	MRW
Biochemical Oxygen Demand	9.7	mg/l	2.0	2.0	SM 5210 B	07/13/22 15:32		KMS
Nitrate as N	<0.11	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/12/22 21:58	U	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/12/22 21:58	U	JAF
Nitrate+Nitrite as N	<0.12	mg/l	0.122	1.10	CALCULATED	07/12/22 21:58		JAF
Nitrogen, Total Kjeldahl (TKN)	1.14	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	07/19/22		MRW
Phosphorus as P, Total	0.02	mg/l	0.01	0.01	SM 4500-P F	07/13/22		MRW
Solids, Total Dissolved	45	mg/l	4	5	SM 2540 C	07/13/22		TMH
Total Organic Carbon	5.4	mg/l	0.3	0.5	SM 5310 C	07/14/22		ALD
Solids, Total Suspended	13	mg/l	1	1	SM 2540 D	07/13/22		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	<1	mpn/100ml	1	SM 9223 B/Quantitray	7/12/22 15:10	7/13/22 9:25		NAK
Total Coliform	2420	mpn/100ml	1	SM 9223 B/Quantitray	7/12/22 15:10	7/13/22 9:25		NAK

Lab ID: 2220749-03 **Collected By:** Client **Sampled:** 07/12/22 10:10 **Received:** 07/12/22 14:50
Sample Desc: PR-2M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.03	mg/l		0.01	SM 4500-P F	07/16/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	24	mg CaCO3/L		2	SM 2320 B	07/14/22		APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	07/13/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/13/22 15:32		KMS
Nitrate as N	0.17	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/12/22 21:41	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/12/22 21:41	U	JAF
Nitrate+Nitrite as N	<0.18	mg/l	0.122	1.10	CALCULATED	07/12/22 21:41		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	07/19/22	U	MRW
Phosphorus as P, Total	0.01	mg/l	0.01	0.01	SM 4500-P F	07/13/22		MRW
Solids, Total Dissolved	33	mg/l	4	5	SM 2540 C	07/13/22		TMH
Total Organic Carbon	3.8	mg/l	0.3	0.5	SM 5310 C	07/14/22		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	07/13/22		ALD

Lab ID: 2220749-04 **Collected By:** Client **Sampled:** 07/12/22 10:10 **Received:** 07/12/22 14:50
Sample Desc: PR-2D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/16/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	27	mg CaCO3/L		2	SM 2320 B	07/14/22		APR
Ammonia as N	0.05	mg/l	0.02	0.02	EPA 350.1	07/13/22		MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/13/22 15:32		KMS
Nitrate as N	0.18	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/12/22 20:00	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/12/22 20:00	U	JAF
Nitrate+Nitrite as N	<0.19	mg/l	0.122	1.10	CALCULATED	07/12/22 20:00		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	07/19/22	U	MRW
Phosphorus as P, Total	0.01	mg/l	0.01	0.01	SM 4500-P F	07/13/22		MRW
Solids, Total Dissolved	22	mg/l	4	5	SM 2540 C	07/13/22		TMH
Total Organic Carbon	3.9	mg/l	0.3	0.5	SM 5310 C	07/14/22		ALD
Solids, Total Suspended	4	mg/l	1	1	SM 2540 D	07/13/22		ALD

M.J. Reider Associates, Inc.

Lab ID: 2220749-05 **Collected By:** Client **Sampled:** 07/12/22 09:25 **Received:** 07/12/22 14:50
Sample Desc: PR-3S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/16/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	27	mg CaCO3/L		2	SM 2320 B	07/14/22		APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	07/13/22	U	MRW
Biochemical Oxygen Demand	6.2	mg/l	2.0	2.0	SM 5210 B	07/13/22 16:22		LES
Nitrate as N	<0.11	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/12/22 21:25	U	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/12/22 21:25	U	JAF
Nitrate+Nitrite as N	<0.12	mg/l	0.122	1.10	CALCULATED	07/12/22 21:25		JAF
Nitrogen, Total Kjeldahl (TKN)	1.12	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	07/19/22		MRW
Phosphorus as P, Total	0.02	mg/l	0.01	0.01	SM 4500-P F	07/13/22		MRW
Solids, Total Dissolved	30	mg/l	4	5	SM 2540 C	07/13/22		TMH
Total Organic Carbon	5.3	mg/l	0.3	0.5	SM 5310 C	07/14/22		ALD
Solids, Total Suspended	11	mg/l	1	1	SM 2540 D	07/13/22		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	<1	mpn/100ml	1	SM 9223 B/Quantitray	7/12/22 15:10	7/13/22 9:25		NAK
Total Coliform	210	mpn/100ml	1	SM 9223 B/Quantitray	7/12/22 15:10	7/13/22 9:25		NAK

Lab ID: 2220749-06 **Collected By:** Client **Sampled:** 07/12/22 09:25 **Received:** 07/12/22 14:50
Sample Desc: PR-3M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/16/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	21	mg CaCO3/L		2	SM 2320 B	07/14/22		APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	07/13/22	U	MRW
Biochemical Oxygen Demand	2.1	mg/l	2.0	2.0	SM 5210 B	07/13/22 15:32		KMS
Nitrate as N	0.20	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/12/22 20:34	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/12/22 20:34	U	JAF
Nitrate+Nitrite as N	<0.21	mg/l	0.122	1.10	CALCULATED	07/12/22 20:34		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	07/19/22	U	MRW
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/13/22		MRW
Solids, Total Dissolved	18	mg/l	4	5	SM 2540 C	07/13/22		TMH
Total Organic Carbon	4.5	mg/l	0.3	0.5	SM 5310 C	07/14/22		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/13/22		ALD

