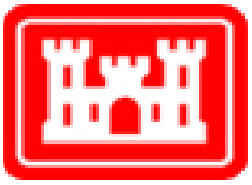
2020 WATER QUALITY MONITORING
F.E. WALTER RESERVOIR
WHITE HAVEN, PENNSYLVANIA



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

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2020 Water Quality Monitoring
F.E. Walter Reservoir
White Haven, Pennsylvania

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1.0 INTRODUCTION

1.1 DESCRIPTION OF F.E. WALTER RESERVOIR

The U.S. Army Corps of Engineers (USACE) manages F.E. Walter Reservoir located in northeastern Pennsylvania within the Delaware River Basin. F.E. Walter Reservoir is an integral part of the Lehigh River Flood Control Program. The authorized purpose of this project is flood control. The reservoir project was authorized for recreation and specifically white-water recreation as part of Public Law 100-676, Section 6, dated November 17, 1988. Located about 9 miles southeast of Wilkes-Barre, PA, the reservoir dams a drainage area of 288 square miles. The dam can impound up to 35.8 billion gallons of floodwater. The primary surface water input into the reservoir is the Lehigh River as it flows west between Luzerne and Carbon Counties. Bear Creek, a secondary surface water input, enters the reservoir from the north. Tobyhanna Creek drains an area to the southeast and joins the Lehigh River near the headwaters of the reservoir. The reservoir is approximately 3 miles long and approximately 50 feet deep when not operating for flood control or recreation. To maximize recreational potential in the reservoir and on the Lehigh River downstream, specifically recreational boating and fishing, the normal operating pool of 50 feet is raised an additional 70 feet in April of most years. The additional storage is used to augment low flows in the Lehigh River downstream as a fishery management tool and increase the number of recreational boating releases throughout the summer whitewater recreation season.

1.2 PURPOSE OF THE MONITORING PROGRAM

Foremost, F.E. Walter Reservoir provides flood control to downstream communities on the Lehigh River. Additionally, the reservoir provides important habitat for fish, waterfowl, and other wildlife, and recreational opportunities through fishing and boating both within the lake and downstream. Drinking water intakes exist at various locations on the Lehigh River downstream of the dam. Due to the broad range of uses and demands F.E. Walter Reservoir serves, the USACE monitors water quality and other aspects related to reservoir health primarily to ensure public health safety and protection of the environment. Water quality monitoring results are compared to state water quality standards 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 F.E. Walter Reservoir and its tributaries from May through September 2020.

1.3 ELEMENTS OF THE STUDY

The USACE, Philadelphia District, has been monitoring the water quality of F.E. Walter Reservoir since 1975. Over this time, yearly monitoring program designs have

evolved to address new areas of concern such as human health aspects of drinking water, sediment contaminants within the reservoir basin, a 2002 investigation of a hydrogen sulfide release near the tail water of the dam, and water quality modeling studies in 2009 and 2013. The 2020 monitoring program was 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 the Pennsylvania state water quality standards and to monitor the overall health of the reservoir.

2.0 METHODS

2.1 PHYSICAL STRATIFICATION MONITORING

Physical stratification monitoring of the water column of F.E. Walter Reservoir was conducted five times between May and September 2020 at all stations (Table 2-1). Physical stratification parameters included temperature, dissolved oxygen (DO), pH, ORP, Chlorophyll a, depth, turbidity, and conductivity. Monitoring was conducted at seven fixed stations located throughout the reservoir watershed (Fig. 2-1). Surface water quality was monitored at stations downstream (outfall discharge) of the reservoir (WA-1S) and upstream tributary stations on Tobyhanna Creek (WA-3S), the Lehigh River (WA-4S), and Bear Creek (WA-5S). Stratification monitoring was conducted within the reservoir at a reservoir tower station (WA-2), Bear Creek arm of the lake (WA-6), and Lehigh River arm of the lake (WA-7) with water quality measured from the water surface to the bottom at 5-ft intervals. All the water quality monitoring was conducted with a calibrated YSI 6600 V2-4 multi-parameter water quality sonde.

In this report, when applicable, water quality data recorded from monitoring was compared to water quality standards mandated by the Pennsylvania Department of Environmental Protection (PADEP Chapter 93). The standard for DO is a minimum concentration of 5 mg/L, and that for pH is an acceptable range from 6 to 9. Temperatures 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 at F.E. Walter Reservoir between May and September 2020 (Table 2-1). Water samples were collected at the seven fixed stations throughout the reservoir drainage area (Fig. 2-1). Surface water samples were collected at stations downstream of the reservoir (WA-1S) and upstream on Tobyhanna Creek (WA-3S), the Lehigh River (WA-4S), and Bear Creek (WA-5S). Surface, middle, and bottom water samples were collected at each of the reservoir-body stations WA-2, WA-6, and WA-7. Surface water samples were collected by opening the sample containers approximately 1 foot below the water's surface. Middle and bottom samples were collected with a Van Dorn design water bottle 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 (TKN), total phosphorus, soluble phosphorus, total dissolved solids (TDS), total suspended solids (TSS), biochemical oxygen demand (BOD), alkalinity, and total organic carbon (TOC). 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.

Figure 2-1. Seven fixed water quality sampling stations at the USACE Philadelphia District F.E. Walter Reservoir located in White Haven, Pennsylvania.

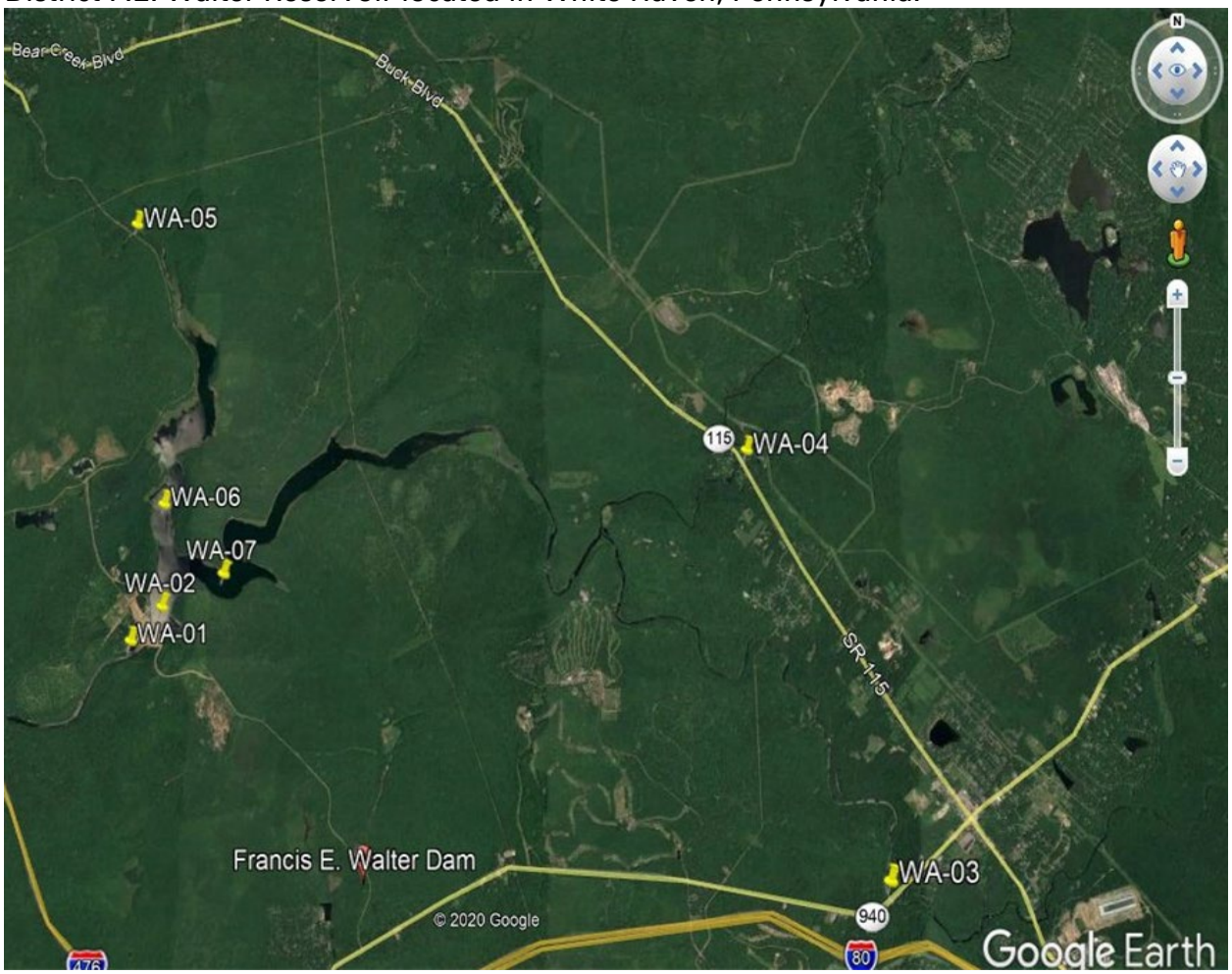

Table 2-1. F.E. Walter Reservoir water quality schedule for 2020 monitoring

Date of Sample Collection	(3) Physical Stratification Monitoring (All Stations)	Water Column Chemistry Monitoring (All Stations)	Trophic State Determination (WA-2)	Coliform Bacteria Monitoring (All Stations)	(4) Sediment Priority Pollutant Monitoring (WA-2)	(2) Lehigh Temperature Probes	(1) Drinking Water Monitoring
20 May	X	X	X	NS	NS	NS	NS
17 June	X	X	X	X	NS	NS	NS
08 July	X	X	X	X	NS	NS	NS
12 August	X	X	X	X	NS	NS	NS
02 September	X	X	X	X	NS	NS	NS

(1) Drinking water samples are sampled quarterly by personnel at each reservoir.
(2) Lehigh River temperature probes continuously monitor river temperatures throughout the sampling period.
(3) Physical stratification monitoring is conducted at all stations during routine monthly sampling.
(4) Sediment Sampling was not conducted in 2020 based on historic sampling results showing low probability of sediment contamination.
NS- Not Sampled

2-3

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

Parameter	(2) Method	Laboratory Limit of Reporting	PADEP Surface Water Quality Criteria	Allowable Hold Times (Days)
Total Alkalinity	SM20 2320 B	2.0 mg/L	Min. 20 mg/L $CaCO_3$	14
Biochemical Oxygen Demand (BOD)	SM 5210 B	2.0 mg/L	None	2
Total Phosphorus	SM 4500-P E	0.05 mg/L	None	28
Diss./Ortho-Phosphate	NA	NA	None	28
Soluble Phosphorus	SM 4500-P F	0.05 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	0.50 mg/L	None	28
Ammonia	ASTM D6919-03	0.10 mg/L	Temp. and pH dependent	28
Nitrate	EPA 300.0 Rev 2.1	1.00 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.
SW846- "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods", 3rd. Edition, November 1986 and updates.
* Total Inorganic Carbon and Total Carbon were not sampled for in 2020

2.3 TROPHIC STATE DETERMINATION

The trophic state of F.E. Walter Reservoir was determined by methods outlined by Carlson (1977) and EPA (1983). In general, these methods calculate trophic state indices (TSIs) independently for total phosphorus and chlorophyll *a* concentration, and secchi disk depth. Surface water measures of total phosphorus and chlorophyll *a* from chemistry monitoring were used independently in determining monthly TSI values. Secchi disk depth was measured only in surface waters in the reservoir-body. Trophic state determinations were calculated only for Station WA-2 within the reservoir.

2.4 RESERVOIR BACTERIA MONITORING

Monitoring for coliform bacteria contaminants was conducted five times at each sampling station between May and September 2020 at F.E. Walter Reservoir. Surface water samples were collected in the same manner as for chemical parameter samples and analyzed for total and escherichia coliform contamination as indicators of risk. Table 2-3 presents the test methods, detection limits, United States Environmental Protection Agency (EPA) and Pennsylvania Department of Environmental Protection (PADEP) standards, and sample holding times for the bacteria parameters monitored at F.E. Walter Reservoir in 2020. The bacteria analytical method was based on a membrane filtration technique. 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 bacteria counts were compared to the EPA primary recreation water quality single sample standard for Escherichia coli bacteria. Application of this standard is not directly applicable at F.E. Walter 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 F.E. Walter Reservoir in 2020.

Parameter	Total Coliform	Escherichia Coliform
Test method	SM 9223 B	SM 9223 B
Limit of Quantification	1 clns/100-mls	1 clns/100-mls
EPA/PADEP standard	None	Geometric mean <126 clns/100 ml or a single sample reading of <235 clns/100 ml
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 describe temporal and spatial patterns for the water quality parameters of temperature, dissolved oxygen (DO) and pH measured throughout the F.E. Walter Reservoir and watershed during 2020. Patterns related to season and depths are described for station WA-2 which is located at the operations tower and maintains the greatest water depths in the reservoir. Maximum depths at station WA-2, during five separate sampling days, varied between approximately 95 to 120 feet depending on 2020 reservoir operations (recreation and flood control) at the time of sampling. The stratification data collected during the 2020 monitoring is presented in Appendix A.

3.1.1 Temperature

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

Temperatures of the tributary surface waters (Stations WA-3S, -4S, and -5S) of the F.E. Walter Reservoir watershed generally followed a similar seasonal pattern throughout the monitoring period. Monthly sampling showed temperatures rising from May into summer with peak surface temperatures seen in August followed by a decline into September (Fig. 3-1). Reservoir downstream release (Station WA-1S) surface water temperatures showed a similar trend with September release temperatures warmer than tributary inflow temperatures. A maximum inflow temperature of 22.40 ºC (WA-4S) was measured in August with a maximum outflow temperature of 21.88 ºC (WA-1S) also seen in August. Surface water temperatures of the reservoir-body (Stations WA-2S, -6S, and -7S) were generally warmer than in tributaries and downstream of the dam as a result of warming from the sun, residence time within the lake, and deep reservoir pool downstream releases only (no surface water withdrawals). In-lake reservoir surface temperatures peaked in August at approximately 26.36 ºC (Station WA-7S). In 2020, tributary and release water temperatures, at times, exceeded the Pennsylvania state water quality criteria for cold water fisheries.

The water column of F.E. Walter Reservoir was temperature stratified during the 2020 sampling season (Fig. 3-2). Due to operations in 2020, specifically the raising of the base pool level and recreational release operations, the temperature stratification within the reservoir was likely affected by bottom flood gate releases and flood control storage on various occasions during the season. This was evident in late August and into September when the pool level was lowered for recreational operations and reservoir profile temperatures showed a breakdown of stratification in the water column. The

reservoir tower was constructed with bottom flood control gates only and does not have the flexibility to withdrawal water from other locations in the water column apart from a small bypass control at elevation 1297'. As a result, deeper and typically cooler bottom waters are withdrawn first, likely causing a disruption in typical lake stratification processes and the accelerated depletion of cooler bottom waters. Overall, reservoir lake temperatures in 2020 showed stratification in May through early August. Cooler deep-water temperatures (less than 20 °C as a fishery temperature target) were available into the late July time period of the recreational season which is typical for most years.

3.1.2 Dissolved Oxygen

Dissolved oxygen (DO) is the measure of the amount of DO in water. 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.

In 2020, DO in the tributary surface waters (stations WA-3S, -4S, and -5S) of F.E. Walter Reservoir remained relatively constant and within acceptable freshwater concentrations from May through September with recorded values ranging from 8.14 mg/L to 12.00 mg/L. These values can be attributed to typically well oxygenated stream and river systems and seasonal changes in water temperature. Station WA-1S located downstream of F.E. Walter Reservoir also maintained a similar seasonal pattern with recorded values ranging from 8.24 mg/L to 11.38 mg/L. This can be attributed, in part, to the re-aeration of reservoir bottom waters as it passes through the conduit system of the dam and is released downstream.

The water column of F.E. Walter Reservoir was weakly stratified with respect to DO during most of the sampling season (Fig. 3-4). The reservoir profile showed the formation of a metalimnetic dissolved oxygen minimum in early September. As seen in some oxygen versus depth profiles of lakes or reservoirs, concentrations of dissolved oxygen may be depleted in the metalimnion of the lake profile. This depletion is termed a negative heterograde curve or metalimnetic oxygen minimum. Metalimnetic minimums of dissolved oxygen in deep mesotrophic reservoirs are often seen and have been shown to also exist in the US Army Corps of Engineers Philadelphia District's Beltzville Reservoir. This water column profile formation may be a natural occurrence and/or man induced. In the case of F.E. Walter Reservoir, the severity of this occurrence appears influenced by seasonal recreational and flood control operations and associated pool heights. The potential exists for negative impacts on water quality, recreational use, and aquatic species such as fish. The occurrence and severity of this DO formation will be monitored during future sampling efforts. In all months sampled the DO concentrations remained above state epilimnion DO state criteria (minimum 5 mg/l).

The health of aquatic ecosystems can be impaired by low DO concentrations in the water column (<5.0 mg/L). The lowest DO concentration (0.90 mg/L) was recorded at the bottom of the reservoir during the 08 July sampling event (Fig. 3-4). 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. F.E. Walter Reservoir did experience hypoxic conditions in deeper reservoir waters during the 2020 sampling season. Low oxygen reservoir waters are re-aerated as they pass through the conduit system of the reservoir during releases downstream. As a result, water releases from the deeper portions of the reservoir containing lower DO concentration did not negatively impact the DO concentrations of the Lehigh River downstream.

3.1.3 pH

PH is the measure of the hydrogen –ion concentration in the water. The pH scale is 0-14 with lower numbers below a pH of 7 considered acidic and higher numbers above a pH of 7 considered 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. The Lehigh River and many of its tributaries are naturally acidic due to tannic acids found throughout the watershed.

Measures of pH in tributary (WA-3S, -4S, and –5S) surface waters of F.E. Walter Reservoir generally followed a similar pattern during the 2020 sampling season and remained relatively constant or within a narrow range of slightly acidic values (6.06-7.48). The lowest pH of 6.11 recorded during the sampling season occurred at station WA-5S during the 17 June sampling with the highest pH reading of 7.48 also being recorded at Station WA-5S in July. Measures of pH at the downstream station WA-1S are directly influenced by tributary inflows and bottom water column releases from the reservoir. Readings of pH at this station ranged from a high of 6.51 in July to a low of 6.32 in August (Fig. 3-5).

For most of the 2020 sampling season, measures of reservoir pH stayed within a tight range of values (6.23-7.15) from the water surface to the lake bottom (Fig. 3-6). July sampling showed low pH values (<6.0) for nearly the entire water column. This drop in pH throughout the water column has not been observed during previous annual sampling events. The cause of these observations has not been determined and may require future scrutiny and sampling. Slightly higher pH values were measured in the surface waters and bottom waters of the lake during most months. Many factors can influence the pH of the reservoir water such as geology, wind, acid rain, algal productivity, deep water biological productivity and others. Measures of pH throughout the water column did not remain in compliance with PADEP water quality standards during the month of July. The water quality standard for pH is a range of acceptable measures between 6 and 9.

3.2 WATER COLUMN CHEMISTRY MONITORING

Table 3-1 provides a summary of water column chemistry sampling for all stations and dates sampled at F.E. Walter Reservoir in 2020. The following sections describe the temporal, spatial, and depth related patterns for these water quality measures.

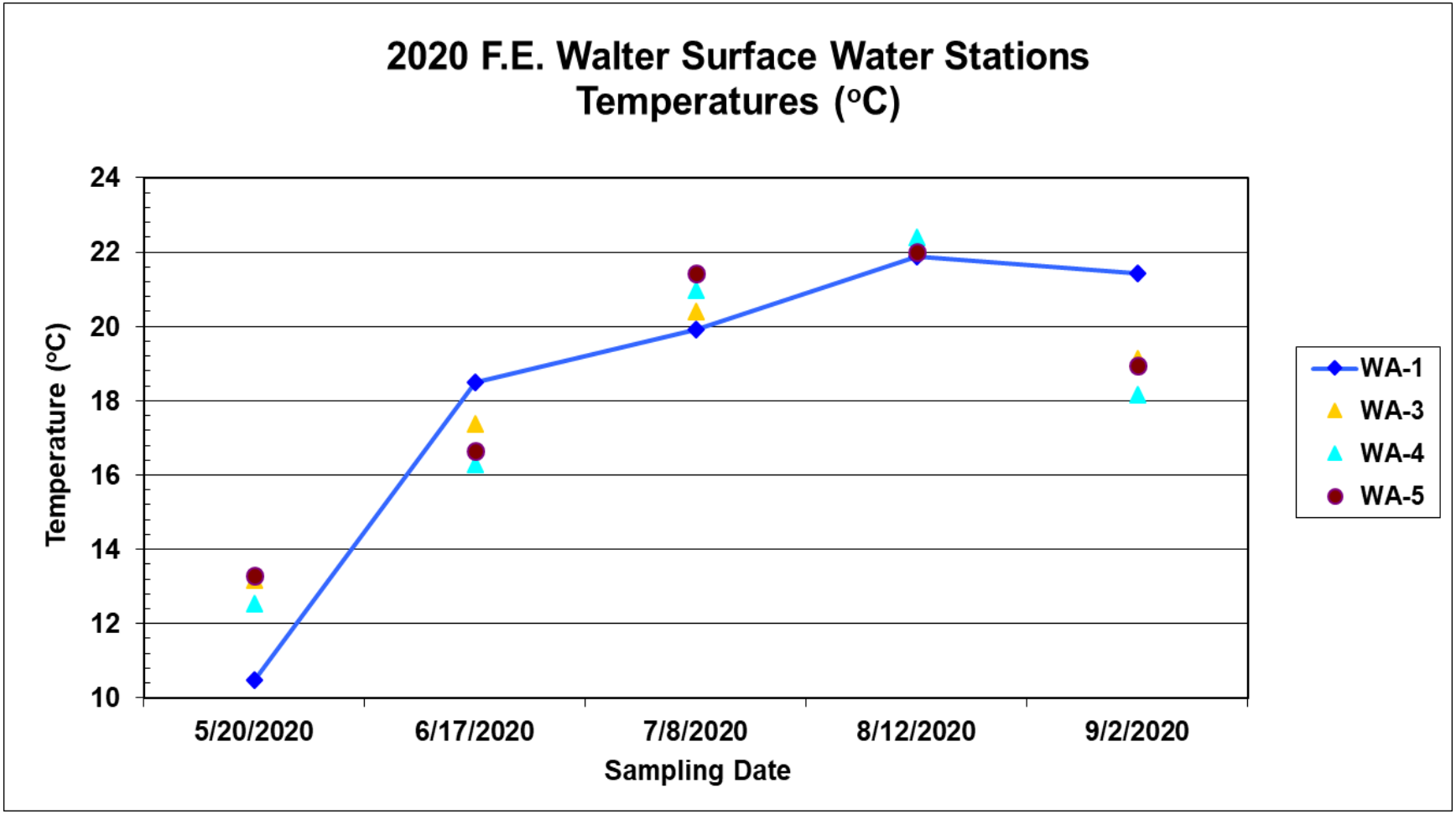

Figure 3-1. Temperature measured in tributary and release (WA-1) surface waters of F.E. Walter Reservoir during 2020. See Appendix A for a summary of the plotted values.

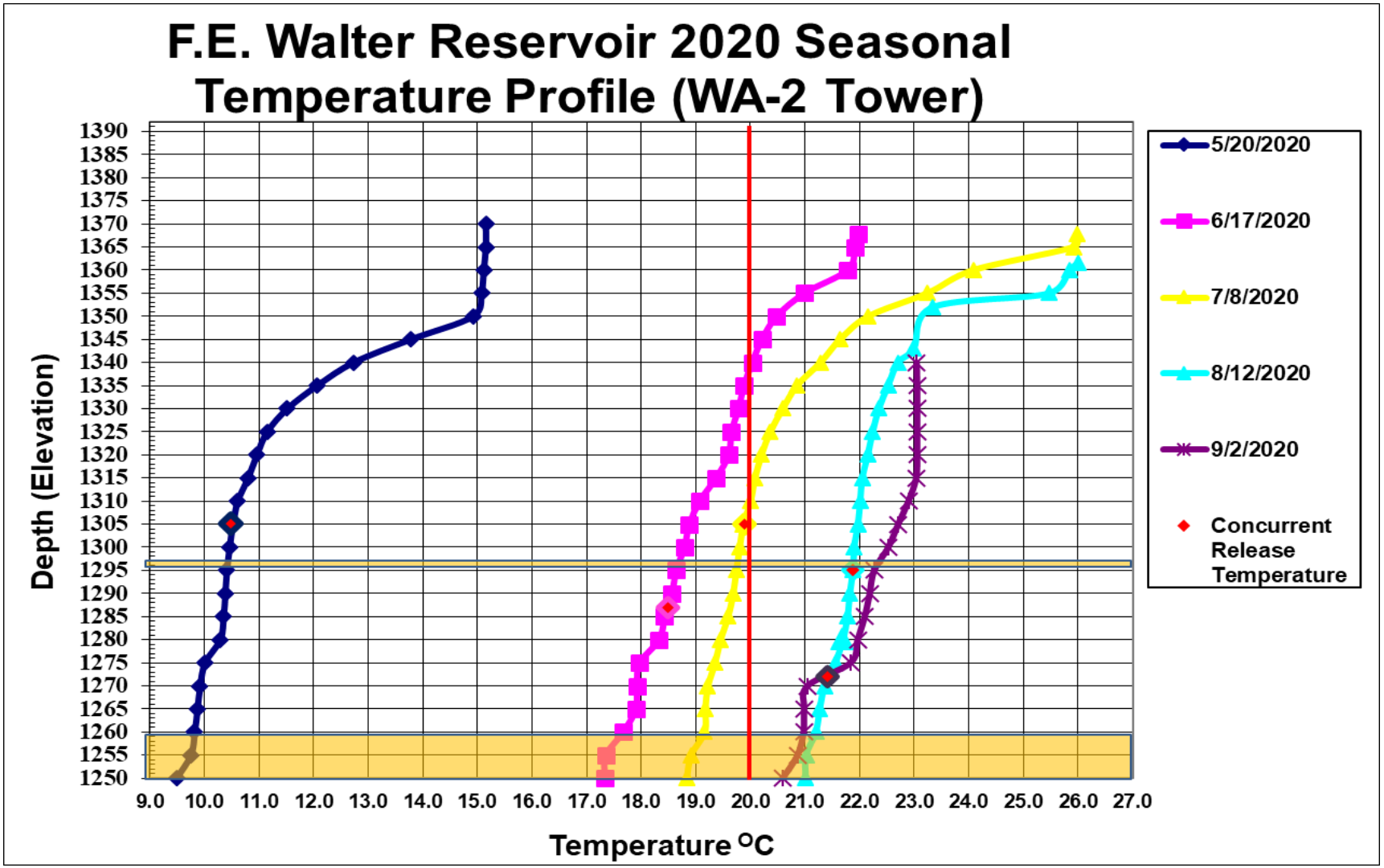

Figure 3-2. Stratification of temperature measured in the water column of F. E. Walter Reservoir at station WA-2 during 2020. See Appendix A for a summary of the plotted values. The cold-water species preference temperature of 20°C is shown as a red line reference.

