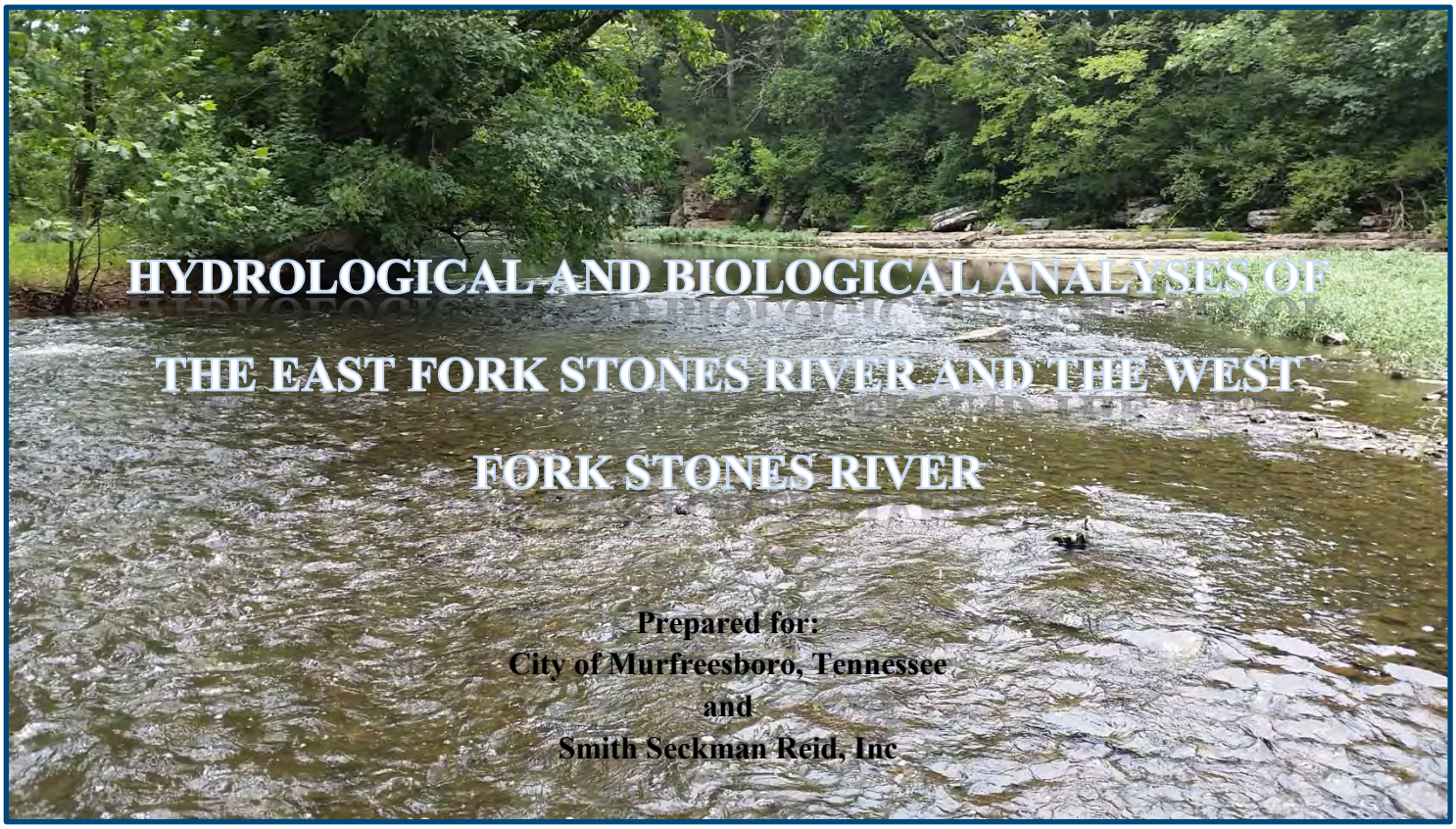

HYDROLOGICAL AND BIOLOGICAL ANALYSES OF THE EAST FORK STONES RIVER AND THE WEST FORK STONES RIVER

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July 2016

Revision 1.0

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EXECUTIVE SUMMARY

The City of Murfreesboro hired SSR, Inc. and AquAeTer, Inc. to evaluate the East Fork Stones and West Fork Stones Rivers as part of the long-term planning for expected growth. The City is achieving tertiary treatment efficiencies from its Sinking Creek Facility and has a large network for distributing reclaimed water usage. Based on the level of treatment achieved, the West Fork Stones River is believed to be capable of supporting additional loading. It is also believed that the East Fork Stones River is capable of supporting loading from the Sinking Creek Facility.

Based on the data collected by AquAeTer, both the East Fork Stones and the West Fork Stones Rivers are meeting their designated uses. The downstream reaches of both streams are affected by the following: 1) Percy Priest Reservoir, which changes them from lotic to lentic conditions; 2) both rivers are also affected by available habitat in the free-flowing sections of the rivers where some areas have only exposed bedrock or limited niche areas for macrobenthos and other aquatic flora and fauna; 3) flood or high water conditions that tend to wash macrobenthos out from normally sampled stations and has been shown to result in a normally healthy station into an "artificially-impaired" station resulting from sampling outside the SOP conditions citing in TDEC procedures; and, 4) instream dams which impact the free movement of fisheries, thus limiting repopulation both upstream and downstream from the dams. The conditions on both Rivers affects the available habitat, which in turn affects the macroinvertebrate community and the higher order fish present.

The study found that correlations cannot be made between nutrient levels and biological metrics. There were also discrepancies between macrobenthic scoring and fisheries. In the lower reaches affected by Percy Priest Reservoir, the macrobenthic community is poor due to a lack of habitat. However, the fish population did not reflect this poor score. In these areas, the fish have the ability to migrate to find food and habitat. If the goal of the Clean Water Act is to protect the fish and aquatic species, the fish should be evaluated. They reflect the long-term health of a stream.

The study found that there is little difference in the oxygen demand between the background water on the West Fork and the tertiary-treated effluent from the Sinking Creek Facility. The current wasteload allocation for the West Fork Stones River was originally based upon the level of treatment achieved in 1990. The current level of treatment achieved is significantly greater than the treatment at the time of 1990. In September 1990, the effluent 5-day total biochemical oxygen demand (TBOD) was 3.9 milligrams per liter (mg/L) and the TBOD at day 21 was 32 mg/L. In September 2015, the effluent 5-day TBOD was 0.6 mg/L and the TBOD at day 21 was 1.9 mg/L.

The largest difference between the background West Fork Stones River sample and the tertiary-treated effluent was in the nitrogen content. However, the areas with higher nitrogen content had better biological metrics when properly assessed. There was one site on the West Fork

that had the highest recorded chlorophyll and accessory pigment concentration and also on the same day had the largest cyanobacteria population. This station was upstream from the WWTP effluent. The lack of available nitrogen in the upstream reaches gives the cyanobacteria an advantage over the alga taxa, since cyanobacteria can obtain the inorganic nitrogen they need by fixing nitrogen gas directly from the atmosphere.

The study found that the West Fork Stones River generally has better habitat than the East Fork Stones River. This results in more diversity and more intolerant macroinvertebrate communities. The presence of the Sinking Creek WWTP discharge on the West Fork does not impair the biological community, which was shown to be better downstream from the discharge than either the upstream areas or the stations on the East Fork Stones River. This is not unusual for streams with a well-treated effluent. The effluent provides beneficial nutrients that sustain a diverse aquatic population. The lack of available habitat on the East Fork means that the macrobenthic metric is not a good indicator for the stream.

Both streams are subject to spikes in flow, which impact the macrobenthic community. Additionally, based upon a review of previous benthic studies on the West Fork, it appears that some studies with lower benthic scores may have been impacted by these natural spikes in flow, rather than by a water quality issue as described on the 303(d) list.

The study also reviewed the basis for the TDEC guidance thresholds for nitrate, habitat, and macrobenthics. The development documents do not follow other TDEC guidance stating that reference streams should be of similar size and stream order to the stream in question. None of the reference streams meet either of these points. The development of these guidance thresholds for these metrics were not well documented. No data were provided that could be used to evaluate the thresholds that were chosen. The small amount of data that are presented in the reports do not reflect the vast overall dataset that was collected. There is no explanation for why certain data were not included. The correlations of the data that were chosen are poor. The linear regression and multiple regression analyses results shown do not give any indication of what data were used, but do point out that there is no correlation between any of the variables presented.

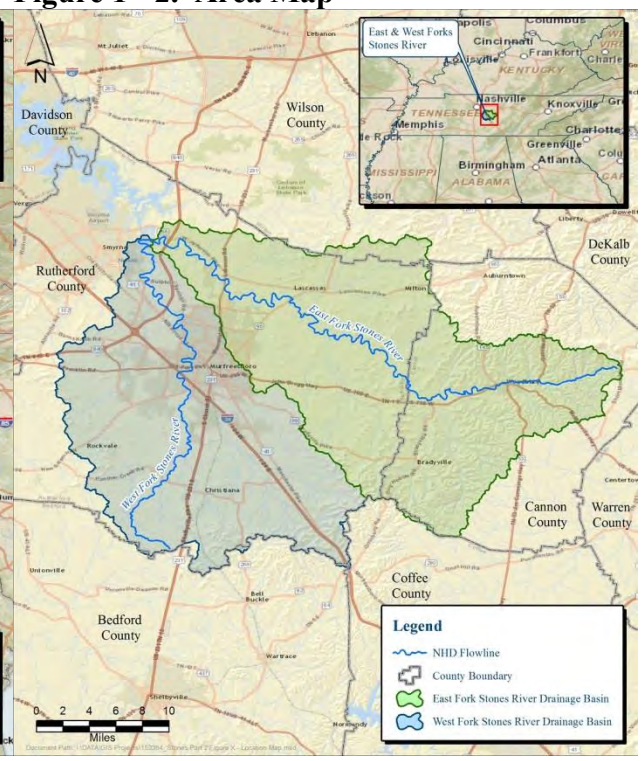
SECTION 1.0

INTRODUCTION

AquAeTer, Inc. (AquAeTer) located in Brentwood, Tennessee, was requested by Smith Seckman Reid, Inc. (SSR) located in Nashville, Tennessee to continue the work begun for the Hydrological and Biological Analysis of the East Fork Stones River and the West Fork Stones River. This Report details the additional findings and includes the previous results for discussion of the overall health of the streams. The location of the study is presented in Figure 1-1. The overall study areas of the two streams are presented in Figure 1-2.

Figure 1 - 1. Location Map

Figure 1 - 2. Area Map



1.1 PURPOSE OF STUDY

The purpose of this study was to collect additional data that will allow the City of Murfreesboro to determine the appropriate permitting for their wastewater treatment plant (WWTP) moving forward as the population of Murfreesboro continues to grow.

For the West Fork Stones River and the East Fork Stones River (West Fork and East Fork, respectively), the previous study showed that habitat was the single-most important factor for the aquatic health of these streams. The collection of additional macrobenthos and water quality data was designed to add to the previous dataset that demonstrates the biological health of the stream.

Additional data were collected in the form of time-series biochemical oxygen demand (BOD) tests to demonstrate the long-term effects of the WWTP on the receiving stream and downstream water bodies.

At the beginning of these studies, two segments on the West Fork were on the 303(d) list. During the course of the study, the Tennessee Department of Environment and Conservation (TDEC) through additional studies indicated that the upstream segment was going to be removed from the 303(d) list. This finding was in agreement with what AquAeTer determined from the detailed field and laboratory macrobenthos studies conducted on the West Fork in accordance with the TDEC Standard Operating Procedures (SOPs) for stream macrobenthological studies.

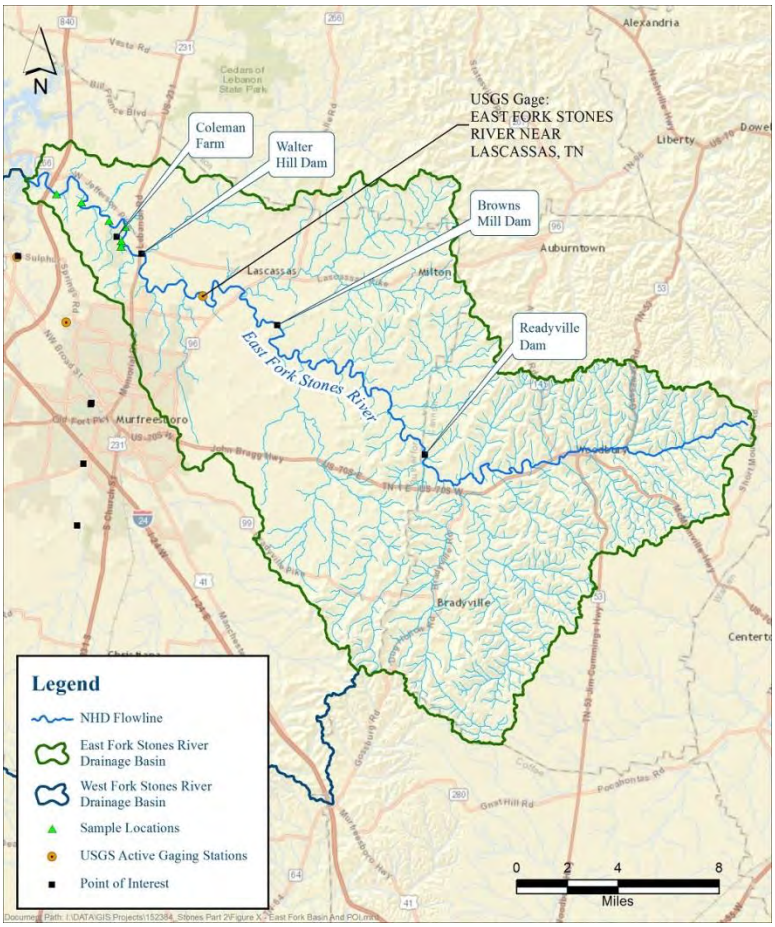
The United States Environmental Protection Agency (USEPA) currently designates the WFSR downstream from the WWTP as suitable for the following water uses: 1) domestic water supply; 2) industrial water supply; 3) irrigation; 4) livestock watering; and 5) wildlife use. It is noted that TDEC evaluates, manages, and maintains the 303(d) list, which is submitted for approval by the USEPA. Recreational use for the WFSR has not been assessed for this reach. However, many people were observed using the area downstream from Nice Mill Dam for fishing, swimming, kayaking, and canoeing. Currently, the 1.3-mile segment of the WFSR where the WWTP discharges is listed as impaired for fish and aquatic life. This segment extends from near State Route 840 downstream to near the confluence with Sinking Creek upstream. The causes for the impairment cited for this area are nitrate/nitrite, total phosphorus, and sedimentation/siltation. It is noted that neither the West Fork Stones River or the East Fork Stones River have appropriately sized reference streams for comparison with the data that were obtained from this study. The drainage basin size for the streams currently selected as reference streams are all more than 3.5 times less than the drainage basin of the West Fork and more than 4.5 times less than the drainage basin for the East Fork. All reference streams established by TDEC are small basins with a maximum stream order of 4, compared to the 5th order designation for the East Fork and West Fork. Using these reference streams selected by TDEC is inappropriate for comparing with these much larger 5th order streams according to TDEC's own protocols. The USEPA currently lists a municipal point source discharge, Murfreesboro WWTP, as the probable cause of the nitrate/nitrite and total phosphorus impairments. It also lists site clearance for land development, or redevelopment, as the source of the sediment/siltation impairment. The USEPA also lists the adjacent upstream segment of the WFSR as impaired for fish and aquatic life, citing discharges from municipal separate storm sewer systems (MS4).

1.2 STREAMS

1.2.1 East Fork Stones River

Figure 1 - 3. East Fork Stones River Drainage Basin with Points of Interest

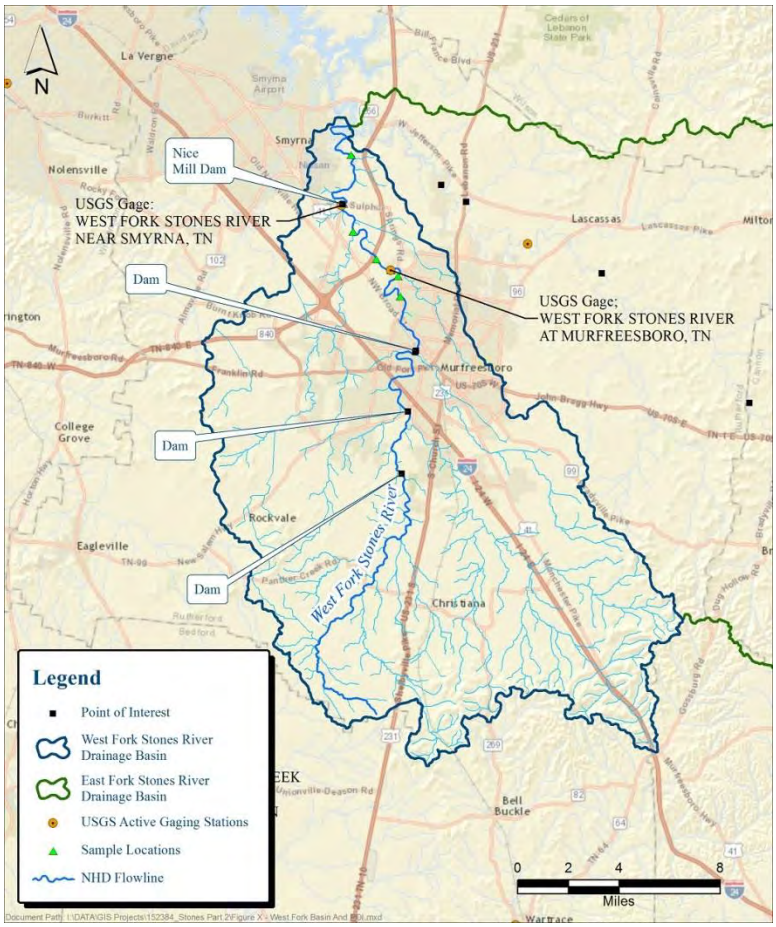
The East Fork is a 54.0 mile stream that rises in Cannon County and terminates at the confluence with the West Fork Stones River to form the Stones River. The confluence is in Percy Priest Lake in between Murfreesboro and Smyrna, Tennessee. Specifically, the East Fork starts on Short Mountain, an outlier of the Cumberland Plateau, and flows through Woodbury, the county seat. The East Fork is roughly paralleled by U.S. Route 70S. The East Fork runs to the north of Murfreesboro, adjacent to the grounds of the Alvin C. York Veterans Affairs Hospital, and is crossed by U.S. 231 near the community of Walter Hill. Walter Hill Dam is located upstream from the study area. A United States Geological Survey (USGS) gage, number 03427500, is located downstream from Walter Hill Dam near Lascassas. At the gage site, the stream has a drainage basin size of 262 square miles. The East Fork Stones River basin and points of interests are presented in Figure 1 - 3.



1.2.2 West Fork Stones River

Figure 1 - 4. West Fork Stones River Drainage Basin with Points of Interest

The West Fork is a 39.1 mile stream that rises in the southern most portion of Rutherford County, near the Bedford County line and terminates at the confluence with the East Fork Stones River in Percy Priest Lake in between Murfreesboro and Smyrna, Tennessee. The West Fork runs roughly parallel to U.S. Highway 231, and just west of downtown Murfreesboro, Tennessee. A USGS gage, number 03428200, is located downstream from the WWTP discharge location in Murfreesboro. At this gage site, the West Fork has a drainage basin size of 177 square miles. The Nice Mill Dam is located downstream from the WWTP prior to the confluence with the backwaters of Percy Priest Lake. The West Fork Stones River basin and points of interests are presented in Figure 1 - 4.



1.3 OBJECTIVES

The City of Murfreesboro is in the process of planning for the anticipated growth of the community. With the anticipated growth, the City must be able to treat and discharge the increased wastewater. The City has already begun the process of decreasing water usage and wastewater discharge through the use of reclaimed water for irrigation. The City has also instituted a runoff pollution prevention plan to help reduce non-point source pollution from within the City. The WWTP currently achieves remarkable levels of treatment in order to meet strict loading limits. The WWTP has been able to increase the flow while still meeting the discharge loading limits.

1.4 PARTICIPATING PARTIES

All field work associated with this project was performed by members of AquAeTer. Time-series BOD tests were completed in AquAeTer's laboratory. Access to the sites was granted

by the City of Murfreesboro or local residents, where applicable. AquAeTer worked with SSR and the City of Murfreesboro to develop and implement the sampling plan.

1.5 PERMITS

During the previous field study, fish collection was done under the following permit:

- Tennessee Wildlife Resources Agency, Scientific Collection Permit Number 1705

Once the collection of fish species was completed during the previous field studies, a report was sent to TWRA and a request was made to renew the permit. Although, no fish were collected during this sample period, the Permit Number 1705 was renewed.

SECTION 2.0

METHODOLOGY

All field notes are provided in Appendix . Where applicable, data have been transcribed in the tables presented in this report. Laboratory reports are provided in Appendix .

2.1 SITE DESCRIPTIONS

Site descriptions for all sites visited between the different studies are included in this report; however, data were not collected from all sites over all studies. The time period when the sites were sampled is included with the site descriptions. If a site was dropped or added, an explanation is provided. The co-ordinates of all sites are presented in Table 2 - 1.

Table 2 - 1. Site Co-ordinates

SITE	LATITUDE	LONGITUDE
EF001	35° 58' 36.146" N	86° 26' 13.489" W
EF002	35° 58' 18.671" N	86° 25' 10.719" W
EF003	35° 57' 41.624" N	86° 23' 59.850" W
EF004	35° 57' 28.801" N	86° 23' 18.638" W
EF005	35° 56' 47.646" N	86° 23' 29.590" W
EF006	35° 56' 59.740" N	86° 23' 28.500" W
WF001	35° 58' 9.169" N	86° 27' 29.843" W
WF002	35° 56' 27.918" N	86° 27' 48.795" W
WF003	35° 55' 30.361" N	86° 27' 23.689" W
WF004	35° 53' 58.737" N	86° 25' 29.684" W
WF005	35° 53' 16.941" N	86° 25' 23.625" W
WF006	35° 54' 34.646" N	86° 26' 25.123" W
WF007	35° 54' 11.131" N	86° 25' 47.960" W
Sinking Creek WWTP Sample	35° 54' 8.470" N	86° 25' 42.740" W

Both Rivers contain sections of lentic and lotic zones as well as transitional areas between the two. Lentic zones are areas with still waters and can include ponds, lakes, embayments, or swamps. Often, as is the case with the East Fork and West Fork Stones Rivers, a downstream impoundment creates a lentic effect in rivers. When the water levels in the lake are higher, they tend to back into what was once a flowing portion of the river. Lotic zones are areas with flowing waters. Lotic zones can be divided into multiple sub-divisions. The deep run is an area of flowing water, generally 3 feet or deeper that has a relatively swift current. These areas generally do not have breaks in the surface water. A shallow run is similar to a deep run, but a depth of 0.5-foot to 3 feet deep. The shallow run, like the deep run, does not have any breaks in the surface water. A riffle is an area that has shallow and swift current, typically less than 0.5-foot of water. Due to the water rushing over the substrate in these reaches, breaks in the surface water, allowing for re-

oxygenation, are abundant. When conducting the rapid habitat assessment, it is typical that the lentic areas of streams score higher due to the diversity in available habitat and flow regimes.

2.1.1 East Fork Stones River

The study area for the East Fork extends from near Highway 840 downstream to the area of the Coleman Farm upstream. The study area is presented in Figure 2 - 1. The original study area incorporated both lentic and lotic portions of the East Fork. The second study focused more on the lotic areas of the East Fork. The approximate locations of lentic, lotic, and transitional areas in the East Fork are presented in Figure 2 - 2.

Figure 2 - 1. East Fork Study Area

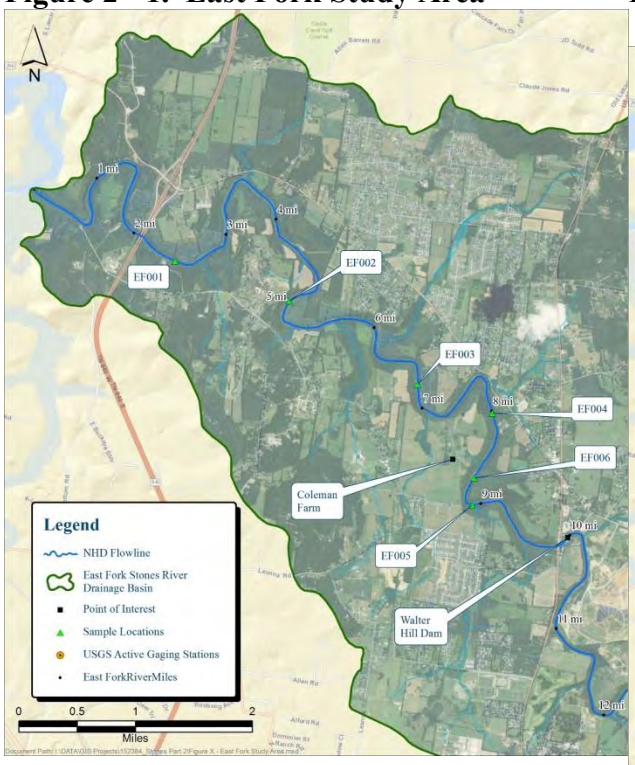
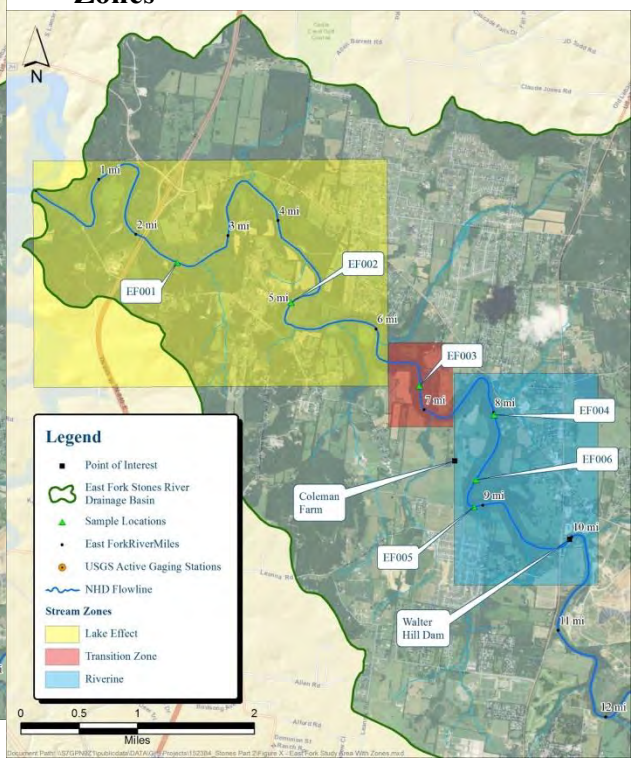


Figure 2 - 2. East Fork Approximate Zones



2.1.1.1 East Fork, EF001

EF001 is located on the East Fork at approximately East Fork Stones River Mile (EFRM) 2.4, as presented in Figure 2 - 3. This site is located within the reach designated by TDEC as TN05130203003_1000, which is Percy Priest Reservoir. This site is located approximately 100 meters upstream from the Highway 840 Bridge. EF001 is located in the lentic zone of the East Fork. This station is in an embayment of Percy Priest Lake, which causes the lentic nature of the site. This area lacked suitable habitat for aquatic organisms. Few log piles were located in this stretch of the river.

This site was sampled during the first study. This site was not resampled in the follow-up study due to the lack of habitat, which is representative of the embayment of Percy Priest Lake and not to a flowing stream.

Figure 2 - 3. East Fork Station, EF001

2.1.1.2 East Fork, EF002

EF002 is located on the East Fork at EFRM 5.0, approximately 0.6 mile upstream from the United States Army Corps of Engineers' (USACE's) Mona Boat Ramp, as presented in Figure 2 - 4. This site is located within the reach designated by TDEC as TN05130203003_1000, which is Percy Priest Reservoir. This site was easily accessible by boat. Similarly to EF001, this area of the East Fork was also lentic in nature as a result of the lake levels on Percy Priest Lake. This site also lacked suitable habitat for aquatic organisms; however, there were aquatic vegetation stands and woody debris piles in greater abundance than EF001.

Figure 2 - 4. East Fork Station, EF002

This site was sampled during the first study. This site was not resampled in the follow-up study due to the lack of habitat, which is representative of the embayment of Percy Priest Lake and not to a flowing stream.

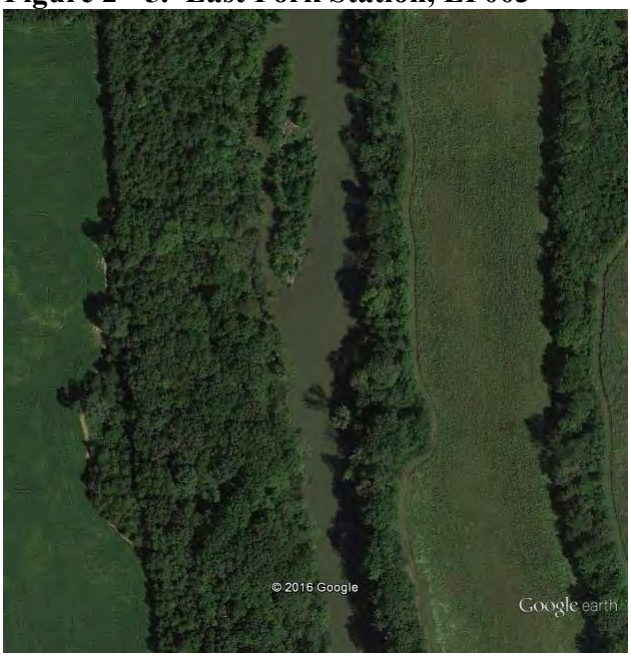
2.1.1.3 East Fork, EF003

EF003 is located on the East Fork at EFRM 6.8, as presented in Figure 2 - 5. This site is located within the reach designated by TDEC as TN05130203023_1000. The site is characterized as a deep run, and is accessible by boat. This site was impacted by Percy Priest Lake. This area of the East Fork is a transitional zone between the lentic and lotic portions of the river. This may be impacted by the level of the impoundment downstream from the sample location. If the level is high, this site may be lentic and if low it would be lotic. The substrate consists of large boulders

and bedrock, which is not ideal for aquatic organisms. Multiple aquatic vegetation stands are present along the banks of this segment.

This site was sampled during the first study. This site was not resampled in the follow-up study due to the lack of habitat, which is representative of the embayment of Percy Priest Lake and not to a flowing stream.

Figure 2 - 5. East Fork Station, EF003



2.1.1.4 East Fork, EF004

EF004 is located on the East Fork at EFRM 8.0. This site is located within the reach designated by TDEC as TN05130203023_1000. The site is accessible by boat during periods of sufficient flow. It is also accessible by foot from West Jefferson Pike when flow is low. This area can be characterized as a shallow run, and the substrate is dominated by large cobbles and bedrock. This is a lotic portion of the river, and habitat is more readily available for aquatic organisms; however, there is still a lack of quality habitat. The site area is presented in Figure 2 - 6.

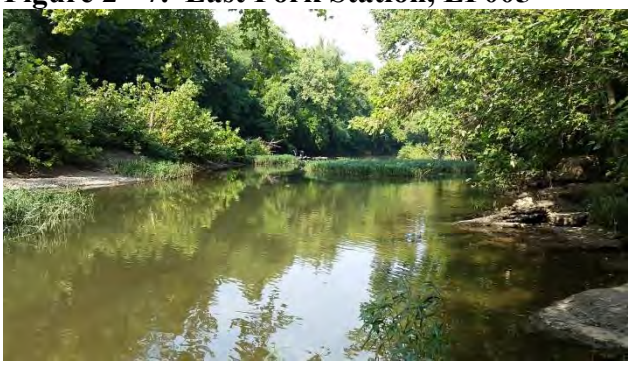
Figure 2 - 6. East Fork Station, EF004

This site was sampled during both studies.

2.1.1.5 East Fork, EF005

EF005 is located on the East Fork at EFRM 9.1. This site is located within the reach designated by TDEC as TN05130203023_1000. This site is only accessible by foot from Central Valley Road. This portion of the river is lotic, and can be described as a deep riffle and shallow run complex. The substrate is dominated by gravel and bedrock, with slightly undercut

Figure 2 - 7. East Fork Station, EF005



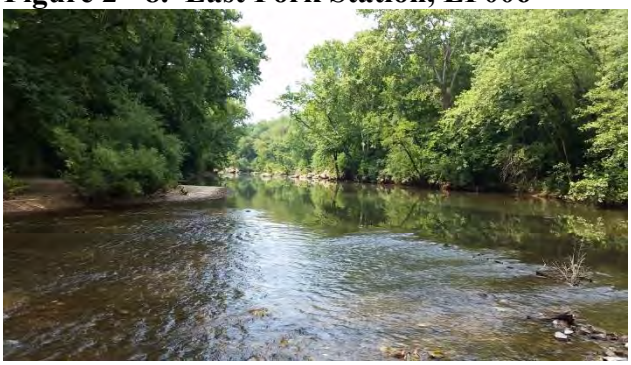
banks. This type of habitat creates some suitable niche space for aquatic organisms, specifically macrobenthos. The site is presented in Figure 2 - 7.

This site was sampled during the first study. Upon return in the summer of 2015, the riffle and run complex were no longer at the site. A similar riffle and run were located 25 meters upstream from the original location for sampling during the second study. This substrate was dominated more by cobble, but gravel was still present within the reach. The riffle area was not as wide as the first year; however, it was longer.

2.1.1.6 East Fork, EF006

EF006 is located on the East Fork at EFRM 8.8. This site is located within the reach designated by TDEC as TN05130203023_1000. This site is accessible from the Coleman Farm property, immediately adjacent to Central Valley Road. This portion of the stream is lotic, and is primarily a long-shallow riffle area. The substrate is dominated by gravel and there was no aquatic vegetation. The site is presented in Figure 2 - 8.

Figure 2 - 8. East Fork Station, EF006



This site was added for the second study.

2.1.2 West Fork Stones River

The study area for the West Fork extends from near the West Fork Recreation Area downstream to the area of the Murfreesboro Greenway upstream. The study area is presented in Figure 2 - 9. The original study area included both lentic and lotic areas. The second study focused more on the lotic zones and added additional sites. The study area covers three different segments identified by TDEC in its Waterbody Quality Assessment Reports. The approximate locations of lentic, lotic, and transitional areas in the East Fork are presented in Figure 2 - 10.