Lab ID: 2220749-07 **Collected By:** Client **Sampled:** 07/12/22 09:25 **Received:** 07/12/22 14:50
Sample Desc: PR-3D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.01	mg/l		0.01	SM 4500-P F	07/16/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	36	mg CaCO3/L		2	SM 2320 B	07/14/22		APR
Ammonia as N	0.60	mg/l	0.02	0.02	EPA 350.1	07/13/22		MRW
Biochemical Oxygen Demand	4.3	mg/l	2.0	2.0	SM 5210 B	07/13/22 15:32		KMS
Nitrate as N	0.13	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/12/22 20:17	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/12/22 20:17	U	JAF
Nitrate+Nitrite as N	<0.14	mg/l	0.122	1.10	CALCULATED	07/12/22 20:17		JAF
Nitrogen, Total Kjeldahl (TKN)	1.13	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	07/19/22		MRW
Phosphorus as P, Total	0.07	mg/l	0.01	0.01	SM 4500-P F	07/13/22		MRW
Solids, Total Dissolved	37	mg/l	4	5	SM 2540 C	07/13/22		TMH
Total Organic Carbon	6.4	mg/l	0.3	0.5	SM 5310 C	07/14/22		ALD
Solids, Total Suspended	23	mg/l	1	1	SM 2540 D	07/13/22		ALD

M.J. Reider Associates, Inc.

Lab ID: 2220749-08 **Collected By:** Client **Sampled:** 07/12/22 08:35 **Received:** 07/12/22 14:50
Sample Desc: PR-4S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/16/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	21	mg CaCO3/L		2	SM 2320 B	07/14/22		APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	07/13/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/13/22 16:00		LES
Nitrate as N	0.28	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/12/22 21:08	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/12/22 21:08	U	JAF
Nitrate+Nitrite as N	<0.29	mg/l	0.122	1.10	CALCULATED	07/12/22 21:08		JAF
Nitrogen, Total Kjeldahl (TKN)	0.48	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	07/19/22	J	MRW
Phosphorus as P, Total	0.02	mg/l	0.01	0.01	SM 4500-P F	07/13/22		MRW
Solids, Total Dissolved	45	mg/l	4	5	SM 2540 C	07/13/22		TMH
Total Organic Carbon	5.1	mg/l	0.3	0.5	SM 5310 C	07/14/22		ALD
Solids, Total Suspended	4	mg/l	1	1	SM 2540 D	07/13/22		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	10	mpn/100ml	1	SM 9223 B/Quantitray	7/12/22 15:10	7/13/22 9:25		NAK
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	7/12/22 15:10	7/13/22 9:25		NAK

Preparation Methods

Specific Method	Preparation Method	Prep Batch	Prepared Date	Prepared By
2220749-01				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2G0809	07/15/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2G0635	07/13/2022	MRW
2220749-02				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2G0809	07/15/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2G0635	07/13/2022	MRW
2220749-03				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2G0809	07/15/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2G0635	07/13/2022	MRW
2220749-04				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2G0809	07/15/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2G0635	07/13/2022	MRW
2220749-05				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2G0809	07/15/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2G0635	07/13/2022	MRW
2220749-06				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2G0809	07/15/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2G0635	07/13/2022	MRW
2220749-07				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2G0809	07/15/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2G0635	07/13/2022	MRW
2220749-08				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2G0809	07/15/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2G0635	07/13/2022	MRW

Notes and Definitions

G-23	The sample was filtered after it was received at the laboratory and outside of the 15-minute hold time.
G-24	The sample was preserved in the laboratory and outside of the 15-minute hold time.
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

2220749

Client Code: 3157
Project Manager: Richard A Wheeler
Client: Tetra Tech
Project: 2022 - 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:

2220749-01 PR-1S

Matrix: Non-Potable Water
Type: Grab
Date: 7/12/22
Time: 0855

NKH JAF JAF
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 EPA 350.1, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

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

2220749-02 PR-2S

Matrix: Non-Potable Water
Type: Grab
Date: 7/12/22
Time: 1010

NKH JAF JAF
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 EPA 350.1, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

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

Relinquished By	Date/Time 7/12/22 1:00	Received By	Date/Time 7-12-22 1300
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	Date/Time 7-12-22 1450

Sample Kit Prepared By: JBS	Date/Time
Sample Temp (°C):	5.9
Samples on Ice?	Yes No NA
Approved By:	
Entered By:	

Printed: 6/1/2022 9:59:31AM

Report Template: wk

M.J. Reider Associates, Inc.

2220749

Client Code: 3157
Project Manager: Richard A Wheeler

Client: Tetra Tech
Project: 2022 - Prompton Reservoir

Collected By : (Full Name) Gregory Wacik

Comments:

2220749-03 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 EPA 350.1, PO4 SM 4500P-F, TSS SM 2540D, TDS SM 2540C, TOC SM 5310C, TKN EPA 351.2

Matrix: Non-Potable Water
Type: Grab
Date: 7/12/22
Time: 1010

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

2220749-04 PR-2D

BOD SM 5210B, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, NO2-N EPA 300.0, NO3-N EPA 300.0
Alk SM 2320B, PO4 SM 4500P-F, TSS SM 2540D, NH3-N EPA 350.1, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C

Matrix: Non-Potable Water
Type: Grab
Date: 7/12/22
Time: 1010

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

2220749-05 PR-3S

BOD SM 5210B, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, PO4-D SM 4500P-F, TC (#) SM 9223B
Alk SM 2320B, PO4 SM 4500P-F, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D, NH3-N EPA 350.1, TDS SM 2540C

Matrix: Non-Potable Water
Type: Grab
Date: 7/12/22
Time: 0925

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	7/12/22 1:00 Date/Time	Received By	7/12/22 1300 Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	7/12-22 1450 Date/Time

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	5.9
Samples on Ice?	Yes No NA
Approved By:	DJS
Entered By:	

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

Printed: 6/1/2022 9:59:31AM

Report Template: wko WorkOrder COC ls

M.J. Reider Associates, Inc.