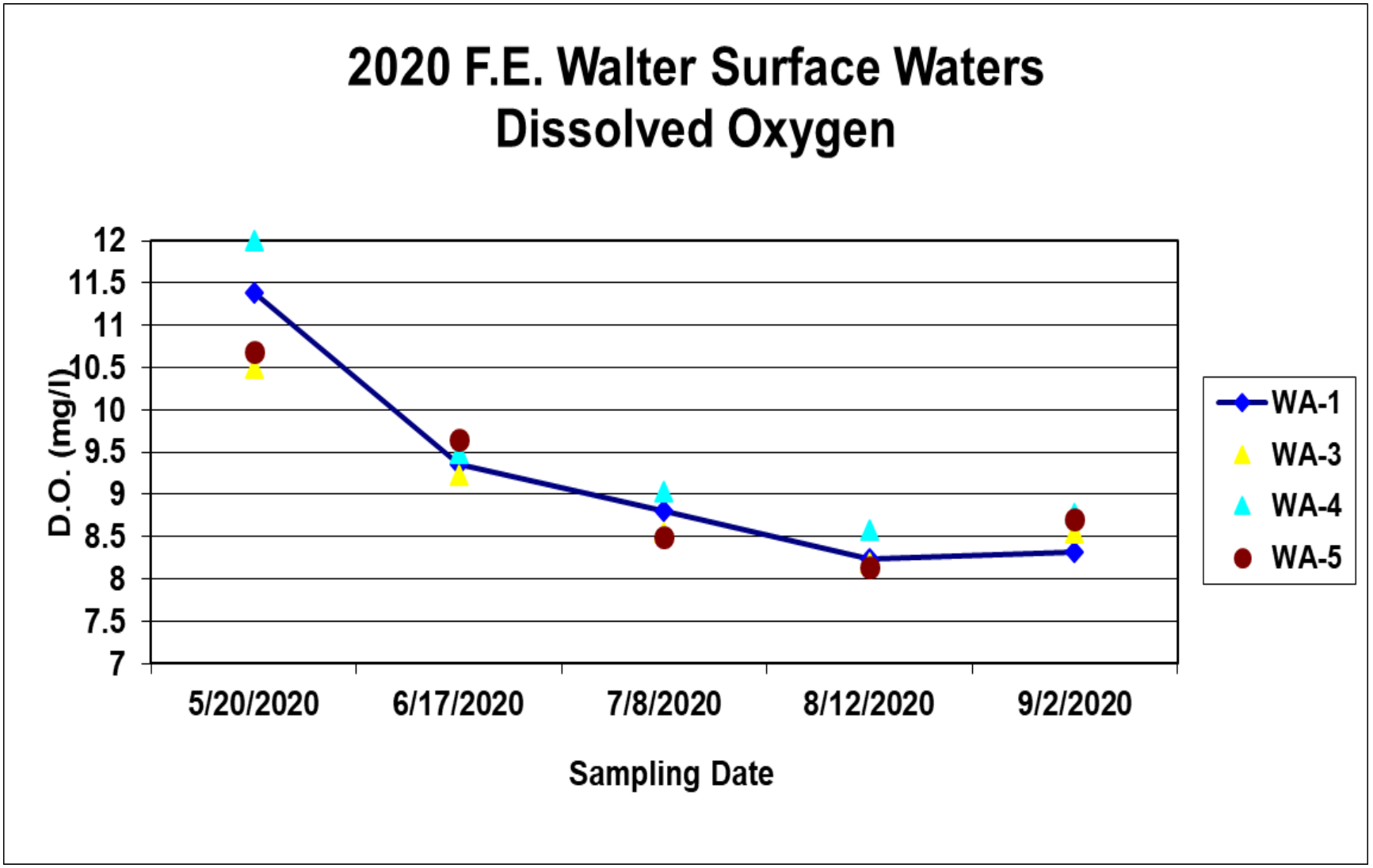

Figure 3-3. Dissolved oxygen measured in tributary and release (WA-1) surface waters of F. E. Walter Reservoir during 2020. See Appendix A for a summary of the plotted value.

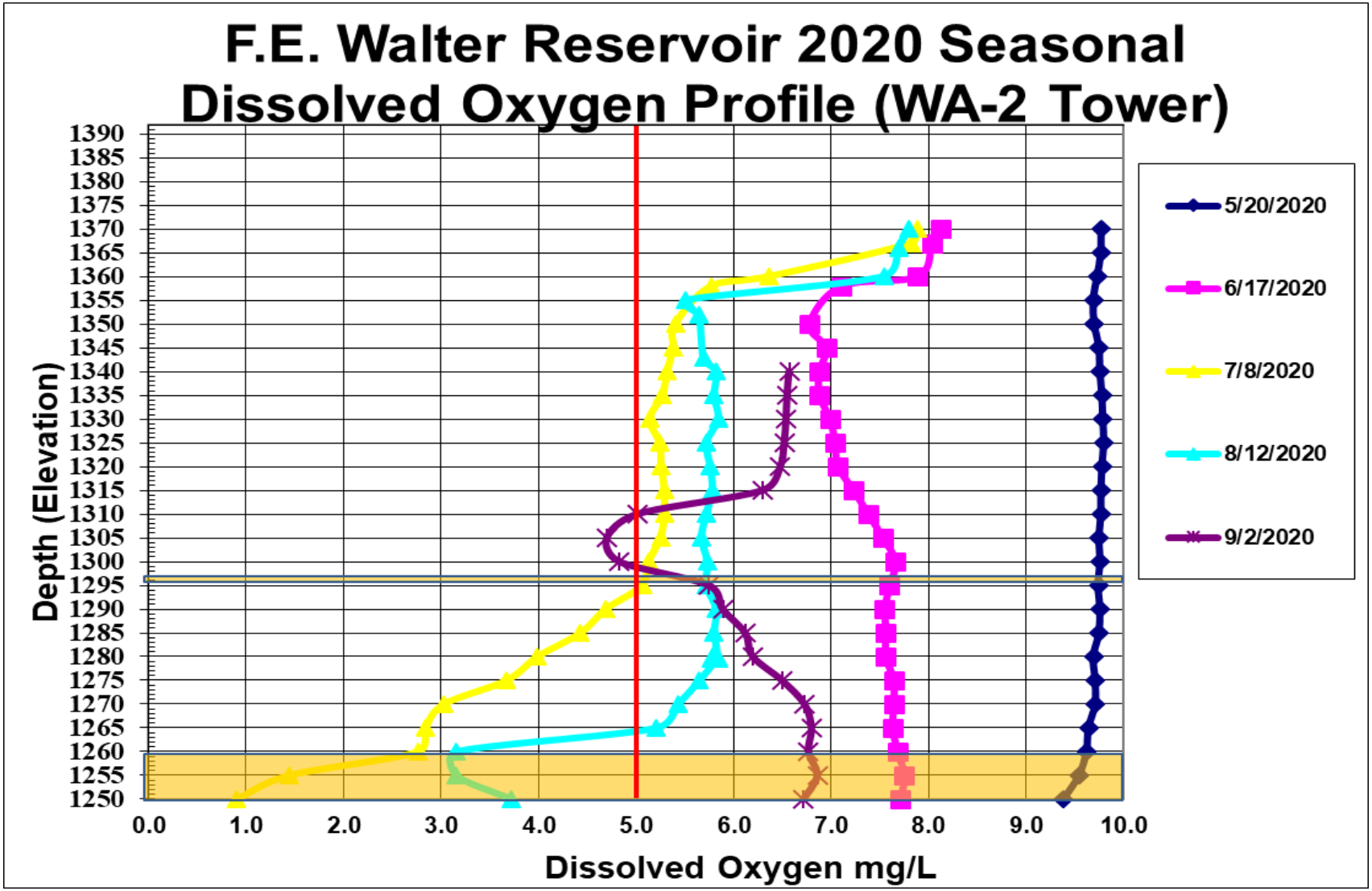

Figure 3-4. Dissolved oxygen measured in the water column of F.E. Walter Reservoir at station WA-2 during 2020. The PADEP WQ standard for DO is an epilimnion minimum concentration of 5 mg/L. See Appendix A for a summary of the plotted values.

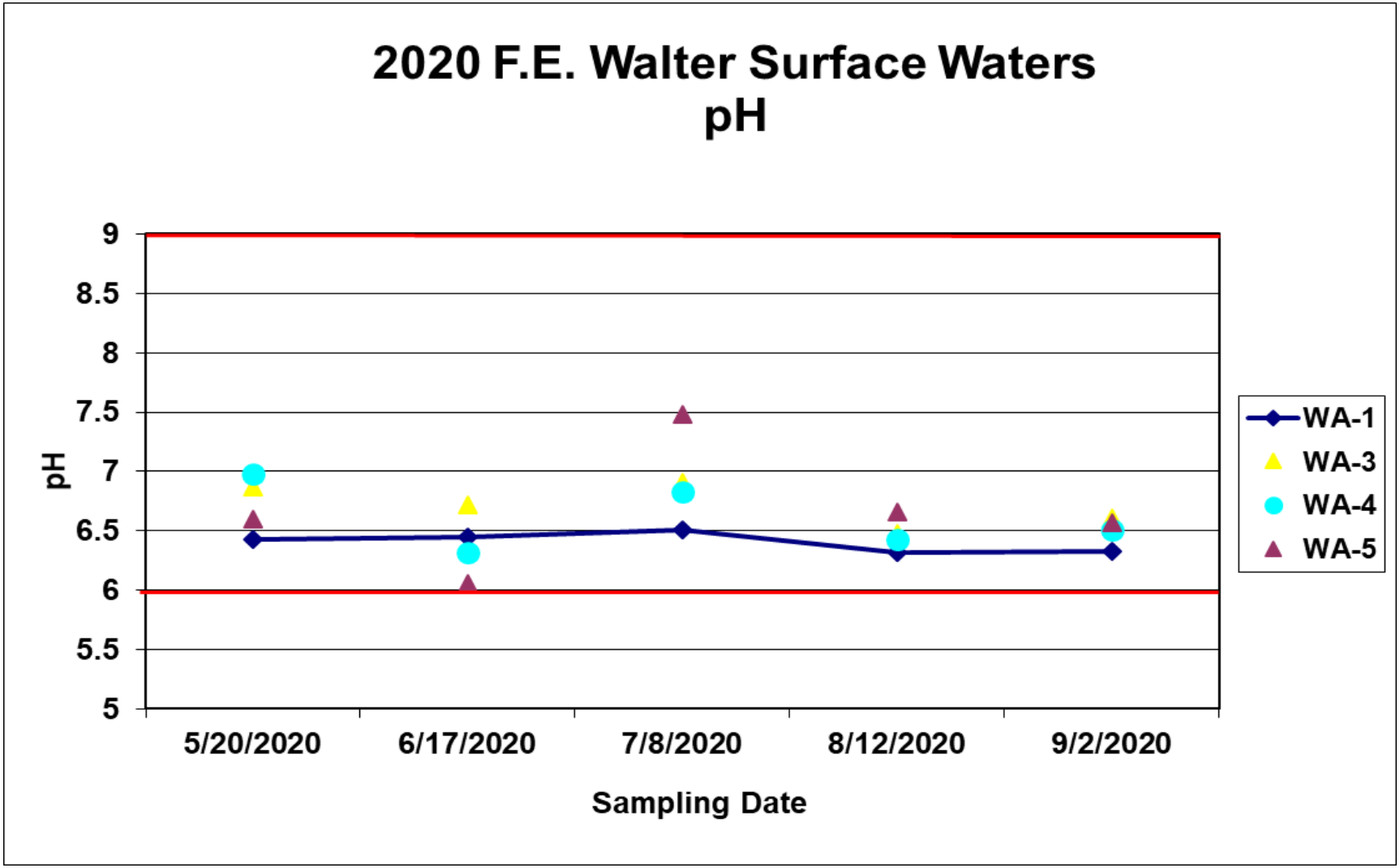

Figure 3-5. Measures of pH in tributary and release (WA-1) surface waters of F.E. Walter Reservoir during 2020. The PADEP WQ standard for pH is an acceptable range from 6 to 9. See Appendix A for a summary of the plotted values

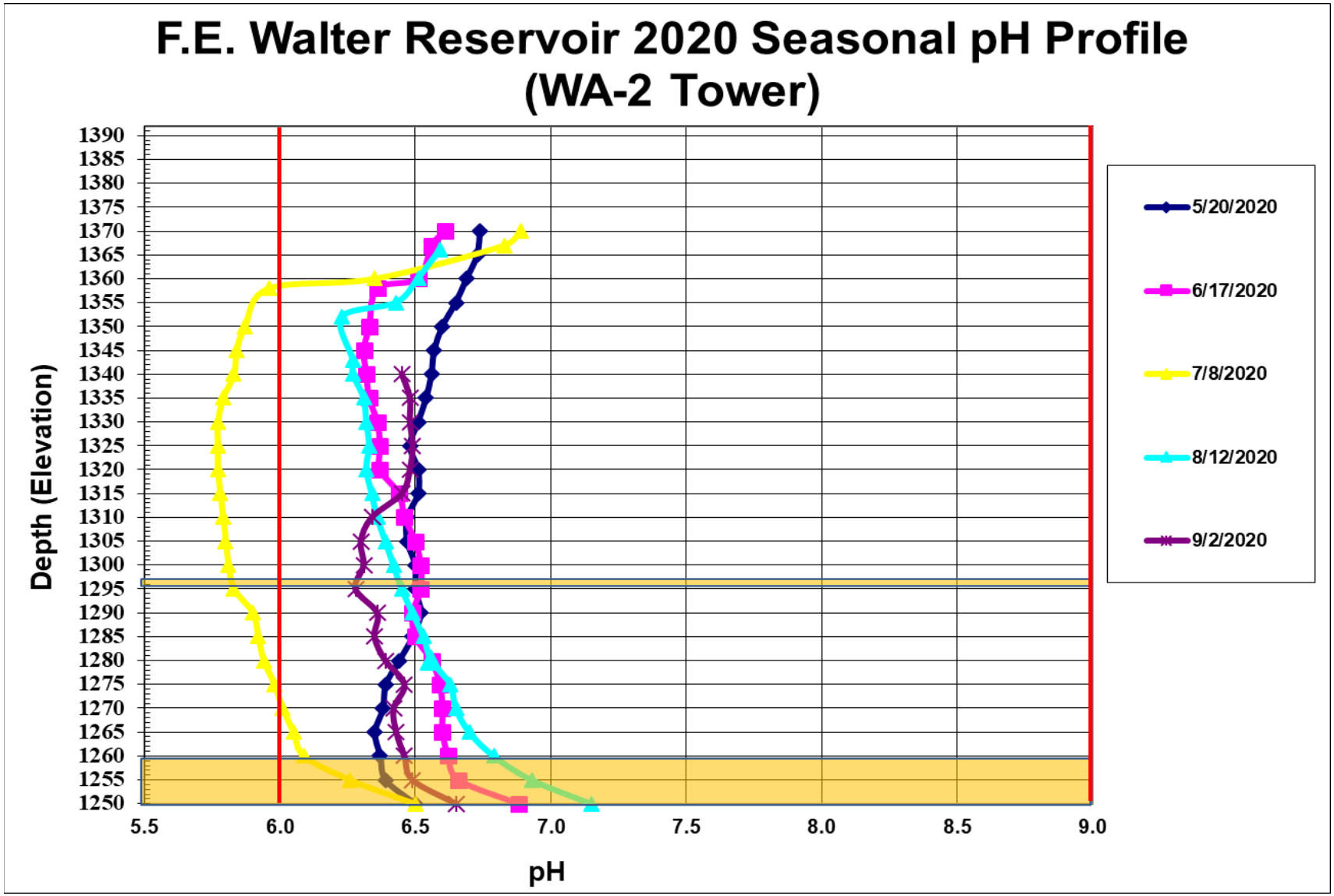

Figure 3-6. Stratification of pH measured in the water column of F.E. Walter Reservoir at station WA-2 during 2020. The PADEP water quality standard pH is an acceptable range from 6 to 9. See Appendix A for a summary of the plotted value.

Table 3-1. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2020

Station	Date	ALK mg/L	BOD5 mg/L	DISS-P mg/L	NH3 mg/L	NO2 mg/L	NO3 mg/L	NO2-NO3 mg/L	TDS mg/L	TKN mg/L	TOC mg/L	TP mg/L	TSS mg/L
WA-01S	5/20/2020	5	<2.0	<0.05	<0.01	<0.01	0.33	0.34	73	0.65	5.7	0.05	2
	6/17/2020	7	3.1	<0.05	0.01	<0.01	0.28	0.29	90	<0.37	8.5	<0.01	2
	7/8/2020	7	<2.0	<0.05	<0.01	<0.01	0.32	0.33	69	<0.47	7.6	<0.01	5
	8/12/2020	8	3	<0.05	0.07	<0.01	0.3	0.31	36	0.94	12.6	0.08	10
	9/2/2020	9	<2.0	<0.05	<0.01	<0.01	0.34	0.35	73	<0.47	6.8	0.02	13
	Mean	7	2.4	0.05	0.02	0.009	0.31	0.32	68	0.58	8.2	0.03	6
	Stdev	1	0.6	0	0.03	0.001	0.02	0.02	20	0.23	2.6	0.03	5
	Max	9	3.1	0.05	0.07	0.01	0.34	0.35	90	0.94	12.6	0.08	13
	Min	5	2	0.05	0.01	0.007	0.28	0.29	36	0.37	5.7	0.01	2
	No. of Det.	5	2	0	2	0	5	5	5	2	5	3	5
WA-02S	5/20/2020	6	<2.0	<0.05	<0.01	<0.01	0.32	0.33	76	0.67	5.2	0.05	<1
	6/17/2020	7	2.5	<0.05	0.02	<0.01	0.28	0.29	75	<0.37	7	0.04	<1
	7/8/2020	7	2.3	<0.05	<0.01	<0.01	0.27	0.28	55	<0.47	6.9	<0.01	1
	8/12/2020	8	2.3	<0.05	<0.01	<0.01	0.27	0.28	45	0.6	6.5	0.05	1
	9/2/2020	8	<2.0	<0.05	<0.01	<0.01	0.3	0.31	73	0.61	6.9	0.01	1
	Mean	7	2.2	0.05	0.01	0.009	0.29	0.30	65	0.54	6.5	0.03	1
	Stdev	1	0.2	0	0.004	0.001	0.02	0.02	14	0.12	0.8	0.02	0
	Max	8	2.5	0.05	0.02	0.01	0.32	0.327	76	0.67	7	0.05	1
	Min	6	2	0.05	0.01	0.007	0.27	0.28	45	0.37	5.2	0.01	1
	No. of Det.	5	3	0	1	0	5	5	5	3	5	4	3

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2020

Station	Date	ALK	BOD5	DISS-P	NH3	NO2	NO3	NO2-NO3	TDS	TKN	TOC	TP	TSS
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
WA-02M	5/20/2020	5	<2.0	<0.05	<0.01	<0.01	0.32	0.33	67	0.6	6	0.04	2
	6/17/2020	6	2.8	0.05	<0.01	<0.01	0.28	0.29	62	<0.37	8.7	<0.01	<1
	7/8/2020	6	<2.0	<0.05	<0.01	<0.01	0.31	0.32	44	<0.47	7.6	<0.01	1
	8/12/2020	8	<2.0	<0.05	0.03	<0.01	0.3	0.31	43	0.62	8.5	0.02	1
	9/2/2020	9	<2.0	<0.05	<0.01	<0.01	0.32	0.33	75	<0.47	6.7	0.01	3
	Mean	7	2.2	0.05	0.01	0.009	0.306	0.32	58	0.51	7.5	0.02	2
	Stdev	2	0.4	0	0.01	0.001	0.017	0.02	14	0.10	1.2	0.01	1
	Max	9	2.8	0.05	0.03	0.01	0.32	0.33	75	0.62	8.7	0.04	3
	Min	5	2	0.05	0.01	0.007	0.28	0.29	43	0.37	6	0.01	1
	No. of Det.	5	1	1	1	0	5	5	5	2	5	3	4
WA-02D	5/20/2020	6	<2.0	<0.05	<0.01	<0.01	0.32	0.33	74	0.62	5.2	0.02	1
	6/17/2020	6	3.2	0.05	0.02	<0.01	0.3	0.31	73	<0.37	8.7	<0.01	7
	7/8/2020	9	<2.0	<0.05	0.09	<0.01	0.31	0.32	38	<0.47	7.4	<0.01	15
	8/12/2020	9	2.2	<0.05	0.09	<0.01	0.31	0.32	57	0.77	14.3	0.02	13
	9/2/2020	9	<2.0	<0.05	<0.01	<0.01	0.34	0.35	75	0.58	6.9	0.02	7
	Mean	8	2.3	0.05	0.04	0.009	0.32	0.33	63	0.56	8.5	0.02	9
	Stdev	2	0.5	0	0.04	0.001	0.02	0.02	16	0.15	3.5	0.01	6
	Max	9	3.2	0.05	0.09	0.01	0.34	0.35	75	0.77	14.3	0.02	15
	Min	6	2	0.05	0.01	0.007	0.3	0.31	38	0.37	5.2	0.01	1
	No. of Det.	5	2	1	3	0	5	5	5	3	5	3	5

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2020

Station	Date	ALK mg/L	BOD5 mg/L	DISS-P mg/L	NH3 mg/L	NO2 mg/L	NO3 mg/L	NO2-NO3 mg/L	TDS mg/L	TKN mg/L	TOC mg/L	TP mg/L	TSS mg/L
WA-03S	5/20/2020	7	<2.0	<0.05	<0.01	<0.01	0.35	0.36	75	0.77	5.8	0.02	3
	6/17/2020	8	2.6	0.05	0.01	<0.01	0.34	0.35	93	<0.37	9.4	<0.01	<1
	7/8/2020	9	<2.0	0.07	<0.01	<0.01	0.79	0.8	66	0.52	5.2	0.06	1
	8/12/2020	7	2.3	0.05	0.01	<0.01	0.4	0.41	58	0.88	13	0.06	3
	9/2/2020	9	<2.0	<0.05	<0.01	<0.01	0.5	0.51	76	0.53	7.5	0.02	2
	Mean	8	2.2	0.05	0.01	0.009	0.48	0.49	74	0.61	8.2	0.03	2
	Stdev	1	0.3	0	0	0.001	0.19	0.19	13	0.21	3.2	0.02	1
	Max	9	2.6	0.07	0.01	0.01	0.79	0.8	93	0.88	13	0.06	3
	Min	7	2	0.05	0.01	0.007	0.34	0.35	58	0.37	5.2	0.01	1
	No. of Det.	5	2	3	2	0	5	5	5	4	5	4	4
WA-04S	5/20/2020	8	<2.0	<0.05	<0.01	<0.01	0.27	0.28	76	0.7	4.7	0.03	7
	6/17/2020	7	2.9	0.06	<0.01	<0.01	0.32	0.33	68	<0.37	6.7	0.02	<1
	7/8/2020	11	<2.0	<0.05	<0.01	<0.01	0.36	0.37	68	<0.47	4.4	0.04	1
	8/12/2020	10	<2.0	<0.05	0.02	<0.01	0.34	0.35	68	0.65	6.2	<0.01	2
	9/2/2020	13	<2.0	<0.05	<0.01	<0.01	0.41	0.42	74	0.52	4.4	<0.01	2
	Mean	10	2.2	0.052	0.01	0.009	0.34	0.35	71	0.54	5.3	0.02	3
	Stdev	2	0.4	0.004	0.004	0.001	0.0515	0.05	4	0.13	1.1	0.01	3
	Max	13	2.9	0.06	0.02	0.01	0.41	0.42	76	0.7	6.7	0.04	7
	Min	7	2	0.05	0.01	0.007	0.27	0.277	68	0.37	4.4	0.01	1
	No. of Det.	5	1	1	1	0	5	5	5	3	5	3	4

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2020

Station	Date	ALK mg/L	BOD5 mg/L	DISS-P mg/L	NH3 mg/L	NO2 mg/L	NO3 mg/L	NO2-NO3 mg/L	TDS mg/L	TKN mg/L	TOC mg/L	TP mg/L	TSS mg/L
WA-05S	5/20/2020	3	<2.0	<0.05	<0.01	<0.01	<0.18	<0.19	59	0.57	3.6	0.02	8
	6/17/2020	3	3.1	0.05	<0.01	<0.01	0.23	0.24	48	<0.37	5.2	<0.01	<1
	7/8/2020	5	<2.0	0.09	<0.01	<0.01	0.28	0.29	59	0.89	4	0.05	2
	8/12/2020	5	2.2	<0.05	<0.01	<0.01	0.29	0.3	65	0.65	5.4	0.03	1
	9/2/2020	6	<2.0	<0.05	<0.01	<0.01	0.3	0.31	69	<0.47	3.7	0.05	1
	Mean	4	2.3	0.06	0.01	0.009	0.256	0.27	60	0.59	4.4	0.03	3
	Stdev	1	0.5	0.02	0	0.001	0.050	0.05	8	0.20	0.9	0.02	3
	Max	6	3.1	0.09	0.01	0.01	0.3	0.31	69	0.89	5.4	0.05	8
	Min	3	2	0.05	0.01	0.007	0.18	0.187	48	0.37	3.6	0.01	1
	No. of Det.	5	2	2	0	0	4	4	5	3	5	4	4
WA-06S	5/20/2020	6	<2.0	<0.05	<0.01	<0.01	0.32	0.33	37	0.5	5.1	0.01	<1
	6/17/2020	6	3	<0.05	<0.01	<0.01	0.28	0.29	65	<0.37	7.1	<0.01	<1
	7/8/2020	7	<2.0	<0.05	<0.01	<0.01	0.27	0.28	62	<0.47	6.8	<0.01	2
	8/12/2020	8	2.3	<0.05	<0.01	<0.01	0.28	0.29	23	0.56	6.8	<0.01	2
	9/2/2020	8	<2.0	<0.05	<0.01	<0.01	0.29	0.3	66	0.83	6.6	<0.01	3
	Mean	7	2.3	0.05	0.01	0.009	0.288	0.30	51	0.55	6.5	0.01	2
	Stdev	1	0.4	0	0	0.001	0.0192	0.02	20	0.17	0.8	0.00	1
	Max	8	3	0.05	0.01	0.01	0.32	0.327	66	0.83	7.1	0.01	3
	Min	6	2	0.05	0.01	0.007	0.27	0.28	23	0.37	5.1	0.01	1
	No. of Det.	5	2	0	0	0	5	5	5	3	5	1	3

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2020

Station	Date	ALK mg/L	BOD5 mg/L	DISS-P mg/L	NH3 mg/L	NO2 mg/L	NO3 mg/L	PO4 mg/L	TDS mg/L	TKN mg/L	TOC mg/L	TP mg/L	TSS mg/L
WA-06M	5/20/2020	5	<2.0	<0.05	<0.01	<0.01	0.31	0.32	38	0.45	5.4	0.01	2
	6/17/2020	6	2.9	0.06	0.02	<0.01	0.27	0.28	68	<0.37	8.7	<0.01	<1
	7/8/2020	6	<2.0	<0.05	<0.01	<0.01	0.3	0.31	53	<0.47	6.9	0.03	3
	8/12/2020	8	<2.0	<0.05	0.05	<0.01	0.3	0.31	48	0.59	7.4	0.02	2
	9/2/2020	8	<2.0	<0.05	<0.01	<0.01	0.3	0.31	74	<0.47	6.6	0.01	3
	Mean	7	2.2	0.052	0.02	0.009	0.296	0.31	56	0.47	7.0	0.02	2
	Stdev	1	0.4	0.004	0.02	0.001	0.015	0.01	15	0.08	1.2	0.01	1
	Max	8	2.9	0.06	0.05	0.01	0.31	0.32	74	0.59	8.7	0.03	3
	Min	5	2	0.05	0.01	0.007	0.27	0.28	38	0.37	5.4	0.01	1
	No. of Det.	5	1	1	2	0	5	5	5	2	5	4	4
WA-06D	5/20/2020	5	<2.0	<0.05	<0.01	<0.01	0.32	0.33	42	0.65	5.5	0.01	1
	6/17/2020	5	2.8	<0.05	0.01	<0.01	0.27	0.28	60	<0.37	6.8	<0.01	4
	7/8/2020	7	<2.0	<0.05	0.02	<0.01	0.32	0.33	69	<0.47	7	0.02	41
	8/12/2020	9	7.5	<0.05	0.09	<0.01	0.29	0.3	60	0.78	9.7	0.02	8
	9/2/2020	8	<2.0	<0.05	<0.01	<0.01	0.32	0.33	71	0.49	6.4	0.01	5
	Mean	7	3.3	0.05	0.03	0.009	0.30	0.31	60	0.55	7.1	0.01	12
	Stdev	2	2.4	0	0.03	0.001	0.02	0	11	0.16	1.6	0.01	17
	Max	9	7.5	0.05	0.09	0.01	0.32	0.33	71	0.78	9.7	0.02	41
	Min	5	2	0.05	0.01	0.007	0.27	0.28	42	0.37	5.5	0.01	1
	No. of Det.	5	2	0	3	0	5	5	5	3	5	4	5

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2020

Station	Date	ALK mg/L	BOD5 mg/L	DISS-P mg/L	NH3 mg/L	NO2 mg/L	NO3 mg/L	NO2-NO3 mg/L	TDS mg/L	TKN mg/L	TOC mg/L	TP mg/L	TSS mg/L
WA-07S	5/20/2020	6	<2.0	<0.05	<0.01	<0.01	0.32	0.33	58	0.62	5.1	0.02	<1
	6/17/2020	6	3.3	0.05	<0.01	<0.01	0.28	0.29	62	<0.37	7.9	<0.01	4
	7/8/2020	7	<2.0	<0.05	<0.01	<0.01	0.28	0.29	81	<0.47	6.8	<0.01	3
	8/12/2020	8	2.6	<0.05	<0.01	<0.01	0.28	0.29	57	0.59	7.3	0.02	2
	9/2/2020	8	<2.0	<0.05	<0.01	<0.01	0.3	0.31	53	0.51	6.7	<0.01	4
	Mean	7	2.4	0.05	0.01	0.009	0.292	0.30	62	0.51	6.8	0.01	3
	Stdev	1	0.6	0.00	0	0.001	0.018	0.02	11	0.10	1.0	0.01	1
	Max	8	3.3	0.05	0.01	0.01	0.32	0.33	81	0.62	7.9	0.02	4
	Min	6	2	0.05	0.01	0.007	0.28	0.29	53	0.37	5.1	0.01	1
	No. of Det.	5	2	1	0	0	5	5	5	3	5	2	4
WA-07M	5/20/2020	6	<2.0	<0.05	<0.01	<0.01	0.32	0.33	75	0.63	5.1	0.02	<1
	6/17/2020	7	2.8	0.05	<0.01	<0.01	0.28	0.29	53	<0.37	9.1	<0.01	4
	7/8/2020	8	<2.0	<0.05	<0.01	<0.01	0.33	0.34	70	<0.47	7.4	0.02	3
	8/12/2020	8	<2.0	0.06	0.06	<0.01	0.28	0.29	58	0.64	9.7	<0.01	1
	9/2/2020	8	<2.0	<0.05	0.03	<0.01	0.3	0.31	54	0.47	6.8	<0.01	2
	Mean	7	2.2	0.052	0.02	0.009	0.30	0.31	62	0.52	7.6	0.01	2
	Stdev	1	0.4	0.004	0.02	0.001	0.02	0.02	10	0.12	1.8	0.01	1
	Max	8	2.8	0.06	0.06	0.01	0.33	0.34	75	0.64	9.7	0.02	4
	Min	6	2	0.05	0.01	0.007	0.28	0.29	53	0.37	5.1	0.01	1
	No. of Det.	5	1	2	2	0	5	5	5	3	5	2	4

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2020

Station	Date	ALK mg/L	BOD5 mg/L	DISS-P mg/L	NH3 mg/L	NO2 mg/L	NO3 mg/L	NO2-NO3 mg/L	TDS mg/L	TKN mg/L	TOC mg/L	TP mg/L	TSS mg/L
WA-07D	5/20/2020	6	<2.0	<0.05	<0.01	<0.01	0.33	0.34	51	0.57	5.7	0.02	5
	6/17/2020	7	4.1	<0.05	0.05	<0.01	0.29	0.3	62	0.39	8.8	0.02	<1
	7/8/2020	10	<2.0	<0.05	0.1	<0.01	0.33	0.34	69	<0.47	6.8	0.03	8
	8/12/2020	8	3.6	0.05	0.05	<0.01	0.3	0.31	62	<2.35	12	0.09	258
	9/2/2020	8	<2.0	<0.05	<0.01	<0.01	0.3	0.31	69	0.64	6.7	0.02	3
	Mean	8	2.7	0.05	0.04	0.009	0.31	0.32	63	0.88	8.0	0.04	55
	Stdev	1	1.0	0	0.04	0.001	0.02	0.02	7	0.83	2.5	0.03	114
	Max	10	4.1	0.05	0.1	0.01	0.33	0.34	69	2.35	12	0.09	258
	Min	6	2	0.05	0.01	0.007	0.29	0.3	51	0.39	5.7	0.02	1
	No. of Det.	5	2	1	3	0	5	5	5	3	5	5	4

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

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 is 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.

