

**2022 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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2022 Water Quality Monitoring
F.E. Walter Reservoir
White Haven, Pennsylvania

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Executive Summary

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

While water quality in the Philadelphia District's reservoirs is generally good overall, several water quality issues exist at each project and need to be closely monitored. The Francis E. Walter Reservoir watershed is predominantly a low nutrient, low pH, tannic acid system that directly affects the water quality of the lake. Recent and future commercial and residential development in the watershed may have long term implications on water quality in the basin and lake. Water quality within the lake and release waters are directly affected by changing operations historically and annually for recreation, flood risk management, and drought storage operations. The project does not have a selective withdrawal tower (bottom release only) that could be used to potentially mitigate water quality concerns in lake and downstream. As it relates to F.E. Walter Reservoir water quality conditions during the May through September 2022 sampling season, the following observations were made:

- Monthly water quality profile monitoring at all seven fixed stations was once a month from May through September 2022. The reservoir has shown weak stratification, that is directly affected by changing operations and meteorological conditions experienced throughout the sampling season. In 2022, tributary and release water temperatures exceeded the Pennsylvania state water quality criteria for maintenance of cold-water fisheries, at times, in late summer and early fall.
- Dissolved oxygen levels remained above the minimum Pennsylvania state water quality criteria for the epilimnion (surface waters) of stratified lakes. However, the deeper waters of the reservoir pool experienced low oxygen conditions in July and August. There are no state criteria established for deep water dissolved oxygen levels. It is believed that bottom water releases associated with the current operating plan helps reduce the severity and formation of low oxygen conditions (hypoxic) in the bottom waters of the reservoir pool. Release waters are re-aerated as they pass through the outlet system of the reservoir during releases downstream and subsequently dissolved oxygen levels remain well above Pennsylvania state surface water quality criteria in the Lehigh River throughout the year.
- The Lehigh River and many of its tributaries are naturally slightly acidic due to tannic acids and the types of geology found throughout the upper watershed (low alkalinity). Measures of pH in tributary, reservoir, and downstream waters were recorded below the minimum Pennsylvania state water quality criteria for pH of 6.0, at times, during the month of May.
- Nutrient samples collected in 2022 (including samples from reservoir, tailwater, and tributary sites), remained consistently within United States Environmental Protection Agency (USEPA) or Pennsylvania state water quality criteria or recommended levels during the May through September sampling season. As an oligotrophic/mesotrophic lake and being located within a relatively low nutrient producing watershed, this would be expected.
- In 2022, surface water bacteria samples were collected at all seven fixed stations in the watershed and reservoir as a monitoring tool. A single sample collected at the upstream tributary station WA-5S on 14 September did exceed the USEPA single sample criteria for freshwater recreational beaches. A bathing beach does not exist at F.E. Walter Reservoir and primary water contact recreation is not authorized within the lake.

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 risk management or recreational operations. 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

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

The Corps' water quality management authority is founded on the Federal Water Pollution Control Act of 1948 and its amendments. Several Corps policies support operating Corps projects in an environmentally responsible manner. These include Engineer Regulations, Engineer Manuals, and the Environmental Operating Principles. U.S. Army Corps of Engineers policy necessitates the development

and implementation of a holistic watershed monitoring plan designed to protect resources and execute an environmentally sound water quality management strategy for each project. The activities of the District's Water Quality Program are driven by the guidance and requirements set forth in ER 1110-2-8154, titled "Water Quality and Environmental Management for Corps Civil Works Projects". ER 1110-2-8154 states, "The Corps operates a water quality management program to ensure that all applicable state and federal water quality standards are met, water quality degradation of Corps resources is avoided or minimized, and project responsibilities are attained."

Foremost, F.E. Walter Reservoir provides flood management 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 of reservoir health to ensure user safety and protection of the environmental resources at the reservoir and downstream along the Lehigh River. Water quality monitoring results are compared to state and federal 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 2022.

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 evolve to address new areas of concern such as human health aspects of drinking water, assessments of potential sediment contaminants within the reservoir basin, a 2002 investigation of Iron and hydrogen sulfide release near the tail water of the dam, and water quality modeling studies in 2009 and 2013. The 2022 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 water quality standards and to monitor the overall health of the reservoir.

2.0 METHODS

2.1 PHYSICAL STRATIFICATION MONITORING

Monitoring was conducted at seven fixed stations located throughout the reservoir watershed (Fig. 2-1). Physical stratification monitoring of the water column of F.E. Walter Reservoir was conducted five times between May and September 2022 at all fixed sampling stations (Table 2-1). Physical stratification parameters included temperature, dissolved oxygen (DO), pH, ORP, Chlorophyll a, depth, turbidity, and conductivity. Surface water quality was monitored at stations downstream (release waters) of the reservoir (WA-1S) and at 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 near the reservoir operational control tower (WA-2) and the Bear Creek (WA-6) and Lehigh River (WA-7) arms of the lake 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 monitoring results were compared to water quality standards established by the United States Environmental Protection Agency (USEPA) and the Pennsylvania Department of Environmental Protection (PADEP). The standard for DO is a minimum concentration of 5 mg/L in the epilimnion of a stratified lake and an acceptable range of pH from 6 to 9. Temperature criteria are based on seasonal guidelines. All the water quality data collected during physical stratification monitoring is summarized in Appendix A.

2.2 WATER COLUMN CHEMISTRY MONITORING

Water column chemistry monitoring was conducted five times at F.E. Walter Reservoir between May and September 2022 (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, total phosphorus, soluble phosphorus, total dissolved solids, total suspended solids, biochemical oxygen demand, alkalinity, and total organic carbon. Table 2-2 summarizes the water quality parameters; laboratory method detection limits, laboratory required reporting limits, state water quality standards, and allowable maximum hold times for each.

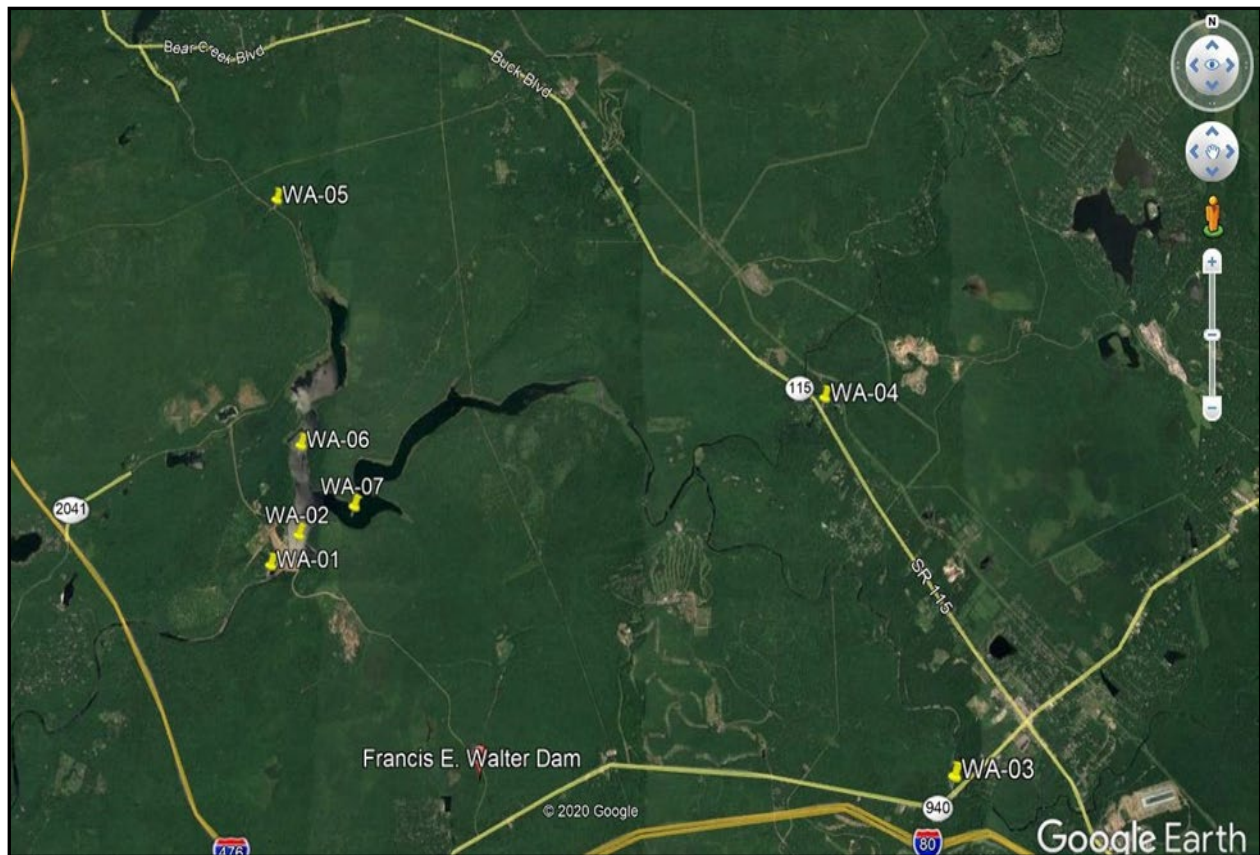


Figure 2-1. Seven fixed water quality sampling stations at the USACE Philadelphia District F.E. Walter Reservoir located in White Haven, Pennsylvania.

Table 2-1. F.E. Walter Reservoir water quality schedule for 2022 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
11 May	X	X	X	X	NS	NS	NS
15 June	X	X	X	X	NS	NS	NS
13 July	X	X	X	X	NS	NS	NS
17 August	X	X	X	X	NS	NS	NS
14 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 2021 based on historic sampling results showing low probability of sediment contamination. NS- Not Sampled							

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 2022

Parameter	(2) Method	Laboratory Limit of Reporting	PADEP Surface Water Quality Criteria	Allowable Hold Times (Days)
Total Alkalinity	SM 2320 B	2.0 mg/L	Min. 20 mg/L CaCO ₃	14
Biochemical Oxygen Demand	SM 5210 B	2.0 mg/L	None	2
Total Phosphorus	SM 4500-P F	0.01 mg/L	None	28
Diss./Ortho-Phosphate	NA	NA	None	28
Soluble Phosphorus	SM 4500-P F	0.01 mg/L	None	28
Total Organic Carbon	SM 5310 C	0.5 mg/L	None	28
Total Inorganic Carbon	NA	NA	None	28
Total Carbon (TOC + TIC) *	NA	NA	None	28
(1) Chlorophyll <i>a</i>	YSI Probe	----	None	In Situ
Total Kjeldahl Nitrogen	EPA 351.2 Rev 2.0	0.50 mg/L	None	28
Ammonia	EPA 350.1	0.02 mg/L	Temp. and pH dependent	28
Nitrate	EPA 300.0 Rev 2.1	1.00 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.

* Total Inorganic Carbon and Total Carbon were not sampled for in 2022

2.3 TROPHIC STATE DETERMINATION

The trophic state of F.E. Walter Reservoir was determined by methods outlined by Carlson (1977) and USEPA (1983). In general, these methods calculate trophic state indices (TSIs) independently for total phosphorus, chlorophyll *a*, 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 monthly 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 2022 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 coli* contamination as indicators of risk. Table 2-3 presents the test methods, detection limits, USEPA and PADEP standards, and sample holding times for the bacteria parameters monitored at F.E. Walter Reservoir in 2022. 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 USEPA 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, USEPA and PADEP standards, and sample holding times for bacteria parameters monitored at F.E. Walter Reservoir in 2022.

Parameter	Total Coliform	Escherichia Coliform
Test method	SM 9223 B	SM 9223 B
Limit of Quantification	1 mpn/100-ml	1 mpn/100-ml
USEPA/PADEP standard	None	Geometric mean <126 mpn/100 ml or a single sample reading of <235 mpn/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 and pH measured throughout the F.E. Walter Reservoir and watershed during 2022. 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 90 to 120 feet depending on 2022 reservoir operations (recreation and flood risk management storage) at the time of sampling. The stratification data collected during the 2022 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 in the tributary surface waters (Stations WA-3S, WA-4S, and WA-5S) in the F.E. Walter Reservoir watershed generally followed a similar seasonal pattern throughout the monitoring period. Monthly sampling showed tributary surface water temperatures rising from May into July and decreasing in August and September (Fig. 3-1). Reservoir downstream release (Station WA-1S) surface water temperatures showed release temperatures similar to tributary inflow temperatures with the exception of August and into September when release temperatures were greater than inflow temperatures. Deep cooler water storage in lake that is collected in early spring and held in preparation for the recreational season, provides for cooler water releases (recreational and fishery) during the early summer recreational season until these cooler waters are exhausted during mid to late summer. A maximum inflow temperature of 21.13 °C (WA-5S) was measured in July with a maximum outflow temperature of 23.01 °C (WA-1S) observed in August. Surface water temperatures of the reservoir-body (Stations WA-2S, WA-6S, and WA-7S) were generally warmer than in tributaries and downstream releases because of warming from the sun and residence time within the lake, and the release of deeper and cooler waters downstream (no surface water withdrawals). In-lake reservoir surface water temperatures peaked in August at approximately 24.60 °C (Station WA-2). In 2022, tributary and release water temperatures, at times, exceeded the Pennsylvania state water quality criteria for maintenance of cold-water fisheries.

The water column of F.E. Walter Reservoir was temperature stratified during the 2022 sampling season (Fig. 3-2). Due to seasonal operations in 2022, specifically the raising of the base pool level and subsequent recreational release and flood risk management operations, the temperature stratification within the reservoir was influenced by the release of deeper lake waters from the reservoir tower bottom flood control gates during the summer season. The reservoir tower was constructed with bottom flood control gates only and does not provide the flexibility to withdrawal water from other depths and locations in the water column apart from a small bypass control at elevation 1297 feet

NGVD. As a result, deeper and typically cooler bottom waters are released first, likely causing a disruption in typical seasonal lake stratification processes and the accelerated depletion of cooler bottom waters captured during spring storage. Overall, reservoir lake temperatures in 2022 showed stratification in May through July. Cooler deep-water temperatures (less than 20°C as a fishery temperature target downstream) were available for release downstream into mid-July of the summer recreational season which is typical for most years under the current operating plan.

3.1.2 Dissolved Oxygen

Dissolved oxygen (DO) is the measure of the amount of oxygen 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 2022, DO in the tributary surface waters (stations WA-3S, WA-4S, and WA-5S) of F.E. Walter Reservoir remained relatively constant and within acceptable freshwater concentrations from May through September with recorded values ranging from 8.40 mg/L to 10.89 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 8.09 mg/L to 11.30 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 stratified with respect to DO during most of the sampling season (Fig. 3-4). Unlike sampling in 2020 for example, the reservoir profile did not show the distinct formation of a metalimnetic dissolved oxygen minimum. 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 formation appears influenced by seasonal recreational and flood management operations and associated pool heights and bottom water release rates. 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 deeper portions of the reservoir pool experienced these conditions in July and August. The lowest DO concentration (2.57 mg/L) was recorded at the bottom of the reservoir during the 13 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 not experience hypoxic conditions in deeper reservoir waters during the 2022

sampling season. It is believed that bottom water releases associated with the current operating plan helps reduce the severity and formation of low oxygen in the bottom waters of the reservoir pool. 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 and the types of geology (low alkalinity) found throughout the upper watershed.

Measures of pH in tributary (WA-3S, WA-4S, and WA-5S) surface waters of F.E. Walter Reservoir generally followed a similar pattern during the 2022 sampling season and remained relatively constant or within a narrow range of slightly acidic values (5.76-7.04). The lowest pH value of 5.76 occurred at station WA-5S during the 11 May sampling with the highest pH reading of 7.04 being recorded at Station WA-3S in late 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 6.55 in September to a low of 5.98 in May (Fig. 3-5).

For the 2022 sampling season, measures of reservoir in-lake pH from the water surface to the lake bottom ranged in values from 5.90 to 6.95 (Fig. 3-6). May sampling showed the lowest pH values in the lower half of the water column. Slightly higher pH values were measured in the surface waters and bottom waters of the lake during all months sampled. Many factors can influence the pH of the reservoir waters 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 May. 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 2022. The following sections describe the temporal, spatial, and depth related patterns observed for these water quality measures.

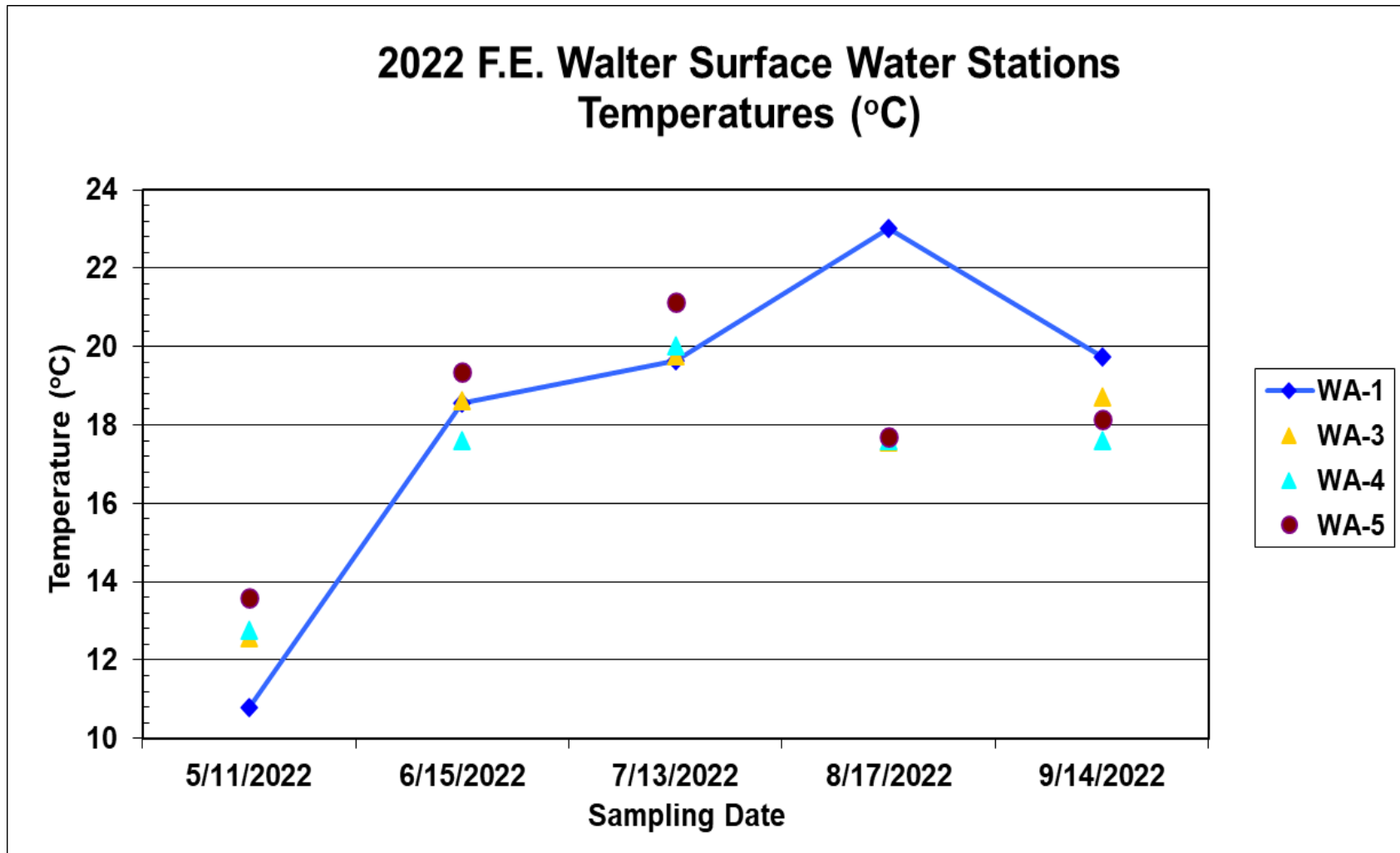


Figure 3-1. Temperature measured in tributary and release (WA-1) surface waters of F.E. Walter Reservoir during 2022. See Appendix A for a summary of the plotted values.

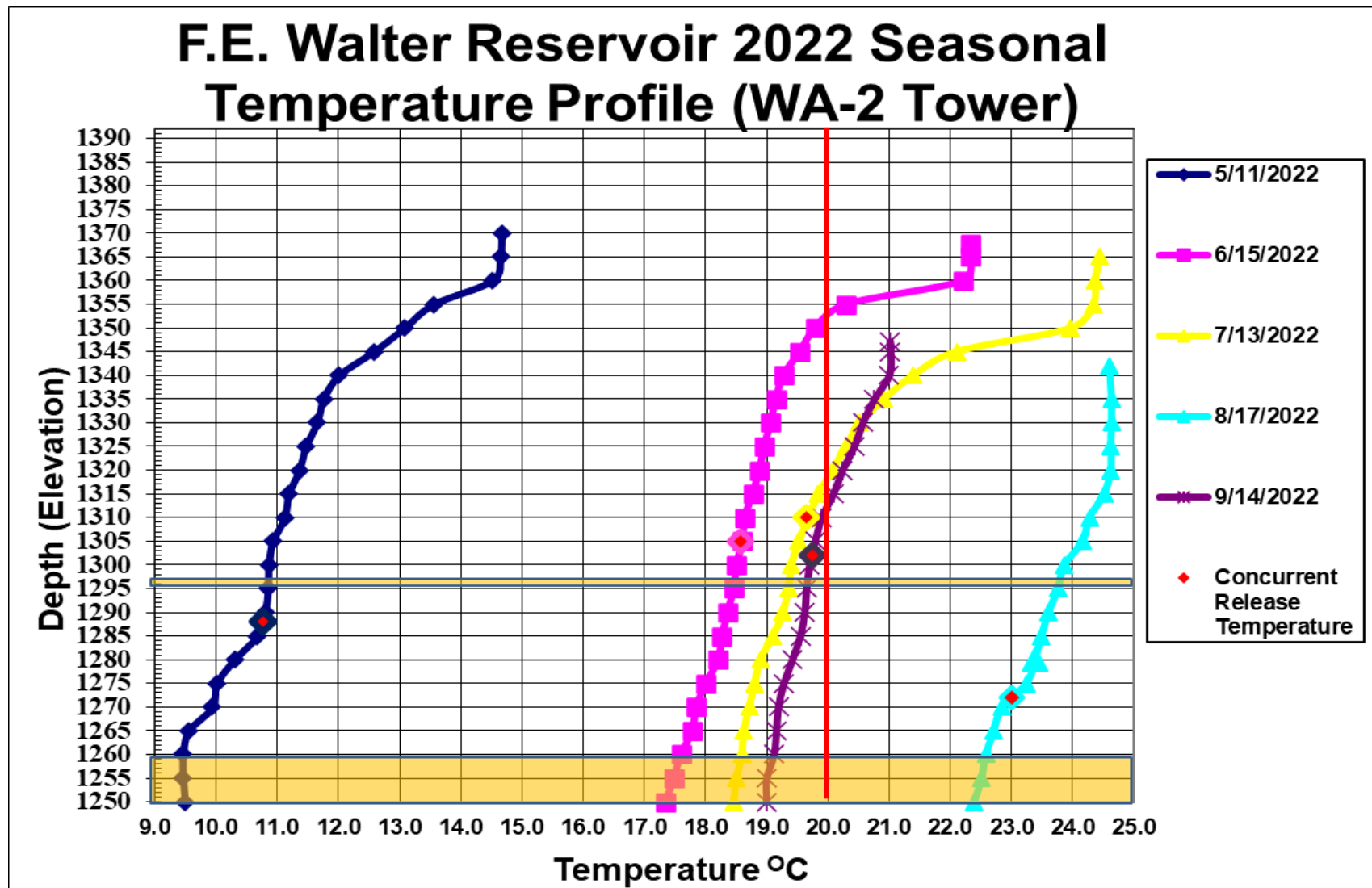


Figure 3-2. Stratification of temperature measured in the water column of F. E. Walter Reservoir at station WA-2 during 2022. See Appendix A for a summary of the plotted values. The cold-water species preference temperature of 20°C is shown as a red line reference.

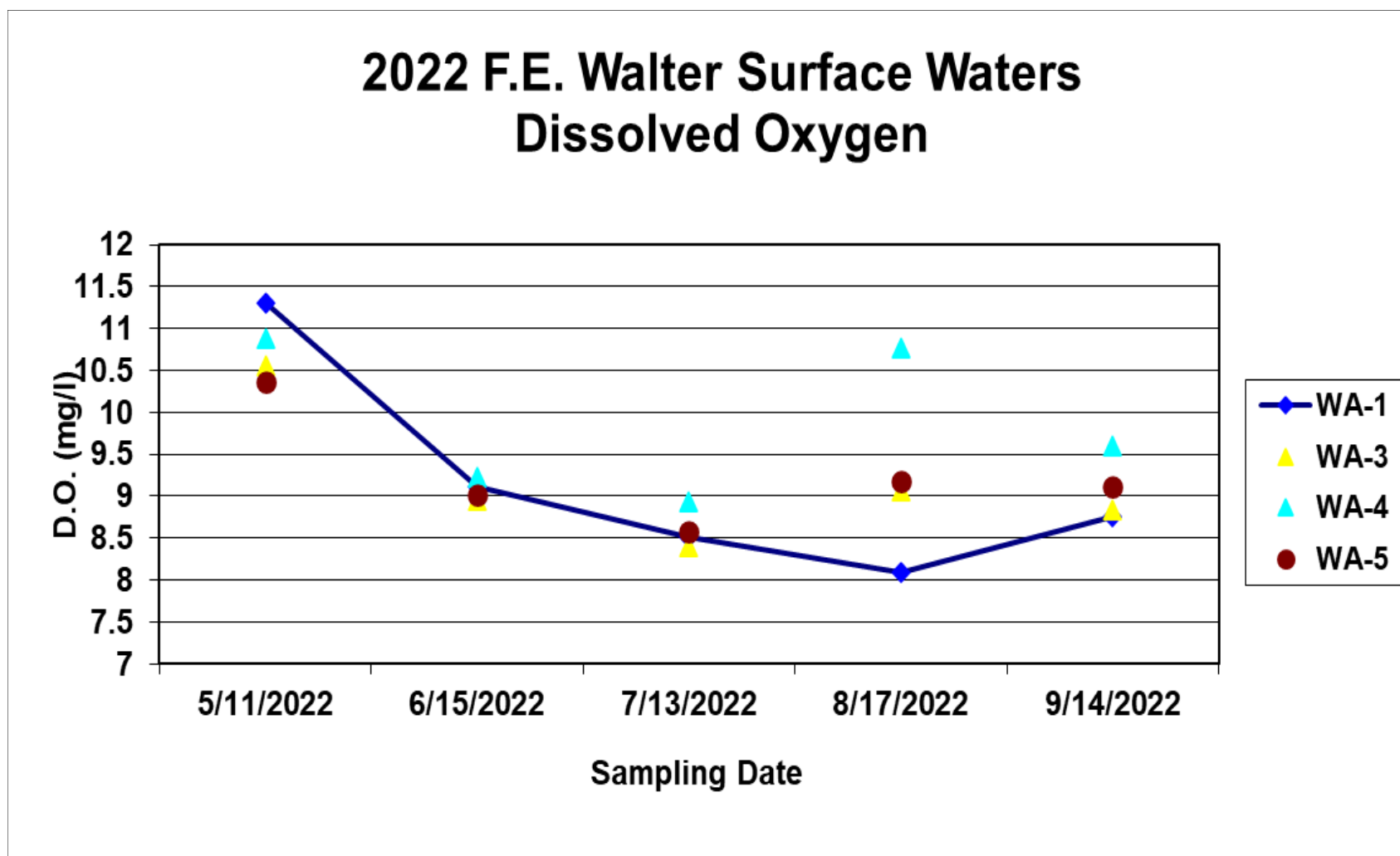


Figure 3-3. Dissolved oxygen measured in tributary and release (WA-1) surface waters of F. E. Walter Reservoir during 2022. See Appendix A for a summary of the plotted value.