2220749

Client Code: 3157
Project Manager: Richard A Wheeler

Client: Tetra Tech
Project: 2022 - Prompton Reservoir

Collected By : (Full Name) Gregory Wacik

Comments:

2220749-06 PR-3M

NLH JAF JAF

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
TOC SM 5310C, TSS SM 2540D, Alk SM 2320B, NH3-N EPA 350.1, TDS SM 2540C, TKN EPA 351.2, PO4 SM 4500P-F

Matrix: Non-Potable Water
Type: Grab
Date: 7/12/22
Time: 0925

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

2220749-07 PR-3D

JAF JAF NLH

PO4-D SM 4500P-F, NO2-N EPA 300.0, NO3-N EPA 300.0, BOD SM 5210B, NO2-N, NO3-N, Combined NO3+NO2
TDS SM 2540C, TOC SM 5310C, TSS SM 2540D, Alk SM 2320B, TKN EPA 351.2, NH3-N EPA 350.1, PO4 SM 4500P-F

Matrix: Non-Potable Water
Type: Grab
Date: 7/12/22
Time: 0925

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

2220749-08 PR-4S

NLH JAF JAF

BOD SM 5210B, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, PO4-D SM 4500P-F, TC (#) SM 9223B
Alk SM 2320B, PO4 SM 4500P-F, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D, NH3-N EPA 350.1, TDS SM 2540C

Matrix: Non-Potable Water
Type: Grab
Date: 7/12/22
Time: 0835

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	7/12/22 1:00 Date/Time	Received By	7-12-22 1300 Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	7/12-22 1450 Date/Time

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	5.9
Samples on Ice?	Yes No NA
Approved By:	
Entered By:	

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

Printed: 6/1/2022 9:59:31AM

Report Template: wko WorkOrder COC ls

MJRA Terms & Conditions

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

Sample Submission, Sample Acceptance & Sampling Containers

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

Turnaround Times (TAT)

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

Analytical Results, Sample Collection Integrity & Subcontracting

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

Payment Terms

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

Warranty & Litigation

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

Reviewed and Approved by:

Richard A Wheeler
Director of Field Services

Certificate of Analysis

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

Laboratory No.: 2226697
Report: 09/15/22
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: 2022 - Prompton Reservoir

Narrative: Amended
09/15/2022

2226697 received on 08/18/2022 14:00 was originally reported on 08/25/2022.

This certificate is a supplement to the original and has been amended to document the MDL change for NO3-N EPA 300.0.

Lab ID: 2226697-01 **Collected By:** Client **Sampled:** 08/16/22 09:00 **Received:** 08/16/22 14:45
Sample Desc: PR-1S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.04	mg/l		0.01	SM 4500-P F	08/18/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	29	mg CaCO3/L		2	SM 2320 B	08/18/22		APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	08/17/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/16/22 17:10		LES
Nitrate as N	0.26	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	08/16/22 16:19	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/16/22 16:19	U	JAF
Nitrate+Nitrite as N	<0.27	mg/l	0.198	1.10	CALCULATED	08/16/22 16:19		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	08/22/22	U	SNF
Phosphorus as P, Total	0.01	mg/l	0.01	0.01	SM 4500-P F	08/17/22		MRW
Solids, Total Dissolved	44	mg/l	4	5	SM 2540 C	08/17/22		TMH
Total Organic Carbon	1.8	mg/l	0.3	0.5	SM 5310 C	08/16/22		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	08/17/22		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	75	mpn/100ml	1	SM 9223 B/Quantitray	8/16/22 15:38	8/17/22 10:07		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	8/16/22 15:38	8/17/22 10:07		JMW

M.J. Reider Associates, Inc.

Lab ID: 2226697-02 **Collected By:** Client **Sampled:** 08/16/22 10:30 **Received:** 08/16/22 14:45
Sample Desc: PR-2S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.03	mg/l		0.01	SM 4500-P F	08/18/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	27	mg CaCO3/L		2	SM 2320 B	08/18/22		APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	08/17/22	U	MRW
Biochemical Oxygen Demand	5.9	mg/l	2.0	2.0	SM 5210 B	08/16/22 17:10		LES
Nitrate as N	<0.18	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	08/17/22 0:29	U	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/17/22 0:29	U	JAF
Nitrate+Nitrite as N	<0.19	mg/l	0.198	1.10	CALCULATED	08/17/22 0:29		JAF
Nitrogen, Total Kjeldahl (TKN)	0.51	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	08/22/22		SNF
Phosphorus as P, Total	0.02	mg/l	0.01	0.01	SM 4500-P F	08/17/22		MRW
Solids, Total Dissolved	42	mg/l	4	5	SM 2540 C	08/17/22		TMH
Total Organic Carbon	4.1	mg/l	0.3	0.5	SM 5310 C	08/16/22		ALD
Solids, Total Suspended	13	mg/l	1	1	SM 2540 D	08/17/22		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	3	mpn/100ml	1	SM 9223 B/Quantitray	8/16/22 15:38	8/17/22 10:07		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	8/16/22 15:38	8/17/22 10:07		JMW

Lab ID: 2226697-03 **Collected By:** Client **Sampled:** 08/16/22 10:30 **Received:** 08/16/22 14:45
Sample Desc: PR-2M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.01	mg/l		0.01	SM 4500-P F	08/18/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	28	mg CaCO3/L		2	SM 2320 B	08/18/22		APR
Ammonia as N	0.03	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	08/17/22		MRW
Biochemical Oxygen Demand	2.7	mg/l	2.0	2.0	SM 5210 B	08/16/22 17:10		LES
Nitrate as N	<0.18	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	08/16/22 16:02	U	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/16/22 16:02	U	JAF
Nitrate+Nitrite as N	<0.19	mg/l	0.198	1.10	CALCULATED	08/16/22 16:02		JAF
Nitrogen, Total Kjeldahl (TKN)	0.52	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	08/22/22		SNF
Phosphorus as P, Total	0.03	mg/l	0.01	0.01	SM 4500-P F	08/17/22		MRW
Solids, Total Dissolved	67	mg/l	4	5	SM 2540 C	08/17/22		TMH
Total Organic Carbon	4.1	mg/l	0.3	0.5	SM 5310 C	08/16/22		ALD
Solids, Total Suspended	13	mg/l	1	1	SM 2540 D	08/17/22		ALD