Ammonia in the water column of F.E. Walter Reservoir was consistently low throughout the monitoring period with most samples less than the minimum laboratory reporting limit (<0.01 mg/L). The maximum NH3 value of 0.09 mg/L was observed in deeper water bottom samples on three occasions. F.E. Walter Reservoir samples were less than the PADEP water quality standard for ammonia during 2020. The water quality standard of ammonia is dependent on temperature and pH (Table 3-2).

Table 3.2 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.	

3.2.2 Nitrite and Nitrate

Nitrite (NO2) is a measure of a form of nitrogen that occurs as an intermediate in the nitrogen cycle. It is unstable and can rapidly be oxidized to nitrate or reduced to nitrogen gas. Nitrite is a source of nutrients for plants and can be toxic to aquatic life in relatively low concentrations. Concentrations of nitrite at F.E. Walter Reservoir were consistently low at all sampling stations during 2020. Concentrations of nitrite measured at all stations and depths were less than the minimum laboratory reporting limit of 0.01 mg/L (Table 3-1).

Nitrate (NO3) is the measure of the most oxidized and stable form of nitrogen. It is the principal form of combined nitrogen in natural waters. Nitrate is the primary form of nitrogen used by plants as a nutrient to stimulate plant growth. Nitrate was also consistently low at F.E. Walter Reservoir during 2020. For all stations and depths, sample results ranged from less than the laboratory reporting limit of 0.187mg/L to a maximum of 0.79 mg/L in the upstream surface waters at station WA-3S on 8 July.

In 2020, F.E. Walter Reservoir was in compliance with the PADEP water quality standard for nitrogen. The water quality standard for nitrogen is a summed concentration of nitrite and nitrate of less than 10-mg/L. Throughout the monitoring period, the summed concentrations for each station were well below this standard. The maximum summed concentration for any single sampling station did not exceed 0.8 mg/L.

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 an inorganic form occurs. TKN in the water column of F.E. Walter Reservoir was low during 2020 (Table 3-1). Concentrations measured at all reservoir stations ranged from less than the minimum laboratory reporting limit of 0.37 mg/L to a high of 2.35 mg/L in the reservoir bottom waters at station WA-7D on 12 August.

3.2.4 Total Phosphorus

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

EPA guidance for nutrient criteria in lakes and reservoirs suggests a maximum concentration for total phosphorus of 0.01-mg/L (EPA 2000). Lakes and reservoirs exceeding this concentration are more likely to experience algal bloom problems during the growing season. For all stations and depths, concentrations ranged from less than the reporting limit of 0.01 mg/L to a high of 0.09 mg/L in the deep waters of station WA-7D in August (Table 3-1).

3.2.5 Dissolved Phosphorus

Dissolved or soluble phosphorus (DISS P) in the water column of F.E. Walter Reservoir remained consistently low during 2020. For all stations and depths, concentrations ranged from less than the reporting limit of 0.05 mg/L to a maximum of 0.09 mg/L (Table 3-1). In freshwater environments, dissolved phosphorus is usually a limiting nutrient and is utilized by freshwater plants and algae during photosynthesis.

3.2.6 Total Dissolved Solids

Total Dissolved Solids (TDS) is a measure of the amount of filterable dissolved material in the water. Dissolved salts such as sulfate, magnesium, chloride, and sodium

contribute to elevated levels. TDS in the lake and tributary stations of F.E. Walter Reservoir remained relatively constant and low during 2020. Concentrations at all stations and depths ranged from 23 to 93 mg/L (Table 3-1). F.E. Walter Reservoir and its tributaries stayed in compliance with the PADEP water quality standard for total dissolved solids during 2020. The water quality standard is a maximum allowable concentration of 500-mg/L.

3.2.7 Total Suspended Solids

Total Suspended Solids (TSS) is a measure of the amount of non-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). TSS measures in the water column of F.E. Walter Reservoir were low in 2020 with many results less than the reporting limit of 1.0 mg/L and ranging to a maximum concentration of 258 mg/L (Table 3-1). Elevated TSS results are predominantly seen in the lake bottom water samples. This is often a result of sampling error and suspended bottom sediments being captured in the sample during lake bottom water grab sampling. These elevated results do not always accurately reflect conditions at those stations and depths. For example, a TSS reading of 258 mg/L was recorded in the lake bottom water sample at station WA-7D on 12 August. These results did not correlate with other samples collected throughout the lake at the same time period.

3.2.8 Biochemical Oxygen Demand

Five-day biochemical oxygen demand (BOD) 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 method time limit. It is an indicator of the quality of a water body and the degree of pollution caused by biodegradable organic matter can therefore be inferred. The five-day biochemical oxygen demand concentrations and commonly accepted water quality inferences are as follows:

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

Biochemical oxygen demand concentrations in the waters of F.E. Walter Reservoir remained low in 2020 (Table 3-2). Sampling results ranged from less than the reporting limit of 2.0 mg/L to 7.5 mg/L. Fifty six of the 65 total samples collected were less than 3.0 mg/L. In considering the overall infrequency of samples showing higher readings, it is

inferred that F.E. Walter Reservoir and its associated tributaries contain very clean water with little biodegradable organic wastes during the 2020 sampling season.

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 measurements in the waters of F.E. Walter Reservoir were low during 2020. Concentrations measured at all stations and depths ranged from 5.0 mg/L to 13.0 mg/L $CaCO_3$ throughout the monitoring period (Table 3-1). The natural alkalinity of water is largely dependent on the underlying geology and soils within the surrounding watershed. The low alkalinity typically measured at F.E. Walter Reservoir probably results from the regional geology, which is primarily sandstone and shale (Van Diver 1990).

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. It is an indicator of potential contamination and the organic character of a waterbody. Carbon is a nutrient required for biological processes. Total Organic Carbon was measured in the water column and tributaries of F.E. Walter Reservoir (Table 3-1). Concentrations of TOC ranged from 3.6 mg/L to 14.3 mg/L and were similar across all stations and depths. No criteria exist for TOC and findings are used as a monitoring tool.

3.2.11 Chlorophyll *a*

Chlorophyll a is the measure of the plant chlorophyll "a" primary pigment which helps plants get energy from light. It is found in most plants, algae, and cyanobacteria. Chlorophyll a concentration increases in relation to algal densities in a water body. Concentrations for all sampling dates for lake stations at depths from 0-10 feet ranged from 3.7 ug/L to 10.5 ug/L (Appendix A). Average concentrations monthly May (4.5 ug/L), June (5.6 ug/L), July (7.1 ug/L), August (6.0 ug/L) and September (4.3 ug/L) shown that lake surface water algae productivity peaked in July.

3.3 TROPHIC STATE DETERMINATION

Carlson's (1977) trophic state index (TSI) is a method of expressing the extent of eutrophication of a lake, quantitatively. The trophic state analysis calculates separate

indices for eutrophication based on measures of total phosphorus, chlorophyll *a*, and secchi disc depth. 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 F.E. Walter Reservoir was based on a single sample each month during the sampling season. It is important to note that variability in measurements not captured between sampling events could influence the resulting classification. Figure 3-7 graphically shows the calculated index and the potential variability between sampling dates.

TSIs calculated for measures of total phosphorus classified F.E. Walter Reservoir as oligotrophic in July (37.35) and September (37.35), and eutrophic in May (60.56), June (57.34), and August (60.56). TSIs calculated for measures of secchi disk depth classified F.E. Walter Reservoir as mesotrophic in May (46.23), June (49.31), July (46.80), August (50.01) and September (46.80). TSIs calculated for measures of chlorophyll *a* classified F.E. Walter Reservoir as mesotrophic in May (45.42), June (46.52), July (49.45), August (48.50) and September (44.12).

Carlson (1977) warned against averaging TSI values estimated for different parameters, and instead suggested giving priority to chlorophyll *a* in the summer and to phosphorus in the spring, fall, and winter. The trophic state of the reservoir, based on TSI's, was mesotrophic/eutrophic throughout the 2020 sampling season. The EPA (1983) also provides criteria for classifying the trophic conditions of lakes of the North Temperate Zone based on concentrations of total phosphorus, chlorophyll *a*, and secchi disk depth (Table 3-3). Considering the general agreement between the EPA classifications with that of the Carlson TSIs, the trophic condition of F.E. Walter Reservoir fluctuated between being mesotrophic and eutrophic throughout much of the 2020 sampling season.

Table 3-3. EPA trophic classification criteria and average monthly measures for F.E. Walter Reservoir in 2020.

Water Quality Variable	Oligo-trophic	Meso-trophic	Eutrophic	20 May	17 June	07 July	12 Aug.	02 Sep.
Total Phosphorus (ppb)	<10	10-20	>20	50	40	10	50	10
Chlorophyll a (ppb)	<4	4-10	>10	4.53	5.07	6.83	6.20	3.97
Secchi Depth (m)	>4	2-4	<2	2.60	2.10	2.50	2.00	2.50

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 F.E. Walter Reservoir once monthly (May-September) during 2020 (Table 3-4). FE Walter surface water samples were not analyzed for fecal coliform bacteria in 2020.

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

Total coliform values for all stations and dates ranged from 109 colonies/100-ml to >2420 colonies/100-ml. Bacteria in natural waters are common and their presence in the sample is not necessarily a human health concern. Given that Corps regular monitoring was completed utilizing single day grab samples, single sample results were compared to the EPA e-coli single sample criteria in 2020. Bacteria contamination was low in F.E. Walter Reservoir and its upstream tributaries during 2020 with no samples exceeding the single sample criteria. Water contact recreation is not permitted at F.E. Walter Reservoir.

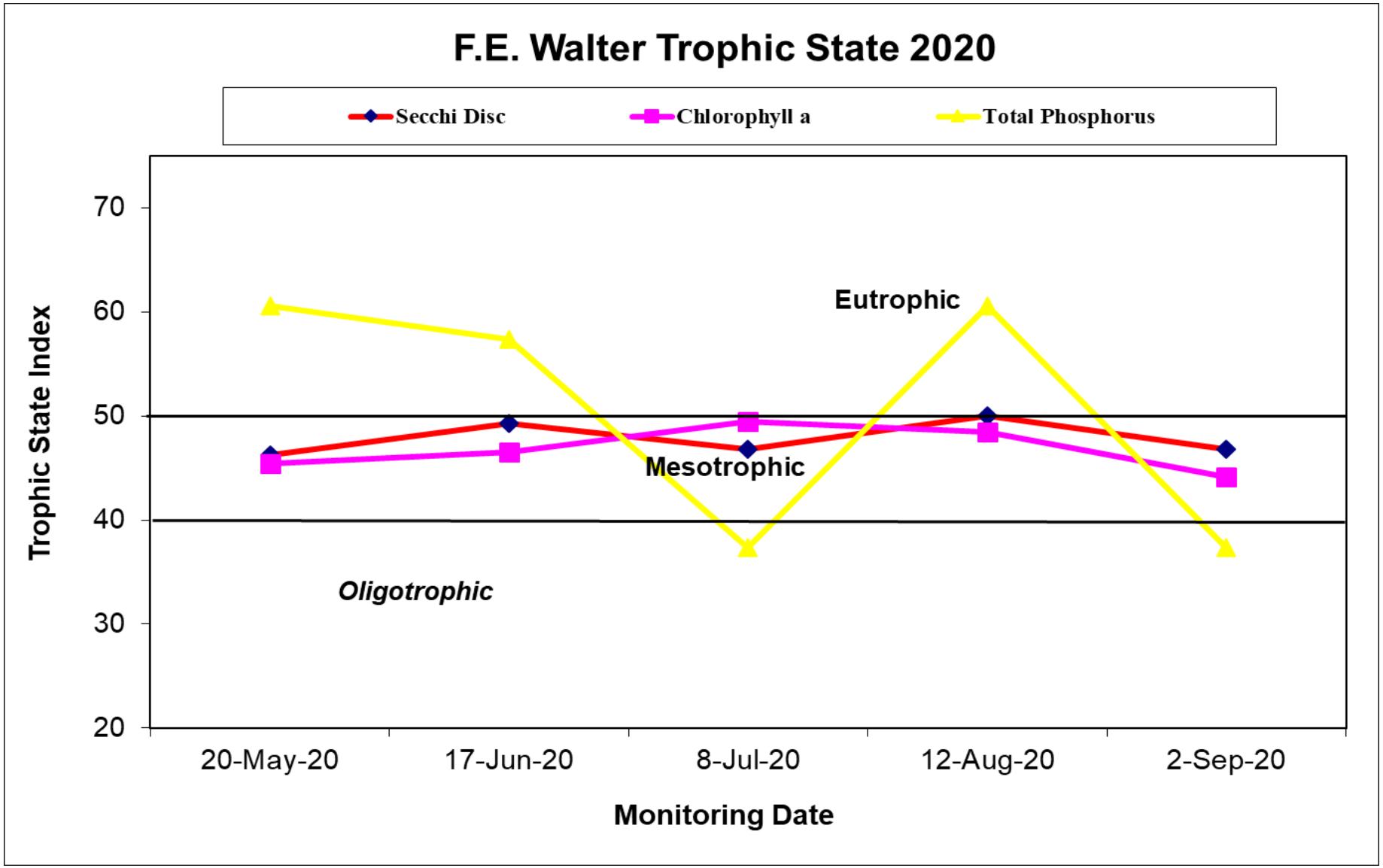

Figure 3-7. Carlson Trophic state indices calculated from secchi disk depth, concentrations of chlorophyll a and Total Phosphorus measured in surface waters of F.E. Walter Reservoir at Station WA-2 during 2020.

Table 3-4. Surface water bacteria counts (colonies/100 ml) at F.E. Walter Reservoir during 2020. Shaded values exceed State bacteria criteria. NS = Not Sampled in 2020

STATION	DATE	Total Coliform		Fecal Coliform		Escherichia coli	
WA-1S	5/20/2020		156		NS	<	1
	6/17/2020	>	2420		NS		70
	7/8/2020		1010		NS		2
	8/12/2020		1730		NS		34
	9/2/2020	>	2420		NS		28
WA-2S	5/20/2020		130		NS		2
	6/17/2020	>	2420		NS		6
	7/8/2020	>	2420		NS		2
	8/12/2020		276		NS		2
	9/2/2020		921		NS	<	1
WA-3S	5/20/2020	>	2420		NS		2
	6/17/2020		1990		NS		30
	7/8/2020	>	2420		NS		26
	8/12/2020	>	2420		NS		150
	9/2/2020	>	2420		NS		62
WA-4S	5/20/2020		914		NS		12
	6/17/2020	>	2420		NS		52
	7/8/2020	>	2420		NS		73
	8/12/2020	>	2420		NS		144
	9/2/2020	>	2420		NS		2
WA-5S	5/20/2020		1120		NS		2
	6/17/2020		1990		NS		20
	7/8/2020	>	2420		NS		39
	8/12/2020	>	2420		NS		33
	9/2/2020		2420		NS		11
WA-6S	5/20/2020		109		NS	<	1
	6/17/2020	>	2420		NS		6
	7/8/2020	>	2420		NS		10
	8/12/2020		326		NS		2
	9/2/2020		1050		NS		1
WA-7S	5/20/2020		152		NS		1
	6/17/2020	>	2420		NS		12
	7/8/2020		1010		NS		2
	8/12/2020		411		NS		4
	9/2/2020	>	2420		NS	<	1

4.0 REFERENCES

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APPENDIX A

STRATIFICATION DATA TABLES

2020 F.E. Walter Water Quality Profiles

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
	5/20/2020	ERROR	0.5	10.49	102	11.38	6.43	7.9	202.6	52.4	4.6	0.054
	6/17/2020	9:32:22	0.5	18.49	99.9	9.36	6.45	7.6	189.1	40.4	5	0.061
WA-1	7/8/2020	9:21:35	0.5	19.90	96.7	8.81	6.51	4.4	151.3	40.4	4.8	0.064
Outfall	8/12/2020	9:47:44	0.5	21.88	94.1	8.24	6.32	15.7	170.7	40.3	X	0.075
	9/2/2020	9:15:04	0.5	21.42	94.1	8.32	6.33	15.2	180.8	39.8	4.3	0.077
		ERROR	0.5	15.16	97.2	9.77	6.74	-9.3	180.2	36.9	5.1	0.064
		ERROR	5	15.16	97.2	9.77	6.73	-8.6	180.9	36.9	4.4	0.064
		ERROR	10	15.12	96.7	9.73	6.69	-6.3	182.5	36.9	4.1	0.064
		ERROR	15	15.08	96.3	9.69	6.65	-4.2	183.5	37.1	4.4	0.064
		ERROR	20	14.93	96	9.70	6.60	-1.3	184.8	37.2	3.9	0.063
		ERROR	25	13.79	94.2	9.75	6.57	0.4	185.7	37.2	4.0	0.056
		ERROR	30	12.74	92.1	9.76	6.56	0.9	186.6	36.7	3.6	0.056
WA-2		ERROR	35	12.07	90.9	9.78	6.54	2.1	187.5	36.7	3.8	0.055
		ERROR	40	11.52	89.8	9.79	6.51	3.6	189.1	37.3	4.3	0.054
Lake		ERROR	45	11.15	89.2	9.80	6.48	5	190.6	36.9	4.1	0.054
Tower	5/20/2020	ERROR	50	10.96	88.6	9.78	6.51	3.5	189.5	36.8	4.3	0.053
		ERROR	55	10.8	88.2	9.77	6.51	3.6	189.8	37.0	4.1	0.053
Secchi		ERROR	60	10.61	87.8	9.77	6.47	5.6	191.6	36.9	4.1	0.054
2.60 M		ERROR	65	10.52	87.5	9.75	6.47	5.6	191.8	37.1	3.8	0.053
		ERROR	70	10.46	87.5	9.76	6.50	4.3	191.2	37.0	3.8	0.053
		ERROR	75	10.41	87.1	9.74	6.50	4.1	191.5	36.9	4.1	0.052
		ERROR	80	10.38	87.3	9.76	6.52	3	191.2	36.7	3.9	0.053
		ERROR	85	10.35	87.1	9.75	6.49	4.5	193	37.0	4.0	0.054
		ERROR	90	10.29	86.4	9.69	6.44	7.2	196.5	37.0	3.7	0.053
		ERROR	95	10.01	86	9.71	6.39	10	200.6	37.3	3.5	0.054
		ERROR	100	9.92	85.9	9.71	6.38	11	202.8	37.1	3.8	0.054
		ERROR	105	9.87	85.2	9.64	6.35	12.2	205.5	44.3	4.8	0.054
		ERROR	110	9.82	84.9	9.62	6.37	11.6	205.9	37.9	4.7	0.054
		ERROR	115	9.75	84	9.54	6.39	10.1	206.9	45.6	3.6	0.054
		ERROR	120	9.49	82.1	9.38	6.50	4.1	205.7	37.5	3.6	0.055

2020 F.E. Walter Water Quality Profiles

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
		8:02:51	0.5	21.97	92.8	8.12	6.61	-1.2	189.8	35.4	5.6	0.072
		8:02:04	5	21.91	91.7	8.03	6.56	1.4	191.1	35.2	5	0.072
		8:01:30	10	21.78	89.9	7.89	6.51	4.6	192.5	35.3	4.6	0.071
		8:00:28	15	20.99	79.7	7.11	6.36	13.5	197.3	35.3	5.7	0.068
WA-2		7:59:11	20	20.48	75.3	6.78	6.33	15.2	196.9	36.6	5.7	0.063
		7:58:10	25	20.21	76.8	6.95	6.31	16.2	197.3	36.3	5.9	0.061
Lake		7:57:18	30	20.03	75.7	6.88	6.32	15.3	196.2	36.6	6.5	0.061
Tower		7:56:19	35	19.88	75.5	6.88	6.33	14.6	195.2	36.2	5.8	0.059
		7:55:08	40	19.78	76.5	6.99	6.36	13.1	194.1	36.5	5.5	0.059
Secchi		7:54:10	45	19.65	76.9	7.04	6.37	12.2	193.7	36.5	6.2	0.06
2.1 M	6/17/2020	7:53:11	50	19.60	77.1	7.07	6.37	12.6	194.2	37	5.9	0.06
		7:52:13	55	19.37	78.5	7.23	6.44	8.3	190.7	37.1	5.1	0.059
		7:50:38	60	19.07	79.7	7.38	6.46	7.5	190.6	37.3	5	0.059
		7:49:19	65	18.88	81.0	7.53	6.50	4.9	188.9	37.4	6	0.06
		7:48:18	70	18.79	82.3	7.66	6.52	3.8	188.0	37.4	6.1	0.062
		7:47:09	75	18.64	81.3	7.60	6.52	3.7	187.3	37.4	5.4	0.061
		7:45:45	80	18.56	80.7	7.55	6.49	5.2	188.3	40.2	6.1	0.061
		7:44:53	85	18.43	80.6	7.56	6.50	4.9	188.3	38	5.8	0.06
		7:41:40	90	18.33	80.4	7.56	6.56	1.7	185.5	37.9	5.9	0.06
		7:40:07	95	17.97	80.7	7.64	6.59	-0.1	184.3	37.9	5	0.061
		7:38:43	100	17.92	80.6	7.64	6.60	-1.2	184.1	38.5	5.4	0.061
		7:37:47	105	17.90	80.4	7.63	6.60	-1.2	185.2	37.9	5.5	0.061
		7:36:41	110	17.67	80.6	7.68	6.62	-2	185.6	38.8	5.6	0.062
		7:35:29	115	17.35	80.8	7.75	6.66	-4.2	185.4	42.4	5.7	0.062
		7:33:00	120	17.33	80.4	7.71	6.88	-17.2	181.7	42.3	5.7	0.062
		7:47:58	0.5	25.98	97.1	7.88	6.89	-17.2	146.3	35.4	6.0	0.076
		7:46:52	5	25.92	96.2	7.82	6.83	-14.2	146.4	35.8	6.1	0.076
		7:44:48	10	24.09	75.7	6.36	6.35	14.4	167.6	35.6	8.4	0.076
		7:42:47	15	23.24	67.6	5.77	5.96	37	186.6	35.7	6.3	0.075
		7:41:18	20	22.16	62.0	5.40	5.87	42.2	189	35.9	5.0	0.071
WA-2		7:40:32	25	21.64	61.1	5.38	5.84	43.7	189.3	35.6	5.0	0.069
Lake		7:39:39	30	21.28	60.0	5.32	5.83	44.5	188.9	35.8	5.1	0.068
Tower		7:38:39	35	20.85	58.9	5.27	5.79	46.6	189.2	35.3	4.9	0.066
		7:37:54	40	20.59	57.2	5.14	5.77	47.7	189.1	35.2	6.0	0.064
Secchi	7/8/2020	7:36:52	45	20.36	58.1	5.24	5.77	47.5	188	35.2	5.7	0.063
2.50 M		7:35:51	50	20.20	58.1	5.26	5.77	47.5	187	35.6	6.5	0.062
		7:35:10	55	20.08	58.3	5.29	5.78	46.9	185.9	34.9	6.0	0.062
		7:34:23	60	20.00	58.2	5.29	5.79	46.4	184.7	35.2	5.6	0.062
		7:33:29	65	19.87	57.6	5.25	5.80	45.7	183.5	35.6	4.8	0.061
		7:32:34	70	19.80	56.2	5.13	5.81	44.8	181.9	35.5	5.1	0.061
		7:31:30	75	19.74	55.3	5.06	5.83	43.7	180.1	36.0	4.8	0.061
		7:29:53	80	19.68	51.2	4.69	5.90	39.7	174.5	36.5	3.9	0.065
		7:28:25	85	19.59	48.3	4.43	5.92	38.7	171.9	38.5	4.3	0.065
		7:27:06	90	19.45	43.4	3.99	5.94	37.2	170.2	38.3	4.4	0.066
		7:25:40	95	19.35	39.8	3.67	5.98	35.2	166.7	39.9	3.7	0.067
		7:24:25	100	19.22	32.9	3.03	6.01	33.1	163	41.8	4.2	0.068
		7:23:21	105	19.17	30.7	2.84	6.05	30.9	159.5	55.5	3.8	0.068
		7:22:20	110	19.16	29.8	2.76	6.09	28.7	156.5	40.7	4.0	0.068
		7:20:14	115	18.91	15.5	1.44	6.26	18.7	140.9	51.0	4.5	0.07
		7:18:30	117	18.83	9.7	0.90	6.50	4.9	125.3	49.1	4.1	0.072