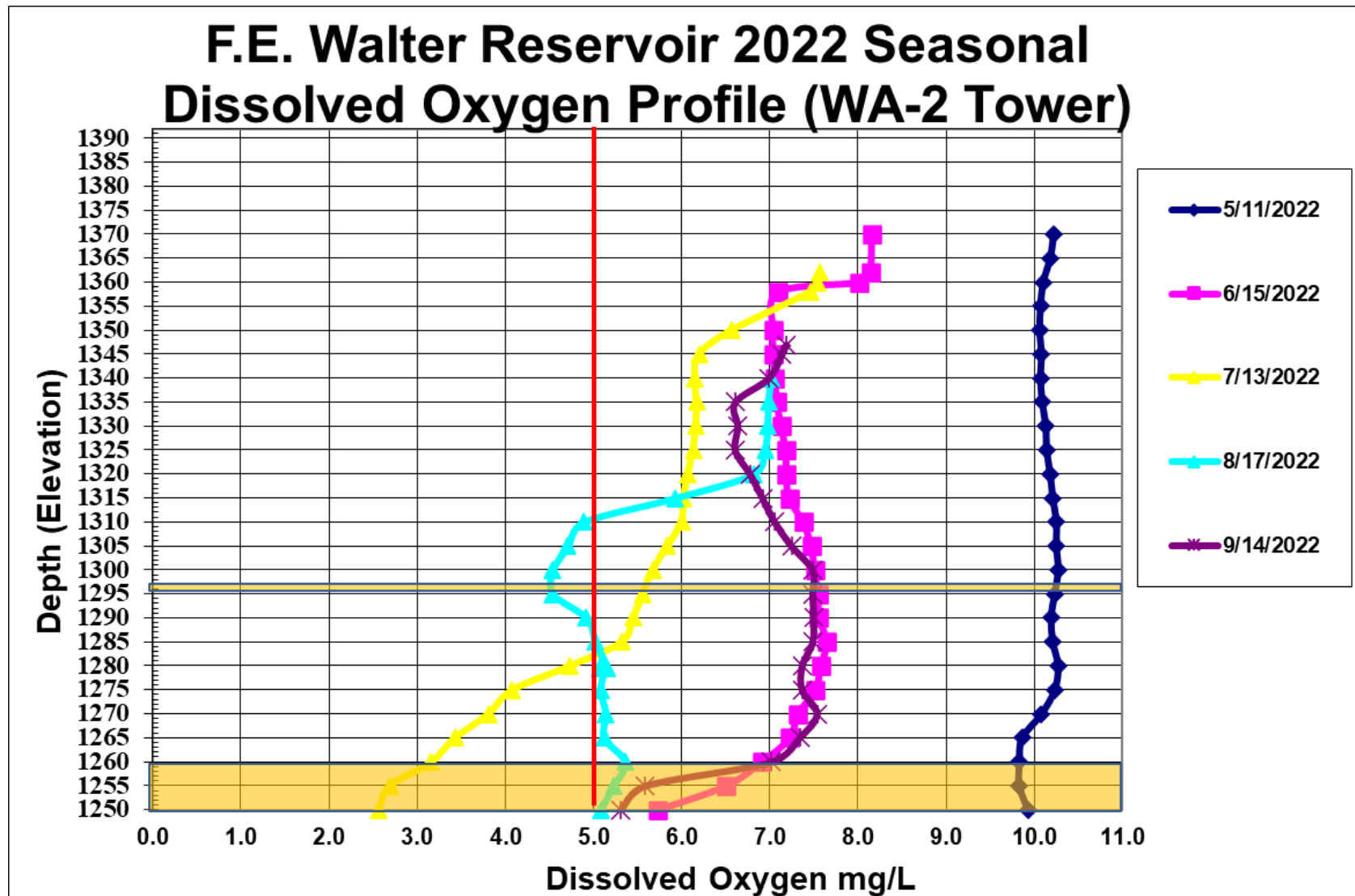


Figure 3-4. Dissolved oxygen measured in the water column of F.E. Walter Reservoir at station WA-2 during 2022. The PADEP WQ standard for DO is an epilimnion minimum concentration of 5 mg/L. See Appendix A for a summary of the plotted values.

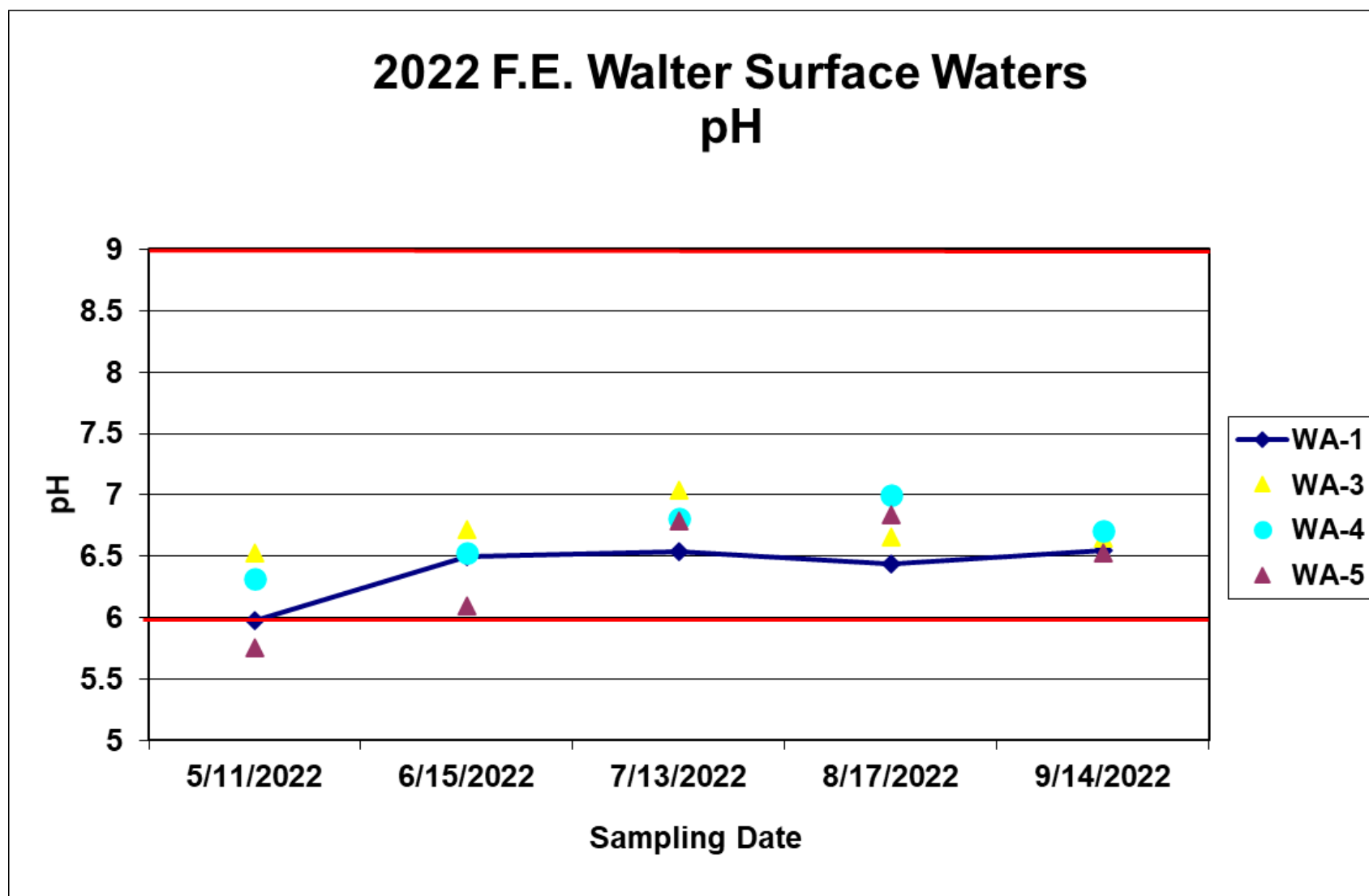


Figure 3-5. Measures of pH in tributary and release (WA-1) surface waters of F.E. Walter Reservoir during 2022. The PADEP WQ standard for pH is an acceptable range from 6 to 9. See Appendix A for a summary of the plotted values

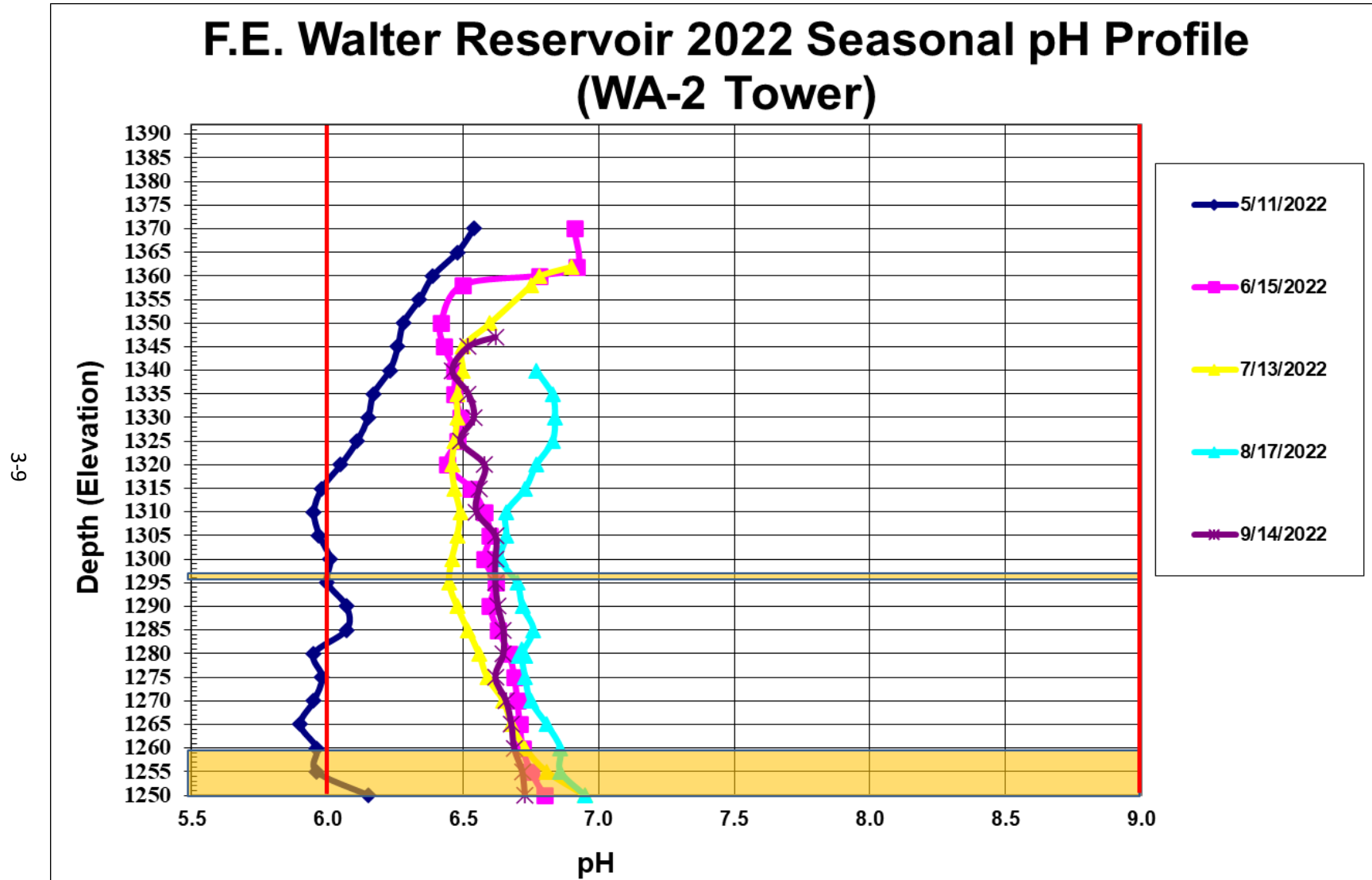


Figure 3-6. Stratification of pH measured in the water column of F.E. Walter Reservoir at station WA-2 during 2022. The PADEP water quality standard pH is an acceptable range from 6 to 9. See Appendix A for a summary of the plotted value.

Table 3-1. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2022

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-01S	5/11/2022	5	<2.0	0.01	<0.02	<0.01	0.26	0.27	65	<0.43	5.3	<0.01	6
	6/15/2022	7	<2.0	<0.01	<0.02	<0.01	0.23	0.24	57	<0.43	6.8	0.02	3
	7/13/2022	7	<2.0	<0.01	0.05	<0.01	0.21	0.22	63	<0.43	5.5	0.02	8
	8/17/2022	9	<2.0	0.03	0.11	<0.01	0.28	0.29	51	<0.43	4.4	0.01	5
	9/14/2022	9	<2.0	0.02	<0.02	<0.01	0.22	0.23	52	0.62	7.2	0.03	3
	Mean	7	2	0.02	0.04	0.01	0.24	0.25	58	0.47	5.8	0.02	5
	Stdev	2	0	0.01	0.04	0.00	0.03	0.03	6	0.08	1.1	0.01	2
	Max	9	2	0.03	0.11	0.01	0.28	0.29	65	0.62	7.2	0.03	8
	Min	5	2	0.01	0.02	0.01	0.21	0.22	51	0.43	4.4	0.01	3
	No. of Det.	5	0	3	2	0	5	5	5	1	5	4	5
WA-02S	5/11/2022	6	<2.0	<0.01	<0.02	<0.01	0.28	0.29	49	<0.43	4.4	<0.01	1
	6/15/2022	6	<2.0	<0.01	<0.02	<0.01	0.22	0.23	47	<0.43	5.6	0.01	<1
	7/13/2022	7	<2.0	<0.01	<0.02	<0.01	0.19	0.20	66	<0.43	5.7	0.01	2
	8/17/2022	7	<2.0	<0.01	<0.02	<0.01	0.23	0.24	48	<0.43	4.6	0.01	<1
	9/14/2022	8	5.0	0.02	<0.02	<0.01	0.25	0.26	55	<0.43	5.2	<0.01	3
	Mean	7	3	0.01	0.02	0.01	0.23	0.24	53	0.43	5.1	0.01	2
	Stdev	1	1	0.00	0.00	0.00	0.03	0.03	8	0.00	0.6	0.00	1
	Max	8	5	0.02	0.02	0.01	0.28	0.29	66	0.43	5.7	0.01	3
	Min	6	2	0.01	0.02	0.01	0.19	0.20	47	0.43	4.4	0.01	1
	No. of Det.	5	1	1	0	0	5	5	5	0	5	3	3

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2022

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	5/11/2022	4	<2.0	0.02	<0.02	<0.01	0.24	0.25	52	<0.43	4.2	<0.01	2
	6/15/2022	7	<2.0	<0.01	<0.02	<0.01	0.22	0.23	48	<0.43	6.9	0.02	1
	7/13/2022	6	<2.0	<0.01	0.03	<0.01	0.21	0.22	47	<0.43	5.7	<0.01	5
	8/17/2022	9	<2.0	0.02	<0.02	<0.01	0.26	0.27	51	<0.43	4.4	<0.01	<1
	9/14/2022	9	<2.0	0.02	<0.02	<0.01	0.21	0.22	53	<0.43	7.3	0.03	4
	Mean	7	2	0.02	0.02	0.01	0.23	0.24	50	0.43	5.7	0.02	3
	Stdev	2	0	0.01	0.00	0.00	0.02	0.02	3	0.00	1.4	0.01	2
	Max	9	2	0.02	0.03	0.01	0.26	0.27	53	0.43	7.3	0.03	5
	Min	4	2	0.01	0.02	0.01	0.21	0.22	47	0.43	4.2	0.01	1
	No. of Det.	5	0	3	1	0	5	5	5	0	5	2	4
WA-02D	5/11/2022	5	<2.0	<0.01	<0.02	<0.01	0.26	0.27	51	<0.43	5.9	0.02	29
	6/15/2022	8	<2.0	<0.01	0.07	<0.01	0.23	0.24	61	<0.43	7.2	0.02	5
	7/13/2022	9	<2.0	<0.01	0.09	<0.01	0.2	0.21	41	<0.43	6	<0.01	23
	8/17/2022	10	<2.0	<0.01	0.05	<0.01	0.28	0.29	65	<0.43	4.3	0.02	17
	9/14/2022	9	<2.0	0.04	<0.02	<0.01	0.23	0.24	65	<0.43	6.9	0.01	7
	Mean	8	2	0.02	0.05	0.01	0.24	0.25	57	0.43	6.1	0.02	16
	Stdev	2	0	0.01	0.03	0.00	0.03	0.03	10	0.00	1.1	0.01	10
	Max	10	2	0.04	0.09	0.01	0.28	0.29	65	0.43	7.2	0.02	29
	Min	5	2	0.01	0.02	0.01	0.20	0.21	41	0.43	4.3	0.01	5
	No. of Det.	5	0	1	3	0	5	5	5	0	5	4	5

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2022

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-03S	5/11/2022	7	<2.0	0.01	<0.02	<0.01	0.3	0.31	69	<0.43	7.3	<0.01	1
	6/15/2022	8	<2.0	0.02	<0.02	<0.01	0.29	0.3	69	<0.43	7.2	<0.01	<1
	7/13/2022	9	<2.0	<0.01	<0.02	<0.01	0.29	0.3	59	<0.43	5.2	<0.01	7
	8/17/2022	11	<2.0	0.01	<0.02	<0.01	0.92	0.93	88	<0.43	4.1	0.02	2
	9/14/2022	9	<2.0	0.02	<0.02	<0.01	0.23	0.24	79	0.44	9.6	<0.01	3
	Mean	9	2	0.01	0.02	0.01	0.41	0.42	73	0.43	6.7	0.01	3
	Stdev	1	0	0.01	0.00	0.00	0.29	0.29	11	0.00	2.1	0.00	2
	Max	11	2	0.02	0.02	0.01	0.92	0.93	88	0.44	9.6	0.02	7
	Min	7	2	0.01	0.02	0.01	0.23	0.24	59	0.43	4.1	0.01	1
	No. of Det.	5	0	4	0	0	5	5	5	1	5	1	4
WA-04S	5/11/2022	6	<2.0	<0.01	<0.02	<0.01	0.26	0.27	23	<0.43	5.2	<0.01	1
	6/15/2022	7	<2.0	0.01	<0.02	<0.01	0.27	0.28	58	<0.43	5.1	<0.01	3
	7/13/2022	11	<2.0	0.02	0.03	<0.01	0.25	0.26	53	<0.43	3.6	<0.01	<1
	8/17/2022	14	<2.0	<0.01	<0.02	<0.01	<0.19	<0.20	55	<0.43	3	<0.01	6
	9/14/2022	10	3.8	0.02	<0.02	<0.01	0.19	0.20	57	0.58	7.5	0.12	5
	Mean	10	2	0.01	0.02	0.01	0.23	0.24	49	0.46	4.9	0.03	3
	Stdev	3	1	0.01	0.00	0.00	0.04	0.04	15	0.07	1.7	0.05	2
	Max	14	3.8	0.02	0.03	0.01	0.27	0.28	58	0.58	7.5	0.12	6
	Min	6	2	0.01	0.02	0.01	0.19	0.20	23	0.43	3.0	0.01	1
	No. of Det.	5	1	3	1	0	4	4	5	1	5	1	4

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2022

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-05S	5/11/2022	3	<2.0	0.01	0.07	<0.01	0.2	0.21	22	<0.43	3.8	<0.01	<1
	6/15/2022	4	<2.0	0.12	<0.02	<0.01	0.16	0.17	49	<0.43	4.6	<0.01	4
	7/13/2022	4	<2.0	<0.01	0.02	<0.01	0.18	0.19	52	<0.43	3.3	<0.01	<1
	8/17/2022	6	<2.0	<0.01	0.07	<0.01	0.22	0.23	65	<0.43	2.6	0.01	5
	9/14/2022	5	<2.0	0.03	<0.02	<0.01	<0.18	<0.19	48	<0.43	7	<0.01	3
	Mean	4	2	0.04	0.04	0.01	0.19	0.20	47	0.43	4.3	0.01	3
	Stdev	1	0	0.05	0.03	0.00	0.02	0.02	16	0.00	1.7	0.00	2
	Max	6	2	0.12	0.07	0.01	0.22	0.23	65	0.43	7.0	0.01	5
	Min	3	2	0.01	0.02	0.01	0.16	0.17	22	0.43	2.6	0.01	1
	No. of Det.	5	0	3	3	0	4	4	5	0	5	1	3
WA-06S	5/11/2022	5	<2.0	<0.01	<0.02	<0.01	0.28	0.29	45	<0.43	4.1	<0.01	1
	6/15/2022	6	<2.0	<0.01	<0.02	<0.01	0.21	0.22	62	<0.43	5.6	<0.01	4
	7/13/2022	7	<2.0	<0.01	0.02	<0.01	0.19	0.2	50	<0.43	5.5	<0.01	5
	8/17/2022	7	<2.0	<0.01	<0.02	<0.01	0.23	0.24	45	<0.43	4.5	<0.01	3
	9/14/2022	9	<2.0	0.02	<0.02	<0.01	0.24	0.25	52	<0.43	5.2	0.03	1
	Mean	7	2	0.01	0.02	0.01	0.23	0.24	51	0.43	5.0	0.01	3
	Stdev	1	0	0.00	0.00	0.00	0.03	0.03	7	0.00	0.7	0.01	2
	Max	9	2	0.02	0.02	0.01	0.28	0.29	62	0.43	5.6	0.03	5
	Min	5	2	0.01	0.02	0.01	0.19	0.20	45	0.43	4.1	0.01	1
	No. of Det.	5	0	1	1	0	5	5	5	0	5	1	5

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2022

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-06M	5/11/2022	4	<2.0	<0.01	<0.02	<0.01	0.24	0.25	30	1.48	4.1	<0.01	1
	6/15/2022	7	<2.0	<0.01	<0.02	<0.01	0.22	0.23	71	<0.43	6.1	<0.01	<1
	7/13/2022	7	<2.0	<0.01	0.02	<0.01	0.2	0.21	52	<0.43	5.3	<0.01	3
	8/17/2022	8	<2.0	<0.01	<0.02	<0.01	0.25	0.26	52	<0.43	4.4	<0.01	1
	9/14/2022	8	3.8	0.03	0.04	<0.01	0.22	0.23	69	<0.43	6.5	0.01	2
	Mean	7	2	0.01	0.02	0.01	0.23	0.24	55	0.64	5.3	0.01	2
	Stdev	2	1	0.01	0.01	0.00	0.02	0.02	17	0.47	1.0	0.00	1
	Max	8	3.8	0.03	0.04	0.01	0.25	0.26	71	1.48	6.5	0.01	3
	Min	4	2	0.01	0.02	0.01	0.20	0.21	30	0.43	4.1	0.01	1
	No. of Det.	5	1	1	2	0	5	5	5	1	5	1	4
WA-06D	5/11/2022	4	<2.0	<0.01	<0.02	<0.01	0.24	0.25	37	0.44	4.5	<0.01	34
	6/15/2022	7	<2.0	<0.01	<0.02	<0.01	0.22	0.23	70	<0.43	6.7	0.01	1
	7/13/2022	8	<2.0	<0.01	0.03	<0.01	0.21	0.22	53	<0.43	5.8	<0.01	3
	8/17/2022	9	<2.0	<0.01	0.02	<0.01	0.25	0.26	59	<0.43	4.3	0.02	6
	9/14/2022	8	<2.0	0.02	0.04	<0.01	0.21	0.22	71	0.47	6.5	0.02	36
	Mean	7	2	0.01	0.03	0.01	0.23	0.24	58	0.44	5.6	0.01	16
	Stdev	2	0	0.00	0.01	0.00	0.02	0.02	14	0.02	1.1	0.01	17
	Max	9	2	0.02	0.04	0.01	0.25	0.26	71	0.47	6.7	0.02	36
	Min	4	2	0.01	0.02	0.01	0.21	0.22	37	0.43	4.3	0.01	1
	No. of Det.	5	0	1	3	0	5	5	5	2	5	3	5

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2022

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-07S	5/11/2022	6	<2.0	<0.01	<0.02	<0.01	0.28	0.29	39	<0.43	4.5	<0.01	1
	6/15/2022	7	<2.0	<0.01	<0.02	<0.01	0.21	0.22	69	<0.43	6.3	<0.01	3
	7/13/2022	8	<2.0	<0.01	<0.02	<0.01	0.2	0.21	52	<0.43	5.8	<0.01	1
	8/17/2022	8	<2.0	<0.01	<0.02	<0.01	0.24	0.25	46	<0.43	4.5	0.02	<1
	9/14/2022	8	<2.0	0.02	0.05	<0.01	0.23	0.24	60	<0.43	5.4	0.3	4
	Mean	7	2	0.01	0.03	0.01	0.23	0.24	53	0.43	5.3	0.07	2
	Stdev	1	0	0.00	0.01	0.00	0.03	0.03	12	0.00	0.8	0.13	1
	Max	8	2	0.02	0.05	0.01	0.28	0.29	69	0.43	6.3	0.30	4
	Min	6	2	0.01	0.02	0.01	0.20	0.21	39	0.43	4.5	0.01	1
	No. of Det.	5	0	1	1	0	5	5	5	0	5	2	4
WA-07M	5/11/2022	6	<2.0	<0.01	<0.02	<0.01	0.28	0.29	49	<0.43	5.2	<0.01	1
	6/15/2022	7	<2.0	<0.01	<0.02	<0.01	0.23	0.24	73	<0.43	7.1	0.01	3
	7/13/2022	8	<2.0	<0.01	<0.02	<0.01	0.21	0.22	52	<0.43	6.1	<0.01	<1
	8/17/2022	7	<2.0	<0.01	<0.02	<0.01	0.23	0.24	46	<0.43	4.4	<0.01	4
	9/14/2022	9	<2.0	0.02	<0.02	<0.01	0.21	0.22	70	<0.43	7.3	0.01	4
	Mean	7	2	0.01	0.02	0.01	0.23	0.24	58	0.43	6.0	0.01	3
	Stdev	1	0	0.00	0.00	0.00	0.03	0.03	13	0.00	1.2	0.00	2
	Max	9	2	0.02	0.02	0.01	0.28	0.29	73	0.43	7.3	0.01	4
	Min	6	2	0.01	0.02	0.01	0.21	0.22	46	0.43	4.4	0.01	1
	No. of Det.	5	0	1	0	0	5	5	5	0	5	2	4

Table 3-1 continued. Summary of surface, middle, and bottom water quality monitoring data for F.E. Walter Reservoir in 2022

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-07D	5/11/2022	7	<2.0	<0.01	<0.02	<0.01	0.27	0.28	52	<0.43	6.8	<0.01	8
	6/15/2022	8	<2.0	0.01	<0.02	<0.01	0.23	0.24	85	<0.43	7.1	0.01	18
	7/13/2022	9	<2.0	<0.01	0.05	<0.01	0.21	0.22	59	<0.43	6	<0.01	16
	8/17/2022	9	<2.0	0.01	<0.02	<0.01	0.26	0.27	52	<0.43	4.4	0.01	2
	9/14/2022	9	4.0	0.02	<0.02	<0.01	0.22	0.23	69	<0.43	7.6	0.02	3
	Mean	8	2	0.01	0.03	0.01	0.24	0.25	63	0.43	6.4	0.01	9
	Stdev	1	1	0.00	0.01	0.00	0.03	0.03	14	0.00	1.2	0.00	7
	Max	9	4	0.02	0.05	0.01	0.27	0.28	85	0.43	7.6	0.02	18
	Min	7	2	0.01	0.02	0.01	0.21	0.22	52	0.43	4.4	0.01	2
	No. of Det.	5	1	3	1	0	5	5	5	0	5	3	5

< 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 (0.02 mg/L). The maximum NH₃ value of 0.11 mg/L was observed in a surface water sample at Station WA-1S on 17 August. All F.E. Walter Reservoir samples were less than the EPA water quality standard for ammonia during 2022. 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 2022. 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 2022. For all stations and depths, sample results ranged from 0.16 mg/L to a maximum of 0.92 mg/L in the upstream tributary surface waters at station WA-3S on 17 August.

In 2022, F.E. Walter Reservoir complied 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 sample did not exceed 0.93 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 remained low during 2022 (Table 3-1). Concentrations measured at all reservoir stations ranged from less than the minimum laboratory reporting limit of 0.43 mg/L to a high of 1.48 mg/L in the reservoir mid-depth waters at station WA-6M on 11 May.

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 but one sample, all stations and depths concentrations ranged from less than the reporting limit of 0.01 mg/L to a high of 0.03 mg/L. A single maximum concentration sample of 0.30 mg/L was measured in the surface waters at station WA-7 on 14 September (Table 3-1). When compared to other samples taken that day, this higher value was an anomaly and may be associated with sampling or some other analysis error.

3.2.5 Dissolved Phosphorus

Dissolved or soluble phosphorus (DISS P) in the waters of F.E. Walter Reservoir and its upstream tributaries remained consistently low during 2022. For all stations and depths, concentrations ranged from less than the reporting limit of 0.01 mg/L to a maximum of 0.12 mg/L (Table 3-1) measured at upstream tributary station WA-5S on 15 June. 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 2022. Concentrations at all stations and depths ranged from 22 to 88 mg/L (Table 3-1). F.E. Walter Reservoir and its tributaries stayed below the PADEP water quality standard for total dissolved solids during 2022. 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 2022 with results ranging from less than the reporting limit of 1.0 mg/L to a maximum concentration of 36 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 36 mg/L was recorded in the lake bottom water sample at station WA-6D on 14 September. These results did not correlate with other samples collected throughout the lake during the same sampling period. It is probable that lake sampling equipment disturbed bottom sediments prior to collecting water quality samples at that depth (sample collection error).