Lab ID: 2226697-04 **Collected By:** Client **Sampled:** 08/16/22 10:30 **Received:** 08/16/22 14:45
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		0.01	SM 4500-P F	08/18/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	27	mg CaCO3/L		2	SM 2320 B	08/18/22		APR
Ammonia as N	0.11	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	08/17/22		MRW
Biochemical Oxygen Demand	2.3	mg/l	2.0	2.0	SM 5210 B	08/16/22 17:10		LES
Nitrate as N	<0.18	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	08/16/22 16:36	U	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/16/22 16:36	U	JAF
Nitrate+Nitrite as N	<0.19	mg/l	0.198	1.10	CALCULATED	08/16/22 16:36		JAF
Nitrogen, Total Kjeldahl (TKN)	2.64	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	08/22/22		SNF
Phosphorus as P, Total	0.44	mg/l	0.01	0.01	SM 4500-P F	08/17/22		MRW
Solids, Total Dissolved	57	mg/l	4	5	SM 2540 C	08/17/22		TMH
Total Organic Carbon	6.2	mg/l	0.3	0.5	SM 5310 C	08/16/22		ALD
Solids, Total Suspended	23	mg/l	1	1	SM 2540 D	08/17/22		ALD

M.J. Reider Associates, Inc.

Lab ID: 2226697-05 **Collected By:** Client **Sampled:** 08/16/22 10:00 **Received:** 08/16/22 14:45
Sample Desc: PR-3S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.01	mg/l		0.01	SM 4500-P F	08/18/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	26	mg CaCO3/L		2	SM 2320 B	08/18/22		APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	08/17/22	U	MRW
Biochemical Oxygen Demand	6.0	mg/l	2.0	2.0	SM 5210 B	08/16/22 17:10		LES
Nitrate as N	<0.18	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	08/17/22 0:12	U	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/17/22 0:12	U	JAF
Nitrate+Nitrite as N	<0.19	mg/l	0.198	1.10	CALCULATED	08/17/22 0:12		JAF
Nitrogen, Total Kjeldahl (TKN)	0.64	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	08/22/22		SNF
Phosphorus as P, Total	0.03	mg/l	0.01	0.01	SM 4500-P F	08/17/22		MRW
Solids, Total Dissolved	48	mg/l	4	5	SM 2540 C	08/17/22		TMH
Total Organic Carbon	4.4	mg/l	0.3	0.5	SM 5310 C	08/16/22		ALD
Solids, Total Suspended	10	mg/l	1	1	SM 2540 D	08/17/22		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	<1	mpn/100ml	1	SM 9223 B/Quantitray	8/16/22 15:38	8/17/22 10:07		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	8/16/22 15:38	8/17/22 10:07		JMW

Lab ID: 2226697-06 **Collected By:** Client **Sampled:** 08/16/22 10:00 **Received:** 08/16/22 14:45
Sample Desc: PR-3M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.02	mg/l		0.01	SM 4500-P F	08/18/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	33	mg CaCO3/L		2	SM 2320 B	08/18/22		APR
Ammonia as N	0.29	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	08/17/22		MRW
Biochemical Oxygen Demand	3.5	mg/l	2.0	2.0	SM 5210 B	08/16/22 17:10		LES
Nitrate as N	<0.18	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	08/17/22 0:47	U	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/17/22 0:47	U	JAF
Nitrate+Nitrite as N	<0.19	mg/l	0.198	1.10	CALCULATED	08/17/22 0:47		JAF
Nitrogen, Total Kjeldahl (TKN)	0.78	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	08/22/22		SNF
Phosphorus as P, Total	0.06	mg/l	0.01	0.01	SM 4500-P F	08/17/22		MRW
Solids, Total Dissolved	34	mg/l	4	5	SM 2540 C	08/17/22		TMH
Total Organic Carbon	4.3	mg/l	0.3	0.5	SM 5310 C	08/16/22		ALD
Solids, Total Suspended	4	mg/l	1	1	SM 2540 D	08/17/22		ALD

Lab ID: 2226697-07 **Collected By:** Client **Sampled:** 08/16/22 10:00 **Received:** 08/16/22 14:45
Sample Desc: PR-3D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.26	mg/l		0.01	SM 4500-P F	08/18/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	51	mg CaCO3/L		2	SM 2320 B	08/18/22		APR
Ammonia as N	2.42	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	08/17/22		MRW
Biochemical Oxygen Demand	12.5	mg/l	2.0	2.0	SM 5210 B	08/16/22 17:10		LES
Nitrate as N	<0.18	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	08/16/22 23:55	U	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/16/22 23:55	U	JAF
Nitrate+Nitrite as N	<0.19	mg/l	0.198	1.10	CALCULATED	08/16/22 23:55		JAF
Nitrogen, Total Kjeldahl (TKN)	3.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	08/22/22		SNF
Phosphorus as P, Total	0.43	mg/l	0.01	0.01	SM 4500-P F	08/17/22		MRW
Solids, Total Dissolved	75	mg/l	4	5	SM 2540 C	08/17/22		TMH
Total Organic Carbon	18.5	mg/l	1.4	2.5	SM 5310 C	08/18/22		ALD
Solids, Total Suspended	84	mg/l	1	1	SM 2540 D	08/17/22		ALD

M.J. Reider Associates, Inc.