2020 F.E. Walter Water Quality Profiles

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
		8:10:24	0.5	26.00	96.2	7.80	6.59	0.4	162.1	30.30	5.7	0.082
		8:09:28	5	25.84	94.5	7.69	6.51	5.0	165.8	30.20	6.8	0.082
		8:08:37	10	25.47	92	7.54	6.43	9.5	169.3	30.30	6.1	0.081
		8:06:33	15	23.34	64.6	5.50	6.23	21.0	178.0	30.40	5.3	0.080
		8:05:52	20	22.99	65.8	5.64	6.27	19.0	176.4	30.60	4.5	0.080
		8:05:00	25	22.70	65.9	5.69	6.27	18.8	176.8	30.70	4.9	0.079
		8:04:11	30	22.52	67.2	5.82	6.31	16.6	175.3	30.40	5.4	0.079
		8:03:04	35	22.35	66.8	5.80	6.32	15.9	175.2	30.30	5.9	0.079
		8:02:21	40	22.24	67.1	5.84	6.33	15.0	174.9	30.50	5.2	0.079
WA-2		8:00:51	45	22.15	65.6	5.72	6.32	15.8	176.1	30.30	5.4	0.078
Lake	8/12/2020	8:00:09	50	22.05	66	5.76	6.34	14.8	175.7	30.50	5.7	0.078
Tower		7:59:36	55	22.01	66.1	5.78	6.36	13.3	174.9	30.70	5.7	0.077
		7:58:55	60	21.97	65.3	5.72	6.39	11.8	174.2	30.70	5.7	0.076
Secchi		7:58:07	65	21.90	64.8	5.67	6.42	9.9	172.9	30.50	4.8	0.075
2.00		7:57:13	70	21.88	65.4	5.73	6.45	8.4	172.4	30.70	5.6	0.075
		7:56:17	75	21.82	65.2	5.72	6.49	5.6	170.4	31.10	5.2	0.075
		7:55:13	80	21.78	66.3	5.82	6.53	3.3	169.0	31.20	6.3	0.075
		7:54:04	85	21.69	66	5.80	6.56	1.8	168.4	32.10	6.3	0.075
		7:53:00	90	21.56	66	5.82	6.63	-2.3	165.4	32.00	6.2	0.075
		7:51:58	95	21.36	63.8	5.65	6.65	-3.7	165.1	32.70	6.0	0.075
		7:50:42	100	21.27	61.3	5.43	6.7	-6.5	163.2	34.40	6.2	0.075
		7:49:37	105	21.20	58.7	5.21	6.79	-12.0	159.2	36.10	6.5	0.075
		7:46:47	110	21.02	35.3	3.15	6.93	-20.2	150.7	48.70	6.8	0.079
		7:45:28	112	21.01	35.3	3.15	7.15	-32.6	144.7	52.60	8.2	0.08
		7:58:26	0.5	23.05	76.6	6.57	6.45	8.0	163.7	28.80	3.7	0.078
		7:58:01	5	23.06	76.5	6.55	6.48	6.7	162.3	28.30	4.1	0.078
WA-2		7:57:19	10	23.06	76.3	6.54	6.48	6.8	162.1	28.60	4.1	0.078
		7:56:48	15	23.06	76.1	6.52	6.49	5.8	161.0	28.40	4.5	0.078
Lake		7:56:05	20	23.06	75.6	6.48	6.48	6.2	160.9	28.60	4.5	0.078
Tower		7:55:09	25	23.04	73.4	6.3	6.45	8.2	162.1	29.30	4.4	0.078
		7:53:34	30	22.90	58.4	5.01	6.34	14.4	166.3	29.10	4.1	0.078
Secchi		7:52:34	35	22.71	54.5	4.7	6.3	17.0	169.5	29.60	4.4	0.079
2.5	9/2/2020	7:51:45	40	22.53	55.8	4.83	6.31	16.3	169.8	29.90	4.1	0.079
		7:50:02	45	22.27	66.1	5.75	6.28	18.0	174.2	31.20	4.2	0.079
		7:49:29	50	22.19	67.6	5.89	6.36	13.5	170.2	31.10	4.5	0.079
		7:48:41	55	22.10	70.1	6.12	6.35	14.1	171.8	31.80	3.6	0.080
		7:48:06	60	21.97	70.9	6.2	6.39	11.4	169.8	33.80	4.0	0.079
		7:47:14	65	21.84	74.1	6.5	6.46	7.6	166.9	31.60	4.1	0.080
		7:46:09	70	21.05	75.5	6.73	6.42	10.0	170.3	32.60	4.2	0.080
		7:45:23	75	20.99	76.3	6.8	6.43	9.3	170.1	33.50	4.4	0.080
		7:44:15	80	20.98	75.9	6.77	6.46	7.7	169.5	33.30	4.5	0.080
		7:42:54	85	20.87	76.7	6.86	6.49	5.8	169.8	34.50	4.6	0.080
		7:41:33	90	20.60	74.8	6.72	6.65	-3.5	163.5	67.80	5.9	0.080

2020 F.E. Walter Water Quality Profiles

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
WA-3 Tobyhanna Creek Upstream	5/20/2020	ERROR	0.5	13.17	99.9	10.49	6.87	-16.8	189.5	37.7	4.6	0.075
	6/17/2020	9:57:07	0.5	17.38	96.3	9.23	6.72	-7.8	173.4	37.6	6.3	0.076
	7/8/2020	10:40:06	0.5	20.41	94.8	8.54	6.91	-18.7	155.5	51.2	3.9	0.106
	8/12/2020	10:57:31	0.5	22.15	93.8	8.18	6.48	6.2	166.5	41.8	6.5	0.083
	9/2/2020	9:37:46	0.5	19.12	92.3	8.54	6.61	-1.5	169.7	29.5	6.4	0.084
WA-4 Lehigh River Upstream	5/20/2020	ERROR	0.5	12.54	112.8	12	6.98	-22.9	186.6	51.5	3.8	0.058
	6/17/2020	10:16:51	0.5	16.28	96.6	9.48	6.32	15.1	186.9	43.6	4	0.055
	7/8/2020	10:14:02	0.5	20.98	101.4	9.04	6.83	-14.1	155.4	39.2	3.3	0.081
	8/12/2020	10:35:14	0.5	22.4	98.8	8.58	6.43	9.4	177.1	42.6	4.2	0.081
	9/2/2020	9:58:33	0.5	18.15	92.9	8.77	6.51	4.5	176.2	32.9	3.1	0.081
WA-5 Bear Creek Upstream	5/20/2020	ERROR	0.5	13.29	102.0	10.68	6.60	-1.3	181.7	49.4	2.7	0.056
	6/17/2020	10:46:14	0.5	16.66	99.2	9.65	6.06	30.1	183.2	52.8	3.2	0.044
	7/8/2020	9:47:08	0.5	21.43	96.1	8.49	7.48	-52.0	139.4	29.1	3.0	0.082
	8/12/2020	10:13:29	0.5	22.01	93.2	8.14	6.66	-4.2	168.0	39.0	3.0	0.078
	9/2/2020	10:18:35	0.5	18.95	93.7	8.7	6.57	0.8	174.3	29.6	1.5	0.078
WA-6 Bear Creek Lake Arm	5/20/2020	ERROR	0.5	15.27	97.7	9.79	6.70	-6.8	198.2	36.0	4.2	0.064
		ERROR	5	15.27	97.4	9.76	6.71	-7.2	198.5	36.0	4.2	0.064
		ERROR	10	15.26	97.3	9.76	6.69	-6.1	199.8	36.1	4.5	0.064
		ERROR	15	15.25	97.0	9.73	6.62	-2.5	202.4	36.0	4.2	0.064
		ERROR	20	14.43	95.5	9.75	6.53	3.0	205.8	37.0	3.2	0.058
		ERROR	25	13.52	94.3	9.82	6.43	8.1	211.3	36.3	3.9	0.055
		ERROR	30	12.89	93.0	9.83	6.45	6.9	210.8	36.7	3.8	0.055
		ERROR	35	12.30	91.7	9.81	6.48	5.3	210.0	36.2	3.8	0.054
		ERROR	40	11.56	90.5	9.85	6.47	5.8	211.9	36.3	3.5	0.054
		ERROR	45	11.10	89.5	9.84	6.45	6.8	213.4	36.0	3.5	0.054
		ERROR	50	10.99	88.9	9.80	6.41	9.0	216.5	36.4	3.7	0.053
		ERROR	55	10.83	88.6	9.81	6.40	9.5	217.6	36.2	4.6	0.053
		ERROR	60	10.65	88.0	9.79	6.37	11.1	220.1	36.5	4.1	0.053
		ERROR	65	10.64	87.9	9.77	6.37	11.2	221.2	36.4	4.3	0.053
		ERROR	70	10.53	87.7	9.77	6.32	14.4	226.2	36.2	3.7	0.053
		ERROR	75	10.48	87.7	9.78	6.29	16.1	229.6	36.6	4.2	0.053
		ERROR	80	10.47	87.5	9.77	6.38	10.7	227.6	40.4	4.2	0.053
WA-6 Bear Creek Lake Arm	6/17/2020	8:27:14	0.5	22.23	93.4	8.13	6.59	0.2	197	35.7	5.3	0.072
		8:26:15	5	22.05	91.9	8.03	6.52	3.8	199.4	35.9	5.3	0.071
		8:24:50	10	21.10	80.7	7.18	6.32	15.7	206.2	35.8	5.0	0.069
		8:24:04	15	20.65	75.4	6.77	6.25	19.6	208	36.5	6.2	0.064
		8:22:59	20	20.42	75.8	6.84	6.18	23.6	211.3	36.8	5.0	0.063
		8:22:11	25	20.23	76.1	6.88	6.17	24.5	211.9	36.9	6.7	0.061
		8:21:28	30	20.12	76.3	6.92	6.15	25.3	212.5	36.8	6.9	0.06
		8:20:45	35	19.94	77.4	7.04	6.09	28.7	215.8	37.3	4.9	0.058
		8:19:55	40	19.75	78.3	7.16	6.17	24.2	212.2	37.4	5.2	0.058
		8:19:10	45	19.59	78.5	7.19	6.17	24	212.8	38.2	4.4	0.058
		8:18:23	50	19.48	79.6	7.31	6.22	21	211.1	38.3	3.7	0.058
		8:17:35	55	19.31	79.4	7.32	6.23	20.5	211.6	37.3	5.5	0.06
		8:16:46	60	19.20	80.4	7.43	6.27	18.3	209.9	37.7	5.4	0.06
		8:15:54	65	19.03	81.3	7.53	6.26	18.8	210.8	37.3	5.3	0.061
		8:15:01	70	18.88	80.6	7.5	6.21	21.6	212.6	38.6	5.1	0.059
		8:14:07	75	18.83	80.3	7.48	6.21	21.5	212.4	39.3	4.1	0.056
		8:13:15	80	18.63	79.6	7.44	6.27	18.4	210.9	39.8	4.4	0.056
		8:12:21	85	18.55	79.5	7.44	6.3	16.6	211.4	39.9	4.6	0.056

2020 F.E. Walter Water Quality Profiles

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	SpCond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
		8:46:32	0.5	26.26	97.0	7.83	6.32	16.1	151.5	35.4	6.4	0.076
		8:46:09	5	26.24	96.5	7.80	6.25	20.2	153.2	35.2	5.7	0.076
		8:44:38	10	24.42	78.9	6.59	6.06	31.5	155.9	35.7	9.3	0.073
		8:43:39	15	23.33	68.7	5.86	5.95	37.5	158.4	35.5	6.5	0.076
		8:42:57	20	22.23	64.2	5.59	5.90	40.3	158.4	35.4	4.5	0.074
		8:41:59	25	21.65	61.4	5.40	5.81	45.4	158.6	35.0	4.9	0.071
WA-6		8:41:07	30	21.23	57.4	5.10	5.71	51.1	158.8	35.5	4.7	0.066
Bear Creek		8:40:29	35	20.96	56.3	5.02	5.71	51.4	155.5	35.3	4.5	0.065
Lake Arm	7/8/2020	8:39:46	40	20.63	55.8	5.01	5.70	51.5	151.6	35.3	4.7	0.064
		8:38:54	45	20.45	55.3	4.99	5.70	51.5	146.8	35.5	4.4	0.063
		8:37:31	50	20.28	54.3	4.91	5.70	51.5	138.5	35.7	4.5	0.062
		8:36:51	55	20.11	53.0	4.81	5.67	53.1	136.0	37.3	4.5	0.062
		8:36:12	60	20.04	53.5	4.86	5.72	50.6	129.2	36.6	5.1	0.062
		8:34:57	65	19.86	51.3	4.68	5.77	47.2	117.3	37.8	4.9	0.061
		8:34:03	70	19.71	49.3	4.51	5.82	44.6	108.8	37.6	4.5	0.064
		8:33:29	75	19.61	46.8	4.29	5.87	41.4	101.1	40.2	4.1	0.064
		8:31:59	80	19.59	46.0	4.22	5.97	35.6	84.6	41.0	3.9	0.066
		8:30:56	85	19.56	45.5	4.18	6.14	26.0	65.5	41.4	4.7	0.065
		8:28:21	87	19.43	3.6	0.33	6.62	-1.9	-113.4	98.3	1.8	0.065
		8:37:36	0.5	26.18	96.9	7.84	6.43	10.1	172.4	30.2	5.7	0.082
		8:36:36	5	25.93	94.7	7.69	6.28	18.7	179.4	30.8	6	0.082
		8:35:12	10	24.67	81.0	6.74	6.07	30.6	187.0	30.1	5	0.08
		8:33:28	15	23.40	64.6	5.50	5.99	35.1	188.5	30.3	4.7	0.079
		8:32:33	20	23.02	66.6	5.71	6.07	30.3	184.1	30.8	5.6	0.08
WA-6		8:31:40	25	22.69	67.4	5.81	6.07	30.3	184.0	30.6	6.2	0.079
Bear Creek		8:30:51	30	22.51	67.6	5.85	6.06	30.8	184.3	30.3	5.5	0.078
Lake Arm	8/12/2020	8:30:00	35	22.42	65.8	5.71	6.07	30.5	183.6	31.0	5.3	0.078
		8:28:48	40	22.28	64.4	5.60	6.03	32.7	185.2	30.2	4.5	0.077
		8:27:55	45	22.23	63.5	5.52	6.03	32.8	185.1	31.1	4.9	0.076
		8:26:56	50	22.12	62.8	5.48	6.05	31.4	183.5	31.2	4.5	0.076
		8:25:53	55	22.06	64.5	5.64	6.12	27.5	179.8	31.5	5.1	0.076
		8:24:34	60	21.98	67.3	5.89	6.13	26.7	178.9	31.0	6.1	0.076
		8:23:42	65	21.85	64.5	5.66	6.15	25.5	177.6	31.7	5.7	0.075
		8:22:51	70	21.69	61.2	5.38	6.16	25.1	177.3	34.7	5.4	0.075
		8:21:39	75	21.64	60.7	5.34	6.26	19.0	172.0	35.5	5.9	0.075
		8:18:39	0.5	23.07	78.6	6.73	6.37	12.9	170.6	28.7	4.2	0.077
		8:17:38	5	23.08	78.5	6.72	6.36	13.7	171.1	28.9	4.8	0.078
		8:16:37	10	23.07	78.3	6.71	6.33	15.1	172.0	28.6	4.6	0.078
		8:15:20	15	23.07	78.1	6.68	6.25	20.2	176.4	29.2	4.8	0.078
		8:14:28	20	23.07	77.5	6.64	6.19	23.3	178.8	28.9	4.6	0.078
WA-6	9/2/2020	8:13:35	25	23.06	75.8	6.49	6.21	22.4	176.7	29.5	4.9	0.077
Bear Creek		8:12:44	30	22.97	69.4	5.95	6.17	24.6	177.4	29.1	4.3	0.077
Lake Arm		8:11:40	35	22.69	62.6	5.40	6.1	28.7	180.6	30.8	4	0.078
		8:10:52	40	22.55	62.6	5.41	6.1	28.6	180.4	31.5	3.6	0.078
		8:10:23	45	22.42	63.6	5.51	6.12	27.3	179.4	32.6	3.7	0.078
		8:09:55	50	22.22	64.2	5.59	6.15	25.5	177.7	33.4	3.7	0.078
		8:09:18	55	21.96	63.1	5.52	6.19	23.4	175.5	36.7	4.3	0.078
		8:07:33	60	21.68	45.0	3.96	6.1	28.5	179.4	X	4	0.079

2020 F.E. Walter Water Quality Profiles

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
		ERROR	0.5	15.09	97.7	9.83	6.72	-8.0	204.1	36.5	4.6	0.064
		ERROR	5	15.09	97.4	9.8	6.72	-8.0	204.9	36.1	4.4	0.064
		ERROR	10	15.08	97.3	9.8	6.66	-4.6	208.6	36.2	5.2	0.064
		ERROR	15	14.97	96.4	9.73	6.59	-0.9	212.0	36.5	4.9	0.064
		ERROR	20	14.57	95.7	9.74	6.59	-0.4	211.7	36.2	4.4	0.062
		ERROR	25	13.58	94.3	9.81	6.53	2.4	214.1	36.2	3.5	0.056
WA-7		ERROR	30	12.55	92.2	9.81	6.49	4.6	217.4	36.6	4.4	0.055
Lehigh	5/20/2020	ERROR	35	12.18	91.5	9.82	6.45	7.0	220.6	36.8	3.8	0.055
Lake Arm		ERROR	40	11.69	90.5	9.83	6.47	6.0	220.6	36.7	4.5	0.055
		ERROR	45	11.53	90.0	9.8	6.44	7.8	223.8	36.1	3.6	0.055
		ERROR	50	10.98	88.9	9.81	6.46	6.4	223.6	36.0	4.5	0.056
		ERROR	55	10.82	88.2	9.77	6.46	6.6	224.4	36.1	4.2	0.055
		ERROR	60	10.68	87.8	9.76	6.38	10.8	229.6	36.2	4.6	0.055
		ERROR	65	10.56	87.6	9.76	6.32	14.3	234.0	36.2	3.9	0.055
		ERROR	70	10.45	87.8	9.8	6.26	17.4	238.6	36.0	4.3	0.055
		ERROR	75	10.44	87.5	9.77	6.23	19.5	242.2	35.9	4.1	0.055
		ERROR	80	10.24	87.1	9.77	6.23	19.0	245.7	36.3	3.6	0.054
		8:55:24	0.5	21.63	89.3	7.87	6.41	10.4	208.4	35.9	6.5	0.069
		8:54:43	5	21.32	87.8	7.78	6.4	10.8	209.9	36.4	7.0	0.068
		8:53:48	10	21.25	85.4	7.58	6.35	13.7	211.3	36.1	5.8	0.067
		8:52:43	15	20.94	78.8	7.03	6.22	21.4	216.0	35.9	5.9	0.067
		8:51:59	20	20.41	75.8	6.84	6.21	21.7	215.4	36.7	6.4	0.063
WA-7		8:48:45	25	20.23	75.6	6.84	6.07	30.0	221.5	36.8	6.0	0.061
Lehigh		8:48:15	30	20.12	75.9	6.89	6.09	28.8	220.6	36.4	6.4	0.060
Lake Arm		8:46:49	35	19.98	77.0	7.00	6.14	26.0	219.2	36.7	6.5	0.061
	6/17/2020	8:46:03	40	19.84	78.2	7.13	6.16	25.0	219.2	36.9	6.6	0.061
		8:45:32	45	19.69	79.5	7.27	6.2	22.5	217.6	36.7	6.7	0.061
		8:44:58	50	19.58	80.2	7.35	6.24	20.1	215.8	37.1	7.1	0.062
		8:43:47	55	19.45	81.0	7.44	6.23	20.7	216.6	37	6.4	0.062
		8:39:42	60	19.22	82.6	7.63	6.25	19.7	217.7	37.4	5.9	0.062
		8:39:00	65	18.98	82.8	7.68	6.25	19.4	217.8	37.2	5.9	0.062
		8:38:27	70	18.75	82.5	7.69	6.3	16.6	215.5	37.1	6.0	0.062
		8:37:37	75	18.63	82.5	7.71	6.31	15.8	215.2	37.4	6.0	0.062
		8:36:36	80	18.31	82.7	7.77	6.34	14.1	214.2	37.3	5.8	0.061
		8:35:34	85	18.16	83.3	7.86	6.42	9.7	210.7	37.8	6.3	0.062
		8:17:07	0.5	26.21	97.2	7.86	6.85	-15.3	150.5	35.2	5.7	0.077
		8:14:48	5	26.17	95.2	7.7	6.27	19.2	179.1	35.70	5.9	0.076
		8:13:51	10	24.97	85.0	7.03	6.13	27.4	184.2	36.10	10.5	0.074
		8:12:58	15	23.27	69.9	5.97	6.03	32.8	188.1	35.80	4.6	0.079
		8:11:44	20	22.23	65.6	5.71	5.99	35.4	188.4	35.30	5.0	0.076
		8:10:37	25	21.55	62.3	5.5	5.92	39.1	189.8	35.60	3.8	0.075
WA-7		8:09:56	30	21.09	60.9	5.42	5.85	43.0	191.8	35.20	4.4	0.071
Lehigh		8:09:13	35	20.85	60.1	5.37	5.86	42.5	189.9	35.50	5.8	0.068
Lake Arm	7/8/2020	8:08:28	40	20.62	61.0	5.48	5.87	41.8	188.5	35.30	4.7	0.069
		8:07:34	45	20.39	61.1	5.52	5.85	43.1	188.2	35.30	4.6	0.069
		8:06:49	50	20.26	59.5	5.38	5.85	42.6	186.0	35.60	5.4	0.067
		8:05:49	55	20.14	60.5	5.48	5.89	40.4	182.5	35.60	5.1	0.069
		8:05:12	60	20.06	60.2	5.46	5.92	38.9	179.7	35.20	4.4	0.070
		8:04:05	65	19.95	58.0	5.28	5.92	39.0	176.8	35.50	4.3	0.072
		8:03:14	70	19.89	54.3	4.95	5.89	40.2	174.7	35.70	3.5	0.074
		8:02:32	75	19.78	50.6	4.62	5.84	43.2	174.3	36.50	4.0	0.074
		8:01:52	80	19.60	44.5	4.08	5.87	41.8	169.1	37.8	4.1	0.071
		8:00:48	85	19.42	26.0	2.39	5.93	38.2	157.7	75.89999	4.8	0.078
		7:59:03	87	19.39	28.3	2.6	6.06	30.7	137.1	54.3	3.4	0.078

2020 F.E. Walter Water Quality Profiles

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
WA-7 Lehigh Lake Arm	8/12/2020	9:09:16	0.5	26.36	96.8	7.8	6.33	15.6	169	30.2	6.3	0.083
		9:08:11	5	25.68	92.2	7.52	6.21	22.6	172.9	31	6.8	0.082
		9:06:58	10	25.26	82.6	6.79	6.10	29.2	175.7	31.0	5.5	0.081
		9:06:07	15	23.54	65.9	5.59	6.03	32.9	177.0	30.5	5.2	0.080
		9:05:12	20	22.89	67.1	5.77	5.99	35.1	178.8	30.4	5.4	0.079
		9:04:18	25	22.61	67.9	5.87	6.06	31.2	174.1	30.5	5.8	0.078
		9:02:59	30	22.48	68.9	5.96	6.04	32	173.8	30.6	5.7	0.078
		9:01:49	35	22.36	69.8	6.06	6.02	33.1	173.5	30.5	5.9	0.077
		9:00:55	40	22.24	69.9	6.08	6.01	34.2	173.2	30.6	6.1	0.076
		9:00:01	45	22.18	70.4	6.13	5.97	36.1	173.7	30.3	6.4	0.076
		8:58:26	50	22.11	70.3	6.13	5.98	35.4	169.5	30.7	6.7	0.076
		8:57:39	55	22.06	70.5	6.16	6.09	29.2	161.4	30.7	6.8	0.075
		8:56:32	60	22.03	70.3	6.14	6.13	27	156.3	30.4	7.1	0.075
		8:54:39	65	21.96	70.6	6.18	6.12	27.7	150.8	30.7	6.2	0.075
		8:53:21	70	21.89	68.9	6.03	6.1	28.6	144.2	31.3	6.4	0.075
		8:51:36	75	21.64	50.6	4.46	6.12	27.2	127	X	X	0.077
WA-7 Lehigh Lake Arm	9/2/2020	8:39:46	0.5	22.99	74.4	6.39	6.26	19.3	172.8	29.1	4.4	0.078
		8:39:04	5	23.00	74.2	6.37	6.23	21.4	174.5	28.9	4.3	0.078
		8:38:31	10	23.01	74.3	6.37	6.23	21.3	174.0	28.7	4.6	0.078
		8:37:53	15	23.00	74.4	6.38	6.21	22.1	174.4	28.9	4.3	0.078
		8:36:37	20	23.00	74.7	6.41	6.27	18.6	170.1	28.8	4.5	0.078
		8:35:57	25	22.99	74.7	6.41	6.26	19.6	170.4	29	4	0.078
		8:34:48	30	22.91	71.1	6.11	6.18	24.3	173.4	29.7	4.1	0.079
		8:33:48	35	22.72	63.3	5.46	6.19	23.6	171.0	29.6	4.3	0.080
		8:33:00	40	22.62	65.6	5.67	6.25	19.7	166.9	29.3	4.1	0.080
		8:30:47	45	22.37	76.2	6.61	6.28	17.9	164.6	29.8	4.8	0.080
		8:29:23	50	22.25	81.9	7.13	6.29	17.7	161.1	29.5	4.9	0.080
		8:28:18	55	21.20	83.8	7.44	6.34	14.3	154.6	34.7	4.8	0.080

APPENDIX B

LABORATORY CUSTODY SHEETS

Certificate of Analysis

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

Laboratory No.: 2015560
Report: 05/27/20
Lab Contact: Richard A Wheeler

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

Project: 2020 - Walter Reservoir

Lab ID: 2015560-01 **Collected By:** Client **Sampled:** 05/20/20 09:30 **Received:** 05/20/20 13:40
Sample Desc: WA-1S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/26/20	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	5	mg CaCO3/L		2	SM 2320 B	05/22/20	C-51c	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	05/21/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/20/20 16:10		KRG
Nitrate as N	0.33	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	05/20/20 20:10	J	MRW
Nitrite as N	<0.007	mg/l	0.007	0.10	EPA 300.0 Rev 2.1	05/20/20 20:10	U	MRW
Nitrate+Nitrite as N	<0.34	mg/l	0.182	1.10	CALCULATED	05/20/20 20:10		MRW
Nitrogen, Total Kjeldahl (TKN)	0.65	mg/l	0.37	0.50	EPA 351.2	05/26/20		TML
Phosphorus as P, Total	0.05	mg/l	0.01	0.05	SM 4500-P E	05/22/20	J	RCE
Solids, Total Dissolved	73	mg/l	4	5	SM 2540 C	05/21/20		TMH
Total Organic Carbon	5.7	mg/l	0.3	0.5	SM 5310 C	05/21/20		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	05/21/20		ARG

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	<1	mpn/100ml	1	SM 9223 B/Quantitray	5/20/20 14:58	5/21/20 15:51		JMW
Total Coliform	156	mpn/100ml	1	SM 9223 B/Quantitray	5/20/20 14:58	5/21/20 15:51		JMW

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

Lab ID: 2015560-02 **Collected By:** Client **Sampled:** 05/20/20 07:45 **Received:** 05/20/20 13:40
Sample Desc: WA-2S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/26/20	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	6	mg CaCO3/L		2	SM 2320 B	05/22/20	C-51e	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	05/21/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/20/20 16:10		KRG
Nitrate as N	0.32	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	05/20/20 20:27	J	MRW
Nitrite as N	<0.007	mg/l	0.007	0.10	EPA 300.0 Rev 2.1	05/20/20 20:27	U	MRW
Nitrate+Nitrite as N	<0.33	mg/l	0.182	1.10	CALCULATED	05/20/20 20:27		MRW
Nitrogen, Total Kjeldahl (TKN)	0.67	mg/l	0.37	0.50	EPA 351.2	05/26/20		TML
Phosphorus as P, Total	0.05	mg/l	0.01	0.05	SM 4500-P E	05/22/20		RCE
Solids, Total Dissolved	76	mg/l	4	5	SM 2540 C	05/21/20		TMH
Total Organic Carbon	5.2	mg/l	0.3	0.5	SM 5310 C	05/21/20		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	05/21/20		ARG