Figure 2 - 9. West Fork Study Area

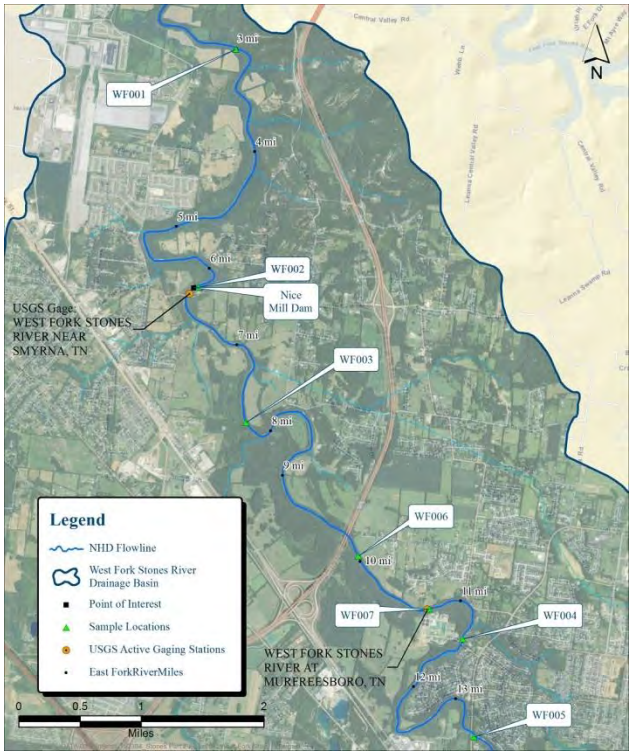
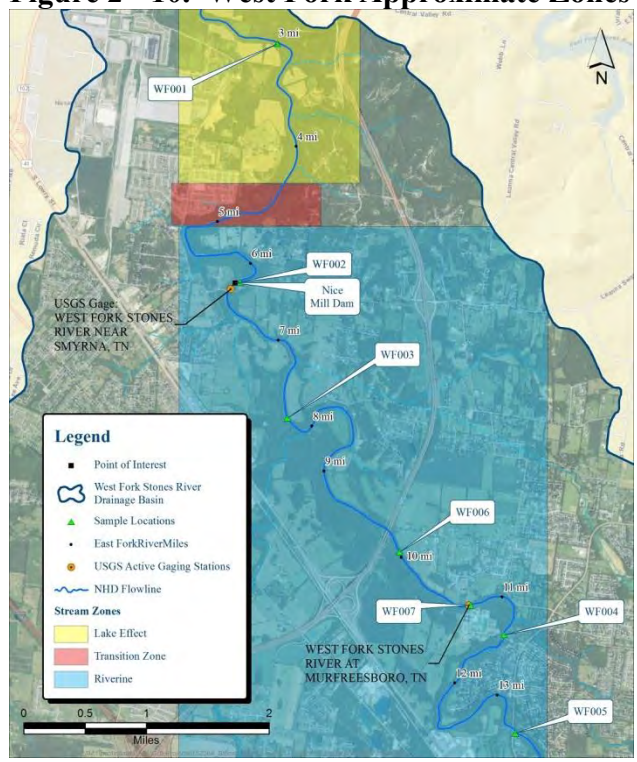


Figure 2 - 10. West Fork Approximate Zones



2.1.2.1 <u>West Fork, WF001</u>

WF001 is located on the West Fork at West Fork Stones River Mile (WFRM) 3.0, approximately 1.5 miles upstream from the West Fork Recreation area, as presented in Figure 2 - 11. The site is within the reach designated as TN05130203018_1000. The site is accessible by boat. This area is impacted by Percy Priest Lake, therefore, it is a lentic environment. The substrate is dominated by silt and bedrock, with no undercut banks or woody debris. There is very little habitat for aquatic organisms at this location.

Figure 2 - 11. West Fork Station, WF001

This site was sampled during the first study. This site was not resampled in the follow-up study due to the lack of habitat, which is representative of the embayment of Percy Priest Lake and not to a flowing stream.

2.1.2.2 West Fork, WF002

WF002 is located on the West Fork at WFRM 6.2, and is 25 meters downstream from the Nice Mill Dam. Flow at this dam, when low enough, passes through an opening on the southeast side. The water is then dispersed through the main channel as it travels downstream. When flows are high, a scouring effect could take place at this site. The site is within the reach designated as TN05130203018_1000. This area is lotic, and can be characterized as a deep riffle and shallow run complex. The substrate is dominated by gravel and bedrock. There is an abundance of aquatic vegetation stands, and backwater areas for aquatic organisms to inhabit. The site is presented in Figure 2 - 12.

Figure 2 - 12. West Fork Station, WF002

This area is frequented for fishing, swimming, canoeing and kayaking. It is easily accessible by foot from the Nice Mill Dam Recreation Area located along Sulfur Springs Road. The Nice Mill Dam provides an impediment to fish species moving freely up and down the River.

This site was sampled during both studies.

2.1.2.3 West Fork, WF003

WF003 is located on the West Fork at WFRM 7.6. The site is within the reach designated as TN05130203018_1000. This area is considered a shallow-run and deep-riffle complex. The substrate at this site is dominated by boulders and bedrock. The reach also contains sparse aquatic vegetation. The site is presented in Figure 2 - 13.

Figure 2 - 13. West Fork Station, WF003

It is accessible by foot, either through property access granted by a local land owner, or by following Overall Creek from Northwest Broad Street.

This site was sampled during both studies. During the second study, water was collected from near this site for time-series BOD tests.

2.1.2.4 West Fork, WF004

Figure 2 - 14. West Fork Station, WF004

WF004 is located on the West Fork at WFRM 11.4, downstream from the Blanton Drive Bridge, and is immediately adjacent to the City of Murfreesboro's wastewater treatment facility. The site is within the reach designated as TN05130203018_3000. The area is considered a shallow-run and deep-riffle complex. The substrate is dominated by bedrock, cobbles, and gravel. The site is presented in Figure 2 - 14.

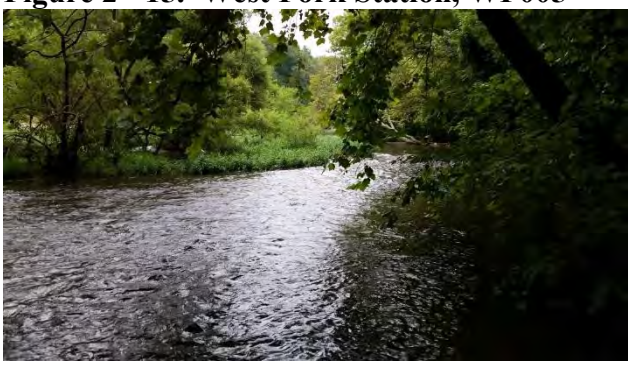
This site is accessible by foot from the treatment facility. The habitat at this location is suitable for a diverse community of aquatic organisms.

This site was sampled during both studies. During the second study, water was collected from near this site for time-series BOD tests.

2.1.2.5 West Fork, WF005

WF005 is located on the West Fork at WFSRM 13.4. This site is accessible from nearby City of Murfreesboro Greenway Park. The site is within the reach designated as TN05130203018_3000. This area is primarily a shallow riffle, with sections of shallow run. The substrate is dominated by gravel, and there are aquatic vegetation stands and backwater areas suitable for aquatic organisms. The site is presented in Figure 2 - 15.

Figure 2 - 15. West Fork Station, WF005



This site was sampled during both studies.

2.1.2.6 West Fork, WF006

Figure 2 - 16. West Fork Station, WF006

WF006 is located on the West Fork at WFSRM 10.0. This site was accessible from the State Route 840 Bridge. The site is the furthest upstream point within the reach designated as TN05130203018_1000. This area is a long shallow riffle area, with gravel substrate and a small amount of aquatic vegetation along the left edge. The riffle area in this reach was suitable for macroinvertebrates and small fish species. The site is presented in Figure 2 - 16.

This site was added after the first study. This site is directly affected by the water quality of the water coming downstream from the "2000" segment.

2.1.2.7 West Fork, WF007

WF007 is located on the West Fork at WFSRM 10.7. The site is within the reach designated as TN05130203018_2000. This site is accessible from the Sinking Creek WWTP facility. The area in this reach is primarily a deep riffle with cobble substrate. There is an area of emergent vegetation that does provide some shelter for aquatic organisms. This site is immediately downstream from the low-head dam downstream from the WWTP facility discharge. When flow is low enough, flow is diverted to the north of the stream where there is an opening in the dam. When flow is high, however, particularly after a rain event, flow is not diverted and this reach is likely scoured. This site is the only site within the "2000" designated segment with suitable habitat. The site is presented in Figure 2 - 17.

Figure 2 - 17. West Fork Station, WF007

This site was added after the first study. It was not sampled during the first study due to concerns about the site location in relation to the low head dam. According to the TDEC SOP (2011), this site should not have been selected due to its proximity to the low-head dam; however, it is the only riffle run habitat downstream from the WWTP in the reach. This site is greatly affected by the influence of the low-head dam, such that the effects of surges in flows are magnified due to the turbulence created downstream from the low-head dam.

2.1.3 Sinking Creek Wastewater Treatment Plant

The WWTP is located along the West Fork. The tertiary-treated effluent is discharged into the reach designated as TN05130203018_2000. Samples for analyses were collected from an

automatic sampler utilized by the City of Murfreesboro at the compliance point in the treatment process.

No samples were collected during the first study. During the second study, water was collected from this site for time-series BOD tests.

2.2 COLLECTION AND ANALYTICAL METHODS

All collection and analytical methods for both studies are included in the following subsection.

2.2.1 In Situ Water Quality Samples

In situ water-quality parameters were taken at each sample location if water was present during the field event. The following parameters were sampled:

- Dissolved Oxygen (DO) in mg/L;
- pH in Standard Units (S.U.);
- Specific conductance at 25°C (conductivity) in milliSiemens per centimeter (mS/cm) or microSiemens per centimeter (µS/cm); and
- Water temperature in degrees centigrade or Celsius (ºC).

Instantaneous readings of DO, pH, conductivity, and water temperature were taken. The instruments used for instantaneous water-quality readings are presented in Table 2 - 2. The instruments were calibrated before and after each day's use.

Table 2 - 2. Field Instrumentation Used

PERIOD	INSTRUMENT	pH	TEMP.	COND.	DO
June 2014	Horiba U-53	Yes	Yes	Yes	Yes
August 2014	YSI 556	Yes	Yes	Yes	Yes
November 2014	Thermo Orion3 Star	Yes	Yes		
	YSI 5100		Yes		Yes
	YSI 30			Yes	Yes
January 2015	Thermo Orion3 Star	Yes	Yes		
	YSI 5100		Yes		Yes
	YSI 30			Yes	Yes
August 2015	In Situ SmarTROLL	Yes	Yes	Yes	Yes

2.2.2 Laboratory Chemical Analyses Samples

2.2.2.1 First Study

Water samples for laboratory analyses were collected at each sample location quarterly. Grab samples were collected from one foot below water surface, except where total water depth was less than two feet. The following parameters were sampled:

- Ammonia (as N) by USEPA Method 350.1;
- Total Kjeldahl Nitrogen as N (TKN) by USEPA Method 351.2;
- Nitrate/Nitrite as N by USEPA Method 353.2;
- Total Phosphorus (TP) by USEPA Method 365.4;
- Orthophosphate, Dissolved by Standard Methods 4500 P E.;
- Orthophosphate by Standard Methods 4500 P E.
- Bicarbonate Alkalinity by Standard Methods 2320B;
- Total suspended solids by Standard Methods 2540D; and
- Silica by Standard Methods 4500 SiO2 C.

Samples were collected in accordance with laboratory guidance. All samples were packed on wet ice and sent to the laboratory under chain of custody.

All chemical analyses listed above were performed by TestAmerica.

2.2.2.2 Second Study

Water samples were collected as part of the time-series BOD tests described in the next section. During the course of the testing, samples were collected for the following parameters:

- Ammonia (as N) by USEPA Method 350.1;
- Total Kjeldahl Nitrogen as N (TKN) by USEPA Method 351.2;
- Nitrate/Nitrite as N by USEPA Method 353.2;
- Total Phosphorus (TP) by USEPA Method 365.1; and,
- Orthophosphate by Standard Methods 4500 P E.

All analyses were performed by Pace Analytical Services. The laboratory was changed from the first study because of their ability to get lower detection limits for the nitrogen species.

2.2.3 Algal Identification and Total Chlorophyll Analyses

During the first study, water samples for laboratory analyses were collected at each sample location quarterly. Samples for these analyses were not collected during the second study. Grab

samples were collected from one foot below water surface, except where total water depth was less than two feet. The following parameters were sampled:

- Total Pigment Analysis by high performance liquid chromatography (HPLC) USEPA Method 447.0; and,
- Algal Identification using EPA Rapid Bioassessment protocols for Assessing the Relative Abundances of Algal Taxa.

Samples for total pigment analysis by HPLC were filtered through Whatman glass-fiber filters. The filters were then sealed in individual containers, placed in a cooler with dry ice, and shipped to the laboratory under chain of custody. Samples for algal identification were preserved with formalin and shipped on ice to Pennington and Associates.

Algal identification was performed by Pennington and Associates in Cookeville, Tennessee. Total pigment analyses by HPLC were performed by the University of Maryland, Horn Point Laboratory. HPLC was used specifically because this is the method that will give quantitative results of the total chlorophylls, a, b, and c, along with the accessory pigments. Spectrophotometry can only be used for qualitative measurements and this method gives widely variable and inaccurate measurements for just chlorophyll a. This is discussed in further detail in Section 3.2.5

2.2.4 Time-Series BOD Tests

Samples were collected from three locations over three sampling rounds during the summer of 2015. The following methodology was used to setup the samples.

The ultimate carbonaceous- and nitrogenous-biochemical oxygen demand is measured by conducting time-series biochemical oxygen demand (BOD) tests. The total BOD (TBOD) measured during the test can be speciated into ultimate carbonaceous BOD ($CBOD_u$) and nitrogenous BOD (NBOD), as well as, immediate oxygen demand (IOD) that is caused by either algal respiration or chemical oxygen demand that either can be asserted within the first 12 hrs of the time-series BOD test. The ratio of $CBOD_u$ to the 5-day BOD (BOD_5), called the f-ratio, can also be determined. This f-ratio is then used to convert a $CBOD_u$ to a regulatory-used BOD_5 concentration for setting permit discharge limits. In reality, BOD_5 as measured in the bottle does not exist in the real environment and it is the $CBOD_u$ that results in the oxygen demand in the natural setting. The different fractions that can be found in the laboratory test decay at different rates in the stream. It is possible that the fraction of the $CBOD_u$ that exists as $CBOD_5$ and the fraction of the CBOD that was measured in the period between 5 and 30 days in the bottle will both be reduced at the same time at nearly the same rate in the natural environment (Corn, Sielbeck, Rogers V, Carmean, & Corn, November 2015). A river decay rate can be determined by collecting samples within the same mass of water as it moves downstream. The City of Murfreesboro previously sponsored a study to determine the stream BOD deoxygenation rate for waste

assimilative capacity determination of the West Fork Stones River for assisting TDEC in establishing the wasteload allocation for the West Fork Stones River. This will be discussed in detail below.

A water sample is collected in a 5-gallon Nalgene® carboy. Samples collected by the field crew were set up immediately in the field or at the AquAeTer laboratory. All samples were stored at the AquAeTer laboratory for the 90-day test. All bottle storage areas were kept at 20°C.

The 5-gallon carboy was shaken vigorously to aerate the samples to near saturation. The lid was then opened without removing it to allow the sample to equilibrate for five minutes. The sample was carefully siphoned into the bottom of two 2 liter (L) glass BOD bottles. After the BOD bottle was full, the DO was measured. If the DO concentration in the two bottles was greater than +/- 0.2 mg/L (the accuracy of the DO measurement), the process was restarted. Samples for nutrient analysis were then collected from the 5-gallon carboy. The nutrients analyzed at time zero were total Kjeldahl nitrogen (TKN), ammonia-nitrogen (NH_3), nitrite+nitrate-nitrogen (NO_2+NO_3), total phosphorus (TP), and ortho-phosphate (PO_4). The remaining sample was then siphoned to a glass 5-gallon carboy. The sample in the glass carboy was used as make-up water and to collect periodic nutrient samples.

The make-up water is intended to replace water lost during periodic DO readings and due to evaporation. Make-up water was transferred to the BOD bottles using a disposable plastic pipette.

After time-zero readings were taken from the two duplicate samples and the lost volume was carefully replaced in the sample (minimizing oxygen addition), both samples were sealed with air-tight caps to prevent DO exchange. All samples, once back in the laboratory in Brentwood, were kept in incubators set at a temperature of 20°C.

No inhibitors for nitrogen inhibition were used since both organic and inorganic nitrogen decay was also measured during the tests and the fact that both Nitrosomonas and Nitrobacter bacteria also may uptake carbonaceous BOD. No sample dilutions were made since effluent BODs were expected to be extremely low.

All samples were run for at least 90 days. Periodic dissolved oxygen measurements were made using a YSI 5100 DO meter. Each meter was calibrated before and after each reading day. If samples approached 3.0 mg/L DO, the remaining sample from Bottle A, B and the matching make-up water bottle was transferred to a 5-gallon carboy where it was reaerated using the same process as mentioned previously. At a DO of less than 2 mg/L, the bacterial population in the bottles may go anoxic and this will affect the total oxygen uptake for the test. The anoxic condition slows the metabolic rates compared to the aerobic condition. The bacterial population may take a while to recover, which introduces an error into the test.

2.2.5 Habitat Assessment

A habitat assessment was performed for each stream station according to the procedures outlined by the TDEC guidelines set forth in the *Quality System Standard Operating Procedure for Macroinvertebrate* Streams (TDEC 2011). At each macrobenthos sampling location, a data sheet was filled out fully in order to calculate a score for the individual sites. The Habitat Assessment Field Sheet considers ten parameters associated with the river and its potential productivity as a source of habitat for aquatic organisms. The ten parameters that the score is calculated for are as follows:

- Epifaunal Substrate/Available Cover;
- Embeddedness of Riffles;
- Velocity/Depth Regime;
- Sediment Deposition;
- Channel Flow Status;
- Channel Alteration;
- Frequency of re-oxygenation zones;
- Bank Stability;
- Vegetative Protective; and
- Riparian Vegetation Zone Width.

TDEC has set a target score for Ecoregion 71i, in which all habitat assessments were performed, of 121 or greater in order for a stream to be considered not impaired. A document produced by TDEC (Arnwine & Denton, November 2001) cited a score of 98 or 96 was acceptable. There is no documentation given by TDEC for why this score is good or bad and why this streams with a score lower than this number is considered "impaired".

2.2.6 Benthic Macroinvertebrates and Identification

Benthic macroinvertebrates were collected during both studies. Where possible, the SQKICK methodology was used (TDEC Division of Water Pollution Control, 2011). This method is considered the "Gold Standard" of biological tests by TDEC (Denton, 2015). Where the SQKICK methodology could not be used, the SQBANK methodology was used. Both methods are reported in the TDEC Macroinvertebrate SOP (2011), which is based on the USEPA Rapid Bioassessment Protocols (Barbour, Gerritsen, Snyder, & Stribling, 1999).

AquAeTer paid close attention to the stream flow to avoid sampling following a high-flow event. These spikes in flow can scour the intolerant (sensitive) species. This can lead to conclusions that are not representative of the River as it truly exists. The TDEC SOP (2011) specifically states to avoid sampling in flooded conditions or immediately after a flood. Literature suggests that at least 2 weeks should be allowed prior to sampling macrobenthos following a high

flow event. Large spikes in flow will disrupt a community of aquatic insects. Those insects that are categorized as clingers, and often sensitive species, are pushed downstream due to the force of water. Studies have shown that extreme flooding can reduce invertebrate densities by 75 to 95 percent in some streams, while reducing taxa richness by 30 to 70 percent (Mundahl & Hunt, 2011). Another study determined that ten days after a flood event abundance was still reduced by up to 50 percent, especially negatively affecting Ephemeroptera, Trichoptera, and Plecoptera (EPT grouping) (McMullen & Lytle, 2012). An additional study determined that aquatic invertebrates in stream in New Zealand were able to fully recover at 132 days, approximately 4 months from a flood of greater than 1,000 cfs (Scrimgeour, Davidson, & Davidson, 1988). They also determined that floods of such magnitude allow for opportunistic colonizers to establish populations in the niche space once occupied by sensitive species. The Georgia macroinvertebrate SOP specifies that sampling should be postponed for a period of at least two weeks following a major rain event (Watershed Protection Branch, March 2007).

2.2.6.1 SQKICK Methodology

The following procedures were performed for the SQKICK methodology and were taken directly from the TDEC Macroinvertebrate SOP (2011):

A one-square meter kick net with a 500-micron mesh to sample the riffle area was used. When necessary, rocks were used to weight the bottom edge to prevent the flow of water beneath the net. At each site, two kicks were collected: one from an area of fast current velocity and one from an area of slower current velocity. Areas with large leaf packs caught on the rocks were avoided.

One person of the sampling crew held the net at an angle that allowed the current to flow into it making sure the bottom was in contact with the substrate and the top of the net is above the surface of the water. The second sampler disturbed the substrate for approximately one-meter distance and the width of the net (one meter) upstream from the net by kicking and shuffling the substrate. This caused organisms and debris to flow into the net. Larger rocks were lifted and rubbed with the hands to remove clinging organisms.

Once the kick was completed, time was allowed for the lighter debris to finish floating into the net. The sampler who performed the kick then grabbed the two pole ends at the bottom of the net and carefully lifted the net out of the water while the other sampler continued to hold the upper end making sure the top of the net did not dip below the water surface allowing organisms to escape. The net was then carried horizontally to the bank for processing.

The field sampler then combined the debris from both kicks by carefully positioning the net in a 500-micron sieve bucket. The debris and organisms were then rinsed, with sieved water, off the net into the sieve bucket. Effort was made to collect all debris and organisms. Large rocks or organic material, such as whole leaves or twigs, were discarded after rinsing and removing

clinging organisms. The sample was then transferred to a wide mouth or plastic container. Using forceps, all organisms clinging to the net were removed and added to the sample container.

The field sampler then preserved the sample with 80% ethanol, and included an internal tag with the station ID, date, sampler's initials and sample type inside the container with the debris. The site information was also printed in indelible ink (i.e., Sharpie) on the sample lid, and this information included station ID, stream name, location, sampler's initials, date sampled, time sampled and sample type.

2.2.6.2 SQBANK Methodology

The following procedures were performed in the event that the regular methodology for the SQKICK samples were not possible (taken directly from the TDEC Macroinvertebrate SOP (2011)):

A triangular dip net with a 500-micron mesh was used to sample the rooted undercut bank. Samples were collected by jabbing the net below the surface of the water using an upward/forward thrusting motion designed to dislodge macroinvertebrates from the roots. Three separate areas of the reach, including at least one sample from each bank, were sampled. Macrophyte beds were substituted if rooted banks were not available. Approximately one linear meter (approximately 3 triangular net widths) was sampled at each of the three sampling locations.

The net was visually inspected for any large organic matter such as whole leaves and sticks. The field sampler removed any organisms clinging to these materials and added them to the smaller debris, before discarding the large material. Using forceps, organisms clinging to the net were removed and added to the sample. The debris from all three bank samples were combined. Upon cursory examination of the debris, if it did not appear that 200 organisms had been collected, additional bank samples were collected. When all rooted bank habitat was exhausted before 200 organisms were collected, it was documented in the field notebook. The total number and location of bank jabs was document, as well.

The field biologist then preserved the sample with 80% ethanol, and included an internal tag with the station ID, date, sampler's initials and sample type inside the container with the debris. The site information was also printed in indelible ink (i.e., Sharpie) on the sample lid, and included station ID, stream name, location, sampler's initials, date sampled, time sampled and sample type.

2.2.6.3 Sample Storage

Samples loosely filled the jar(s) three fourths (3/4) full or less. Samples were delivered to and stored in the lab for subsampling, sorting, and taxonomic identification.

If more than one jar was required for a sample site, jars were labeled with the following format: ## of ##. The jars were labeled with Rite-in-the-Rain paper and indelible ink inside the jar. The label contained the following information:

- Sample site ID;
- Location/Stream;
- Date and Time;
- Collectors' initials;
- Sampling Method Used; and
- ## of ##.

Any additional information was documented in a field notebook with the same information above.

2.2.6.4 Sample Preparation

The TDEC Standard Sampling Procedures for Macroinvertebrate Stream Surveys (2011) was used as guidance for the subsampling procedure used in Laboratory Analyses. The TDEC methodology came directly from the USEPA Rapid Bioassessment Protocols (Barbour, Gerritsen, Snyder, & Stribling, 1999) which was also the protocol currently in use at the AquAeTer biological laboratory. The specific laboratory methodology is listed below and taken directly from the TDEC Macroinvertebrate SOP (2011). The following procedures were followed accordingly:

All semi-quantitative samples were reduced to a 200 +/- 20% (160-240) organism subsample using the following technique (taken directly from the TDEC Macroinvertebrate SOP (2011)):

1. The sample was thoroughly rinsed in a 500-micron mesh sieve to remove preservative and fine sediment. Large organic material such as whole leaves, twigs, etc., that were not removed in the field were rinsed, visually inspected and discarded. If the sample was stored in more than one container, the contents of all containers for a given sample were combined at that time. The samples were gently mixed by hand while rinsing to make it homogenous.

2. The cleaned sample was transferred to a gridded pick subsampler (or similar apparatus). The subsampler was a white plastic cutting tray that measures approximately 18” x 12½” x 2¼.” The tray is divided into 28, 2”x2” grids and marked with indelible ink. Note: it is preferable that a sieve insert or raised grid divider be used to separate the grids. The animals and debris were removed using a combination of scoop and transfer pipette.

3. If the debris did not fit in one tray, two or more trays were used. The debris was thoroughly mixed and divided equally between the trays. The same grids for both trays were sorted. For example, if grid # 5 was randomly selected, both # 5 grids were picked. This counted as one grid out of 28.

4. Enough water (or ethanol) was added to evenly distribute the debris. The trays were gently shaken and swirled until the organisms were evenly distributed within the tray. The excess water was removed with a suction device (i.e., turkey baster with a 500 micron or smaller screen over the aperture), to the point where the sample was settled onto the bottom of the tray. If a raised grid insert was not being used, care was taken not to pull organisms towards the area of suction.

5. Four numbers were randomly selected corresponding to squares (grids) within the gridded subsampling pan. All material was removed (organisms and debris) from the four grids and the material was placed into a dish or jar with a small amount of water. A magnifying light was used to make sure all organisms and debris were removed from the grids. Any organism that was lying over a line separating two grids was considered to be on the grid containing its head. If it was not possible to determine the location of the head (i.e., oligochaetes), the organism was considered to be in the grid containing most of the body.

6. If there appeared to be 160-240 organisms (cumulative of the four grids), then subsampling was completed. If there appeared to be fewer than 160 organisms, grids continued to be selected one at a time until between 160 and 240 organisms were selected. If more than 240 organisms were contained in the first four grids, the contents of the four grids were transferred to a second gridded pan. Grids were randomly selected for the second subsampling as was done for the first, sorting grids four (and then one) at a time until the second subsample contained 160-240 organisms. If it was estimated that the first four grids of the second subsample contained more than 240 organisms, the four grids were transferred to another pan and conducted a third subsample. Subsamples were continually created until there were 160-240 organisms.

2.2.6.5 Sample Sorting

The subsamples were transferred, a small amount at a time, to a petri dish for sorting (removing organisms). All sorting was completed under a dissecting scope, removing and preserving all organisms in 80% ethanol. If the number of organisms from the four-grid subsample did not equal the specified number of 160-240, a fifth grid was randomly chosen and all organisms were picked in that grid. If the addition of the fifth grid fulfilled the quota, than the subsampling was complete. If not, additional grids were chosen (one at a time) until the quota was reached or

surpassed. All the organisms from the final grid that were randomly selected were removed even if the quota was reached midway through the picking of the grid.

If, after microscopic sorting, more than 240 organisms were found, all organisms were transferred to a small gridded dish (36 grids). Subsampling by groups of first four and then one random grid was continued until the target of 160-240 organisms was achieved.

The sorted debris was placed in a separate container and preserved in 80% ethanol. Both external and internal tags were included. The words "sorted debris" was then added to the tag information. The remaining unsorted sample debris residue was saved in a separate container labeled "sample residue". This container included the original sample label and internal tag.

The sorted 160-240 organism subsample was placed into a glass vial and preserved in 80% ethanol. An internal tag, written in pencil, was placed on waterproof paper citing the log number, station ID, date collected and taxonomist inside each vial. The label was positioned so it could be read through the vial.

After sorting was completed, the appropriate information was recorded (log number, station ID, sorters initials, date sorted and the number of organisms found) in the laboratory log book.

2.2.6.6 Sample Identification

In the laboratory, all organisms were identified to genus except Acari, Nematoda, Hydra, Brachiobdellida, immature Tubificidae, Lumbriculidae and Nematomorpha using the primary taxonomic literature. Animals that were missing heads, exuviae, empty shells, empty caddis cases, or terrestrial life stages were not counted.

All biometrics were calculated at the specified level only. It was important that all taxonomists used the same primary keys for consistency in identification and nomenclature.

Taxonomic nomenclature and number of organisms were recorded on a bench sheet. Header information that must be provided included the log number, station ID number, date collected, time collected, samplers, sample source location, ecoregion, sample type, taxonomist and analysis date. Taxonomic information included order, family and genus.

After identifying all taxa in the subsample, they were returned to the vial and fresh preservative (80% ethanol) was added. Initial, date and log numbers were added to the internal tag. The sample was then placed in storage and will be kept for a minimum of five years.

Chironomids, oligochaetes and other small organisms were mounted on slides for identification. A permanent mounting media, such as CMCP-10 which clears the mount so a separate clearing agent is not necessary, was used. A round coverslips (12 mm) for small

specimens was used. One organism was placed under each coverslip. A maximum of 10 coverslips could be placed on each slide. Square coverslips (22mm) could be used to mount larger specimens. One to three organisms were placed under each coverslip with a maximum of 3 coverslips per slide.

Chironomid larvae were mounted so that their bodies were viewed laterally and their heads were viewed ventrally. Enough pressure was applied to the coverslip so that the mandibles were open exposing the mentum. The S1 setae, premandibles and pectin epipharyngias were also visible. Oligochaetes were mounted laterally with minimal pressure. The mounting media extended past the edges of the coverslip to allow for shrinkage during drying. The slides were air-dryed at least 24 hours before attempting identification. (A slide dryer could be used to dry mounts faster if desired). Slides were labeled with the log number, station ID, date, taxonomist initials and slide box slot number. Labeled slides will be kept in a slide box a minimum of five years after completion of the study.

2.2.6.7 Sample Analysis

Analyses for the benthic macroinvertebrate data included the Tennessee Macroinvertebrate Index (TMI), species abundance and diversity, and species tolerance levels. Tolerance values tell you how tolerant any given species is to pollution within its habitat. The tolerance value scale goes from 0 to 10. Organisms with low numbers are very sensitive to pollution, while those with tolerance value numbers closer to 10 tolerate more pollution within their habitat. Organisms with tolerance values less than 3 are extremely pollution sensitive, while those with values between 8 and 10 are considered highly tolerant to heavy pollution levels. All organisms in between 3 and 8 on the tolerance scale are considered intermediate or moderately tolerant to pollution. Results from data analyses are provided below.

Species within the EPT metric are normally considered sensitive (pollution intolerant) and greatly affect the TMI score. The EPT is a metric describing the total number of Ephemeropteran, Plecopteran, and Trichopteran taxa.

TDEC has developed a guidance document that sets a TMI score of 32 as the target threshold for wadeable streams within this Ecoregion based on reference streams specified by TDEC. It is unclear how the scoring was established by TDEC. As noted previously, it is noted that the reference streams selected by TDEC are not of the same order as either the East Fork or West Fork so there is no basis for any impairment that has been set for the West Fork Stones River in the study area. The maximum possible TMI score is 42.

2.2.7 Fish Collection and Identification

Fish were collected as part of the first study. Fish collection was not repeated for the second study. TDEC does not have a scoring system for fish species, but this is an important part of the

aquatic ecosystem and is most directly important for human health since humans eat fish and not macrobenthos.

2.2.7.1 Stream Collection Procedures

Streams were sampled using a Smith-Root model LR-24 backpack electrofishing device, or a Type VI boat-mounted electrofisher. Samples were collected from all available habitats. For both methods, the field team consisted of three workers. Backpack electrofishing was conducted with one field personnel to operate the probe and carry the backpack; one team member was assigned to net stunned fish; and one team member carried a bucket and net for collection of the stunned fish. Boat electrofishing was conducted with one field personnel to operate the boat and two personnel to net fish. A reach was calculated using the formula of forty (40) times the average wetted width. A maximum length of 500 meters was used for reaches that were wadeable and sampled with the backpack electrofisher, and a maximum length of 1,000 meters was used for reaches that were non-wadeable and sampled with the boat mounted electrofisher. All micro- and macrohabitats (riffles, pools, runs, snags, undercuts, deadfalls, quiescent leaf-covered substrates, etc.) were thoroughly sampled. Stunned fish were collected with dip nets and placed into buckets, or a live well with water that was frequently changed to minimize stress and mortality.

When possible, individuals were identified to species in the field, examined for diseases, sores, lesions, fin damage, and skeletal anomalies, measured (total length to the nearest 1 mm), and then released. Deformed or diseased fish were also noted on the data sheet by circling the total length measurement of the affected fish. Photographs were taken of any deformed or diseased fish. Two representative specimens of any unidentifiable species were preserved in 10% formalin and transported to the biology lab for identification. Fish were identified in the laboratory to the lowest possible taxonomic level. A representative sample of each species observed was collected for QA/QC identification in the laboratory.

Once the first 30 specimens of a species were measured, the remaining fish of that particular species were only counted and released.

A GPS was used to mark each sampling location. Field data sheets were completed for each site. These data sheets included a list of all species, lengths, and anomalies documented for each fish collected.

2.2.7.2 Electrofishing

Backpack and boat electrofishing was performed according to the guidelines and procedures provided in the user manual. Personnel wearing the backpack electrofisher and all personnel standing in the water while sampling, wore rubber gloves and insulated chest waders. While boat electrofishing, all personnel wore rubber gloves. All personnel who participated in the electrofishing had been trained by the American Red Cross in “Adult First Aid/CPR/AED”.

2.2.7.3 Sample Storage

Fish individuals that were taken back to the laboratory for identification and QA/QC procedures were preserved in a 10% formalin solution.

If more than one jar was required for a sample site, the jars were labeled with the following format: ## of ##. The jar was labeled with tape affixed to the lid of each sample jar in addition to Rite-in-the-Rain paper inside the jar. The label contained the following information:

- Sample site ID;
- Location/Stream;
- Date and Time;
- Collectors' initials;
- Sampling Method Used; and
- ## of ##.

Any additional information was documented in a field notebook with the same information above. The fish sampling field data sheets were attached to any associated field notes.

2.2.7.4 Analysis of Fish Data

Three metrics were considered when evaluating the data collected during the fish sampling events. Overall, fish data are not considered by TDEC when determining impairment in streams, and there is no regional Index of Biotic Integrity established for this area. The metrics that were analyzed were: Shannon's Diversity Index, evenness, and the number of intolerant fish species.