Lab ID: 2226697-08 **Collected By:** Client **Sampled:** 08/16/22 08:30 **Received:** 08/16/22 14:45
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		0.01	SM 4500-P F	08/18/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	31	mg CaCO3/L		2	SM 2320 B	08/18/22		APR
Ammonia as N	0.27	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	08/17/22		MRW
Biochemical Oxygen Demand	2.5	mg/l	2.0	2.0	SM 5210 B	08/16/22 17:10		LES
Nitrate as N	0.36	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	08/16/22 15:45	J	JAF
Nitrite as N	0.03	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/16/22 15:45	J	JAF
Nitrate+Nitrite as N	0.39	mg/l	0.198	1.10	CALCULATED	08/16/22 15:45		JAF
Nitrogen, Total Kjeldahl (TKN)	2.18	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	08/22/22		SNF
Phosphorus as P, Total	0.30	mg/l	0.01	0.01	SM 4500-P F	08/17/22		MRW
Solids, Total Dissolved	62	mg/l	4	5	SM 2540 C	08/17/22		TMH
Total Organic Carbon	4.5	mg/l	0.3	0.5	SM 5310 C	08/16/22		ALD
Solids, Total Suspended	8	mg/l	1	1	SM 2540 D	08/17/22		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	5	mpn/100ml	1	SM 9223 B/Quantitray	8/16/22 15:38	8/17/22 10:07		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	8/16/22 15:38	8/17/22 10:07		JMW

Preparation Methods

Specific Method	Preparation Method	Prep Batch	Prepared Date	Prepared By
2226697-01				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2H1053	08/17/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2H1003	08/17/2022	SNF
2226697-02				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2H1053	08/17/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2H1003	08/17/2022	SNF
2226697-03				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2H1053	08/17/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2H1003	08/17/2022	SNF
2226697-04				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2H1053	08/17/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2H1003	08/17/2022	SNF
2226697-05				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2H1053	08/17/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2H1003	08/17/2022	SNF
2226697-06				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2H1053	08/17/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2H1003	08/17/2022	SNF
2226697-07				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2H1053	08/17/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2H1003	08/17/2022	SNF
2226697-08				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2H1053	08/17/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2H1003	08/17/2022	SNF

Notes and Definitions

G-23	The sample was filtered after it was received at the laboratory and outside of the 15-minute hold time.
G-24	The sample was preserved in the laboratory and outside of the 15-minute hold time.
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

2226697

Client Code: 3157
Project Manager: Richard A Wheeler
Client: Tetra Tech
Project: 2022 - 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:

2226697-01 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 EPA 350.1, TDS SM 2540C, TKN EPA 351.2, PO4 SM 4500P-F, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water
Type: Grab
Date: 8/10/22
Time: 0900

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

2226697-02 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 EPA 350.1, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water
Type: Grab
Date: 8/10/22
Time: 1030

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

Relinquished By: Gregory Wacik	Date/Time: 8/10/22 1:35	Received By:	Date/Time: 8-16-22 1340
Relinquished By:	Date/Time:	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received at Laboratory By:	Date/Time: 8-16-22 1445

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	4.9
Samples on Ice?	Yes / No / NA
Approved By:	
Entered By:	

Printed: 7/12/2022 7:40:01AM

Report Template: wko WorkOrder COC ls

M.J. Reider Associates, Inc.

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

Project Manager: Richard A Wheeler **Project:** 2022 - Prompton Reservoir

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

2226697-03 PR-2M

Matrix: Non-Potable Water Date: 8/16/22
Type: Grab Time: 1030

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 EPA 350.1, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, PO4 SM 4500P-F, TSS SM 2540D

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

2226697-04 PR-2D

Matrix: Non-Potable Water Date: 8/16/22
Type: Grab Time: 1030

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 EPA 350.1, TDS SM 2540C, TOC SM 5310C, TSS SM 2540D, Alk SM 2320B, PO4 SM 4500P-F, TKN EPA 351.2

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

2226697-05 PR-3S

Matrix: Non-Potable Water Date: 8/16/22
Type: Grab Time: 1080

NO2-N EPA 300.0, NO3-N EPA 300.0, PO4-D SM 4500P-F, TC (#) SM 9223B, BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N, NO3-N, Combined NO3+NO2
Alk SM 2320B, TDS SM 2540C, NH3-N EPA 350.1, PO4 SM 4500P-F, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

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

Relinquished By	Date/Time 8/16/22 1:35	Received By	Date/Time 8-16-22 1340
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	Date/Time 8-16-22 1445

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	4.9
Samples on Ice?	Yes No NA
Approved By:	
Entered By:	

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

Printed: 7/12/2022 7:40:01AM

Report Template: wkd

M.J. Reider Associates, Inc.

2226697

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

Project Manager: Richard A Wheeler **Project:** 2022 - Prompton Reservoir

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

2226697-06 PR-3M

Matrix: Non-Potable Water Date: 8/16/22
Type: Grab Time: 1000

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 EPA 350.1, PO4 SM 4500P-F, TSS SM 2540D, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C

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

2226697-07 PR-3D

Matrix: Non-Potable Water Date: 8/16/22
Type: Grab Time: 1000

BOD SM 5210B, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, NO2-N EPA 300.0, NO3-N EPA 300.0
TOC SM 5310C, TSS SM 2540D, Alk SM 2320B, PO4 SM 4500P-F, NH3-N EPA 350.1, TDS SM 2540C, TKN EPA 351.2

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

2226697-08 PR-4S

Matrix: Non-Potable Water Date: 8/16/22
Type: Grab Time: 0830

NO2-N EPA 300.0, BOD SM 5210B, EC (#) SM 9223B Confirmation, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B
Alk SM 2320B, PO4 SM 4500P-F, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D, NH3-N EPA 350.1, TDS SM 2540C

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

Relinquished By	8/16/22 1:35 Date/Time	Received By	8-16-22 1340 Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	8-16-22 Date/Time

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	4.9
Samples on Ice?	(Yes) No NA
Approved By:	
Entered By:	