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	2	mpn/100ml	1	SM 9223 B/Quantitray	5/20/20 14:58	5/21/20 15:51		JMW
Total Coliform	130	mpn/100ml	1	SM 9223 B/Quantitray	5/20/20 14:58	5/21/20 15:51		JMW

Lab ID: 2015560-03 **Collected By:** Client **Sampled:** 05/20/20 07:45 **Received:** 05/20/20 13:40
Sample Desc: WA-2M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/26/20	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	5	mg CaCO3/L		2	SM 2320 B	05/22/20	C-51b	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	05/21/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/20/20 16:10		KRG
Nitrate as N	0.32	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	05/20/20 20:44	J	MRW
Nitrite as N	<0.007	mg/l	0.007	0.10	EPA 300.0 Rev 2.1	05/20/20 20:44	U	MRW
Nitrate+Nitrite as N	<0.33	mg/l	0.182	1.10	CALCULATED	05/20/20 20:44		MRW
Nitrogen, Total Kjeldahl (TKN)	0.60	mg/l	0.37	0.50	EPA 351.2	05/26/20		TML
Phosphorus as P, Total	0.04	mg/l	0.01	0.05	SM 4500-P E	05/22/20	J	RCE
Solids, Total Dissolved	67	mg/l	4	5	SM 2540 C	05/21/20		TMH
Total Organic Carbon	6.0	mg/l	0.3	0.5	SM 5310 C	05/21/20		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	05/21/20		ARG

Lab ID: 2015560-04 **Collected By:** Client **Sampled:** 05/20/20 07:15 **Received:** 05/20/20 13:40
Sample Desc: WA-2D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/26/20	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	6	mg CaCO3/L		2	SM 2320 B	05/22/20	C-51g	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	05/21/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/20/20 16:10		KRG
Nitrate as N	0.32	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	05/20/20 21:01	J	MRW
Nitrite as N	<0.007	mg/l	0.007	0.10	EPA 300.0 Rev 2.1	05/20/20 21:01	U	MRW
Nitrate+Nitrite as N	<0.33	mg/l	0.182	1.10	CALCULATED	05/20/20 21:01		MRW
Nitrogen, Total Kjeldahl (TKN)	0.62	mg/l	0.37	0.50	EPA 351.2	05/26/20		TML
Phosphorus as P, Total	0.02	mg/l	0.01	0.05	SM 4500-P E	05/21/20	J	RCE
Solids, Total Dissolved	74	mg/l	4	5	SM 2540 C	05/21/20		TMH
Total Organic Carbon	5.2	mg/l	0.3	0.5	SM 5310 C	05/21/20		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	05/21/20		ARG

Lab ID: 2015560-05 **Collected By:** Client **Sampled:** 05/20/20 10:00 **Received:** 05/20/20 13:40
Sample Desc: WA-3S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/26/20	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO3/L		2	SM 2320 B	05/22/20	C-51h	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	05/21/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/20/20 16:10		KRG
Nitrate as N	0.35	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	05/20/20 22:08	J	MRW
Nitrite as N	<0.007	mg/l	0.007	0.10	EPA 300.0 Rev 2.1	05/20/20 22:08	U	MRW
Nitrate+Nitrite as N	<0.36	mg/l	0.182	1.10	CALCULATED	05/20/20 22:08		MRW
Nitrogen, Total Kjeldahl (TKN)	0.77	mg/l	0.37	0.50	EPA 351.2	05/26/20		TML
Phosphorus as P, Total	0.02	mg/l	0.01	0.05	SM 4500-P E	05/21/20	J	RCE
Solids, Total Dissolved	75	mg/l	4	5	SM 2540 C	05/21/20		TMH
Total Organic Carbon	5.8	mg/l	0.3	0.5	SM 5310 C	05/21/20		ALD
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	05/21/20		ARG

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	2	mpn/100ml	1	SM 9223 B/Quantitray	5/20/20 14:58	5/21/20 15:51		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	5/20/20 14:58	5/21/20 15:51		JMW

Lab ID: 2015560-06 **Collected By:** Client **Sampled:** 05/20/20 10:20 **Received:** 05/20/20 13:40
Sample Desc: WA-4S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/26/20	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO3/L		2	SM 2320 B	05/22/20	C-51i	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	05/21/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/20/20 16:10		KRG
Nitrate as N	0.27	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	05/20/20 22:25	J	MRW
Nitrite as N	<0.007	mg/l	0.007	0.10	EPA 300.0 Rev 2.1	05/20/20 22:25	U	MRW
Nitrate+Nitrite as N	<0.28	mg/l	0.182	1.10	CALCULATED	05/20/20 22:25		MRW
Nitrogen, Total Kjeldahl (TKN)	0.70	mg/l	0.37	0.50	EPA 351.2	05/26/20		TML
Phosphorus as P, Total	0.03	mg/l	0.01	0.05	SM 4500-P E	05/21/20	J	RCE
Solids, Total Dissolved	76	mg/l	4	5	SM 2540 C	05/21/20		TMH
Total Organic Carbon	4.7	mg/l	0.3	0.5	SM 5310 C	05/21/20		ALD
Solids, Total Suspended	7	mg/l	1	1	SM 2540 D	05/21/20		ARG

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	12	mpn/100ml	1	SM 9223 B/Quantitray	5/20/20 14:58	5/21/20 15:51		JMW
Total Coliform	914	mpn/100ml	1	SM 9223 B/Quantitray	5/20/20 14:58	5/21/20 15:51		JMW

Lab ID: 2015560-07 **Collected By:** Client **Sampled:** 05/20/20 10:45 **Received:** 05/20/20 13:40
Sample Desc: WA-5S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/26/20	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	3	mg CaCO3/L		2	SM 2320 B	05/22/20	C-51	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	05/21/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/20/20 16:10		KRG
Nitrate as N	<0.18	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	05/20/20 22:42	U	MRW
Nitrite as N	<0.007	mg/l	0.007	0.10	EPA 300.0 Rev 2.1	05/20/20 22:42	U	MRW
Nitrate+Nitrite as N	<0.19	mg/l	0.182	1.10	CALCULATED	05/20/20 22:42		MRW
Nitrogen, Total Kjeldahl (TKN)	0.57	mg/l	0.37	0.50	EPA 351.2	05/26/20		TML
Phosphorus as P, Total	0.02	mg/l	0.01	0.05	SM 4500-P E	05/21/20	J	RCE
Solids, Total Dissolved	59	mg/l	4	5	SM 2540 C	05/21/20		TMH
Total Organic Carbon	3.6	mg/l	0.3	0.5	SM 5310 C	05/21/20		ALD
Solids, Total Suspended	8	mg/l	1	1	SM 2540 D	05/21/20		ARG

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	2	mpn/100ml	1	SM 9223 B/Quantitray	5/20/20 14:58	5/21/20 15:51		JMW
Total Coliform	1120	mpn/100ml	1	SM 9223 B/Quantitray	5/20/20 14:58	5/21/20 15:51		JMW

Lab ID: 2015560-08 **Collected By:** Client **Sampled:** 05/20/20 08:15 **Received:** 05/20/20 13:40
Sample Desc: WA-6S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/26/20	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	6	mg CaCO3/L		2	SM 2320 B	05/22/20	C-51e	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	05/21/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/20/20 16:10		KRG
Nitrate as N	0.32	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	05/20/20 22:58	J	MRW
Nitrite as N	<0.007	mg/l	0.007	0.10	EPA 300.0 Rev 2.1	05/20/20 22:58	U	MRW
Nitrate+Nitrite as N	<0.33	mg/l	0.182	1.10	CALCULATED	05/20/20 22:58		MRW
Nitrogen, Total Kjeldahl (TKN)	0.50	mg/l	0.37	0.50	EPA 351.2	05/26/20		TML
Phosphorus as P, Total	0.01	mg/l	0.01	0.05	SM 4500-P E	05/21/20	J	RCE
Solids, Total Dissolved	37	mg/l	4	5	SM 2540 C	05/21/20		TMH
Total Organic Carbon	5.1	mg/l	0.3	0.5	SM 5310 C	05/21/20		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	05/21/20		ARG

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	<1	mpn/100ml	1	SM 9223 B/Quantitray	5/20/20 14:58	5/21/20 15:51		JMW
Total Coliform	109	mpn/100ml	1	SM 9223 B/Quantitray	5/20/20 14:58	5/21/20 15:51		JMW

Lab ID: 2015560-09 **Collected By:** Client **Sampled:** 05/20/20 08:15 **Received:** 05/20/20 13:40
Sample Desc: WA-6M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/26/20	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	5	mg CaCO3/L		2	SM 2320 B	05/22/20	C-51a	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	05/21/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/20/20 16:20		KRG
Nitrate as N	0.31	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	05/20/20 23:49	J	MRW
Nitrite as N	<0.007	mg/l	0.007	0.10	EPA 300.0 Rev 2.1	05/20/20 23:49	U	MRW
Nitrate+Nitrite as N	<0.32	mg/l	0.182	1.10	CALCULATED	05/20/20 23:49		MRW
Nitrogen, Total Kjeldahl (TKN)	0.45	mg/l	0.37	0.50	EPA 351.2	05/26/20	Q-10, J	TML
Phosphorus as P, Total	0.01	mg/l	0.01	0.05	SM 4500-P E	05/21/20	J	RCE
Solids, Total Dissolved	38	mg/l	4	5	SM 2540 C	05/21/20		TMH
Total Organic Carbon	5.4	mg/l	0.3	0.5	SM 5310 C	05/21/20		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	05/21/20		ARG

Lab ID: 2015560-10 **Collected By:** Client **Sampled:** 05/20/20 08:15 **Received:** 05/20/20 13:40
Sample Desc: WA-6D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/26/20	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	5	mg CaCO3/L		2	SM 2320 B	05/22/20	C-51b	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	05/21/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/20/20 16:10		KRG
Nitrate as N	0.32	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	05/21/20 0:06	J	MRW
Nitrite as N	<0.007	mg/l	0.007	0.10	EPA 300.0 Rev 2.1	05/21/20 0:06	U	MRW
Nitrate+Nitrite as N	<0.33	mg/l	0.182	1.10	CALCULATED	05/21/20 0:06		MRW
Nitrogen, Total Kjeldahl (TKN)	0.65	mg/l	0.37	0.50	EPA 351.2	05/26/20		TML
Phosphorus as P, Total	0.01	mg/l	0.01	0.05	SM 4500-P E	05/21/20	J	RCE
Solids, Total Dissolved	42	mg/l	4	5	SM 2540 C	05/21/20		TMH
Total Organic Carbon	5.5	mg/l	0.3	0.5	SM 5310 C	05/21/20		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	05/21/20		ARG

Lab ID: 2015560-11 **Collected By:** Client **Sampled:** 05/20/20 08:45 **Received:** 05/20/20 13:40
Sample Desc: WA-7S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/26/20	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	6	mg CaCO3/L		2	SM 2320 B	05/22/20	C-51f	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	05/21/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/20/20 16:10		KRG
Nitrate as N	0.32	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	05/21/20 0:22	J	MRW
Nitrite as N	<0.007	mg/l	0.007	0.10	EPA 300.0 Rev 2.1	05/21/20 0:22	U	MRW
Nitrate+Nitrite as N	<0.33	mg/l	0.182	1.10	CALCULATED	05/21/20 0:22		MRW
Nitrogen, Total Kjeldahl (TKN)	0.62	mg/l	0.37	0.50	EPA 351.2	05/26/20		TML
Phosphorus as P, Total	0.02	mg/l	0.01	0.05	SM 4500-P E	05/21/20	J	RCE
Solids, Total Dissolved	58	mg/l	4	5	SM 2540 C	05/21/20		TMH
Total Organic Carbon	5.1	mg/l	0.3	0.5	SM 5310 C	05/21/20		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	05/21/20		ARG

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	1	mpn/100ml	1	SM 9223 B/Quantitray	5/20/20 14:58	5/21/20 15:51		JMW
Total Coliform	152	mpn/100ml	1	SM 9223 B/Quantitray	5/20/20 14:58	5/21/20 15:51		JMW

Lab ID: 2015560-12 **Collected By:** Client **Sampled:** 05/19/20 08:45 **Received:** 05/20/20 13:40
Sample Desc: WA-7M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/26/20	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	6	mg CaCO3/L		2	SM 2320 B	05/22/20	C-51e	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	05/21/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/20/20 16:10		KRG
Nitrate as N	0.32	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	05/21/20 0:39	J	MRW
Nitrite as N	<0.007	mg/l	0.007	0.10	EPA 300.0 Rev 2.1	05/21/20 0:39	U	MRW
Nitrate+Nitrite as N	<0.33	mg/l	0.182	1.10	CALCULATED	05/21/20 0:39		MRW
Nitrogen, Total Kjeldahl (TKN)	0.63	mg/l	0.37	0.50	EPA 351.2	05/26/20		TML
Phosphorus as P, Total	0.02	mg/l	0.01	0.05	SM 4500-P E	05/21/20	J	RCE
Solids, Total Dissolved	75	mg/l	4	5	SM 2540 C	05/21/20		TMH
Total Organic Carbon	5.1	mg/l	0.3	0.5	SM 5310 C	05/21/20		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	05/21/20		ARG

Lab ID: 2015560-13 **Collected By:** Client **Sampled:** 05/19/20 08:45 **Received:** 05/20/20 13:40
Sample Desc: WA-7D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	05/26/20	G-11, G-17	TML
General Chemistry								
Alkalinity, Total to pH 4.5	6	mg CaCO3/L		2	SM 2320 B	05/22/20	C-51d	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	05/21/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/20/20 16:10		KRG
Nitrate as N	0.33	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	05/21/20 0:56	J	MRW
Nitrite as N	<0.007	mg/l	0.007	0.10	EPA 300.0 Rev 2.1	05/21/20 0:56	U	MRW
Nitrate+Nitrite as N	<0.34	mg/l	0.182	1.10	CALCULATED	05/21/20 0:56		MRW
Nitrogen, Total Kjeldahl (TKN)	0.57	mg/l	0.37	0.50	EPA 351.2	05/26/20		TML
Phosphorus as P, Total	0.02	mg/l	0.01	0.05	SM 4500-P E	05/21/20	J	RCE
Solids, Total Dissolved	51	mg/l	4	5	SM 2540 C	05/21/20		TMH
Total Organic Carbon	5.7	mg/l	0.3	0.5	SM 5310 C	05/21/20		ALD
Solids, Total Suspended	5	mg/l	1	1	SM 2540 D	05/21/20		ARG

Preparation Methods

Specific Method	Preparation Method	Prep Batch	Prepared Date	Prepared By
2015560-01				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0E1258	05/21/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0E1259	05/22/2020	RCE
2015560-02				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0E1258	05/21/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0E1259	05/22/2020	RCE
2015560-03				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0E1258	05/21/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0E1259	05/22/2020	RCE
2015560-04				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0E1258	05/21/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0E1220	05/21/2020	RCE
2015560-05				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0E1258	05/21/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0E1220	05/21/2020	RCE
2015560-06				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0E1258	05/21/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0E1220	05/21/2020	RCE
2015560-07				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0E1258	05/21/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0E1220	05/21/2020	RCE
2015560-08				
Dissolved General Chemistry				

SM 4500-P F	SM 4500-P B	B0E1258	05/21/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0E1220	05/21/2020	RCE
2015560-09				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0E1258	05/21/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0E1220	05/21/2020	RCE
2015560-10				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0E1258	05/21/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0E1220	05/21/2020	RCE
2015560-11				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0E1258	05/21/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0E1220	05/21/2020	RCE
2015560-12				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0E1258	05/21/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0E1220	05/21/2020	RCE
2015560-13				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0E1258	05/21/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0E1220	05/21/2020	RCE

Notes and Definitions

C-51	The alkalinity to pH 4.2 = 3.3 mg CaCO3/L.
C-51a	The alkalinity to pH 4.2 = 5.0 mg CaCO3/L.
C-51b	The alkalinity to pH 4.2 = 5.2 mg CaCO3/L.
C-51c	The alkalinity to pH 4.2 = 5.4 mg CaCO3/L.
C-51d	The alkalinity to pH 4.2 = 5.9 mg CaCO3/L.
C-51e	The alkalinity to pH 4.2 = 6.0 mg CaCO3/L.
C-51f	The alkalinity to pH 4.2 = 6.1 mg CaCO3/L.
C-51g	The alkalinity to pH 4.2 = 6.4 mg CaCO3/L.
C-51h	The alkalinity to pH 4.2 = 7.0 mg CaCO3/L.
C-51i	The alkalinity to pH 4.2 = 8.1 mg CaCO3/L.
G-11	The sample was filtered after it was received at the laboratory.
G-17	The sample was preserved in the laboratory.
J	Estimated value
Q-10	The matrix spike(s) were outside acceptable limits of 90-110% recovery at 122% and 122%.
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

2015560

Client Code: 3157
Client: Tetra Tech
Project Manager: Richard A Wheeler
Project: 2020 - Walter 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:

2015560-01 WA-1S

Matrix: Non-Potable Water
Type: Grab
Date: 5/20/20
Time: 0930

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

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

2015560-02 WA-2S

Matrix: Non-Potable Water
Type: Grab
Date: 5/20/20
Time: 0745

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

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

Relinquished By	Date/Time 5/20/20 1215	Received By	Date/Time 5-20-20 1230
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	Date/Time 5-20-20 1340

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

Printed: 5/7/2020 2:05:43PM

Report Template: wko WorkOrder COC ls

M.J. Reider Associates, Inc.

2015560

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

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

Comments:

Collected By : (Full Name) Gregory Wacik

2015560-03 WA-2M

Matrix: Non-Potable Water Date: 5/20/20
Type: Grab Time: 0745

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

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

2015560-04 WA-2D

Matrix: Non-Potable Water Date: 5/20/20
Type: Grab Time: 0715

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

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

2015560-05 WA-3S

Matrix: Non-Potable Water Date: 5/20/20
Type: Grab Time: 1000

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

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	5/20/20 1215 Date/Time	Received By	5-20-20 1230 Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	5-20-20 1340 Date/Time

Sample Kit Prepared By:	Date/Time
JV QMS	5/1/20
Sample Temp (°C):	5
Samples on Ice?	(Yes) No NA
Approved By:	
Entered By:	BSW

M.J. Reider Associates, Inc.

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

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

Comments:

Collected By : (Full Name) Gregory Wacik

2015560-06 WA-4S

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

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

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

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

2015560-07 WA-5S

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

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

Matrix: Non-Potable Water Date: 5/20/20
Type: Grab Time: 1045

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

2015560-08 WA-6S

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

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

Matrix: Non-Potable Water Date: 5/20/20
Type: Grab Time: 0815

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

Relinquished By	5/20/20 1215 Date/Time	Received By	5-20-20 1230 Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	5-20-20 1340 Date/Time

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

Printed: 5/7/2020 2:05:43PM

Report Template: wkO WorkOrder COC is

M.J. Reider Associates, Inc.

2015560

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

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

Comments:

Collected By : (Full Name) Gregory Wacik

2015560-09 WA-6M

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

Matrix: Non-Potable Water Date: 5/20/20
Type: Grab Time: 0815

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

2015560-10 WA-6D

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

Matrix: Non-Potable Water Date: 5/20/20
Type: Grab Time: 0815

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

2015560-11 WA-7S

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

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

Relinquished By	Date/Time 5/20/20 1215	Received By	Date/Time 5-20-20 1230
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	Date/Time 5-20-20 1340

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

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

Printed: 5/7/2020 2:05:43PM

Report Template: wko WorkOrder COC ls

M.J. Reider Associates, Inc.

Client Code: 3157
Project Manager: Richard A Wheeler

Client: Tetra Tech
Project: 2020 - Walter Reservoir

Comments:

Collected By : (Full Name) Gregory Wacik

2015560-12 WA-7M

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

Matrix: Non-Potable Water
Type: Grab
Date: 5/20/20
Time: 0845

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

2015560-13 WA-7D

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

Matrix: Non-Potable Water
Type: Grab
Date: 5/20/20
Time: 0845

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

Relinquished By	5/20/20 1715 Date/Time	Received By	5-20-20 1238 Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	5-20-20 1346 Date/Time

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

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Report Template: wkb workorder COC is

MJRA Terms & Conditions

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

Sample Submission, Sample Acceptance & Sampling Containers

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

Turnaround Times (TAT)

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

Analytical Results, Sample Collection Integrity & Subcontracting

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

Payment Terms

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

Warranty & Litigation

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

Reviewed and Approved by:

Richard A Wheeler
Director of Field Services

NELAP accredited by PA. (PADEP #06-00003) Visit our website to view our current
NELAC accreditations for various drinking water, wastewater and solid & chemical materials analytes.
Additional accreditations by CT (PH-0210), MD (261), NY(12094)

Certificate of Analysis

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

Laboratory No.: 2016282
Report: 06/24/20
Lab Contact: Richard A Wheeler

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

Project: 2020 - Walter Reservoir

Lab ID: 2016282-01 **Collected By:** Client **Sampled:** 06/17/20 09:30 **Received:** 06/17/20 13:00
Sample Desc: WA-1S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	06/22/20	G-11	TML
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO3/L		2	SM 2320 B	06/19/20	C-51h	APR
Ammonia as N	0.01	mg/l	0.01	0.10	ASTM D6919-03	06/18/20	J	APR
Biochemical Oxygen Demand	3.1	mg/l	2.0	2.0	SM 5210 B	06/17/20 15:00		KRG
Nitrate as N	0.28	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/17/20 13:49	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/17/20 13:49	U	TML
Nitrate+Nitrite as N	<0.29	mg/l	0.125	1.10	CALCULATED	06/17/20 13:49		TML
Nitrogen, Total Kjeldahl (TKN)	<0.37	mg/l	0.37	0.50	EPA 351.2	06/22/20	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.05	SM 4500-P E	06/19/20	U	RCE
Solids, Total Dissolved	90	mg/l	4	5	SM 2540 C	06/18/20		TMH
Total Organic Carbon	8.5	mg/l	0.3	0.5	SM 5310 C	06/17/20		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	06/18/20		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	70	mpn/100ml	1	SM 9223 B/Quantitray	6/17/20 14:50	6/18/20 8:54		QMS
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	6/17/20 14:50	6/18/20 8:54		QMS

Lab ID: 2016282-02 **Collected By:** Client **Sampled:** 06/17/20 07:30 **Received:** 06/17/20 13:00
Sample Desc: WA-2S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	06/22/20	G-11	TML
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO3/L		2	SM 2320 B	06/19/20	C-51g	APR
Ammonia as N	0.02	mg/l	0.01	0.10	ASTM D6919-03	06/18/20	J	APR
Biochemical Oxygen Demand	2.5	mg/l	2.0	2.0	SM 5210 B	06/17/20 15:00		KRG
Nitrate as N	0.28	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/17/20 14:06	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/17/20 14:06	U	TML
Nitrate+Nitrite as N	<0.29	mg/l	0.125	1.10	CALCULATED	06/17/20 14:06		TML
Nitrogen, Total Kjeldahl (TKN)	<0.37	mg/l	0.37	0.50	EPA 351.2	06/22/20	U	TML
Phosphorus as P, Total	0.04	mg/l	0.01	0.05	SM 4500-P E	06/19/20	J	RCE
Solids, Total Dissolved	75	mg/l	4	5	SM 2540 C	06/18/20		TMH
Total Organic Carbon	7.0	mg/l	0.3	0.5	SM 5310 C	06/17/20		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	06/18/20		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	6	mpn/100ml	1	SM 9223 B/Quantitray	6/17/20 14:50	6/18/20 8:54		QMS
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	6/17/20 14:50	6/18/20 8:54		QMS

Lab ID: 2016282-03 **Collected By:** Client **Sampled:** 06/17/20 07:30 **Received:** 06/17/20 13:00
Sample Desc: WA-2M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.05	mg/l		0.05	SM 4500-P F	06/19/20	G-11	TML
General Chemistry								
Alkalinity, Total to pH 4.5	6	mg CaCO3/L		2	SM 2320 B	06/19/20	C-51d	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	06/18/20	U	APR
Biochemical Oxygen Demand	2.8	mg/l	2.0	2.0	SM 5210 B	06/17/20 15:00		KRG
Nitrate as N	0.28	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/17/20 14:23	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/17/20 14:23	U	TML
Nitrate+Nitrite as N	<0.29	mg/l	0.125	1.10	CALCULATED	06/17/20 14:23		TML
Nitrogen, Total Kjeldahl (TKN)	<0.37	mg/l	0.37	0.50	EPA 351.2	06/22/20	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.05	SM 4500-P E	06/18/20	U	RCE
Solids, Total Dissolved	62	mg/l	4	5	SM 2540 C	06/18/20		TMH
Total Organic Carbon	8.7	mg/l	0.3	0.5	SM 5310 C	06/17/20		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	06/18/20		ALD

Lab ID: 2016282-04 **Collected By:** Client **Sampled:** 06/17/20 07:30 **Received:** 06/17/20 13:00
Sample Desc: WA-2D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.05	mg/l		0.05	SM 4500-P F	06/19/20	G-11	TML
General Chemistry								
Alkalinity, Total to pH 4.5	6	mg CaCO3/L		2	SM 2320 B	06/19/20	C-51b	APR
Ammonia as N	0.02	mg/l	0.01	0.10	ASTM D6919-03	06/18/20	J	APR
Biochemical Oxygen Demand	3.2	mg/l	2.0	2.0	SM 5210 B	06/17/20 15:00		KRG
Nitrate as N	0.30	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/17/20 14:40	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/17/20 14:40	U	TML
Nitrate+Nitrite as N	<0.31	mg/l	0.125	1.10	CALCULATED	06/17/20 14:40		TML
Nitrogen, Total Kjeldahl (TKN)	<0.37	mg/l	0.37	0.50	EPA 351.2	06/22/20	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.05	SM 4500-P E	06/18/20	U	RCE
Solids, Total Dissolved	73	mg/l	4	5	SM 2540 C	06/18/20		TMH
Total Organic Carbon	8.7	mg/l	0.3	0.5	SM 5310 C	06/17/20		ALD
Solids, Total Suspended	7	mg/l	1	1	SM 2540 D	06/18/20		ALD

Lab ID: 2016282-05 **Collected By:** Client **Sampled:** 06/17/20 09:50 **Received:** 06/17/20 13:00
Sample Desc: WA-3S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.05	mg/l		0.05	SM 4500-P F	06/19/20	G-11	TML
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO3/L		2	SM 2320 B	06/19/20	C-51k	APR
Ammonia as N	0.01	mg/l	0.01	0.10	ASTM D6919-03	06/18/20	J	APR
Biochemical Oxygen Demand	2.6	mg/l	2.0	2.0	SM 5210 B	06/17/20 15:00		KRG
Nitrate as N	0.34	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/17/20 14:57	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/17/20 14:57	U	TML
Nitrate+Nitrite as N	<0.35	mg/l	0.125	1.10	CALCULATED	06/17/20 14:57		TML
Nitrogen, Total Kjeldahl (TKN)	<0.37	mg/l	0.37	0.50	EPA 351.2	06/22/20	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.05	SM 4500-P E	06/18/20	U	RCE
Solids, Total Dissolved	93	mg/l	4	5	SM 2540 C	06/18/20		TMH
Total Organic Carbon	9.4	mg/l	0.3	0.5	SM 5310 C	06/17/20		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	06/18/20		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	30	mpn/100ml	1	SM 9223 B/Quantitray	6/17/20 14:50	6/18/20 8:54		QMS
Total Coliform	1990	mpn/100ml	1	SM 9223 B/Quantitray	6/17/20 14:50	6/18/20 8:54		QMS