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 2022 (Table 3-2). Sampling results ranged from less than the reporting limit of 2.0 mg/L to 5.0 mg/L. Sixty one of the 65 total samples collected were less than or equal to the 2.0 mg/L laboratory minimal reporting limit. In considering the overall infrequency of samples showing higher readings, it is inferred that F.E. Walter Reservoir and its associated tributaries contained very clean water with little biodegradable organic wastes during the 2022 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 2022. Concentrations measured at all stations and depths ranged from 3.0 mg/L to 14.0 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). In this context, all samples met PADEP water quality standards for alkalinity.

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 3.0 mg/L to 9.6 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* concentrations increase in relation to increased algal densities in a water body. Concentrations for all sampling dates for all lake stations at depths from 0-10 feet ranged from 1.1 ug/L to 9.0 ug/L (Appendix A). Average concentrations monthly in May (3.44 ug/L), June (3.38 ug/L), July (4.81 ug/L), August (1.84 ug/L) and September (3.41 ug/L) shown that lake surface water algae productivity peaked in July but remained low throughout the sampling season.

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 (nutrient enrichment of a lake). 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 conditions not captured between sampling events could influence the resulting classification. Figure 3-7 graphically shows the calculated TSI index over the 2022 sampling season.

TSIs calculated for measures of total phosphorus classified F.E. Walter Reservoir as oligotrophic in May (37.35), June (37.35), July (37.35), August (37.35) and September (37.35). TSIs calculated for measures of secchi disk depth classified F.E. Walter Reservoir as mesotrophic in May (43.23), June (43.70), July (44.17), August (45.16) and September (43.70). TSIs calculated for measures of chlorophyll

a classified F.E. Walter Reservoir as mesotrophic in May (41.38), June (41.86), July (43.95) and September (43.17) and oligotrophic in August (35.51).

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 oligotrophic/mesotrophic throughout the 2022 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 oligotrophic and mesotrophic throughout much of the 2022 sampling season. Factors that affect F.E. Walter's water quality and trophic classification include relatively low nutrients (Total Phosphorus) within the watershed that subsequently affect algae productivity (chlorophyll *a*). In addition, water transparency (secchi disk readings) is affected (reduced) by tannic acids and the lake water discoloration resulting from those tannins.

Table 3-3. EPA trophic classification criteria and average monthly measures for F.E. Walter Reservoir in 2022.								
Water Quality Variable	Oligo-trophic	Meso-trophic	Eutrophic	11 May	15 June	13 July	17 Aug	14 Sep
Total Phosphorus (ppb)	<10	10-20	>20	<10	10	10	10	<10
Chlorophyll <i>a</i> (ppb)	<4	4-10	>10	3.00	3.15	3.90	1.65	3.60
Secchi Depth (m)	>4	2-4	<2	3.2	3.1	3.0	2.8	3.1

3.4 RESERVOIR BACTERIA MONITORING

Total coliform bacteria include *Escherichia 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 have been replaced with a recommended *E. coli* criterion. Bacteria contamination was monitored in the tributary and lake surface waters at F.E. Walter Reservoir (May-September) during 2022 (Table 3-4).

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

Total coliform values for all stations and dates ranged from 124 colonies/100-ml to >2420 colonies/100-ml. Bacteria in natural waters are common and their presence in the sample is not

necessarily a human health concern. Given that Corps regular monitoring was completed utilizing single day grab samples, single sample results were compared to the EPA E. coli single sample criteria in 2022. Bacteria contamination was low in F.E. Walter Reservoir and its upstream tributaries during 2022. A single sample collected at the upstream tributary station WA-5S on 14 September did exceed the EPA single sample criteria. Water contact recreation is not permitted at F.E. Walter Reservoir and bacteria sampling is utilized as a watershed and reservoir long term monitoring tool.

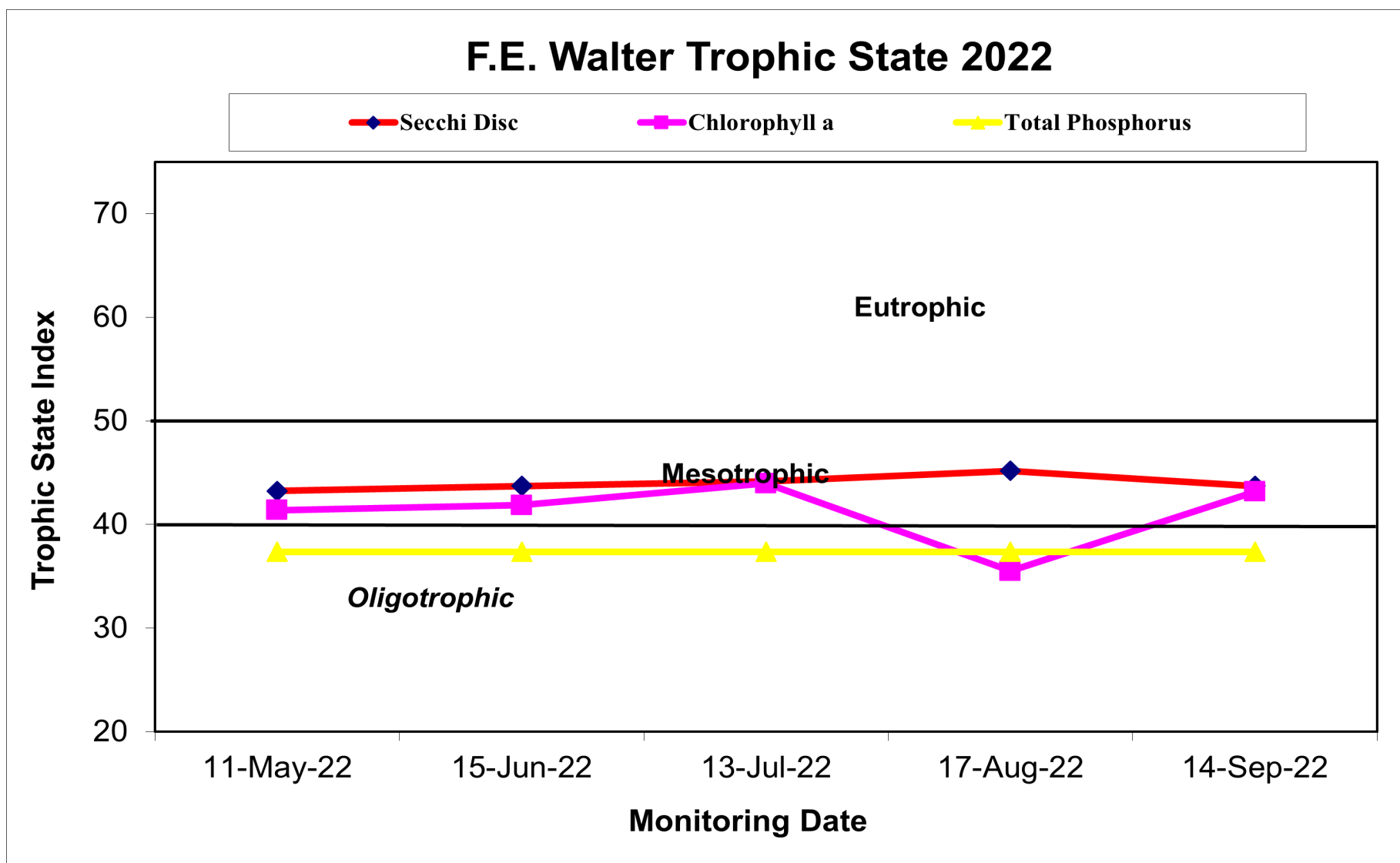


Figure 3-7. Carlson Trophic state indices calculated from secchi disk depth, concentrations of chlorophyll a and Total Phosphorus measured in surface waters of F.E. Walter Reservoir at Station WA-2 during 2022.

Table 3-4. Bacteria single water surface monthly grab sample results (colonies/100 ml) at F.E. Walter Reservoir and its tributaries during 2022. Shaded values exceed EPA bacteria criteria.

STATION	DATE		Total Coliform		Escherichia coli
WA-1S	5/11/2022	>	2420		72
	6/15/2022	>	2420		5
	7/13/2022	>	2420		1
	8/17/2022		1990		5
	9/14/2022	>	2420		79
WA-2S	5/11/2022		192	<	1
	6/15/2022	>	2420	<	1
	7/13/2022	>	2420		1
	8/17/2022		435	<	1
	9/14/2022		172		3
WA-3S	5/11/2022		1990		22
	6/15/2022	>	2420		11
	7/13/2022	>	2420		68
	8/17/2022	>	2420		12
	9/14/2022		2420		20
WA-4S	5/11/2022		1550		3
	6/15/2022	>	2420		48
	7/13/2022	>	2420		88
	8/17/2022		1730		26
	9/14/2022	>	2420		46
WA-5S	5/11/2022		1730	<	1
	6/15/2022	>	2420		42
	7/13/2022	>	2420		18
	8/17/2022		1730		14
	9/14/2022	>	2420		365
WA-6S	5/11/2022		179		1
	6/15/2022	>	2420	<	1
	7/13/2022	>	2420	<	1
	8/17/2022		461	<	1
	9/14/2022		124		9
WA-7S	5/11/2022		214		3
	6/15/2022	>	2420		1
	7/13/2022	>	2420		1
	8/17/2022		435	<	1
	9/14/2022		488		15

4.0 REFERENCES

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APPENDIX A

FE WALTER RESERVOIR 2022 STRATIFICATION DATA TABLES

2022 F.E. Walter Water Quality Profiles

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	Cond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
WA-1 Outfall	5/11/2022	10:56:46	0.5	10.78	102	11.3	5.98	14.8	68.8	2.1	5.8	0.057
	6/15/2022	9:56:43	0.5	18.57	97.4	9.11	6.5	-11.5	83.8	2.0	4	0.074
	7/13/2022	9:54:49	0.5	19.65	93	8.51	6.54	-13.3	90.2	2.6	3.2	0.076
	8/17/2022	10:22:03	0.5	23.01	94.3	8.09	6.44	-7.8	144.4	7.8	1.5	0.104
	9/14/2022	11:11:35	0.5	19.74	95.8	8.76	6.55	-14.3	141.4	3.8	4.1	0.093
WA-2 Lake Tower Secchi 3.2 M	5/11/2022	8:40:50	0.5	14.67	100.6	10.22	6.54	-13.7	64.7	0.2	2.7	0.07
		8:39:16	5	14.65	100.2	10.18	6.48	-10.6	64.3	0.3	3.3	0.07
		8:38:27	10	14.52	99.2	10.10	6.39	-6	65.3	0.4	3.3	0.07
		8:37:45	15	13.56	96.8	10.07	6.34	-3.4	66.1	0.7	3.9	0.068
		8:36:42	20	13.08	95.7	10.06	6.28	-0.5	66.3	0.6	3.1	0.067
		8:35:17	25	12.58	94.8	10.08	6.26	0.4	66	0.7	3.7	0.065
		8:34:28	30	12.01	93.5	10.07	6.23	2.1	66.5	0.3	3.8	0.064
		8:32:10	35	11.76	93.1	10.09	6.17	5.3	67.1	0.8	3.4	0.063
		8:30:58	40	11.65	93.2	10.13	6.15	5.9	66.7	0.9	3.3	0.064
		8:30:10	45	11.47	93	10.14	6.11	8.3	66.8	0.7	3.1	0.063
		8:29:31	50	11.36	93.1	10.18	6.05	11	67	0.9	3.3	0.06
		8:28:17	55	11.19	93	10.21	5.98	15	67.8	1.3	2.6	0.054
		8:26:46	60	11.12	93.2	10.25	5.95	16.3	67.9	1.0	2.1	0.053
		8:26:01	65	10.93	92.8	10.25	5.97	15.5	67.7	0.9	2.9	0.052
		8:24:44	70	10.86	92.9	10.27	6.01	13.4	67.1	1.2	2.9	0.053
		8:24:04	75	10.85	92.5	10.23	6.00	13.8	67.4	1.3	2.7	0.055
		8:23:17	80	10.8	92	10.19	6.07	10.3	67	1.5	3.0	0.056
		8:22:34	85	10.67	91.9	10.21	6.07	10	66.3	1.4	3.5	0.06
		8:21:06	90	10.3	91.6	10.27	5.95	16.3	67.5	1.4	3.0	0.053
		8:19:53	95	10.01	90.7	10.23	5.98	14.5	66.6	2.5	3.5	0.053
		8:18:55	100	9.94	89.2	10.08	5.95	15.9	66.5	5.2	3.5	0.053
		8:18:07	105	9.55	86.4	9.86	5.90	18.6	67.3	5.0	3.9	0.053
		8:17:50	110	9.46	86	9.83	5.96	15.7	66.2	4.6	3.4	0.053
		8:16:48	115	9.46	86	9.83	5.96	15.6	66.3	5.3	4.3	0.053
		8:14:19	120	9.49	87	9.93	6.15	5.6	64.7	3.8	4.1	0.053

2022 F.E. Walter Water Quality Profiles

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	Cond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
WA-2 Lake Tower Secchi 3.1 M	6/15/2022	8:04:49	0.5	22.33	94.0	8.16	6.91	-33.4	72.5	0.0	3.3	0.079
		8:04:01	5	22.33	93.7	8.14	6.92	-33.6	70.0	0.0	3	0.079
		8:02:54	10	22.21	92.1	8.02	6.78	-26.3	70.5	0.0	3.5	0.079
		8:01:33	15	20.29	78.5	7.10	6.50	-11.3	75.6	0.0	3.2	0.076
		8:00:19	20	19.79	77.1	7.04	6.42	-7.2	77.1	0.0	3	0.074
		7:59:27	25	19.54	76.7	7.04	6.43	-7.6	77.7	0.0	4	0.073
		7:58:33	30	19.27	76.5	7.06	6.47	-9.9	76.1	0.0	3.1	0.075
		7:57:45	35	19.15	76.6	7.08	6.47	-9.9	76.8	0.2	3.8	0.075
		7:56:44	40	19.06	77.0	7.13	6.49	-10.7	76.3	0.1	3.9	0.074
		7:55:50	45	18.96	77.4	7.18	6.48	-10.2	76.7	0.0	3.5	0.074
		7:55:05	50	18.88	77.3	7.19	6.44	-8.4	78.9	0.3	3.4	0.072
		7:54:32	55	18.77	77.5	7.22	6.53	-13.1	76.8	0.0	2.6	0.071
		7:53:15	60	18.64	79.0	7.38	6.58	-15.5	76.0	0.3	3.5	0.072
		7:52:18	65	18.60	79.8	7.47	6.60	-16.7	75.1	0.3	3.4	0.073
		7:51:34	70	18.51	80.2	7.51	6.58	-15.5	76.8	0.5	2.9	0.073
		7:50:53	75	18.46	80.5	7.55	6.62	-17.7	75.1	0.5	4	0.073
		7:50:16	80	18.36	80.5	7.56	6.60	-16.8	77.1	0.7	4.1	0.074
		7:49:35	85	18.27	81.2	7.65	6.63	-18.4	76.4	0.7	3.8	0.074
		7:48:56	90	18.21	80.4	7.58	6.67	-20.4	75.6	0.9	3.6	0.074
		7:47:59	95	18.00	79.4	7.52	6.69	-21.8	75.5	1.7	3.8	0.075
		7:46:01	100	17.85	77.1	7.32	6.70	-22.3	75.7	2.9	3.2	0.076
		7:45:14	105	17.78	76.0	7.23	6.71	-22.9	75.8	3.2	3.7	0.076
		7:43:58	110	17.60	72.4	6.91	6.72	-23.1	76.7	6.3	3.7	0.075
		7:42:50	115	17.48	67.9	6.50	6.75	-25	76.4	8.7	4	0.075
		7:40:20	120	17.35	59.8	5.73	6.80	-27.7	73.9	39.2	4.7	0.075
WA-2 Lake Tower Secchi 3.0 M	7/13/2022	8:11:46	0.5	24.43	90.7	7.57	6.90	-32.7	81.8	0.0	3.8	0.086
		8:10:56	5	24.36	90.2	7.54	6.78	-26.2	85.8	0.0	4.0	0.086
		8:10:06	10	24.33	89.1	7.46	6.75	-24.5	86.3	0.0	4.0	0.086
		8:08:14	15	23.97	78.1	6.57	6.60	-16.4	88.9	0.0	3.5	0.085
		8:06:32	20	22.10	71.0	6.20	6.50	-11.1	90.9	0.0	3.3	0.084
		8:05:27	25	21.39	69.5	6.15	6.50	-11.4	90.7	0.0	3.5	0.086
		8:04:11	30	20.91	69.1	6.17	6.48	-10.4	91.3	0.0	3.8	0.084
		8:03:20	35	20.52	68.4	6.16	6.48	-10.5	91.2	0.0	3.2	0.080
		8:02:23	40	20.29	67.8	6.13	6.47	-9.7	92.1	0.0	3.0	0.077
		8:01:35	45	20.07	66.8	6.07	6.46	-9	92.7	0.0	3.3	0.076
		8:00:52	50	19.84	66.0	6.02	6.47	-9.9	92.2	0.0	2.8	0.077
		7:59:57	55	19.68	65.5	6.00	6.49	-10.8	92.1	0.0	3.0	0.075
		7:58:44	60	19.52	63.6	5.84	6.48	-10.3	92.5	0.0	2.7	0.074
		7:57:38	65	19.40	61.6	5.67	6.46	-9.4	93.4	0.0	2.8	0.073
		7:56:52	70	19.35	60.3	5.56	6.45	-9	94.5	0.1	3.0	0.072
		7:56:08	75	19.26	59.0	5.45	6.48	-10.2	94.3	0.3	2.4	0.071
		7:55:15	80	19.10	57.5	5.32	6.52	-12.7	93.1	0.6	2.9	0.073
		7:53:34	85	18.89	50.9	4.73	6.56	-14.5	92.3	2.2	2.8	0.078
		7:51:36	90	18.80	43.9	4.08	6.59	-16.2	91.9	3.8	2.2	0.080
		7:50:08	95	18.71	40.8	3.81	6.65	-19.7	91.3	6.3	2.6	0.079
		7:48:45	100	18.62	36.7	3.43	6.68	-21.3	92.2	9.7	2.2	0.079
		7:47:51	105	18.59	33.8	3.16	6.73	-23.9	92.5	12.1	2.7	0.08
		7:46:19	110	18.50	28.7	2.69	6.81	-28.1	93.3	17.2	3.0	0.08
		7:44:31	112	18.46	27.4	2.57	6.95	-35.3	92	18.8	3.2	0.081

2022 F.E. Walter Water Quality Profiles

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	Cond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
WA-2 Lake Tower Secchi 2.8 M	8/17/2022	8:25:01	0.5	24.60	84.3	7.02	6.77	-25.4	133.8	0.1	1.4	0.095
		8:22:53	5	24.63	84.1	6.99	6.83	-28.9	129.4	0.5	1.9	0.095
		8:22:09	10	24.63	83.9	6.98	6.84	-29.3	128.5	0.3	2.1	0.095
		8:21:12	15	24.62	83.5	6.95	6.83	-28.8	128.7	0.1	2.3	0.095
		8:18:56	20	24.62	82	6.82	6.77	-25.9	130.1	0.5	2.7	0.095
		8:17:34	25	24.51	71.2	5.93	6.73	-23.6	131.5	0.0	2.1	0.095
		8:12:51	30	24.27	58.4	4.89	6.66	-19.9	133.2	0.6	1.1	0.095
		8:10:50	35	24.16	56.1	4.71	6.66	-19.5	134.1	0.2	1.2	0.097
		8:09:58	40	23.86	53.8	4.54	6.64	-18.6	136.1	1.0	2.3	0.098
		8:09:24	45	23.76	53.7	4.54	6.7	-21.9	132.0	1.4	1.9	0.098
		8:07:59	50	23.60	58	4.92	6.72	-23.0	131.5	2.3	2.1	0.100
		8:06:32	55	23.49	59.1	5.02	6.76	-25.0	129.7	2.3	1.9	0.100
		8:05:08	60	23.39	60.2	5.12	6.72	-23.0	133.6	3.3	1.8	0.103
		8:04:19	65	23.24	59.5	5.08	6.73	-23.5	133.9	3.4	2.1	0.103
		8:03:36	70	22.84	59.7	5.14	6.75	-24.7	133.4	7.5	1.9	0.105
		8:02:46	75	22.71	59.4	5.12	6.81	-28.0	129.8	8.5	2.1	0.105
		8:00:04	80	22.58	61.9	5.36	6.86	-30.7	127.5	10.6	1.9	0.106
		7:58:50	85	22.51	60.5	5.23	6.86	-30.8	128.0	14.1	1.8	0.106
		7:55:55	90	22.39	58.6	5.08	6.95	-35.7	120.2	21.1	2.8	0.106
WA-2 Lake Tower Secchi 3.1 M	9/14/2022											
		8:59:14	0.5	21.01	80.7	7.19	6.62	-17.6	136.0	3.8	3.4	0.091
		8:58:11	5	21.02	80.2	7.14	6.52	-12.3	142.5	5.7	3.8	0.091
		8:56:48	10	21.00	78.4	6.99	6.46	-9.0	146.8	5.5	3.5	0.091
		8:55:42	15	20.76	73.8	6.61	6.52	-12.3	143.0	9.4	3.3	0.089
		8:54:08	20	20.57	73.9	6.64	6.54	-13.6	141.7	13.5	3.4	0.093
		8:53:17	25	20.43	73.4	6.61	6.49	-10.9	145.5	15.3	3.6	0.094
		8:52:07	30	20.24	75	6.78	6.58	-15.8	140.1	18.4	3.7	0.095
		8:50:50	35	20.09	76.3	6.92	6.56	-14.6	142.2	24.7	3.7	0.096
		8:49:32	40	19.90	77.5	7.06	6.55	-14.3	143.5	25.4	3.8	0.096
		8:48:00	45	19.79	79.4	7.25	6.62	-18.0	139.4	28.9	4.3	0.097
		8:46:38	50	19.70	81.9	7.49	6.62	-17.6	140.7	28.5	4.9	0.094
		8:45:53	55	19.65	81.9	7.49	6.62	-17.9	140.6	27.7	3.5	0.094
		8:44:26	60	19.62	81.9	7.5	6.63	-18.1	140.9	23.1	4.7	0.094
		8:43:06	65	19.55	81.6	7.49	6.65	-19.4	139.6	25.8	5.0	0.093
		8:41:15	70	19.42	80.2	7.37	6.65	-19.4	140.4	30.1	3.8	0.094
		8:40:18	75	19.28	79.9	7.37	6.62	-17.7	143.2	33.0	4.9	0.091
		8:39:04	80	19.19	81.6	7.54	6.66	-20.1	140.9	26.5	4.1	0.087
		8:37:32	85	19.16	79.4	7.34	6.68	-21.1	140.1	17.1	4.3	0.089
		8:36:17	90	19.12	75.9	7.02	6.69	-21.7	139.9	7.6	4.2	0.090
		8:34:05	95	19.00	60.3	5.59	6.72	-23.1	138.5	14.2	4.4	0.096
		8:31:39	97	19.00	57.3	5.31	6.73	-23.5	142.0	16.9	4.5	0.098

2022 F.E. Walter Water Quality Profiles

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	Cond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
WA-3 Tobyhanna Creek Upstream	5/11/2022	11:20:16	1	12.56	99.3	10.56	6.53	-13.6	66.4	1.2	4.3	0.084
	6/15/2022	10:22:55	0.5	18.63	95.8	8.95	6.72	-23.2	81.5	1.7	3.9	0.094
	7/13/2022	10:16:38	0.5	19.76	92	8.4	7.04	-40	83.8	1.1	2.6	0.102
	8/17/2022	10:50:04	0.5	17.57	95	9.07	6.66	-19.8	134.2	0.4	2	0.128
	9/14/2022	11:39:37	0.5	18.7	94.8	8.84	6.65	-19.4	140.9	1.9	5.3	0.098
WA-4 Lehigh River Upstream	5/11/2022	11:40:25	1	12.77	102.8	10.89	6.32	-2.8	67.7	0.8	2.5	0.053
	6/15/2022	10:43:28	0.5	17.6	96.6	9.22	6.53	-13.1	85.6	1.1	2.8	0.068
	7/13/2022	10:37:35	0.5	20.01	98.4	8.94	6.81	-28.1	87.8	0.0	1.7	0.087
	8/17/2022	11:12:29	0.5	17.59	112.9	10.77	7.00	-38.3	129.7	0.2	1	0.096
	9/14/2022	12:01:01	0.5	17.61	100.6	9.6	6.71	-22.8	140.8	2.5	4.8	0.074
WA-5 Bear Creek Upstream	5/11/2022	12:00:01	1.0	13.58	99.6	10.36	5.76	26.8	72.9	0.6	4.2	0.045
	6/15/2022	11:10:20	0.5	19.34	97.9	9.02	6.1	10.0	87.4	0.2	167.6	0.06
	7/13/2022	11:01:51	0.5	21.13	96.4	8.57	6.79	-27.0	89.2	0.0	0.8	0.082
	8/17/2022	11:37:26	0.5	17.7	96.3	9.17	6.84	-29.8	138.0	0.1	1.3	0.11
	9/14/2022	12:25:00	0.5	18.14	96.7	9.12	6.53	-13.0	144.5	2.3	3.4	0.076
WA-6 Bear Creek Lake Arm	5/11/2022	9:23:19	0.5	14.66	100.6	10.22	6.50	-11.6	70.1	0.5	2.7	0.069
		9:21:44	5	14.61	100.5	10.22	6.46	-9.5	69.8	0.7	3.6	0.069
		9:20:33	10	14.03	98.4	10.13	6.39	-6.0	71.1	0.6	4.3	0.068
		9:19:19	15	13.34	96.7	10.11	6.33	-2.9	71.3	0.8	3.8	0.067
		9:18:14	20	12.78	95.8	10.15	6.28	-0.7	71.9	0.8	3.7	0.066
		9:16:02	25	12.36	95.1	10.17	6.18	4.6	73.0	1.1	3.9	0.065
		9:15:15	30	12.10	94.0	10.11	6.15	5.9	72.4	0.9	3.3	0.065
		9:14:41	35	11.83	93.1	10.07	6.18	4.7	72.0	1.0	3.2	0.063
		9:13:18	40	11.69	93.4	10.13	6.07	10.2	73.2	0.7	2.7	0.060
		9:11:55	45	11.40	93.7	10.24	5.95	16.3	73.8	1.0	3.1	0.053
		9:10:15	50	11.25	93.9	10.30	5.90	19.0	74.4	0.5	2.2	0.050
		9:09:07	55	11.07	94.0	10.35	5.80	24.3	76.6	0.2	1.9	0.049
		9:08:54	60	10.87	93.5	10.34	5.83	22.3	75.6	1.0	1.9	0.048
		9:08:31	65	10.69	93.2	10.35	5.87	20.3	75.0	1.5	2.4	0.050
		9:07:26	70	10.60	93.1	10.36	5.87	20.3	74.8	1.4	2.9	0.049
		9:06:27	75	10.49	92.6	10.33	5.88	19.8	75.2	1.3	3.6	0.050
		9:05:13	80	10.29	92.3	10.35	5.81	23.2	75.8	1.6	2.7	0.047
		9:04:13	85	10.12	91.3	10.28	5.83	22.6	75.9	7.6	2.8	0.048
		9:02:20	90	10.11	90.9	10.24	5.99	14.1	75.3	6.9	3.2	0.048
		8:35:38	0.5	22.41	94.4	8.19	6.49	-10.6	77.9	0.0	3.1	0.078
WA-6 Bear Creek Lake Arm	6/15/2022	8:34:52	5	22.13	92.8	8.09	6.35	-3.2	81.5	0.0	3.8	0.078
		8:34:08	10	21.96	90.1	7.88	6.29	0.1	80.9	0.0	3.5	0.077
		8:33:27	15	20.41	80.1	7.23	6.23	3.3	79.4	0.0	3.8	0.076
		8:32:43	20	19.79	78.2	7.14	6.16	6.7	79.9	0.1	2.8	0.074
		8:32:08	25	19.54	78.1	7.17	6.12	9	81.7	0.0	2.3	0.071
		8:31:25	30	19.35	77.6	7.14	6.09	10.4	83.4	0.3	2.9	0.072
		8:30:52	35	19.25	77.3	7.13	6.15	7	81.4	0.0	3.8	0.075
		8:30:14	40	19.16	77.4	7.16	6.15	7.3	81.8	0.0	3.1	0.074
		8:29:24	45	19.04	77.9	7.22	6.16	6.8	80.9	0.1	3.7	0.074
		8:28:46	50	18.94	78.0	7.24	6.16	6.9	81.3	0.2	2.6	0.071
		8:27:45	55	18.85	78.2	7.27	6.14	7.7	82.1	0.5	3.3	0.069
		8:26:23	60	18.81	78.7	7.32	6.14	7.9	81.5	0.2	3.7	0.069
		8:25:38	65	18.66	79.6	7.43	6.14	7.5	81.6	0.9	2.4	0.065
		8:24:45	70	18.50	79.4	7.44	6.21	4.2	81.4	0.9	3.6	0.069
		8:23:38	75	18.40	79.9	7.5	6.24	2.4	80.2	0.9	3.6	0.072
		8:22:34	80	18.23	77.5	7.3	6.24	2.2	79.9	14.7	3.8	0.071
		8:20:17	85	18.19	79.6	7.51	6.32	-1.8	82	6.5	3.2	0.069