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

Printed: 7/12/2022 7:40:01AM

Report Template: wk

MJRA Terms & Conditions

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

Sample Submission, Sample Acceptance & Sampling Containers

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

Turnaround Times (TAT)

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

Analytical Results, Sample Collection Integrity & Subcontracting

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

Payment Terms

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

Warranty & Litigation

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

Reviewed and Approved by:

Richard A Wheeler
Director of Field Services

Certificate of Analysis

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

Laboratory No.: 2229487
Report: 09/28/22
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: 2022 - Prompton Reservoir

Lab ID: 2229487-01 **Collected By:** Client **Sampled:** 09/13/22 09:05 **Received:** 09/13/22 14:20
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		0.01	SM 4500-P F	09/24/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	23	mg CaCO3/L		2	SM 2320 B	09/16/22		APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	09/19/22	U	SNF
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	09/14/22 15:20		NKH
Nitrate as N	0.38	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	09/13/22 18:38	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/13/22 18:38	U	JAF
Nitrate+Nitrite as N	<0.39	mg/l	0.198	1.10	CALCULATED	09/13/22 18:38		JAF
Nitrogen, Total Kjeldahl (TKN)	0.63	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	09/16/22		SNF
Phosphorus as P, Total	0.04	mg/l	0.01	0.01	SM 4500-P F	09/19/22		SNF
Solids, Total Dissolved	47	mg/l	4	5	SM 2540 C	09/14/22		TMH
Total Organic Carbon	4.2	mg/l	0.3	0.5	SM 5310 C	09/13/22		ALD
Solids, Total Suspended	10	mg/l	1	1	SM 2540 D	09/14/22		ASD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	2420	mpn/100ml	1	SM 9223 B/Quantitray	9/13/22 15:04	9/14/22 11:08		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	9/13/22 15:04	9/14/22 11:08		JMW

M.J. Reider Associates, Inc.

Lab ID: 2229487-02 **Collected By:** Client **Sampled:** 09/13/22 10:30 **Received:** 09/13/22 14:20
Sample Desc: PR-2S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.04	mg/l		0.01	SM 4500-P F	09/24/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	22	mg CaCO3/L		2	SM 2320 B	09/16/22		APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	09/19/22	U	SNF
Biochemical Oxygen Demand	3.4	mg/l	2.0	2.0	SM 5210 B	09/14/22 15:20		NKH
Nitrate as N	<0.18	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	09/13/22 19:28	U	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/13/22 19:28	U	JAF
Nitrate+Nitrite as N	<0.19	mg/l	0.198	1.10	CALCULATED	09/13/22 19:28		JAF
Nitrogen, Total Kjeldahl (TKN)	0.98	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	09/16/22	Q-10	SNF
Phosphorus as P, Total	0.04	mg/l	0.01	0.01	SM 4500-P F	09/19/22		SNF
Solids, Total Dissolved	52	mg/l	4	5	SM 2540 C	09/14/22		TMH
Total Organic Carbon	5.4	mg/l	0.3	0.5	SM 5310 C	09/13/22		ALD
Solids, Total Suspended	12	mg/l	1	1	SM 2540 D	09/14/22		ASD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	2	mpn/100ml	1	SM 9223 B/Quantitray	9/13/22 15:04	9/14/22 11:08		JMW
Total Coliform	1990	mpn/100ml	1	SM 9223 B/Quantitray	9/13/22 15:04	9/14/22 11:08		JMW

Lab ID: 2229487-03 **Collected By:** Client **Sampled:** 09/13/22 10:30 **Received:** 09/13/22 14:20
Sample Desc: PR-2M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.02	mg/l		0.01	SM 4500-P F	09/24/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	21	mg CaCO3/L		2	SM 2320 B	09/16/22		APR
Ammonia as N	0.04	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	09/19/22		SNF
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	09/13/22 17:40		LES
Nitrate as N	0.27	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	09/13/22 21:09	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/13/22 21:09	U	JAF
Nitrate+Nitrite as N	<0.28	mg/l	0.198	1.10	CALCULATED	09/13/22 21:09		JAF
Nitrogen, Total Kjeldahl (TKN)	0.82	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	09/16/22		SNF
Phosphorus as P, Total	0.02	mg/l	0.01	0.01	SM 4500-P F	09/19/22		SNF
Solids, Total Dissolved	42	mg/l	4	5	SM 2540 C	09/14/22		TMH
Total Organic Carbon	5.2	mg/l	0.3	0.5	SM 5310 C	09/13/22		ALD
Solids, Total Suspended	7	mg/l	1	1	SM 2540 D	09/14/22		ASD

Lab ID: 2229487-04 **Collected By:** Client **Sampled:** 09/13/22 10:30 **Received:** 09/13/22 14:20
Sample Desc: PR-2D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.04	mg/l		0.01	SM 4500-P F	09/24/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	24	mg CaCO3/L		2	SM 2320 B	09/16/22		APR
Ammonia as N	0.10	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	09/19/22		SNF
Biochemical Oxygen Demand	2.1	mg/l	2.0	2.0	SM 5210 B	09/13/22 17:40		LES
Nitrate as N	0.28	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	09/13/22 20:36	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/13/22 20:36	U	JAF
Nitrate+Nitrite as N	<0.29	mg/l	0.198	1.10	CALCULATED	09/13/22 20:36		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	09/16/22	U	SNF
Phosphorus as P, Total	0.04	mg/l	0.01	0.01	SM 4500-P F	09/19/22		SNF
Solids, Total Dissolved	39	mg/l	4	5	SM 2540 C	09/14/22		TMH
Total Organic Carbon	4.8	mg/l	0.3	0.5	SM 5310 C	09/13/22		ALD
Solids, Total Suspended	16	mg/l	1	1	SM 2540 D	09/14/22		ASD

M.J. Reider Associates, Inc.