- Evenness: A measure of the equitability in relative abundance among species. A community that is closer to even, or a score of 1, is considered a well distributed and stable community.

- Shannon's Diversity: A commonly used index that is used to characterize the diversity in a community. This index accounts for both abundance and evenness of the species present. This metric is applicable to all habitat types, terrestrial and aquatic.

- Intolerant Fish Species: Those specimen that are less capable of surviving contaminants within water bodies. Species classified as intolerant are generally the first species to disappear after impairment and the last to re-establish after restoration.

It is noted that the instream-dams are a detriment to fish migration and thus are an impediment to fish abundance and movement.

SECTION 3.0

RESULTS DISCUSSION

3.1 SITE SUMMARIES

The following site summaries are categorized by parameter groupings in order to better compare the variability moving up or downstream on each River. The flow recorded by the nearest gage is presented with the data. Unless specifically relevant, pH and conductivity measurements are not discussed in this section. They are provided in Appendix .

3.1.1 East Fork Stones River

All sample times and locations for the East Fork are presented in Table 3 - 1. All samples were collected at 1 foot below water surface unless otherwise noted. The River flows at the time of the sampling at the specific sample are presented in Table 3 - 2.

Table 3 - 1. Summary of Sample Locations and Times on the East Fork

DATE	TIME, LOCATION IN CHANNEL[1]					
	EF001 EFRM 2.4	EF002 EFRM 5.0	EF003 EFRM 6.8	EF004 EFRM 8.0	EF005 EFRM 9.1	EF006 EFRM 8.8
6/5/2014	10:20 Mid	9:48 Mid	9:27 Mid	9:00 Mid	12:30 Mid	-
8/12/2014	11:08 Mid	10:39 Mid	10:18 Mid	10:01 Mid	7:56 Mid	-
11/4/2014	9:20 Mid	9:35 Mid	10:05 Mid	10:20 Mid	11:30 Mid	-
1/20/2015	15:40 Mid	15:28 Mid	15:00 Mid	13:20 REW	13:50 LEW	-
8/5/2015	-	-	-	7:50 REW	8:54 LEW	10:31 Mid
8/13/2015	-	-	-	16:00 REW	15:08 Mid	15:28 Mid

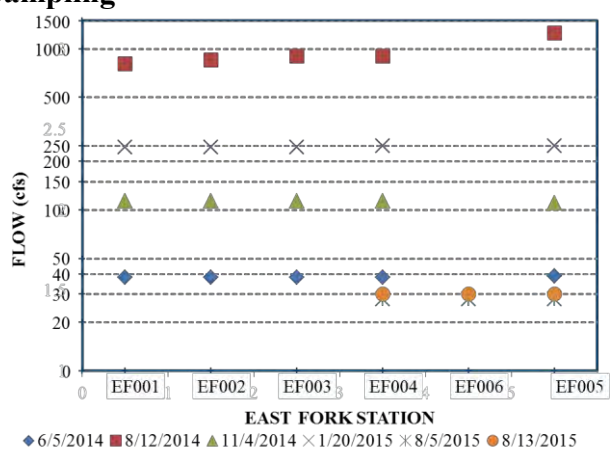
Note: 1. Location in channel references the following:
LEW = Left edge of water when facing downstream
Mid = Middle of Channel
REW = Right edge of water when facing downstream

Table 3 - 2. East Fork Stones River Flows During Sampling Events

DATE	FLOW (cfs)					
	EF001 EFRM 2.4	EF002 EFRM 5.0	EF003 EFRM 6.8	EF004 EFRM 8.0	EF005 EFRM 9.1	EF006 EFRM 8.8
6/5/2014	38	38	38	38	39	-
8/12/2014	813	854	900	900	1260	-
11/4/2014	114	114	114	114	111	-
1/20/2015	245	245	245	250	250	-
8/5/2015	-	-	-	28	28	28
8/13/2015	-	-	-	30	30	30

The samples covered a range in flow conditions on the East Fork Stones River. The flows are presented in Figure 3 - 1. Samples were collected over a wide variety of flow ranges when the upper stations on the East Fork were still wadeable.

Figure 3 - 1. Flows in East Fork During Sampling



3.1.1.1 <u>In Situ Water Quality Samples</u>

The results of the dissolved oxygen readings on the East Fork are presented in Table 3 - 3 and shown in Figure 3 - 2 and Figure 3 - 3.

The DO met the water quality standard of 5 mg/L for all measurements collected. It is interesting to note that the DO concentration was reduced in August during the higher flow conditions than the measurements collected in June. The water temperatures were equivalent, so it was not a situation of lower saturation potential. This difference also cannot be explained due specifically to the diurnal cycle. Lower DO readings are expected in the morning. However, the June 2014 samples were collected at an earlier time than the August 2014 samples. The two sample readings in August 2015 demonstrate the differences in the diurnal concentrations. Both were taken at similar flow conditions. However, measurements were collected on the 5th in the morning, while measurements collected on the 13th were collected in the afternoon. The East Fork had dissolved oxygen concentrations that fully support a healthy aquatic ecosystem.

Table 3 - 3. East Fork Dissolved Oxygen Measurements

DATE	DO (mg/L and %Saturation)					
	EF001 EFRM 2.4	EF002 EFRM 5.0	EF003 EFRM 6.8	EF004 EFRM 8.0	EF005 EFRM 9.1	EF006 EFRM 8.8
6/5/2014	10.1 125%	9.7 118%	8.8 107%	6.1 74%	7.6 91%	
8/12/2014	5.2 65%	5.5 67%	5.9 73%	6.4 78%	6.3 77%	
11/4/2014	8.6 81%	9.5 90%	10.5 96%	11.9 111%	12 112%	
1/20/2015	13.5 118%	13.6 119%	17.1 152%	17.1 153%	14.9 131%	
8/5/2015	-	-	-	5.9 74%	5.4 68%	5.00 63%
8/13/2015	-	-	-	10.2 127%	11.9 154%	10.9 137%

Figure 3 - 2. DO in the East Fork

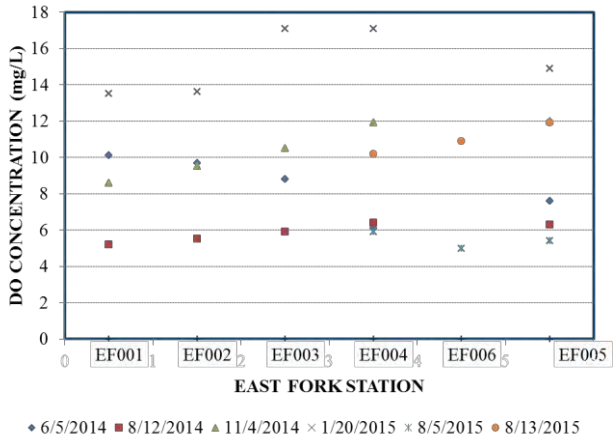
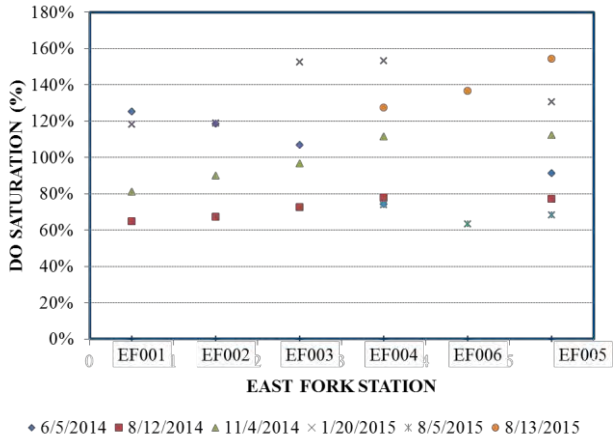


Figure 3 - 3. DO % Saturation in the East Fork

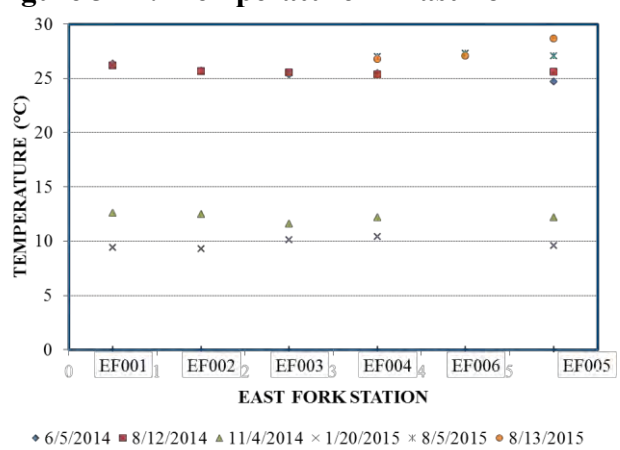


The water temperatures measured during the study are presented in Table 3 - 4 and shown in Table 3 - 4. The water temperatures were similar in both June and August 2014 samples, but hotter in August 2015.

Table 3 - 4. East Fork Temperature Readings

DATE	TEMPERATURE (°C)					
	EF001 EFRM 2.4	EF002 EFRM 5.0	EF003 EFRM 6.8	EF004 EFRM 8.0	EF005 EFRM 9.1	EF006 EFRM 8.8
6/5/2014	26.4	25.7	25.3	25.4	24.7	-
8/12/2014	26.2	25.7	25.5	25.3	25.6	-
11/4/2014	12.6	12.5	11.6	12.2	12.2	-
1/20/2015	9.4	9.3	10.1	10.4	9.6	-
8/5/2015	-	-	-	27.0	27.1	27.3
8/13/2015	-	-	-	26.8	28.7	27.1

Figure 3 - 4. Temperature in East Fork



Temperature affects the amount of dissolved oxygen that can physically be forced into the water. Higher temperatures result in lower saturation concentrations. At the same time, the reaeration rate is higher at higher temperatures or more oxygen can physically be transferred at higher temperatures. Algae can add oxygen to the water so that the DO concentration can be greater than the saturation concentration. The algae will follow a diel cycle, producing oxygen during the day through photosynthesis and removing oxygen at night through respiration. This diel cycle usually peaks in the late afternoon and reaches a minimum in the morning. Most of the DO measurements followed this trend. However, during the August 2014 sampling event, the flows were greater than 1,000 cfs. During this time, the DO concentrations were lower than measurements made in the June 2014 sampling event.

Higher flows by themselves do not explain a decrease in DO. It is possible that the higher flows caused an increase in mixing within the embayment, so that the DO concentrations on the bottom layers were brought to the surface. DO is expected to be lower in the deeper portions of the embayment due to stratification and lack of opportunity for contact with the surface. The lower DOs could also indicate either nonpoint sources from stormwater runoff or a significant decrease in addition of oxygen to the stream from the algae which would be curtailed during high rain events.

3.1.1.2 Laboratory Chemical Analyses Samples

The laboratory analyzed parameters are provided in the following series of tables. Results for all parameters are provided with the lab reports in Appendix . Silica, TSS, and bicarbonate samples were collected during the first study and are not discussed in this section.

Ammonia, reported in Table 3 - 5, was not collected during the second study at any site on the East Fork. The results of the ammonia indicate that there is no clear source of ammonia on the East Fork. The maximum measured concentration was collected during a higher flow event, but the entire reach did not mimic this concentration.

Table 3 - 5. East Fork Ammonia Concentrations

DATE	AMMONIA – N (mg/L)					
	EF001 EFRM 2.4	EF002 EFRM 5.0	EF003 EFRM 6.8	EF004 EFRM 8.0	EF005 EFRM 9.1	EF006 EFRM 8.8
6/5/2014	0.149	<0.1	<0.1	0.109 & 0.105 (D)	0.151	-
8/12/2014	<0.1	0.13	0.155	<0.1	0.262	-
11/4/2014	<0.1	<0.1	<0.1	<0.1	<0.1	-
1/20/2015	0.122	<0.1	<0.1	<0.1	<0.1	-
8/5/2015	-	-	-	-	-	-
8/13/2015	-	-	-	-	-	-

Note: (D) - indicates duplicate sample.

Total Kjeldahl nitrogen (TKN) concentrations are presented in Table 3 - 6. A TKN concentration of less than 1 mg/L indicates the stream is likely nutrient limited. In addition, the accuracy of a TKN analyses less than 1 mg/L has been historically poor, with plus or minus 100% given in Standard Methods. So minor variations at these concentrations may or may not reflect real variations in the environment. From the time-series BOD sample results and analyses, about 50% of the organic nitrogen is generally recalcitrant and not available for conversion to ammonia. The organic nitrogen concentrations are presented in Table 3 - 7.

Table 3 - 6. East Fork Total Kjeldahl Nitrogen Concentrations

DATE	TOTAL KJELDAHL NITROGEN (mg/L)					
	EF001 EFRM 2.4	EF002 EFRM 5.0	EF003 EFRM 6.8	EF004 EFRM 8.0	EF005 EFRM 9.1	EF006 EFRM 8.8
6/5/2014	0.309	0.466	0.355	0.368 0.39 (D)	0.341	-
8/12/2014	0.638	0.622	0.623	0.655	0.703	-
11/4/2014	0.529	0.57	0.389	0.542	0.355	-
1/20/2015	<0.25	0.548	0.323	<0.25	<0.25	-
8/5/2015	-	-	-	-	-	-
8/13/2015	-	-	-	<0.5	<0.5	<0.5

Note: (D) - indicates duplicate sample.

Table 3 - 7. East Fork Organic Nitrogen Concentrations

DATE	ORGANIC NITROGEN (mg/L)					
	EF001 EFRM 2.4	EF002 EFRM 5.0	EF003 EFRM 6.8	EF004 EFRM 8.0	EF005 EFRM 9.1	EF006 EFRM 8.8
6/5/2014	0.16	<0.466	<0.355	0.259 0.285 (D)	0.341	-
8/12/2014	<0.638	0.492	0.468	<0.655	0.441	-
11/4/2014	<0.529	<0.57	<0.389	<0.542	<0.355	-
1/20/2015	<0.128	<0.548	<0.323	<0.25	<0.25	-
8/5/2015	-	-	-	-	-	-
8/13/2015	-	-	-	<0.5	<0.5	<0.5

Note: (D) - indicates duplicate sample.

Nitrite and nitrate concentrations are presented in Table 3 - 8. It is expected that the majority of these results are in the form of nitrate. The nitrate results are relatively consistent in both the lentic portion of the River and lotic portions of the lake. There is no clear increase in nitrate concentrations downstream from the Coleman Farm, indicating that the land application of reclaimed water by the City of Murfreesboro is not resulting in an increase in nitrate concentrations in the East Fork. It is not anticipated that nitrate levels at the concentrations found in the East Fork are harmful to the aquatic life. This will be discussed in further detail with the results of the biological investigations.

It is noted that algae utilize ammonia and nitrate. At low nitrogen concentrations, blue-green algae can dominate since they have the ability to utilize atmospheric nitrogen for their nitrogen source for photosynthesis. Removing nitrogen from the river can have detrimental effects to the health of the river and the aquatic species within the system.

Table 3 - 8. East Fork Nitrite and Nitrate Nitrogen Concentrations

DATE	NITRITE + NITRATE - N (mg/L)					
	EF001 EFRM 2.4	EF002 EFRM 5.0	EF003 EFRM 6.8	EF004 EFRM 8.0	EF005 EFRM 9.1	EF006 EFRM 8.8
6/5/2014	<0.1	<0.1	0.284	0.194 0.201 (D)	0.126	-
8/12/2014	0.363	0.615	0.641	0.625	0.634	-
11/4/2014	0.876	0.889	0.884	0.907	0.863	-
1/20/2015	0.775	0.773	0.718	0.701	0.739	-
8/5/2015	-	-	-	-	-	-
8/13/2015	-	-	-	0.3	0.26	0.3

Note: (D) - indicates duplicate sample.

Orthophosphate as phosphorus (PO_4-P) concentrations are presented in Table 3 - 9. During three of the initial four quarterly sampling, orthophosphate was not detected. Orthophosphate concentrations were detected in the upper reaches during the higher flow event. This could potentially indicate a non-point source. However, orthophosphate was detected during the August 2015 sampling, which occurred during a period of lower flows. As with the nitrate concentrations, there was not an indication of an increase in orthophosphate concentrations downstream from the Coleman Farm at any time during the sampling events.

Table 3 - 9. East Fork Orthophosphate as PO_4-P Concentrations

DATE	PO_4-P (mg/L)					
	EF001 EFRM 2.4	EF002 EFRM 5.0	EF003 EFRM 6.8	EF004 EFRM 8.0	EF005 EFRM 9.1	EF006 EFRM 8.8
6/5/2014[1]	<0.1	<0.1	<0.1	<0.1 <0.1 (D)	<0.1	-
8/12/2014[1]	<0.1	0.129	0.165	0.161	0.162	-
11/4/2014[1]	<0.1	<0.1	<0.1	<0.1	<0.1	-
1/20/2015[2]	<0.1	<0.1	<0.1	<0.1	<0.1	-
8/5/2015[2]	-	-	-	-	-	-
8/13/2015[2]	-	-	-	0.14	0.13	0.16

Notes: (D) – indicates duplicate sample.
1 – Samples were reported as dissolved orthophosphate
2 – Samples were reported as orthophosphate

Total phosphorus concentrations are presented in Table 3 - 10. There is no clear indication of a continuous source for phosphorus on the East Fork.

Table 3 - 10. East Fork Total Phosphorus Concentrations

DATE	TOTAL PHOSPHORUS (mg/L)					
	EF001 EFRM 2.4	EF002 EFRM 5.0	EF003 EFRM 6.8	EF004 EFRM 8.0	EF005 EFRM 9.1	EF006 EFRM 8.8
6/5/2014	0.138	<0.1	0.154	<0.1 0.12 (D)	0.143	-
8/12/2014	<0.1	*0.129*	*0.165*	0.161	0.18	-
11/4/2014	<0.1	0.28	<0.1	<0.1	<0.1	-
1/20/2015	<0.1	<0.1	<0.1	<0.1	<0.1	-
8/5/2015	-	-	-	-	-	-
8/13/2015	-	-	-	*0.14*	*0.13*	*0.16*

Note: (D) - indicates duplicate sample.
Italicized results indicates Total Phosphorus concentration was less than ortho-phosphate-P concentration and is reported as the orthophosphate result.
All lab results are provided in Appendix .

3.1.1.3 Algal Identification and Chlorophyll Analysis

There are no applicable standards set for algal species or chlorophyll. The chlorophyll analyses are presented in Table 3 - 11. The algal identification results are provided in Table 3 - 12. All laboratory reports are provided in Appendix .

There is no correlation between the number of organisms present in a given volume and the total pigment concentration. The chlorophyll a makes up the majority of the overall pigments. However, ignoring the other pigments present ignores the capability of the algae to utilize the energy present in the system. Water quality models that try to specify a fixed rate of chlorophyll to biomass or species counts are inadequate and are not accurate. The relationship between the species counts and the chlorophyll concentrations is presented in Figure 3 - 5.

Figure 3 - 5. East Fork Algal Species Counts Versus Chlorophyll and Accessory Pigments

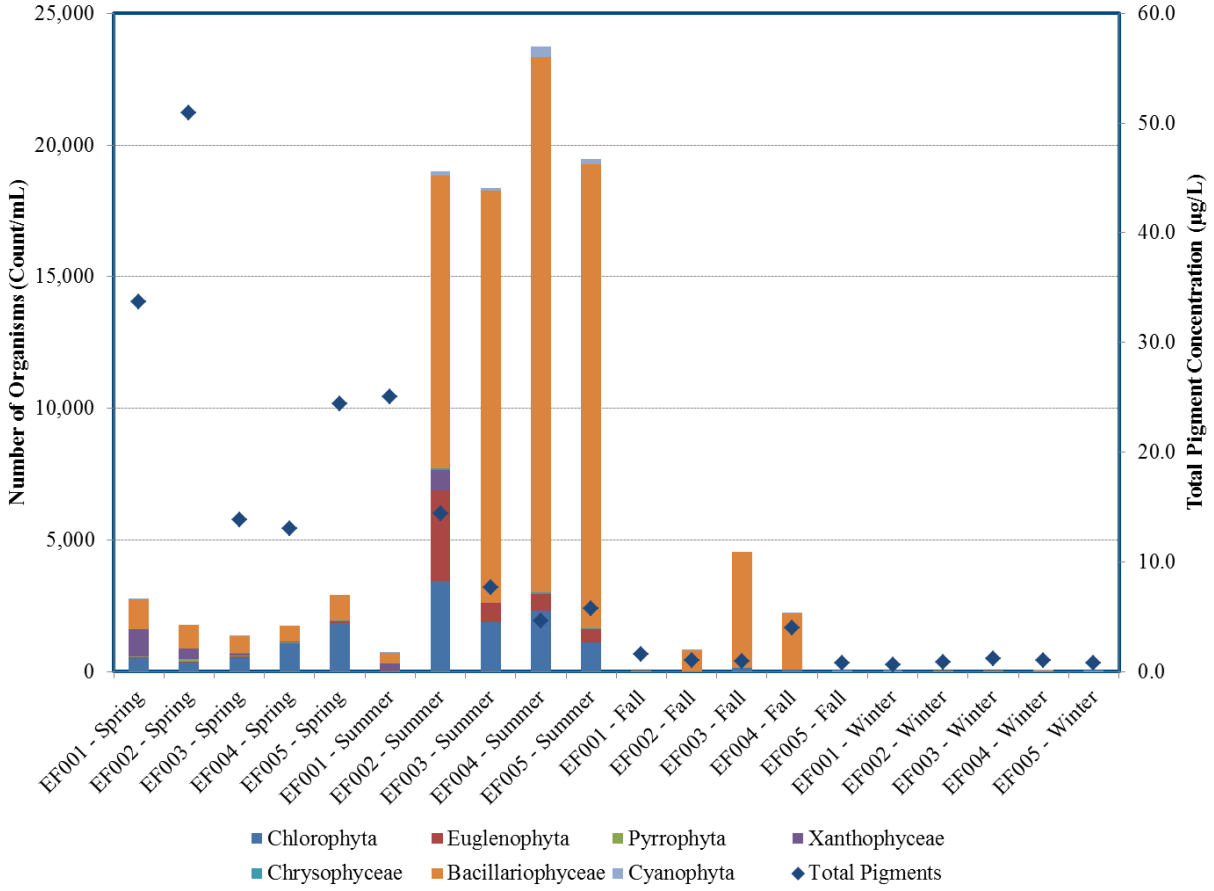


Table 3 - 11. East Fork Chlorophyll Results

DATE	PIGMENT	CHLOROPHYLL AND PIGMENTS (µg/L)				
		EF001 EFRM 2.4	EF002 EFRM 5.0	EF003 EFRM 6.8	EF004 EFRM 8.0	EF005 EFRM 9.1
6/5/2014	T. Pigment	33.724 33.777 (D)	50.893	13.868	13.047 12.741 (d)	24.439
	T. Chl. a	23.414 23.448 (D)	33.647	9.584	9.033 8.916 (d)	16.836
	T. Chl. b	2.601 2.665 (D)	2.512	1.047	0.983 0.951 (d)	2.383
	T. Chl c	1.320 1.317 (D)	2.574	0.419	0.399 0.370 (d)	0.871
	T. Acc.	10.310 10.329 (D)	17.246	4.284	4.014 3.825 (d)	7.603
8/12/2014	T. Pigment	25.028	14.396	7.690	4.662	5.781
	T. Chl. a	16.693	9.814	5.087	3.026	3.675
	T. Chl. b	1.000	1.007	0.661	0.361	0.472
	T. Chl c	1.022	0.552	0.263	0.166	0.193
	T. Acc.	8.335	4.582	2.603	1.636	2.106
11/4/2014	T. Pigment	1.561 1.556 (D)	1.008	0.965	3.986	0.761 0.765 (D)
	T. Chl. a	1.047 1.046 (D)	0.657	0.595	2.488	0.473 0.479 (D)
	T. Chl. b	0.056 0.054 (D)	0.045	0.036	0.076	0.043 0.040 (D)
	T. Chl c	0.063 0.064 (D)	0.040	0.049	0.228	0.031 0.031 (D)
	T. Acc.	0.514 0.510 (D)	0.351	0.370	1.498	0.288 0.286 (D)
1/20/2015	T. Pigment	0.594	0.594	0.861	1.212	1.027
	T. Chl. a	0.351	0.351	0.512	0.716	0.614
	T. Chl. b	0.008	0.008	0.011	0.014	0.014
	T. Chl c	0.029	0.029	0.044	0.072	0.058
	T. Acc.	0.243	0.243	0.349	0.496	0.413

Note (D) – Indicates internal laboratory duplicate
(d) – Indicates duplicate sample collected

Table 3 - 12. East Fork Algal Identification Results

DATE	PARAM.[1]	ALGAL IDENTIFICATION				
		EF001 EFRM 2.4	EF002 EFRM 5.0	EF003 EFRM 6.8	EF004 EFRM 8.0	EF005 EFRM 9.1
6/5/2014	Organisms (#/mL)	2,751	1,784	1,356	1,753	2,910
	Taxa	20	10	18	15	14
	Shannon Diversity	2.346	2.276	3.139	2.256	2.088
	Pollution Tolerance	2.70	2.92	2.37	2.39	2.39
	Dominant Phylum[2]	Diatoms	Diatoms	Diatoms	Green	Green
8/12/2014	Organisms	703	18,994	18,373	23,747	19,484
	Taxa	28	24	18	21	22
	Shannon Diversity	3.427	3.723	3.552	3.434	3.633
	Pollution Tolerance	2.61	2.49	2.73	2.41	2.57
	Dominant Taxa	Diatoms	Diatoms	Diatoms	Diatoms	Diatoms
11/4/2014	Organisms	20	811	4,541	2,217	21
	Taxa	19	15	15	16	10
	Shannon Diversity	2.919	2.459	2.216	2.489	2.144
	Pollution Tolerance	2.74	2.38	2.30	2.37	2.31
	Dominant Taxa	Diatoms	Diatoms	Diatoms	Diatoms	Diatoms
1/20/2015	Organisms	18	40	21	32	28
	Taxa	16	11	14	17	16
	Shannon Diversity	2.71	2.626	3.011	2.897	2.679
	Pollution Tolerance	2.36	2.41	2.45	2.53	2.33
	Dominant Taxa	Diatoms	Diatoms	Diatoms	Diatoms	Diatoms

Note 1. Indicates Parameter
2. Dominant phylum ranked by number of organisms.

3.1.1.4 Habitat Assessment

For this ecoregion, TDEC has established a guidance threshold of 121 out of 200 as a target for a wadeable stream. Scores less than 121 may be considered impaired, while a score of 121 or greater will not be considered impaired for habitat. The three lower stations, EF001, EF002, and EF003, are not wadeable streams. The station EF004 can be impacted by Percy Priest Lake when the lake levels are up. The habitat scores for the East Fork are provided in Table 3 - 13. It is noted that the TDEC guidance threshold is not a water quality standard.

Table 3 - 13. East Fork Habitat Assessment Scores

STATION	HABITAT SCORE	
	6/30/14	8/5/15
EF001	112	Not Analyzed
EF002	132	Not Analyzed
EF003	138	Not Analyzed
EF004	143	111
EF006	Not Analyzed	163
EF005	170	137

EF001 Habitat Assessment

EF001 was only characterized during the initial biological sampling event. At this location there were no riffles, as the area is heavily influenced by Percy Priest Lake. The velocity and depth regimes were dominated by deep and slow pool areas and there were very few re-oxygenation zones in the reach. For these reasons, this reach was scored at 112, which is below the TDEC guidance threshold for wadeable streams of 121. However, this area of the stream is not wadeable and should not be considered impaired based on the TDEC guidance developed for wadeable streams.

EF002 Habitat Assessment

EF002 was also only characterized during the 2014 biological sampling event and was also heavily influenced by Percy Priest Lake. Therefore, there were no riffles, a lack of velocity and depth regime and a lack of re-oxygenation zones. This reach of the East Fork Stones River was scored at 132, which is above the TDEC guidance threshold of 121, and is not considered impaired based on habitat. As with EF001, this portion of the stream is not wadeable and should not be compared to a TDEC guidance value developed for wadeable streams.

EF003 Habitat Assessment

EF003 was characterized during the 2014 biological sampling event and this site is also influenced by Percy Priest. Much like the two sites downstream from EF003, the reach lacked visible riffles and had poor velocity and depth regime. Even given these low scoring parameters, the reach scored 138, above the TDEC guidance threshold of 121. As with EF001 and EF002, this portion of the stream is not wadeable and should not be compared to a TDEC guidance value developed for wadeable streams.

EF004 Habitat Assessment

EF004 was characterized during the 2014 and 2015 biological sampling events and this site has the tendency to be influenced by Percy Priest Lake during the winter and early spring months of the year. In addition, if there has been significant precipitation recently this site may be influenced by the embayment from Percy Priest Lake. The 2014 sample occurred when this reach was influenced slightly by the Lake. Therefore, the embeddedness of the riffles, velocity and depth regime, and frequency of re-oxygenation zones all scored low. Even though there were no riffles in the area, the reach still scored a 143, which is above the TDEC guidance threshold of 121 based on habitat. During the 2015 sample, this reach had little impact from Percy Priest Lake and water was flowing more freely than in 2014. The embeddedness of riffles and velocity and depth regime both scored high. Overall, this reach scored a 147, well above the TDEC guidance threshold of 121.

EF005 Habitat Assessment

EF005 is a free-flowing lentic portion of the East Fork Stones River. The reach in 2014 contained one large riffle and a large majority were shallow runs. Due to the lack of multiple riffles, the frequency of re-oxygenation was scored as marginal and the riffles contained fine sediment, which was scored as suboptimal. The reach during the 2014 event scored a 170. In between the 2014 and 2015 sampling events, the suitable habitat for macroinvertebrate collection was changed due to high flows. EF005 was moved upstream approximately 50 yards. The habitat at this location was slightly different from the further downstream location. For instance, the left edge was a sand bar with little stability and very little vegetation. There was only one riffle in this area, and the majority was a shallow run. For these reasons the habitat score was lower in 2015, at 137. However, this score is still above the TDEC guidance threshold of 121.

EF006 Habitat Assessment

EF006 was added in 2015 to better represent the lentic areas of the East Fork Stones River. The reach contained a long riffle area and multiple shallow runs. The banks in this reach were primarily composed of erodible material and the vegetative protection on the left bank was

somewhat sparse. This reach scored a 163 on the habitat assessment, which is above the TDEC guidance threshold of 121.

3.1.1.5 Benthic Macroinvertebrates and Identification

Samples collected for macroinvertebrate identification were collected on the East Fork in 2014 and 2015. A summary of the data collected, including the resulting TMI scores, for all stations sampled are given in Table 3 - 14. The TMI calculations are provided in Appendix . Individual species found at each site are provided in Appendix . As with the habitat assessment, the guidance threshold used by TDEC is not a water quality standard.

Table 3 - 14. East Fork Benthic Data

PARAMETER	DATE	NON-WADEABLE			WADEABLE		
		EF001	EF002	EF003	EF004	EF005	EF006
Number of Specimens	6/30/2014	76	21	171	168	179	-
	8/5/2015	-	-	-	187	220	178
Number of Taxa	6/30/2014	17	11	33	35	20	-
	8/5/2015	-	-	-	39	30	16
Number of EPT Taxa	6/30/2014	2	1	6	5	7	-
	8/5/2015	-	-	-	5	12	9
NCBI	6/30/2014	7.49	7.20	6.75	6.48	5.52	-
	8/5/2015	-	-	-	5.34	4.76	5.62
TMI	6/30/2014	18	14	22	26	32	-
	8/5/2015	-	-	-	26	36	28

EF001 Benthic Results

During the 2014 sample event the EF001 macrobenthos sample analysis resulted in the identification of 76 total specimens from 17 different taxa. The species were dominated by the highly tolerant family Chironomidae. The overall TMI score for this site was 18, which is below the TDEC guidance threshold for wadeable streams of 32. It is noted that this site is not wadeable.

The North Carolina Biotic Index (NCBI), which measures the mean tolerance value of the overall community was 7.49. The primary reason for the low abundance and high mean tolerance value at EF001 stems from the lake impacts from Percy Priest Lake and lack of suitable habitat for macrobenthos. EF001 is a deep, slow moving section of the river within the embayment, which is not suitable for high-quality macrobenthos, or a large abundance. Two EPT taxa were collected at EF001. A summary of all specimens collected at EF001 during the 2014 event is provided in

Appendix . EF001 was not sampled during the 2015 sample event due to the overwhelming effect of Percy Priest on suitable habitat.

EF002 Benthic Results

During the 2014 sample event, the EF002 macrobenthos sample analysis resulted in the identification of 21 total specimens from 11 different taxa. No particular taxa dominated the identified species. The overall TMI score for this site was 14, which is below the TDEC guidance threshold for wadeable streams of 32. It is noted that this site is not wadeable.

The NCBI of the overall community was 7.20. The primary reason for the low abundance and high mean tolerance value at EF002, like EF001, stems from the lake impacts from Percy Priest Lake and lack of suitable habitat for macrobenthos. EF002 is a deep, slow moving section of the river within the embayment, which is not suitable for high quality macrobenthos, or a large abundance. One EPT taxa was collected at EF002. A summary of all specimens collected at EF002 during the 2014 event is provided in Appendix . EF002 was not sampled during the 2015 sample event due to the overwhelming effect of Percy Priest on suitable habitat.

EF003 Benthic Results

During the 2014 sample event, the EF003 macrobenthos sample analysis resulted in the identification of 171 total specimens from 33 different taxa. The species were dominated by the highly tolerant family Chironomidae. The overall TMI score for this site was 22, which is below the TDEC guidance threshold for wadeable streams of 32. It is noted that this site is not wadeable.

The NCBI of the overall community was 6.75, which is in the tolerant range. This is primarily due to the high abundance of the previously mentioned Chrinomidae family. This can also be attributed to the lack of suitable habitat and low velocity and deep waters over areas of potential habitat. Six EPT taxa were collected at EF003. A summary of all specimens collected at EF003 during the 2014 event is provided in Appendix . EF003 was not sampled during the 2015 sample event due to the overwhelming effect of Percy Priest on suitable habitat.

EF004 Benthic Results

During the 2014 sample event the EF004 macrobenthos sample analysis resulted in the identification of 168 total specimens from 35 different taxa. The species were dominated by the slightly tolerant family Coenagrionidae. The overall TMI score for this site was 26, which is below the TDEC guidance threshold for wadeable streams of 32.

The NCBI of the overall community was 6.48, which is in the tolerant range. This can be attributed to the lack of suitable habitat, such as small cobble and gravel, as well as, aquatic vegetation. The substrate in this region was dominated by bedrock, which is not ideal habitat for

intolerant macrobenthic species. Five EPT taxa were collected at EF004. A summary of all specimens collected at EF004 during the 2014 event is provided in Appendix .

During the 2015 sample event the EF004 macrobenthos sample analysis resulted in the identification of 187 total specimens from 39 different taxa. The species were dominated by the tolerant family Chironomidae. The overall TMI score for this site was 28, which is below the TDEC guidance threshold for wadeable streams of 32.