2022 F.E. Walter Water Quality Profiles

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	Cond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
WA-6 Bear Creek Lake Arm	7/13/2022	8:46:07	0.5	24.88	91.0	7.54	6.66	-19.6	85.6	0.0	4.3	0.086
		8:45:13	5	24.66	89.9	7.48	6.55	-13.6	89.2	0.0	4.9	0.086
		8:44:09	10	24.51	88.4	7.37	6.50	-10.8	87.9	0.0	4.8	0.086
		8:42:55	15	23.18	75.8	6.48	6.34	-2.3	91.1	0.0	2.9	0.083
		8:41:57	20	22.21	71.6	6.23	6.30	-0.5	91.6	0.0	3.1	0.083
		8:41:05	25	21.58	69.7	6.14	6.29	0.3	91.5	0.0	2.7	0.083
		8:40:12	30	21.09	68.7	6.11	6.25	1.9	93.0	0.0	3.4	0.081
		8:38:46	35	20.67	67.3	6.04	6.24	2.4	92.3	0.1	2.6	0.077
		8:37:54	40	20.43	66.0	5.95	6.23	3.3	93.2	0.1	3.0	0.075
		8:36:09	45	20.16	64.1	5.81	6.15	7.4	95.4	0.0	2.4	0.075
		8:35:47	50	19.93	63.0	5.74	6.19	5.4	93.7	0.3	2.3	0.074
		8:35:04	55	19.68	61.5	5.62	6.20	4.8	93.6	0.2	2.7	0.073
		8:33:18	60	19.39	58.4	5.38	6.22	3.3	94.4	3.5	2.7	0.072
		8:31:55	65	19.30	59.5	5.49	6.31	-1.1	91.0	2.3	3.1	0.078
		8:30:41	70	19.19	58.4	5.40	6.35	-3.3	88.7	4.0	2.8	0.079
WA-6 Bear Creek Lake Arm	8/17/2022	9:28:51	0.5	24.64	81.9	6.81	6.51	-11.4	140.4	0.4	2.3	0.095
		9:27:15	5	24.64	81.6	6.78	6.52	-12.0	137.9	0.3	1.1	0.095
		9:26:03	10	24.62	81.3	6.76	6.51	-11.3	137.2	0.0	1.7	0.095
		9:24:35	15	24.62	80.2	6.68	6.39	-5.2	143.1	0.5	1.9	0.095
		9:23:45	20	24.60	77.9	6.49	6.37	-3.9	143.1	0.5	1.9	0.094
		9:22:27	25	24.48	66.9	5.58	6.27	1.3	147.1	0.5	1.4	0.094
		9:21:12	30	24.36	61.8	5.16	6.27	1.6	146.4	0.9	1.9	0.096
		9:19:46	35	24.11	59.0	4.96	6.24	3.4	148.8	1.1	1.9	0.098
		9:15:03	40	23.93	57.5	4.85	6.24	3.0	146.7	0.9	2	0.1
		9:12:48	45	23.76	59.2	5.01	6.23	3.5	146.0	1.8	1.4	0.099
		9:12:00	50	23.71	58.7	4.97	6.23	3.9	145.9	3.1	1.3	0.098
		9:10:30	55	23.53	59.0	5.01	6.22	4.3	145.5	5.9	1.8	0.097
		9:08:51	60	23.28	56.9	4.85	6.21	4.5	144.8	10.5	1.9	0.098
WA-6 Bear Creek Lake Arm	9/14/2022	9:38:14	0.5	21.17	83.2	7.39	6.48	-10.1	141.3	1.9	3.3	0.093
		9:37:33	5	21.02	82.2	7.32	6.52	-12.1	138.2	1.4	3.4	0.092
		9:36:34	10	20.96	78.0	6.96	6.46	-9.4	141.0	1.0	3.1	0.093
		9:35:56	15	20.84	76.2	6.81	6.4	-5.9	144.7	2.0	3.8	0.096
		9:35:02	20	20.65	74.8	6.71	6.46	-9.2	140.3	1.5	3.5	0.095
		9:34:10	25	20.46	74.9	6.75	6.43	-7.4	142.3	2.0	3.7	0.094
		9:32:52	30	20.30	75.4	6.81	6.43	-7.6	141.5	2.8	3.5	0.095
		9:30:57	35	20.15	75.7	6.86	6.43	-7.4	140.8	2.8	3.2	0.094
		9:29:44	40	20.03	76.8	6.98	6.41	-6.5	141.4	4.4	3.2	0.094
		9:28:37	45	19.94	78.1	7.11	6.37	-4.6	143.5	3.4	2.9	0.09
		9:27:40	50	19.66	78.9	7.22	6.38	-5.0	142.4	3.8	2.7	0.089
		9:26:33	55	19.60	79.4	7.28	6.36	-3.7	142.6	3.9	3.5	0.09
		9:25:31	60	19.45	79.5	7.30	6.37	-4.6	139.9	4.5	4.1	0.085
		9:24:09	65	19.32	78.9	7.27	6.36	-4.0	136.0	7.2	3.5	0.083
		9:23:02	70	19.13	80.0	7.40	6.38	-5.2	135.1	24.5	4.3	0.08

2022 F.E. Walter Water Quality Profiles

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	Cond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
WA-7 Lehigh Lake Arm	5/11/2022	10:07:46	0.5	14.77	101.3	10.26	6.45	-9.2	70.5	0.7	2.8	0.070
		10:06:55	5	14.35	99.4	10.17	6.42	-7.5	70.3	0.5	4.7	0.069
		10:06:12	10	13.75	98.8	10.23	6.37	-4.9	70.3	0.7	3.6	0.068
		10:05:28	15	13.15	97.3	10.22	6.27	-0.1	71.8	1.5	4.3	0.066
		10:04:26	20	12.63	96.0	10.19	6.33	-3.2	70.6	0.8	4.0	0.066
		10:02:33	25	12.15	95.7	10.28	6.23	1.8	71.6	1.2	4.2	0.064
		10:01:24	30	12.00	95.2	10.25	6.27	-0.2	71.0	1.1	3.9	0.064
		10:00:00	35	11.68	93.8	10.18	6.23	1.8	71.2	0.7	3.4	0.063
		9:59:20	40	11.57	92.6	10.08	6.21	3.1	71.9	0.7	3.5	0.064
		9:58:02	45	11.40	92.4	10.09	6.25	0.8	71.6	0.7	2.8	0.064
		9:56:06	50	11.37	92.3	10.09	6.18	4.3	72.5	0.8	3.4	0.064
		9:54:58	55	11.35	92.8	10.15	6.16	5.5	72.8	1.0	3.0	0.063
		9:53:32	60	11.13	92.7	10.19	6.21	3.0	72.6	1.4	4.2	0.063
		9:51:52	65	10.91	92.2	10.19	6.18	4.4	72.7	1.5	4.3	0.061
		9:50:51	70	10.75	91.3	10.12	6.19	3.9	72.6	1.2	4.2	0.061
		9:49:37	75	10.69	91.0	10.11	6.18	4.6	73.4	1.4	4.5	0.060
		9:48:24	80	10.46	90.6	10.11	6.20	3.4	73.7	1.9	4.2	0.059
WA-7 Lehigh Lake Arm	6/15/2022	9:46:58	85	10.38	90.0	10.06	6.26	0.3	74.1	3.4	4.3	0.060
		9:04:36	0.5	22.79	95.0	8.18	6.45	-8.6	80.3	0.0	3.8	0.081
		9:03:52	5	22.38	92.4	8.02	6.4	-5.7	80.7	0.0	3.2	0.080
		9:02:59	10	21.54	88.6	7.81	6.33	-2.2	80.5	0.0	3.2	0.079
		9:01:30	15	20.40	80.4	7.25	6.24	2.6	80.9	0.0	4.0	0.077
		9:00:40	20	19.84	78.4	7.15	6.22	3.8	80.7	0.0	3.6	0.076
		9:00:00	25	19.54	78.7	7.22	6.21	3.8	81.2	0.0	3.7	0.076
		8:59:14	30	19.36	79.3	7.30	6.2	4.6	82.1	0.0	4.0	0.076
		8:58:40	35	19.26	79.6	7.35	6.24	2.3	80.5	0.0	3.7	0.075
		8:57:56	40	19.12	79.8	7.38	6.23	3.1	81.7	0.4	4.1	0.076
		8:56:39	45	19.04	80.6	7.47	6.24	2.6	81.1	0.5	4.1	0.076
		8:56:02	50	18.92	80.9	7.51	6.25	1.9	81.2	0.0	4.3	0.075
		8:55:16	55	18.72	82.1	7.66	6.25	1.9	81.3	0.5	3.9	0.076
		8:54:35	60	18.63	82.7	7.73	6.27	0.7	80.9	0.4	3.6	0.076
		8:53:54	65	18.56	82.8	7.74	6.28	0.1	80.6	0.4	4.2	0.077
		8:53:05	70	18.46	82.1	7.70	6.24	2.2	82.3	0.4	3.9	0.077
		8:52:19	75	18.37	80.6	7.57	6.25	1.6	81.5	0.8	4.2	0.075
WA-7 Lehigh Lake Arm	7/13/2022	8:51:30	80	18.25	78.2	7.37	6.22	3.2	82.8	1.5	4.0	0.075
		8:50:42	85	18.18	76.3	7.19	6.25	1.7	82.6	8.8	3.4	0.076
		8:49:49	90	18.07	76.1	7.19	6.33	-2.6	81.7	11.1	3.8	0.078
		9:15:20	0.5	24.97	93.1	7.69	6.7	-21.5	86.4	0.1	4.8	0.091
		9:14:32	5	24.63	91.4	7.6	6.60	-16.3	89.8	0.0	9.0	0.090
		9:13:22	10	24.49	89.0	7.42	6.54	-12.9	87.4	0.0	3.7	0.089
		9:11:56	15	23.35	76.6	6.52	6.39	-5.1	89.7	0.0	3.3	0.089
		9:10:47	20	22.21	72.7	6.33	6.36	-3.5	89.5	0.0	2.8	0.092
		9:09:55	25	21.34	70.1	6.21	6.34	-2.5	89.7	0.0	3.1	0.091
		9:08:58	30	21.01	68.8	6.14	6.31	-1.2	89.8	0.0	3.3	0.089
		9:07:56	35	20.56	67.2	6.04	6.27	0.9	91.0	0.0	3.0	0.086
		9:07:06	40	20.34	66.5	6.01	6.28	0.6	90.7	0.0	3.4	0.087
		9:05:42	45	20.12	66.1	5.99	6.26	1.7	90.9	0.0	3.2	0.081
		9:04:33	50	19.93	65.8	5.99	6.27	1.0	90.5	0.0	3.7	0.078
		9:03:14	55	19.83	63.0	5.74	6.26	1.7	90.3	0.0	3.5	0.082
		9:02:21	60	19.63	61.0	5.59	6.25	1.8	90.3	0.0	3.4	0.082
		9:01:16	65	19.44	56.2	5.17	6.23	2.8	91.3	0.7	3.5	0.083
		9:00:20	70	19.32	52.3	4.82	6.25	1.9	91.4	1.2	3.3	0.084
		8:59:06	75	19.18	50.5	4.67	6.29	-0.1	92.8	2.3	2.8	0.083

2022 F.E. Walter Water Quality Profiles

Station	Date	Time	Depth	Temp	DO	DO	pH	pHmV	ORP	Turbidity	Chloro.	Cond
	M/D/Y	hh:mm:ss	ft	C	%	mg/L		mV	mV	NTU	ug/L	mS/cm
WA-7 Lehigh Lake Arm	8/17/2022	8:52:10	0.5	24.44	77.7	6.49	6.48	-10	142.5	0.4	2.3	0.097
		8:51:05	5	24.45	78.1	6.52	6.57	-14.8	135.8	0.5	1.9	0.097
		8:49:40	10	24.45	78.7	6.57	6.57	-14.8	134.5	0.7	1.9	0.096
		8:48:22	15	24.45	77.5	6.47	6.54	-13.1	135.3	0.4	1.8	0.097
		8:47:19	20	24.44	75.4	6.30	6.46	-8.8	140.0	0.5	2.6	0.097
		8:46:33	25	24.43	72.1	6.02	6.47	-9.1	139.0	0.0	2.0	0.098
		8:45:48	30	24.33	72.9	6.10	6.47	-9.3	138.1	1.1	2.5	0.098
		8:43:46	35	24.10	59.5	5.00	6.39	-5.2	140.9	0.5	1.9	0.099
		8:42:49	40	23.99	61.3	5.16	6.42	-6.8	138.6	1.1	2.2	0.102
		8:41:00	45	23.82	63.5	5.36	6.42	-6.6	137.6	1.2	1.2	0.103
		8:40:14	50	23.54	62.8	5.33	6.41	-6.2	137.2	2.3	2.6	0.101
		8:39:23	55	23.19	71.4	6.11	6.43	-7.4	134.5	3.4	1.8	0.104
		8:37:57	60	22.54	75.5	6.53	6.41	-6.4	128.2	10.0	2.2	0.107
WA-7 Lehigh Lake Arm	9/14/2022	10:18:55	0.5	21.13	84	7.47	6.32	-1.8	149.7	0.8	3	0.093
		10:17:42	5	21.04	81.3	7.24	6.38	-5.1	145.2	0.8	3.9	0.094
		10:15:51	10	20.80	83.8	7.50	6.38	-4.7	146.2	1.9	3.3	0.095
		10:15:07	15	20.63	83.1	7.46	6.37	-4.2	146.3	1.7	3.7	0.096
		10:13:04	20	20.43	78.7	7.09	6.31	-1.0	149.4	1.4	4	0.098
		10:12:04	25	20.29	78.6	7.10	6.30	-0.5	150.6	1.6	4.1	0.098
		10:10:48	30	20.19	81.9	7.42	6.29	-0.4	151.7	1.5	4.5	0.097
		10:09:58	35	20.09	81.9	7.43	6.27	0.7	153.7	1.9	4	0.097
		10:08:40	40	19.91	81.9	7.45	6.33	-2.5	150.2	1.8	4.6	0.096
		10:07:38	45	19.85	80.7	7.36	6.49	-10.7	139.7	1.6	4.2	0.096
		10:06:57	50	19.78	80.9	7.38	6.47	-9.9	140.2	1.4	3.6	0.096
		10:05:59	55	19.74	80.8	7.39	6.42	-7.0	143.8	1.6	4.1	0.095
		10:04:30	60	19.72	83.9	7.67	6.47	-9.8	138.9	2.0	4.6	0.093
		10:03:23	65	19.53	84.6	7.76	6.49	-11.0	135.3	4.5	4.9	0.087
		10:01:28	70	19.48	83.8	7.70	6.49	-10.9	134.5	15.7	5.8	0.087



Possible Sampling Collection Error

APPENDIX B

**FE WALTER RESERVOIR 2022
LABORATORY CUSTODY SHEETS**



M.J. Reider Associates, Inc.

ENVIRONMENTAL TESTING LABORATORY
U.S. EPA/PA DEP #06-00003

Certificate of Analysis

Laboratory No.: 2216594

Report: 05/23/22

Lab Contact: Richard A Wheeler

Attention: David Wertz

Project: 2022 - Walter Reservoir

Reported To: Tetra Tech

USACE, Phila Dist. Env.Resources Branch 100 Penn Square E.
Arlington, VA 22201

Lab ID: 2216594-01

Collected By: Client

Sampled: 05/11/22 10:50

Received: 05/11/22 14:15

Sample Desc: WA-1S

Sample Type: Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst	
Dissolved General Chemistry									
Phosphorus as P, Dissolved	0.01	mg/l		0.01	SM 4500-P F	05/12/22	G-23, G-24	AXM	
General Chemistry									
Alkalinity, Total to pH 4.5	5	mg CaCO3/L		2	SM 2320 B	05/12/22	C-51d	APR	
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	05/13/22	U	MRW	
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/11/22 16:12		KMS	
Nitrate as N	0.26	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	05/11/22 22:14	J	JAF	
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/11/22 22:14	U	JAF	
Nitrate+Nitrite as N	<0.27	mg/l	0.122	1.10	CALCULATED	05/11/22 22:14		JAF	
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	05/17/22	Q-10, U	SNF	
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/13/22		MRW	
Solids, Total Dissolved	65	mg/l	4	5	SM 2540 C	05/12/22		TMH	
Total Organic Carbon	5.3	mg/l	0.3	0.5	SM 5310 C	05/16/22		ALD	
Solids, Total Suspended	6	mg/l	1	1	SM 2540 D	05/12/22		TMH	
	Result	Unit	Rep. Limit		Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology									
Escherichia coli	72	mpn/100ml	1		SM 9223 B/Quantitray	5/11/22 15:36	5/12/22 11:11		JMW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	5/11/22 15:36	5/12/22 11:11		JMW



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Additional accreditations by MD (261), NY(12094)

M.J. Reider Associates, Inc.

Lab ID: 2216594-02 **Collected By:** Client **Sampled:** 05/11/22 08:10 **Received:** 05/11/22 14:15
Sample Desc: WA-2S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	05/12/22	G-23, G-24	AXM
General Chemistry								
Alkalinity, Total to pH 4.5	6	mg CaCO ₃ /L		2	SM 2320 B	05/12/22	C-51g	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	05/13/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/11/22 16:12		KMS
Nitrate as N	0.28	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	05/11/22 18:52	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/11/22 18:52	U	JAF
Nitrate+Nitrite as N	<0.29	mg/l	0.122	1.10	CALCULATED	05/11/22 18:52		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	05/17/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/13/22		MRW
Solids, Total Dissolved	49	mg/l	4	5	SM 2540 C	05/12/22		TMH
Total Organic Carbon	4.4	mg/l	0.3	0.5	SM 5310 C	05/16/22		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	05/12/22		TMH
Microbiology								
Escherichia coli	<1	mpn/100ml	1		SM 9223 B/Quantitray	5/11/22 15:36	5/12/22 11:11	JMW
Total Coliform	192	mpn/100ml	1		SM 9223 B/Quantitray	5/11/22 15:36	5/12/22 11:11	JMW



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Additional accreditations by MD (261), NY(12094)

M.J. Reider Associates, Inc.

Lab ID: 2216594-03 **Collected By:** Client **Sampled:** 05/11/22 08:10 **Received:** 05/11/22 14:15
Sample Desc: WA-2M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.02	mg/l		0.01	SM 4500-P F	05/12/22	G-23, G-24	AXM
General Chemistry								
Alkalinity, Total to pH 4.5	4	mg CaCO ₃ /L		2	SM 2320 B	05/12/22	C-51a	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	05/13/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/11/22 16:12		KMS
Nitrate as N	0.24	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	05/11/22 21:40	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/11/22 21:40	U	JAF
Nitrate+Nitrite as N	<0.25	mg/l	0.122	1.10	CALCULATED	05/11/22 21:40		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	05/17/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/13/22		MRW
Solids, Total Dissolved	52	mg/l	4	5	SM 2540 C	05/12/22		TMH
Total Organic Carbon	4.2	mg/l	0.3	0.5	SM 5310 C	05/16/22		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	05/12/22		TMH

Lab ID: 2216594-04 **Collected By:** Client **Sampled:** 05/11/22 08:10 **Received:** 05/11/22 14:15
Sample Desc: WA-2D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	05/12/22	G-23, G-24	AXM
General Chemistry								
Alkalinity, Total to pH 4.5	5	mg CaCO ₃ /L		2	SM 2320 B	05/12/22	C-51c	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	05/13/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/11/22 16:13		KMS
Nitrate as N	0.26	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	05/11/22 21:06	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/11/22 21:06	U	JAF
Nitrate+Nitrite as N	<0.27	mg/l	0.122	1.10	CALCULATED	05/11/22 21:06		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	05/17/22	U	SNF
Phosphorus as P, Total	0.02	mg/l	0.01	0.01	SM 4500-P F	05/13/22		MRW
Solids, Total Dissolved	51	mg/l	4	5	SM 2540 C	05/12/22		TMH
Total Organic Carbon	5.9	mg/l	0.3	0.5	SM 5310 C	05/16/22		ALD
Solids, Total Suspended	29	mg/l	1	1	SM 2540 D	05/12/22		TMH



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M.J. Reider Associates, Inc.

Lab ID: 2216594-05 **Collected By:** Client **Sampled:** 05/11/22 11:05 **Received:** 05/11/22 14:15
Sample Desc: WA-3S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.01	mg/l		0.01	SM 4500-P F	05/12/22	G-23, G-24	AXM
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO ₃ /L		2	SM 2320 B	05/12/22	C-51i	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	05/13/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/11/22 16:12		KMS
Nitrate as N	0.30	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	05/11/22 23:21	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/11/22 23:21	U	JAF
Nitrate+Nitrite as N	<0.31	mg/l	0.122	1.10	CALCULATED	05/11/22 23:21		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	05/17/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/13/22		MRW
Solids, Total Dissolved	69	mg/l	4	5	SM 2540 C	05/12/22		TMH
Total Organic Carbon	7.3	mg/l	0.3	0.5	SM 5310 C	05/16/22		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	05/12/22		TMH
Microbiology								
Escherichia coli	22	mpn/100ml	1		SM 9223 B/Quantitray	5/11/22 15:36	5/12/22 11:11	JMW
Total Coliform	1990	mpn/100ml	1		SM 9223 B/Quantitray	5/11/22 15:36	5/12/22 11:11	JMW



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M.J. Reider Associates, Inc.

Lab ID: 2216594-06 Collected By: Client Sampled: 05/11/22 11:40 Received: 05/11/22 14:15
Sample Desc: WA-4S Sample Type: Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	05/12/22	G-23, G-24	AXM
General Chemistry								
Alkalinity, Total to pH 4.5	6	mg CaCO ₃ /L		2	SM 2320 B	05/12/22	C-51h	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	05/13/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/11/22 16:13		KMS
Nitrate as N	0.26	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	05/11/22 19:08	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/11/22 19:08	U	JAF
Nitrate+Nitrite as N	<0.27	mg/l	0.122	1.10	CALCULATED	05/11/22 19:08		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	05/17/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/13/22		MRW
Solids, Total Dissolved	23	mg/l	4	5	SM 2540 C	05/12/22		TMH
Total Organic Carbon	5.2	mg/l	0.3	0.5	SM 5310 C	05/16/22		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	05/12/22		TMH
Microbiology								
Escherichia coli	3	mpn/100ml	1		SM 9223 B/Quantitray	5/11/22 15:36	5/12/22 11:11	JMW
Total Coliform	1550	mpn/100ml	1		SM 9223 B/Quantitray	5/11/22 15:36	5/12/22 11:11	JMW



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Lab ID: 2216594-07 **Collected By:** Client **Sampled:** 05/11/22 11:50 **Received:** 05/11/22 14:15
Sample Desc: WA-5S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.01	mg/l		0.01	SM 4500-P F	05/12/22	G-23, G-24	AXM
General Chemistry								
Alkalinity, Total to pH 4.5	3	mg CaCO ₃ /L		2	SM 2320 B	05/12/22	C-51	APR
Ammonia as N	0.07	mg/l	0.02	0.02	EPA 350.1	05/13/22		MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/11/22 16:12		KMS
Nitrate as N	0.20	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	05/11/22 21:23	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/11/22 21:23	U	JAF
Nitrate+Nitrite as N	<0.21	mg/l	0.122	1.10	CALCULATED	05/11/22 21:23		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	05/17/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/13/22		MRW
Solids, Total Dissolved	22	mg/l	4	5	SM 2540 C	05/12/22		TMH
Total Organic Carbon	3.8	mg/l	0.3	0.5	SM 5310 C	05/16/22		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	05/12/22		TMH
Microbiology								
Escherichia coli	<1	mpn/100ml	1		SM 9223 B/Quantitray	5/11/22 15:36	5/12/22 11:11	JMW
Total Coliform	1730	mpn/100ml	1		SM 9223 B/Quantitray	5/11/22 15:36	5/12/22 11:11	JMW



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Lab ID: 2216594-08 **Collected By:** Client **Sampled:** 05/11/22 09:00 **Received:** 05/11/22 14:15
Sample Desc: WA-6S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	05/12/22	G-23, G-24	AXM
General Chemistry								
Alkalinity, Total to pH 4.5	5	mg CaCO ₃ /L		2	SM 2320 B	05/12/22	C-51e	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	05/13/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/11/22 16:12		KMS
Nitrate as N	0.28	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	05/11/22 22:47	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/11/22 22:47	U	JAF
Nitrate+Nitrite as N	<0.29	mg/l	0.122	1.10	CALCULATED	05/11/22 22:47		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	05/17/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/13/22		MRW
Solids, Total Dissolved	45	mg/l	4	5	SM 2540 C	05/12/22		TMH
Total Organic Carbon	4.1	mg/l	0.3	0.5	SM 5310 C	05/16/22		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	05/12/22		TMH
Microbiology								
Escherichia coli	1	mpn/100ml	1		SM 9223 B/Quantitray	5/11/22 15:36	5/12/22 11:11	JMW
Total Coliform	179	mpn/100ml	1		SM 9223 B/Quantitray	5/11/22 15:36	5/12/22 11:11	JMW



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M.J. Reider Associates, Inc.

Lab ID: 2216594-09 **Collected By:** Client **Sampled:** 05/11/22 09:00 **Received:** 05/11/22 14:15
Sample Desc: WA-6M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	05/12/22	G-23, G-24	AXM
General Chemistry								
Alkalinity, Total to pH 4.5	4	mg CaCO ₃ /L		2	SM 2320 B	05/12/22	C-51b	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	05/13/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/11/22 16:13		KMS
Nitrate as N	0.24	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	05/12/22 0:11	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/12/22 0:11	U	JAF
Nitrate+Nitrite as N	<0.25	mg/l	0.122	1.10	CALCULATED	05/12/22 0:11		JAF
Nitrogen, Total Kjeldahl (TKN)	1.48	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	05/17/22		SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/13/22		MRW
Solids, Total Dissolved	30	mg/l	4	5	SM 2540 C	05/12/22		TMH
Total Organic Carbon	4.1	mg/l	0.3	0.5	SM 5310 C	05/16/22		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	05/12/22		TMH

Lab ID: 2216594-10 **Collected By:** Client **Sampled:** 05/11/22 09:00 **Received:** 05/11/22 14:15
Sample Desc: WA-6D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	05/12/22	G-23, G-24	AXM
General Chemistry								
Alkalinity, Total to pH 4.5	4	mg CaCO ₃ /L		2	SM 2320 B	05/12/22	C-51a	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	05/13/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/11/22 16:13		KMS
Nitrate as N	0.24	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	05/11/22 22:30	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/11/22 22:30	U	JAF
Nitrate+Nitrite as N	<0.25	mg/l	0.122	1.10	CALCULATED	05/11/22 22:30		JAF
Nitrogen, Total Kjeldahl (TKN)	0.44	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	05/17/22	J	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/13/22		MRW
Solids, Total Dissolved	37	mg/l	4	5	SM 2540 C	05/12/22		TMH
Total Organic Carbon	4.5	mg/l	0.3	0.5	SM 5310 C	05/17/22		ALD
Solids, Total Suspended	34	mg/l	1	1	SM 2540 D	05/12/22		TMH



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Lab ID: 2216594-11 **Collected By:** Client **Sampled:** 05/11/22 09:35 **Received:** 05/11/22 14:15
Sample Desc: WA-7S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	05/12/22	G-23, G-24	AXM
General Chemistry								
Alkalinity, Total to pH 4.5	6	mg CaCO ₃ /L		2	SM 2320 B	05/12/22	C-51f	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	05/13/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/11/22 16:13		KMS
Nitrate as N	0.28	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	05/11/22 21:57	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/11/22 21:57	U	JAF
Nitrate+Nitrite as N	<0.29	mg/l	0.122	1.10	CALCULATED	05/11/22 21:57		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	05/17/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/13/22		MRW
Solids, Total Dissolved	39	mg/l	4	5	SM 2540 C	05/12/22		TMH
Total Organic Carbon	4.5	mg/l	0.3	0.5	SM 5310 C	05/17/22		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	05/12/22		TMH
Microbiology								
Escherichia coli	3	mpn/100ml	1		SM 9223 B/Quantitray	5/11/22 15:36	5/12/22 11:11	JMW
Total Coliform	214	mpn/100ml	1		SM 9223 B/Quantitray	5/11/22 15:36	5/12/22 11:11	JMW



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M.J. Reider Associates, Inc.