Lab ID: 2229487-05 **Collected By:** Client **Sampled:** 09/13/22 09:45 **Received:** 09/13/22 14:20
Sample Desc: PR-3S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.04	mg/l		0.01	SM 4500-P F	09/24/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	23	mg CaCO3/L		2	SM 2320 B	09/16/22		APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	09/19/22	Q-10a, U	SNF
Biochemical Oxygen Demand	6.7	mg/l	2.0	2.0	SM 5210 B	09/14/22 16:00		NKH
Nitrate as N	<0.18	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	09/13/22 19:45	U	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/13/22 19:45	U	JAF
Nitrate+Nitrite as N	<0.19	mg/l	0.198	1.10	CALCULATED	09/13/22 19:45		JAF
Nitrogen, Total Kjeldahl (TKN)	0.89	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	09/16/22		SNF
Phosphorus as P, Total	0.02	mg/l	0.01	0.01	SM 4500-P F	09/19/22		SNF
Solids, Total Dissolved	44	mg/l	4	5	SM 2540 C	09/14/22		TMH
Total Organic Carbon	5.3	mg/l	0.3	0.5	SM 5310 C	09/13/22		ALD
Solids, Total Suspended	8	mg/l	1	1	SM 2540 D	09/14/22		ASD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	<1	mpn/100ml	1	SM 9223 B/Quantitray	9/13/22 15:04	9/14/22 11:08		JMW
Total Coliform	1120	mpn/100ml	1	SM 9223 B/Quantitray	9/13/22 15:04	9/14/22 11:08		JMW

Lab ID: 2229487-06 **Collected By:** Client **Sampled:** 09/13/22 09:45 **Received:** 09/13/22 14:20
Sample Desc: PR-3M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.03	mg/l		0.01	SM 4500-P F	09/24/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	19	mg CaCO3/L		2	SM 2320 B	09/16/22	C-51	APR
Ammonia as N	0.04	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	09/19/22		SNF
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	09/14/22 15:20		NKH
Nitrate as N	0.27	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	09/13/22 20:02	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/13/22 20:02	U	JAF
Nitrate+Nitrite as N	<0.28	mg/l	0.198	1.10	CALCULATED	09/13/22 20:02		JAF
Nitrogen, Total Kjeldahl (TKN)	0.59	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	09/16/22		SNF
Phosphorus as P, Total	0.02	mg/l	0.01	0.01	SM 4500-P F	09/19/22		SNF
Solids, Total Dissolved	37	mg/l	4	5	SM 2540 C	09/14/22		TMH
Total Organic Carbon	6.4	mg/l	0.3	0.5	SM 5310 C	09/13/22		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	09/14/22		ASD

Lab ID: 2229487-07 **Collected By:** Client **Sampled:** 09/13/22 09:45 **Received:** 09/13/22 14:20
Sample Desc: PR-3D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.09	mg/l		0.01	SM 4500-P F	09/24/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	44	mg CaCO3/L		2	SM 2320 B	09/16/22		APR
Ammonia as N	1.54	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	09/19/22		SNF
Biochemical Oxygen Demand	9.8	mg/l	2.0	2.0	SM 5210 B	09/13/22 17:40		LES
Nitrate as N	<0.18	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	09/13/22 20:19	U	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/13/22 20:19	U	JAF
Nitrate+Nitrite as N	<0.19	mg/l	0.198	1.10	CALCULATED	09/13/22 20:19		JAF
Nitrogen, Total Kjeldahl (TKN)	2.11	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	09/16/22		SNF
Phosphorus as P, Total	0.09	mg/l	0.01	0.01	SM 4500-P F	09/19/22		SNF
Solids, Total Dissolved	51	mg/l	4	5	SM 2540 C	09/14/22		TMH
Total Organic Carbon	7.5	mg/l	0.3	0.5	SM 5310 C	09/13/22		ALD
Solids, Total Suspended	12	mg/l	1	1	SM 2540 D	09/14/22		ASD

M.J. Reider Associates, Inc.

Lab ID: 2229487-08 **Collected By:** Client **Sampled:** 09/13/22 08:40 **Received:** 09/13/22 14:20
Sample Desc: PR-4S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.03	mg/l		0.01	SM 4500-P F	09/24/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	19	mg CaCO3/L		2	SM 2320 B	09/16/22	C-51a	APR
Ammonia as N	0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	09/19/22		SNF
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	09/14/22 15:20		NKH
Nitrate as N	0.28	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	09/13/22 20:52	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/13/22 20:52	U	JAF
Nitrate+Nitrite as N	<0.29	mg/l	0.198	1.10	CALCULATED	09/13/22 20:52		JAF
Nitrogen, Total Kjeldahl (TKN)	0.56	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	09/16/22		SNF
Phosphorus as P, Total	0.03	mg/l	0.01	0.01	SM 4500-P F	09/19/22		SNF
Solids, Total Dissolved	58	mg/l	4	5	SM 2540 C	09/14/22		TMH
Total Organic Carbon	5.9	mg/l	0.3	0.5	SM 5310 C	09/13/22		ALD
Solids, Total Suspended	10	mg/l	1	1	SM 2540 D	09/14/22	Q-19	ASD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	118	mpn/100ml	1	SM 9223 B/Quantitray	9/13/22 15:04	9/14/22 11:08		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	9/13/22 15:04	9/14/22 11:08		JMW

Preparation Methods

Specific Method	Preparation Method	Prep Batch	Prepared Date	Prepared By
2229487-01				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2I1399	09/23/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2I1019	09/19/2022	JMW
2229487-02				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2I1399	09/23/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2I1019	09/19/2022	JMW
2229487-03				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2I1399	09/23/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2I1019	09/19/2022	JMW
2229487-04				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2I1399	09/23/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2I1019	09/19/2022	JMW
2229487-05				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2I1399	09/23/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2I1019	09/19/2022	JMW
2229487-06				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2I1399	09/23/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2I1019	09/19/2022	JMW
2229487-07				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2I1399	09/23/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2I1019	09/19/2022	JMW
2229487-08				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2I1399	09/23/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2I1019	09/19/2022	JMW