Lab ID: 2016282-06 **Collected By:** Client **Sampled:** 06/17/20 09:50 **Received:** 06/17/20 13:00
Sample Desc: WA-4S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.06	mg/l		0.05	SM 4500-P F	06/19/20	G-11	TML
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO3/L		2	SM 2320 B	06/19/20	C-51i	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	06/18/20	U	APR
Biochemical Oxygen Demand	2.9	mg/l	2.0	2.0	SM 5210 B	06/17/20 15:00		KRG
Nitrate as N	0.32	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/17/20 15:14	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/17/20 15:14	U	TML
Nitrate+Nitrite as N	<0.33	mg/l	0.125	1.10	CALCULATED	06/17/20 15:14		TML
Nitrogen, Total Kjeldahl (TKN)	<0.37	mg/l	0.37	0.50	EPA 351.2	06/22/20	U	TML
Phosphorus as P, Total	0.02	mg/l	0.01	0.05	SM 4500-P E	06/18/20	J	RCE
Solids, Total Dissolved	68	mg/l	4	5	SM 2540 C	06/18/20		TMH
Total Organic Carbon	6.7	mg/l	0.3	0.5	SM 5310 C	06/17/20		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	06/18/20		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	52	mpn/100ml	1	SM 9223 B/Quantitray	6/17/20 14:50	6/18/20 8:54		QMS
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	6/17/20 14:50	6/18/20 8:54		QMS

Lab ID: 2016282-07 **Collected By:** Client **Sampled:** 06/17/20 10:15 **Received:** 06/17/20 13:00
Sample Desc: WA-5S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.05	mg/l		0.05	SM 4500-P F	06/19/20	G-11	TML
General Chemistry								
Alkalinity, Total to pH 4.5	3	mg CaCO3/L		2	SM 2320 B	06/19/20	C-51	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	06/18/20	U	APR
Biochemical Oxygen Demand	3.1	mg/l	2.0	2.0	SM 5210 B	06/17/20 15:00		KRG
Nitrate as N	0.23	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/17/20 15:31	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/17/20 15:31	U	TML
Nitrate+Nitrite as N	<0.24	mg/l	0.125	1.10	CALCULATED	06/17/20 15:31		TML
Nitrogen, Total Kjeldahl (TKN)	<0.37	mg/l	0.37	0.50	EPA 351.2	06/22/20	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.05	SM 4500-P E	06/18/20	U	RCE
Solids, Total Dissolved	48	mg/l	4	5	SM 2540 C	06/18/20		TMH
Total Organic Carbon	5.2	mg/l	0.3	0.5	SM 5310 C	06/17/20		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	06/18/20		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	20	mpn/100ml	1	SM 9223 B/Quantitray	6/17/20 14:50	6/18/20 8:54		QMS
Total Coliform	1990	mpn/100ml	1	SM 9223 B/Quantitray	6/17/20 14:50	6/18/20 8:54		QMS

Lab ID: 2016282-08 **Collected By:** Client **Sampled:** 06/17/20 08:15 **Received:** 06/17/20 13:00
Sample Desc: WA-6S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	06/19/20	G-11	TML
General Chemistry								
Alkalinity, Total to pH 4.5	6	mg CaCO3/L		2	SM 2320 B	06/19/20	C-51e	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	06/18/20	U	APR
Biochemical Oxygen Demand	3.0	mg/l	2.0	2.0	SM 5210 B	06/17/20 15:00		KRG
Nitrate as N	0.28	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/17/20 15:47	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/17/20 15:47	U	TML
Nitrate+Nitrite as N	<0.29	mg/l	0.125	1.10	CALCULATED	06/17/20 15:47		TML
Nitrogen, Total Kjeldahl (TKN)	<0.37	mg/l	0.37	0.50	EPA 351.2	06/22/20	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.05	SM 4500-P E	06/18/20	U	RCE
Solids, Total Dissolved	65	mg/l	4	5	SM 2540 C	06/18/20		TMH
Total Organic Carbon	7.1	mg/l	0.3	0.5	SM 5310 C	06/17/20		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	06/18/20		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	6	mpn/100ml	1	SM 9223 B/Quantitray	6/17/20 14:50	6/18/20 8:54		QMS
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	6/17/20 14:50	6/18/20 8:54		QMS

Lab ID: 2016282-09 **Collected By:** Client **Sampled:** 06/17/20 08:15 **Received:** 06/17/20 13:00
Sample Desc: WA-6M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.06	mg/l		0.05	SM 4500-P F	06/19/20	G-11	TML
General Chemistry								
Alkalinity, Total to pH 4.5	6	mg CaCO3/L		2	SM 2320 B	06/19/20	C-51c	APR
Ammonia as N	0.02	mg/l	0.01	0.10	ASTM D6919-03	06/18/20	J	APR
Biochemical Oxygen Demand	2.9	mg/l	2.0	2.0	SM 5210 B	06/17/20 15:00		KRG
Nitrate as N	0.27	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/17/20 16:04	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/17/20 16:04	U	TML
Nitrate+Nitrite as N	<0.28	mg/l	0.125	1.10	CALCULATED	06/17/20 16:04		TML
Nitrogen, Total Kjeldahl (TKN)	<0.37	mg/l	0.37	0.50	EPA 351.2	06/22/20	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.05	SM 4500-P E	06/18/20	U	RCE
Solids, Total Dissolved	68	mg/l	4	5	SM 2540 C	06/18/20		TMH
Total Organic Carbon	8.7	mg/l	0.3	0.5	SM 5310 C	06/17/20		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	06/18/20		ALD

Lab ID: 2016282-10 **Collected By:** Client **Sampled:** 06/17/20 08:15 **Received:** 06/17/20 13:00
Sample Desc: WA-6D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	06/19/20	G-11	TML
General Chemistry								
Alkalinity, Total to pH 4.5	5	mg CaCO3/L		2	SM 2320 B	06/19/20	C-51a	APR
Ammonia as N	0.01	mg/l	0.01	0.10	ASTM D6919-03	06/18/20	J	APR
Biochemical Oxygen Demand	2.8	mg/l	2.0	2.0	SM 5210 B	06/17/20 15:00		KRG
Nitrate as N	0.27	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/17/20 17:31	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/17/20 17:31	U	TML
Nitrate+Nitrite as N	<0.28	mg/l	0.125	1.10	CALCULATED	06/17/20 17:31		TML
Nitrogen, Total Kjeldahl (TKN)	<0.37	mg/l	0.37	0.50	EPA 351.2	06/22/20	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.05	SM 4500-P E	06/18/20	U	RCE
Solids, Total Dissolved	60	mg/l	4	5	SM 2540 C	06/18/20		TMH
Total Organic Carbon	6.8	mg/l	0.3	0.5	SM 5310 C	06/17/20		ALD
Solids, Total Suspended	4	mg/l	1	1	SM 2540 D	06/18/20		ALD

Lab ID: 2016282-11 **Collected By:** Client **Sampled:** 06/17/20 08:45 **Received:** 06/17/20 13:00
Sample Desc: WA-7S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.05	mg/l		0.05	SM 4500-P F	06/19/20	G-11	TML
General Chemistry								
Alkalinity, Total to pH 4.5	6	mg CaCO3/L		2	SM 2320 B	06/19/20	C-51e	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	06/18/20	U	APR
Biochemical Oxygen Demand	3.3	mg/l	2.0	2.0	SM 5210 B	06/17/20 15:00		KRG
Nitrate as N	0.28	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/17/20 17:48	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/17/20 17:48	U	TML
Nitrate+Nitrite as N	<0.29	mg/l	0.125	1.10	CALCULATED	06/17/20 17:48		TML
Nitrogen, Total Kjeldahl (TKN)	<0.37	mg/l	0.37	0.50	EPA 351.2	06/22/20	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.05	SM 4500-P E	06/18/20	U	RCE
Solids, Total Dissolved	62	mg/l	4	5	SM 2540 C	06/18/20		TMH
Total Organic Carbon	7.9	mg/l	0.3	0.5	SM 5310 C	06/18/20		ALD
Solids, Total Suspended	4	mg/l	1	1	SM 2540 D	06/18/20		ALD

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	12	mpn/100ml	1	SM 9223 B/Quantitray	6/17/20 14:50	6/18/20 8:54		QMS
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	6/17/20 14:50	6/18/20 8:54		QMS

Lab ID: 2016282-12 **Collected By:** Client **Sampled:** 06/17/20 08:45 **Received:** 06/17/20 13:00
Sample Desc: WA-7M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.05	mg/l		0.05	SM 4500-P F	06/19/20	G-11	TML
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO3/L		2	SM 2320 B	06/19/20	C-51f	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	06/18/20	U	APR
Biochemical Oxygen Demand	2.8	mg/l	2.0	2.0	SM 5210 B	06/17/20 15:00		KRG
Nitrate as N	0.28	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/17/20 18:04	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/17/20 18:04	U	TML
Nitrate+Nitrite as N	<0.29	mg/l	0.125	1.10	CALCULATED	06/17/20 18:04		TML
Nitrogen, Total Kjeldahl (TKN)	<0.37	mg/l	0.37	0.50	EPA 351.2	06/22/20	U	TML
Phosphorus as P, Total	<0.01	mg/l	0.01	0.05	SM 4500-P E	06/18/20	U	RCE
Solids, Total Dissolved	53	mg/l	4	5	SM 2540 C	06/18/20		TMH
Total Organic Carbon	9.1	mg/l	0.3	0.5	SM 5310 C	06/17/20		ALD
Solids, Total Suspended	4	mg/l	1	1	SM 2540 D	06/18/20		ALD

Lab ID: 2016282-13 **Collected By:** Client **Sampled:** 06/17/20 08:45 **Received:** 06/17/20 13:00
Sample Desc: WA-7D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	06/19/20	G-11	TML
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO3/L		2	SM 2320 B	06/19/20	C-51j	APR
Ammonia as N	0.05	mg/l	0.01	0.10	ASTM D6919-03	06/18/20	J	APR
Biochemical Oxygen Demand	4.1	mg/l	2.0	2.0	SM 5210 B	06/17/20 15:00		KRG
Nitrate as N	0.29	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/17/20 18:21	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/17/20 18:21	U	TML
Nitrate+Nitrite as N	<0.30	mg/l	0.125	1.10	CALCULATED	06/17/20 18:21		TML
Nitrogen, Total Kjeldahl (TKN)	0.39	mg/l	0.37	0.50	EPA 351.2	06/18/20	J	RCE
Phosphorus as P, Total	0.02	mg/l	0.01	0.05	SM 4500-P E	06/18/20	J	RCE
Solids, Total Dissolved	62	mg/l	4	5	SM 2540 C	06/18/20		TMH
Total Organic Carbon	8.8	mg/l	0.3	0.5	SM 5310 C	06/17/20		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	06/18/20		ALD

Preparation Methods

Specific Method	Preparation Method	Prep Batch	Prepared Date	Prepared By
2016282-01				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0F1193	06/19/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0F1194	06/19/2020	RCE
2016282-02				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0F1193	06/19/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0F1194	06/19/2020	RCE
2016282-03				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0F1088	06/17/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0F1087	06/18/2020	RCE
2016282-04				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0F1088	06/17/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0F1087	06/18/2020	RCE
2016282-05				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0F1088	06/17/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0F1087	06/18/2020	RCE
2016282-06				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0F1088	06/17/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0F1087	06/18/2020	RCE
2016282-07				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0F1088	06/17/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0F1087	06/18/2020	RCE
2016282-08				
Dissolved General Chemistry				

SM 4500-P F	SM 4500-P B	B0F1088	06/17/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0F1087	06/18/2020	RCE
2016282-09				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0F1088	06/17/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0F1087	06/18/2020	RCE
2016282-10				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0F1088	06/17/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0F1087	06/18/2020	RCE
2016282-11				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0F1088	06/17/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0F1087	06/18/2020	RCE
2016282-12				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0F1088	06/17/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0F1087	06/18/2020	RCE
2016282-13				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0F1088	06/17/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0F1087	06/18/2020	RCE

Notes and Definitions

C-51	The alkalinity to pH 4.2 = 3.1 mg CaCO3/L.
C-51a	The alkalinity to pH 4.2 = 5.2 mg CaCO3/L.
C-51b	The alkalinity to pH 4.2 = 5.5 mg CaCO3/L.
C-51c	The alkalinity to pH 4.2 = 6.0 mg CaCO3/L.
C-51d	The alkalinity to pH 4.2 = 6.4 mg CaCO3/L.
C-51e	The alkalinity to pH 4.2 = 6.5 mg CaCO3/L.
C-51f	The alkalinity to pH 4.2 = 6.6 mg CaCO3/L.
C-51g	The alkalinity to pH 4.2 = 6.7 mg CaCO3/L.
C-51h	The alkalinity to pH 4.2 = 6.8 mg CaCO3/L.
C-51i	The alkalinity to pH 4.2 = 7.2 mg CaCO3/L.
C-51j	The alkalinity to pH 4.2 = 7.4 mg CaCO3/L.
C-51k	The alkalinity to pH 4.2 = 7.8 mg CaCO3/L.
G-11	The sample was filtered after it was received at the laboratory.
J	Estimated value
U	Analyte was not detected above the indicated value.

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

WORK ORDER
Chain of Custody

2016282

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

Comments:

Collected By : (Full Name) Gregory Wacik

2016282-01 WA-1S

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

Matrix: Non-Potable Water
Type: Grab
Date: 6/17/20
Time: 0930

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

2016282-02 WA-2S

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

Matrix: Non-Potable Water
Type: Grab
Date: 6/17/20
Time: 0730

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

Relinquished By	6/17/20 1130 Date/Time	Received By	6-17-20 1140 Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	6-17-20 1300 Date/Time

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

Report Template:

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

Printed: 5/14/2020 10:17:28AM

M.J. Reider Associates, Inc.

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

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

Comments:

Collected By : (Full Name) Gregory Wacik

2016282-03 WA-2M

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

Matrix: Non-Potable Water Date: 6/17/20
Type: Grab Time: 0730

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

2016282-04 WA-2D

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

Matrix: Non-Potable Water Date: 6/17/20
Type: Grab Time: 0730

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

2016282-05 WA-3S

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

Matrix: Non-Potable Water Date: 6/17/20
Type: Grab Time: 0950

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

Relinquished By	Date/Time 6/17/20 1130	Received By	Date/Time 6-17-20 1140
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	Date/Time 6-17-20 1300

Sample Kit Prepared By:	Date/Time 5/8/20
Sample Temp (°C):	5
Samples on Ice?	Yes No NA
Approved By:	
Entered By:	BSW

Report Template: v

Printed: 5/14/2020 10:17:28AM

M.J. Reider Associates, Inc.

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

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

Comments:

Collected By : (Full Name) Gregory Wacik

2016282-06 WA-4S

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

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

Matrix: Non-Potable Water **Type:** Grab

Date: 6/17/20 Time: 0950

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

2016282-07 WA-5S

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

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

Matrix: Non-Potable Water **Type:** Grab

Date: 6/17/20 Time: 1015

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

2016282-08 WA-6S

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

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

Matrix: Non-Potable Water **Type:** Grab

Date: 6/17/20 Time: 0815

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

	Relinquished By	Date/Time	Received By	Date/Time
1		6/17/20 1130		6-17-20 1140
2				
3				6-17-20 1300

Sample Kit Prepared By: Date/Time 5/18/20

Sample Temp (°C): 5

Samples on Ice? Yes No NA

Approved By:

Entered By:

Printed: 5/14/2020 10:17:28AM

Report Template: w

M.J. Reider Associates, Inc.

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

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

Comments:

Collected By : (Full Name) Gregory Wacik

2016282-09 WA-6M

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

Matrix: Non-Potable Water Date: 6/17/20
Type: Grab Time: 0815

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

2016282-10 WA-6D

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

Matrix: Non-Potable Water Date: 6/17/20
Type: Grab Time: 0815

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

2016282-11 WA-7S

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

Matrix: Non-Potable Water Date: 6/17/20
Type: Grab 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

	Relinquished By	Date/Time	Received By	Date/Time
1		6/17/20 1130		6-17-20 1140
2				
3				6-17-20 1300

Received at Laboratory By

Sample Kit Prepared By:	Date/Time
	5/8/20
Sample Temp (°C):	5
Samples on Ice?	Yes No NA
Approved By:	BSW
Entered By:	

Printed: 5/14/2020 10:17:28AM

Report Template: w

M.J. Reider Associates, Inc.

2016282

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

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

Comments:

Collected By : (Full Name) Gregory Wacik

2016282-12 WA-7M

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

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

Matrix: Non-Potable Water Date: 6/17/20

Type: Grab Time: 0845

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

2016282-13 WA-7D

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

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

Matrix: Non-Potable Water Date: 6/17/20

Type: Grab Time: 0845

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

Relinquished By	6/17/20 1130 Date/Time	Received By	6-17-20 1140 Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	6-17-20 1300 Date/Time

Sample Kit Prepared By:	Date/Time
	6/18/20
Sample Temp (°C):	5
Samples on Ice?	Yes No NA
Approved By:	
Entered By:	

Printed: 5/14/2020 10:17:28AM

Report Template. v

MJRA Terms & Conditions

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

Sample Submission, Sample Acceptance & Sampling Containers

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

Turnaround Times (TAT)

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

Analytical Results, Sample Collection Integrity & Subcontracting

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

Payment Terms

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

Warranty & Litigation

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

Reviewed and Approved by:

Richard A Wheeler
Director of Field Services

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 CT (PH-0210), MD (261), NY(12094)

Certificate of Analysis

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

Laboratory No.: 2019017
Report: 07/16/20
Lab Contact: Richard A Wheeler

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

Project: 2020 - Walter Reservoir

Lab ID: 2019017-01 **Collected By:** Client **Sampled:** 07/08/20 09:20 **Received:** 07/08/20 13:30
Sample Desc: WA-1S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	07/13/20	G-11	TML
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO3/L		2	SM 2320 B	07/09/20	C-51f	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	07/09/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/08/20 14:35		SLM
Nitrate as N	0.32	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/08/20 14:57	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/08/20 14:57	U	JAF
Nitrate+Nitrite as N	<0.33	mg/l	0.125	1.10	CALCULATED	07/08/20 14:57		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.47	mg/l	0.47	0.50	EPA 351.2	07/10/20	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.05	SM 4500-P E	07/14/20	U	RCE
Solids, Total Dissolved	69	mg/l	4	5	SM 2540 C	07/09/20		TMH
Total Organic Carbon	7.6	mg/l	0.3	0.5	SM 5310 C	07/09/20		ALD
Solids, Total Suspended	5	mg/l	1	1	SM 2540 D	07/09/20		TMH

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	2	mpn/100ml	1	SM 9223 B/Quantitray	7/8/20 14:33	7/9/20 15:42		JMW
Total Coliform	1010	mpn/100ml	1	SM 9223 B/Quantitray	7/8/20 14:33	7/9/20 15:42		JMW

Lab ID: 2019017-02 **Collected By:** Client **Sampled:** 07/08/20 07:30 **Received:** 07/08/20 13:30
Sample Desc: WA-2S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	07/13/20	G-11	TML
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO3/L		2	SM 2320 B	07/09/20	C-51g	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	07/09/20	U	APR
Biochemical Oxygen Demand	2.3	mg/l	2.0	2.0	SM 5210 B	07/08/20 14:35		SLM
Nitrate as N	0.27	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/08/20 15:14	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/08/20 15:14	U	JAF
Nitrate+Nitrite as N	<0.28	mg/l	0.125	1.10	CALCULATED	07/08/20 15:14		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.47	mg/l	0.47	0.50	EPA 351.2	07/10/20	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.05	SM 4500-P E	07/14/20	U	RCE
Solids, Total Dissolved	55	mg/l	4	5	SM 2540 C	07/09/20		TMH
Total Organic Carbon	6.9	mg/l	0.3	0.5	SM 5310 C	07/09/20		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	07/09/20		TMH

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	2	mpn/100ml	1	SM 9223 B/Quantitray	7/8/20 14:33	7/9/20 15:42		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	7/8/20 14:33	7/9/20 15:42		JMW

Lab ID: 2019017-03 **Collected By:** Client **Sampled:** 07/08/20 07:30 **Received:** 07/08/20 13:30
Sample Desc: WA-2M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	07/13/20	G-11	TML
General Chemistry								
Alkalinity, Total to pH 4.5	6	mg CaCO3/L		2	SM 2320 B	07/09/20	C-51d	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	07/09/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/08/20 14:35		SLM
Nitrate as N	0.31	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/08/20 15:31	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/08/20 15:31	U	JAF
Nitrate+Nitrite as N	<0.32	mg/l	0.125	1.10	CALCULATED	07/08/20 15:31		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.47	mg/l	0.47	0.50	EPA 351.2	07/10/20	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.05	SM 4500-P E	07/13/20	U	RCE
Solids, Total Dissolved	44	mg/l	4	5	SM 2540 C	07/09/20		TMH
Total Organic Carbon	7.6	mg/l	0.3	0.5	SM 5310 C	07/09/20		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	07/09/20		TMH

Lab ID: 2019017-04 **Collected By:** Client **Sampled:** 07/08/20 07:30 **Received:** 07/08/20 13:30
Sample Desc: WA-2D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	07/13/20	G-11	TML
General Chemistry								
Alkalinity, Total to pH 4.5	9	mg CaCO3/L		2	SM 2320 B	07/09/20	C-51j	APR
Ammonia as N	0.09	mg/l	0.01	0.10	ASTM D6919-03	07/09/20	J	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/08/20 14:35		SLM
Nitrate as N	0.31	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/08/20 15:48	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/08/20 15:48	U	JAF
Nitrate+Nitrite as N	<0.32	mg/l	0.125	1.10	CALCULATED	07/08/20 15:48		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.47	mg/l	0.47	0.50	EPA 351.2	07/10/20	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.05	SM 4500-P E	07/13/20	U	RCE
Solids, Total Dissolved	38	mg/l	4	5	SM 2540 C	07/09/20		TMH
Total Organic Carbon	7.4	mg/l	0.3	0.5	SM 5310 C	07/09/20		ALD
Solids, Total Suspended	15	mg/l	1	1	SM 2540 D	07/09/20		TMH

Lab ID: 2019017-05 **Collected By:** Client **Sampled:** 07/08/20 10:35 **Received:** 07/08/20 13:30
Sample Desc: WA-3S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.07	mg/l		0.05	SM 4500-P F	07/10/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	9	mg CaCO3/L		2	SM 2320 B	07/09/20	C-51k	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	07/09/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/08/20 14:35		SLM
Nitrate as N	0.79	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/08/20 16:05	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/08/20 16:05	U	JAF
Nitrate+Nitrite as N	<0.80	mg/l	0.125	1.10	CALCULATED	07/08/20 16:05		JAF
Nitrogen, Total Kjeldahl (TKN)	0.52	mg/l	0.47	0.50	EPA 351.2	07/10/20		SNF
Phosphorus as P, Total	0.06	mg/l	0.01	0.05	SM 4500-P E	07/13/20		RCE
Solids, Total Dissolved	66	mg/l	4	5	SM 2540 C	07/09/20		TMH
Total Organic Carbon	5.2	mg/l	0.3	0.5	SM 5310 C	07/09/20		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	07/09/20		TMH

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	26	mpn/100ml	1	SM 9223 B/Quantitray	7/8/20 14:33	7/9/20 15:42		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	7/8/20 14:33	7/9/20 15:42		JMW

Lab ID: 2019017-06 **Collected By:** Client **Sampled:** 07/08/20 10:10 **Received:** 07/08/20 13:30
Sample Desc: WA-4S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	07/10/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	11	mg CaCO3/L		2	SM 2320 B	07/09/20	C-51a	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	07/09/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/08/20 14:35		SLM
Nitrate as N	0.36	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/08/20 16:21	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/08/20 16:21	U	JAF
Nitrate+Nitrite as N	<0.37	mg/l	0.125	1.10	CALCULATED	07/08/20 16:21		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.47	mg/l	0.47	0.50	EPA 351.2	07/10/20	U	SNF
Phosphorus as P, Total	0.04	mg/l	0.01	0.05	SM 4500-P E	07/13/20	J	RCE
Solids, Total Dissolved	68	mg/l	4	5	SM 2540 C	07/09/20		TMH
Total Organic Carbon	4.4	mg/l	0.3	0.5	SM 5310 C	07/09/20		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	07/09/20		TMH

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	52	mpn/100ml	1	SM 9223 B/Quantitray	7/8/20 14:33	7/9/20 15:42		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	7/8/20 14:33	7/9/20 15:42		JMW

Lab ID: 2019017-07 **Collected By:** Client **Sampled:** 07/08/20 09:40 **Received:** 07/08/20 13:30
Sample Desc: WA-5S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.09	mg/l		0.05	SM 4500-P F	07/10/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	5	mg CaCO3/L		2	SM 2320 B	07/09/20	C-51b	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	07/09/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/08/20 14:35		SLM
Nitrate as N	0.28	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/08/20 22:33	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/08/20 22:33	U	JAF
Nitrate+Nitrite as N	<0.29	mg/l	0.125	1.10	CALCULATED	07/08/20 22:33		JAF
Nitrogen, Total Kjeldahl (TKN)	0.89	mg/l	0.47	0.50	EPA 351.2	07/10/20		SNF
Phosphorus as P, Total	0.05	mg/l	0.01	0.05	SM 4500-P E	07/13/20	J	RCE
Solids, Total Dissolved	59	mg/l	4	5	SM 2540 C	07/09/20		TMH
Total Organic Carbon	4.0	mg/l	0.3	0.5	SM 5310 C	07/09/20		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	07/09/20		TMH

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	39	mpn/100ml	1	SM 9223 B/Quantitray	7/8/20 14:33	7/9/20 15:42		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	7/8/20 14:33	7/9/20 15:42		JMW

Lab ID: 2019017-08 **Collected By:** Client **Sampled:** 07/08/20 08:50 **Received:** 07/08/20 13:30
Sample Desc: WA-6S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	07/10/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO3/L		2	SM 2320 B	07/09/20	C-51e	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	07/09/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/08/20 14:35		SLM
Nitrate as N	0.27	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/08/20 22:50	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/08/20 22:50	U	JAF
Nitrate+Nitrite as N	<0.28	mg/l	0.125	1.10	CALCULATED	07/08/20 22:50		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.47	mg/l	0.47	0.50	EPA 351.2	07/10/20	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.05	SM 4500-P E	07/13/20	U	RCE
Solids, Total Dissolved	62	mg/l	4	5	SM 2540 C	07/09/20		TMH
Total Organic Carbon	6.8	mg/l	0.3	0.5	SM 5310 C	07/09/20		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	07/09/20		TMH

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	10	mpn/100ml	1	SM 9223 B/Quantitray	7/8/20 14:33	7/9/20 15:42		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	7/8/20 14:33	7/9/20 15:42		JMW

Lab ID: 2019017-09 **Collected By:** Client **Sampled:** 07/08/20 08:50 **Received:** 07/08/20 13:30
Sample Desc: WA-6M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	07/10/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	6	mg CaCO3/L		2	SM 2320 B	07/09/20	C-51c	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	07/09/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/08/20 14:35		SLM
Nitrate as N	0.30	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/08/20 23:06	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/08/20 23:06	U	JAF
Nitrate+Nitrite as N	<0.31	mg/l	0.125	1.10	CALCULATED	07/08/20 23:06		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.47	mg/l	0.47	0.50	EPA 351.2	07/10/20	U	SNF
Phosphorus as P, Total	0.03	mg/l	0.01	0.05	SM 4500-P E	07/13/20	J	RCE
Solids, Total Dissolved	53	mg/l	4	5	SM 2540 C	07/09/20		TMH
Total Organic Carbon	6.9	mg/l	0.3	0.5	SM 5310 C	07/09/20		ALD
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	07/09/20		TMH

Lab ID: 2019017-10 **Collected By:** Client **Sampled:** 07/08/20 08:50 **Received:** 07/08/20 13:30
Sample Desc: WA-6D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	07/10/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO3/L		2	SM 2320 B	07/09/20	C-51h	APR
Ammonia as N	0.02	mg/l	0.01	0.10	ASTM D6919-03	07/09/20	J	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/08/20 14:35		SLM
Nitrate as N	0.32	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/08/20 23:23	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/08/20 23:23	U	JAF
Nitrate+Nitrite as N	<0.33	mg/l	0.125	1.10	CALCULATED	07/08/20 23:23		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.47	mg/l	0.47	0.50	EPA 351.2	07/10/20	U	SNF
Phosphorus as P, Total	0.02	mg/l	0.01	0.05	SM 4500-P E	07/13/20	J	RCE
Solids, Total Dissolved	69	mg/l	4	5	SM 2540 C	07/09/20		TMH
Total Organic Carbon	7.0	mg/l	0.3	0.5	SM 5310 C	07/09/20		ALD
Solids, Total Suspended	41	mg/l	1	1	SM 2540 D	07/09/20		TMH