The NCBI of the overall community was 5.34, which is in the tolerant range. In addition, five EPT taxa were collected during this sampling event. A summary of all specimens collected at EF004 during the 2015 event is provided in Appendix .

EF005 Benthic Results

During the 2014 sample event, the EF005 macrobenthos sample analysis resulted in the identification of 179 total specimens. The specimens represent 20 different taxa and were dominated by the slightly tolerant family, Leptohyphidae. The overall TMI score for this site was 32, which meets the TDEC guidance threshold for wadeable streams set by TDEC.

The NCBI of the overall community was 5.52, which is slightly in the tolerant range. This can be attributed to the presence of the highly tolerant Caenidae and Naididae families collected. The substrate in this region was dominated by bedrock. Seven EPT taxa were collected at EF005. A summary of all specimens collected at EF005 during the July 2014 event is provided in Appendix .

During the 2015 sample event, the EF005 macrobenthos sample analysis resulted in the identification of 220 total specimens. The specimens represent 30 different taxa and were dominated by the tolerant family, Hydropsychidae. The overall TMI score for this site was 36, which is above the threshold of 32, which meets the TDEC guidance threshold set by TDEC.

The NCBI of the overall community was 4.76, which is on the lower end of the tolerant range. In addition, twelve EPT taxa were collected during this sampling event. A summary of all specimens collected at EF005 during the 2015 event is provided in Appendix .

EF006 Benthic Results

During the 2015 sample event, the EF006 macrobenthos sample analysis resulted in the identification of 178 total specimens. The specimens represent 16 different taxa and were dominated by the slightly tolerant family Hydropsychidae. The overall TMI score for this site was 28, which is below the TDEC guidance threshold for wadeable streams of 32.

The NCBI of the overall community was 5.62, which is slightly in the tolerant range. This can be attributed to the presence of the tolerant *Cheumatopsyche* sp. collected. The substrate in

this region was dominated by a thin layer of gravel above solid bedrock. While the gravel provides habitat for macrobenthos, the layer was too thin to create a sufficient layer of suitable niche habitat. Nine EPT taxa were collected at EF006. A summary of all specimens collected at EF005 during the 2015 event is provided in Appendix .

3.1.1.6 Fish Identification

The East Fork was sampled for fish species and diversity in August 2014. There are no specific water quality standards or guidance thresholds developed for fish in Tennessee, although fish are the primary pathway to human health risk and recreational purposes. This survey was conducted to collect data to evaluate the fish population in conjunction with the habitat and macroinvertebrate collections. The overall diversity of each community was calculated using Shannon's Diversity Index, and the evenness of the distribution of those communities was derived from this score. In addition, species which are considered intolerant, or sensitive to pollution, by standards in the *Development and Application of the Kentucky Index of Biotic Integrity* (Kentucky Division of Water, 2003) were counted. A summary of the results for the East Fork is presented in Table 3 - 15.

Table 3 - 15. East Fork Fish Sampling Results

SITE	NUMBER OF FISH	NUMBER OF SPECIES	NUMBER OF INTOLERANT SPECIES	SHANNON'S DIVERSITY INDEX	EVENNESS
EF001	70	9	0	0.371	0.389
EF002	101	14	0	0.806	0.703
EF003	107	15	0	0.968	0.823
EF004	143	19	1	1.07	0.834
EF005	91	14	4	0.869	0.758
EF006	-	-	-	-	-

EF001 Fish Results

A total of 1,000 meters was sampled at EF001. The boat-mounted electrofishing equipment was utilized.

There were a total of 70 fish specimens representing 9 species collected from EF001. Fish collected were identified to the species level and a length measurement was taken. There were no anomalies observed for any fish collected at this site. All data are provided in Appendix .

Little flow was observed within the reach during the time of sampling due to the impact that Percy Priest Lake has on this reach. The source of fish specimens collected from this pool during the sampling event is most likely Percy Priest, which is evident by the lentic favoring species that were collected. The site was dominated by gizzard shad (*Dorosoma cepedianum*). No intolerant species were collected at this site. It displayed a Shannon's Diversity index score of 0.371, and an evenness score of 0.389. An ideal Shannon's Diversity index will measure 1.5-4, and this site is below that ideal level. This is likely attributed to the lack of habitat and slow flowing water.

EF002 Fish Results

A total of 1,000 meters was sampled at EF002. The boat-mounted electrofishing equipment was utilized.

There were a total of 101 fish specimens representing 14 species collected from EF002. Fish collected were identified to the species level and a length measurement was taken. There were no anomalies observed for any fish collected at this site. All data are provided in Appendix .

Little flow was observed within the reach during the time of sampling due to the impact that Percy Priest Lake has on this reach. The source of fish specimens collected from this pool during the sampling event is most likely Percy Priest, which is evident by the lentic favoring species that were collected. The site was dominated by threadfin shad (*Dorosoma petenense*) and gizzard shad. No intolerant species were collected at this site. It displayed a Shannon's Diversity index score of 0.806, and an evenness score of 0.703. An ideal Shannon's Diversity index will measure 1.5-4, and this site is below that ideal level. This is likely attributed to the lack of habitat and slow flowing water, which is similar to EF001.

EF003 Fish Results

A total of 1,000 meters was sampled at EF003. The-boat mounted electrofishing equipment was utilized. This was possible due to the pool and deep run complexes that were downstream and upstream from the sample location.

There were a total of 107 fish specimens representing 15 species collected from EF003. Fish collected were identified to the species level and a length measurement was taken. There were no anomalies observed for any fish collected at this site. All data are provided in Appendix .

This area was a transitional zone between Percy Priest Lake influence and the lotic upper reaches of the river. Although there was flow in the area, available habitat for species was still relatively low. The site was dominated by gizzard shad and bluegill (*Lepomis macrochirus*). No intolerant species were collected at this site. It displayed a Shannon's Diversity index score of

0.968, and an evenness score of 0.823. An ideal Shannon's Diversity index will measure 1.5-4, and this site is below that ideal level. This index score may be attributed to the lack of quality habitat in this reach.

EF004 Fish Results

A total of 1,000 meters was sampled at EF004. The boat-mounted electrofishing equipment was utilized. This was possible due to the river depth allowing for a navigable channel to the sampling location.

There were a total of 143 fish specimens representing 19 species collected from EF004. Fish collected were identified to the species level and a length measurement was taken. There were no anomalies observed for any fish collected at this site. All data are provided in Appendix .

This area was an entirely lotic environment, and more suitable habitat for river species was present. This sample reach yielded the greatest number of specimens collected on the EFSR. The site was dominated by longear sunfish (*Lepomis megalotis*) and bluegill. These two more tolerant species are habitat generalists, and are likely the dominant species due to the lack of high quality habitat in this reach of the river. One intolerant species was collected at this location, the black redhorse. It displayed a Shannon's Diversity index score of 1.07, and an evenness score of 0.834. An ideal Shannon's Diversity index will measure 1.5-4, and this site is below that ideal level. Although this index score is below the ideal range, this location had the highest recorded diversity score on the EFSR.

EF005 Fish Results

A total of 500 meters was sampled at EF005. The backpack electrofishing unit was utilized due to access issues with the boat mounted equipment.

There were a total of 91 fish specimens representing 14 species collected from EF005. Fish collected were identified to the species level and a length measurement was taken. There were no anomalies observed for any fish collected at this site. All data are provided in Appendix .

This area was an entirely lotic environment, and more suitable habitat for river species was present. The site, like EF004, was dominated by longear sunfish and bluegill. Again, these species were likely prevalent due to the lack of high quality habitat in the area. Further, the upstream Walter Hill Dam is a potential factor in the movement of fish species throughout the river. It is likely that fish avoided moving downstream to this area from above the impounded area caused by the previously mentioned dam. Four intolerant species were collected at this location, the brindled madtom, bigeye chub, steelcolor shiner, and Tennessee snubnose darter. It displayed a Shannon's Diversity index score of 0.869, and an evenness score of 0.758. An ideal Shannon's Diversity index will measure 1.5-4, and this site is below that ideal level. This index score may

be attributed to the lack of diverse quality habitat in this reach, as the area was dominated by a shallow run and riffle.

3.1.2 West Fork Stones River

All sample times and locations for the West Fork are presented in Table 3 - 16. All samples were collected at 1 foot below water surface unless otherwise noted. The River flows at the time of the sampling at the specific sample are presented in Table 3 - 17.

Table 3 - 16. Summary of Sample Locations and Times on the West Fork

DATE	TIME, LOCATION IN CHANNEL[1]						
	WF001 WFRM 3.0	WF002 WFRM 6.2	WF003 WFRM 7.6	WF006 WFRM 10.0	WF007 WFRM 10.7	WF004 WFRM 11.4	WF005 WFRM 13.4
6/6/2014	11:15 MID	10:45 MID	9:55 MID	-	-	8:02 MID	8:26 MID
8/12/2014	12:59 MID	13:17 MID	13:49 MID	-	-	14:48 MID	16:35 MID
11/4/2014	15:25 MID	14:55 MID	13:30 MID	-	-	12:05 MID	12:30 MID
1/20/2015	12:45 REW	11:10 REW	11:45 REW	-	-	10:28 LEW	9:48 LEW
7/29/15	-	-	11:36 MID	-	-	12:40 MID	-
8/5/2015	-	14:08 MID	11:39 LEW	12:50 LEW	15:42 MID	-	-
8/7/2015	-	-	-	-	-	10:05 MID	8:35 MID
8/13/2015	-	13:45 MID	13:00 MID	11:50 MID	11:20 MID	10:55 MID	9:20 MID
8/27/2015	-	-	9:14 MID	-	-	9:38 MID	-
9/28/2015	-	-	10:32 MID	-	-	11:17 MID	-

Note: 1. Location in channel references the following:
LEW = Left edge of water when facing downstream
MID = Middle of Channel
REW = Right edge of water when facing downstream

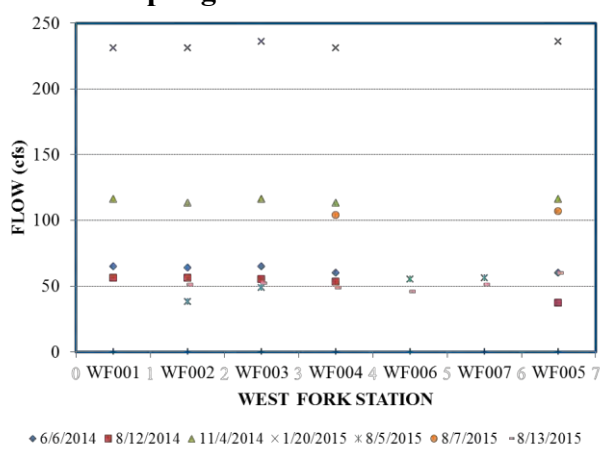
The samples collected in 2015 on 7/29, 8/27, and 9/28 were collected for time series BOD analysis. In situ water quality measurements were not collected from the River. Laboratory analyses were collected from the water obtained as part of the overall BOD sample.

Table 3 - 17. West Fork Stones River Flows During Sampling Events

DATE	FLOW (cfs)						
	WF001 WFRM 3.0	WF002 WFRM 6.2	WF003 WFRM 7.6	WF006 WFRM 10.0	WF007 WFRM 10.7	WF004 WFRM 11.4	WF005 WFRM 13.4
6/6/2014	65	64	65	-	-	60	60
8/12/2014	56	56	55	-	-	53	37
11/4/2014	116	113	116	-	-	113	116
1/20/2015	231	231	236	-	-	231	236
7/29/15	-	-	64	-	-	76	-
8/5/2015	-	38	49	55	56	-	-
8/7/2015	-	-	-	-	-	104	107
8/13/2015	-	51	52	46	51	49	60
8/27/2015	-	-	131	-	-	128	-
9/28/2015	-	-	35	-	-	35	-

The samples covered a range in flow conditions on the West Fork Stones River. The flows are presented in Figure 3 - 6. Samples were collected over a varying level of river conditions while the River could still be considered wadeable.

Figure 3 - 6. Flows in West Fork During Sampling



3.1.2.1 <u>In Situ Water Quality Samples</u>

The results of the dissolved oxygen readings on the West Fork are presented in Figure 3 - 7 and Figure 3 - 8.

Table 3 - 18. West Fork Dissolved Oxygen Measurements

DATE	DO (mg/L and %Saturation)						
	WF001 WFRM 3.0	WF002 WFRM 6.2	WF003 WFRM 7.6	WF006 WFRM 10.0	WF007 WFRM 10.7	WF004 WFRM 11.4	WF005 WFRM 13.4
6/6/2014	10.9 132%	10.4 119%	8.2 94%	-	-	9.2 109%	8.4 99%
8/12/2014	7.5 96%	7.3 93%	6.8 85%	-	-	8.7 111%	8.8 110%
11/4/2014	10.5 103%	13.7 137%	12.1 121%	-	-	11.7 110%	12.4 119%
1/20/2015	12.5 115%	15.4 139%	17.4 155%	-	-	14.7 128%	15 131%
8/5/2015	-	9.1 114%	8.5 104%	9.7 126%	7.9 101%	-	-
8/7/2015	-	-	-	-	-	4.9 58%	5 60%
8/13/2015	-	9.8 118%	8.5 103%	9.4 117%	8 97%	6.2 76%	6.9 83%

The DO met the water-quality standard of 5 mg/L for all measurements collected except one measurement collected upstream from the POTW. That measurement was collected in the morning. However, a measurement at the same location collected 6 days later at about the same time met the instantaneous DO concentration of 5 mg/L specified by TDEC. Because algae supply an important part of the DO in streams and lakes, the diurnal fluctuation that may fall between 4 to 5 mg/L does not negatively impact the stream. In fact, literature suggests DO's in the 4 to 5

Figure 3 - 7. DO in the West Fork

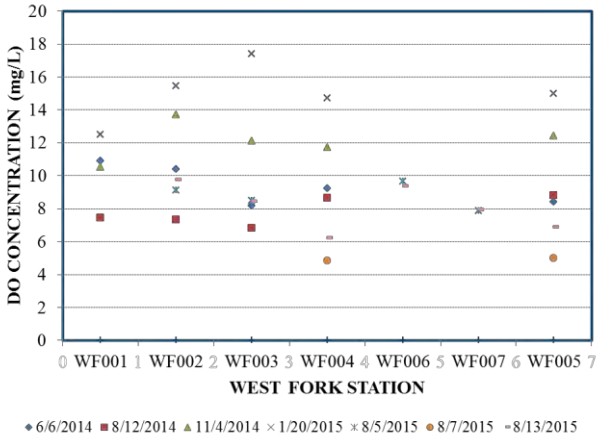
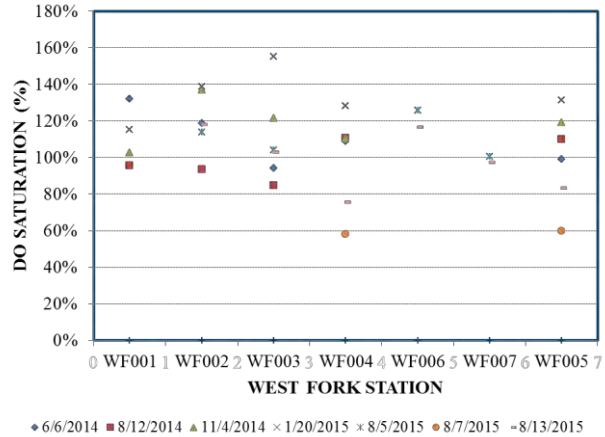


Figure 3 - 8. DO % Saturation in the West Fork



mg/L are not harmful to warmwater fisheries (Doudoroff & Shumway, 1970). The main difference is that a small storm came through on August 5th, which caused a brief spike in the flows. The flows when the measurements were taken on the 7th were somewhat elevated. Six days later, the flows were in the same range as the flows on the 5th before the storm. It appears that, as with the East Fork, this stream is highly affected by storm events.

The water temperatures measured during the study are presented in Table 3 - 19 and shown in Figure 3 - 9. The water temperatures were lower on the morning of August 7th, when the lowest DO measurements were recorded, than on August 5th. However, the water temperatures on the 7th were approximately the same as the temperatures from August 13th. This indicates that temperature was not likely the cause for the drop in the DO on the 5th.

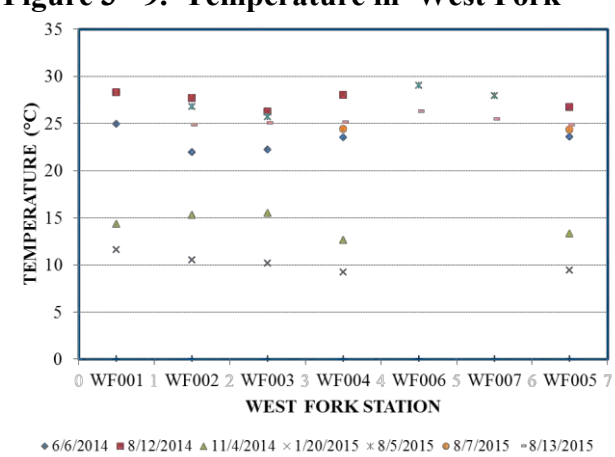
Table 3 - 19. West Fork Temperature Readings

DATE	TEMPERATURE (°C)						
	WF001 WFRM 3.0	WF002 WFRM 6.2	WF003 WFRM 7.6	WF006 WFRM 10.0	WF007 WFRM 10.7	WF004 WFRM 11.4	WF005 WFRM 13.4
6/6/2014	24.92	21.92	22.22	23.5	-	-	23.58
8/12/2014	28.26	27.67	26.22	27.99	-	-	26.72
11/4/2014	14.3	15.3	15.5	12.6	-	-	13.3
1/20/2015	11.6	10.5	10.2	9.2	-	-	9.4
8/5/2015	-	26.78	25.67	-	29.04	27.93	-
8/7/2015	-	-	-	24.4	-	-	24.32
8/13/2015	-	24.86	25.09	25.14	26.31	25.45	24.84

As discussed previously, temperature and algae are the normal cause for natural fluctuations in the DO concentration. As with the East Fork, however, neither the temperature nor the diel cycle are the reason for the lowest measurements collected on the West Fork.

As discussed with the East Fork, higher flows by themselves do not explain a decrease in DO. The two stations where the lower DO was recorded are upstream from the Sinking Creek WWTP. There are no

Figure 3 - 9. Temperature in West Fork



impoundments that affect the water quality of these two stations. It is not known at this time what the cause of the drop in the DO concentration was; however, it is known that the cause was not due to the influence of the WWTP or the temperature. Regardless, the DOs monitored did not represent an impediment to aquatic health and were most likely due to decreased algae productivity during the high flow event that can wash the algal populations out of the reach or cause light transmittance problems with higher sediment loads.

3.1.2.2 Laboratory Chemical Analyses Samples

The laboratory analyzed parameters are provided in the following series of tables. Results for all parameters are provided with the lab reports in Appendix . Silica, TSS, and bicarbonate samples were collected during the first study and are not discussed in this section. No samples were collected in 2015 on August 5th or 7th, so these dates have been removed from the tables.

Ammonia, reported in Table 3 - 20, was collected during the second study as part of the Time-Series BOD tests. The results of the ammonia analyses indicate that there is no clear source of ammonia on the West Fork. The maximum measured concentration was from a duplicate taken at WF002, downstream. However, the other sample taken at that time was almost half the duplicate concentration. This sample was taken during a lower flow period. There was no clear indication of a continuous source of ammonia in the river. Samples collected upstream from the WWTP frequently had greater concentrations.

Table 3 - 20. West Fork Ammonia Concentrations

DATE	AMMONIA – N (mg/L)						
	WF001 WFRM 3.0	WF002 WFRM 6.2	WF003 WFRM 7.6	WF006 WFRM 10.0	WF007 WFRM 10.7	WF004 WFRM 11.4	WF005 WFRM 13.4
6/6/2014	0.16	0.19 0.335 (D)	0.119	-	-	0.133	0.163
8/12/2014	0.124	0.119 <0.05 (D)	<0.05	-	-	<0.05	<0.05
11/4/2014	<0.05	0.126	0.104	-	-	<0.05	0.104 <0.05 (D)
1/20/2015	<0.05	<0.05	<0.05	-	-	<0.05	<0.05 <0.05 (D)
7/29/2015	-	-	0.034	-	-	0.017	-
8/27/2015	-	-	0.014	-	-	<0.01	-
9/28/2015	-	-	0.015	-	-	0.036 0.03 (D)	-

Note: (D) - indicates duplicate sample.

Total Kjeldahl nitrogen (TKN) concentrations are presented in Table 3 - 21. The accuracy of a TKN analyses less than 1 mg/L has been historically poor, with plus or minus 100% given in Standard Methods. So minor variations at these concentrations may or may not reflect real variations in the environment. The TKN measurement is the sum of ammonia and organic nitrogen. Some organic nitrogen has the ability to hydrolyze to ammonia. The percentage of organic nitrogen that can be considered labile, or bioavailable, can be determined with the Time-Series BOD test. With the information from this study, the total amount of bioavailable organic nitrogen can be estimated. However, the accuracy of the TKN test at these low concentrations makes any further analysis qualitative at best. The estimated organic nitrogen concentrations are presented in Table 3 - 22.

Table 3 - 21. West Fork Total Kjeldahl Nitrogen Concentrations

DATE	TOTAL KJELDAHL NITROGEN (mg/L)						
	WF001 WFRM 3.0	WF002 WFRM 6.2	WF003 WFRM 7.6	WF006 WFRM 10.0	WF007 WFRM 10.7	WF004 WFRM 11.4	WF005 WFRM 13.4
6/6/2014	0.73	0.626 0.813 (D)	0.484	-	-	0.653	0.429
8/12/2014	0.617	0.651 0.632 (D)	0.613	-	-	0.764	0.791
11/4/2014	0.317	0.348	0.262	-	-	0.311	0.365 0.294 (D)
1/20/2015	<0.25	<0.25	0.914	-	-	<0.25	<0.25 <0.25 (D)
7/29/2015	-	-	0.36	-	-	<0.1	-
8/13/2015	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5 <0.5 (D)
8/27/2015	-	-	<0.5	-	-	<0.5	-
9/28/2015	-	-	<0.5	-	-	<0.5 <0.5 (D)	-

Note: (D) - indicates duplicate sample.

Table 3 - 22. West Fork Organic Nitrogen Concentrations

DATE	ORGANIC NITROGEN (mg/L)						
	WF001 WFRM 3.0	WF002 WFRM 6.2	WF003 WFRM 7.6	WF006 WFRM 10.0	WF007 WFRM 10.7	WF004 WFRM 11.4	WF005 WFRM 13.4
6/6/2014	0.57	0.436 0.478(D)	0.365	-	-	0.52	0.266
8/12/2014	0.493	0.532 <0.632	<0.613	-	-	<0.764	<0.791
11/4/2014	<0.317	0.222	0.158	-	-	<0.311	<0.365 <0.294 (D)
1/20/2015	<0.25	<0.25	<0.914	-	-	<0.25	<0.25 <0.25 (D)
7/29/2015	-	-	0.326	-	-	<0.083	-
8/13/2015	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5 <0.5 (D)
8/27/2015	-	-	<0.486	-	-	<0.5	-
9/28/2015	-	-	<0.485	-	-	<0.464 <0.5 (D)	-

Note: (D) - indicates duplicate sample.

Nitrite and nitrate concentrations are presented in Table 3 - 23. It is expected that the majority of these results are in the form of nitrate. It is not anticipated that nitrate levels at the concentrations found in the West Fork are harmful to the aquatic life, given that the highest TMI scores on the

Table 3 - 23. West Fork Nitrite and Nitrate Nitrogen Concentrations

DATE	NITRITE + NITRATE - N (mg/L)						
	WF001 WFRM 3.0	WF002 WFRM 6.2	WF003 WFRM 7.6	WF006 WFRM 10.0	WF007 WFRM 10.7	WF004 WFRM 11.4	WF005 WFRM 13.4
6/6/2014	0.211	0.791 0.804 (D)	0.749	-	-	0.351	0.338
8/12/2014	<0.05	<0.05 <0.05 (D)	0.501	-	-	0.48	<0.05
11/4/2014	0.956	1.03	1.51	-	-	0.635	0.633 0.624 (D)
1/20/2015	1.03	1.01	0.837	-	-	0.774	0.782 0.784
7/29/2015	-	-	0.28	-	-	0.13	-
8/13/2015	-	1.4	1.4	2	1.7	0.12	0.1 0.1 (D)
8/27/2015	-	-	0.41	-	-	0.2	-
9/28/2015	-	-	0.45	-	-	0.23 0.11 (D)	-

Note: (D) - indicates duplicate sample.

West Fork were found in the locations with the highest nitrate concentrations. This will be discussed in further detail with the results of the biological investigations.

Orthophosphate as phosphorus (PO_4-P) concentrations are presented in Table 3 - 24. Orthophosphate was detected more regularly in the West Fork than in the East Fork. At times, orthophosphate concentrations were higher upstream from the WWTP. Other times, there appeared to be an increase downstream from the WWTP.

Table 3 - 24. West Fork Orthophosphate as PO_4-P Concentrations

DATE	PO_4-P (mg/L)						
	WF001 WFRM 3.0	**WF002 WFRM 6.2**	**WF003 WFRM 7.6**	**WF006 WFRM 10.0**	**WF007 WFRM 10.7**	**WF004 WFRM 11.4**	**WF005 WFRM 13.4**
6/6/2014[1]	0.136	0.728 0.729 (D)	0.917	-	-	<0.1	<0.1
8/12/2014[1]	<0.1	<0.1 <0.1 (D)	0.627	-	-	0.74	<0.1
11/4/2014[1]	0.149	0.22	<0.1	-	-	<0.1	<0.1 <0.1 (D)
1/20/2015[2]	0.123	<0.1	0.102	-	-	<0.1	<0.1 <0.1 (D)
7/29/2015[2]	-	-	0.46	-	-	<0.1	-
8/13/2015[2]	-	1	1	1.8	1.9	0.073	<0.1 <0.1 (D)
8/27/2015[2]	-	-	0.46	-	-	<0.1	-
9/28/2015[2]	-	-	0.63	-	-	0.079 0.14 (D)	-

Notes: (D) – indicates duplicate sample.
1 – Samples were reported as dissolved orthophosphate
2 – Samples were reported as orthophosphate

Total phosphorus concentrations are presented in Table 3 - 25. There is no clear indication of a continuous source for phosphorus on the West Fork.

Table 3 - 25. West Fork Total Phosphorus Concentrations

DATE	TOTAL PHOSPHORUS (mg/L)						
	WF001 WFRM 3.0	WF002 WFRM 6.2	WF003 WFRM 7.6	WF006 WFRM 10.0	WF007 WFRM 10.7	WF004 WFRM 11.4	WF005 WFRM 13.4
6/6/2014	0.189	*0.728* *0.729 (D)*	*0.917*	-	-	<0.1	<0.1
8/12/2014	<0.1	<0.1 <0.1 (D)	*0.627*	-	-	*0.74*	<0.1
11/4/2014	0.169	*0.22*	<0.1	-	-	<0.1	<0.1 <0.1 (D)
1/20/2015	0.159	0.102	*0.102*	-	-	<0.1	<0.1 <0.1 (D)
7/29/2015	-	-	0.48	-	-	<0.1	-
8/13/2015	-	*1*	1.1	2.1	1.9	*0.073*	<0.1 <0.1 (D)
8/27/2015	-	-	0.51	-	-	<0.1	-
9/28/2015	-	-	*0.63*	-	-	*0.079* *0.14 (D)*	-

Note: (D) - indicates duplicate sample.
Italicized results indicates Total Phosphorus concentration was less than ortho-phosphate-P concentration and is reported as the orthophosphate result. All lab results are provided in Appendix .

3.1.2.3 Algal Identification and Chlorophyll Analysis

There are no applicable standards set for algal species or chlorophyll. The chlorophyll analyses are presented in Table 3 - 26. The algal identification results are provided in Table 3 - 27. All laboratory reports are provided in Appendix . No algal or chlorophyll samples were collected during the 2015 study. Those sample stations have not been included in these tables.

As with the results on the East Fork, there is no correlation between chlorophyll concentrations and the species counts nor with nutrient concentrations. This is identical to what TDEC found when their relationships showed R^2 of less than 0.07 for any relationship with nutrients in Ecoregion 71i. A perfect fit would give a R^2 of 1 and any R^2 of less than 0.5 should not be used.

Table 3 - 26. West Fork Chlorophyll Results

DATE	PIGMENT	CHLOROPHYLL AND PIGMENTS (µg/L)				
		WF001 WFRM 3.0	WF002 WFRM 6.2	WF003 WFRM 7.6	WF004 WFRM 11.4	WF005 WFRM 13.4
6/5/2014	T. Pigment	43.693	4.635	3.131	4.465	9.176
	T. Chl. a	28.895	2.941	1.954	2.833	6.140
	T. Chl. b	4.294	0.306	0.259	0.343	0.821
	T. Chl c	1.231	0.167	0.101	0.124	0.216
	T. Acc.	14.798	1.694	1.177	1.632	3.036
8/12/2014	T. Pigment	11.433	3.519	3.254	1.591	52.201
	T. Chl. a	7.570	2.288	2.077	0.990	34.163
	T. Chl. b	1.069	0.271	0.252	0.165	2.126
	T. Chl c	0.312	0.129	0.089	0.047	1.184
	T. Acc.	3.863	1.231	1.177	0.601	18.038
11/4/2014	T. Pigment	3.746	3.717	1.312	3.292	3.412 3.177 (d)
	T. Chl. a	2.569	2.400	0.898	2.121	2.150 1.993 (d)
	T. Chl. b	0.113	0.112	0.065	0.122	0.113 0.103 (d)
	T. Chl c	0.138	0.192	0.048	0.159	0.181 0.165 (d)
	T. Acc.	1.177	1.317	0.414	1.171	1.262 1.184 (d)
1/20/2015	T. Pigment	1.709	1.880	1.757	1.712	1.862 2.014 (d)
	T. Chl. a	1.032	1.136	1.030	0.996	1.092 1.182 (d)
	T. Chl. b	0.062	0.116	0.060	0.059	0.052 0.056 (d)
	T. Chl c	0.071	0.088	0.104	0.099	0.104 0.119 (d)
	T. Acc.	0.677	0.744	0.727	0.716	0.770 0.832 (d)

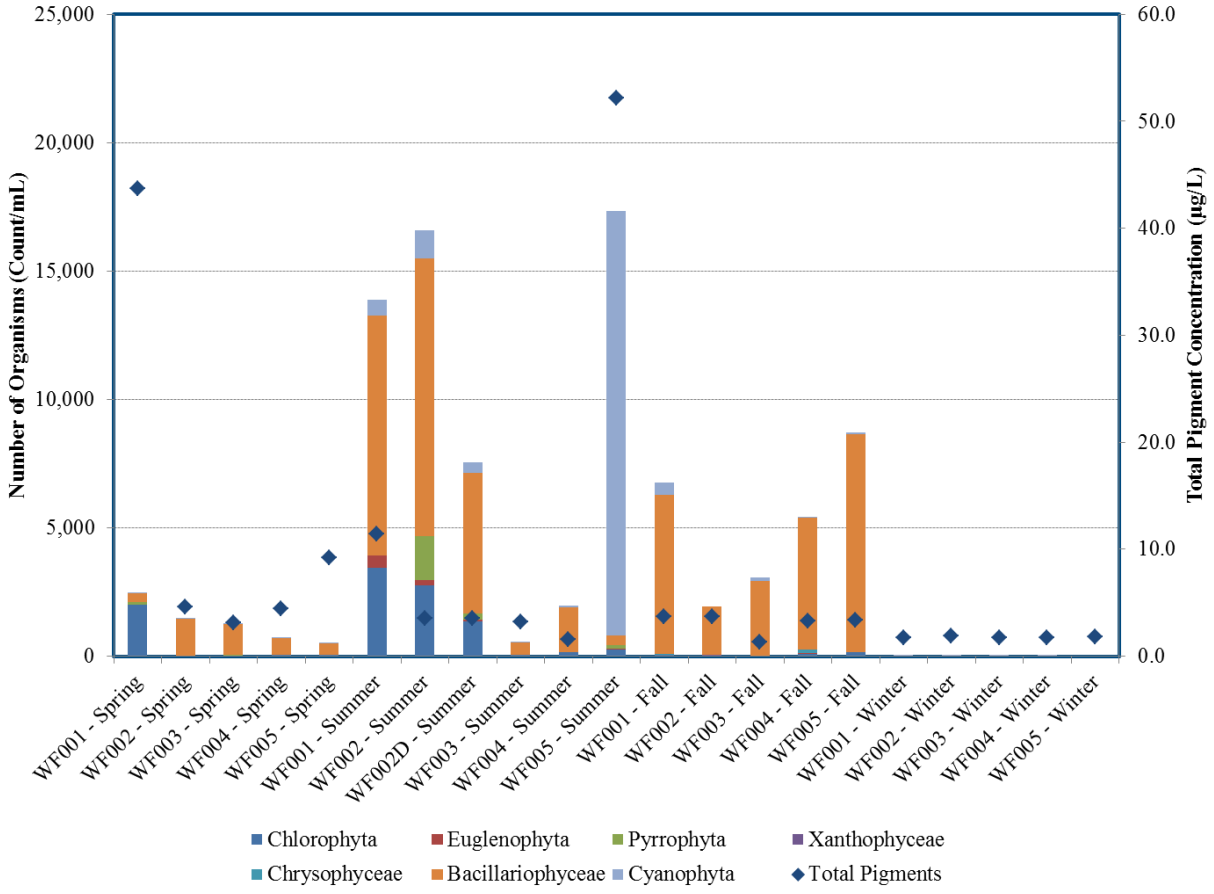
Note (D) – Indicates internal laboratory duplicate
(d) – Indicates duplicate sample collected

Table 3 - 27. West Fork Algal Identification Results

DATE	PARAM.[1]	ALGAL IDENTIFICATION				
		WF001 WFRM 3.0	WF002 WFRM 6.2	WF003 WFRM 7.6	WF004 WFRM 11.4	WF005 WFRM 13.4
6/5/2014	Organisms (#/mL)	2,459	1,452	1,275	704	489
	Taxa	21	19	19	21	17
	Shannon Diversity	3.297	2.378	2.87	2.612	2.575
	Pollution Tolerance	2.39	2.24	2.47	2.30	2.18
	Dominant Phylum[2]	Green	Diatoms	Diatoms	Diatoms	Diatoms
8/12/2014	Organisms	13,882	16,593 7,545 (d)	571	1,960	17,344
	Taxa	19	23 18 (d)	22	12	15
	Shannon Diversity	3.449	3.729 3.445 (d)	3.34	3.224	1.046
	Pollution Tolerance	2.78	2.85 2.66 (d)	2.42	2.82	2.00
	Dominant Taxa	Diatoms	Diatoms Diatoms (d)	Diatoms	Diatoms	Cyanobacteria
11/4/2014	Organisms	6,764	1,950	3,052	5,432	8,710
	Taxa	15	14	14	15	10
	Shannon Diversity	2.749	2.876	2.687	2.113	1.942
	Pollution Tolerance	2.44	2.59	2.39	2.30	2.28
	Dominant Taxa	Diatoms	Diatoms	Diatoms	Diatoms	Diatoms
1/20/2015	Organisms	26.7	33.6	32.2	33.1	33.2
	Taxa	19	16	18	16	14
	Shannon Diversity	3.132	2.848	2.655	2.758	2.788
	Pollution Tolerance	2.59	2.48	2.60	2.49	2.43
	Dominant Taxa	Diatoms	Diatoms	Diatoms	Diatoms	Diatoms

Note 1. Indicates Parameter
2. Dominant phylum ranked by number of organisms.
(d) Field Duplicate

Figure 3 - 10. West Fork Algal Species Counts Versus Chlorophyll and Accessory Pigments



3.1.2.4 Time Series BOD Tests

A summary of the results for all Time-Series BOD tests is provided in Table 3 - 28. In addition, a summary memo of the BOD results was provided to the Murfreesboro Water and Sewer Department in June 2016, which is provided in Appendix 6 . This memo has been modified from the original memo. All laboratory results originally attached are now located in Appendix 3 . The ratio of the ultimate carbonaceous biochemical oxygen demand ($CBOD_u$) and the 5-day BOD (BOD_5) is also provided. Various curves can be derived from the Time-Series BOD tests, which represent the various rates that the food is consumed by the bacterial populations. This is an artifact of the laboratory test. In the natural environment, the bacterial populations will consume the food that is available, so that in the River the materials consumed in the first 5 days in the bottle may be consumed at the same time as the materials consumed over the first 30 days. In keeping with this, a rate developed from a bottle is not valid for use in the river setting. Murfreesboro has previously measured the $CBOD_u$ in the West Fork Stones River, but these measurements were before increased treatment efficiencies were implemented. All sample results are provided in Appendix .