Notes and Definitions

C-51	The alkalinity to pH 4.2 = 18.7 mg CaCO3/L.
C-51a	The alkalinity to pH 4.2 = 18.8 mg CaCO3/L.
G-23	The sample was filtered after it was received at the laboratory and outside of the 15-minute hold time.
G-24	The sample was preserved in the laboratory and outside of the 15-minute hold time.
J	Estimated value
Q-10	The matrix spike(s) were outside acceptable limits of 90-110% recovery at 112%.
Q-10a	The matrix spike(s) were outside acceptable limits of 90-110% recovery at 89.9%.
Q-19	The duplicate RPD was greater than 10% at 10.5%.
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

2229487

Client Code: 3157
Project Manager: Richard A Wheeler
Client: Tetra Tech
Project: 2022 - 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:

2229487-01 PR-1S

Matrix: Non-Potable Water
Type: Grab
Date: 9/13/22
Time: 9:05

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 EPA 350.1, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

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

2229487-02 PR-2S

Matrix: Non-Potable Water
Type: Grab
Date: 9/13/22
Time: 1030

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 EPA 350.1, PO4 SM 4500P-F, TDS SM 2540C, TOC SM 5310C, TSS SM 2540D, TKN EPA 351.2

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

	Date/Time		Date/Time
Relinquished By	9/13/22 1230	Received By	9-13-22 1305
Relinquished By		Received By	
Relinquished By		Received at Laboratory By	9-13-22 1420

Sample Kit Prepared By:	Date/Time: JUL 29 2022
Sample Temp (°C):	4.0
Samples on Ice?	Yes No NA
Approved By:	
Entered By:	

Printed: 7/28/2022 2:17:30PM

Report Template: w

M.J. Reider Associates, Inc.

Client Code: 3157
Project Manager: Richard A Wheeler

Client: Tetra Tech
Project: 2022 - Prompton Reservoir
Comments:

Collected By : (Full Name) Gregory Wacik

2229487-03 PR-2M

Matrix: Non-Potable Water
Type: Grab
Date: 9/13/22
Time: 1030

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 EPA 350.1, PO4 SM 4500P-F, TOC SM 5310C, TSS SM 2540D, TDS SM 2540C, TKN EPA 351.2

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

2229487-04 PR-2D

Matrix: Non-Potable Water
Type: Grab
Date: 9/13/22
Time: 1030

NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, BOD SM 5210B, NO2-N EPA 300.0, PO4-D SM 4500P-F
Alk SM 2320B, PO4 SM 4500P-F, TOC SM 5310C, TSS SM 2540D, NH3-N EPA 350.1, TDS SM 2540C, TKN EPA 351.2

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

2229487-05 PR-3S

Matrix: Non-Potable Water
Type: Grab
Date: 9/13/22
Time: 0945

NO2-N EPA 300.0, NO3-N EPA 300.0, PO4-D SM 4500P-F, TC (#) SM 9223B, BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N, NO3-N, Combined NO3+NO2
Alk SM 2320B, TSS SM 2540D, NH3-N EPA 350.1, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C

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

	Date/Time		Date/Time
Relinquished By	9/13/22 1730	Received By	9-13-22 1305
Relinquished By		Received By	
Relinquished By		Received at Laboratory By	9-13-22 1420

Sample Kit Prepared By: Date/Time: JUL 29 2022
Sample Temp (°C): 4.0
Samples on Ice? Yes No NA
Approved By:
Entered By:

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

Printed: 7/28/2022 2:17:30PM

Report Template

M.J. Reider Associates, Inc.

2229487

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

Project Manager: Richard A Wheeler **Project:** 2022 - Prompton Reservoir

Comments:

Collected By : (Full Name) Gregory Wacik

2229487-06 PR-3M

Matrix: Non-Potable Water Date: 9/13/22
Type: Grab Time: 0945

NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, BOD SM 5210B, NO2-N EPA 300.0, NO3-N EPA 300.0
Alk SM 2320B, PO4 SM 4500P-F, NH3-N EPA 350.1, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

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

2229487-07 PR-3D

Matrix: Non-Potable Water Date: 9/13/22
Type: Grab Time: 0945

BOD SM 5210B, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, NO2-N EPA 300.0, NO3-N EPA 300.0
TSS SM 2540D, TOC SM 5310C, Alk SM 2320B, PO4 SM 4500P-F, NH3-N EPA 350.1, TDS SM 2540C, TKN EPA 351.2

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

2229487-08 PR-4S

Matrix: Non-Potable Water Date: 9/13/22
Type: Grab Time: 0840

BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, NO2-N EPA 300.0, NO3-N EPA 300.0, TC (#) SM 9223B
NH3-N EPA 350.1, PO4 SM 4500P-F, TOC SM 5310C, TSS SM 2540D, Alk SM 2320B, TDS SM 2540C, TKN EPA 351.2

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

	Date/Time		Date/Time
Relinquished By	9/13/22 1330	Received By	9-13-22 1305
Relinquished By		Received By	
Relinquished By		Received at Laboratory By	9-13-22 1420

Sample Kit Prepared By:	Date/Time AUG 29 2022
Sample Temp (°C):	4.0
Samples on Ice?	Yes No NA
Approved By:	BSW
Entered By:	KMD

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

Printed: 7/28/2022 2:17:30PM

Report Template: w

MJRA Terms & Conditions

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

Sample Submission, Sample Acceptance & Sampling Containers

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

Turnaround Times (TAT)

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

Analytical Results, Sample Collection Integrity & Subcontracting

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

Payment Terms

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

Warranty & Litigation

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

Reviewed and Approved by:

Richard A Wheeler
Director of Field Services