Lab ID: 2019017-11 **Collected By:** Client **Sampled:** 07/08/20 08:00 **Received:** 07/08/20 13:30
Sample Desc: WA-7S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	07/10/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO3/L		2	SM 2320 B	07/09/20	C-51f	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	07/09/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/08/20 14:35		SLM
Nitrate as N	0.28	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/08/20 23:40	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/08/20 23:40	U	JAF
Nitrate+Nitrite as N	<0.29	mg/l	0.125	1.10	CALCULATED	07/08/20 23:40		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.47	mg/l	0.47	0.50	EPA 351.2	07/10/20	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.05	SM 4500-P E	07/13/20	U	RCE
Solids, Total Dissolved	81	mg/l	4	5	SM 2540 C	07/09/20		TMH
Total Organic Carbon	6.8	mg/l	0.3	0.5	SM 5310 C	07/09/20		ALD
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	07/09/20		TMH

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	2	mpn/100ml	1	SM 9223 B/Quantitray	7/8/20 14:33	7/9/20 15:42		JMW
Total Coliform	1010	mpn/100ml	1	SM 9223 B/Quantitray	7/8/20 14:33	7/9/20 15:42		JMW

Lab ID: 2019017-12 **Collected By:** Client **Sampled:** 07/08/20 08:00 **Received:** 07/08/20 13:30
Sample Desc: WA-7M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	07/10/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO3/L		2	SM 2320 B	07/09/20	C-51i	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	07/09/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/08/20 14:35		SLM
Nitrate as N	0.33	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/08/20 23:57	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/08/20 23:57	U	JAF
Nitrate+Nitrite as N	<0.34	mg/l	0.125	1.10	CALCULATED	07/08/20 23:57		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.47	mg/l	0.47	0.50	EPA 351.2	07/10/20	U	SNF
Phosphorus as P, Total	0.02	mg/l	0.01	0.05	SM 4500-P E	07/13/20	J	RCE
Solids, Total Dissolved	70	mg/l	4	5	SM 2540 C	07/09/20		TMH
Total Organic Carbon	7.4	mg/l	0.3	0.5	SM 5310 C	07/09/20		ALD
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	07/09/20		TMH

Lab ID: 2019017-13 **Collected By:** Client **Sampled:** 07/08/20 08:00 **Received:** 07/08/20 13:30
Sample Desc: WA-7D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	07/10/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	10	mg CaCO3/L		2	SM 2320 B	07/09/20	C-51	APR
Ammonia as N	0.10	mg/l	0.01	0.10	ASTM D6919-03	07/09/20		APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/08/20 14:35		SLM
Nitrate as N	0.33	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/09/20 0:14	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/09/20 0:14	U	JAF
Nitrate+Nitrite as N	<0.34	mg/l	0.125	1.10	CALCULATED	07/09/20 0:14		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.47	mg/l	0.47	0.50	EPA 351.2	07/10/20	U	SNF
Phosphorus as P, Total	0.03	mg/l	0.01	0.05	SM 4500-P E	07/13/20	J	RCE
Solids, Total Dissolved	69	mg/l	4	5	SM 2540 C	07/09/20		TMH
Total Organic Carbon	6.8	mg/l	0.3	0.5	SM 5310 C	07/09/20		ALD
Solids, Total Suspended	8	mg/l	1	1	SM 2540 D	07/09/20		TMH

Preparation Methods

Specific Method	Preparation Method	Prep Batch	Prepared Date	Prepared By
2019017-01				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0G0562	07/09/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0G0774	07/14/2020	SNF
2019017-02				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0G0562	07/09/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0G0774	07/14/2020	SNF
2019017-03				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0G0562	07/09/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0G0719	07/13/2020	RCE
2019017-04				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0G0562	07/09/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0G0719	07/13/2020	RCE
2019017-05				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0G0464	07/08/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0G0719	07/13/2020	RCE
2019017-06				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0G0464	07/08/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0G0719	07/13/2020	RCE
2019017-07				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0G0464	07/08/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0G0719	07/13/2020	RCE
2019017-08				
Dissolved General Chemistry				

SM 4500-P F	SM 4500-P B	B0G0464	07/08/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0G0719	07/13/2020	RCE
2019017-09				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0G0464	07/08/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0G0719	07/13/2020	RCE
2019017-10				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0G0464	07/08/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0G0719	07/13/2020	RCE
2019017-11				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0G0464	07/08/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0G0719	07/13/2020	RCE
2019017-12				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0G0464	07/08/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0G0719	07/13/2020	RCE
2019017-13				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0G0464	07/08/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0G0719	07/13/2020	RCE

Notes and Definitions

C-51	The alkalinity to pH 4.2 = 10.4 mg CaCO3/L.
C-51a	The alkalinity to pH 4.2 = 10.8 mg CaCO3/L.
C-51b	The alkalinity to pH 4.2 = 5.0 mg CaCO3/L.
C-51c	The alkalinity to pH 4.2 = 5.7 mg CaCO3/L.
C-51d	The alkalinity to pH 4.2 = 6.0 mg CaCO3/L.
C-51e	The alkalinity to pH 4.2 = 6.6 mg CaCO3/L.
C-51f	The alkalinity to pH 4.2 = 6.8 mg CaCO3/L.
C-51g	The alkalinity to pH 4.2 = 6.9 mg CaCO3/L.
C-51h	The alkalinity to pH 4.2 = 7.0 mg CaCO3/L.
C-51i	The alkalinity to pH 4.2 = 7.5 mg CaCO3/L.
C-51j	The alkalinity to pH 4.2 = 8.6 mg CaCO3/L.
C-51k	The alkalinity to pH 4.2 = 9.3 mg CaCO3/L.
G-11	The sample was filtered after it was received at the laboratory.
J	Estimated value
U	Analyte was not detected above the indicated value.

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

WORK ORDER
Chain of Custody

2019017

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

Comments:

Collected By : (Full Name) Gregory Wacik

2019017-01 WA-1S

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

Matrix: Non-Potable Water Date: 7/8/20
Type: Grab Time: 0920

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

2019017-02 WA-2S

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

Matrix: Non-Potable Water Date: 7/8/20
Type: Grab Time: 0730

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	7/8/20 1215 Date/Time	Received By	7-8-20 1215 Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	7-8-20 1330 Date/Time

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

Printed: 6/5/2020 8:29:14AM

Report Template: wk[illegible]

M.J. Reider Associates, Inc.

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

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

Comments:

Collected By : (Full Name) Gregory Wacik

2019017-03 WA-2M

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

Matrix: Non-Potable Water Date: 7/8/20
Type: Grab Time: 0730

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

2019017-04 WA-2D

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

Matrix: Non-Potable Water Date: 7/8/20
Type: Grab Time: 0730

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

2019017-05 WA-3S

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

Matrix: Non-Potable Water Date: 7/8/20
Type: Grab Time: 1035

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 7/8/20 1215	Received By	Date/Time 7-8-20 1215
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	Date/Time 7-8-20 1330

Sample Kit Prepared By: JSV	Date/Time 6/10/20
Sample Temp (°C):	6°
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: 6/5/2020 8:29:14AM

Report Template: wko WorkOrder COC ts

M.J. Reider Associates, Inc.

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

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

Comments:

Collected By : (Full Name) Gregory Wadk

2019017-06 WA-4S

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

Matrix: Non-Potable Water Date: 7/8/20
Type: Grab Time: 1010

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

2019017-07 WA-5S

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

Matrix: Non-Potable Water Date: 7/8/20
Type: Grab Time: 0940

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

2019017-08 WA-6S

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

Matrix: Non-Potable Water Date: 7/8/20
Type: Grab Time: 0850

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 7/8/20 1216	Received By	Date/Time 7-8-20 1215
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	Date/Time 7-8-20 1330

Sample Kit Prepared By:	Date/Time
VL TH JJV	6/19/20
Sample Temp (°C):	6°
Samples on Ice?	Yes No NA
Approved By:	
Entered By:	

Printed: 6/5/2020 8:29:14AM

Report Template: wko WorkOrder COC 15

M.J. Reider Associates, Inc.

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

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

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

2019017-09 WA-6M

Matrix: Non-Potable Water Date: 7/8/20
Type: Grab Time: 0850

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

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

2019017-10 WA-6D

Matrix: Non-Potable Water Date: 7/8/20
Type: Grab Time: 0850

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

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

2019017-11 WA-7S

Matrix: Non-Potable Water Date: 7/8/20
Type: Grab Time: 0800

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

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

Relinquished By	Date/Time	Received By	Date/Time
[signature]	7/8/20 1215	[signature]	7-8-20 1215
		[signature]	7-8-20 1330

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

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.

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Report Template: wko WorkOrder COC is

M.J. Reider Associates, Inc.

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

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

Comments:

Collected By : Gregory Wadik
(Full Name)

2019017-12 WA-7M

Matrix: Non-Potable Water Date: 7/8/20
Type: Grab Time: 0800

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

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

2019017-13 WA-7D

Matrix: Non-Potable Water Date: 7/8/20
Type: Grab Time: 0800

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

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

Relinquished By	Date/Time	Received By	Date/Time
	7/8/20 1115		7-8-20 1215
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	Date/Time
			7-8-20 1330

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

Printed: 6/5/2020 8:29:14AM

Report Template: ~~Web WorkOrder COC~~ is

MJRA Terms & Conditions

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

Sample Submission, Sample Acceptance & Sampling Containers

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

Turnaround Times (TAT)

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

Analytical Results, Sample Collection Integrity & Subcontracting

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

Payment Terms

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

Warranty & Litigation

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

Reviewed and Approved by:

Richard A Wheeler
Director of Field Services

NELAP accredited by PA. (PADEP #06-00003) Visit our website to view our current
NELAC accreditations for various drinking water, wastewater and solid & chemical materials analytes.
Additional accreditations by CT (PH-0210), MD (261), NY(12094)

Certificate of Analysis

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

Laboratory No.: 2021820
Report: 08/20/20
Lab Contact: Richard A Wheeler

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

Project: 2020 - Walter Reservoir

Lab ID: 2021820-01 **Collected By:** Client **Sampled:** 08/12/20 09:50 **Received:** 08/12/20 14:35
Sample Desc: WA-1S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	08/14/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO3/L		2	SM 2320 B	08/18/20	C-51h	APR
Ammonia as N	0.07	mg/l	0.01	0.10	ASTM D6919-03	08/13/20	J	APR
Biochemical Oxygen Demand	3.0	mg/l	2.0	2.0	SM 5210 B	08/12/20 15:50		SLM
Nitrate as N	0.30	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	08/12/20 15:49	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/12/20 15:49	U	TML
Nitrate+Nitrite as N	<0.31	mg/l	0.125	1.10	CALCULATED	08/12/20 15:49		TML
Nitrogen, Total Kjeldahl (TKN)	0.94	mg/l	0.47	0.50	EPA 351.2	08/14/20		SNF
Phosphorus as P, Total	0.08	mg/l	0.01	0.05	SM 4500-P E	08/14/20		RCE
Solids, Total Dissolved	36	mg/l	4	5	SM 2540 C	08/13/20		TMH
Total Organic Carbon	12.6	mg/l	1.7	2.5	SM 5310 C	08/14/20		ALD
Solids, Total Suspended	10	mg/l	1	1	SM 2540 D	08/13/20		TMH

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	34	mpn/100ml	1	SM 9223 B/Quantitray	8/12/20 15:13	8/13/20 10:13		JMW
Total Coliform	1730	mpn/100ml	1	SM 9223 B/Quantitray	8/12/20 15:13	8/13/20 10:13		JMW

M.J. Reider Associates, Inc.

Lab ID: 2021820-02 **Collected By:** Client **Sampled:** 08/12/20 07:50 **Received:** 08/12/20 14:35
Sample Desc: WA-2S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	08/14/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO3/L		2	SM 2320 B	08/18/20	C-51e	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	08/13/20	U	APR
Biochemical Oxygen Demand	2.3	mg/l	2.0	2.0	SM 5210 B	08/12/20 15:50		SLM
Nitrate as N	0.27	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	08/12/20 16:39	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/12/20 16:39	U	TML
Nitrate+Nitrite as N	<0.28	mg/l	0.125	1.10	CALCULATED	08/12/20 16:39		TML
Nitrogen, Total Kjeldahl (TKN)	0.60	mg/l	0.47	0.50	EPA 351.2	08/14/20		SNF
Phosphorus as P, Total	0.05	mg/l	0.01	0.05	SM 4500-P E	08/14/20	J	RCE
Solids, Total Dissolved	45	mg/l	4	5	SM 2540 C	08/13/20		TMH
Total Organic Carbon	6.5	mg/l	0.3	0.5	SM 5310 C	08/13/20		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	08/13/20		TMH

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	2	mpn/100ml	1	SM 9223 B/Quantitray	8/12/20 15:13	8/13/20 10:13		JMW
Total Coliform	276	mpn/100ml	1	SM 9223 B/Quantitray	8/12/20 15:13	8/13/20 10:13		JMW

Lab ID: 2021820-03 **Collected By:** Client **Sampled:** 08/12/20 07:50 **Received:** 08/12/20 14:35
Sample Desc: WA-2M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	08/14/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO3/L		2	SM 2320 B	08/18/20	C-51i	APR
Ammonia as N	0.03	mg/l	0.01	0.10	ASTM D6919-03	08/13/20	J	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/12/20 16:50		SLM
Nitrate as N	0.30	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	08/12/20 16:56	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/12/20 16:56	U	TML
Nitrate+Nitrite as N	<0.31	mg/l	0.125	1.10	CALCULATED	08/12/20 16:56		TML
Nitrogen, Total Kjeldahl (TKN)	0.62	mg/l	0.47	0.50	EPA 351.2	08/14/20		SNF
Phosphorus as P, Total	0.02	mg/l	0.01	0.05	SM 4500-P E	08/13/20	J	RCE
Solids, Total Dissolved	43	mg/l	4	5	SM 2540 C	08/13/20		TMH
Total Organic Carbon	8.5	mg/l	0.3	0.5	SM 5310 C	08/13/20		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	08/13/20		TMH

Lab ID: 2021820-04 **Collected By:** Client **Sampled:** 08/12/20 07:50 **Received:** 08/12/20 14:35
Sample Desc: WA-2D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	08/14/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	9	mg CaCO3/L		2	SM 2320 B	08/18/20	C-51i	APR
Ammonia as N	0.09	mg/l	0.01	0.10	ASTM D6919-03	08/13/20	J	APR
Biochemical Oxygen Demand	2.2	mg/l	2.0	2.0	SM 5210 B	08/12/20 16:50		SLM
Nitrate as N	0.31	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	08/12/20 17:13	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/12/20 17:13	U	TML
Nitrate+Nitrite as N	<0.32	mg/l	0.125	1.10	CALCULATED	08/12/20 17:13		TML
Nitrogen, Total Kjeldahl (TKN)	0.77	mg/l	0.47	0.50	EPA 351.2	08/14/20		SNF
Phosphorus as P, Total	0.02	mg/l	0.01	0.05	SM 4500-P E	08/13/20	J	RCE
Solids, Total Dissolved	57	mg/l	4	5	SM 2540 C	08/13/20		TMH
Total Organic Carbon	14.3	mg/l	1.7	2.5	SM 5310 C	08/14/20		ALD
Solids, Total Suspended	13	mg/l	1	1	SM 2540 D	08/13/20		TMH

Lab ID: 2021820-05 **Collected By:** Client **Sampled:** 08/12/20 11:00 **Received:** 08/12/20 14:35
Sample Desc: WA-3S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.05	mg/l		0.05	SM 4500-P F	08/14/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO3/L		2	SM 2320 B	08/18/20	C-51b	APR
Ammonia as N	0.01	mg/l	0.01	0.10	ASTM D6919-03	08/13/20	J	APR
Biochemical Oxygen Demand	2.3	mg/l	2.0	2.0	SM 5210 B	08/12/20 16:50		SLM
Nitrate as N	0.40	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	08/12/20 17:30	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/12/20 17:30	U	TML
Nitrate+Nitrite as N	<0.41	mg/l	0.125	1.10	CALCULATED	08/12/20 17:30		TML
Nitrogen, Total Kjeldahl (TKN)	0.88	mg/l	0.47	0.50	EPA 351.2	08/14/20		SNF
Phosphorus as P, Total	0.06	mg/l	0.01	0.05	SM 4500-P E	08/13/20		RCE
Solids, Total Dissolved	58	mg/l	4	5	SM 2540 C	08/13/20		TMH
Total Organic Carbon	13.0	mg/l	1.7	2.5	SM 5310 C	08/14/20		ALD
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	08/13/20		TMH

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	150	mpn/100ml	1	SM 9223 B/Quantitray	8/12/20 15:13	8/13/20 10:13		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	8/12/20 15:13	8/13/20 10:13		JMW

Lab ID: 2021820-06 **Collected By:** Client **Sampled:** 08/12/20 10:30 **Received:** 08/12/20 14:35
Sample Desc: WA-4S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	08/14/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	10	mg CaCO3/L		2	SM 2320 B	08/18/20	C-51	APR
Ammonia as N	0.02	mg/l	0.01	0.10	ASTM D6919-03	08/13/20	J	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/12/20 16:50		SLM
Nitrate as N	0.34	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	08/12/20 17:46	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/12/20 17:46	U	TML
Nitrate+Nitrite as N	<0.35	mg/l	0.125	1.10	CALCULATED	08/12/20 17:46		TML
Nitrogen, Total Kjeldahl (TKN)	0.65	mg/l	0.47	0.50	EPA 351.2	08/14/20		SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.05	SM 4500-P E	08/13/20	U	RCE
Solids, Total Dissolved	68	mg/l	4	5	SM 2540 C	08/13/20		TMH
Total Organic Carbon	6.2	mg/l	0.3	0.5	SM 5310 C	08/13/20		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	08/13/20		TMH

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	73	mpn/100ml	1	SM 9223 B/Quantitray	8/12/20 15:13	8/13/20 10:13		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	8/12/20 15:13	8/13/20 10:13		JMW

Lab ID: 2021820-07 **Collected By:** Client **Sampled:** 08/12/20 10:10 **Received:** 08/12/20 14:35
Sample Desc: WA-5S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	08/14/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	5	mg CaCO3/L		2	SM 2320 B	08/18/20	C-51a	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	08/13/20	U	APR
Biochemical Oxygen Demand	2.2	mg/l	2.0	2.0	SM 5210 B	08/12/20 16:50		SLM
Nitrate as N	0.29	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	08/12/20 18:03	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/12/20 18:03	U	TML
Nitrate+Nitrite as N	<0.30	mg/l	0.125	1.10	CALCULATED	08/12/20 18:03		TML
Nitrogen, Total Kjeldahl (TKN)	0.65	mg/l	0.47	0.50	EPA 351.2	08/14/20		SNF
Phosphorus as P, Total	0.03	mg/l	0.01	0.05	SM 4500-P E	08/13/20	J	RCE
Solids, Total Dissolved	65	mg/l	4	5	SM 2540 C	08/13/20		TMH
Total Organic Carbon	5.4	mg/l	0.3	0.5	SM 5310 C	08/13/20		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	08/13/20		TMH

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	33	mpn/100ml	1	SM 9223 B/Quantitray	8/12/20 15:13	8/13/20 10:13		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	8/12/20 15:13	8/13/20 10:13		JMW

Lab ID: 2021820-08 **Collected By:** Client **Sampled:** 08/12/20 08:35 **Received:** 08/12/20 14:35
Sample Desc: WA-6S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	08/14/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO3/L		2	SM 2320 B	08/18/20	C-51c	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	08/13/20	U	APR
Biochemical Oxygen Demand	2.3	mg/l	2.0	2.0	SM 5210 B	08/12/20 16:50		SLM
Nitrate as N	0.28	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	08/12/20 18:20	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/12/20 18:20	U	TML
Nitrate+Nitrite as N	<0.29	mg/l	0.125	1.10	CALCULATED	08/12/20 18:20		TML
Nitrogen, Total Kjeldahl (TKN)	0.56	mg/l	0.47	0.50	EPA 351.2	08/14/20		SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.05	SM 4500-P E	08/13/20	U	RCE
Solids, Total Dissolved	23	mg/l	4	5	SM 2540 C	08/13/20		TMH
Total Organic Carbon	6.8	mg/l	0.3	0.5	SM 5310 C	08/13/20		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	08/13/20		TMH

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	2	mpn/100ml	1	SM 9223 B/Quantitray	8/12/20 15:13	8/13/20 10:13		JMW
Total Coliform	326	mpn/100ml	1	SM 9223 B/Quantitray	8/12/20 15:13	8/13/20 10:13		JMW

Lab ID: 2021820-09 **Collected By:** Client **Sampled:** 08/12/20 08:35 **Received:** 08/12/20 14:35
Sample Desc: WA-6M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	08/14/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO3/L		2	SM 2320 B	08/18/20	C-51d	APR
Ammonia as N	0.05	mg/l	0.01	0.10	ASTM D6919-03	08/13/20	J	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/12/20 16:50		SLM
Nitrate as N	0.30	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	08/12/20 18:54	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/12/20 18:54	U	TML
Nitrate+Nitrite as N	<0.31	mg/l	0.125	1.10	CALCULATED	08/12/20 18:54		TML
Nitrogen, Total Kjeldahl (TKN)	0.59	mg/l	0.47	0.50	EPA 351.2	08/14/20		SNF
Phosphorus as P, Total	0.02	mg/l	0.01	0.05	SM 4500-P E	08/13/20	J	RCE
Solids, Total Dissolved	48	mg/l	4	5	SM 2540 C	08/13/20		TMH
Total Organic Carbon	7.4	mg/l	0.3	0.5	SM 5310 C	08/13/20		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	08/13/20		TMH

Lab ID: 2021820-10 **Collected By:** Client **Sampled:** 08/12/20 08:35 **Received:** 08/12/20 14:35
Sample Desc: WA-6D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	08/14/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	9	mg CaCO3/L		2	SM 2320 B	08/18/20	C-51k	APR
Ammonia as N	0.09	mg/l	0.01	0.10	ASTM D6919-03	08/13/20	J	APR
Biochemical Oxygen Demand	7.5	mg/l	2.0	2.0	SM 5210 B	08/12/20 16:50		SLM
Nitrate as N	0.29	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	08/12/20 18:37	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/12/20 18:37	U	TML
Nitrate+Nitrite as N	<0.30	mg/l	0.125	1.10	CALCULATED	08/12/20 18:37		TML
Nitrogen, Total Kjeldahl (TKN)	0.78	mg/l	0.47	0.50	EPA 351.2	08/14/20		SNF
Phosphorus as P, Total	0.02	mg/l	0.01	0.05	SM 4500-P E	08/13/20	J	RCE
Solids, Total Dissolved	60	mg/l	4	5	SM 2540 C	08/13/20		TMH
Total Organic Carbon	9.7	mg/l	0.3	0.5	SM 5310 C	08/13/20		ALD
Solids, Total Suspended	8	mg/l	1	1	SM 2540 D	08/13/20		TMH

Lab ID: 2021820-11 **Collected By:** Client **Sampled:** 08/12/20 09:00 **Received:** 08/12/20 14:35
Sample Desc: WA-7S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	08/14/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO3/L		2	SM 2320 B	08/18/20	C-51f	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	08/13/20	U	APR
Biochemical Oxygen Demand	2.6	mg/l	2.0	2.0	SM 5210 B	08/12/20 16:50		SLM
Nitrate as N	0.28	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	08/12/20 19:11	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/12/20 19:11	U	TML
Nitrate+Nitrite as N	<0.29	mg/l	0.125	1.10	CALCULATED	08/12/20 19:11		TML
Nitrogen, Total Kjeldahl (TKN)	0.59	mg/l	0.47	0.50	EPA 351.2	08/14/20		SNF
Phosphorus as P, Total	0.02	mg/l	0.01	0.05	SM 4500-P E	08/13/20	J	RCE
Solids, Total Dissolved	57	mg/l	4	5	SM 2540 C	08/13/20		TMH
Total Organic Carbon	7.3	mg/l	0.3	0.5	SM 5310 C	08/13/20		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	08/13/20		TMH

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	4	mpn/100ml	1	SM 9223 B/Quantitray	8/12/20 15:13	8/13/20 10:13		JMW
Total Coliform	411	mpn/100ml	1	SM 9223 B/Quantitray	8/12/20 15:13	8/13/20 10:13		JMW

Lab ID: 2021820-12 **Collected By:** Client **Sampled:** 08/12/20 09:00 **Received:** 08/12/20 14:35
Sample Desc: WA-7M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.06	mg/l		0.05	SM 4500-P F	08/17/20	G-11	TML
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO3/L		2	SM 2320 B	08/18/20	C-51g	APR
Ammonia as N	0.06	mg/l	0.01	0.10	ASTM D6919-03	08/13/20	J	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/12/20 16:50		SLM
Nitrate as N	0.28	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	08/12/20 21:42	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/12/20 21:42	U	TML
Nitrate+Nitrite as N	<0.29	mg/l	0.125	1.10	CALCULATED	08/12/20 21:42		TML
Nitrogen, Total Kjeldahl (TKN)	0.64	mg/l	0.47	0.50	EPA 351.2	08/14/20		SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.05	SM 4500-P E	08/13/20	U	RCE
Solids, Total Dissolved	58	mg/l	4	5	SM 2540 C	08/13/20		TMH
Total Organic Carbon	9.7	mg/l	0.3	0.5	SM 5310 C	08/13/20		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	08/13/20		TMH

Lab ID: 2021820-13 **Collected By:** Client **Sampled:** 08/12/20 09:00 **Received:** 08/12/20 14:35
Sample Desc: WA-7D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.05	mg/l		0.05	SM 4500-P F	08/17/20	G-11	TML
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO3/L		2	SM 2320 B	08/18/20	C-51j	APR
Ammonia as N	0.05	mg/l	0.01	0.10	ASTM D6919-03	08/13/20	J	APR
Biochemical Oxygen Demand	3.6	mg/l	2.0	2.0	SM 5210 B	08/12/20 16:50		SLM
Nitrate as N	0.30	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	08/12/20 21:59	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/12/20 21:59	U	TML
Nitrate+Nitrite as N	<0.31	mg/l	0.125	1.10	CALCULATED	08/12/20 21:59		TML
Nitrogen, Total Kjeldahl (TKN)	<2.35	mg/l	2.35	2.50	EPA 351.2	08/14/20	U	SNF
Phosphorus as P, Total	0.09	mg/l	0.01	0.05	SM 4500-P E	08/13/20		RCE
Solids, Total Dissolved	62	mg/l	4	5	SM 2540 C	08/13/20		TMH
Total Organic Carbon	12.0	mg/l	1.7	2.5	SM 5310 C	08/14/20		ALD
Solids, Total Suspended	258	mg/l	1	1	SM 2540 D	08/13/20		TMH

Preparation Methods

Specific Method	Preparation Method	Prep Batch	Prepared Date	Prepared By
2021820-01				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0H0643	08/13/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0H0833	08/14/2020	RCE
2021820-02				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0H0643	08/13/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0H0833	08/14/2020	RCE
2021820-03				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0H0643	08/13/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0H0740	08/13/2020	RCE
2021820-04				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0H0643	08/13/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0H0740	08/13/2020	RCE
2021820-05				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0H0643	08/13/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0H0740	08/13/2020	RCE
2021820-06				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0H0643	08/13/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0H0740	08/13/2020	RCE
2021820-07				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0H0643	08/13/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0H0740	08/13/2020	RCE
2021820-08				
Dissolved General Chemistry				

SM 4500-P F	SM 4500-P B	B0H0643	08/13/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0H0740	08/13/2020	RCE
2021820-09				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0H0643	08/13/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0H0740	08/13/2020	RCE
2021820-10				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0H0643	08/13/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0H0740	08/13/2020	RCE
2021820-11				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0H0643	08/13/2020	QMS
General Chemistry				
SM 4500-P E	SM 4500-P B	B0H0740	08/13/2020	RCE
2021820-12				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0H0834	08/14/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0H0740	08/13/2020	RCE
2021820-13				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0H0834	08/14/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0H0740	08/13/2020	RCE

Notes and Definitions

C-51	The alkalinity to pH 4.2 = 10.2 mg CaCO3/L.
C-51a	The alkalinity to pH 4.2 = 5.1 mg CaCO3/L.
C-51b	The alkalinity to pH 4.2 = 7.4 mg CaCO3/L.
C-51c	The alkalinity to pH 4.2 = 7.6 mg CaCO3/L.
C-51d	The alkalinity to pH 4.2 = 7.7 mg CaCO3/L.
C-51e	The alkalinity to pH 4.2 = 7.9 mg CaCO3/L.
C-51f	The alkalinity to pH 4.2 = 8.0 mg CaCO3/L.
C-51g	The alkalinity to pH 4.2 = 8.1 mg CaCO3/L.
C-51h	The alkalinity to pH 4.2 = 8.2 mg CaCO3/L.
C-51i	The alkalinity to pH 4.2 = 8.3 mg CaCO3/L.
C-51j	The alkalinity to pH 4.2 = 8.5 mg CaCO3/L.
C-51k	The alkalinity to pH 4.2 = 8.6 mg CaCO3/L.
C-51l	The alkalinity to pH 4.2 = 8.8 mg CaCO3/L.
G-11	The sample was filtered after it was received at the laboratory.
J	Estimated value
U	Analyte was not detected above the indicated value.