Lab ID: 2216594-12 **Collected By:** Client **Sampled:** 05/11/22 09:35 **Received:** 05/11/22 14:15
Sample Desc: WA-7M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	05/12/22	G-23, G-24	AXM
General Chemistry								
Alkalinity, Total to pH 4.5	6	mg CaCO ₃ /L		2	SM 2320 B	05/12/22	C-51g	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	05/13/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/11/22 16:13		KMS
Nitrate as N	0.28	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	05/11/22 23:04	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/11/22 23:04	U	JAF
Nitrate+Nitrite as N	<0.29	mg/l	0.122	1.10	CALCULATED	05/11/22 23:04		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	05/17/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/13/22		MRW
Solids, Total Dissolved	49	mg/l	4	5	SM 2540 C	05/12/22		TMH
Total Organic Carbon	5.2	mg/l	0.3	0.5	SM 5310 C	05/17/22		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	05/12/22		TMH

Lab ID: 2216594-13 **Collected By:** Client **Sampled:** 05/11/22 09:35 **Received:** 05/11/22 14:15
Sample Desc: WA-7D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	05/12/22	G-23, G-24	AXM
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO ₃ /L		2	SM 2320 B	05/12/22	C-51i	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	05/13/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	05/11/22 16:12		KMS
Nitrate as N	0.27	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	05/11/22 20:16	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	05/11/22 20:16	U	JAF
Nitrate+Nitrite as N	<0.28	mg/l	0.122	1.10	CALCULATED	05/11/22 20:16		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	05/17/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	05/13/22		MRW
Solids, Total Dissolved	52	mg/l	4	5	SM 2540 C	05/12/22		TMH
Total Organic Carbon	6.8	mg/l	0.3	0.5	SM 5310 C	05/17/22		ALD
Solids, Total Suspended	8	mg/l	1	1	SM 2540 D	05/12/22		TMH



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Preparation Methods

Specific Method	Preparation Method	Prep Batch	Prepared Date	Prepared By
2216594-01				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2E0639	05/11/2022	SNF
General Chemistry				
SM 4500-P F	SM 4500-P B	B2E0767	05/13/2022	MRW
2216594-02				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2E0639	05/11/2022	SNF
General Chemistry				
SM 4500-P F	SM 4500-P B	B2E0767	05/13/2022	MRW
2216594-03				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2E0639	05/11/2022	SNF
General Chemistry				
SM 4500-P F	SM 4500-P B	B2E0767	05/13/2022	MRW
2216594-04				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2E0639	05/11/2022	SNF
General Chemistry				
SM 4500-P F	SM 4500-P B	B2E0767	05/13/2022	MRW
2216594-05				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2E0639	05/11/2022	SNF
General Chemistry				
SM 4500-P F	SM 4500-P B	B2E0767	05/13/2022	MRW
2216594-06				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2E0639	05/11/2022	SNF
General Chemistry				
SM 4500-P F	SM 4500-P B	B2E0767	05/13/2022	MRW
2216594-07				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2E0639	05/11/2022	SNF
General Chemistry				
SM 4500-P F	SM 4500-P B	B2E0767	05/13/2022	MRW
2216594-08				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2E0639	05/11/2022	SNF
General Chemistry				
SM 4500-P F	SM 4500-P B	B2E0767	05/13/2022	MRW
2216594-09				



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Dissolved General Chemistry

SM 4500-P F	SM 4500-P B	B2E0639	05/11/2022	SNF
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General Chemistry

SM 4500-P F	SM 4500-P B	B2E0767	05/13/2022	MRW
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2216594-10

Dissolved General Chemistry

SM 4500-P F	SM 4500-P B	B2E0639	05/11/2022	SNF
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General Chemistry

SM 4500-P F	SM 4500-P B	B2E0767	05/13/2022	MRW
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2216594-11

Dissolved General Chemistry

SM 4500-P F	SM 4500-P B	B2E0639	05/11/2022	SNF
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General Chemistry

SM 4500-P F	SM 4500-P B	B2E0767	05/13/2022	MRW
-------------	-------------	---------	------------	-----

2216594-12

Dissolved General Chemistry

SM 4500-P F	SM 4500-P B	B2E0639	05/11/2022	SNF
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General Chemistry

SM 4500-P F	SM 4500-P B	B2E0767	05/13/2022	MRW
-------------	-------------	---------	------------	-----

2216594-13

Dissolved General Chemistry

SM 4500-P F	SM 4500-P B	B2E0639	05/11/2022	SNF
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General Chemistry

SM 4500-P F	SM 4500-P B	B2E0767	05/13/2022	MRW
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Notes and Definitions

- C-51 The alkalinity to pH 4.2 = 2.6 mg CaCO₃/L.
- C-51a The alkalinity to pH 4.2 = 3.6 mg CaCO₃/L.
- C-51b The alkalinity to pH 4.2 = 3.7 mg CaCO₃/L.
- C-51c The alkalinity to pH 4.2 = 4.6 mg CaCO₃/L.
- C-51d The alkalinity to pH 4.2 = 4.8 mg CaCO₃/L.
- C-51e The alkalinity to pH 4.2 = 5.4 mg CaCO₃/L.
- C-51f The alkalinity to pH 4.2 = 5.6 mg CaCO₃/L.
- C-51g The alkalinity to pH 4.2 = 5.8 mg CaCO₃/L.
- C-51h The alkalinity to pH 4.2 = 6.5 mg CaCO₃/L.
- C-51i The alkalinity to pH 4.2 = 6.7 mg CaCO₃/L.
- G-23 The sample was filtered after it was received at the laboratory and outside of the 15-minute hold time.
- G-24 The sample was preserved in the laboratory and outside of the 15-minute hold time.
- J Estimated value
- Q-10 The matrix spike(s) were outside acceptable limits of 90-110% recovery at 118% and 119%.
- U Analyte was not detected above the indicated value.



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610-374-5129 www.mjreider.com**WORK ORDER
Chain of Custody****2216594**Client Code: **3157**Project Manager: **Richard A Wheeler**

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

Client: **Tetra Tech**Project: **2022 - Walter Reservoir**

Collected By :

(Full Name)

Gregory Wacik

Comments: _____

2216594-01 WA-1S*AK*
AK
AK
BOD SM 5210B, EC (#) SM 9223B Confirmation, NO₂-N EPA 300.0, NO₃-N EPA 300.0, PO₄-D SM 4500P-F, TC (#) SM 9223B, NO₂-N, NO₃-N, Combined NO₃+NO₂
Alk SM 2320B, NH₃-N EPA 350.1, TDS SM 2540C, TKN EPA 351.2, PO₄ SM 4500P-F, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date: *5/11/22*Time: *1050*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**2216594-02 WA-2S***AK*
AK
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
TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D, Alk SM 2320B, NH₃-N EPA 350.1, PO₄ SM 4500P-F, TDS SM 2540C

Matrix: Non-Potable Water

Type: Grab

Date: *5/11/22*Time: *0810*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

Relinquished By

Date/Time

Relinquished By

Date/Time

Received By

Date/Time

Received By

Date/Time

Received at Laboratory By

Date/Time

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.

Sample Kit Prepared By: <i>JBS</i>	Date/Time
Sample Temp (°C): <i>3.3</i>	
Samples on Ice? <i>Yes</i>	Yes No NA
Approved By: <i>JBS</i>	
Entered By: <i>JBS</i>	



M.J. Reider Associates, Inc.

2216594

Client Code: 3157
Project Manager: Richard A Wheeler

Client: Tetra Tech
Project: 2022 - Walter Reservoir

Collected By : Gregory Wacik
(Full Name)

Comments: _____

2216594-03 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 EPA 350.1, PO4 SM 4500P-F, TOC SM 5310C, TSS SM 2540D, TDS SM 2540C, TKN EPA 351.2

Matrix: Non-Potable Water

Type: Grab

Date: 5/11/22
Time: 0810

- 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

2216594-04 WA-2D

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

Matrix: Non-Potable Water

Type: Grab

Date: 5/11/22
Time: 0810

- 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

2216594-05 WA-3S

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

Matrix: Non-Potable Water

Type: Grab

Date: 5/11/22
Time: 1105

- 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 [Signature] Date/Time 5/11/22 1245

Received By [Signature] Date/Time 5-11-22 1245

Relinquished By _____ Date/Time _____

Received By _____ Date/Time _____

Relinquished By _____ Date/Time _____

Received at Laboratory By [Signature] Date/Time 5-11-22 1415

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.

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	<u>3.3</u>
Samples on Ice?	<u>Yes</u> No NA
Approved By:	<u>[Signature]</u>
Entered By:	<u>[Signature]</u>



M.J. Reider Associates, Inc.

2216594

Client Code: 3157
Project Manager: Richard A Wheeler

Client: Tetra Tech
Project: 2022 - Walter Reservoir

Comments: _____

Collected By : Gregory Wacik
(Full Name)

2216594-06 WA-4S

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

Matrix: Non-Potable Water

Type: Grab

Date: 5/11/22
Time: 1140

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

2216594-07 WA-5S

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

Matrix: Non-Potable Water

Type: Grab

Date: 5/11/22
Time: 1150

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

2216594-08 WA-6S

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

Matrix: Non-Potable Water

Type: Grab

Date: 5/11/22
Time: 0900

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

Relinquished By: [Signature] Date/Time: 5/11/22 1245

Received By: [Signature] Date/Time: 5-11-22 1245

Relinquished By: _____ Date/Time: _____

Received By: _____ Date/Time: _____

Relinquished By: _____ Date/Time: _____

Received at Laboratory By: [Signature] Date/Time: 5-11-22 1415

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	3.3
Samples on Ice?	Yes No NA
Approved By:	[Signature]
Entered By:	[Signature]

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.



M.J. Reider Associates, Inc.

2216594

Client Code: 3157

Project Manager: Richard A Wheeler

Client: Tetra Tech

Project: 2022 - Walter Reservoir

Collected By :

(Full Name)

Gregory Wacik

Comments:

2216594-09 WA-6M

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

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

5/11/22
0900

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

2216594-10 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 EPA 350.1, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

5/11/22
0900

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

2216594-11 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 EPA 350.1, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

5/11/22
0935

A - PI 500ml NP, minimal hdspc
B - PI Liter NP
C - Sterile PI 125ml NaThio
D - PI 500ml H2SO4
E - PI 250ml NP
F - PI 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

Relinquished By

Date/Time

Received By

Date/Time

Relinquished By

Date/Time

Received at Laboratory By

Date/Time

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	3.3
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.



M.J. Reider Associates, Inc.

2216594

Client Code: 3157

Project Manager: Richard A Wheeler

Client: Tetra Tech

Project: 2022 - Walter Reservoir

Comments: _____

Collected By : Gregory Wack
(Full Name)

2216594-12 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 EPA 350.1, TDS SM 2540C, TOC SM 5310C, TSS SM 2540D, TKN EPA 351.2, PO₄ SM 4500P-F

Matrix: Non-Potable Water

Type: Grab

Date: 5/11/22
Time: 0935

- 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

2216594-13 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 EPA 350.1, PO₄ SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date: 5/11/22
Time: 0935

- 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 [Signature] Date/Time 5/11/22 1245

Received By [Signature] Date/Time 5-11-22 1245

Relinquished By _____ Date/Time _____

Received By _____ Date/Time _____

Relinquished By _____ Date/Time _____

Received at Laboratory By [Signature] Date/Time 5-11-22 1415

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.

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	<u>3.3</u>
Samples on Ice?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
Approved By:	<u>[Signature]</u>
Entered By:	<u>[Signature]</u>

M.J. Reider Associates, Inc.**MJRA Terms & Conditions**

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

Sample Submission, Sample Acceptance & Sampling Containers

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

Turnaround Times (TAT)

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

Analytical Results, Sample Collection Integrity & Subcontracting

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

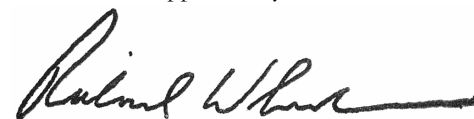
Payment Terms

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

Warranty & Litigation

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

Reviewed and Approved by:



Richard A Wheeler
Director of Field Services

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Additional accreditations by MD (261), NY(12094)



M.J. Reider Associates, Inc.

ENVIRONMENTAL TESTING LABORATORY
U.S. EPA/PA DEP #06-00003

Certificate of Analysis

Laboratory No.: 2216903

Report: 07/06/22

Lab Contact: Richard A Wheeler

Attention: David Wertz

Project: 2022 - Walter Reservoir

Reported To: Tetra Tech

USACE, Phila Dist. Env.Resources Branch 100 Penn Square E.
Arlington, VA 22201

Lab ID: 2216903-01

Collected By: Client

Sampled: 06/15/22 10:00

Received: 06/15/22 14:15

Sample Desc: WA-1S

Sample Type: Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	06/22/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO ₃ /L		2	SM 2320 B	06/17/22	C-51f	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	06/21/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/15/22 17:38		KMS
Nitrate as N	0.23	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/15/22 23:46	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/15/22 23:46	U	JAF
Nitrate+Nitrite as N	<0.24	mg/l	0.122	1.10	CALCULATED	06/15/22 23:46		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	06/17/22	U	SNF
Phosphorus as P, Total	0.02	mg/l	0.01	0.01	SM 4500-P F	06/21/22		MRW
Solids, Total Dissolved	57	mg/l	4	5	SM 2540 C	06/16/22		TMH
Total Organic Carbon	6.8	mg/l	0.3	0.5	SM 5310 C	06/16/22		ALD
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	06/16/22		ALD
Microbiology								
Escherichia coli	5	mpn/100ml	1		SM 9223 B/Quantitray	6/15/22 15:12	6/16/22 10:31	DRW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	6/15/22 15:12	6/16/22 10:31	DRW



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Additional accreditations by MD (261), NY(12094)

M.J. Reider Associates, Inc.

Lab ID: 2216903-02 **Collected By:** Client **Sampled:** 06/15/22 07:35 **Received:** 06/15/22 14:15
Sample Desc: WA-2S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	06/22/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	6	mg CaCO ₃ /L		2	SM 2320 B	06/17/22	C-51b	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	06/21/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/15/22 17:38		KMS
Nitrate as N	0.22	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/16/22 0:55	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/16/22 0:55	U	JAF
Nitrate+Nitrite as N	<0.23	mg/l	0.122	1.10	CALCULATED	06/16/22 0:55		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	06/17/22	U	SNF
Phosphorus as P, Total	0.01	mg/l	0.01	0.01	SM 4500-P F	06/21/22		MRW
Solids, Total Dissolved	47	mg/l	4	5	SM 2540 C	06/16/22		TMH
Total Organic Carbon	5.6	mg/l	0.3	0.5	SM 5310 C	06/16/22		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	06/16/22		ALD
Microbiology								
Escherichia coli	<1	mpn/100ml	1		SM 9223 B/Quantitray	6/15/22 15:12	6/16/22 10:31	DRW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	6/15/22 15:12	6/16/22 10:31	DRW



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Additional accreditations by MD (261), NY(12094)

M.J. Reider Associates, Inc.

Lab ID: 2216903-03 **Collected By:** Client **Sampled:** 06/15/22 07:35 **Received:** 06/15/22 14:15
Sample Desc: WA-2M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	06/22/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO ₃ /L		2	SM 2320 B	06/17/22	C-51f	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	06/21/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/15/22 17:50	C-40	KMS
Nitrate as N	0.22	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/15/22 22:21	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/15/22 22:21	U	JAF
Nitrate+Nitrite as N	<0.23	mg/l	0.122	1.10	CALCULATED	06/15/22 22:21		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	06/17/22	U	SNF
Phosphorus as P, Total	0.02	mg/l	0.01	0.01	SM 4500-P F	06/21/22		MRW
Solids, Total Dissolved	48	mg/l	4	5	SM 2540 C	06/16/22		TMH
Total Organic Carbon	6.9	mg/l	0.3	0.5	SM 5310 C	06/16/22		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	06/16/22		ALD

Lab ID: 2216903-04 **Collected By:** Client **Sampled:** 06/15/22 07:35 **Received:** 06/15/22 14:15
Sample Desc: WA-2D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	06/22/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO ₃ /L		2	SM 2320 B	06/17/22	C-51j	APR
Ammonia as N	0.07	mg/l	0.02	0.02	EPA 350.1	06/21/22		MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/15/22 17:38		KMS
Nitrate as N	0.23	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/16/22 1:13	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/16/22 1:13	U	JAF
Nitrate+Nitrite as N	<0.24	mg/l	0.122	1.10	CALCULATED	06/16/22 1:13		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	06/17/22	U	SNF
Phosphorus as P, Total	0.02	mg/l	0.01	0.01	SM 4500-P F	06/21/22		MRW
Solids, Total Dissolved	61	mg/l	4	5	SM 2540 C	06/16/22		TMH
Total Organic Carbon	7.2	mg/l	0.3	0.5	SM 5310 C	06/16/22		ALD
Solids, Total Suspended	5	mg/l	1	1	SM 2540 D	06/16/22		ALD



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Lab ID: 2216903-05 **Collected By:** Client **Sampled:** 06/15/22 10:25 **Received:** 06/15/22 14:15
Sample Desc: WA-3S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.02	mg/l		0.01	SM 4500-P F	06/21/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO ₃ /L		2	SM 2320 B	06/17/22	C-51i	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	06/21/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/15/22 17:38		KMS
Nitrate as N	0.29	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/16/22 0:04	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/16/22 0:04	U	JAF
Nitrate+Nitrite as N	<0.30	mg/l	0.122	1.10	CALCULATED	06/16/22 0:04		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	06/17/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	06/21/22		MRW
Solids, Total Dissolved	69	mg/l	4	5	SM 2540 C	06/16/22		TMH
Total Organic Carbon	7.2	mg/l	0.3	0.5	SM 5310 C	06/16/22		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	06/16/22		ALD
Microbiology								
Escherichia coli	11	mpn/100ml	1		SM 9223 B/Quantitray	6/15/22 15:12	6/16/22 10:31	DRW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	6/15/22 15:12	6/16/22 10:31	DRW



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M.J. Reider Associates, Inc.

Lab ID: 2216903-06 **Collected By:** Client **Sampled:** 06/15/22 10:45 **Received:** 06/15/22 14:15
Sample Desc: WA-4S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.01	mg/l		0.01	SM 4500-P F	06/22/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO ₃ /L		2	SM 2320 B	06/17/22	C-51c	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	06/21/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/15/22 17:38		KMS
Nitrate as N	0.27	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/16/22 0:21	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/16/22 0:21	U	JAF
Nitrate+Nitrite as N	<0.28	mg/l	0.122	1.10	CALCULATED	06/16/22 0:21		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	06/17/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	06/21/22		MRW
Solids, Total Dissolved	58	mg/l	4	5	SM 2540 C	06/16/22		TMH
Total Organic Carbon	5.1	mg/l	0.3	0.5	SM 5310 C	06/16/22		ALD
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	06/16/22		ALD
Microbiology								
Escherichia coli	48	mpn/100ml	1		SM 9223 B/Quantitray	6/15/22 15:12	6/16/22 10:31	DRW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	6/15/22 15:12	6/16/22 10:31	DRW



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M.J. Reider Associates, Inc.

Lab ID: 2216903-07 **Collected By:** Client **Sampled:** 06/15/22 11:10 **Received:** 06/15/22 14:15
Sample Desc: WA-5S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.12	mg/l		0.01	SM 4500-P F	06/21/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	4	mg CaCO ₃ /L		2	SM 2320 B	06/17/22	C-51	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	06/21/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/15/22 17:38		KMS
Nitrate as N	0.16	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/15/22 21:14	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/15/22 21:14	U	JAF
Nitrate+Nitrite as N	<0.17	mg/l	0.122	1.10	CALCULATED	06/15/22 21:14		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	06/17/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	06/21/22		MRW
Solids, Total Dissolved	49	mg/l	4	5	SM 2540 C	06/16/22		TMH
Total Organic Carbon	4.6	mg/l	0.3	0.5	SM 5310 C	06/16/22		ALD
Solids, Total Suspended	4	mg/l	1	1	SM 2540 D	06/16/22		ALD
Microbiology								
Escherichia coli	42	mpn/100ml	1		SM 9223 B/Quantitray	6/15/22 15:12	6/16/22 10:31	DRW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	6/15/22 15:12	6/16/22 10:31	DRW



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M.J. Reider Associates, Inc.

Lab ID: 2216903-08 **Collected By:** Client **Sampled:** 06/15/22 08:25 **Received:** 06/15/22 14:15
Sample Desc: WA-6S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	06/22/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	6	mg CaCO ₃ /L		2	SM 2320 B	06/17/22	C-51a	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	06/21/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/15/22 17:38		KMS
Nitrate as N	0.21	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/15/22 23:12	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/15/22 23:12	U	JAF
Nitrate+Nitrite as N	<0.22	mg/l	0.122	1.10	CALCULATED	06/15/22 23:12		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	06/17/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	06/21/22		MRW
Solids, Total Dissolved	62	mg/l	4	5	SM 2540 C	06/16/22		TMH
Total Organic Carbon	5.6	mg/l	0.3	0.5	SM 5310 C	06/16/22		ALD
Solids, Total Suspended	4	mg/l	1	1	SM 2540 D	06/16/22		ALD
Microbiology								
Escherichia coli	<1	mpn/100ml	1		SM 9223 B/Quantitray	6/15/22 15:12	6/16/22 10:31	DRW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	6/15/22 15:12	6/16/22 10:31	DRW



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M.J. Reider Associates, Inc.

Lab ID: 2216903-09 **Collected By:** Client **Sampled:** 06/15/22 08:25 **Received:** 06/15/22 14:15
Sample Desc: WA-6M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	06/21/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO ₃ /L		2	SM 2320 B	06/17/22	C-51d	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	06/21/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/15/22 17:38		KMS
Nitrate as N	0.22	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/15/22 22:04	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/15/22 22:04	U	JAF
Nitrate+Nitrite as N	<0.23	mg/l	0.122	1.10	CALCULATED	06/15/22 22:04		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	06/17/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	06/21/22		MRW
Solids, Total Dissolved	71	mg/l	4	5	SM 2540 C	06/16/22		TMH
Total Organic Carbon	6.1	mg/l	0.3	0.5	SM 5310 C	06/16/22		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	06/16/22		ALD

Lab ID: 2216903-10 **Collected By:** Client **Sampled:** 06/15/22 08:25 **Received:** 06/15/22 14:15
Sample Desc: WA-6D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	06/22/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO ₃ /L		2	SM 2320 B	06/17/22	C-51g	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	06/21/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/15/22 17:38		KMS
Nitrate as N	0.22	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/15/22 23:29	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/15/22 23:29	U	JAF
Nitrate+Nitrite as N	<0.23	mg/l	0.122	1.10	CALCULATED	06/15/22 23:29		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	06/17/22	U	SNF
Phosphorus as P, Total	0.01	mg/l	0.01	0.01	SM 4500-P F	06/21/22		MRW
Solids, Total Dissolved	70	mg/l	4	5	SM 2540 C	06/16/22		TMH
Total Organic Carbon	6.7	mg/l	0.3	0.5	SM 5310 C	06/16/22		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	06/16/22		ALD



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M.J. Reider Associates, Inc.

Lab ID: 2216903-11 **Collected By:** Client **Sampled:** 06/15/22 09:00 **Received:** 06/15/22 14:15
Sample Desc: WA-7S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	06/22/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO ₃ /L		2	SM 2320 B	06/17/22	C-51e	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	06/21/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/15/22 17:38		KMS
Nitrate as N	0.21	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/16/22 0:38	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/16/22 0:38	U	JAF
Nitrate+Nitrite as N	<0.22	mg/l	0.122	1.10	CALCULATED	06/16/22 0:38		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	06/17/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	06/21/22		MRW
Solids, Total Dissolved	69	mg/l	4	5	SM 2540 C	06/16/22		TMH
Total Organic Carbon	6.3	mg/l	0.3	0.5	SM 5310 C	06/16/22		ALD
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	06/16/22		ALD
Microbiology								
Escherichia coli	1	mpn/100ml	1		SM 9223 B/Quantitray	6/15/22 15:12	6/16/22 10:31	DRW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	6/15/22 15:12	6/16/22 10:31	DRW



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M.J. Reider Associates, Inc.

Lab ID: 2216903-12 **Collected By:** Client **Sampled:** 06/15/22 09:00 **Received:** 06/15/22 14:15
Sample Desc: WA-7M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	06/22/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO ₃ /L		2	SM 2320 B	06/17/22	C-51h	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	06/21/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/15/22 17:38		KMS
Nitrate as N	0.23	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/16/22 2:22	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/16/22 2:22	U	JAF
Nitrate+Nitrite as N	<0.24	mg/l	0.122	1.10	CALCULATED	06/16/22 2:22		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	06/17/22	U	SNF
Phosphorus as P, Total	0.01	mg/l	0.01	0.01	SM 4500-P F	06/21/22		MRW
Solids, Total Dissolved	73	mg/l	4	5	SM 2540 C	06/16/22		TMH
Total Organic Carbon	7.1	mg/l	0.3	0.5	SM 5310 C	06/16/22		ALD
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	06/16/22		ALD

Lab ID: 2216903-13 **Collected By:** Client **Sampled:** 06/15/22 09:00 **Received:** 06/15/22 14:15
Sample Desc: WA-7D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.01	mg/l		0.01	SM 4500-P F	06/22/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO ₃ /L		2	SM 2320 B	06/17/22	C-51i	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	06/21/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	06/15/22 17:50	C-40	KMS
Nitrate as N	0.23	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	06/16/22 3:14	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	06/16/22 3:14	U	JAF
Nitrate+Nitrite as N	<0.24	mg/l	0.122	1.10	CALCULATED	06/16/22 3:14		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	06/17/22	U	SNF
Phosphorus as P, Total	0.01	mg/l	0.01	0.01	SM 4500-P F	06/21/22		MRW
Solids, Total Dissolved	85	mg/l	4	5	SM 2540 C	06/16/22		TMH
Total Organic Carbon	7.1	mg/l	0.3	0.5	SM 5310 C	06/16/22		ALD
Solids, Total Suspended	18	mg/l	1	1	SM 2540 D	06/16/22		ALD



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Preparation Methods

Specific Method	Preparation Method	Prep Batch	Prepared Date	Prepared By
2216903-01				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2F1186	06/21/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2F1163	06/21/2022	MRW
2216903-02				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2F1186	06/21/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2F1163	06/21/2022	MRW
2216903-03				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2F1186	06/21/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2F1163	06/21/2022	MRW
2216903-04				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2F1186	06/21/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2F1163	06/21/2022	MRW
2216903-05				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2F1186	06/21/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2F1163	06/21/2022	MRW
2216903-06				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2F1186	06/21/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2F1163	06/21/2022	MRW
2216903-07				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2F1186	06/21/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2F1163	06/21/2022	MRW
2216903-08				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2F1186	06/21/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2F1163	06/21/2022	MRW
2216903-09				


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Additional accreditations by MD (261), NY(12094)

M.J. Reider Associates, Inc.