An additional benefit to this test is the ability to determine the amount of both labile and recalcitrant nitrogen and phosphorus that is present in the sample. By tracking the conversion of ammonia and organic nitrogen to nitrate over time, one can determine the amount of nitrogen that could be expected to impact a system. Organic nitrogen that remains after 90 days is recalcitrant and is not expected to impact the system. For this system, the phosphorus concentrations were not large enough to allow for this analysis to take place. The results of this analysis are presented in Table 3 - 29.

Table 3 - 28. 90-Day Time Series BOD Tests

COLLECTION DATE	SAMPLE	LOCATION	TBOD (mg/L)	$CBOD_u$ (mg/L)	F-RATIO	NBOD (mg/L)
July 29, 2015	WFSRDown	WF003	4.4	3.5	2.6	0.9
	WFSREff	WWTP	4.7	3.2	3.4	1.5
	WFSRUP	WF004	4.4	3.9	2.9	0.5
August 27, 2015	WFSRDown	WF003	3.3	2.4	3.0	0.9
	WFSREff	WWTP	7.1	5.3	5.7	1.8
	WFSRUP	WF004	4.0	3.3	2.9	0.7
September 28, 2015	WFSRDown	WF003	5.0	4.3	4.8	0.7
	WFSREff	WWTP	4.4	4.0	6.0	0.5
	WFSRUP	WF004	4.0	3.4	4.2	0.6
	WFSRUP-D	WF004	4.0	3.3	4.1	0.7

Note: (D) Represents a duplicate sample

The results of these tests show that the Sinking Creek WWTP is having little impact on the dissolved oxygen resources on the West Fork due to the level of treatment achieved. These tests were completed over a 90-day period. The station directly downstream at WF003 would not see the full impact of the 90-days exertion. They also demonstrate through the high f-ratio that the effluent $CBOD_u$ is highly recalcitrant and that the river deoxygenation rate should be much lower than what Murfreesboro reported in 1991 (Crane, Vlachos, Leeds, Verner, Corn, & Lane, 1991).

It is noted that the NBOD exerted in the bottle may not be exerted in the same manner in the River. The Time-Series BOD test is conducted without light, so that algal impacts are removed. In the River, the algae will out-compete the nitrifying bacteria for nutrients. With the nutrient-starved conditions in the system, the small addition of nutrients allow the algae to grow and provide a solid foundation for the food chain. While excessive algae are not desirable from an aesthetic condition and from potentially causing DOs to fall below 1 to 2 mg/L during the early morning hours, the absence of nutrients also impacts the stream in a negative manner. Without the nutrients,

the food chain suffers, which can be seen in the lower fisheries population on the East Fork compared to the West Fork. Because both the West Fork and the East Fork have good DO concentrations, the system appears to be in balance to support a healthy aquatic ecosystem.

Table 3 - 29. Labile and Recalcitrant Nitrogen

COLLECTION DATE	SAMPLE	LOCATION	INITIAL ORG. N (mg/L)	FINAL ORG. N (mg/L)	RECALC. ORG. N (%)	LABILE ORG. N (%)
July 29, 2015	WFSRDown	WF003	0.326	0.17	52%	48%
	WFSREff	WWTP	0.972	0.67	69%	31%
	WFSRUP	WF004	*0.093*	0	0%	100%
August 27, 2015	WFSRDown	WF003	0.231	0.05	22%	78%
	WFSREff	WWTP	1.072	0.6	56%	44%
	WFSRUP	WF004	0.222	0.09	41%	59%
September 28, 2015	WFSRDown	WF003	0.218	0.09	41%	59%
	WFSREff	WWTP	1.35	1.3	96%	4%
	WFSRUP	WF004	0.211	0.11	52%	48%
	WFSRUP-D	WF004	0.22	0.09	41%	59%

Note: (D) Represents a duplicate sample
Italicized text represents an estimated concentration.

The United States Army Corps of Engineers (USACE) (1998) has estimated that the J. Percy Priest Reservoir retains water for 176 days. This means that the results of these Time-Series BOD tests would be fully realized within the reservoir. The tests show that it would not be possible to distinguish an area in Percy Priest Lake that is impacted by the WWTP versus the impacts from the existing background conditions.

The amount of labile nitrogen in the system increases slightly downstream from the WWTP, although the percent of nitrogen that is labile, or available for biological uptake, appears to decrease.

3.1.2.5 Habitat Assessment

For this ecoregion, TDEC has established a guidance threshold of 121 out of 200 as a target for a wadeable stream. Scores less than 121 may be considered impaired, while a score of 121 or greater will not be considered impaired for habitat. The most downstream station, WF001, is not a wadeable section of the River and thus this station did not score as well as other stations. However, WF001 scored greater than the TDEC guidance threshold of 121. Regardless, the fishery in Percy Priest Lake is excellent. The habitat scores for the West Fork are provided in Table 3 - 30.

Table 3 - 30. West Fork Habitat Assessment Scores

STATION	HABITAT SCORE	
	7/1/14	8/5/15 or 8/7/15
WF001	128	Not Analyzed
WF002	161	154
WF003	158	161
WF006	Not Analyzed	155
WF007	Not Analyzed	127
WF004	169	147
WF005	170	150

WF001 Habitat Assessment

WF001 was only characterized during the initial biological sampling event. At this location there were no riffles, as the area is heavily influenced by Percy Priest Lake. There were no zones of re-oxygenation and the velocity and depth regime was dominated by deep and slow pool areas. Large woody debris and undercut banks were present within the reach. Primarily due to the habitat availability, this reach was scored at 128, which is greater than the TDEC guidance threshold of 121 for wadeable streams. However, this area of the stream is not wadeable and does not necessarily conform to the standards established for use in the habitat assessment.

WF002 Habitat Assessment

WF002 was characterized during the 2014 and 2015 biological sampling events. This location is downstream from the Nice Mill dam and is a long reach of a deep riffle. Alongside the reach on both banks was emergent aquatic vegetation creating ample habitat for aquatic organisms. In the reach, there was very little sediment deposition and there were three different velocity and depth regimes. Overall, this location was favorable as habitat for aquatic organisms and scored

similarly in 2014 and 2015. The reach was scored at a 161 during 2014 and a 154 during 2015. Both of the scores are greater than the TDEC guidance threshold of 121.

WF003 Habitat Assessment

WF003 was characterized during the 2014 and 2015 biological sampling events. This location was near the confluence with Overall Creek and was accessible through land to the east of the sample location. This reach was dominated by shallow and deep riffles, as well as, a deeper run segment. There was very little sediment deposition in the area and the channel had not been altered in any obvious way. Much like WF002, the two years scored similarly with a 158 in 2014 and a 161 in 2015. Both of these scores are well above the TDEC guidance threshold of 121.

WF006 Habitat Assessment

WF006 was added in 2015 to better represent the lentic areas of the West Fork Stones River. This site was also immediately downstream from the TDEC-determined impaired "2000" segment of the River. This site was primarily a long shallow riffle complex with gravel substrate. In addition, aquatic vegetation was noted on the left bank of the River. There was very little sediment deposition and the depth and velocity regime was slow and deep. There were no alterations to this reach and bank stability was high. For these reasons, WF006 scored at 155, which is greater than the TDEC guidance threshold of 121.

WF007 Habitat Assessment

WF007 was added in 2015 to evaluate the "2000" segment of the West Fork Stone River that is listed on the 303(d) list. This location is immediately downstream from the low-head dam downstream from the Sinking Creek WWTP outfall. Although the TDEC SOP states that sites that are affected by hydraulic modifications like WF007 should not be sampled, this location marks the only riffle habitat within the "2000" segment, which would normally be prime habitat for macroinvertebrates.

The reach is heavily impacted by the dam, which causes a definite scouring effect when flows rise. In addition, the dam redirects flow when water levels are down. There is only one small riffle complex in the reach and the substrate is primarily cobble. Due to the influence of the low head dam, sediment was noted along the banks of the river, as well as on the small island in the reach. The banks, especially the left bank, had signs of erosion. The erosion was, most likely caused by high flows and the effect of the low head dam. Although this reach had many metrics fall into the suboptimal to marginal categories, it still scored at 127 which is greater than the TDEC guidance threshold of 121. It is the only riffle habitat located within the "2000" segment.

WF004 Habitat Assessment

WF004 was characterized during the 2014 and 2015 biological sampling events. This location is upstream from the City of Murfreesboro WWT facility, and is located within a segment of the West Fork that is scheduled to be removed from the 303(d) list. The reach contained all velocity and depth regimes in the 2014 assessment; however, due to a slightly higher flow in 2015, the shallow riffle regime was lost. In addition, it appeared that the right bank in 2015 had been further cleared since 2014, therefore reducing the riparian zone on that side. Overall, this reach was dominated by a deep riffle and cobble substrate with very little sediment deposit. However, due to the slight difference in flows, habitat scores varied greatly. In 2014 the reach scored at 169 and in 2015 the reach scored at 147. While both of these scores are above the TDEC guidance threshold, the difference can be attributed to the water level being higher and some of the vegetation on the right bank being cleared. This shows the variability that can occur at the same site.

WF005 Habitat Assessment

WF005 is a free-flowing lentic portion of the West Fork Stones River located adjacent to the Murfreesboro Greenway Trailhead. The reach was assessed during the 2014 and 2015 biological sampling events. The reach is dominated by a long gravel riffle that, due to a slight increase in flow in 2015, was somewhat changed into a shallow run. However, this did not affect the overall velocity and depth regime. The striking difference between 2014 and 2015 was the scoring on the riparian zone. Although no real change was noted, knowledge of the surrounding land use and the actual vegetative buffer and its width yielded a lower score for this site in 2015. Although both scores were above the TDEC guidance threshold of 121, the 2015 score of 150 was lower than 2014 of 170.

3.1.2.6 Benthic Macroinvertebrates and Identification

Samples collected for macroinvertebrate identification were collected on the East Fork in 2014 and 2015. A summary of the data collected, including the resulting TMI scores, for all stations sampled, are given in Table 3 - 31. The TMI calculations are provided in Appendix . Individual species found at each site are provided in Appendix .

Table 3 - 31. West Fork Benthic Data

PARAMETER	DATE	WF001	WF002	WF003	WF006	WF007	WF004	WF005
Number of Specimens	7/1/14	24	209	237	-	-	168	235
	8/15[1]	-	223	183	233	215	180	222
Number of Taxa	7/1/14	8	21	24	-	-	19	22
	8/15[1]	-	18	24	26	33	23	22
Number of EPT Taxa	7/1/14	1	8	9	-	-	7	7
	8/15[1]	-	8	8	12	9	10	10
NCBI	7/1/14	8.68	4.52	5.10	-	-	4.63	4.81
	8/15[1]	-	4.49	4.82	5.00	5.07	5.49	4.55
TMI	7/1/14	14	40	42	-	-	38	34
	8/15[1]	-	38	40	38	38	32	30

Note: 1: Samples for WF002, WF003, WF006, and WF007 were collected on 8/5/2015. Samples for WF004 and WF005 were collected on 8/7/2015.

WF001 Benthic Results

During the 2014 sample event, the WF001 macrobenthos sample analysis resulted in the identification of 24 total specimens. The specimens represent 8 different taxa and the site was not dominated by a specific taxa. The overall TMI score for this site was 14, which is below the TDEC guidance threshold for wadeable streams of 32. It is noted that this site is not wadeable.

The NCBI, which measures the average tolerance value, of the overall community was 8.68, which is in the tolerant range. This can be attributed to the lack of suitable habitat and flow in the area due to the impact that Percy Priest Lake has on the site. One EPT taxa was collected at WF001. A summary of all specimens collected at WF001 during the July 2014 event is provided in Appendix .

WF002 Benthic Results

During the 2014 sample event, the WF002 macrobenthos sample analysis resulted in the identification of 209 total specimens. The specimens represented 21 different taxa and were dominated by the slightly intolerant-family Heptageniidae. The overall TMI score for this site was 40, which is above the TDEC guidance threshold of 32.

The NCBI of the overall community was 4.52, which is slightly in the intolerant range. This can be attributed to the high velocity and available suitable habitat in the sample location. The substrate in this region was dominated by gravel and cobble. Nine EPT taxa were collected

at WF002. A summary of all specimens collected at WF002 during the July 2014 event is provided in Appendix .

The 2015 WF002 macrobenthos sample analysis resulted in the identification of 223 total specimens. The specimens represented 18 different taxa and were dominated by the slightly intolerant family Hydropsychidae. The overall TMI score for this site was 38, which is above the TDEC guidance threshold of 32.

The NCBI of the overall community was 4.49, which is slightly in the intolerant range. This, like in 2014, can be attributed to the high velocity and available suitable habitat in the sample location. Eight EPT taxa were collected at WF002. A summary of all specimens collected at WF002 during the 2015 event is provided in Appendix .

WF003 Benthic Results

During the 2014 sample event, the WF003 macrobenthos sample analysis resulted in the identification of 237 total specimens. The specimens represented 24 different taxa and were dominated by the slightly intolerant family Leptohyphidae. The overall TMI score for this site was 42, which is above the TDEC guidance threshold of 32.

The NCBI of the overall community was 5.10, which is slightly in the intolerant range. This can be attributed to the high velocity and available suitable habitat in the sample location. The substrate in this region was dominated by large cobble and bedrock. Twelve EPT taxa were collected at WF003. A summary of all specimens collected at WF003 during the July 2014 event is provided in Appendix .

The 2015 WF003 macrobenthos sample analysis resulted in the identification of 183 total specimens. The specimens represented 24 different taxa and were dominated by the slightly intolerant family Hydropsychidae. The overall TMI score for this site was 40, which is above the TDEC guidance threshold of 32.

The NCBI of the overall community was 4.83, which is slightly in the intolerant range. This, like in 2014, can be attributed to the high velocity and available suitable habitat in the sample location. Nine EPT taxa were collected at WF003. A summary of all specimens collected at WF003 during the 2015 event is provided in Appendix .

WF006 Benthic Results

The 2015 WF006 macrobenthos sample analysis resulted in the identification of 233 total specimens. The specimens represented 26 different taxa and were dominated by the slightly tolerant family Elmidae. The overall TMI score for this site was 38, which is above the TDEC guidance threshold of 32.

The NCBI of the overall community was 5.00, which is slightly in the tolerant range. This can be attributed to the riffle complex and the dominant gravel substrate. This substrate, and aquatic vegetation along the left bank, created suitable habitat for many species, especially those species that are considered clingers, which are often intolerant species. Twelve EPT taxa were collected at WF005. A summary of all specimens collected at WF006 during the 2015 event is provided in Appendix .

WF007 Benthic Results

The 2015 WF007 macrobenthos sample analysis resulted in the identification of 215 total specimens. The specimens represented 33 different taxa and were dominated by the slightly tolerant family Elmidae. The overall TMI score for this site was 38, which is above the TDEC guidance threshold of 32.

The NCBI of the overall community was 5.07, which is slightly in the tolerant range. This site is immediately downstream from a low-head dam, and is heavily influenced by this structure. The riffle complex in the reach is very short and dominated by cobble. The macrobenthic community at this sample location had been allowed to establish due to the relatively low flow conditions prior to the sampling event. Nine EPT taxa were collected at WF007. A summary of all specimens collected at WF007 during the 2015 event is provided in Appendix .

WF004 Benthic Results

During the 2014 sample event, the WF004 macrobenthos sample analysis resulted in the identification of 168 total specimens. The specimens represented 19 different taxa and were dominated by the slightly tolerant families Baetidae and Elmidae. The overall TMI score for this site was 38, which is above the TDEC guidance threshold of 32.

The NCBI of the overall community was 4.63, which is slightly in the tolerant range. This can be attributed to the high velocity and available suitable habitat in the sample location. The substrate in this region was dominated by cobble, gravel, and bedrock. There were also several aquatic vegetation stands in the reach. Seven EPT taxa were collected at WF004. A summary of all specimens collected at WF004 during the July 2014 event is provided in Appendix .

The 2015 WF004 macrobenthos sample analysis resulted in the identification of 180 total specimens. The specimens represented 23 different taxa and were dominated by the slightly intolerant family Hydropsychidae. The overall TMI score for this site was 32, which meets the TDEC guidance threshold of 32.

The NCBI of the overall community was 5.49, which is slightly in the tolerant range. Flows were slightly higher during this sample event and may have led to the dispersion of the more intolerant species. Ten EPT taxa were collected at WF004. A summary of all specimens collected at WF004 during the 2015 event is provided in Appendix .

WF005 Benthic Results

During the 2014 sample event, the WF005 macrobenthos sample analysis resulted in the identification of 235 total specimens. The specimens represented 22 different taxa and were dominated by the slightly tolerant family Elmidae. The overall TMI score for this site was 34, which is above the TDEC guidance threshold of 32.

The NCBI of the overall community was 4.81, which is slightly in the tolerant range. This can be attributed to the high velocity and available suitable habitat in the sample location. The substrate in this region was dominated by cobble, gravel, and bedrock. There were also several aquatic vegetation stands in the reach. Seven EPT taxa were collected at WF005. A summary of all specimens collected at WF005 during the July 2014 event is provided in Appendix .

The 2015 WF005 macrobenthos sample analysis resulted in the identification of 222 total specimens. The specimens represent 22 different taxa and were dominated by the slightly tolerant family Chironomidae. The overall TMI score for this site was 30, which is below the TDEC guidance threshold of 32.

The NCBI of the overall community was 4.55, which is slightly in the intolerant range. The lower TMI may be attributed to the slightly higher flows and the inability of the higher quality organisms to adhere to the substrate at this site. While ten EPT taxa were collected at WF005, these families were not collected in high numbers. A summary of all specimens collected at WF005 during the 2015 event is provided in Appendix .

3.1.2.7 Fish Identification

The West Fork was sampled for fish species and diversity in August 2014. There are no specific water quality standards or guidance thresholds developed for fish in Tennessee. This survey was conducted to collect data to evaluate the fish population in conjunction with the habitat and macroinvertebrate collections. A summary of the results for the West Fork is presented in Table 3 - 15. No fish collections have been made for WF006 or WF007. The overall diversity of each community was calculated using Shannon's Diversity Index, and the evenness of the distribution of those communities was derived from this score. In addition, species which are considered intolerant, or sensitive to pollution, by standards in the *Development and Application of the Kentucky Index of Biotic Integrity* (Kentucky Division of Water, 2003) were counted.

Table 3 - 32. West Fork Fish Sampling Results

SITE	NUMBER OF FISH	NUMBER OF SPECIES	NUMBER OF INTOLERANT SPECIES	SHANNON'S DIVERSITY INDEX	EVENNESS
WF001	98	7	0	0.658	0.779
WF002	149	18	4	0.999	0.796
WF003	131	15	6	0.935	0.795
WF004	125	20	5	1.068	0.820
WF005	216	16	4	0.797	0.662

WF001 Fish Results

A total of 1,000 meters was sampled at WF001. The boat-mounted electrofishing equipment was utilized.

There were a total of 98 fish specimens representing 7 species collected from WF001. Fish collected were identified to the species level and a length measurement was taken. There were no anomalies observed for any fish collected at this site. All data are presented in Appendix .

Little flow was observed within the reach during the time of sampling due to the impact that Percy Priest Lake has on this reach. The source of fish specimens collected from this pool during the sampling event is most likely Percy Priest, which is evident by the lentic favoring species that were collected. The site was dominated by threadfin shad and bluegill. No intolerant species were collected at this location. It displayed a Shannon's Diversity index score of 0.658, and an evenness score of 0.779. An ideal Shannon's Diversity index will measure 1.5-4, and this site is below that ideal level. This index score may be attributed to the lack of habitat and flow in this reach, which was impacted by Percy Priest Lake.

WF002 Fish Results

A total of 500 meters was sampled at WF002. The backpack electrofishing unit was utilized at this site.

There were a total of 149 fish specimens representing 18 species collected from WF002. Fish collected were identified to the species level and a length measurement was taken. There were no anomalies observed for any fish collected at this site. All data are presented in Appendix .

This area was an entirely lotic environment, there was suitable habitat for river species present, and there was a long riffle and run complex. The site was dominated by longear sunfish. Four intolerant species were collected at this location: 1) the banded sculpin; 2) redline darter; 3) Tennessee shiner (*Notropis leucoidus*); and 4) Tennessee snubnose darter. It displayed a Shannon's Diversity index score of 0.999, and an evenness score of 0.796. An ideal Shannon's Diversity index will measure 1.5-4, and this site is below that ideal level. This index score may be attributed to the lack of true pools, and the high velocities that run through this riffle area.

WF003 Fish Results

A total of 500 meters was sampled at WF003. The backpack electrofishing unit was utilized at this site.

There were a total of 131 fish specimens representing 15 species collected from WF003. Fish collected were identified to the species level and a length measurement was taken. There were no anomalies observed for any fish collected at this site. All data are presented in Appendix .

This area was an entirely lotic environment, and suitable habitat for river species was present, as well as, a long riffle and run complex. The site was dominated by the greenside darter (*Etheostoma blennoides*). Six intolerant species were collected at this location: 1) the banded sculpin; 2) the redline darter; 3) the striped darter; 4) the, Tennessee shiner (*Notropis leucoidus*); 5) the Tennessee snubnose darter; and 6) and whitetail shiner. It displayed a Shannon's Diversity index score of 0.935, and an evenness score of 0.795. An ideal Shannon's Diversity index will measure 1.5-4, and this site is below that ideal level. This index score may be attributed to the lack of true pools, and the percent of bedrock present, leaving little niche space for fish.

WF004 Fish Results

A total of 500 meters was sampled at WF004. The backpack electrofishing unit was utilized at this site.

There were a total of 125 fish specimens representing 20 species collected from WF004. Fish collected were identified to the species level and a length measurement was taken. There were no anomalies observed for any fish collected at this site. All data are presented in Appendix .

This area was an entirely lotic environment, had suitable habitat for river species, and had multiple riffle and run complexes along with backwater areas. The site was dominated by the greenside darter. Five intolerant species were collected at this location: 1) the redline darter; 2) the striped darter; 3) the Tennessee shiner (*Notropis leucoidus*); 4) the Tennessee snubnose darter; and the whitetail shiner. It displayed a Shannon's Diversity index score of 1.068, and an evenness score of 0.820. An ideal Shannon's Diversity index will measure 1.5-4, and this site is below that

ideal level. Although this site is below the ideal range, it has the highest index score on the WFSR. However, this location did not contain the highest number of intolerant species on the WFSR.

WF005 Fish Results

A total of 500 meters was sampled at WF005. The backpack electrofishing unit was utilized at this site.

There were a total of 216 fish specimens representing 16 species collected from WF005. Fish collected were identified to the species level and a length measurement was taken. There were no anomalies observed for any fish collected at this site. All data are presented in Appendix .

This area was an entirely lotic environment, had suitable habitat for river species present, and had multiple riffle and run complexes along with backwater areas. The site was dominated by the longear sunfish. Four intolerant species were collected at this location; 1) the bigeye chub; 2) the redline darter; 3) the striped darter; and 4) the Tennessee snubnose darter. It displayed a Shannon's Diversity index score of 0.797, and an evenness score of 0.662. An ideal Shannon's Diversity index will measure 1.5-4, and this site is below that ideal level. This index score may be attributed to the majority of the habitat consisting of a riffle, which does not allow for slower moving water species to thrive.

3.1.3 Sinking Creek WWTP

Samples were collected from the WWTP for analysis of the Total BOD. These have been presented previously in Table 3 - 28 with the West Fork Samples. Approximately 50% or more of the organic nitrogen from the WWTP was recalcitrant and would not be expected to convert to ammonia in the river or in Percy Priest Lake.

3.2 DISCUSSION AND COMPARISON

The following section is intended to discuss results in more detail including the differences between the East Fork and West Fork, as well as, any differences between upstream and downstream stations.

3.2.1 Comparison of East Fork Stones and West Fork Stones Rivers

Vast differences between the habitat in the East Fork Stones River and the West Fork Stones River create specialized niche habitat that are present in abundance in the rivers exclusively. Both rivers create unique habitat that is suitable for different aquatic organisms and this was evident through the biological sampling events.

The East Fork Stones River is impacted to a much greater degree by Percy Priest Lake. This creates a slow-moving deep-pool habitat up to River Mile 8 and slightly beyond. The substrate throughout the majority of the East Fork Stones River downstream from Coleman Farm is bedrock, large cobble, and boulders. Riffle frequency in the East Fork is infrequent. In general, the water is deeper and slower moving. Habitat such as this creates excellent sport fisheries. Species such as largemouth bass, spotted bass, catfish species and sucker species often inhabit these areas. Often, as in the East Fork Stones River, this type of habitat produces few numbers of these specimen, but larger specimens. The lack of riffle habitat and swift moving waters diminishes the macroinvertebrate community quality. This leads to a reduction in the overall food supply for the top predator fish. The lack of macrobenthos is thus due to poor habitat due to substrate consisting primarily of rock.

The West Fork Stones River habitat is that of cobble and gravel substrate and various riffles and areas with swift moving water. This flow pattern and distribution of substrate creates ideal habitat for macroinvertebrate communities. Riffles allow for oxygen entrainment into this river, which is essential to these aquatic organisms. In addition, the riffle and run habitats in the West Fork Stones River is required by many of the smaller and intolerant fish species, such as darter species and shiner species. Generally, fish communities are more abundant in rivers with the riffle/run/pool complex structure found in the West Fork Stones River, as was evident in the West Fork fish collection.

3.2.2 Comparison of West Fork Stones River Upstream and Downstream from Sinking Creek WWTP

The main impact of the WWTP is on the steady flow of treated water. During periods of low flow, the water discharged by the WWTP maintains the habitat required by the aquatic species. The treatment level achieved by the WWTP allows a non-toxic water supply for the sensitive species. Upstream from the WWTP, the River is subjected to the natural conditions of the basin, including periods of low flow that limit the amount of available habitat. While the macrobenthic community can respond to changes in habitat, the fish present do not have the same ability to migrate upstream or downstream during a stressful situation such as a drought.

Of the sites sampled, the ***biological metrics were greatest in areas that were influenced by the WWTP.***

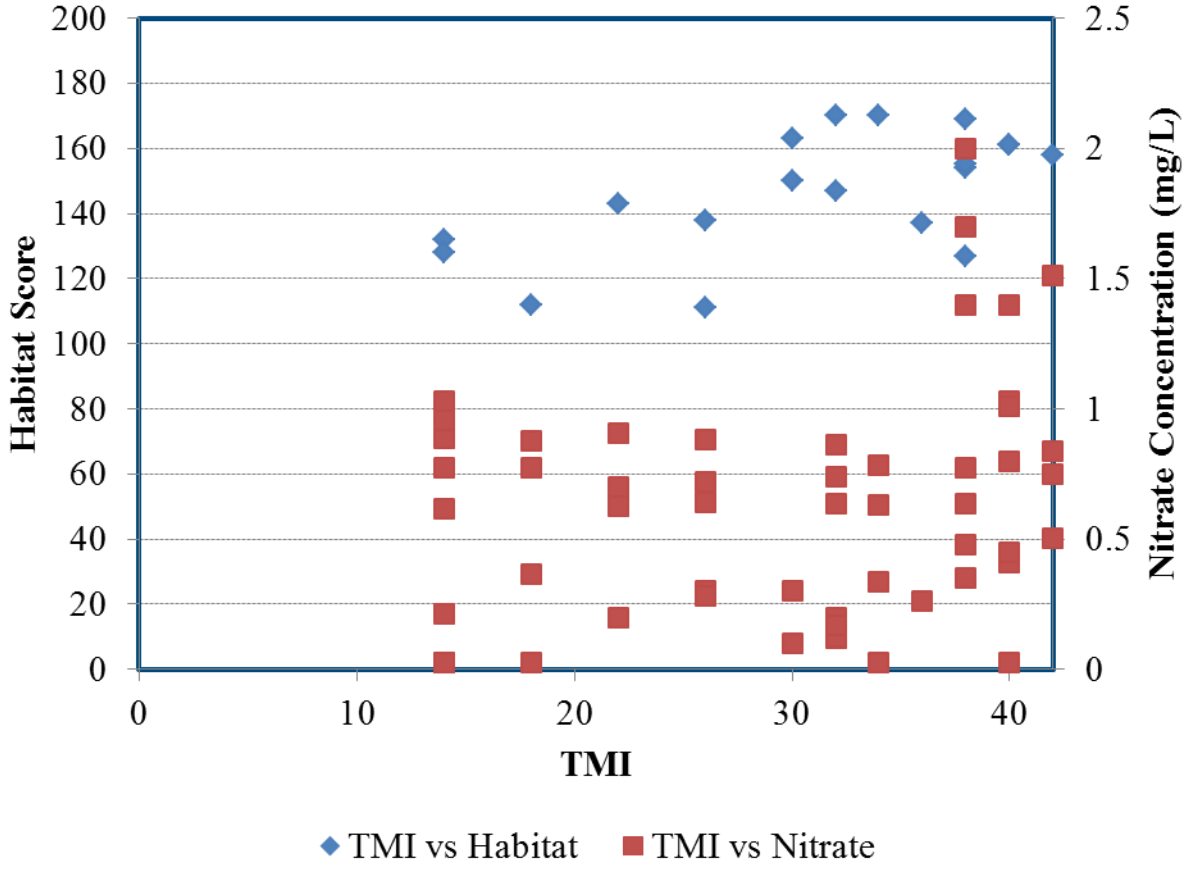
3.2.3 Relationship of Biological Metrics with Water Quality Parameters

The West Fork Stones River segment "2000" is currently listed on the 303(d) list as impaired for nitrates. This impairment was implemented due to what was conceived as a diminished aquatic macroinvertebrate community. However, these data show that there is no correlation between TMI and nitrate levels, and more aptly correlated to habitat assessment scores, as shown in Figure 3 - 11. In fact, many of the sites that were measured to have the highest nitrate

concentrations have the highest calculated TMI scores. As the figure illustrates, TMI scores increase, generally, with the habitat assessment score. Benthic macroinvertebrates thrive in communities with available niche space, suitable vegetative cover, a high ratio of riffle to run complexes and variable habitat types. Many of the intolerant macroinvertebrates occupy various habitat types. As habitat types increase, the potential for intolerant species to reside in the area increases. Thus, a higher TMI score is achieved.

None of the samples showed violations of a nitrate water quality standard, which is based on a drinking water limit. TDEC has developed a guidance threshold for nitrate and for TMI. When a stream does not meet its TMI threshold and the nitrate concentrations are greater than the nitrate guidance threshold, the stream may be placed on the 303(d) list with nitrate being the cause of impairment. However, the data from the West Fork indicate that there is no correlation between nitrate concentrations above the threshold and below with respect to the TMI score. Reviewing the basis document for the nitrate threshold, the r^2 of the correlation between any single nutrient and the TMI was less than 0.063. An r^2 of 1 means a perfect correlation with the hypothesis, and a minimum r^2 of about 0.5 may mean that there is some correlation. An r^2 of 0.063 cannot statistically be justified to form a hypothesis that nitrate has a correlation with the TMI score, so there is no technical basis for using this hypothesis for setting an impairment. The development of the multi-variate analysis presented in the same report is not shown, making it impossible to determine what was done. The report did not present or provide all available data collected as part of the study. Data collected were left out of the analysis without providing an analysis to justify the omissions.

Figure 3 - 11. Nitrate Levels and Habitat Scores Compared to TMI Scores



3.2.4 Long Term Effects

When the potential for increasing loadings from the WWTP was broached during our meeting, one point that was brought up was the potential for long term impacts further downstream. The time-series BOD analysis shows that there is no significant difference in oxygen demand between the WWTP effluent and the West Fork Stones River upstream from the WWTP. They also demonstrated that approximately 50% of the organic nitrogen was recalcitrant and would not be converted into ammonia. Another important point is that a blue-green algae bloom occurred at WF005 in the summer 2014 sampling event when both ammonia and nitrate concentrations at this station were non-detect. Blue-green algae have the ability to utilize atmospheric nitrogen for their nitrogen supply and thus can become the dominant species if we remove all of the nitrogen from the water column. The domination by blue-green algae can potentially be an unhealthy situation for the stream. This also would have a detrimental effect on the oxygen resources in both the two rivers and the lake since algae provide a significant portion of the DO in these two rivers and in the lake. DO is an important parameter for a healthy aquatic ecosystem.

An argument that also came up was about the chlorophyll concentrations in Percy Priest Lake. The data from the West Fork show that where the highest nitrate concentration was found,

the total pigment count was the lowest, while the highest pigment counts occurred when the nitrate concentrations were lowest. Additionally, it is our understanding that TDEC relies on spectrometry for chlorophyll a measurements. This test method gives qualitative results at best and it cannot measure the total chlorophyll and accessory pigments that impact the algal populations in the rivers and lake.