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

WORK ORDER
Chain of Custody

2021820

Client Code: 3157 **Client:** Tetra Tech
Project Manager: Richard A Wheeler **Project:** 2020 - Walter 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:

2021820-01 WA-1S

Matrix: Non-Potable Water Date: 8/12/20
Type: Grab Time: 0950

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

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

2021820-02 WA-2S

Matrix: Non-Potable Water Date: 8/12/20
Type: Grab Time: 0750

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

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

Relinquished By	Date/Time 8/12/20 1230	Received By	Date/Time 8/12/20 1240
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	Date/Time 8/12/20 1435

Sample Kit Prepared By:	Date/Time 6.30
Sample Temp (°C):	5
Samples on Ice?	Yes No NA
Approved By:	
Entered By:	

Printed: 6/29/2020 9:06:19AM

Report Template: WKO WorkOrder COC 15

M.J. Reider Associates, Inc.

2021820

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

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

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

2021820-03 WA-2M

Matrix: Non-Potable Water Date: 8/12/20
Type: Grab Time: 0750

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

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

2021820-04 WA-2D

Matrix: Non-Potable Water Date: 8/12/20
Type: Grab Time: 0750

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

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

2021820-05 WA-3S

Matrix: Non-Potable Water Date: 8/12/20
Type: Grab Time: 1100

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

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	8/12/20 1250	Received By	8-12-20 1740
Relinquished By		Received By	
Relinquished By		Received at Laboratory By	8-12-20 1435

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	3
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.

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Report Template: ~~WR~~ WorkOrder_COC_ls

M.J. Reider Associates, Inc.

2021820

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

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

Comments:

Collected By : (Full Name) Gregory Wacik

2021820-06 WA-4S

Matrix: Non-Potable Water Date: 8/12/20
Type: Grab Time: 1030

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

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

2021820-07 WA-5S

Matrix: Non-Potable Water Date: 8/12/20
Type: Grab Time: 1010

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

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

2021820-08 WA-6S

Matrix: Non-Potable Water Date: 8/12/20
Type: Grab Time: 0835

BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, TC (#) SM 9223B, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F
NH3-N D6919-03, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, Alk SM 2320B, PO4 SM 4500P-E, 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 8/12/20 1230	Received By	Date/Time 8.12.20 1240
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	Date/Time 8.12.20 1435

Sample Kit Prepared By:	Date/Time
Sample Temp (°C): 3	
Samples on Ice? Yes No NA	
Approved By:	
Entered By:	

Printed: 6/29/2020 9:06:19AM

Report Template: WRD WorkOrder COC 18

M.J. Reider Associates, Inc.

2021820

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

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

Comments:

Collected By : (Full Name) Gregory Wacik

2021820-09 WA-6M

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

Matrix: Non-Potable Water Date: 8/12/20
Type: Grab Time: 0835

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

2021820-10 WA-6D

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

Matrix: Non-Potable Water Date: 8/12/20
Type: Grab Time: 0835

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

2021820-11 WA-7S

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

Matrix: Non-Potable Water Date: 8/12/20
Type: Grab 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

	Date/Time		Date/Time
Relinquished By	8/12/20 1230	Received By	8.12.20 1240
Relinquished By		Received By	
Relinquished By		Received at Laboratory By	8.12.20 1435

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

Report Template:

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

Printed: 6/29/2020 9:06:19AM

M.J. Reider Associates, Inc.

2021820

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

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

Comments:

Collected By : (Full Name) Gregory Wacik

2021820-12 WA-7M

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

Matrix: Non-Potable Water Date: 8/12/20
Type: Grab Time: 0900

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

2021820-13 WA-7D

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

Matrix: Non-Potable Water Date: 8/12/20
Type: Grab Time: 0900

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

Relinquished By	Date/Time 8/12/20 1230	Received By	Date/Time 8.12.20 1290
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	Date/Time 8/12/20 1935

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

Printed: 6/29/2020 9:06:19AM

Report Template: MJRA WorkOrder COC 18

MJRA Terms & Conditions

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

Sample Submission, Sample Acceptance & Sampling Containers

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

Turnaround Times (TAT)

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

Analytical Results, Sample Collection Integrity & Subcontracting

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

Payment Terms

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

Warranty & Litigation

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

Reviewed and Approved by:

Richard A Wheeler
Director of Field Services

NELAP accredited by PA. (PADEP #06-00003) Visit our website to view our current
NELAC accreditations for various drinking water, wastewater and solid & chemical materials analytes.
Additional accreditations by CT (PH-0210), MD (261), NY(12094)

Certificate of Analysis

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

Laboratory No.: 2026762
Report: 09/11/20
Lab Contact: Richard A Wheeler

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

Project: 2020 - Walter Reservoir

Lab ID: 2026762-01 **Collected By:** Client **Sampled:** 09/02/20 09:15 **Received:** 09/02/20 13:30
Sample Desc: WA-1S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	09/08/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	9	mg CaCO3/L		2	SM 2320 B	09/09/20	C-51h	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	09/03/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	09/02/20 15:50		RCE
Nitrate as N	0.34	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	09/02/20 14:25	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/02/20 14:25	U	TML
Nitrate+Nitrite as N	<0.35	mg/l	0.125	1.10	CALCULATED	09/02/20 14:25		TML
Nitrogen, Total Kjeldahl (TKN)	<0.47	mg/l	0.47	0.50	EPA 351.2	09/10/20	U	SNF
Phosphorus as P, Total	0.02	mg/l	0.01	0.05	SM 4500-P E	09/04/20	J	RCE
Solids, Total Dissolved	73	mg/l	4	5	SM 2540 C	09/03/20		TMH
Total Organic Carbon	6.8	mg/l	0.3	0.5	SM 5310 C	09/09/20		ALD
Solids, Total Suspended	13	mg/l	1	1	SM 2540 D	09/03/20		TMH

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	28	mpn/100ml	1	SM 9223 B/Quantitray	9/2/20 14:56	9/3/20 9:41		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	9/2/20 14:56	9/3/20 9:41		JMW

Lab ID: 2026762-02 **Collected By:** Client **Sampled:** 09/02/20 07:45 **Received:** 09/02/20 13:30
Sample Desc: WA-2S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	09/08/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO3/L		2	SM 2320 B	09/09/20	C-51c	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	09/03/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	09/02/20 15:50		RCE
Nitrate as N	0.30	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	09/02/20 14:41	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/02/20 14:41	U	TML
Nitrate+Nitrite as N	<0.31	mg/l	0.125	1.10	CALCULATED	09/02/20 14:41		TML
Nitrogen, Total Kjeldahl (TKN)	0.61	mg/l	0.47	0.50	EPA 351.2	09/10/20		SNF
Phosphorus as P, Total	0.01	mg/l	0.01	0.05	SM 4500-P E	09/04/20	J	RCE
Solids, Total Dissolved	73	mg/l	4	5	SM 2540 C	09/03/20		TMH
Total Organic Carbon	6.9	mg/l	0.3	0.5	SM 5310 C	09/09/20		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	09/03/20		TMH

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	<1	mpn/100ml	1	SM 9223 B/Quantitray	9/2/20 14:56	9/3/20 9:41		JMW
Total Coliform	921	mpn/100ml	1	SM 9223 B/Quantitray	9/2/20 14:56	9/3/20 9:41		JMW

Lab ID: 2026762-03 **Collected By:** Client **Sampled:** 09/02/20 07:45 **Received:** 09/02/20 13:30
Sample Desc: WA-2M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	09/08/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	9	mg CaCO3/L		2	SM 2320 B	09/09/20	C-51f	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	09/03/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	09/02/20 15:50		RCE
Nitrate as N	0.32	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	09/02/20 15:34	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/02/20 15:34	U	TML
Nitrate+Nitrite as N	<0.33	mg/l	0.125	1.10	CALCULATED	09/02/20 15:34		TML
Nitrogen, Total Kjeldahl (TKN)	<0.47	mg/l	0.47	0.50	EPA 351.2	09/10/20	U	SNF
Phosphorus as P, Total	0.01	mg/l	0.01	0.05	SM 4500-P E	09/03/20	J	RCE
Solids, Total Dissolved	75	mg/l	4	5	SM 2540 C	09/03/20		TMH
Total Organic Carbon	6.7	mg/l	0.3	0.5	SM 5310 C	09/09/20		ALD
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	09/03/20		TMH

Lab ID: 2026762-04 **Collected By:** Client **Sampled:** 09/02/20 07:45 **Received:** 09/02/20 13:30
Sample Desc: WA-2D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	09/04/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	9	mg CaCO3/L		2	SM 2320 B	09/09/20	C-51i	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	09/03/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	09/02/20 15:50		RCE
Nitrate as N	0.34	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	09/02/20 15:51	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/02/20 15:51	U	TML
Nitrate+Nitrite as N	<0.35	mg/l	0.125	1.10	CALCULATED	09/02/20 15:51		TML
Nitrogen, Total Kjeldahl (TKN)	0.58	mg/l	0.47	0.50	EPA 351.2	09/09/20		SNF
Phosphorus as P, Total	0.02	mg/l	0.01	0.05	SM 4500-P E	09/03/20	J	RCE
Solids, Total Dissolved	75	mg/l	4	5	SM 2540 C	09/03/20		TMH
Total Organic Carbon	6.9	mg/l	0.3	0.5	SM 5310 C	09/09/20		ALD
Solids, Total Suspended	7	mg/l	1	1	SM 2540 D	09/03/20		TMH

Lab ID: 2026762-05 **Collected By:** Client **Sampled:** 09/02/20 09:40 **Received:** 09/02/20 13:30
Sample Desc: WA-3S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	09/04/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	9	mg CaCO3/L		2	SM 2320 B	09/09/20	C-51g	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	09/03/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	09/02/20 15:50		RCE
Nitrate as N	0.50	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	09/02/20 16:41	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/02/20 16:41	U	TML
Nitrate+Nitrite as N	<0.51	mg/l	0.125	1.10	CALCULATED	09/02/20 16:41		TML
Nitrogen, Total Kjeldahl (TKN)	0.53	mg/l	0.47	0.50	EPA 351.2	09/09/20		SNF
Phosphorus as P, Total	0.02	mg/l	0.01	0.05	SM 4500-P E	09/03/20	J	RCE
Solids, Total Dissolved	76	mg/l	4	5	SM 2540 C	09/03/20		TMH
Total Organic Carbon	7.5	mg/l	0.3	0.5	SM 5310 C	09/09/20		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	09/03/20		TMH

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	62	mpn/100ml	1	SM 9223 B/Quantitray	9/2/20 14:56	9/3/20 9:41		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	9/2/20 14:56	9/3/20 9:41		JMW

Lab ID: 2026762-06 **Collected By:** Client **Sampled:** 09/02/20 10:15 **Received:** 09/02/20 13:30
Sample Desc: WA-4S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	09/04/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	13	mg CaCO3/L		2	SM 2320 B	09/09/20	C-51	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	09/03/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	09/02/20 15:50		RCE
Nitrate as N	0.41	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	09/02/20 16:58	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/02/20 16:58	U	TML
Nitrate+Nitrite as N	<0.42	mg/l	0.125	1.10	CALCULATED	09/02/20 16:58		TML
Nitrogen, Total Kjeldahl (TKN)	0.52	mg/l	0.47	0.50	EPA 351.2	09/09/20		SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.05	SM 4500-P E	09/03/20	U	RCE
Solids, Total Dissolved	74	mg/l	4	5	SM 2540 C	09/03/20		TMH
Total Organic Carbon	4.4	mg/l	0.3	0.5	SM 5310 C	09/09/20		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	09/03/20		TMH

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	144	mpn/100ml	1	SM 9223 B/Quantitray	9/2/20 14:56	9/3/20 9:41		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	9/2/20 14:56	9/3/20 9:41		JMW

Lab ID: 2026762-07 **Collected By:** Client **Sampled:** 09/02/20 10:20 **Received:** 09/02/20 13:30
Sample Desc: WA-5S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	09/04/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	6	mg CaCO3/L		2	SM 2320 B	09/09/20	C-51a	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	09/03/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	09/02/20 16:50		RCE
Nitrate as N	0.30	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	09/02/20 17:15	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/02/20 17:15	U	TML
Nitrate+Nitrite as N	<0.31	mg/l	0.125	1.10	CALCULATED	09/02/20 17:15		TML
Nitrogen, Total Kjeldahl (TKN)	<0.47	mg/l	0.47	0.50	EPA 351.2	09/09/20	U	SNF
Phosphorus as P, Total	0.05	mg/l	0.01	0.05	SM 4500-P E	09/03/20	J	RCE
Solids, Total Dissolved	69	mg/l	4	5	SM 2540 C	09/03/20		TMH
Total Organic Carbon	3.7	mg/l	0.3	0.5	SM 5310 C	09/09/20		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	09/03/20		TMH

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	11	mpn/100ml	1	SM 9223 B/Quantitray	9/2/20 14:56	9/3/20 9:41		JMW
Total Coliform	2420	mpn/100ml	1	SM 9223 B/Quantitray	9/2/20 14:56	9/3/20 9:41		JMW

Lab ID: 2026762-08 **Collected By:** Client **Sampled:** 09/02/20 08:15 **Received:** 09/02/20 13:30
Sample Desc: WA-6S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	09/04/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO3/L		2	SM 2320 B	09/09/20	C-51d	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	09/03/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	09/02/20 15:50		RCE
Nitrate as N	0.29	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	09/02/20 17:32	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/02/20 17:32	U	TML
Nitrate+Nitrite as N	<0.30	mg/l	0.125	1.10	CALCULATED	09/02/20 17:32		TML
Nitrogen, Total Kjeldahl (TKN)	0.83	mg/l	0.47	0.50	EPA 351.2	09/09/20		SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.05	SM 4500-P E	09/03/20	U	RCE
Solids, Total Dissolved	66	mg/l	4	5	SM 2540 C	09/03/20		TMH
Total Organic Carbon	6.6	mg/l	0.3	0.5	SM 5310 C	09/09/20		ALD
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	09/03/20		TMH

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	1	mpn/100ml	1	SM 9223 B/Quantitray	9/2/20 14:56	9/3/20 9:41		JMW
Total Coliform	1050	mpn/100ml	1	SM 9223 B/Quantitray	9/2/20 14:56	9/3/20 9:41		JMW

Lab ID: 2026762-09 **Collected By:** Client **Sampled:** 09/02/20 08:15 **Received:** 09/02/20 13:30
Sample Desc: WA-6M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	09/04/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO3/L		2	SM 2320 B	09/09/20	C-51b	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	09/03/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	09/02/20 15:50		RCE
Nitrate as N	0.30	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	09/02/20 17:48	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/02/20 17:48	U	TML
Nitrate+Nitrite as N	<0.31	mg/l	0.125	1.10	CALCULATED	09/02/20 17:48		TML
Nitrogen, Total Kjeldahl (TKN)	<0.47	mg/l	0.47	0.50	EPA 351.2	09/09/20	U	SNF
Phosphorus as P, Total	0.01	mg/l	0.01	0.05	SM 4500-P E	09/03/20	J	RCE
Solids, Total Dissolved	74	mg/l	4	5	SM 2540 C	09/03/20		TMH
Total Organic Carbon	6.6	mg/l	0.3	0.5	SM 5310 C	09/09/20		ALD
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	09/03/20		TMH

Lab ID: 2026762-10 **Collected By:** Client **Sampled:** 09/02/20 08:15 **Received:** 09/02/20 13:30
Sample Desc: WA-6D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	09/04/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO3/L		2	SM 2320 B	09/09/20	C-51e	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	09/03/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	09/02/20 15:50		RCE
Nitrate as N	0.32	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	09/02/20 18:05	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/02/20 18:05	U	TML
Nitrate+Nitrite as N	<0.33	mg/l	0.125	1.10	CALCULATED	09/02/20 18:05		TML
Nitrogen, Total Kjeldahl (TKN)	0.49	mg/l	0.47	0.50	EPA 351.2	09/09/20	J	SNF
Phosphorus as P, Total	0.01	mg/l	0.01	0.05	SM 4500-P E	09/03/20	J	RCE
Solids, Total Dissolved	71	mg/l	4	5	SM 2540 C	09/03/20		TMH
Total Organic Carbon	6.4	mg/l	0.3	0.5	SM 5310 C	09/09/20		ALD
Solids, Total Suspended	5	mg/l	1	1	SM 2540 D	09/03/20		TMH

Lab ID: 2026762-11 **Collected By:** Client **Sampled:** 09/02/20 08:40 **Received:** 09/02/20 13:30
Sample Desc: WA-7S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	09/04/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO3/L		2	SM 2320 B	09/09/20	C-51c	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	09/03/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	09/02/20 15:50		RCE
Nitrate as N	0.30	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	09/02/20 18:22	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/02/20 18:22	U	TML
Nitrate+Nitrite as N	<0.31	mg/l	0.125	1.10	CALCULATED	09/02/20 18:22		TML
Nitrogen, Total Kjeldahl (TKN)	0.51	mg/l	0.47	0.50	EPA 351.2	09/09/20		SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.05	SM 4500-P E	09/03/20	U	RCE
Solids, Total Dissolved	53	mg/l	4	5	SM 2540 C	09/03/20		TMH
Total Organic Carbon	6.7	mg/l	0.3	0.5	SM 5310 C	09/09/20		ALD
Solids, Total Suspended	4	mg/l	1	1	SM 2540 D	09/03/20		TMH

	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	<1	mpn/100ml	1	SM 9223 B/Quantitray	9/2/20 14:56	9/3/20 9:41		JMW
Total Coliform	>2420	mpn/100ml	1	SM 9223 B/Quantitray	9/2/20 14:56	9/3/20 9:41		JMW

Lab ID: 2026762-12 **Collected By:** Client **Sampled:** 09/02/20 08:40 **Received:** 09/02/20 13:30
Sample Desc: WA-7M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	09/04/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO3/L		2	SM 2320 B	09/09/20	C-51c	APR
Ammonia as N	0.03	mg/l	0.01	0.10	ASTM D6919-03	09/03/20	J	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	09/02/20 15:50		RCE
Nitrate as N	0.30	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	09/02/20 18:39	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/02/20 18:39	U	TML
Nitrate+Nitrite as N	<0.31	mg/l	0.125	1.10	CALCULATED	09/02/20 18:39		TML
Nitrogen, Total Kjeldahl (TKN)	0.47	mg/l	0.47	0.50	EPA 351.2	09/09/20	J	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.05	SM 4500-P E	09/03/20	U	RCE
Solids, Total Dissolved	54	mg/l	4	5	SM 2540 C	09/03/20		TMH
Total Organic Carbon	6.8	mg/l	0.3	0.5	SM 5310 C	09/09/20		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	09/03/20		TMH

Lab ID: 2026762-13 **Collected By:** Client **Sampled:** 09/02/20 08:40 **Received:** 09/02/20 13:30
Sample Desc: WA-7D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.05	mg/l		0.05	SM 4500-P F	09/04/20	G-11	SNF
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO3/L		2	SM 2320 B	09/09/20	C-51e	APR
Ammonia as N	<0.01	mg/l	0.01	0.10	ASTM D6919-03	09/03/20	U	APR
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	09/02/20 15:50		RCE
Nitrate as N	0.30	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	09/02/20 19:46	J	TML
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/02/20 19:46	U	TML
Nitrate+Nitrite as N	<0.31	mg/l	0.125	1.10	CALCULATED	09/02/20 19:46		TML
Nitrogen, Total Kjeldahl (TKN)	0.64	mg/l	0.47	0.50	EPA 351.2	09/09/20		SNF
Phosphorus as P, Total	0.02	mg/l	0.01	0.05	SM 4500-P E	09/03/20	J	RCE
Solids, Total Dissolved	69	mg/l	4	5	SM 2540 C	09/03/20		TMH
Total Organic Carbon	6.7	mg/l	0.3	0.5	SM 5310 C	09/09/20		ALD
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	09/03/20		TMH

Preparation Methods

Specific Method	Preparation Method	Prep Batch	Prepared Date	Prepared By
2026762-01				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0I0288	09/04/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0I0289	09/04/2020	RCE
2026762-02				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0I0288	09/04/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0I0289	09/04/2020	RCE
2026762-03				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0I0288	09/04/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0I0179	09/03/2020	RCE
2026762-04				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0I0182	09/02/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0I0179	09/03/2020	RCE
2026762-05				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0I0182	09/02/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0I0179	09/03/2020	RCE
2026762-06				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0I0182	09/02/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0I0179	09/03/2020	RCE
2026762-07				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0I0182	09/02/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0I0179	09/03/2020	RCE
2026762-08				
Dissolved General Chemistry				

SM 4500-P F	SM 4500-P B	B0I0182	09/02/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0I0179	09/03/2020	RCE
2026762-09				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0I0182	09/02/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0I0179	09/03/2020	RCE
2026762-10				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0I0182	09/02/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0I0179	09/03/2020	RCE
2026762-11				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0I0182	09/02/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0I0179	09/03/2020	RCE
2026762-12				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0I0182	09/02/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0I0179	09/03/2020	RCE
2026762-13				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B0I0182	09/02/2020	RCE
General Chemistry				
SM 4500-P E	SM 4500-P B	B0I0179	09/03/2020	RCE

Notes and Definitions

C-51	The alkalinity to pH 4.2 = 12.8 mg CaCO3/L.
C-51a	The alkalinity to pH 4.2 = 5.5 mg CaCO3/L.
C-51b	The alkalinity to pH 4.2 = 7.9 mg CaCO3/L.
C-51c	The alkalinity to pH 4.2 = 8.0 mg CaCO3/L.
C-51d	The alkalinity to pH 4.2 = 8.1 mg CaCO3/L.
C-51e	The alkalinity to pH 4.2 = 8.5 mg CaCO3/L.
C-51f	The alkalinity to pH 4.2 = 8.7 mg CaCO3/L.
C-51g	The alkalinity to pH 4.2 = 9.0 mg CaCO3/L.
C-51h	The alkalinity to pH 4.2 = 9.1 mg CaCO3/L.
C-51i	The alkalinity to pH 4.2 = 9.4 mg CaCO3/L.
G-11	The sample was filtered after it was received at the laboratory.
J	Estimated value
U	Analyte was not detected above the indicated value.

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

WORK ORDER
Chain of Custody

2026762

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

Comments:

Collected By : (Full Name) Gregory Wachs

2026762-01 WA-1S

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

Matrix: Non-Potable Water Date: 9/2/20
Type: Grab 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

2026762-02 WA-2S

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

Matrix: Non-Potable Water Date: 9/2/20
Type: Grab Time: 0745

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

Relinquished By	9/2/20 1145 Date/Time	Received By	9-2-20 1200 Date/Time
	Date/Time	Received By	Date/Time
	Date/Time	Received at Laboratory By	9-2-20 1330 Date/Time

Sample Kit Prepared By:	Date/Time 8-11-20
Sample Temp (°C):	8
Samples on Ice?	Yes No NA
Approved By:	
Entered By:	

he client's agent sign), agrees to MJRA's Terms and Conditions and ees including any additional associated fees incurred.

Printed: 8/6/2020 12:10:23

Report Template: wlab WorkOrder COC 8

M.J. Reider Associates, Inc.

2026762

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

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

Comments: WA2M one Amber bottle broke

Collected By : (Full Name) Gregory Wacik

2026762-03 WA-2M

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

one Amber bottle broke

Matrix: Non-Potable Water Date: 9/2/20
Type: Grab Time: 0745

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

2026762-04 WA-2D

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

Matrix: Non-Potable Water Date: 9/2/20
Type: Grab Time: 0745

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

2026762-05 WA-3S

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

Matrix: Non-Potable Water Date: 9/2/20
Type: Grab Time: 0940

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

Relinquished By	Date/Time 9/2/20 1145	Received By	Date/Time 9-2-20 1200
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	Date/Time 9-2-20 1330

Sample Kit Prepared By:	Date/Time 8-11-20
Sample Temp (°C):	8
Samples on Ice?	(Yes) No NA
Approved By:	
Entered By:	

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

Printed: 8/6/2020 12:10:23

Report Template: wko WorkOrder COC ls

M.J. Reider Associates, Inc.

2026762

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

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

Comments:

Collected By : (Full Name) Gregory Wacik

2026762-06 WA-4S

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

Matrix: Non-Potable Water Date: 9/2/20
Type: Grab Time: 1015

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

2026762-07 WA-5S

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

Matrix: Non-Potable Water Date: 9/2/20
Type: Grab Time: 1020

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

2026762-08 WA-6S

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

Matrix: Non-Potable Water Date: 9/2/20
Type: Grab Time: 0815

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

Relinquished By	Date/Time 9/2/20 1145	Received By	Date/Time 9-2-20 1200
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	Date/Time 9-2-20 1330

Sample Kit Prepared By:	Date/Time 8-11-20
Sample Temp (°C):	8
Samples on Ice?	Yes No NA
Approved By:	
Entered By:	

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

Printed: 8/6/2020 12:10:23

Report Template: wko WorkOrder COC ls

M.J. Reider Associates, Inc.

2026762

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

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

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

2026762-09 WA-6M

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

Matrix: Non-Potable Water Date: 9/2/20
Type: Grab Time: 0815

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

2026762-10 WA-6D

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

Matrix: Non-Potable Water Date: 9/2/20
Type: Grab Time: 0815

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

2026762-11 WA-7S

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

Matrix: Non-Potable Water Date: 9/2/20
Type: Grab Time: 0840

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

Relinquished By	9/2/20 1145 Date/Time	Received By	9-2-20 1200 Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	9-2-20 1330 Date/Time

Sample Kit Prepared By:	Date/Time
VL TA	8-11-20
Sample Temp (°C):	8
Samples on Ice?	Yes No NA
Approved By:	
Entered By:	1356

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

Printed: 8/6/2020 12:10:23

Report Template: Wet WetGrader COC is

M.J. Reider Associates, Inc.

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

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

Comments:

Collected By : (Full Name) Gregory Wacik

2026762-12 WA-7M

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

Matrix: Non-Potable Water Date: 9/2/20
Type: Grab Time: 0840

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

2026762-13 WA-7D

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

Matrix: Non-Potable Water Date: 9/2/20
Type: Grab Time: 0840

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

Relinquished By	Date/Time 9/2/20 1145	Received By	Date/Time 9-2-20 1200
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received at Laboratory By	Date/Time 9-2-20 1330

Sample Kit Prepared By:	Date/Time 8-14-20
Sample Temp (°C):	8
Samples on Ice?	Yes No NA
Approved By:	
Entered By:	

Report Template:

Printed: 8/6/2020 12:10:23

MJRA Terms & Conditions

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

Sample Submission, Sample Acceptance & Sampling Containers

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

Turnaround Times (TAT)

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

Analytical Results, Sample Collection Integrity & Subcontracting

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

Payment Terms

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

Warranty & Litigation

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

Reviewed and Approved by:

Richard A Wheeler
Director of Field Services

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 CT (PH-0210), MD (261), NY(12094)