Dissolved General Chemistry

SM 4500-P F	SM 4500-P B	B2F1186	06/21/2022	MRW
-------------	-------------	---------	------------	-----

General Chemistry

SM 4500-P F	SM 4500-P B	B2F1163	06/21/2022	MRW
-------------	-------------	---------	------------	-----

2216903-10

Dissolved General Chemistry

SM 4500-P F	SM 4500-P B	B2F1186	06/21/2022	MRW
-------------	-------------	---------	------------	-----

General Chemistry

SM 4500-P F	SM 4500-P B	B2F1163	06/21/2022	MRW
-------------	-------------	---------	------------	-----

2216903-11

Dissolved General Chemistry

SM 4500-P F	SM 4500-P B	B2F1186	06/21/2022	MRW
-------------	-------------	---------	------------	-----

General Chemistry

SM 4500-P F	SM 4500-P B	B2F1163	06/21/2022	MRW
-------------	-------------	---------	------------	-----

2216903-12

Dissolved General Chemistry

SM 4500-P F	SM 4500-P B	B2F1186	06/21/2022	MRW
-------------	-------------	---------	------------	-----

General Chemistry

SM 4500-P F	SM 4500-P B	B2F1163	06/21/2022	MRW
-------------	-------------	---------	------------	-----

2216903-13

Dissolved General Chemistry

SM 4500-P F	SM 4500-P B	B2F1186	06/21/2022	MRW
-------------	-------------	---------	------------	-----

General Chemistry

SM 4500-P F	SM 4500-P B	B2F1163	06/21/2022	MRW
-------------	-------------	---------	------------	-----

Notes and Definitions

- C-40 The Glucose-Glutamic Acid check was outside of the acceptable criteria of 198 ± 30.5 mg/L at 229.5 mg/L.
- C-51 The alkalinity to pH 4.2 = 3.6 mg CaCO₃/L.
- C-51a The alkalinity to pH 4.2 = 6.3 mg CaCO₃/L.
- C-51b The alkalinity to pH 4.2 = 6.5 mg CaCO₃/L.
- C-51c The alkalinity to pH 4.2 = 6.6 mg CaCO₃/L.
- C-51d The alkalinity to pH 4.2 = 6.7 mg CaCO₃/L.
- C-51e The alkalinity to pH 4.2 = 6.8 mg CaCO₃/L.
- C-51f The alkalinity to pH 4.2 = 7.1 mg CaCO₃/L.
- C-51g The alkalinity to pH 4.2 = 7.2 mg CaCO₃/L.
- C-51h The alkalinity to pH 4.2 = 7.4 mg CaCO₃/L.
- C-51i The alkalinity to pH 4.2 = 7.8 mg CaCO₃/L.
- C-51j The alkalinity to pH 4.2 = 7.9 mg CaCO₃/L.
- G-23 The sample was filtered after it was received at the laboratory and outside of the 15-minute hold time.
- G-24 The sample was preserved in the laboratory and outside of the 15-minute hold time.
- J Estimated value
- U Analyte was not detected above the indicated value.



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Additional accreditations by MD (261), NY(12094)

**M.J. Reider Associates, Inc.**107 Angelica St, Reading PA, 19611
610-374-5129 www.mjreider.com**WORK ORDER
Chain of Custody****2216903**Client Code: **3157**Project Manager: **Richard A Wheeler**

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: _____

2216903-01 WA-1S*JAC* *JAC*
BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B
Alk SM 2320B, NH3-N EPA 350.1, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date: *6/15/22*Time: *1000*A - Pl 500ml NP, minimal hdspe
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 hdspe
H - Vial Amber 40ml H3PO4, minimal hdspe
I - Vial Amber 40ml H3PO4, minimal hdspe**2216903-02 WA-2S***JAC* *JAC*
BOD SM 5210B, EC (#) SM 9223B Confirmation, NO2-N EPA 300.0, NO3-N EPA 300.0, NO2-N, NO3-N, Combined NO3+NO2, PO4-D SM 4500P-F, TC (#) SM 9223B
Alk SM 2320B, NH3-N EPA 350.1, PO4 SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date: *6/15/22*Time: *0735*A - Pl 500ml NP, minimal hdspe
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 hdspe
H - Vial Amber 40ml H3PO4, minimal hdspe
I - Vial Amber 40ml H3PO4, minimal hdspe

Relinquished By

Date/Time

6/15/22 1245

Received By

Date/Time

6/15/22 1250

Relinquished By

Date/Time

Received By

Date/Time

Relinquished By

Date/Time

Received at Laboratory By

Date/Time

6/15/22 1415

Sample Kit Prepared By:

Date/Time

Sample Temp (°C):

Samples on Ice?

Approved By:

Entered By:

6.8
Yes No NA*JSW*

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.



M.J. Reider Associates, Inc.

2216903

Client Code: 3157

Project Manager: Richard A Wheeler

Client: Tetra Tech

Project: 2022 - Walter Reservoir

Collected By :

(Full Name)

Gregory Wacker

Comments:

2216903-03 WA-2M

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

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

6/15/22
0735

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

2216903-04 WA-2D

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

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

6/15/22
0735

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

2216903-05 WA-3S

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

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

6/15/22
1025

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

Relinquished By

Date/Time

Received By

Date/Time

Relinquished By

Date/Time

Received By

Date/Time

Relinquished By

Date/Time

Received at Laboratory By

Date/Time

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.

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	<i>6.8</i>
Samples on Ice?	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> NA
Approved By:	<i>[Signature]</i>
Entered By:	<i>[Signature]</i>



M.J. Reider Associates, Inc.

2216903

Client Code: 3157

Project Manager: Richard A Wheeler

Client: Tetra Tech

Project: 2022 - Walter Reservoir

Comments: _____

Collected By : Gregory Dacic
(Full Name)

2216903-06 WA-4S

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

Matrix: Non-Potable Water

Type: Grab

Date: 6/15/22
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

2216903-07 WA-5S

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

Matrix: Non-Potable Water

Type: Grab

Date: 6/15/22
Time: 1110

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

2216903-08 WA-6S

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

Matrix: Non-Potable Water

Type: Grab

Date: 6/15/22
Time: 0825

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

Relinquished By: [Signature] Date/Time: 6/15/22 1245

Received By: [Signature] Date/Time: 6-15-22 1250

Relinquished By: _____ Date/Time: _____

Received By: _____ Date/Time: _____

Relinquished By: _____ Date/Time: _____

Received at Laboratory By: [Signature] Date/Time: 6-15-22 1415

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	<u>6.8</u>
Samples on Ice?	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> NA
Approved By:	<u>[Signature]</u>
Entered By:	<u>[Signature]</u>



M.J. Reider Associates, Inc.

2216903

Client Code: 3157

Project Manager: Richard A Wheeler

Client: Tetra Tech

Project: 2022 - Walter Reservoir

Collected By :

(Full Name)

Gregory Wacik

Comments:

2216903-09 WA-6M

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

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

6/15/22
0825

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

2216903-10 WA-6D

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

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

6/15/22
0825

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

2216903-11 WA-7S

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

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

6/15/22
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

Relinquished By

Date/Time

Received By

Date/Time

Relinquished By

Date/Time

Received By

Date/Time

Relinquished By

Date/Time

Received at Laboratory By

Date/Time

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.

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	<i>6.8</i>
Samples on Ice?	<i>Yes</i> <i>No</i> <i>NA</i>
Approved By:	<i>BSH</i>
Entered By:	



M.J. Reider Associates, Inc.

2216903

Client Code: 3157

Project Manager: Richard A Wheeler

Client: Tetra Tech

Project: 2022 - Walter Reservoir

Collected By :

(Full Name)

Gregory Wacik

Comments:

2216903-12 WA-7M

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

Matrix: Non-Potable Water

Type: Grab

Date: 6/15/22
Time: 0900

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

2216903-13 WA-7D

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

Matrix: Non-Potable Water

Type: Grab

Date: 6/15/22
Time: 900

- A - PI 500ml NP, minimal hdspc
- B - PI Liter NP
- C - PI 500ml H2SO4
- D - PI 250ml NP
- E - PI 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

Relinquished By

Date/Time

Received By

Date/Time

Relinquished By

Date/Time

Received at Laboratory By

Date/Time

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	6.8
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.

M.J. Reider Associates, Inc.**MJRA Terms & Conditions**

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

Sample Submission, Sample Acceptance & Sampling Containers

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

Turnaround Times (TAT)

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

Analytical Results, Sample Collection Integrity & Subcontracting

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

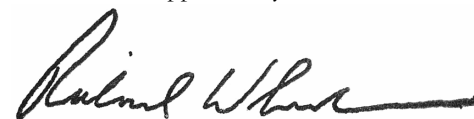
Payment Terms

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

Warranty & Litigation

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

Reviewed and Approved by:



Richard A Wheeler
Director of Field Services

107 Angelica Street ○ Reading, PA 19611 ○ www.mjreider.com ○ (610) 374-5129 ○ fax (610) 374-7234**This certificate shall not be reproduced except in full without the written approval of M.J. Reider Associates, Inc.**

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NELAC accreditations for various drinking water, wastewater and solid & chemical materials analytes.

Additional accreditations by MD (261), NY(12094)



M.J. Reider Associates, Inc.

ENVIRONMENTAL TESTING LABORATORY
U.S. EPA/PA DEP #06-00003

Certificate of Analysis

Laboratory No.: 2220751

Report: 07/25/22

Lab Contact: Richard A Wheeler

Attention: David Wertz

Project: 2022 - Walter Reservoir

Reported To: Tetra Tech

USACE, Phila Dist. Env.Resources Branch 100 Penn Square E.
Arlington, VA 22201

Lab ID: 2220751-01

Collected By: Client

Sampled: 07/13/22 09:55

Received: 07/13/22 14:38

Sample Desc: WA-1S

Sample Type: Grab

Notes: G-25

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst	
Dissolved General Chemistry									
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/21/22	G-23, G-24	MRW	
General Chemistry									
Alkalinity, Total to pH 4.5	7	mg CaCO3/L		2	SM 2320 B	07/14/22	C-51d	APR	
Ammonia as N	0.05	mg/l	0.02	0.02	EPA 350.1	07/15/22		MRW	
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/13/22 21:40		KMS	
Nitrate as N	0.21	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/14/22 11:42	J	JAF	
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/14/22 11:42	U	JAF	
Nitrate+Nitrite as N	<0.22	mg/l	0.122	1.10	CALCULATED	07/14/22 11:42		JAF	
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	07/21/22	U	MRW	
Phosphorus as P, Total	0.02	mg/l	0.01	0.01	SM 4500-P F	07/15/22		MRW	
Solids, Total Dissolved	63	mg/l	4	5	SM 2540 C	07/14/22		TMH	
Total Organic Carbon	5.5	mg/l	0.3	0.5	SM 5310 C	07/14/22		ALD	
Solids, Total Suspended	8	mg/l	1	1	SM 2540 D	07/14/22		ALD	
	Result	Unit	Rep. Limit		Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology									
Escherichia coli	1	mpn/100ml	1		SM 9223 B/Quantitray	7/13/22 15:15	7/14/22 9:27		DRW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	7/13/22 15:15	7/14/22 9:27		DRW



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M.J. Reider Associates, Inc.

Lab ID: 2220751-02 **Collected By:** Client **Sampled:** 07/13/22 07:35 **Received:** 07/13/22 14:38
Sample Desc: WA-2S **Sample Type:** Grab
Notes: G-25

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/21/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO ₃ /L		2	SM 2320 B	07/14/22	C-51d	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	07/15/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/13/22 20:26	C-40	LES
Nitrate as N	0.19	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/14/22 0:48	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/14/22 0:48	U	JAF
Nitrate+Nitrite as N	<0.20	mg/l	0.122	1.10	CALCULATED	07/14/22 0:48		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	07/21/22	U	MRW
Phosphorus as P, Total	0.01	mg/l	0.01	0.01	SM 4500-P F	07/15/22		MRW
Solids, Total Dissolved	66	mg/l	4	5	SM 2540 C	07/14/22		TMH
Total Organic Carbon	5.7	mg/l	0.3	0.5	SM 5310 C	07/14/22		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	07/14/22		ALD
Microbiology								
Escherichia coli	1	mpn/100ml	1		SM 9223 B/Quantitray	7/13/22 15:15	7/14/22 9:27	DRW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	7/13/22 15:15	7/14/22 9:27	DRW



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M.J. Reider Associates, Inc.

Lab ID: 2220751-03 **Collected By:** Client **Sampled:** 07/13/22 07:35 **Received:** 07/13/22 14:38
Sample Desc: WA-2M **Sample Type:** Grab
Notes: G-25

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/21/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	6	mg CaCO ₃ /L		2	SM 2320 B	07/14/22	C-51b	APR
Ammonia as N	0.03	mg/l	0.02	0.02	EPA 350.1	07/19/22		MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/13/22 19:04		KMS
Nitrate as N	0.21	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/14/22 1:39	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/14/22 1:39	U	JAF
Nitrate+Nitrite as N	<0.22	mg/l	0.122	1.10	CALCULATED	07/14/22 1:39		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	07/21/22	U	MRW
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/19/22		MRW
Solids, Total Dissolved	47	mg/l	4	5	SM 2540 C	07/14/22		TMH
Total Organic Carbon	5.7	mg/l	0.3	0.5	SM 5310 C	07/14/22		ALD
Solids, Total Suspended	5	mg/l	1	1	SM 2540 D	07/14/22		ALD

Lab ID: 2220751-04 **Collected By:** Client **Sampled:** 07/13/22 07:35 **Received:** 07/13/22 14:38
Sample Desc: WA-2D **Sample Type:** Grab
Notes: G-25

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/21/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	9	mg CaCO ₃ /L		2	SM 2320 B	07/14/22	C-51i	APR
Ammonia as N	0.09	mg/l	0.02	0.02	EPA 350.1	07/19/22		MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/13/22 19:04		KMS
Nitrate as N	0.20	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/14/22 1:57	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/14/22 1:57	U	JAF
Nitrate+Nitrite as N	<0.21	mg/l	0.122	1.10	CALCULATED	07/14/22 1:57		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	07/21/22	U	MRW
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/19/22		MRW
Solids, Total Dissolved	41	mg/l	4	5	SM 2540 C	07/14/22		TMH
Total Organic Carbon	6.0	mg/l	0.3	0.5	SM 5310 C	07/14/22		ALD
Solids, Total Suspended	23	mg/l	1	1	SM 2540 D	07/14/22		ALD



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Lab ID: 2220751-05 **Collected By:** Client **Sampled:** 07/13/22 10:20 **Received:** 07/13/22 14:38
Sample Desc: WA-3S **Sample Type:** Grab
Notes: G-25

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/21/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	9	mg CaCO ₃ /L		2	SM 2320 B	07/14/22	C-51j	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	07/19/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/13/22 19:04		KMS
Nitrate as N	0.29	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/14/22 10:51	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/14/22 10:51	U	JAF
Nitrate+Nitrite as N	<0.30	mg/l	0.122	1.10	CALCULATED	07/14/22 10:51		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	07/21/22	U	MRW
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/19/22		MRW
Solids, Total Dissolved	59	mg/l	4	5	SM 2540 C	07/14/22		TMH
Total Organic Carbon	5.2	mg/l	0.3	0.5	SM 5310 C	07/14/22		ALD
Solids, Total Suspended	7	mg/l	1	1	SM 2540 D	07/14/22		ALD
Microbiology								
Escherichia coli	68	mpn/100ml	1		SM 9223 B/Quantitray	7/13/22 15:15	7/14/22 9:27	DRW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	7/13/22 15:15	7/14/22 9:27	DRW



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M.J. Reider Associates, Inc.

Lab ID: 2220751-06 **Collected By:** Client **Sampled:** 07/13/22 10:40 **Received:** 07/13/22 14:38
Sample Desc: WA-4S **Sample Type:** Grab
Notes: G-25

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst	
Dissolved General Chemistry									
Phosphorus as P, Dissolved	0.02	mg/l		0.01	SM 4500-P F	07/21/22	G-23, G-24	MRW	
General Chemistry									
Alkalinity, Total to pH 4.5	11	mg CaCO3/L		2	SM 2320 B	07/14/22	C-51	APR	
Ammonia as N	0.03	mg/l	0.02	0.02	EPA 350.1	07/19/22		MRW	
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/13/22 20:26	C-40	LES	
Nitrate as N	0.25	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/14/22 1:22	J	JAF	
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/14/22 1:22	U	JAF	
Nitrate+Nitrite as N	<0.26	mg/l	0.122	1.10	CALCULATED	07/14/22 1:22		JAF	
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	07/21/22	U	MRW	
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/19/22		MRW	
Solids, Total Dissolved	53	mg/l	4	5	SM 2540 C	07/14/22		TMH	
Total Organic Carbon	3.6	mg/l	0.3	0.5	SM 5310 C	07/14/22		ALD	
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/14/22		ALD	
	Result	Unit	Rep. Limit		Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology									
Escherichia coli	88	mpn/100ml	1		SM 9223 B/Quantitray	7/13/22 15:15	7/14/22 9:27		DRW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	7/13/22 15:15	7/14/22 9:27		DRW



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M.J. Reider Associates, Inc.

Lab ID: 2220751-07 **Collected By:** Client **Sampled:** 07/13/22 11:00 **Received:** 07/13/22 14:38
Sample Desc: WA-5S **Sample Type:** Grab
Notes: G-25

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/21/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	4	mg CaCO ₃ /L		2	SM 2320 B	07/14/22	C-51a	APR
Ammonia as N	0.02	mg/l	0.02	0.02	EPA 350.1	07/19/22	J	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/13/22 20:26	C-40	LES
Nitrate as N	0.18	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/14/22 0:31	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/14/22 0:31	U	JAF
Nitrate+Nitrite as N	<0.19	mg/l	0.122	1.10	CALCULATED	07/14/22 0:31		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	07/21/22	U	MRW
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/19/22		MRW
Solids, Total Dissolved	52	mg/l	4	5	SM 2540 C	07/14/22		TMH
Total Organic Carbon	3.3	mg/l	0.3	0.5	SM 5310 C	07/14/22		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/14/22		ALD
Microbiology								
Escherichia coli	18	mpn/100ml	1		SM 9223 B/Quantitray	7/13/22 15:15	7/14/22 9:27	DRW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	7/13/22 15:15	7/14/22 9:27	DRW



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M.J. Reider Associates, Inc.

Lab ID: 2220751-08 **Collected By:** Client **Sampled:** 07/13/22 08:20 **Received:** 07/13/22 14:38
Sample Desc: WA-6S **Sample Type:** Grab
Notes: G-25

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/21/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO ₃ /L		2	SM 2320 B	07/14/22	C-51c	APR
Ammonia as N	0.02	mg/l	0.02	0.02	EPA 350.1	07/19/22	J	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/13/22 19:04		KMS
Nitrate as N	0.19	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/14/22 0:14	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/14/22 0:14	U	JAF
Nitrate+Nitrite as N	<0.20	mg/l	0.122	1.10	CALCULATED	07/14/22 0:14		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	07/22/22	U	MRW
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/19/22		MRW
Solids, Total Dissolved	50	mg/l	4	5	SM 2540 C	07/14/22		TMH
Total Organic Carbon	5.5	mg/l	0.3	0.5	SM 5310 C	07/14/22		ALD
Solids, Total Suspended	5	mg/l	1	1	SM 2540 D	07/14/22		ALD
Microbiology								
Escherichia coli	<1	mpn/100ml	1		SM 9223 B/Quantitray	7/13/22 15:15	7/14/22 9:27	DRW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	7/13/22 15:15	7/14/22 9:27	DRW



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M.J. Reider Associates, Inc.

Lab ID: 2220751-09 **Collected By:** Client **Sampled:** 07/13/22 08:20 **Received:** 07/13/22 14:38
Sample Desc: WA-6M **Sample Type:** Grab
Notes: G-25

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/21/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO ₃ /L		2	SM 2320 B	07/14/22	C-51e	APR
Ammonia as N	0.02	mg/l	0.02	0.02	EPA 350.1	07/19/22	J	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/13/22 19:04		KMS
Nitrate as N	0.20	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/14/22 1:05	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/14/22 1:05	U	JAF
Nitrate+Nitrite as N	<0.21	mg/l	0.122	1.10	CALCULATED	07/14/22 1:05		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	07/21/22	U	MRW
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/19/22		MRW
Solids, Total Dissolved	52	mg/l	4	5	SM 2540 C	07/14/22		TMH
Total Organic Carbon	5.3	mg/l	0.3	0.5	SM 5310 C	07/14/22		ALD
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	07/14/22		ALD

Lab ID: 2220751-10 **Collected By:** Client **Sampled:** 07/13/22 08:20 **Received:** 07/13/22 14:38
Sample Desc: WA-6D **Sample Type:** Grab
Notes: G-25

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/21/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO ₃ /L		2	SM 2320 B	07/14/22	C-51h	APR
Ammonia as N	0.03	mg/l	0.02	0.02	EPA 350.1	07/19/22		MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/13/22 19:04		KMS
Nitrate as N	0.21	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/14/22 11:59	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/14/22 11:59	U	JAF
Nitrate+Nitrite as N	<0.22	mg/l	0.122	1.10	CALCULATED	07/14/22 11:59		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	07/21/22	U	MRW
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/19/22		MRW
Solids, Total Dissolved	53	mg/l	4	5	SM 2540 C	07/14/22		TMH
Total Organic Carbon	5.8	mg/l	0.3	0.5	SM 5310 C	07/14/22		ALD
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	07/14/22		ALD



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Lab ID: 2220751-11 **Collected By:** Client **Sampled:** 07/13/22 09:15 **Received:** 07/13/22 14:38
Sample Desc: WA-7S **Sample Type:** Grab
Notes: G-25

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/21/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO ₃ /L		2	SM 2320 B	07/14/22	C-51f	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	07/19/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/13/22 19:04		KMS
Nitrate as N	0.20	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/14/22 10:34	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/14/22 10:34	U	JAF
Nitrate+Nitrite as N	<0.21	mg/l	0.122	1.10	CALCULATED	07/14/22 10:34		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	07/21/22	U	MRW
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/19/22		MRW
Solids, Total Dissolved	52	mg/l	4	5	SM 2540 C	07/14/22		TMH
Total Organic Carbon	5.8	mg/l	0.3	0.5	SM 5310 C	07/14/22		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	07/14/22		ALD
Microbiology								
Escherichia coli	1	mpn/100ml	1		SM 9223 B/Quantitray	7/13/22 15:15	7/14/22 9:27	DRW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	7/13/22 15:15	7/14/22 9:27	DRW



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 Additional accreditations by MD (261), NY(12094)

M.J. Reider Associates, Inc.

Lab ID: 2220751-12 **Collected By:** Client **Sampled:** 07/13/22 09:15 **Received:** 07/13/22 14:38
Sample Desc: WA-7M **Sample Type:** Grab
Notes: G-25

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/21/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO ₃ /L		2	SM 2320 B	07/14/22	C-51g	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1	07/19/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/13/22 20:26	C-40	LES
Nitrate as N	0.21	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/14/22 2:14	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/14/22 2:14	U	JAF
Nitrate+Nitrite as N	<0.22	mg/l	0.122	1.10	CALCULATED	07/14/22 2:14		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	07/21/22	U	MRW
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/19/22		MRW
Solids, Total Dissolved	52	mg/l	4	5	SM 2540 C	07/14/22		TMH
Total Organic Carbon	6.1	mg/l	0.3	0.5	SM 5310 C	07/14/22		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	07/14/22		ALD

Lab ID: 2220751-13 **Collected By:** Client **Sampled:** 07/13/22 09:15 **Received:** 07/13/22 14:38
Sample Desc: WA-7D **Sample Type:** Grab
Notes: G-25

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	07/21/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	9	mg CaCO ₃ /L		2	SM 2320 B	07/14/22	C-51k	APR
Ammonia as N	0.05	mg/l	0.02	0.02	EPA 350.1	07/19/22		MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	07/13/22 20:26	C-40	LES
Nitrate as N	0.21	mg/l	0.11	1.00	EPA 300.0 Rev 2.1	07/14/22 2:31	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	07/14/22 2:31	U	JAF
Nitrate+Nitrite as N	<0.22	mg/l	0.122	1.10	CALCULATED	07/14/22 2:31		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	07/21/22	U	MRW
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	07/19/22		MRW
Solids, Total Dissolved	59	mg/l	4	5	SM 2540 C	07/14/22		TMH
Total Organic Carbon	6.0	mg/l	0.3	0.5	SM 5310 C	07/14/22		ALD
Solids, Total Suspended	16	mg/l	1	1	SM 2540 D	07/14/22		ALD



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Additional accreditations by MD (261), NY(12094)

M.J. Reider Associates, Inc.
Preparation Methods

Specific Method	Preparation Method	Prep Batch	Prepared Date	Prepared By
2220751-01				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2G1116	07/20/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2G0796	07/15/2022	MRW
2220751-02				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2G1116	07/20/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2G0796	07/15/2022	MRW
2220751-03				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2G1116	07/20/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2G0959	07/19/2022	MRW
2220751-04				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2G1116	07/20/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2G0959	07/19/2022	MRW
2220751-05				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2G1116	07/20/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2G0959	07/19/2022	MRW
2220751-06				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2G1116	07/20/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2G0959	07/19/2022	MRW
2220751-07				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2G1116	07/20/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2G0959	07/19/2022	MRW
2220751-08				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2G1116	07/20/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2G0959	07/19/2022	MRW
2220751-09				


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M.J. Reider Associates, Inc.

Dissolved General Chemistry

SM 4500-P F	SM 4500-P B	B2G1116	07/20/2022	MRW
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General Chemistry

SM 4500-P F	SM 4500-P B	B2G0959	07/19/2022	MRW
-------------	-------------	---------	------------	-----

2220751-10

Dissolved General Chemistry

SM 4500-P F	SM 4500-P B	B2G1116	07/20/2022	MRW
-------------	-------------	---------	------------	-----

General Chemistry

SM 4500-P F	SM 4500-P B	B2G0959	07/19/2022	MRW
-------------	-------------	---------	------------	-----

2220751-11

Dissolved General Chemistry

SM 4500-P F	SM 4500-P B	B2G1116	07/20/2022	MRW
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General Chemistry

SM 4500-P F	SM 4500-P B	B2G0959	07/19/2022	MRW
-------------	-------------	---------	------------	-----

2220751-12

Dissolved General Chemistry

SM 4500-P F	SM 4500-P B	B2G1116	07/20/2022	MRW
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General Chemistry

SM 4500-P F	SM 4500-P B	B2G0959	07/19/2022	MRW
-------------	-------------	---------	------------	-----

2220751-13

Dissolved General Chemistry

SM 4500-P F	SM 4500-P B	B2G1116	07/20/2022	MRW
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General Chemistry

SM 4500-P F	SM 4500-P B	B2G0959	07/19/2022	MRW
-------------	-------------	---------	------------	-----

Notes and Definitions

- C-40 The Glucose-Glutamic Acid check was outside of the acceptable criteria of 198 ± 30.5 mg/L at 155 mg/L.
- C-51 The alkalinity to pH 4.2 = 11.1 mg CaCO₃/L.
- C-51a The alkalinity to pH 4.2 = 4.5 mg CaCO₃/L.
- C-51b The alkalinity to pH 4.2 = 6.3 mg CaCO₃/L.
- C-51c The alkalinity to pH 4.2 = 6.9 mg CaCO₃/L.
- C-51d The alkalinity to pH 4.2 = 7.0 mg CaCO₃/L.
- C-51e The alkalinity to pH 4.2 = 7.1 mg CaCO₃/L.
- C-51f The alkalinity to pH 4.2 = 7.5 mg CaCO₃/L.
- C-51g The alkalinity to pH 4.2 = 7.7 mg CaCO₃/L.
- C-51h The alkalinity to pH 4.2 = 7.8 mg CaCO₃/L.
- C-51i The alkalinity to pH 4.2 = 8.6 mg CaCO₃/L.
- C-51j The alkalinity to pH 4.2 = 9.1 mg CaCO₃/L.
- C-51k The alkalinity to pH 4.2 = 9.3 mg CaCO₃/L.
- G-23 The sample was filtered after it was received at the laboratory and outside of the 15-minute hold time.
- G-24 The sample was preserved in the laboratory and outside of the 15-minute hold time.
- G-25 Sample storage for container B was not maintained at 0-6C.
- J Estimated value
- U Analyte was not detected above the indicated value.



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PM-D
Sue

2220751



Client Code: 3157

Client: Tetra Tech

Project Manager: Richard A Wheeler

Project: 2022 - 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 Wasin

Comments:

2220751-01 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 EPA 350.1, PO₄ SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM
2540D

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

7/13/22
0955

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

2220751-02 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 EPA 350.1, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D, PO₄ SM
4500P-F

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

7/13/22
0735

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

Relinquished By

Date/Time

Received By

Date/Time

Relinquished By

Date/Time

Received By

Date/Time

Relinquished By

Date/Time

Received at Laboratory By

Date/Time

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

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



M.J. Reider Associates, Inc.

2220751

Client Code: 3157

Client: Tetra Tech

Project Manager: Richard A Wheeler

Project: 2022 - Walter Reservoir

Collected By :

(Full Name)

Gregory Wacik

Comments:

2220751-03 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 EPA 350.1, PO₄ SM 4500P-F, TSS SM 2540D, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

7/13/22
0735

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

2220751-04 WA-2D

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

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

7/13/22
0735

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

2220751-05 WA-3S

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

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

7/13/22
1020

- A - Pl 500ml NP, minimal hdspe
- 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 hdspe
- H - Vial Amber 40ml H₃PO₄, minimal hdspe
- I - Vial Amber 40ml H₃PO₄, minimal hdspe

Relinquished By

Date/Time

Received By

Date/Time

Relinquished By

Date/Time

Received By

Date/Time

Relinquished By

Date/Time

Received at Laboratory By

Date/Time

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

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



M.J. Reider Associates, Inc.