Percy Priest Reservoir was designed from the beginning with the realization that this reservoir would be eutrophic due to the high natural phosphorus levels in the soils in the basin. This is one of the primary reasons the reservoir is considered to be such a good fishing reservoir. The following information is given for Percy Priest Lake:

> "Three species of black bass, striped bass, Cherokee bass and catfish top the wish list here. Crappie and Bluegill provide panfish action. Only 10 miles from Nashville, Priest is considered one of the finest smallmouth lakes in Tennessee. 14,200 acres." (Fishidy)

3.2.5 Discussion of the Qualitative and Quantitative Chlorophyll Analytical Methods

The methods used to measure chlorophyll offer a wide variety of techniques that include both laboratory analyses and *in situ* measurements. The United States Environmental Protection Agency (USEPA) lists three methods: 1) Method 445.0, using fluorescence; 2) Method 446.0, using spectrophotometry; and 3) Method 447.0, using high performance liquid chromatography (HPLC). Since 1978, multiple studies have evaluated the discrepancies of the three different methods (Jacobson & Rai, 1990). The fluorometric and spectrophotometric methods are unable to quantitatively distinguish between chlorophyll a and other porphyrin pigments that are also common in aquatic ecosystems. Although potentially more expensive, HPLC provides a quantitative means to identify and measure the concentrations of the individual chlorophylls and the accessory pigments.

AquAeTer has also previously compared the results from HPLC and spectrophotometric measurements. The comparison is provided in Table 3 - 33. This comparison also shows that the spectrophotometric method does not provide consistent results within the same sample.

Samples were analyzed by the Horn Point Laboratory-University of Maryland Center for Environmental Science (HPL-UMCES). The method of analysis used by the HPL-UMCES has been used by the laboratory since 1999 (Van Heukelem & Thomas, 2001) (Hooker, et al., August 2005).

HPLC is an established technique in the analysis of chlorophyll α and its associated pigments. The HPLC method not only separates compounds in a sample, but also identifies and quantifies the concentrations of the separated compounds.

The use of HPLC methods in marine studies has been promoted by the international Joint Global Ocean Flux Study (JGOFS) program (JGOFS, 1994). HPLC has also been used in applications where accuracy is of high importance. Recently, HPLC has been used as a reference method for calibration and validation activities of chlorophyll α remote sensing measurements (Hooker, et al., August 2005).

Table 3 - 33. Comparison of Chlorophyll a Methods

STUDY	SAMPLE	CHLOROPHYLL a BY HPLC (µg/L)	CHL a AND KNOWN INTERFERENTS BY HPLC[1] (µg/L)	CHLOROPHYLL a BY SPECTROPHOTO-METRIC TRICHROMATIC (µg/L)
I	River 1	1.498	1.828	1.8
	Tributary A	0.465	0.510	2.0
	River 2	2.884	3.146	3.5
	River 3	1.825	2.108	1.4
	River 4	1.490	1.761	2.6
	River 5	6.890	8.040	3.6
	River 6	1.945	2.212	5.5
	Tributary B	0.278	0.419	3.7
	River 7	2.820	3.141	3.7
	Tributary C	2.009	2.432	1.7
	River 8	1.635	1.944	3.4
	River 9	1.994	2.375	5.0
	River 10	2.256	2.553	7.5
	River 11	3.619	4.137	7.3
II	River 2	32.513	33.660	13
	River 3[2]	49.570	52.700	28 43 33 35 38
	River 4	9.285	10.196	7.5

Notes: 1 – Known interferents to the spectrophotometric analysis method include the breakdown products Phaeophytin a, Phaeophytin a prime and Phaeophorbide a pigments.
2 – One sample was split into five for the spectrophotometric analyses.

The Second SeaWiFS HPLC Analysis Round-Robin Experiment (SeaHARRE-2) determined uncertainties in the quantification of individual pigments using HPLC (Hooker, et al.,

August 2005). Field samples for pigment quantification were collected from eutrophic (high supply of nutrients) and mesotrophic (clear water conditions). Among the eight international laboratories that participated in this study, the Horn Point Laboratory at the University of Maryland Center for Environmental Science (UMCES/HPL) developed an HPLC method for use with a variety of water types. The method used by UMCES/HPL demonstrated the ability to obtain quantitative results for up to 25 pigments and qualitative information for additional pigments. The accuracy of the HPLC method used by UMCES/HPL was reported by the percentage in uncertainties: 1) 0.5%-3.8% precision of replicate injections; 2) 3.2% for chlorophyll α calibration reproducibility; and 3) 5.1% for chlorophyll α method precision. The study's (SeaHARRE-2) objectives stated that primary pigments (e.g. total chlorophyll α, b, and c) must be determined with an accuracy of 25% and a precision of 8%.

Based on the reported uncertainties by UMCES/HPL, HPLC proved to be an accurate and precise method for the determination and quantification of pigments in aquatic environments. It is apparent that the alternative measurement methods provide at best a qualitative procedure.

There has been some effort in recent years to quantify good algae levels versus harmful algae levels. These efforts utilize chlorophyll-a as a tracer to represent algae. There are multiple problems with this approach. The main reason is that the ratio of chlorophyll-a to algae is not constant and algae will produce greater numbers under intermittent light situations but less biomass (such as, in estuaries where light transmittance is zero near the bottom but chlorophyll concentrations are equal to near surface concentrations (Jannsen, 2002). There is no set ratio that represents all algae species. There is no set ratio that represents an individual algal species. Algae produce or remove chlorophyll depending upon the environmental conditions as well as based on the age of the individual cell. A secondary problem with the attempt to determine a harmful concentration of chlorophyll is the use of analytical methods that are at best qualitative. As will be discussed below, HPLC is currently the only analytical method available that reliably determines the concentrations of the chlorophyll pigments. Both spectrophotometric and fluorometric procedures have known flaws that have been recognized for more than 40 years. In addition to the research available, AquAeTer also demonstrated the variability that the spectrophotometric method gives.

3.3 RELATIONSHIP OF WEST FORK STONES RIVER TO ECOREGION REFERENCE STREAMS

The reference streams that are listed and are currently in use in the Ecoregion are mostly small tributaries that are being compared to the West Fork Stones River. According to the 305(b) narrative interpretation by TDEC, the target scores should be based on a reference stream that is mostly in the same ecoregion and that is similar in size (order). The reference streams utilized by

TDEC are significantly smaller in regards to drainage basin size or order. The reference stream list is not constant and changes according to the sampling of the small streams chosen.

In comparison, the West Fork Stones River originates in the same type of habitat as the reference streams. Two sites on the West Fork Stones River have historically been considered reference streams by TDEC. However, there is a large discrepancy in the drainage area size between the West Fork reference sites and the West Fork sample locations for this study. The reference sites have a maximum drainage area of approximately 26 mi^2 and the sample locations have a minimum drainage area of approximately 168 mi^2. Additionally, the largest reference stream location has a drainage area of approximately 67 mi^2, or almost 300% lower than the smallest sample location on the West Fork.

Overall, the reference streams used by TDEC to establish the recommended guidelines for surface water quality are not comparable to the locations sampled on the West Fork Stones River for this project. Placing sections of the lower West Fork Stones River on the 303(d) list due to differences with much smaller streams is not in keeping with the guidance documents produced by TDEC personnel.

REFERENCES

Arnwine, D., & Denton, G. (November 2001). *Habitat Quality of Least-Impacted Streams in Tennessee.* Nashville: TDEC, Division of Water Pollution Control.

Barbour, M. T., Gerritsen, J., Snyder, B. D., & Stribling, J. B. (1999). *Rapid Bioassessment Protocols For Use in Streams and Wadeable Rivers: Periphyton, Benthic Macroinvertebrates, and Fish, Second Edition.* United States Environmental Protection Agency, Office of Water, Washington, D.C.

Corn, J., Sielbeck, M., Rogers V, R., Carmean, N., & Corn, M. (November 2015). *Wasteload Allocation Analysis, North Newport River near Riceboro, Georgia.* Brentwood: AquAeTer, Inc.

Crane, C., Vlachos, D., Leeds, L., Verner, S., Corn, M., & Lane, S. (1991). *Assimilative Capacity of the West Fork Stones River.* Brentwood and Nashville: The Advent Group, Inc. and Smith Seckman Reid, Inc.

Denton, G. (2015, July 14). Communication to Darren Gore, Subject: RE: NPDES Permit No. TN0022586 - Data Collected on West and East Fork Stones River 2014-15. Nashville, TN.

Doudoroff, P., & Shumway, D. (1970). *Dissolved Oxygen Requirements of Freshwater Fisheries.* Rome: Food and Agriculture Organization of the United Nations.

Fishidy. (n.d.). Retrieved from http://www.fishidy.com/map/us/tennessee/percy-priest-lake

Hooker, S., Van Heukelem, L., Thomas, C., Claustre, H., Ras, J., Barlow, R., et al. (August 2005). *The Second SeaWiFS HPLC Analysis Round-Robin Experiment.* Greenbelt: NASA, Goddard Space Flight Center.

Jacobson, T., & Rai, H. (1990). Comparison of Spectrophotometric, Fluorometric and High Performance Liquid Chromatography Methods for Determination of Chlorophyll a in Aquatic Samples: Effects of Solvent and Extraction Procedures. *Internationale Revue der gesamten Hydrobiologie und Hydrographie*, 207-217.

Jannsen, M. (2002). *Cultivation of microalgae: effect of light/dark cycles on biomass yield.* Wageningen University. Wageningen: Ponsen & Looijen BV.

JGOFS. (1994). *Protocols for the Joint Global Ocean Flux Study (JGOFS) Core Measurements.* UNESCO.

Kentucky Division of Water. (2003). *Development and Application of the Kentucky Index of Biotic Integrity (KIBI).* Frankfort: Kentucky Department of Environmental Protection, Division of Water.

McMullen, L., & Lytle, D. (2012, December). Quantifying invertebrate resistance to floods: a global-scale meta-analysis. (J. L. Sabo, Ed.) *Ecological Applications, 22*(8), 2164-2175.

Mundahl, N. D., & Hunt, A. M. (2011). Recovery of stream invertebrates after catastrophic flooding in southeastern Minnesota, USA. *Journal of Freshwater Ecology, 26*(4), 445-457.

Scrimgeour, G., Davidson, R., & Davidson, J. (1988). Recovery of benthic macroinvertebrate and epilithic communities following a large flood, in an unstable, braided, New Zealand river. *New Zealand Journal of Marine and Freshwater Research, 22*, 337-344.

TDEC Division of Water Pollution Control. (2011). *Standard Operating Procedure for Macroinvertebrate Stream Surveys.* Nashville: TDEC.

USACE. (1998). *National Inventory of Dams.* Washington, D.C.: USACE, Office of the Chief.

Van Heukelem, L., & Thomas, C. (2001). Computer-assissted high-performance liquid chromatography method development with applications to the isolation and analysis of phytoplankton pigments. *Journal of Chromatography A, 910*, 31-49.

Watershed Protection Branch. (March 2007). *Macroinvertebrate Biological Assessment of Wadeable Streams in Georgia.* Atlanta: Georgia Department of Natural Resources, Environmental Protection Division.

APPENDIX 1

FIELD NOTES

142299 - E+W Fork Stones 5/7/14

Sunny +78.3°F

NTC RWR

Arrive 0940 @ Nice Mill Dam Rec Area

- Packed up canoe w/ equipment
- 0955 - Headed up the W. Fork to Overall Creek
- 1105 - Arrive @ upstream location - Above Overall Creek + Vanderford spring.
- 1120 - Begin velocity measurements
- 1200 - Left US
- 1215 - DS overall Creek
- 1220 - Recon upland area for access.
- 1230 - Start velocity measurements
- 1325 - Leave site DS overall
- 1345 - Arrive DS Spring
- 1350 - Take measurements
- 1435 - Packed up canoe + headed to the launch point
- 1510 - Arrived at vehicle + loaded up. Headed to check access points for future sampling locations.
- 1730 - Arrived at Farm to unload.
- 1755 - Arrived at office

NTC 5/7/14

142299 - W Fork Stones 6/4/14

Cloudy + 86°F

NTC RWR

Arrive 10:20 @ Nice Mill Dam

1035 - Head upstream

1130 - Arrive @ US Spring

1145 - Temp reading + set up tape

1152 - Start flow reading

1235 - Leave US site + head to Vanderford Spring

1240 - Vanderford Spring - H2O temp 18.26°C

1245 - Arrive DS Overall location + prepare to take flow measurements.

1328 - Pack up canoe + head down stream.

1350 - Arrive DS springs

1440 - Leave

1530 - Leave WF Stones

1630 - Arrive Farm + unpack

NTC 6/4/14

Rite in the Rain

142299 E+W Fork Stones 6/5/14
Cloudy + 76°F
NTC RGM
Arrive 0750 + gear-up
0820-Leave for EF004
0850-Arrive EF004
0857-Sample 1 + 0900 Dup.
0912-Leave for EF003
0925-Arrive EF003
0927-Measurements + samples taken
0935-Left EF003
0945-Arrive EF002
0948-Samples taken @ EF002
0955-Leave EF002 for EF001
1015-Arrive EF001
1020-Samples taken
1130-Arrive back @ ramp,
pack up to head to EF005
1220-Arrive EF005
1230-Samples
~~1240 Bain NTC~~
~~1250-Arrive boat ra NTC~~
1300-Packed up + headed to take
boat to shop.
NTC
6/5/14

142299-E+W Fork Stones 6/6/14
Cloudy + 74°F
NTC RGM
Leave office @ 0650
Arrive WF004 @ 750
0802-samples taken
0815-Leave WF 004
0820-Arrive WF005
0826 Samples taken @ WF005
0905-Arrive @ Overall Creek
0910-Walk toward WF003
0955-Sample @ WF003
1005-Leave WF003 for van
1035-Arrive van + head to WF002
1042-Arrive WF002
1047-Sample WF002 + Dup.
Leave 1055.
1110-Arrive WF001
Sample @ 1115.
Leave @ 1125.

Rite in the Rain

142299 E Fork Stones 6/30/14
Partly cloudy + 82°F
NTR ROM JWM CST
Arrived @ 0950 Mona Boat Ramp
Left ramp @ 1010
Arrive site EF004 @ 1042
- 1115 Collect bugs
4 bank sweep → Preserved in 70% ethanol.
- 1130 head to EF003
EF003 Sample taken @ 12:05
1220 Headed to EF002
EF002 Sample collected @ 1245
Headed to boat ramp to wait out weather @ 1300
Left boat ramp after rain @ 1330.
Arrive 1340 @ EF001.
Sample bugs @ 1350. Head back to boat ramp.
Arrive, Pack up + Leave Mona @ 1426 for EF005
1520 Arrive @ EF005
Collect samples @ 1525.
Leave @ 1605.

NTR
6/30/14

142299 W Fork Stones 7/1/14
Cloudy + 82°F
NTR ROM JWM
Arrived @ 0955 @ WF005
Collect bugs @ 1000 2 kicknets
Leave WF005 @ 1030
Arrive WF004 @ 1050
Sample @ 1055
Leave WF004 @ 1120 for ~~EF~~ NTR WF002 + 003
Arrive WF002 @ 1140
Samples taken @ 1145
Leave WF002 @ 1220
Arrive WF003 @ 1316
Samples taken upon arrival
Left WF003 @ 1345
Arrive ramp @ 1425 + leave
Arrive boat ramp for WF001 @ 1500
1541 Arrive WF001 - samples taken

NTR
7/1/14

Rite in the Rain

142299 7/10/14

0800 MBS pick up ~~Bean~~

0835 MBS + RWR at farm

1015 MBS + RWR at put in location for West Fork

Weather: 85°F, Sunny

PPE: PFD, sun block, sun glasses, hats, closed toed shoes

11:10: Arrive at upstream Overall Creek cross section location

98.6 feet wide

Water level is lower than previous trips

1146 end velocity measurement

Spring Vanderford had flow

Overall Creek had little flow

1210 at cross section #2

1243 Complete cross section

Collect Water temp reading

Go upstream to collect water temp reading at cross section 1

1300 Collect Water temp reading at Station 1

1306 - Water temp @ Vanderford = 19.0°C taken above beaver dam @ 12" depth

1313 - Water temp @ Overall = 24.2°C @ 12" depth

- 2 photos @ creek

142299 7/10/14

1330 Wallace Spring temp: 18.4°

~~1330 Arrive at~~ MBS

Wallace Spring had ~~steady~~ moderate flow

1330 Arrive at 3 velocity reading location.

1345 Began velocity reading

1415 complete velocity reading

1424 ~~Couple~~ leave site

* water temp probe not working

1500 - Arrive @ put-in, load equipment to van, head towards office

1615 - Arrive @ farm, unload equipment Miriam returning van.

Richard W. Fosner 7/10/14

Rite in the Rain

142299 WATER QUAL. SAMPLING 8/12/14

Weather: Partly Cloudy / humid /

Personnel: Richard Rogers - Jerrod Manning

Arrival @ EF005 @ ~~0700~~ 0730 Parking

0755 - Arrive @ sample location EF005 on LEW

- Water high, no reading
- Pulled samples
- Photos taken, GPS point taken

0815 ~~0800~~ - Filtered HPLC sample @ von in parking area

0830 - Leaving for Mona Boat Ramp

0900 - ARRIVE MONA BR

0930 - DEPART RAMP FOR EF004

1001 - ARRIVE @ EF004

- Pulled Samples
- GPS points taken

1018 - ARRIVE @ EF003

- PULLED SAMPLES
- GPS POINT TAKEN

1039 - ARRIVE @ EF002

- PULLED SAMPLES
- GPS POINT TAKEN

1108 - ARRIVE @ EF001

- PULLED SAMPLES
- GPS POINT TAKEN

142299 WATER QUAL. SAMPLING 8/12/14

1145 - Arrive @ Boat dock, pull boat

1153 - Filter ~~EF004~~ EF001 for HPLC sample

1157 - Filter EF004 for HPLC sample

1159 - Filter EF003 for HPLC sample

1202 - Filter EF002 for HPLC sample

1255 - Arrive @ WF001

- Pulled Samples
- Took GPS coords "WF001

1314 - Arrive @ WF002 parking

1317 - Pulled Samples WF002 & WF002-D ← 1319 sample time

- Flow = Low to moderate

1448 - Arrive @ WF004 via canoe from dam

- Pull samples "WF004" @ 1448

Water Quality in-situ

Temp = 29.99

pH = 8.26

Cond = 0.639

DO = 8.66 mg/L - 111.2 %

~~Notes~~ Pulled WF003 @ 1349

1604 - running filter pump for WF001

1600 - Arrive @ boat launch for WF005 sample site

1635 - Sampled @ WF005

- Took GPS coords

Rite in the Rain

142299 Water Qual. Sampling 8/12/14

1648 - Back @ boat launch

1657 - Filtering WF005, WF00, WF00 & WF00 For HPLC

1709 - Finish loading canoe & packing van

1730 - Leaving boat launch to office

Richard W. Rogers 8/12/14

142299 Velocity Meas. 8/13/14

Weather: Clear cool morning / 64°

Personnel: RWR SWM

0945 - arrive @ boat launch

- paddle upstream to US overall velocity location

1054 - begin velocity @ US location

1150 - Arrive @ DS overall location

1156 - begin Velocity @ DS OVERALL LOCATION

1250 - Arrive @ "DS Both Springs" location

1255 - begin velocity @ DS Both Springs

- Begin paddling back to launch

1410 - Arrive @ boat launch

Pack equip. in truck

1430 - Leaving boat launch for "lunch"

1530 - Arrive @ Farm, unload canoe & other equipment

1545 - Finished

Richard W. Rogers 8/13/14

Rite in the Rain

142299 Discharge/Velocity 9-9-14

Weather: Cool 70 +/- F in am, Sunny, hot 88°F +/- pm

Personnel: RWR + KSL

0715 - Load canoe & processing equip. RWR
0730 - KSL arrives @ farm
0745 - Stop by office to get rest of equip.
0800 - Leave office for canoe launch
0900 - Arrive @ launch, launch canoe from east side of river @ dam
1000 - arrive a upstream discharge reading location, discuss method & begin
1021 - take first measurement @ upstream location
1105 - leaving upstream velocity reading loc.
1110 - Arrive @ 2nd velocity reading loc "downstream overall"
1208 - leave "downstream overall" reading loc
1217 - arrive @ 3rd velocity reading loc "downstream - both springs"
1257 - last reading @ 3rd reading location
- empty canoe & dump water
- paddle downstream to launch site
1345 - Arrive @ launch site, store gear & load canoe onto truck, begin drive
1355 - stop for fuel & drinks
1445 - Arrive @ farm, unload equip.
1515 - leave farm

Richard W. Fitzgerald 9-9-14

142299 10-2-14

Weather - Cloudy + 23.9°C
Personnel - NTC JWM
0730 - Load equipment @ farm
0745 - Stop by office
0915 - Arrive @ overall Creek + load up equipment.
0955 - Arrive @ US site.
1030 - Last measurement
1033 - Head to DS Overall
1040 - Arrive DS Overall
1048 - First measurement
1105 - Leave DS Overall
1119 - Arrive DS Springs
1122 - First measurement
1140 - Last measurement
1143 - Headed to vehicle
1245 - Left site

NTC
10/2/14

Rite in the Rain

142299 11/4/14

NR JWM

Sunny + 55°F

0700: Calibrate probes @ office

0730: Arrive Farm + get equipment

800: Leave for Mona Boat Ramp

0850: Arrive Mona

0905 - Head to EF001

0920 - EF001 collected.

0930 - Leave EF001

0935 - Collect EF002

0945 - Leave EF002

1005 - EF003 Collected.

1010 - Leave EF003

1020 - Collect EF004

1030 - Leave EF004 for ramp

1040 - Leave Mona for EF005

1110 - Arrive EF005 parking

1130 - EF005 Collected

1145 - Leave EF005

1205 - Collect WF004

1225 - Leave WF004

1230 - Collect WF005

1300 - Arrive Overall Creek for hike

1330 - Arrive WF003 + sample

1430 - Leave site

1455 - Collect WF002

1510 - Leave for WF001

1525 - Collect WF001

1540 - Leave W. Fork Rec area.

NR

11/4/14

Rite in the Rain

June 29, 2015
Stones River DO Sampling NJ, ROS

Calibration of II @ 0714
DO: 100.5 % 8.42 mg DO: 100.0 % 8.52 mg
Temp: 23.10°C Temp: 23.38°C
Calibration of I @ 0716
DO: 99.9 8.37 mg DO: 100.0 % 8.37 mg
Temp 24.25 Temp: 24.32°C

152384 -
Sunny + 90°F
Arrive @ Jordan property @ 0825
Arrive @ Blanton Rd Bridge @ 0855
Survey stream area downstream from bridge
0915 - Speak w/ Josh LeMay - M'boro PTOW. Showed us access to current outfall
0925 - Enter W. Fork Stones + head downstream
- Low water dam just DS from outfall - Not ideal for macrobenthos.
1136 - Take WFSR Down - 07 sample
1140 - Exit WFSR on Jordan Property

1210-Arrive @ Treatment facility
1219- Take WFSR EFF-07 sample
1225- Arrive outside gate and set up for samples.
1228-Turn on DO meter II
1237 - WFSR Down-07
1240- Collect WFSRUP-07 sample
1258- Collection of WFSREFF-07 sample bottles + glass carboy
1317 - Collection of WFSRUP-07 samples bottles and glass carboy
1340 - AAT offsite

7/29/15

152384 8/5/15
Stones River Macroinvertebrate
NJL ROS CST
SmartTROLL Calibration
0628
RDO - 98.7% 8.15 mg/L 23.9°C
100.0% 8.26 mg/L 23.9°C

pH 7 7.98 S.U 23.9°C
7.00 S.U. 23.9°C
pH 10 10.79 S.U. 23.9°C
10.00 S.U. 23.9°C
pH 4 4.98 S.U 23.8°C
4.03 S.U. 23.8°C
Cond 1409 - 1384 µS/cm 23.6°C
1413 µS/cm 23.6°C
0747 - Arrived @ EF004
0816 - EF004 collection time. 4 vegetative stalks
0850 - Arrived @ EF005
1031 - Arrive @ EF006
1130 - Arrive @ WF003
1250 - Arrive @ WF006
1380 Lunch
1405 - Arrive WF002
1542 - Arrive WF007
1640 - Leave facility due to storms

Rite in the Rain

-Arrive AAT Offices
- Post-Validate SmartROLL
- 99.3% 8.14 mg/L 24.18°C
7 - 7.47 S.U. 25.17°C
0 - 10.16 S.U. 24.77°C
4 - 4.45 S.U. 24.36°C
409 - 1422.8 24.61°C

8/5/15

152384 8/7/15
Stones River Macro pt II
NTR ROS CST
SmartROLL Calibration
0725
DO - 99.9% 8.34 mg/L 23.08°C
~~pH 7~~ 100.0% 8.30 mg/L 23.08°C
pH ~~10~~ 7 - 7.85 S.U. 23.44°C
7.01 S.U. 23.44°C
pH 10 - 10.91 S.U 22.5°C
10.04 S.U. 22.5°C
pH 4 - 4.91 S.U 22.4°C
4.01 S.U. 22.4°C
Cond 1409 - 1394 µS/cm 22.8°C
1413 µS/cm 22.8°C
0745 Leave AAT
0830 Arrive Murfreesboro Greenway + WF005
1000 - Arrive @ WF004
1050 - Leave and hiked to WF007
- WF007 elevated flow.
- Looked at rocks in stream
- No EPT present.
1100 - Leave for EF005 to observe flow
1115 - Flow Elevated, still no riffle in area.
1135 - Leave for AAT

Rite in the Rain

-Arrive AAT. & Unload.
Post validation SmartTroll
DO - 100.9% 8.35 mg/L 23.55°C
pH 7 - 7.22 22.88°C
RS ~~pH 10~~ - 4.62 es 23.23°C
RS ~~pH 4~~ 9.95 23.26°C
3 ~~Cond 1409~~ 1391.5 22.92°C

Post 8/7/15

152384 8/13/15
Stones River WQ
NTC ROS
SmartTROLL Calibration
0705
RDO 98.2% 8.27 mg/L 23.1°C
100.1% 8.42 mg/L 23.1°C
pH 7 - 7.25 S.U. 23.2°C
7.21 S.U. 23.2°C
pH 10 - 10.92 S.U. 22.9°C
10.00 S.U. 22.9°C
pH 4 - 4.84 S.U. 22.8°C
4.01 S.U. 22.8°C
Cond 1413 - 1377 uS/cm 22.7°C
1413 uS/cm 22.7°C
0735 - Leave AAT for Nice Mill Dam
0930 - Arrive @ City of Murf. Greenway
unload kayaks + gear.
Sample WF005 + Dup.
1055 - Arrive WF004 + Sample
1120 Arrive WF001 + sample
1150 Arrive WF006 + sample
1300 Arrive WF003 + Sample
1345 Arrive WF002 + Sample
1508 Arrive EF005 + Sample
1528 Arrive EF006 + Sample

Rite in the Rain

1600-Arrive EF004 + sample
1732- Pre Val SmarTROLL
DO - 97.0% 7.21 mg/L 29.84°C
pH 7- 7.13 S.U. 25.04°C
pH 10 - 9.94 S.U. 22.91°C
pH 4 - 4.31 S.U. 23.13°C
Cond 1413 - 1401.7 22.82°C

8/13/15

152384 8/27/15
Stones River BOD 70°F
NJC CST
YSI 5100 - Probe I Cal
0735 - 100.9% 9.25 mg/L 22.67°C
100.0% 8.62 mg/L 22.74°C
0745 Load up van - head to Murfreesboro
0905 - Arrive WFSR Down-08
0914 - Collect WFSR Down-08
0923 - Arrive @ Blanton Rd bridge for WFSR UP-08.
0938 - Collect WFSR UP-08
0940 - Got in touch w/ Josh LeMay, send Josh Smith to meet us @ sample port for WFSR EFF-08
0950 - Collection of WFSR EFF-08 start
1000 - Collection of WFSR EFF-08 Finish
1005 - Head to set up BOD samples
1016 - DO meter on
1025 - WFSR Down-08 sampled
1133 - WFSR UP-08 sampled
1157 - WFSR EFF-08 Sampled

NJC
8/27/15

Rite in the Rain

152384 9/28/15
JWM NJC
Cloudy & 68°F

YSI 5100 II + ~~3~~ III
Calibrate - 0730
0750 - Leave AAT office
0838 - Arrive WFSR Down-09
0845 - Sampled WFSR Down-09
0910 - Arrive Murfreesboro WWTP.
0923 - Sample collected.
0928 - Arrive WFSR Up-09
0934 - Collect WFSR UP-09
1032 - WFSR Down-09 set up + sample
1047 - WFSR EFF-09 set up + sample
1117 - WFSR UP09 - set up + sample
1126 - WFSR UP-09-Dup - Set up + sample

9/28/15

APPENDIX 2

LABORATORY REPORTS

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Tel: (615)726-0177

TestAmerica Job ID: 490-59263-1
Client Project/Site: Stones River

For:
Aquaeter Inc
215 Jamestown Park
Suite 204
Brentwood, Tennessee 37027

Attn: Nick Carmean

Heather Baker

Authorized for release by:
8/29/2014 11:25:48 AM

Heather Baker, Project Manager I
(615)301-5043
heather.baker@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Sample Summary

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-59263-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-59263-1	EF005	Water	08/12/14 07:56	08/13/14 11:06
490-59263-2	EF004	Water	08/12/14 10:01	08/13/14 11:06
490-59263-3	EF003	Water	08/12/14 10:18	08/13/14 11:06
490-59263-4	EF002	Water	08/12/14 10:39	08/13/14 11:06
490-59263-5	EF001	Water	08/12/14 11:08	08/13/14 11:06
490-59263-6	WF001	Water	08/12/14 12:55	08/13/14 11:06
490-59263-7	WF002	Water	08/12/14 13:17	08/13/14 11:06
490-59263-8	WF002-D	Water	08/12/14 13:19	08/13/14 11:06
490-59263-9	WF003	Water	08/12/14 13:49	08/13/14 11:06
490-59263-10	WF004	Water	08/12/14 14:48	08/13/14 11:06
490-59263-11	WF005	Water	08/12/14 16:35	08/13/14 11:06

Case Narrative

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-59263-1

Job ID: 490-59263-1

Laboratory: TestAmerica Nashville

Narrative

Job Narrative
490-59263-1

Comments
No additional comments.

Receipt
The samples were received on 8/13/2014 11:06 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 2.3º C, 2.9º C and 3.0º C.

General Chemistry
Method(s) 351.2: The matrix spike (MS) recovery for batch 186263 was outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method(s) 353.2: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for batch 183524 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method(s) 365.4: The matrix spike duplicate (MSD) recovery for batch 186217 was outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Definitions/Glossary

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-59263-1

Qualifiers

General Chemistry

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery exceeds the control limits

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-59263-1

Client Sample ID: EF005

Lab Sample ID: 490-59263-1

Date Collected: 08/12/14 07:56

Matrix: Water

Date Received: 08/13/14 11:06

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	0.262		0.100		mg/L		08/25/14 12:21	08/25/14 15:57	1
Kjeldahl Nitrogen as N	0.703		0.250		mg/L		08/22/14 09:55	08/25/14 08:28	1
Nitrate Nitrite as N	0.634		0.100		mg/L			08/13/14 14:18	1
Phosphorus, Total	0.180		0.100		mg/L		08/22/14 09:55	08/25/14 12:51	1
Bicarbonate Alkalinity	131		10.0		mg/L			08/13/14 16:04	1
Total Suspended Solids	34.8		1.33		mg/L			08/14/14 14:09	1
Orthophosphate as P, Dissolved	0.162		0.100		mg/L			08/14/14 11:58	1
Silica	6.06		1.00		mg/L			08/22/14 12:19	1

Client Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-59263-1

Client Sample ID: EF004

Lab Sample ID: 490-59263-2

Date Collected: 08/12/14 10:01
Date Received: 08/13/14 11:06

Matrix: Water

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	ND		0.100		mg/L		08/25/14 12:21	08/25/14 15:57	1
Kjeldahl Nitrogen as N	**0.655**		0.250		mg/L		08/22/14 09:55	08/25/14 08:32	1
Nitrate Nitrite as N	**0.625**		0.100		mg/L			08/13/14 14:24	1
Phosphorus, Total	**0.161**		0.100		mg/L		08/22/14 09:55	08/25/14 12:52	1
Bicarbonate Alkalinity	**133**		10.0		mg/L			08/13/14 16:10	1
Total Suspended Solids	**31.8**		2.00		mg/L			08/14/14 14:09	1
Orthophosphate as P, Dissolved	**0.161**		0.100		mg/L			08/14/14 11:58	1
Silica	**5.81**		1.00		mg/L			08/22/14 12:19	1

Client Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-59263-1

Client Sample ID: EF003

Lab Sample ID: 490-59263-3

Date Collected: 08/12/14 10:18

Matrix: Water

Date Received: 08/13/14 11:06

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	0.155		0.100		mg/L		08/25/14 12:21	08/25/14 15:58	1
Kjeldahl Nitrogen as N	0.623		0.250		mg/L		08/22/14 09:55	08/25/14 08:33	1
Nitrate Nitrite as N	0.641		0.100		mg/L			08/13/14 14:26	1
Phosphorus, Total	0.136		0.100		mg/L		08/22/14 09:55	08/25/14 12:53	1
Bicarbonate Alkalinity	131		10.0		mg/L			08/13/14 16:16	1
Total Suspended Solids	33.2		2.00		mg/L			08/14/14 14:09	1
Orthophosphate as P, Dissolved	0.165		0.100		mg/L			08/14/14 11:58	1
Silica	5.81		1.00		mg/L			08/22/14 12:19	1

Client Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-59263-1

Client Sample ID: EF002

Lab Sample ID: 490-59263-4

Date Collected: 08/12/14 10:39

Matrix: Water

Date Received: 08/13/14 11:06

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	**0.130**		0.100		mg/L		08/25/14 12:21	08/25/14 16:00	1
Kjeldahl Nitrogen as N	**0.622**		0.250		mg/L		08/22/14 09:55	08/25/14 08:34	1
Nitrate Nitrite as N	**0.615**		0.100		mg/L			08/13/14 14:27	1
Phosphorus, Total	ND		0.100		mg/L		08/22/14 09:55	08/25/14 12:55	1
Bicarbonate Alkalinity	**138**		10.0		mg/L			08/13/14 14:59	1
Total Suspended Solids	**16.7**		1.33		mg/L			08/14/14 14:09	1
Orthophosphate as P, Dissolved	**0.129**		0.100		mg/L			08/14/14 11:58	1
Silica	**5.57**		1.00		mg/L			08/22/14 12:19	1

Client Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-59263-1

Client Sample ID: EF001

Lab Sample ID: 490-59263-5

Date Collected: 08/12/14 11:08
Matrix: Water
Date Received: 08/13/14 11:06

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	ND		0.100		mg/L		08/25/14 12:21	08/25/14 16:01	1
Kjeldahl Nitrogen as N	**0.638**		0.250		mg/L		08/22/14 09:55	08/25/14 08:35	1
Nitrate Nitrite as N	**0.363**		0.100		mg/L			08/13/14 14:28	1
Phosphorus, Total	ND		0.100		mg/L		08/22/14 09:55	08/25/14 12:56	1
Bicarbonate Alkalinity	**133**		10.0		mg/L			08/13/14 15:05	1
Total Suspended Solids	**13.7**		1.33		mg/L			08/14/14 14:09	1
Orthophosphate as P, Dissolved	ND		0.100		mg/L			08/14/14 11:58	1
Silica	**4.84**		1.00		mg/L			08/22/14 12:19	1

Client Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-59263-1

Client Sample ID: WF001

Lab Sample ID: 490-59263-6

Date Collected: 08/12/14 12:55

Matrix: Water

Date Received: 08/13/14 11:06

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	**0.124**		0.100		mg/L		08/25/14 12:21	08/25/14 16:02	1
Kjeldahl Nitrogen as N	**0.617**		0.250		mg/L		08/22/14 09:55	08/25/14 08:39	1
Nitrate Nitrite as N	ND		0.100		mg/L			08/13/14 14:29	1
Phosphorus, Total	ND		0.100		mg/L		08/22/14 09:55	08/25/14 12:57	1
Bicarbonate Alkalinity	**159**		10.0		mg/L			08/13/14 15:11	1
Total Suspended Solids	**6.50**		1.00		mg/L			08/14/14 14:09	1
Orthophosphate as P, Dissolved	ND		0.100		mg/L			08/14/14 11:58	1
Silica	**6.15**		1.00		mg/L			08/22/14 12:19	1

Client Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-59263-1

Client Sample ID: WF002

Lab Sample ID: 490-59263-7

Date Collected: 08/12/14 13:17

Matrix: Water

Date Received: 08/13/14 11:06

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	**0.119**		0.100		mg/L		08/25/14 12:21	08/25/14 16:03	1
Kjeldahl Nitrogen as N	**0.651**		0.250		mg/L		08/22/14 09:55	08/25/14 08:40	1
Nitrate Nitrite as N	ND		0.100		mg/L			08/13/14 14:30	1
Phosphorus, Total	ND		0.100		mg/L		08/22/14 09:55	08/25/14 12:58	1
Bicarbonate Alkalinity	**158**		10.0		mg/L			08/13/14 15:17	1
Total Suspended Solids	**2.00**		1.00		mg/L			08/14/14 14:09	1
Orthophosphate as P, Dissolved	ND		0.100		mg/L			08/14/14 11:58	1
Silica	**6.20**		1.00		mg/L			08/22/14 12:23	1

Client Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-59263-1

Client Sample ID: WF002-D

Lab Sample ID: 490-59263-8

Date Collected: 08/12/14 13:19

Matrix: Water

Date Received: 08/13/14 11:06

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	ND		0.100		mg/L		08/25/14 12:21	08/25/14 16:03	1
Kjeldahl Nitrogen as N	**0.632**		0.250		mg/L		08/22/14 09:55	08/25/14 08:41	1
Nitrate Nitrite as N	ND		0.100		mg/L			08/13/14 14:31	1
Phosphorus, Total	ND		0.100		mg/L		08/22/14 09:55	08/25/14 12:59	1
Bicarbonate Alkalinity	**158**		10.0		mg/L			08/13/14 15:23	1
Total Suspended Solids	**2.30**		1.00		mg/L			08/14/14 14:09	1
Orthophosphate as P, Dissolved	ND		0.100		mg/L			08/14/14 11:58	1
Silica	**5.61**		1.00		mg/L			08/22/14 12:52	1

Client Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-59263-1

Client Sample ID: WF003

Lab Sample ID: 490-59263-9

Date Collected: 08/12/14 13:49

Matrix: Water

Date Received: 08/13/14 11:06

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	ND		0.100		mg/L		08/25/14 12:21	08/25/14 16:04	1
Kjeldahl Nitrogen as N	**0.613**		0.250		mg/L		08/22/14 09:55	08/25/14 08:42	1
Nitrate Nitrite as N	**0.501**		0.100		mg/L			08/13/14 14:32	1
Phosphorus, Total	**0.512**		0.100		mg/L		08/22/14 09:55	08/25/14 13:02	1
Bicarbonate Alkalinity	**205**		10.0		mg/L			08/13/14 15:28	1
Total Suspended Solids	**12.4**		1.00		mg/L			08/14/14 14:09	1
Orthophosphate as P, Dissolved	**0.627**		0.100		mg/L			08/14/14 11:58	1
Silica	**6.36**		1.00		mg/L			08/22/14 12:52	1

Client Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-59263-1

Client Sample ID: WF004

Date Collected: 08/12/14 14:48
Date Received: 08/13/14 11:06

Lab Sample ID: 490-59263-10

Matrix: Water

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	ND		0.100		mg/L		08/25/14 12:21	08/25/14 16:05	1
Kjeldahl Nitrogen as N	**0.764**		0.250		mg/L		08/22/14 09:55	08/25/14 08:44	1
Nitrate Nitrite as N	**0.480**		0.100		mg/L			08/13/14 14:33	1
Phosphorus, Total	**0.589**		0.100		mg/L		08/22/14 09:55	08/25/14 13:04	1
Bicarbonate Alkalinity	**204**		10.0		mg/L			08/13/14 15:46	1
Total Suspended Solids	**4.60**		1.00		mg/L			08/14/14 14:09	1
Orthophosphate as P, Dissolved	**0.740**		0.100		mg/L			08/14/14 12:00	1
Silica	**6.47**		1.00		mg/L			08/22/14 12:52	1

Client Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-59263-1

Client Sample ID: WF005

Lab Sample ID: 490-59263-11

Date Collected: 08/12/14 16:35

Matrix: Water

Date Received: 08/13/14 11:06

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	ND		0.100		mg/L		08/25/14 12:21	08/25/14 16:06	1
Kjeldahl Nitrogen as N	**0.791**		0.250		mg/L		08/22/14 09:55	08/25/14 08:45	1
Nitrate Nitrite as N	ND		0.100		mg/L			08/13/14 14:34	1
Phosphorus, Total	ND		0.100		mg/L		08/22/14 09:55	08/25/14 13:05	1
Bicarbonate Alkalinity	**84.6**		10.0		mg/L			08/13/14 15:52	1
Total Suspended Solids	**9.57**		1.43		mg/L			08/14/14 14:09	1
Orthophosphate as P, Dissolved	ND		0.100		mg/L			08/14/14 12:19	1
Silica	**2.66**		1.00		mg/L			08/22/14 12:52	1

QC Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-59263-1

Method: 350.1 - Nitrogen, Ammonia

Lab Sample ID: MB 490-186177/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 186274 — **Prep Batch: 186177**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	ND		0.100		mg/L		08/25/14 12:21	08/25/14 15:52	1

Lab Sample ID: LCS 490-186177/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 186274 — **Prep Batch: 186177**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia (as N)	5.00	5.034		mg/L		101	90 - 110

Lab Sample ID: 490-59188-A-4-C MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 186274 — **Prep Batch: 186177**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia (as N)	1.50		5.00	6.140		mg/L		93	90 - 110

Lab Sample ID: 490-59263-11 MS — **Client Sample ID: WF005**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 186274 — **Prep Batch: 186177**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia (as N)	ND		5.00	4.705		mg/L		93	90 - 110

Method: 351.2 - Nitrogen, Total Kjeldahl

Lab Sample ID: MB 490-185677/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 186263 — **Prep Batch: 185677**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Kjeldahl Nitrogen as N	ND		0.250		mg/L		08/22/14 09:55	08/25/14 08:26	1

Lab Sample ID: LCS 490-185677/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 186263 — **Prep Batch: 185677**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Kjeldahl Nitrogen as N	2.50	2.537		mg/L		101	90 - 110

Lab Sample ID: 490-59263-1 MS — **Client Sample ID: EF005**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 186263 — **Prep Batch: 185677**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Kjeldahl Nitrogen as N	0.703		2.50	2.876	F1	mg/L		87	90 - 110

Method: 351.2 - Nitrogen, Total Kjeldahl (Continued)

Lab Sample ID: 490-59263-1 MSD — **Client Sample ID: EF005**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 186263 — **Prep Batch: 185677**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Kjeldahl Nitrogen as N	0.703		2.50	3.031		mg/L		93	90 - 110	5	20

Lab Sample ID: 490-59583-A-1-B MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 186263 — **Prep Batch: 185677**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Kjeldahl Nitrogen as N	1.45		2.50	3.397	F1	mg/L		78	90 - 110		

Lab Sample ID: 490-59583-A-1-C MSD — **Client Sample ID: Matrix Spike Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 186263 — **Prep Batch: 185677**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Kjeldahl Nitrogen as N	1.45		2.50	3.743		mg/L		92	90 - 110	10	20

Method: 353.2 - Nitrogen, Nitrate-Nitrite

Lab Sample ID: MB 490-183524/3 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 183524

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate Nitrite as N	ND		0.100		mg/L			08/13/14 13:53	1

Lab Sample ID: MB 490-183524/33 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 183524

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate Nitrite as N	ND		0.100		mg/L			08/13/14 14:21	1

Lab Sample ID: LCS 490-183524/34 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 183524

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Nitrate Nitrite as N	0.996	0.9680		mg/L		97	90 - 110		

Lab Sample ID: LCS 490-183524/4 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 183524

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Nitrate Nitrite as N	0.996	1.001		mg/L		101	90 - 110		

Method: 353.2 - Nitrogen, Nitrate-Nitrite (Continued)

Lab Sample ID: LCSD 490-183524/35 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 183524

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate Nitrite as N			0.996	0.9590		mg/L		96	90 - 110	1	20

Lab Sample ID: LCSD 490-183524/5 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 183524

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate Nitrite as N			0.996	0.9990		mg/L		100	90 - 110	0	20

Lab Sample ID: 490-58942-I-2 MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 183524

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Nitrate Nitrite as N	ND		0.996	0.6100	F1	mg/L		61	90 - 110		

Lab Sample ID: 490-58942-I-2 MSD — **Client Sample ID: Matrix Spike Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 183524

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate Nitrite as N	ND		0.996	0.6100	F1	mg/L		61	90 - 110	0	20

Lab Sample ID: 490-59081-E-5 MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 183524

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Nitrate Nitrite as N	1.49		0.996	2.399		mg/L		91	90 - 110		

Lab Sample ID: 490-59263-2 MS — **Client Sample ID: EF004**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 183524

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Nitrate Nitrite as N	0.625		0.996	1.540		mg/L		92	90 - 110		

Lab Sample ID: 490-59263-2 MSD — **Client Sample ID: EF004**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 183524

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate Nitrite as N	0.625		0.996	1.546		mg/L		92	90 - 110	0	20

QC Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-59263-1

Method: 365.4 - Phosphorus, Total

Lab Sample ID: MB 490-185701/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 186217 — **Prep Batch: 185701**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	ND		0.100		mg/L		08/22/14 09:55	08/25/14 12:44	1

Lab Sample ID: LCS 490-185701/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 186217 — **Prep Batch: 185701**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phosphorus, Total	2.00	1.970		mg/L		99	90 - 110

Lab Sample ID: 490-59242-B-1-B MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 186217 — **Prep Batch: 185701**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Phosphorus, Total	3.33		2.00	5.051		mg/L		86	73 - 119

Lab Sample ID: 490-59242-B-1-C MSD — **Client Sample ID: Matrix Spike Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 186217 — **Prep Batch: 185701**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Phosphorus, Total	3.33		2.00	5.816	F1	mg/L		124	73 - 119	14	20

Lab Sample ID: 490-59690-A-2-B DU — **Client Sample ID: Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 186217 — **Prep Batch: 185701**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Phosphorus, Total	0.894		0.9130		mg/L		2	20

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 490-183844/5 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 183844

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity	ND		10.0		mg/L			08/13/14 14:20	1

Lab Sample ID: 490-59174-D-1 DU — **Client Sample ID: Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 183844

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Bicarbonate Alkalinity	86.9		86.50		mg/L		0.4	20

QC Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-59263-1

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 490-183741/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 183741

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		1.00		mg/L			08/14/14 14:09	1

Lab Sample ID: LCS 490-183741/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 183741

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	100	102.0		mg/L		102	90 - 110

Lab Sample ID: 490-59258-K-1 DU — **Client Sample ID: Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 183741

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Suspended Solids	896		910.0		mg/L		2	20

Lab Sample ID: 490-59268-I-1 DU — **Client Sample ID: Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 183741

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Suspended Solids	31.0		28.60		mg/L		8	20

Method: SM 4500 P E - Orthophosphate

Lab Sample ID: MB 490-183777/4 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 183777

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Orthophosphate as P, Dissolved	ND		0.100		mg/L			08/14/14 11:35	1

Lab Sample ID: LCS 490-183777/7 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 183777

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Orthophosphate as P, Dissolved	0.250	0.2542		mg/L		102	90 - 110

Lab Sample ID: 490-59263-1 MS — **Client Sample ID: EF005**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 183777

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Orthophosphate as P, Dissolved	0.162		0.250	0.4291		mg/L		107	72 - 129

Method: SM 4500 P E - Orthophosphate (Continued)

Lab Sample ID: 490-59263-1 MSD — **Client Sample ID: EF005**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 183777

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Orthophosphate as P, Dissolved	0.162		0.250	0.4077		mg/L		98	72 - 129	5	20

Lab Sample ID: 490-59263-1 DU — **Client Sample ID: EF005**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 183777

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Orthophosphate as P, Dissolved	0.162			0.1731		mg/L				7	20

Method: SM4500 SiO2 C - Silica, Molybdosilicate Method

Lab Sample ID: MB 490-185732/6 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 185732

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silica	ND		1.00		mg/L			08/22/14 11:25	1

Lab Sample ID: LCS 490-185732/7 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 185732

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Silica			25.0	23.45		mg/L		94	90 - 110		

Lab Sample ID: LCSD 490-185732/8 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 185732

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Silica			25.0	24.71		mg/L		99	90 - 110	5	10

Lab Sample ID: 490-59263-1 MS — **Client Sample ID: EF005**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 185732

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Silica	6.06		25.0	29.02		mg/L		92	80 - 120		

Lab Sample ID: 490-59263-1 MSD — **Client Sample ID: EF005**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 185732

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Silica	6.06		25.0	29.63		mg/L		94	80 - 120	2	20

QC Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-59263-1

Method: SM4500 SiO2 C - Silica, Molybdosilicate Method (Continued)

Lab Sample ID: 490-59263-1 DU
Matrix: Water
Analysis Batch: 185732

Client Sample ID: EF005
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Silica	6.06			5.741		mg/L				5	20

QC Association Summary

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-59263-1

General Chemistry

Analysis Batch: 183524

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-58942-I-2 MS	Matrix Spike	Total/NA	Water	353.2	
490-58942-I-2 MSD	Matrix Spike Duplicate	Total/NA	Water	353.2	
490-59081-E-5 MS	Matrix Spike	Total/NA	Water	353.2	
490-59263-1	EF005	Total/NA	Water	353.2	
490-59263-2	EF004	Total/NA	Water	353.2	
490-59263-2 MS	EF004	Total/NA	Water	353.2	
490-59263-2 MSD	EF004	Total/NA	Water	353.2	
490-59263-3	EF003	Total/NA	Water	353.2	
490-59263-4	EF002	Total/NA	Water	353.2	
490-59263-5	EF001	Total/NA	Water	353.2	
490-59263-6	WF001	Total/NA	Water	353.2	
490-59263-7	WF002	Total/NA	Water	353.2	
490-59263-8	WF002-D	Total/NA	Water	353.2	
490-59263-9	WF003	Total/NA	Water	353.2	
490-59263-10	WF004	Total/NA	Water	353.2	
490-59263-11	WF005	Total/NA	Water	353.2	
LCS 490-183524/34	Lab Control Sample	Total/NA	Water	353.2	
LCS 490-183524/4	Lab Control Sample	Total/NA	Water	353.2	
LCSD 490-183524/35	Lab Control Sample Dup	Total/NA	Water	353.2	
LCSD 490-183524/5	Lab Control Sample Dup	Total/NA	Water	353.2	
MB 490-183524/3	Method Blank	Total/NA	Water	353.2	
MB 490-183524/33	Method Blank	Total/NA	Water	353.2	

Analysis Batch: 183741

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-59258-K-1 DU	Duplicate	Total/NA	Water	SM 2540D	
490-59263-1	EF005	Total/NA	Water	SM 2540D	
490-59263-2	EF004	Total/NA	Water	SM 2540D	
490-59263-3	EF003	Total/NA	Water	SM 2540D	
490-59263-4	EF002	Total/NA	Water	SM 2540D	
490-59263-5	EF001	Total/NA	Water	SM 2540D	
490-59263-6	WF001	Total/NA	Water	SM 2540D	
490-59263-7	WF002	Total/NA	Water	SM 2540D	
490-59263-8	WF002-D	Total/NA	Water	SM 2540D	
490-59263-9	WF003	Total/NA	Water	SM 2540D	
490-59263-10	WF004	Total/NA	Water	SM 2540D	
490-59263-11	WF005	Total/NA	Water	SM 2540D	
490-59268-I-1 DU	Duplicate	Total/NA	Water	SM 2540D	
LCS 490-183741/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 490-183741/1	Method Blank	Total/NA	Water	SM 2540D	

Analysis Batch: 183777

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-59263-1	EF005	Total/NA	Water	SM 4500 P E	
490-59263-1 DU	EF005	Total/NA	Water	SM 4500 P E	
490-59263-1 MS	EF005	Total/NA	Water	SM 4500 P E	
490-59263-1 MSD	EF005	Total/NA	Water	SM 4500 P E	
490-59263-2	EF004	Total/NA	Water	SM 4500 P E	
490-59263-3	EF003	Total/NA	Water	SM 4500 P E	
490-59263-4	EF002	Total/NA	Water	SM 4500 P E	
490-59263-5	EF001	Total/NA	Water	SM 4500 P E	

General Chemistry (Continued)

Analysis Batch: 183777 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-59263-6	WF001	Total/NA	Water	SM 4500 P E	
490-59263-7	WF002	Total/NA	Water	SM 4500 P E	
490-59263-8	WF002-D	Total/NA	Water	SM 4500 P E	
490-59263-9	WF003	Total/NA	Water	SM 4500 P E	
490-59263-10	WF004	Total/NA	Water	SM 4500 P E	
490-59263-11	WF005	Total/NA	Water	SM 4500 P E	
LCS 490-183777/7	Lab Control Sample	Total/NA	Water	SM 4500 P E	
MB 490-183777/4	Method Blank	Total/NA	Water	SM 4500 P E	

Analysis Batch: 183844

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-59174-D-1 DU	Duplicate	Total/NA	Water	SM 2320B	
490-59263-1	EF005	Total/NA	Water	SM 2320B	
490-59263-2	EF004	Total/NA	Water	SM 2320B	
490-59263-3	EF003	Total/NA	Water	SM 2320B	
490-59263-4	EF002	Total/NA	Water	SM 2320B	
490-59263-5	EF001	Total/NA	Water	SM 2320B	
490-59263-6	WF001	Total/NA	Water	SM 2320B	
490-59263-7	WF002	Total/NA	Water	SM 2320B	
490-59263-8	WF002-D	Total/NA	Water	SM 2320B	
490-59263-9	WF003	Total/NA	Water	SM 2320B	
490-59263-10	WF004	Total/NA	Water	SM 2320B	
490-59263-11	WF005	Total/NA	Water	SM 2320B	
LCS 490-183844/6	Lab Control Sample	Total/NA	Water	SM 2320B	
MB 490-183844/5	Method Blank	Total/NA	Water	SM 2320B	

Prep Batch: 185677

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-59263-1	EF005	Total/NA	Water	351.2	
490-59263-1 MS	EF005	Total/NA	Water	351.2	
490-59263-1 MSD	EF005	Total/NA	Water	351.2	
490-59263-2	EF004	Total/NA	Water	351.2	
490-59263-3	EF003	Total/NA	Water	351.2	
490-59263-4	EF002	Total/NA	Water	351.2	
490-59263-5	EF001	Total/NA	Water	351.2	
490-59263-6	WF001	Total/NA	Water	351.2	
490-59263-7	WF002	Total/NA	Water	351.2	
490-59263-8	WF002-D	Total/NA	Water	351.2	
490-59263-9	WF003	Total/NA	Water	351.2	
490-59263-10	WF004	Total/NA	Water	351.2	
490-59263-11	WF005	Total/NA	Water	351.2	
490-59583-A-1-B MS	Matrix Spike	Total/NA	Water	351.2	
490-59583-A-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	351.2	
LCS 490-185677/2-A	Lab Control Sample	Total/NA	Water	351.2	
MB 490-185677/1-A	Method Blank	Total/NA	Water	351.2	

Prep Batch: 185701

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-59242-B-1-B MS	Matrix Spike	Total/NA	Water	365.2/365.3/365	
490-59242-B-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	365.2/365.3/365	
490-59263-1	EF005	Total/NA	Water	365.2/365.3/365	

QC Association Summary

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-59263-1

General Chemistry (Continued)

Prep Batch: 185701 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-59263-2	EF004	Total/NA	Water	365.2/365.3/365	
490-59263-3	EF003	Total/NA	Water	365.2/365.3/365	
490-59263-4	EF002	Total/NA	Water	365.2/365.3/365	
490-59263-5	EF001	Total/NA	Water	365.2/365.3/365	
490-59263-6	WF001	Total/NA	Water	365.2/365.3/365	
490-59263-7	WF002	Total/NA	Water	365.2/365.3/365	
490-59263-8	WF002-D	Total/NA	Water	365.2/365.3/365	
490-59263-9	WF003	Total/NA	Water	365.2/365.3/365	
490-59263-10	WF004	Total/NA	Water	365.2/365.3/365	
490-59263-11	WF005	Total/NA	Water	365.2/365.3/365	
490-59690-A-2-B DU	Duplicate	Total/NA	Water	365.2/365.3/365	
LCS 490-185701/2-A	Lab Control Sample	Total/NA	Water	365.2/365.3/365	
MB 490-185701/1-A	Method Blank	Total/NA	Water	365.2/365.3/365	

Analysis Batch: 185732

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-59263-1	EF005	Total/NA	Water	SM4500 SiO2 C	
490-59263-1 DU	EF005	Total/NA	Water	SM4500 SiO2 C	
490-59263-1 MS	EF005	Total/NA	Water	SM4500 SiO2 C	
490-59263-1 MSD	EF005	Total/NA	Water	SM4500 SiO2 C	
490-59263-2	EF004	Total/NA	Water	SM4500 SiO2 C	
490-59263-3	EF003	Total/NA	Water	SM4500 SiO2 C	
490-59263-4	EF002	Total/NA	Water	SM4500 SiO2 C	
490-59263-5	EF001	Total/NA	Water	SM4500 SiO2 C	
490-59263-6	WF001	Total/NA	Water	SM4500 SiO2 C	
490-59263-7	WF002	Total/NA	Water	SM4500 SiO2 C	
490-59263-8	WF002-D	Total/NA	Water	SM4500 SiO2 C	
490-59263-9	WF003	Total/NA	Water	SM4500 SiO2 C	
490-59263-10	WF004	Total/NA	Water	SM4500 SiO2 C	
490-59263-11	WF005	Total/NA	Water	SM4500 SiO2 C	
LCS 490-185732/7	Lab Control Sample	Total/NA	Water	SM4500 SiO2 C	
LCSD 490-185732/8	Lab Control Sample Dup	Total/NA	Water	SM4500 SiO2 C	
MB 490-185732/6	Method Blank	Total/NA	Water	SM4500 SiO2 C	

Prep Batch: 186177

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-59188-A-4-C MS	Matrix Spike	Total/NA	Water	Distill/Ammonia	
490-59263-1	EF005	Total/NA	Water	Distill/Ammonia	
490-59263-2	EF004	Total/NA	Water	Distill/Ammonia	
490-59263-3	EF003	Total/NA	Water	Distill/Ammonia	
490-59263-4	EF002	Total/NA	Water	Distill/Ammonia	
490-59263-5	EF001	Total/NA	Water	Distill/Ammonia	
490-59263-6	WF001	Total/NA	Water	Distill/Ammonia	
490-59263-7	WF002	Total/NA	Water	Distill/Ammonia	
490-59263-8	WF002-D	Total/NA	Water	Distill/Ammonia	
490-59263-9	WF003	Total/NA	Water	Distill/Ammonia	
490-59263-10	WF004	Total/NA	Water	Distill/Ammonia	
490-59263-11	WF005	Total/NA	Water	Distill/Ammonia	
490-59263-11 MS	WF005	Total/NA	Water	Distill/Ammonia	
LCS 490-186177/2-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 490-186177/1-A	Method Blank	Total/NA	Water	Distill/Ammonia	

General Chemistry (Continued)

Analysis Batch: 186217

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-59242-B-1-B MS	Matrix Spike	Total/NA	Water	365.4	185701
490-59242-B-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	365.4	185701
490-59263-1	EF005	Total/NA	Water	365.4	185701
490-59263-2	EF004	Total/NA	Water	365.4	185701
490-59263-3	EF003	Total/NA	Water	365.4	185701
490-59263-4	EF002	Total/NA	Water	365.4	185701
490-59263-5	EF001	Total/NA	Water	365.4	185701
490-59263-6	WF001	Total/NA	Water	365.4	185701
490-59263-7	WF002	Total/NA	Water	365.4	185701
490-59263-8	WF002-D	Total/NA	Water	365.4	185701
490-59263-9	WF003	Total/NA	Water	365.4	185701
490-59263-10	WF004	Total/NA	Water	365.4	185701
490-59263-11	WF005	Total/NA	Water	365.4	185701
490-59690-A-2-B DU	Duplicate	Total/NA	Water	365.4	185701
LCS 490-185701/2-A	Lab Control Sample	Total/NA	Water	365.4	185701
MB 490-185701/1-A	Method Blank	Total/NA	Water	365.4	185701

Analysis Batch: 186263

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-59263-1	EF005	Total/NA	Water	351.2	185677
490-59263-1 MS	EF005	Total/NA	Water	351.2	185677
490-59263-1 MSD	EF005	Total/NA	Water	351.2	185677
490-59263-2	EF004	Total/NA	Water	351.2	185677
490-59263-3	EF003	Total/NA	Water	351.2	185677
490-59263-4	EF002	Total/NA	Water	351.2	185677
490-59263-5	EF001	Total/NA	Water	351.2	185677
490-59263-6	WF001	Total/NA	Water	351.2	185677
490-59263-7	WF002	Total/NA	Water	351.2	185677
490-59263-8	WF002-D	Total/NA	Water	351.2	185677
490-59263-9	WF003	Total/NA	Water	351.2	185677
490-59263-10	WF004	Total/NA	Water	351.2	185677
490-59263-11	WF005	Total/NA	Water	351.2	185677
490-59583-A-1-B MS	Matrix Spike	Total/NA	Water	351.2	185677
490-59583-A-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	351.2	185677
LCS 490-185677/2-A	Lab Control Sample	Total/NA	Water	351.2	185677
MB 490-185677/1-A	Method Blank	Total/NA	Water	351.2	185677

Analysis Batch: 186274

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-59188-A-4-C MS	Matrix Spike	Total/NA	Water	350.1	186177
490-59263-1	EF005	Total/NA	Water	350.1	186177
490-59263-2	EF004	Total/NA	Water	350.1	186177
490-59263-3	EF003	Total/NA	Water	350.1	186177
490-59263-4	EF002	Total/NA	Water	350.1	186177
490-59263-5	EF001	Total/NA	Water	350.1	186177
490-59263-6	WF001	Total/NA	Water	350.1	186177
490-59263-7	WF002	Total/NA	Water	350.1	186177
490-59263-8	WF002-D	Total/NA	Water	350.1	186177
490-59263-9	WF003	Total/NA	Water	350.1	186177
490-59263-10	WF004	Total/NA	Water	350.1	186177
490-59263-11	WF005	Total/NA	Water	350.1	186177

QC Association Summary

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-59263-1

General Chemistry (Continued)

Analysis Batch: 186274 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-59263-11 MS	WF005	Total/NA	Water	350.1	186177
LCS 490-186177/2-A	Lab Control Sample	Total/NA	Water	350.1	186177
MB 490-186177/1-A	Method Blank	Total/NA	Water	350.1	186177

Lab Chronicle

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-59263-1

Client Sample ID: EF005

Lab Sample ID: 490-59263-1

Date Collected: 08/12/14 07:56

Matrix: Water

Date Received: 08/13/14 11:06

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	186177	08/25/14 12:21	AHN	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	186274	08/25/14 15:57	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	185677	08/22/14 09:55	REM	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	186263	08/25/14 08:28	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	183524	08/13/14 14:18	RKG	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	185701	08/22/14 09:55	REM	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	186217	08/25/14 12:51	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	183844	08/13/14 16:04	PHB	TAL NSH
Total/NA	Analysis	SM 2540D		1	750 mL	1000 mL	183741	08/14/14 14:09	CRM	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	183777	08/14/14 11:58	CRM	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	185732	08/22/14 12:19	BLM	TAL NSH

Client Sample ID: EF004

Lab Sample ID: 490-59263-2

Date Collected: 08/12/14 10:01

Matrix: Water

Date Received: 08/13/14 11:06

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	186177	08/25/14 12:21	AHN	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	186274	08/25/14 15:57	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	185677	08/22/14 09:55	REM	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	186263	08/25/14 08:32	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	183524	08/13/14 14:24	RKG	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	185701	08/22/14 09:55	REM	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	186217	08/25/14 12:52	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	183844	08/13/14 16:10	PHB	TAL NSH
Total/NA	Analysis	SM 2540D		1	500 mL	1000 mL	183741	08/14/14 14:09	CRM	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	183777	08/14/14 11:58	CRM	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	185732	08/22/14 12:19	BLM	TAL NSH

Client Sample ID: EF003

Lab Sample ID: 490-59263-3

Date Collected: 08/12/14 10:18

Matrix: Water

Date Received: 08/13/14 11:06

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	186177	08/25/14 12:21	AHN	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	186274	08/25/14 15:58	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	185677	08/22/14 09:55	REM	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	186263	08/25/14 08:33	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	183524	08/13/14 14:26	RKG	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	185701	08/22/14 09:55	REM	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	186217	08/25/14 12:53	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	183844	08/13/14 16:16	PHB	TAL NSH

Lab Chronicle

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-59263-1

Client Sample ID: EF003

Lab Sample ID: 490-59263-3
Date Collected: 08/12/14 10:18
Matrix: Water
Date Received: 08/13/14 11:06

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540D		1	500 mL	1000 mL	183741	08/14/14 14:09	CRM	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	183777	08/14/14 11:58	CRM	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	185732	08/22/14 12:19	BLM	TAL NSH

Client Sample ID: EF002

Lab Sample ID: 490-59263-4
Date Collected: 08/12/14 10:39
Matrix: Water
Date Received: 08/13/14 11:06

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	186177	08/25/14 12:21	AHN	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	186274	08/25/14 16:00	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	185677	08/22/14 09:55	REM	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	186263	08/25/14 08:34	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	183524	08/13/14 14:27	RKG	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	185701	08/22/14 09:55	REM	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	186217	08/25/14 12:55	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	183844	08/13/14 14:59	PHB	TAL NSH
Total/NA	Analysis	SM 2540D		1	750 mL	1000 mL	183741	08/14/14 14:09	CRM	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	183777	08/14/14 11:58	CRM	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	185732	08/22/14 12:19	BLM	TAL NSH

Client Sample ID: EF001

Lab Sample ID: 490-59263-5
Date Collected: 08/12/14 11:08
Matrix: Water
Date Received: 08/13/14 11:06

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	186177	08/25/14 12:21	AHN	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	186274	08/25/14 16:01	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	185677	08/22/14 09:55	REM	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	186263	08/25/14 08:35	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	183524	08/13/14 14:28	RKG	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	185701	08/22/14 09:55	REM	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	186217	08/25/14 12:56	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	183844	08/13/14 15:05	PHB	TAL NSH
Total/NA	Analysis	SM 2540D		1	750 mL	1000 mL	183741	08/14/14 14:09	CRM	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	183777	08/14/14 11:58	CRM	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	185732	08/22/14 12:19	BLM	TAL NSH

Lab Chronicle

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-59263-1

Client Sample ID: WF001

Lab Sample ID: 490-59263-6

Date Collected: 08/12/14 12:55
Matrix: Water
Date Received: 08/13/14 11:06

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	186177	08/25/14 12:21	AHN	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	186274	08/25/14 16:02	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	185677	08/22/14 09:55	REM	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	186263	08/25/14 08:39	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	183524	08/13/14 14:29	RKG	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	185701	08/22/14 09:55	REM	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	186217	08/25/14 12:57	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	183844	08/13/14 15:11	PHB	TAL NSH
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	183741	08/14/14 14:09	CRM	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	183777	08/14/14 11:58	CRM	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	185732	08/22/14 12:19	BLM	TAL NSH

Client Sample ID: WF002

Lab Sample ID: 490-59263-7

Date Collected: 08/12/14 13:17
Matrix: Water
Date Received: 08/13/14 11:06

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	186177	08/25/14 12:21	AHN	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	186274	08/25/14 16:03	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	185677	08/22/14 09:55	REM	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	186263	08/25/14 08:40	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	183524	08/13/14 14:30	RKG	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	185701	08/22/14 09:55	REM	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	186217	08/25/14 12:58	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	183844	08/13/14 15:17	PHB	TAL NSH
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	183741	08/14/14 14:09	CRM	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	183777	08/14/14 11:58	CRM	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	185732	08/22/14 12:23	BLM	TAL NSH

Client Sample ID: WF002-D

Lab Sample ID: 490-59263-8

Date Collected: 08/12/14 13:19
Matrix: Water
Date Received: 08/13/14 11:06

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	186177	08/25/14 12:21	AHN	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	186274	08/25/14 16:03	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	185677	08/22/14 09:55	REM	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	186263	08/25/14 08:41	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	183524	08/13/14 14:31	RKG	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	185701	08/22/14 09:55	REM	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	186217	08/25/14 12:59	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	183844	08/13/14 15:23	PHB	TAL NSH

Lab Chronicle

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-59263-1

Client Sample ID: WF002-D

Lab Sample ID: 490-59263-8

Date Collected: 08/12/14 13:19
Matrix: Water
Date Received: 08/13/14 11:06

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	183741	08/14/14 14:09	CRM	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	183777	08/14/14 11:58	CRM	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	185732	08/22/14 12:52	BLM	TAL NSH

Client Sample ID: WF003

Lab Sample ID: 490-59263-9

Date Collected: 08/12/14 13:49
Matrix: Water
Date Received: 08/13/14 11:06

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	186177	08/25/14 12:21	AHN	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	186274	08/25/14 16:04	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	185677	08/22/14 09:55	REM	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	186263	08/25/14 08:42	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	183524	08/13/14 14:32	RKG	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	185701	08/22/14 09:55	REM	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	186217	08/25/14 13:02	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	183844	08/13/14 15:28	PHB	TAL NSH
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	183741	08/14/14 14:09	CRM	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	183777	08/14/14 11:58	CRM	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	185732	08/22/14 12:52	BLM	TAL NSH