2220751

Client Code: 3157

Client: Tetra Tech

Project Manager: Richard A Wheeler

Project: 2022 - Walter Reservoir

Collected By :

(Full Name)

Gregory Wacik

Comments:

2220751-06 WA-4S

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

Matrix: Non-Potable Water

Type: Grab

Date: 7/13/22
Time: 1040

A - Pl 500ml NP, minimal hdspe
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 hdspe
H - Vial Amber 40ml H₃PO₄, minimal hdspe
I - Vial Amber 40ml H₃PO₄, minimal hdspe

2220751-07 WA-5S

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

Matrix: Non-Potable Water

Type: Grab

Date: 7/13/22
Time: 1100

A - Pl 500ml NP, minimal hdspe
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 hdspe
H - Vial Amber 40ml H₃PO₄, minimal hdspe
I - Vial Amber 40ml H₃PO₄, minimal hdspe

2220751-08 WA-6S

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

Matrix: Non-Potable Water

Type: Grab

Date: 7/13/22
Time: 0820

A - Pl 500ml NP, minimal hdspe
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 hdspe
H - Vial Amber 40ml H₃PO₄, minimal hdspe
I - Vial Amber 40ml H₃PO₄, minimal hdspe

Relinquished By

Date/Time

Received By

Date/Time

Relinquished By

Date/Time

Received By

Date/Time

Relinquished By

Date/Time

Received at Laboratory By

Date/Time

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.

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



Client Code: 3157

Client: Tetra Tech

Project Manager: Richard A Wheeler

Project: 2022 - Walter Reservoir

Comments:

Collected By :
(Full Name)

Gregory Wack

2220751-09 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 EPA 350.1, PO₄ SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

7/13/22
0820

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

2220751-10 WA-6D

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

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

7/13/22
0820

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

2220751-11 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
TSS SM 2540D, Alk SM 2320B, NH₃-N EPA 350.1, TDS SM 2540C, TOC SM 5310C, TKN EPA 351.2, PO₄ SM 4500P-F

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

7/13/22
0915

A - Pl 500ml NP, minimal hdspe
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 hdspe
H - Vial Amber 40ml H₃PO₄, minimal hdspe
I - Vial Amber 40ml H₃PO₄, minimal hdspe

Relinquished By

Date/Time

Received By

Date/Time

Relinquished By

Date/Time

Received By

Date/Time

Relinquished By

Date/Time

Received at Laboratory By

Date/Time

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.

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



M.J. Reider Associates, Inc.

2220751

Client Code: 3157

Client: Tetra Tech

Project Manager: Richard A Wheeler

Project: 2022 - Walter Reservoir

Comments: _____

Collected By : Gregory Wacik
(Full Name)

2220751-12 WA-7M

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

Matrix: Non-Potable Water

Type: Grab

Date: 7/13/22
Time: 0915

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

2220751-13 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 EPA 350.1, PO₄ SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date: 7/13/22
Time: 0915

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

Relinquished By: [Signature] Date/Time: 7/13/22 1250

Relinquished By: _____ Date/Time: _____

Relinquished By: _____ Date/Time: _____

Received By: [Signature] Date/Time: 7-13-22 1250

Received By: [Signature] Date/Time: _____

Received at Laboratory By: [Signature] Date/Time: 7-13-22 1438

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	<u>5.9</u>
Samples on Ice?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
Approved By:	<u>[Signature]</u>
Entered By:	<u>[Signature]</u>

M.J. Reider Associates, Inc.**MJRA Terms & Conditions**

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

Sample Submission, Sample Acceptance & Sampling Containers

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

Turnaround Times (TAT)

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

Analytical Results, Sample Collection Integrity & Subcontracting

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

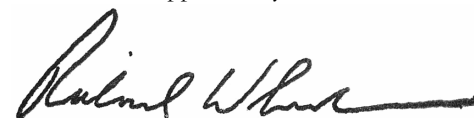
Payment Terms

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

Warranty & Litigation

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

Reviewed and Approved by:



Richard A Wheeler
Director of Field Services

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**M.J. Reider Associates, Inc.**ENVIRONMENTAL TESTING LABORATORY
U.S. EPA/PA DEP #06-00003**Certificate of Analysis****Laboratory No.:** 2226698**Report:** 09/15/22**Lab Contact:** Richard A Wheeler**Attention:** David Wertz**Project:** 2022 - Walter Reservoir**Reported To:** Tetra TechUSACE, Phila Dist. Env.Resources Branch 100 Penn Square E.
Arlington, VA 22201**Narrative:** Amended
09/15/2022

2226698 received on 08/18/2022 14:00 was originally reported on 08/25/2022.

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

Lab ID: 2226698-01	Collected By: Client	Sampled: 08/17/22 10:15	Received: 08/17/22 14:10
Sample Desc: WA-1S			Sample Type: Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.03	mg/l		0.01	SM 4500-P F	08/18/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	9	mg CaCO ₃ /L		2	SM 2320 B	08/18/22	C-51k	APR
Ammonia as N	0.11	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	08/19/22		MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/17/22 15:58		RXN
Nitrate as N	0.28	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	08/17/22 20:06	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/17/22 20:06	U	JAF
Nitrate+Nitrite as N	<0.29	mg/l	0.198	1.10	CALCULATED	08/17/22 20:06		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	08/22/22	U	SNF
Phosphorus as P, Total	0.01	mg/l	0.01	0.01	SM 4500-P F	08/19/22		MRW
Solids, Total Dissolved	51	mg/l	4	5	SM 2540 C	08/18/22		TMH
Total Organic Carbon	4.4	mg/l	0.3	0.5	SM 5310 C	08/18/22		ALD
Solids, Total Suspended	5	mg/l	1	1	SM 2540 D	08/18/22		ALD
	Result	Unit	Rep. Limit	Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology								
Escherichia coli	5	mpn/100ml	1	SM 9223 B/Quantitray	8/17/22 15:03	8/18/22 9:16		JMW
Total Coliform	1990	mpn/100ml	1	SM 9223 B/Quantitray	8/17/22 15:03	8/18/22 9:16		JMW

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M.J. Reider Associates, Inc.

Lab ID: 2226698-02 **Collected By:** Client **Sampled:** 08/17/22 07:30 **Received:** 08/17/22 14:10
Sample Desc: WA-2S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	08/18/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO ₃ /L		2	SM 2320 B	08/18/22	C-51f	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	08/19/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/17/22 15:58		RXN
Nitrate as N	0.23	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	08/17/22 18:42	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/17/22 18:42	U	JAF
Nitrate+Nitrite as N	<0.24	mg/l	0.198	1.10	CALCULATED	08/17/22 18:42		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	08/22/22	U	SNF
Phosphorus as P, Total	0.01	mg/l	0.01	0.01	SM 4500-P F	08/19/22		MRW
Solids, Total Dissolved	48	mg/l	4	5	SM 2540 C	08/18/22		TMH
Total Organic Carbon	4.6	mg/l	0.3	0.5	SM 5310 C	08/18/22		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	08/18/22		ALD
Microbiology								
Escherichia coli	<1	mpn/100ml	1		SM 9223 B/Quantitray	8/17/22 15:03	8/18/22 9:16	JMW
Total Coliform	435	mpn/100ml	1		SM 9223 B/Quantitray	8/17/22 15:03	8/18/22 9:16	JMW



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M.J. Reider Associates, Inc.

Lab ID: 2226698-03 **Collected By:** Client **Sampled:** 08/17/22 07:30 **Received:** 08/17/22 14:10
Sample Desc: WA-2M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.02	mg/l		0.01	SM 4500-P F	08/18/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	9	mg CaCO ₃ /L		2	SM 2320 B	08/18/22	C-51k	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	08/19/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/17/22 15:58		RXN
Nitrate as N	0.25	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	08/17/22 17:18	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/17/22 17:18	U	JAF
Nitrate+Nitrite as N	<0.26	mg/l	0.198	1.10	CALCULATED	08/17/22 17:18		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	08/22/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	08/19/22		MRW
Solids, Total Dissolved	51	mg/l	4	5	SM 2540 C	08/18/22		TMH
Total Organic Carbon	4.4	mg/l	0.3	0.5	SM 5310 C	08/18/22		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	08/18/22		ALD

Lab ID: 2226698-04 **Collected By:** Client **Sampled:** 08/17/22 07:30 **Received:** 08/17/22 14:10
Sample Desc: WA-2D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	08/18/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	10	mg CaCO ₃ /L		2	SM 2320 B	08/18/22	C-51	APR
Ammonia as N	0.05	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	08/19/22		MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/17/22 15:56		RXN
Nitrate as N	0.28	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	08/17/22 21:47	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/17/22 21:47	U	JAF
Nitrate+Nitrite as N	<0.29	mg/l	0.198	1.10	CALCULATED	08/17/22 21:47		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	08/22/22	U	SNF
Phosphorus as P, Total	0.02	mg/l	0.01	0.01	SM 4500-P F	08/19/22		MRW
Solids, Total Dissolved	65	mg/l	4	5	SM 2540 C	08/18/22		TMH
Total Organic Carbon	4.3	mg/l	0.3	0.5	SM 5310 C	08/18/22		ALD
Solids, Total Suspended	17	mg/l	1	1	SM 2540 D	08/18/22		ALD



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M.J. Reider Associates, Inc.

Lab ID: 2226698-05 **Collected By:** Client **Sampled:** 08/17/22 11:00 **Received:** 08/17/22 14:10
Sample Desc: WA-3S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.01	mg/l		0.01	SM 4500-P F	08/18/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	11	mg CaCO ₃ /L		2	SM 2320 B	08/18/22	C-51a	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	08/19/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/17/22 15:56		RXN
Nitrate as N	0.92	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	08/17/22 21:30	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/17/22 21:30	U	JAF
Nitrate+Nitrite as N	<0.93	mg/l	0.198	1.10	CALCULATED	08/17/22 21:30		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	08/22/22	U	SNF
Phosphorus as P, Total	0.02	mg/l	0.01	0.01	SM 4500-P F	08/19/22		MRW
Solids, Total Dissolved	88	mg/l	4	5	SM 2540 C	08/18/22		TMH
Total Organic Carbon	4.1	mg/l	0.3	0.5	SM 5310 C	08/18/22		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	08/18/22		ALD
Microbiology								
Escherichia coli	12	mpn/100ml	1		SM 9223 B/Quantitray	8/17/22 15:03	8/18/22 9:16	JMW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	8/17/22 15:03	8/18/22 9:16	JMW



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M.J. Reider Associates, Inc.

Lab ID: 2226698-06 **Collected By:** Client **Sampled:** 08/17/22 11:15 **Received:** 08/17/22 14:10
Sample Desc: WA-4S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	08/18/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	14	mg CaCO ₃ /L		2	SM 2320 B	08/18/22	C-51b	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	08/19/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/17/22 15:58		RXN
Nitrate as N	<0.18	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	08/17/22 17:35	U	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/17/22 17:35	U	JAF
Nitrate+Nitrite as N	<0.19	mg/l	0.198	1.10	CALCULATED	08/17/22 17:35		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	08/22/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	08/19/22		MRW
Solids, Total Dissolved	55	mg/l	4	5	SM 2540 C	08/18/22		TMH
Total Organic Carbon	3.0	mg/l	0.3	0.5	SM 5310 C	08/18/22		ALD
Solids, Total Suspended	6	mg/l	1	1	SM 2540 D	08/18/22		ALD
Microbiology								
Escherichia coli	26	mpn/100ml	1		SM 9223 B/Quantitray	8/17/22 15:03	8/18/22 9:16	JMW
Total Coliform	1730	mpn/100ml	1		SM 9223 B/Quantitray	8/17/22 15:03	8/18/22 9:16	JMW



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M.J. Reider Associates, Inc.

Lab ID: 2226698-07 **Collected By:** Client **Sampled:** 08/17/22 11:30 **Received:** 08/17/22 14:10
Sample Desc: WA-5S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	08/18/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	6	mg CaCO ₃ /L		2	SM 2320 B	08/18/22	C-51c	APR
Ammonia as N	0.07	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	08/19/22		MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/17/22 15:58		RXN
Nitrate as N	0.22	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	08/17/22 20:23	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/17/22 20:23	U	JAF
Nitrate+Nitrite as N	<0.23	mg/l	0.198	1.10	CALCULATED	08/17/22 20:23		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	08/22/22	U	SNF
Phosphorus as P, Total	0.01	mg/l	0.01	0.01	SM 4500-P F	08/19/22		MRW
Solids, Total Dissolved	65	mg/l	4	5	SM 2540 C	08/18/22		TMH
Total Organic Carbon	2.6	mg/l	0.3	0.5	SM 5310 C	08/18/22		ALD
Solids, Total Suspended	5	mg/l	1	1	SM 2540 D	08/18/22		ALD
Microbiology								
Escherichia coli	14	mpn/100ml	1		SM 9223 B/Quantitray	8/17/22 15:03	8/18/22 9:16	JMW
Total Coliform	1730	mpn/100ml	1		SM 9223 B/Quantitray	8/17/22 15:03	8/18/22 9:16	JMW



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M.J. Reider Associates, Inc.

Lab ID: 2226698-08 **Collected By:** Client **Sampled:** 08/17/22 09:00 **Received:** 08/17/22 14:10
Sample Desc: WA-6S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	08/18/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO ₃ /L		2	SM 2320 B	08/18/22	C-51e	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	08/19/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/17/22 15:58		RXN
Nitrate as N	0.23	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	08/17/22 17:01	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/17/22 17:01	U	JAF
Nitrate+Nitrite as N	<0.24	mg/l	0.198	1.10	CALCULATED	08/17/22 17:01		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	08/22/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	08/19/22		MRW
Solids, Total Dissolved	45	mg/l	4	5	SM 2540 C	08/18/22		TMH
Total Organic Carbon	4.5	mg/l	0.3	0.5	SM 5310 C	08/18/22		ALD
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	08/18/22		ALD
Microbiology								
Escherichia coli	<1	mpn/100ml	1		SM 9223 B/Quantitray	8/17/22 15:03	8/18/22 9:16	JMW
Total Coliform	461	mpn/100ml	1		SM 9223 B/Quantitray	8/17/22 15:03	8/18/22 9:16	JMW



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M.J. Reider Associates, Inc.

Lab ID: 2226698-09 Collected By: Client Sampled: 08/17/22 09:00 Received: 08/17/22 14:10
Sample Desc: WA-6M Sample Type: Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	08/18/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO ₃ /L		2	SM 2320 B	08/18/22	C-51h	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	08/19/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/17/22 15:56		RXN
Nitrate as N	0.25	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	08/17/22 19:49	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/17/22 19:49	U	JAF
Nitrate+Nitrite as N	<0.26	mg/l	0.198	1.10	CALCULATED	08/17/22 19:49		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	08/22/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	08/19/22		MRW
Solids, Total Dissolved	52	mg/l	4	5	SM 2540 C	08/18/22		TMH
Total Organic Carbon	4.4	mg/l	0.3	0.5	SM 5310 C	08/18/22		ALD
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	08/18/22		ALD

Lab ID: 2226698-10 Collected By: Client Sampled: 08/17/22 09:00 Received: 08/17/22 14:10
Sample Desc: WA-6D Sample Type: Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	08/18/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	9	mg CaCO ₃ /L		2	SM 2320 B	08/18/22	C-51j	APR
Ammonia as N	0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	08/19/22		MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/17/22 15:56		RXN
Nitrate as N	0.25	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	08/17/22 19:32	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/17/22 19:32	U	JAF
Nitrate+Nitrite as N	<0.26	mg/l	0.198	1.10	CALCULATED	08/17/22 19:32		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	08/22/22	U	SNF
Phosphorus as P, Total	0.02	mg/l	0.01	0.01	SM 4500-P F	08/19/22		MRW
Solids, Total Dissolved	59	mg/l	4	5	SM 2540 C	08/18/22		TMH
Total Organic Carbon	4.3	mg/l	0.3	0.5	SM 5310 C	08/18/22		ALD
Solids, Total Suspended	6	mg/l	1	1	SM 2540 D	08/18/22		ALD



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M.J. Reider Associates, Inc.

Lab ID: 2226698-11 **Collected By:** Client **Sampled:** 08/17/22 08:30 **Received:** 08/17/22 14:10
Sample Desc: WA-7S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	08/18/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO ₃ /L		2	SM 2320 B	08/18/22	C-51g	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	08/19/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/17/22 15:56		RXN
Nitrate as N	0.24	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	08/17/22 20:57	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/17/22 20:57	U	JAF
Nitrate+Nitrite as N	<0.25	mg/l	0.198	1.10	CALCULATED	08/17/22 20:57		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	08/22/22	U	SNF
Phosphorus as P, Total	0.02	mg/l	0.01	0.01	SM 4500-P F	08/19/22		MRW
Solids, Total Dissolved	46	mg/l	4	5	SM 2540 C	08/18/22		TMH
Total Organic Carbon	4.5	mg/l	0.3	0.5	SM 5310 C	08/18/22		ALD
Solids, Total Suspended	<1	mg/l	1	1	SM 2540 D	08/18/22		ALD
Microbiology								
Escherichia coli	<1	mpn/100ml	1		SM 9223 B/Quantitray	8/17/22 15:03	8/18/22 9:16	JMW
Total Coliform	435	mpn/100ml	1		SM 9223 B/Quantitray	8/17/22 15:03	8/18/22 9:16	JMW



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M.J. Reider Associates, Inc.

Lab ID: 2226698-12 **Collected By:** Client **Sampled:** 08/17/22 08:30 **Received:** 08/17/22 14:10
Sample Desc: WA-7M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	<0.01	mg/l		0.01	SM 4500-P F	08/20/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	7	mg CaCO ₃ /L		2	SM 2320 B	08/18/22	C-51d	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	08/19/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/17/22 15:58		RXN
Nitrate as N	0.23	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	08/17/22 21:13	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/17/22 21:13	U	JAF
Nitrate+Nitrite as N	<0.24	mg/l	0.198	1.10	CALCULATED	08/17/22 21:13		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	08/23/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	08/19/22		MRW
Solids, Total Dissolved	46	mg/l	4	5	SM 2540 C	08/18/22		TMH
Total Organic Carbon	4.4	mg/l	0.3	0.5	SM 5310 C	08/18/22		ALD
Solids, Total Suspended	4	mg/l	1	1	SM 2540 D	08/18/22		ALD

Lab ID: 2226698-13 **Collected By:** Client **Sampled:** 08/17/22 08:30 **Received:** 08/17/22 14:10
Sample Desc: WA-7D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.01	mg/l		0.01	SM 4500-P F	08/20/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	9	mg CaCO ₃ /L		2	SM 2320 B	08/18/22	C-51i	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	08/19/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	08/17/22 15:58		RXN
Nitrate as N	0.26	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	08/17/22 20:40	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	08/17/22 20:40	U	JAF
Nitrate+Nitrite as N	<0.27	mg/l	0.198	1.10	CALCULATED	08/17/22 20:40		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	08/23/22	U	SNF
Phosphorus as P, Total	0.01	mg/l	0.01	0.01	SM 4500-P F	08/19/22		MRW
Solids, Total Dissolved	52	mg/l	4	5	SM 2540 C	08/18/22		TMH
Total Organic Carbon	4.4	mg/l	0.3	0.5	SM 5310 C	08/18/22		ALD
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	08/18/22		ALD



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Preparation Methods

Specific Method	Preparation Method	Prep Batch	Prepared Date	Prepared By
2226698-01				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2H1053	08/17/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2H1180	08/19/2022	MRW
2226698-02				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2H1053	08/17/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2H1180	08/19/2022	MRW
2226698-03				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2H1053	08/17/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2H1180	08/19/2022	MRW
2226698-04				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2H1053	08/17/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2H1180	08/19/2022	MRW
2226698-05				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2H1053	08/17/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2H1180	08/19/2022	MRW
2226698-06				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2H1053	08/17/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2H1180	08/19/2022	MRW
2226698-07				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2H1053	08/17/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2H1180	08/19/2022	MRW
2226698-08				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2H1053	08/17/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2H1180	08/19/2022	MRW
2226698-09				



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Dissolved General Chemistry

SM 4500-P F	SM 4500-P B	B2H1053	08/17/2022	MRW
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General Chemistry

SM 4500-P F	SM 4500-P B	B2H1180	08/19/2022	MRW
-------------	-------------	---------	------------	-----

2226698-10

Dissolved General Chemistry

SM 4500-P F	SM 4500-P B	B2H1053	08/17/2022	MRW
-------------	-------------	---------	------------	-----

General Chemistry

SM 4500-P F	SM 4500-P B	B2H1180	08/19/2022	MRW
-------------	-------------	---------	------------	-----

2226698-11

Dissolved General Chemistry

SM 4500-P F	SM 4500-P B	B2H1053	08/17/2022	MRW
-------------	-------------	---------	------------	-----

General Chemistry

SM 4500-P F	SM 4500-P B	B2H1180	08/19/2022	MRW
-------------	-------------	---------	------------	-----

2226698-12

Dissolved General Chemistry

SM 4500-P F	SM 4500-P B	B2H1209	08/19/2022	MRW
-------------	-------------	---------	------------	-----

General Chemistry

SM 4500-P F	SM 4500-P B	B2H1180	08/19/2022	MRW
-------------	-------------	---------	------------	-----

2226698-13

Dissolved General Chemistry

SM 4500-P F	SM 4500-P B	B2H1209	08/19/2022	MRW
-------------	-------------	---------	------------	-----

General Chemistry

SM 4500-P F	SM 4500-P B	B2H1180	08/19/2022	MRW
-------------	-------------	---------	------------	-----

Notes and Definitions

- C-51 The alkalinity to pH 4.2 = 10.4 mg CaCO₃/L.
- C-51a The alkalinity to pH 4.2 = 10.6 mg CaCO₃/L.
- C-51b The alkalinity to pH 4.2 = 13.6 mg CaCO₃/L.
- C-51c The alkalinity to pH 4.2 = 5.6 mg CaCO₃/L.
- C-51d The alkalinity to pH 4.2 = 7.0 mg CaCO₃/L.
- C-51e The alkalinity to pH 4.2 = 7.2 mg CaCO₃/L.
- C-51f The alkalinity to pH 4.2 = 7.4 mg CaCO₃/L.
- C-51g The alkalinity to pH 4.2 = 8.1 mg CaCO₃/L.
- C-51h The alkalinity to pH 4.2 = 8.4 mg CaCO₃/L.
- C-51i The alkalinity to pH 4.2 = 8.6 mg CaCO₃/L.
- C-51j The alkalinity to pH 4.2 = 8.8 mg CaCO₃/L.
- C-51k The alkalinity to pH 4.2 = 9.0 mg CaCO₃/L.
- G-23 The sample was filtered after it was received at the laboratory and outside of the 15-minute hold time.
- G-24 The sample was preserved in the laboratory and outside of the 15-minute hold time.
- J Estimated value
- U Analyte was not detected above the indicated value.



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Client Code: 3157

Project Manager: Richard A Wheeler

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

WORK ORDER Chain of Custody

2226698



Client: Tetra Tech

Project: 2022 - Walter Reservoir

Collected By:

(Full Name)

Gregory Wacik

Comments:

2226698-01 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 EPA 350.1, PO₄ SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

8/17/22
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

2226698-02 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 EPA 350.1, PO₄ SM 4500P-F, TDS SM 2540C, TOC SM 5310C, TSS SM 2540D, TKN EPA 351.2

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

8/17/22
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

Date/Time

8/17/22 1230

Received By

Date/Time

8-17-22 1245

Relinquished By

Date/Time

Received By

Date/Time

Relinquished By

Date/Time

Received at Laboratory By

Date/Time

8-17-22 1410

Sample Kit Prepared By:	Date/Time
JPS	
Sample Temp (°C):	4.0
Samples on Ice?	Yes No NA
Approved By:	B98
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.



M.J. Reider Associates, Inc.

2226698

Client Code: 3157

Client: Tetra Tech

Project Manager: Richard A Wheeler

Project: 2022 - Walter Reservoir

Collected By :
(Full Name)

Gregory Wacik

Comments: _____

2226698-03 WA-2M

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

Matrix: Non-Potable Water
Type: Grab

Date: 8/17/22
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

2226698-04 WA-2D

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

Matrix: Non-Potable Water
Type: Grab

Date: 8/17/22
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

2226698-05 WA-3S

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

Matrix: Non-Potable Water
Type: Grab

Date: 8/17/22
Time: 1100

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

Relinquished By: *[Signature]* Date/Time: 8/17/22 1230

Received By: *Benny Nant* Date/Time: 8-17-22 1245

Relinquished By: _____ Date/Time: _____

Received By: *Benny Nant* Date/Time: 8-17-22 1410

Relinquished By: _____ Date/Time: _____

Received at Laboratory By: _____ Date/Time: _____

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	<u>4.0</u>
Samples on Ice?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>
Approved By:	<i>[Signature]</i>
Entered By:	_____



M.J. Reider Associates, Inc.

2226698

Client Code: 3157

Client: Tetra Tech

Project Manager: Richard A Wheeler

Project: 2022 - Walter Reservoir

Comments: _____

Collected By :
(Full Name)

Gregory Wacik

2226698-06 WA-4S

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

Matrix: Non-Potable Water

Type: Grab

Date: 8/17/22
Time: 1115

- A - Pl 500ml NP, minimal hdspe
- 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 hdspe
- H - Vial Amber 40ml H₃PO₄, minimal hdspe
- I - Vial Amber 40ml H₃PO₄, minimal hdspe

2226698-07 WA-5S

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

Matrix: Non-Potable Water

Type: Grab

Date: 8/17/22
Time: 1130

- A - Pl 500ml NP, minimal hdspe
- 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 hdspe
- H - Vial Amber 40ml H₃PO₄, minimal hdspe
- I - Vial Amber 40ml H₃PO₄, minimal hdspe

2226698-08 WA-6S

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

Matrix: Non-Potable Water

Type: Grab

Date: 8/17/22
Time: 0900

- A - Pl 500ml NP, minimal hdspe
- 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 hdspe
- H - Vial Amber 40ml H₃PO₄, minimal hdspe
- I - Vial Amber 40ml H₃PO₄, minimal hdspe

Relinquished By: *[Signature]* Date/Time: 8/17/22 1230

Received By: *Benny Nath* Date/Time: 8-17-22 1245

Relinquished By: _____ Date/Time: _____

Received By: *Benny Nath* Date/Time: 8-17-22 1410

Relinquished By: _____ Date/Time: _____

Received at Laboratory By: _____ Date/Time: _____

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.

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	<u>4.0</u>
Samples on Ice?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>
Approved By:	<i>[Signature]</i>
Entered By:	_____



M.J. Reider Associates, Inc.

2226698

Client Code: 3157

Client: Tetra Tech

Project Manager: Richard A Wheeler

Project: 2022 - Walter Reservoir

Comments: _____

Collected By: _____
(Full Name)

Gregory Wacik

2226698-09 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 EPA 350.1, PO₄ SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date: 8/17/22
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

2226698-10 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 EPA 350.1, PO₄ SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date: 8/17/22
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

2226698-11 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 EPA 350.1, TOC SM 5310C, TDS SM 2540C, TKN EPA 351.2, TSS SM 2540D, PO₄ SM 4500P-F

Matrix: Non-Potable Water

Type: Grab

Date: 8/17/22
Time: 0830

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

Relinquished By: *Gregory Wacik* Date/Time: 8/17/22 1230

Received By: *Benny Wacik* Date/Time: 8-17-22 1245

Relinquished By: _____ Date/Time: _____

Received By: *Benny Wacik* Date/Time: 8-17-22 1410

Relinquished By: _____ Date/Time: _____

Received at Laboratory By: _____ Date/Time: _____

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	<u>4.0</u>
Samples on Ice?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
Approved By:	<u><i>Benny Wacik</i></u>
Entered By:	<u><i>Benny Wacik</i></u>



M.J. Reider Associates, Inc.

2226698

Client Code: 3157

Client: Tetra Tech

Project Manager: Richard A Wheeler

Project: 2022 - Walter Reservoir

Comments: _____

Collected By :
(Full Name)

Gregory Wasik

2226698-12 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 EPA 350.1, PO₄ SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date: 8/17/22

Time: 0830

- 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

2226698-13 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 EPA 350.1, PO₄ SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date: 8/17/22

Time: 0830

- 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: Gregory Wasik Date/Time: 8/17/22 1230

Received By: Benny Nhat Date/Time: 8-17-22 1245

Relinquished By: _____ Date/Time: _____

Received By: Benny Nhat Date/Time: _____

Relinquished By: _____ Date/Time: _____

Received at Laboratory By: _____ Date/Time: 8-17-22 1410

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.

Sample Kit Prepared By:	Date/Time
Sample Temp (°C):	<u>4.0</u>
Samples on Ice?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA <input type="checkbox"/>
Approved By:	<u>Benny Nhat</u>
Entered By:	_____

M.J. Reider Associates, Inc.**MJRA Terms & Conditions**

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

Sample Submission, Sample Acceptance & Sampling Containers

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

Turnaround Times (TAT)

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

Analytical Results, Sample Collection Integrity & Subcontracting

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

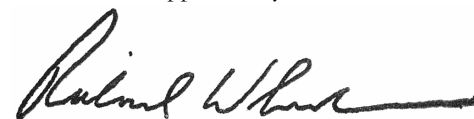
Payment Terms

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

Warranty & Litigation

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

Reviewed and Approved by:



Richard A Wheeler
Director of Field Services

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Additional accreditations by MD (261), NY(12094)



M.J. Reider Associates, Inc.

ENVIRONMENTAL TESTING LABORATORY
U.S. EPA/PA DEP #06-00003

Certificate of Analysis

Laboratory No.: 2229488

Report: 09/28/22

Lab Contact: Richard A Wheeler

Attention: David Wertz

Project: 2022 - Walter Reservoir

Reported To: Tetra Tech

USACE, Phila Dist. Env.Resources Branch 100 Penn Square E.
Arlington, VA 22201

Lab ID: 2229488-01

Collected By: Client

Sampled: 09/14/22 11:10

Received: 09/14/22 15:15

Sample Desc: WA-1S

Sample Type: Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst	
Dissolved General Chemistry									
Phosphorus as P, Dissolved	0.02	mg/l		0.01	SM 4500-P F	09/24/22	G-23, G-24	MRW	
General Chemistry									
Alkalinity, Total to pH 4.5	9	mg CaCO3/L		2	SM 2320 B	09/16/22	C-51f	APR	
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	09/20/22	U	SNF	
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	09/15/22 11:00		NKH	
Nitrate as N	0.22	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	09/15/22 1:10	J	JAF	
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/15/22 1:10	U	JAF	
Nitrate+Nitrite as N	<0.23	mg/l	0.198	1.10	CALCULATED	09/15/22 1:10		JAF	
Nitrogen, Total Kjeldahl (TKN)	0.62	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	09/22/22		SNF	
Phosphorus as P, Total	0.03	mg/l	0.01	0.01	SM 4500-P F	09/20/22		SNF	
Solids, Total Dissolved	52	mg/l	4	5	SM 2540 C	09/15/22		TMH	
Total Organic Carbon	7.2	mg/l	0.3	0.5	SM 5310 C	09/20/22		HRG	
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	09/15/22		TMH	
	Result	Unit	Rep. Limit		Analysis Method	Incubated	Analyzed	Notes	Analyst
Microbiology									
Escherichia coli	79	mpn/100ml	1		SM 9223 B/Quantitray	9/14/22 15:58	9/15/22 11:08		JMW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	9/14/22 15:58	9/15/22 11:08		JMW



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Additional accreditations by MD (261), NY(12094)

M.J. Reider Associates, Inc.

Lab ID: 2229488-02 **Collected By:** Client **Sampled:** 09/14/22 08:30 **Received:** 09/14/22 15:15
Sample Desc: WA-2S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.02	mg/l		0.01	SM 4500-P F	09/24/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO ₃ /L		2	SM 2320 B	09/16/22	C-51d	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	09/23/22	U	MRW
Biochemical Oxygen Demand	5.0	mg/l	2.0	2.0	SM 5210 B	09/15/22 12:00	C-37	NKH
Nitrate as N	0.25	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	09/15/22 2:54	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/15/22 2:54	U	JAF
Nitrate+Nitrite as N	<0.26	mg/l	0.198	1.10	CALCULATED	09/15/22 2:54		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	09/22/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	09/23/22		MRW
Solids, Total Dissolved	55	mg/l	4	5	SM 2540 C	09/15/22		TMH
Total Organic Carbon	5.2	mg/l	0.3	0.5	SM 5310 C	09/20/22		HRG
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	09/15/22		TMH
Microbiology								
Escherichia coli	3	mpn/100ml	1		SM 9223 B/Quantitray	9/14/22 15:58	9/15/22 11:08	JMW
Total Coliform	172	mpn/100ml	1		SM 9223 B/Quantitray	9/14/22 15:58	9/15/22 11:08	JMW



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Additional accreditations by MD (261), NY(12094)

M.J. Reider Associates, Inc.

Lab ID: 2229488-03 **Collected By:** Client **Sampled:** 09/14/22 08:30 **Received:** 09/14/22 15:15
Sample Desc: WA-2M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.02	mg/l		0.01	SM 4500-P F	09/24/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	9	mg CaCO ₃ /L		2	SM 2320 B	09/16/22	C-51h	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	09/23/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	09/15/22 12:00	C-37	NKH
Nitrate as N	0.21	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	09/14/22 18:51	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/14/22 18:51	U	JAF
Nitrate+Nitrite as N	<0.22	mg/l	0.198	1.10	CALCULATED	09/14/22 18:51		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	09/22/22	U	SNF
Phosphorus as P, Total	0.03	mg/l	0.01	0.01	SM 4500-P F	09/23/22		MRW
Solids, Total Dissolved	53	mg/l	4	5	SM 2540 C	09/15/22		TMH
Total Organic Carbon	7.3	mg/l	0.3	0.5	SM 5310 C	09/20/22		HRG
Solids, Total Suspended	4	mg/l	1	1	SM 2540 D	09/15/22		TMH

Lab ID: 2229488-04 **Collected By:** Client **Sampled:** 09/14/22 08:30 **Received:** 09/14/22 15:15
Sample Desc: WA-2D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.04	mg/l		0.01	SM 4500-P F	09/24/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	9	mg CaCO ₃ /L		2	SM 2320 B	09/16/22	C-51i	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	09/23/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	09/15/22 12:00	C-37	NKH
Nitrate as N	0.23	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	09/14/22 22:54	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/14/22 22:54	U	JAF
Nitrate+Nitrite as N	<0.24	mg/l	0.198	1.10	CALCULATED	09/14/22 22:54		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	09/22/22	U	SNF
Phosphorus as P, Total	0.01	mg/l	0.01	0.01	SM 4500-P F	09/23/22		MRW
Solids, Total Dissolved	65	mg/l	4	5	SM 2540 C	09/15/22		TMH
Total Organic Carbon	6.9	mg/l	0.3	0.5	SM 5310 C	09/20/22		HRG
Solids, Total Suspended	7	mg/l	1	1	SM 2540 D	09/15/22		TMH



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M.J. Reider Associates, Inc.

Lab ID: 2229488-05 **Collected By:** Client **Sampled:** 09/14/22 11:40 **Received:** 09/14/22 15:15
Sample Desc: WA-3S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.02	mg/l		0.01	SM 4500-P F	09/24/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	9	mg CaCO ₃ /L		2	SM 2320 B	09/16/22	C-51g	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	09/23/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	09/15/22 11:00		NKH
Nitrate as N	0.23	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	09/15/22 0:18	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/15/22 0:18	U	JAF
Nitrate+Nitrite as N	<0.24	mg/l	0.198	1.10	CALCULATED	09/15/22 0:18		JAF
Nitrogen, Total Kjeldahl (TKN)	0.44	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	09/22/22	J	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	09/23/22		MRW
Solids, Total Dissolved	79	mg/l	4	5	SM 2540 C	09/15/22		TMH
Total Organic Carbon	9.6	mg/l	0.3	0.5	SM 5310 C	09/20/22		HRG
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	09/15/22		TMH
Microbiology								
Escherichia coli	20	mpn/100ml	1		SM 9223 B/Quantitray	9/14/22 15:58	9/15/22 11:08	JMW
Total Coliform	2420	mpn/100ml	1		SM 9223 B/Quantitray	9/14/22 15:58	9/15/22 11:08	JMW



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M.J. Reider Associates, Inc.

Lab ID: 2229488-06 **Collected By:** Client **Sampled:** 09/14/22 12:00 **Received:** 09/14/22 15:15
Sample Desc: WA-4S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.02	mg/l		0.01	SM 4500-P F	09/24/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	10	mg CaCO ₃ /L		2	SM 2320 B	09/16/22	C-51	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	09/23/22	U	MRW
Biochemical Oxygen Demand	3.8	mg/l	2.0	2.0	SM 5210 B	09/15/22 11:00		NKH
Nitrate as N	0.19	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	09/15/22 2:02	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/15/22 2:02	U	JAF
Nitrate+Nitrite as N	<0.20	mg/l	0.198	1.10	CALCULATED	09/15/22 2:02		JAF
Nitrogen, Total Kjeldahl (TKN)	0.58	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	09/22/22		SNF
Phosphorus as P, Total	0.12	mg/l	0.01	0.01	SM 4500-P F	09/23/22		MRW
Solids, Total Dissolved	57	mg/l	4	5	SM 2540 C	09/15/22		TMH
Total Organic Carbon	7.5	mg/l	0.3	0.5	SM 5310 C	09/20/22		HRG
Solids, Total Suspended	5	mg/l	1	1	SM 2540 D	09/15/22		TMH
Microbiology								
Escherichia coli	46	mpn/100ml	1		SM 9223 B/Quantitray	9/14/22 15:58	9/15/22 11:08	JMW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	9/14/22 15:58	9/15/22 11:08	JMW



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M.J. Reider Associates, Inc.

Lab ID: 2229488-07 **Collected By:** Client **Sampled:** 09/14/22 12:30 **Received:** 09/14/22 15:15
Sample Desc: WA-5S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.03	mg/l		0.01	SM 4500-P F	09/24/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	5	mg CaCO ₃ /L		2	SM 2320 B	09/16/22	C-51a	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	09/23/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	09/15/22 12:00	C-37	NKH
Nitrate as N	<0.18	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	09/15/22 2:19	U	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/15/22 2:19	U	JAF
Nitrate+Nitrite as N	<0.19	mg/l	0.198	1.10	CALCULATED	09/15/22 2:19		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	09/22/22	U	SNF
Phosphorus as P, Total	<0.01	mg/l	0.01	0.01	SM 4500-P F	09/23/22		MRW
Solids, Total Dissolved	48	mg/l	4	5	SM 2540 C	09/15/22		TMH
Total Organic Carbon	7.0	mg/l	0.3	0.5	SM 5310 C	09/20/22		HRG
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	09/15/22		TMH
Microbiology								
Escherichia coli	365	mpn/100ml	1		SM 9223 B/Quantitray	9/14/22 15:58	9/15/22 11:08	JMW
Total Coliform	>2420	mpn/100ml	1		SM 9223 B/Quantitray	9/14/22 15:58	9/15/22 11:08	JMW



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Lab ID: 2229488-08 **Collected By:** Client **Sampled:** 09/14/22 09:30 **Received:** 09/14/22 15:15
Sample Desc: WA-6S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.02	mg/l		0.01	SM 4500-P F	09/24/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	9	mg CaCO ₃ /L		2	SM 2320 B	09/16/22	C-51f	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	09/23/22	U	MRW
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	09/15/22 11:00		NKH
Nitrate as N	0.24	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	09/15/22 1:27	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/15/22 1:27	U	JAF
Nitrate+Nitrite as N	<0.25	mg/l	0.198	1.10	CALCULATED	09/15/22 1:27		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	09/22/22	U	SNF
Phosphorus as P, Total	0.03	mg/l	0.01	0.01	SM 4500-P F	09/23/22		MRW
Solids, Total Dissolved	52	mg/l	4	5	SM 2540 C	09/15/22		TMH
Total Organic Carbon	5.2	mg/l	0.3	0.5	SM 5310 C	09/20/22		HRG
Solids, Total Suspended	1	mg/l	1	1	SM 2540 D	09/15/22		TMH
Microbiology								
Escherichia coli	9	mpn/100ml	1		SM 9223 B/Quantitray	9/14/22 15:58	9/15/22 11:08	JMW
Total Coliform	124	mpn/100ml	1		SM 9223 B/Quantitray	9/14/22 15:58	9/15/22 11:08	JMW



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M.J. Reider Associates, Inc.

Lab ID: 2229488-09 **Collected By:** Client **Sampled:** 09/14/22 09:30 **Received:** 09/14/22 15:15
Sample Desc: WA-6M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.03	mg/l		0.01	SM 4500-P F	09/24/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO ₃ /L		2	SM 2320 B	09/16/22	C-51c	APR
Ammonia as N	0.04	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	09/20/22		SNF
Biochemical Oxygen Demand	3.8	mg/l	2.0	2.0	SM 5210 B	09/15/22 12:00	C-37	NKH
Nitrate as N	0.22	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	09/14/22 23:45	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/14/22 23:45	U	JAF
Nitrate+Nitrite as N	<0.23	mg/l	0.198	1.10	CALCULATED	09/14/22 23:45		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	09/22/22	U	SNF
Phosphorus as P, Total	0.01	mg/l	0.01	0.01	SM 4500-P F	09/20/22		SNF
Solids, Total Dissolved	69	mg/l	4	5	SM 2540 C	09/15/22		TMH
Total Organic Carbon	6.5	mg/l	0.3	0.5	SM 5310 C	09/20/22		HRG
Solids, Total Suspended	2	mg/l	1	1	SM 2540 D	09/15/22		TMH

Lab ID: 2229488-10 **Collected By:** Client **Sampled:** 09/14/22 09:30 **Received:** 09/14/22 15:15
Sample Desc: WA-6D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.02	mg/l		0.01	SM 4500-P F	09/24/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO ₃ /L		2	SM 2320 B	09/16/22	C-51b	APR
Ammonia as N	0.04	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	09/20/22		SNF
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	09/15/22 11:00		NKH
Nitrate as N	0.21	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	09/15/22 0:02	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/15/22 0:02	U	JAF
Nitrate+Nitrite as N	<0.22	mg/l	0.198	1.10	CALCULATED	09/15/22 0:02		JAF
Nitrogen, Total Kjeldahl (TKN)	0.47	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	09/22/22	J	SNF
Phosphorus as P, Total	0.02	mg/l	0.01	0.01	SM 4500-P F	09/20/22		SNF
Solids, Total Dissolved	71	mg/l	4	5	SM 2540 C	09/15/22		TMH
Total Organic Carbon	6.5	mg/l	0.3	0.5	SM 5310 C	09/20/22		HRG
Solids, Total Suspended	36	mg/l	1	1	SM 2540 D	09/15/22		TMH



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M.J. Reider Associates, Inc.

Lab ID: 2229488-11 **Collected By:** Client **Sampled:** 09/14/22 10:15 **Received:** 09/14/22 15:15
Sample Desc: WA-7S **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.02	mg/l		0.01	SM 4500-P F	09/24/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	8	mg CaCO ₃ /L		2	SM 2320 B	09/16/22	C-51e	APR
Ammonia as N	0.05	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	09/20/22		SNF
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	09/15/22 11:00		NKH
Nitrate as N	0.23	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	09/15/22 2:36	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/15/22 2:36	U	JAF
Nitrate+Nitrite as N	<0.24	mg/l	0.198	1.10	CALCULATED	09/15/22 2:36		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	09/22/22	U	SNF
Phosphorus as P, Total	0.30	mg/l	0.01	0.01	SM 4500-P F	09/20/22	Q-11	SNF
Solids, Total Dissolved	60	mg/l	4	5	SM 2540 C	09/15/22		TMH
Total Organic Carbon	5.4	mg/l	0.3	0.5	SM 5310 C	09/20/22		HRG
Solids, Total Suspended	4	mg/l	1	1	SM 2540 D	09/15/22		TMH
Microbiology								
Escherichia coli	15	mpn/100ml	1		SM 9223 B/Quantitray	9/14/22 15:58	9/15/22 11:08	JMW
Total Coliform	488	mpn/100ml	1		SM 9223 B/Quantitray	9/14/22 15:58	9/15/22 11:08	JMW



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M.J. Reider Associates, Inc.

Lab ID: 2229488-12 **Collected By:** Client **Sampled:** 09/14/22 10:15 **Received:** 09/14/22 15:15
Sample Desc: WA-7M **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.02	mg/l		0.01	SM 4500-P F	09/24/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	9	mg CaCO ₃ /L		2	SM 2320 B	09/16/22	C-51j	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	09/20/22	U	SNF
Biochemical Oxygen Demand	<2.0	mg/l	2.0	2.0	SM 5210 B	09/15/22 11:00		NKH
Nitrate as N	0.21	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	09/15/22 1:44	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/15/22 1:44	U	JAF
Nitrate+Nitrite as N	<0.22	mg/l	0.198	1.10	CALCULATED	09/15/22 1:44		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	09/22/22	U	SNF
Phosphorus as P, Total	0.01	mg/l	0.01	0.01	SM 4500-P F	09/20/22		SNF
Solids, Total Dissolved	70	mg/l	4	5	SM 2540 C	09/15/22		TMH
Total Organic Carbon	7.3	mg/l	0.3	0.5	SM 5310 C	09/20/22		HRG
Solids, Total Suspended	4	mg/l	1	1	SM 2540 D	09/15/22		TMH

Lab ID: 2229488-13 **Collected By:** Client **Sampled:** 09/14/22 10:15 **Received:** 09/14/22 15:15
Sample Desc: WA-7D **Sample Type:** Grab

	Result	Unit	MDL	Rep. Limit	Analysis Method	Analyzed	Notes	Analyst
Dissolved General Chemistry								
Phosphorus as P, Dissolved	0.02	mg/l		0.01	SM 4500-P F	09/24/22	G-23, G-24	MRW
General Chemistry								
Alkalinity, Total to pH 4.5	9	mg CaCO ₃ /L		2	SM 2320 B	09/16/22	C-51j	APR
Ammonia as N	<0.02	mg/l	0.02	0.02	EPA 350.1 Rev 2.0	09/20/22	U	SNF
Biochemical Oxygen Demand	4.0	mg/l	2.0	2.0	SM 5210 B	09/15/22 12:00	C-37	NKH
Nitrate as N	0.22	mg/l	0.18	1.00	EPA 300.0 Rev 2.1	09/14/22 18:34	J	JAF
Nitrite as N	<0.01	mg/l	0.01	0.10	EPA 300.0 Rev 2.1	09/14/22 18:34	U	JAF
Nitrate+Nitrite as N	<0.23	mg/l	0.198	1.10	CALCULATED	09/14/22 18:34		JAF
Nitrogen, Total Kjeldahl (TKN)	<0.43	mg/l	0.43	0.50	EPA 351.2 Rev 2.0	09/22/22	U	SNF
Phosphorus as P, Total	0.02	mg/l	0.01	0.01	SM 4500-P F	09/20/22		SNF
Solids, Total Dissolved	69	mg/l	4	5	SM 2540 C	09/15/22		TMH
Total Organic Carbon	7.6	mg/l	0.3	0.5	SM 5310 C	09/20/22		HRG
Solids, Total Suspended	3	mg/l	1	1	SM 2540 D	09/15/22		TMH



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Preparation Methods

Specific Method	Preparation Method	Prep Batch	Prepared Date	Prepared By
2229488-01				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2I1399	09/23/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2I1022	09/19/2022	SNF
2229488-02				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2I1399	09/23/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2I1384	09/23/2022	MRW
2229488-03				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2I1399	09/23/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2I1384	09/23/2022	MRW
2229488-04				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2I1399	09/23/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2I1384	09/23/2022	MRW
2229488-05				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2I1399	09/23/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2I1384	09/23/2022	MRW
2229488-06				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2I1399	09/23/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2I1384	09/23/2022	MRW
2229488-07				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2I1399	09/23/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2I1384	09/23/2022	MRW
2229488-08				
Dissolved General Chemistry				
SM 4500-P F	SM 4500-P B	B2I1399	09/23/2022	MRW
General Chemistry				
SM 4500-P F	SM 4500-P B	B2I1384	09/23/2022	MRW
2229488-09				



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Dissolved General Chemistry

SM 4500-P F	SM 4500-P B	B2I1399	09/23/2022	MRW
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General Chemistry

SM 4500-P F	SM 4500-P B	B2I1022	09/19/2022	SNF
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2229488-10
Dissolved General Chemistry

SM 4500-P F	SM 4500-P B	B2I1399	09/23/2022	MRW
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General Chemistry

SM 4500-P F	SM 4500-P B	B2I1022	09/19/2022	SNF
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2229488-11
Dissolved General Chemistry

SM 4500-P F	SM 4500-P B	B2I1399	09/23/2022	MRW
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General Chemistry

SM 4500-P F	SM 4500-P B	B2I1022	09/19/2022	SNF
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2229488-12
Dissolved General Chemistry

SM 4500-P F	SM 4500-P B	B2I1399	09/23/2022	MRW
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General Chemistry

SM 4500-P F	SM 4500-P B	B2I1022	09/19/2022	SNF
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2229488-13
Dissolved General Chemistry

SM 4500-P F	SM 4500-P B	B2I1399	09/23/2022	MRW
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General Chemistry

SM 4500-P F	SM 4500-P B	B2I1022	09/19/2022	SNF
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Notes and Definitions

- C-37 The dissolved oxygen depletion for the dilution water blank was greater than 0.20mg/L at 0.67mg/L.
- C-51 The alkalinity to pH 4.2 = 10.3 mg CaCO₃/L.
- C-51a The alkalinity to pH 4.2 = 5.0 mg CaCO₃/L.
- C-51b The alkalinity to pH 4.2 = 7.5 mg CaCO₃/L.
- C-51c The alkalinity to pH 4.2 = 7.7 mg CaCO₃/L.
- C-51d The alkalinity to pH 4.2 = 8.2 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 = 8.8 mg CaCO₃/L.
- C-51h The alkalinity to pH 4.2 = 9.1 mg CaCO₃/L.
- C-51i The alkalinity to pH 4.2 = 9.2 mg CaCO₃/L.
- C-51j The alkalinity to pH 4.2 = 9.3 mg CaCO₃/L.
- G-23 The sample was filtered after it was received at the laboratory and outside of the 15-minute hold time.
- G-24 The sample was preserved in the laboratory and outside of the 15-minute hold time.
- J Estimated value
- Q-11 The matrix spike(s) were outside acceptable limits of 85-115% recovery at 74.1% and 73.6%.
- U Analyte was not detected above the indicated value.


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

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NELAC accreditations for various drinking water, wastewater and solid & chemical materials analytes.

Additional accreditations by MD (261), NY(12094)

**M.J. Reider Associates, Inc.**107 Angelica St, Reading PA, 19611
610-374-5129 www.mjreider.com**WORK ORDER
Chain of Custody**

2229488



Client Code: 3157

Project Manager: Richard A Wheeler

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

Client: Tetra Tech

Project: 2022 - Walter Reservoir

Collected By :
(Full Name)Gregory Wacik

Comments: _____

2229488-01 WA-1S

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

Matrix: Non-Potable Water

Type: Grab

Date: 9/14/22
Time: 1110

- 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

2229488-02 WA-2S

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

Matrix: Non-Potable Water

Type: Grab

Date: 9/14/22
Time: 0830

- 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

9/14/221115

Received By

Date/Time

9-14-221320

Relinquished By

Date/Time

Received By

Date/Time

Relinquished By

Date/Time

Received at Laboratory By

Date/Time

9-14-221515

Sample Kit Prepared By:

Date/Time

RT AUG 01 2022

Sample Temp (°C):

3.9

Samples on Ice?

Yes No NA

Approved By:

BJSW

Entered By:

BJSW

Page 13 of 18

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.

Page 1 of 5

Printed: 7/28/2022 2:17:40PM

Report Template: wko_WorkOrder_COC_10



M.J. Reider Associates, Inc.

2229488

Client Code: 3157

Project Manager: Richard A Wheeler

Client: Tetra Tech

Project: 2022 - Walter Reservoir

Collected By :

(Full Name)

Gregory Wacik

Comments:

2229488-03 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 EPA 350.1, PO4 SM 4500P-F, TOC SM 5310C, TSS SM 2540D, TDS SM 2540C, TKN EPA 351.2

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

9/14/22
0830

A - Pl 500ml NP, minimal hdspe

B - Pl Liter NP

C - Pl 500ml H2SO4

D - Pl 250ml NP

E - Pl 500ml Lab Filtered

F - Vial Amber 40ml H3PO4, minimal hdspe

G - Vial Amber 40ml H3PO4, minimal hdspe

H - Vial Amber 40ml H3PO4, minimal hdspe

2229488-04 WA-2D

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

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

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

9/14/22
0830

A - Pl 500ml NP, minimal hdspe

B - Pl Liter NP

C - Pl 500ml H2SO4

D - Pl 250ml NP

E - Pl 500ml Lab Filtered

F - Vial Amber 40ml H3PO4, minimal hdspe

G - Vial Amber 40ml H3PO4, minimal hdspe

H - Vial Amber 40ml H3PO4, minimal hdspe

2229488-05 WA-3S

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

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

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

9/14/22
1140

A - Pl 500ml NP, minimal hdspe

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 hdspe

H - Vial Amber 40ml H3PO4, minimal hdspe

I - Vial Amber 40ml H3PO4, minimal hdspe

Relinquished By

Date/Time

Received By

Date/Time

Relinquished By

Date/Time

Received By

Date/Time

Relinquished By

Date/Time

Received at Laboratory By

Date/Time

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.

Page 2 of 5

Printed: 7/28/2022 2:17:40PM

Sample Kit Prepared By:	Date/Time
SV	AUG 01 2022
Sample Temp (°C):	3.9
Samples on Ice?	Yes No NA
Approved By:	BSN
Entered By:	

Page 14 of 18

Report Template: wko WorkOrder COC Is



M.J. Reider Associates, Inc.

2229488

Client Code: 3157

Client: Tetra Tech

Project Manager: Richard A Wheeler

Project: 2022 - Walter Reservoir

Collected By :

(Full Name)

Gregory Warik

Comments:

2229488-06 WA-4S

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

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

9/14/22
1200

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

2229488-07 WA-5S

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

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

9/14/22
1230

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

2229488-08 WA-6S

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

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

9/14/22
0930

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

Relinquished By

Date/Time

Received By

Date/Time

Relinquished By

Date/Time

Received By

Date/Time

Relinquished By

Date/Time

Received at Laboratory By

Date/Time

Sample Kit Prepared By:	Date/Time
800	AUG 01 2022
Sample Temp (°C):	3.9
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.



M.J. Reider Associates, Inc.

2229488

Client Code: 3157

Client: Tetra Tech

Project Manager: Richard A Wheeler

Project: 2022 - Walter Reservoir

Collected By :

(Full Name)

Gregory Wack

Comments:

2229488-09 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 EPA 350.1, PO₄ SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

9/14/22
0930

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

2229488-10 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 EPA 350.1, PO₄ SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

9/14/22
0930

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

2229488-11 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 EPA 350.1, PO₄ SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

9/14/22
1015

A - PI 500ml NP, minimal hdspc
B - PI Liter NP
C - Sterile PI 125ml NaThio
D - PI 500ml H₂SO₄
E - PI 250ml NP
F - PI 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

Relinquished By

Date/Time

Received By

Date/Time

Relinquished By

Date/Time

Received at Laboratory By

Date/Time

9/14/22 175

Benny Nant

9-14-22 1320

Benny Nant

9-14-22 1515

Sample Kit Prepared By:	Date/Time
	AUG 01 2022
Sample Temp (°C):	3.9
Samples on Ice?	Yes No NA
Approved By:	Bsk
Entered By:	

Page 16 of 18



M.J. Reider Associates, Inc.

2229488

Client Code: 3157

Project Manager: Richard A Wheeler

Client: Tetra Tech

Project: 2022 - Walter Reservoir

Collected By :

(Full Name)

Gregory Wacik

Comments:

2229488-12 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 EPA 350.1, PO₄ SM 4500P-F, TDS SM 2540C, TKN EPA 351.2, TOC SM 5310C, TSS SM 2540D

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

9/14/22
1015

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

2229488-13 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
TSS SM 2540D, Alk SM 2320B, NH₃-N EPA 350.1, PO₄ SM 4500P-F, TDS SM 2540C, TOC SM 5310C, TKN EPA 351.2

Matrix: Non-Potable Water

Type: Grab

Date:

Time:

9/14/22
1015

A - PI 500ml NP, minimal hdspc
B - PI Liter NP
C - PI 500ml H₂SO₄
D - PI 250ml NP
E - PI 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

Relinquished By

Date/Time

Received By

Date/Time

Relinquished By

Date/Time

Received at Laboratory By

Date/Time

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.

Page 5 of 5

Printed: 7/28/2022 2:17:40PM

Sample Kit Prepared By:	Date/Time
8/14/22	AUG 01 2022
Sample Temp (°C):	3.8
Samples on Ice?	Yes No NA
Approved By:	13/5/22
Entered By:	

Page 17 of 18

M.J. Reider Associates, Inc.**MJRA Terms & Conditions**

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

Sample Submission, Sample Acceptance & Sampling Containers

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

Turnaround Times (TAT)

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

Analytical Results, Sample Collection Integrity & Subcontracting

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

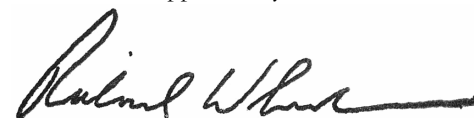
Payment Terms

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

Warranty & Litigation

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

Reviewed and Approved by:



Richard A Wheeler
Director of Field Services

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Additional accreditations by MD (261), NY(12094)