Client Sample ID: WF004

Lab Sample ID: 490-59263-10

Date Collected: 08/12/14 14:48
Matrix: Water
Date Received: 08/13/14 11:06

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	186177	08/25/14 12:21	AHN	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	186274	08/25/14 16:05	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	185677	08/22/14 09:55	REM	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	186263	08/25/14 08:44	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	183524	08/13/14 14:33	RKG	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	185701	08/22/14 09:55	REM	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	186217	08/25/14 13:04	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	183844	08/13/14 15:46	PHB	TAL NSH
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	183741	08/14/14 14:09	CRM	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	183777	08/14/14 12:00	CRM	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	185732	08/22/14 12:52	BLM	TAL NSH

Lab Chronicle

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-59263-1

Client Sample ID: WF005

Date Collected: 08/12/14 16:35
Date Received: 08/13/14 11:06

Lab Sample ID: 490-59263-11

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	186177	08/25/14 12:21	AHN	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	186274	08/25/14 16:06	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	185677	08/22/14 09:55	REM	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	186263	08/25/14 08:45	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	183524	08/13/14 14:34	RKG	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	185701	08/22/14 09:55	REM	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	186217	08/25/14 13:05	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	183844	08/13/14 15:52	PHB	TAL NSH
Total/NA	Analysis	SM 2540D		1	700 mL	1000 mL	183741	08/14/14 14:09	CRM	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	183777	08/14/14 12:19	CRM	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	185732	08/22/14 12:52	BLM	TAL NSH

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Method Summary

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-59263-1

Method	Method Description	Protocol	Laboratory
350.1	Nitrogen, Ammonia	MCAWW	TAL NSH
351.2	Nitrogen, Total Kjeldahl	MCAWW	TAL NSH
353.2	Nitrogen, Nitrate-Nitrite	MCAWW	TAL NSH
365.4	Phosphorus, Total	EPA	TAL NSH
SM 2320B	Alkalinity	SM	TAL NSH
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL NSH
SM 4500 P E	Orthophosphate	SM	TAL NSH
SM4500 SiO2 C	Silica, Molybdosilicate Method	SM	TAL NSH

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "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",

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Certification Summary

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-59263-1

Laboratory: TestAmerica Nashville

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	A2LA		NA: NELAP & A2LA	12-31-15
A2LA	ISO/IEC 17025		0453.07	12-31-15
Alaska (UST)	State Program	10	UST-087	10-31-14
Arizona	State Program	9	AZ0473	05-05-15
Arkansas DEQ	State Program	6	88-0737	04-25-15
California	NELAP	9	1168CA	10-31-14
Connecticut	State Program	1	PH-0220	12-31-15
Florida	NELAP	4	E87358	06-30-15
Illinois	NELAP	5	200010	12-09-14
Iowa	State Program	7	131	04-01-16
Kansas	NELAP	7	E-10229	10-31-14
Kentucky (UST)	State Program	4	19	06-30-15
Louisiana	NELAP	6	30613	06-30-15
Maryland	State Program	3	316	03-31-15
Massachusetts	State Program	1	M-TN032	06-30-15
Minnesota	NELAP	5	047-999-345	12-31-14
Mississippi	State Program	4	N/A	06-30-15
Montana (UST)	State Program	8	NA	02-24-20
Nevada	State Program	9	TN00032	07-31-15
New Hampshire	NELAP	1	2963	10-09-14
New Jersey	NELAP	2	TN965	06-30-15
New York	NELAP	2	11342	03-31-15
North Carolina (WW/SW)	State Program	4	387	12-31-14
North Dakota	State Program	8	R-146	06-30-14 *
Ohio VAP	State Program	5	CL0033	10-16-15
Oklahoma	State Program	6	9412	08-31-14 *
Oregon	NELAP	10	TN200001	04-29-15
Pennsylvania	NELAP	3	68-00585	06-30-15
Rhode Island	State Program	1	LAO00268	12-30-14
South Carolina	State Program	4	84009 (001)	02-28-15
South Carolina (DW)	State Program	4	84009 (002)	02-23-17
Tennessee	State Program	4	2008	02-23-17
Texas	NELAP	6	T104704077	08-31-15
USDA	Federal		S-48469	10-30-16
Utah	NELAP	8	TN00032	07-31-15
Virginia	NELAP	3	460152	06-14-15
Washington	State Program	10	C789	07-19-15
West Virginia DEP	State Program	3	219	02-28-15
Wisconsin	State Program	5	998020430	08-31-15
Wyoming (UST)	A2LA	8	453.07	12-31-15

* Certification renewal pending - certification considered valid.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

COOLER RECEIPT FORM

490-59263 Chain of Custody

Cooler Received/Opened On 8/13/2014@ 1106

1. Tracking # N/A (last 4 digits, FedEx)

Courier: Client Drop Off IR Gun ID Raynger

2. Temperature of rep. sample or temp blank when opened: 2.9 *Degrees Celsius*

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO..NA

4. Were custody seals on outside of cooler? YES..NO..NA

If yes, how many and where:

5. Were the seals intact, signed, and dated correctly? YES...NO..NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (intial) DA

7. Were custody seals on containers: YES NO and Intact YES...NO...NA

Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES...NO...NA

b. Was there any observable headspace present in any VOA vial? YES...NO...NA

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence #

I certify that I unloaded the cooler and answered questions 7-14 (intial) DA

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES..NO..NA

b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial) DA

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial) DA

I certify that I attached a label with the unique LIMS number to each container (intial) DA

21. Were there Non-Conformance issues at login? YES...NO Was a NCM generated? YES...NO...#

BIS = Broken in shipment
Cooler Receipt Form.doc

LF-1
End of Form

Revised 11/28/12

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

COOLER RECEIPT FORM

Loc: 490
59263

Cooler Received/Opened On 8/13/2014@ 1106

1. Tracking # N/A (last 4 digits, FedEx)

Courier: Client Drop Off IR Gun ID Raynger

2. Temperature of rep. sample or temp blank when opened: 3.0 *Degrees Celsius*

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO..NA

4. Were custody seals on outside of cooler? YES..NO..NA

   If yes, how many and where:

5. Were the seals intact, signed, and dated correctly? YES...NO..NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (intial) DA

7. Were custody seals on containers: YES NO and Intact YES...NO..NA

   Were these signed and dated correctly? YES...NO..NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES..NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES..NO..NA

   b. Was there any observable headspace present in any VOA vial? YES...NO..NA

14. Was there a Trip Blank in this cooler? YES..NO..NA If multiple coolers, sequence #

I certify that I unloaded the cooler and answered questions 7-14 (intial) DA

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES..NO..NA

   b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES..NO..NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial) DA

17. Were custody papers properly filled out (ink, signed, etc)? YES..NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial) DA

I certify that I attached a label with the unique LIMS number to each container (intial) DA

21. Were there Non-Conformance issues at login? YES..NO Was a NCM generated? YES..NO..#

BIS = Broken in shipment
Cooler Receipt Form.doc

LF-1
End of Form

Revised 11/28/12

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

Loc: 490
59263

COOLER RECEIPT FORM

Cooler Received/Opened On 8/13/2014@ 1106

1. Tracking # N/A (last 4 digits, FedEx)

Courier: Client Drop Off IR Gun ID Raynger

2. Temperature of rep. sample or temp blank when opened: 2.3 *Degrees Celsius*

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO..NA

4. Were custody seals on outside of cooler? YES..NO..NA

   If yes, how many and where:_____

5. Were the seals intact, signed, and dated correctly? YES...NO..NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (intial) DA

7. Were custody seals on containers: YES NO and Intact YES...NO..NA

   Were these signed and dated correctly? YES...NO..NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES..NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES..NO..NA

   b. Was there any observable headspace present in any VOA vial? YES...NO..NA

14. Was there a Trip Blank in this cooler? YES..NO..NA If multiple coolers, sequence #_____

I certify that I unloaded the cooler and answered questions 7-14 (intial) DA

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES..NO..NA

   b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES..NO..NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial) DA

17. Were custody papers properly filled out (ink, signed, etc)? YES..NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES..NO...NA

20. Was sufficient amount of sample sent in each container? YES..NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial) DA

I certify that I attached a label with the unique LIMS number to each container (intial) DA

21. Were there Non-Conformance issues at login? YES..NO Was a NCM generated? YES..NO..#_____

BIS = Broken in shipment
Cooler Receipt Form.doc

LF-1
End of Form

Revised 11/28/12

TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Phone (615) 726-0177 Fax (615) 726-3404

Chain of Custody Record

Loc: 490
59263

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

8/29/2014

Client Information	Sampler: Richard W. Rogers	Lab PM: Baker, Heather	Ca	COC No: 490-25561-9400.1
Client Contact: Nick Carmean	Phone: 615-373-8532	E-Mail: heather.baker@testamericainc.com		Page: Page 1 of 1
Company: Aquaeter Inc				Job #: 142299
Address: 215 Jamestown Park Suite 204	Due Date Requested:			
City: Brentwood	TAT Requested (days): Standard			
State, Zip: TN, 37027				
Phone: 615-373-8532	PO #: Purchase Order Requested			
Email: ncarmean@aquaeter.com	WO #:			
Project Name: Stones River	Project #: 49007047			
Site: N/A	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Other:

	Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	350.1 - Ammonia	351.2 - TKN	353.2 - Nitrate-Nitrite	365.4 - Total Phosphorus	SM2320B - Bicarbonate Alkalinity	SM5600 - Ortho-phosphate	SM4500 - Silica	SM2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:
				Preservation Code:				S	S	S	S	N	N	N	N		
1	EF005	8/12/14	0756	G	Water	N		✓	✓	✓	✓	✓	✓	✓	✓		
2	~~EF006~~ ZWR EF004	8/12/14	1001	G	Water	N		✓	✓	✓	✓	✓	✓	✓	✓		
3	EF003	8/12/14	1018	G	Water	N		✓	✓	✓	✓	✓	✓	✓	✓		
4	EF002	8/12/14	1039	G	Water	N		✓	✓	✓	✓	✓	✓	✓	✓		
5	EF001	8/12/14	1108	G	Water	N		✓	✓	✓	✓	✓	✓	✓	✓		
6	WF001	8/12/14	1255	G	Water	N		✓	✓	✓	✓	✓	✓	✓	✓		
7	WF002	8/12/14	1317	G	Water	N		✓	✓	✓	✓	✓	✓	✓	✓		
8	WF002-D	8/12/14	1319	G	Water	N		✓	✓	✓	✓	✓	✓	✓	✓		
9	WF003	8/12/14	1349	G	Water	N		✓	✓	✓	✓	✓	✓	✓	✓		
10	WF004	8/12/14	1448	G	Water	N		✓	✓	✓	✓	✓	✓	✓	✓		
11	WF005	8/12/14	1635	G	Water	N		✓	✓	✓	✓	✓	✓	✓	✓		

Possible Hazard Identification
☐ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* ☐ *Poison B* ☐ *Unknown* ☐ *Radiological*

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	8-13-14 1105	Aquaeter	[signature] TAN	08/13/14 1106	TAN
			[signature]	8-13-14 1106	TAN

Custody Seals Intact:	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:
Δ Yes Δ No		2.9, 3.0, 2.3

Login Sample Receipt Checklist

Client: Aquaeter Inc

Job Number: 490-59263-1

Login Number: 59263
List Number: 1
Creator: Armstrong, Daniel

List Source: TestAmerica Nashville

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	2.9C, 3.0C, 2.3C
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	True	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Tel: (615)726-0177

TestAmerica Job ID: 490-54599-1
Client Project/Site: Aquaeter Treated Wastewater

For:
Aquaeter Inc
215 Jamestown Park
Suite 204
Brentwood, Tennessee 37027

Attn: Nick Carmean

Heather Baker

Authorized for release by:
6/19/2014 4:31:18 PM

Heather Baker, Project Manager I
(615)301-5043
heather.baker@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Sample Summary

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54599-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-54599-1	EF001	Water	06/05/14 10:20	06/05/14 15:00
490-54599-2	EF002	Water	06/05/14 09:48	06/05/14 15:00
490-54599-3	EF003	Water	06/05/14 09:27	06/05/14 15:00
490-54599-4	EF004	Water	06/05/14 08:57	06/05/14 15:00
490-54599-5	EF005	Water	06/05/14 12:30	06/05/14 15:00
490-54599-6	EF004-Dup	Water	06/05/14 09:00	06/05/14 15:00

Case Narrative

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54599-1

Job ID: 490-54599-1

Laboratory: TestAmerica Nashville

Narrative

Job Narrative
490-54599-1

Comments
No additional comments.

Receipt
The samples were received on 6/5/2014 3:00 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 7.7º C.

General Chemistry
Method(s) SM 2320B: The following sample(s) had an initial pH below endpoint for total alkalinity analysis: MW-11I (490-54549-2 DU).

Method(s) 350.1: The matrix spike (MS) recovery for batch 170339 was outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method(s) 351.2: The matrix spike (MS) recovery for batch 170759 was outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method(s) 365.4: The method blank for batch 170996 contained phosphorus above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.

Method(s) 365.4: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for batch 170996 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Definitions/Glossary

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54599-1

Qualifiers

General Chemistry

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery exceeds the control limits
F3	Duplicate RPD exceeds the control limit

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client Sample Results

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54599-1

Client Sample ID: EF001 — Lab Sample ID: 490-54599-1

Date Collected: 06/05/14 10:20
Date Received: 06/05/14 15:00
Matrix: Water

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	**0.149**		0.100		mg/L		06/17/14 13:45	06/17/14 16:19	1
Kjeldahl Nitrogen as N	**0.309**		0.250		mg/L		06/17/14 13:06	06/18/14 22:42	1
Nitrate Nitrite as N	ND		0.100		mg/L			06/17/14 14:42	1
Phosphorus, Total	**0.138**		0.100		mg/L		06/17/14 14:54	06/19/14 11:35	1
Bicarbonate Alkalinity	**151**		10.0		mg/L			06/13/14 04:47	1
Total Suspended Solids	**6.91**		1.06		mg/L			06/06/14 11:56	1
Orthophosphate as P, Dissolved	ND		0.100		mg/L			06/06/14 08:22	1
Silica	**3.34**		1.00		mg/L			06/12/14 16:28	1

Client Sample ID: EF002 — Lab Sample ID: 490-54599-2

Date Collected: 06/05/14 09:48
Date Received: 06/05/14 15:00
Matrix: Water

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	ND		0.100		mg/L		06/17/14 13:45	06/17/14 16:20	1
Kjeldahl Nitrogen as N	**0.466**		0.250		mg/L		06/17/14 13:06	06/18/14 22:50	1
Nitrate Nitrite as N	ND		0.100		mg/L			06/17/14 14:43	1
Phosphorus, Total	ND		0.100		mg/L		06/17/14 14:54	06/19/14 11:36	1
Bicarbonate Alkalinity	**162**		10.0		mg/L			06/13/14 17:11	1
Total Suspended Solids	**8.00**		1.33		mg/L			06/06/14 08:40	1
Orthophosphate as P, Dissolved	ND		0.100		mg/L			06/06/14 08:22	1
Silica	**5.02**		1.00		mg/L			06/12/14 16:28	1

Client Sample ID: EF003 — Lab Sample ID: 490-54599-3

Date Collected: 06/05/14 09:27
Date Received: 06/05/14 15:00
Matrix: Water

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	ND		0.100		mg/L		06/17/14 13:45	06/17/14 16:20	1
Kjeldahl Nitrogen as N	**0.355**		0.250		mg/L		06/17/14 13:06	06/18/14 22:58	1
Nitrate Nitrite as N	**0.284**		0.100		mg/L			06/17/14 14:46	1
Phosphorus, Total	**0.154**		0.100		mg/L		06/17/14 14:54	06/19/14 11:37	1
Bicarbonate Alkalinity	**163**		10.0		mg/L			06/13/14 17:17	1
Total Suspended Solids	**10.6**		1.43		mg/L			06/06/14 08:40	1
Orthophosphate as P, Dissolved	ND		0.100		mg/L			06/06/14 08:22	1
Silica	**6.29**		1.00		mg/L			06/12/14 16:08	1

Client Sample ID: EF004 — Lab Sample ID: 490-54599-4

Date Collected: 06/05/14 08:57
Date Received: 06/05/14 15:00
Matrix: Water

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	**0.109**		0.100		mg/L		06/17/14 13:45	06/17/14 16:21	1
Kjeldahl Nitrogen as N	**0.368**		0.250		mg/L		06/17/14 13:06	06/18/14 23:06	1
Nitrate Nitrite as N	**0.194**		0.100		mg/L			06/17/14 14:48	1
Phosphorus, Total	ND		0.100		mg/L		06/17/14 14:54	06/19/14 11:38	1
Bicarbonate Alkalinity	**151**		10.0		mg/L			06/13/14 20:18	1

Client Sample Results

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54599-1

Client Sample ID: EF004

Lab Sample ID: 490-54599-4
Date Collected: 06/05/14 08:57
Matrix: Water
Date Received: 06/05/14 15:00

General Chemistry (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	9.86		1.43		mg/L			06/06/14 08:40	1
Orthophosphate as P, Dissolved	ND		0.100		mg/L			06/06/14 08:22	1
Silica	5.19		1.00		mg/L			06/12/14 16:29	1

Client Sample ID: EF005

Lab Sample ID: 490-54599-5
Date Collected: 06/05/14 12:30
Matrix: Water
Date Received: 06/05/14 15:00

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	0.151		0.100		mg/L		06/17/14 13:45	06/17/14 16:24	1
Kjeldahl Nitrogen as N	0.341		0.250		mg/L		06/17/14 13:06	06/18/14 23:14	1
Nitrate Nitrite as N	0.126		0.100		mg/L			06/17/14 14:49	1
Phosphorus, Total	0.143		0.100		mg/L		06/17/14 14:54	06/19/14 11:39	1
Bicarbonate Alkalinity	144		10.0		mg/L			06/13/14 20:35	1
Total Suspended Solids	7.80		1.00		mg/L			06/06/14 08:40	1
Orthophosphate as P, Dissolved	ND		0.100		mg/L			06/06/14 08:22	1
Silica	5.43		1.00		mg/L			06/12/14 16:08	1

Client Sample ID: EF004-Dup

Lab Sample ID: 490-54599-6
Date Collected: 06/05/14 09:00
Matrix: Water
Date Received: 06/05/14 15:00

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	0.105		0.100		mg/L		06/17/14 13:45	06/17/14 16:24	1
Kjeldahl Nitrogen as N	0.390		0.250		mg/L		06/17/14 13:06	06/18/14 23:22	1
Nitrate Nitrite as N	0.201		0.100		mg/L			06/17/14 14:50	1
Phosphorus, Total	0.120		0.100		mg/L		06/17/14 14:54	06/19/14 11:41	1
Bicarbonate Alkalinity	148		10.0		mg/L			06/08/14 07:55	1
Total Suspended Solids	9.07		1.33		mg/L			06/06/14 08:40	1
Orthophosphate as P, Dissolved	ND		0.100		mg/L			06/06/14 08:22	1
Silica	5.70		1.00		mg/L			06/12/14 16:08	1

QC Sample Results

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54599-1

Method: 350.1 - Nitrogen, Ammonia

Lab Sample ID: MB 490-170262/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 170339 — **Prep Batch: 170262**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	ND		0.100		mg/L		06/17/14 13:45	06/17/14 16:15	1

Lab Sample ID: LCS 490-170262/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 170339 — **Prep Batch: 170262**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia (as N)	5.00	5.187		mg/L		104	90 - 110

Lab Sample ID: 490-54567-A-1-B MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 170339 — **Prep Batch: 170262**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia (as N)	12.7		5.00	17.78		mg/L		101	90 - 110

Lab Sample ID: 490-54704-F-4-B MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 170339 — **Prep Batch: 170262**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia (as N)	0.248		5.00	4.701	F1	mg/L		89	90 - 110

Method: 351.2 - Nitrogen, Total Kjeldahl

Lab Sample ID: MB 490-170284/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 170759 — **Prep Batch: 170284**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Kjeldahl Nitrogen as N	ND		0.250		mg/L		06/17/14 13:06	06/18/14 21:14	1

Lab Sample ID: LCS 490-170284/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 170759 — **Prep Batch: 170284**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Kjeldahl Nitrogen as N	2.50	2.735		mg/L		109	90 - 110

Lab Sample ID: 490-54607-F-1-B MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 170759 — **Prep Batch: 170284**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Kjeldahl Nitrogen as N	1.54		2.50	4.217		mg/L		107	90 - 110

QC Sample Results

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54599-1

Method: 351.2 - Nitrogen, Total Kjeldahl (Continued)

Lab Sample ID: 490-54607-F-1-C MSD — **Client Sample ID: Matrix Spike Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 170759 — **Prep Batch: 170284**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Kjeldahl Nitrogen as N	1.54		2.50	4.024		mg/L		99	90 - 110	5	20

Lab Sample ID: 490-54896-D-2-B MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 170759 — **Prep Batch: 170284**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Kjeldahl Nitrogen as N	1.10		2.50	4.071	F1	mg/L		119	90 - 110

Lab Sample ID: 490-54896-D-2-C MSD — **Client Sample ID: Matrix Spike Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 170759 — **Prep Batch: 170284**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Kjeldahl Nitrogen as N	1.10		2.50	3.418		mg/L		93	90 - 110	17	20

Method: 353.2 - Nitrogen, Nitrate-Nitrite

Lab Sample ID: MB 490-170304/3 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 170304

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate Nitrite as N	ND		0.100		mg/L			06/17/14 14:31	1

Lab Sample ID: LCS 490-170304/4 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 170304

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate Nitrite as N	0.996	1.007		mg/L		101	90 - 110

Lab Sample ID: LCSD 490-170304/5 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 170304

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate Nitrite as N	0.996	1.006		mg/L		101	90 - 110	0	20

Lab Sample ID: 490-54567-B-1 MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 170304

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate Nitrite as N	0.531		0.996	1.436		mg/L		91	90 - 110

QC Sample Results

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54599-1

Method: 353.2 - Nitrogen, Nitrate-Nitrite (Continued)

Lab Sample ID: 490-54567-B-1 MSD — **Client Sample ID: Matrix Spike Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 170304

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate Nitrite as N	0.531		0.996	1.448		mg/L		92	90 - 110	1	20

Lab Sample ID: 490-54599-3 MS — **Client Sample ID: EF003**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 170304

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate Nitrite as N	0.284		0.996	1.233		mg/L		95	90 - 110

Method: 365.4 - Phosphorus, Total

Lab Sample ID: MB 490-170297/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 170996 — **Prep Batch: 170297**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	ND		0.100		mg/L		06/17/14 14:54	06/19/14 11:26	1

Lab Sample ID: LCS 490-170297/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 170996 — **Prep Batch: 170297**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phosphorus, Total	2.00	2.177		mg/L		109	90 - 110

Lab Sample ID: 490-54519-B-3-D MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 170996 — **Prep Batch: 170297**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Phosphorus, Total	4.10		2.00	4.163	F1	mg/L		3	73 - 119

Lab Sample ID: 490-54519-B-3-E MSD — **Client Sample ID: Matrix Spike Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 170996 — **Prep Batch: 170297**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Phosphorus, Total	4.10		2.00	4.077	F1	mg/L		-1	73 - 119	2	20

Lab Sample ID: 490-54803-D-10-B DU — **Client Sample ID: Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 170996 — **Prep Batch: 170297**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Phosphorus, Total	ND		ND		mg/L		NC	20

QC Sample Results

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54599-1

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 490-168344/40 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 168344

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity	ND		10.0		mg/L			06/08/14 06:20	1

Lab Sample ID: 490-54018-L-1 DU — **Client Sample ID: Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 168344

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Bicarbonate Alkalinity	69.6			69.28		mg/L				0.4	20

Lab Sample ID: MB 490-169388/33 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 169388

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity	ND		10.0		mg/L			06/13/14 02:24	1

Lab Sample ID: 490-54589-A-6 DU — **Client Sample ID: Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 169388

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Bicarbonate Alkalinity	391			392.8		mg/L				0.4	20

Lab Sample ID: 490-54589-J-7 DU — **Client Sample ID: Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 169388

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Bicarbonate Alkalinity	342			342.6		mg/L				0.2	20

Lab Sample ID: MB 490-169670/3 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 169670

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity	ND		10.0		mg/L			06/13/14 14:20	1

Lab Sample ID: MB 490-169670/31 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 169670

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity	ND		10.0		mg/L			06/13/14 19:18	1

Lab Sample ID: 490-54549-K-2 DU — **Client Sample ID: Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 169670

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Bicarbonate Alkalinity	ND			ND		mg/L				NC	20

QC Sample Results

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54599-1

Lab Sample ID: 490-54599-3 DU — **Client Sample ID: EF003**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 169670

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Bicarbonate Alkalinity	163			162.8		mg/L				0.1	20

Lab Sample ID: 490-54700-I-8 DU — **Client Sample ID: Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 169670

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Bicarbonate Alkalinity	26.8			22.44		mg/L				18	20

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 490-167319/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 167319

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		1.00		mg/L			06/06/14 11:56	1

Lab Sample ID: LCS 490-167319/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 167319

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Suspended Solids			100	99.70		mg/L		100	90 - 110		

Lab Sample ID: 490-54528-A-1 DU — **Client Sample ID: Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 167319

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Suspended Solids	51.2			45.20		mg/L				12	20

Lab Sample ID: MB 490-167320/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 167320

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		1.00		mg/L			06/06/14 08:40	1

Lab Sample ID: LCS 490-167320/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 167320

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Suspended Solids			100	97.30		mg/L		97	90 - 110		

Method: SM 2540D - Solids, Total Suspended (TSS) (Continued)

Lab Sample ID: LCSD 490-167320/3 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 167320

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Suspended Solids			100	98.40		mg/L		98	90 - 110	1	20

Lab Sample ID: 490-54612-M-1 DU — **Client Sample ID: Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 167320

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Suspended Solids	153			78.00	F3	mg/L				65	20

Method: SM 4500 P E - Orthophosphate

Lab Sample ID: MB 490-167357/4 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 167357

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Orthophosphate as P, Dissolved	ND		0.100		mg/L			06/06/14 07:59	1

Lab Sample ID: LCS 490-167357/7 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 167357

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Orthophosphate as P, Dissolved			0.250	0.2582		mg/L		103	90 - 110		

Lab Sample ID: 490-54599-1 MS — **Client Sample ID: EF001**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 167357

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Orthophosphate as P, Dissolved	ND		0.250	0.2554		mg/L		102	72 - 129		

Lab Sample ID: 490-54599-1 MSD — **Client Sample ID: EF001**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 167357

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Orthophosphate as P, Dissolved	ND		0.250	0.2577		mg/L		103	72 - 129	1	20

Lab Sample ID: 490-54599-1 DU — **Client Sample ID: EF001**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 167357

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Orthophosphate as P, Dissolved	ND			ND		mg/L				NC	20

QC Sample Results

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54599-1

Method: SM4500 SiO2 C - Silica, Molybdosilicate Method

Lab Sample ID: MB 490-169164/18 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 169164

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silica	ND		1.00		mg/L			06/12/14 16:18	1

Lab Sample ID: MB 490-169164/6 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 169164

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silica	ND		1.00		mg/L			06/12/14 12:34	1

Lab Sample ID: LCS 490-169164/20 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 169164

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Silica			25.0	27.56		mg/L		110	90 - 110		

Lab Sample ID: LCS 490-169164/7 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 169164

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Silica			25.0	26.02		mg/L		104	90 - 110		

Lab Sample ID: LCSD 490-169164/8 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 169164

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Silica			25.0	26.15		mg/L		105	90 - 110	1	10

Lab Sample ID: 490-54599-1 MS — **Client Sample ID: EF001**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 169164

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Silica	3.34		25.0	28.68		mg/L		101	80 - 120		

Lab Sample ID: 490-54599-1 MSD — **Client Sample ID: EF001**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 169164

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Silica	3.34		25.0	30.18		mg/L		107	80 - 120	5	20

Lab Sample ID: 490-54599-1 DU — **Client Sample ID: EF001**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 169164

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Silica	3.34			3.376		mg/L				1	20

QC Association Summary

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54599-1

General Chemistry

Analysis Batch: 167319

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-54528-A-1 DU	Duplicate	Total/NA	Water	SM 2540D	
490-54599-1	EF001	Total/NA	Water	SM 2540D	
LCS 490-167319/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 490-167319/1	Method Blank	Total/NA	Water	SM 2540D	

Analysis Batch: 167320

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-54599-2	EF002	Total/NA	Water	SM 2540D	
490-54599-3	EF003	Total/NA	Water	SM 2540D	
490-54599-4	EF004	Total/NA	Water	SM 2540D	
490-54599-5	EF005	Total/NA	Water	SM 2540D	
490-54599-6	EF004-Dup	Total/NA	Water	SM 2540D	
490-54612-M-1 DU	Duplicate	Total/NA	Water	SM 2540D	
LCS 490-167320/2	Lab Control Sample	Total/NA	Water	SM 2540D	
LCSD 490-167320/3	Lab Control Sample Dup	Total/NA	Water	SM 2540D	
MB 490-167320/1	Method Blank	Total/NA	Water	SM 2540D	

Analysis Batch: 167357

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-54599-1	EF001	Total/NA	Water	SM 4500 P E	
490-54599-1 DU	EF001	Total/NA	Water	SM 4500 P E	
490-54599-1 MS	EF001	Total/NA	Water	SM 4500 P E	
490-54599-1 MSD	EF001	Total/NA	Water	SM 4500 P E	
490-54599-2	EF002	Total/NA	Water	SM 4500 P E	
490-54599-3	EF003	Total/NA	Water	SM 4500 P E	
490-54599-4	EF004	Total/NA	Water	SM 4500 P E	
490-54599-5	EF005	Total/NA	Water	SM 4500 P E	
490-54599-6	EF004-Dup	Total/NA	Water	SM 4500 P E	
LCS 490-167357/7	Lab Control Sample	Total/NA	Water	SM 4500 P E	
MB 490-167357/4	Method Blank	Total/NA	Water	SM 4500 P E	

Analysis Batch: 168344

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-54018-L-1 DU	Duplicate	Total/NA	Water	SM 2320B	
490-54599-6	EF004-Dup	Total/NA	Water	SM 2320B	
LCS 490-168344/41	Lab Control Sample	Total/NA	Water	SM 2320B	
LCSD 490-168344/42	Lab Control Sample Dup	Total/NA	Water	SM 2320B	
MB 490-168344/40	Method Blank	Total/NA	Water	SM 2320B	

Analysis Batch: 169164

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-54599-1	EF001	Total/NA	Water	SM4500 SiO2 C	
490-54599-1 DU	EF001	Total/NA	Water	SM4500 SiO2 C	
490-54599-1 MS	EF001	Total/NA	Water	SM4500 SiO2 C	
490-54599-1 MSD	EF001	Total/NA	Water	SM4500 SiO2 C	
490-54599-2	EF002	Total/NA	Water	SM4500 SiO2 C	
490-54599-3	EF003	Total/NA	Water	SM4500 SiO2 C	
490-54599-4	EF004	Total/NA	Water	SM4500 SiO2 C	
490-54599-5	EF005	Total/NA	Water	SM4500 SiO2 C	
490-54599-6	EF004-Dup	Total/NA	Water	SM4500 SiO2 C	
LCS 490-169164/20	Lab Control Sample	Total/NA	Water	SM4500 SiO2 C	

QC Association Summary

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54599-1

General Chemistry (Continued)

Analysis Batch: 169164 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 490-169164/7	Lab Control Sample	Total/NA	Water	SM4500 SiO2 C	
LCSD 490-169164/8	Lab Control Sample Dup	Total/NA	Water	SM4500 SiO2 C	
MB 490-169164/18	Method Blank	Total/NA	Water	SM4500 SiO2 C	
MB 490-169164/6	Method Blank	Total/NA	Water	SM4500 SiO2 C	

Analysis Batch: 169388

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-54589-A-6 DU	Duplicate	Total/NA	Water	SM 2320B	
490-54589-J-7 DU	Duplicate	Total/NA	Water	SM 2320B	
490-54599-1	EF001	Total/NA	Water	SM 2320B	
LCS 490-169388/34	Lab Control Sample	Total/NA	Water	SM 2320B	
LCSD 490-169388/35	Lab Control Sample Dup	Total/NA	Water	SM 2320B	
MB 490-169388/33	Method Blank	Total/NA	Water	SM 2320B	

Analysis Batch: 169670

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-54549-K-2 DU	Duplicate	Total/NA	Water	SM 2320B	
490-54599-2	EF002	Total/NA	Water	SM 2320B	
490-54599-3	EF003	Total/NA	Water	SM 2320B	
490-54599-3 DU	EF003	Total/NA	Water	SM 2320B	
490-54599-4	EF004	Total/NA	Water	SM 2320B	
490-54599-5	EF005	Total/NA	Water	SM 2320B	
490-54700-I-8 DU	Duplicate	Total/NA	Water	SM 2320B	
LCS 490-169670/32	Lab Control Sample	Total/NA	Water	SM 2320B	
LCS 490-169670/4	Lab Control Sample	Total/NA	Water	SM 2320B	
LCSD 490-169670/33	Lab Control Sample Dup	Total/NA	Water	SM 2320B	
LCSD 490-169670/5	Lab Control Sample Dup	Total/NA	Water	SM 2320B	
MB 490-169670/3	Method Blank	Total/NA	Water	SM 2320B	
MB 490-169670/31	Method Blank	Total/NA	Water	SM 2320B	

Prep Batch: 170262

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-54567-A-1-B MS	Matrix Spike	Total/NA	Water	Distill/Ammonia	
490-54599-1	EF001	Total/NA	Water	Distill/Ammonia	
490-54599-2	EF002	Total/NA	Water	Distill/Ammonia	
490-54599-3	EF003	Total/NA	Water	Distill/Ammonia	
490-54599-4	EF004	Total/NA	Water	Distill/Ammonia	
490-54599-5	EF005	Total/NA	Water	Distill/Ammonia	
490-54599-6	EF004-Dup	Total/NA	Water	Distill/Ammonia	
490-54704-F-4-B MS	Matrix Spike	Total/NA	Water	Distill/Ammonia	
LCS 490-170262/2-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 490-170262/1-A	Method Blank	Total/NA	Water	Distill/Ammonia	

Prep Batch: 170284

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-54599-1	EF001	Total/NA	Water	351.2	
490-54599-2	EF002	Total/NA	Water	351.2	
490-54599-3	EF003	Total/NA	Water	351.2	
490-54599-4	EF004	Total/NA	Water	351.2	
490-54599-5	EF005	Total/NA	Water	351.2	
490-54599-6	EF004-Dup	Total/NA	Water	351.2	

QC Association Summary

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54599-1

General Chemistry (Continued)

Prep Batch: 170284 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-54607-F-1-B MS	Matrix Spike	Total/NA	Water	351.2	
490-54607-F-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	351.2	
490-54896-D-2-B MS	Matrix Spike	Total/NA	Water	351.2	
490-54896-D-2-C MSD	Matrix Spike Duplicate	Total/NA	Water	351.2	
LCS 490-170284/2-A	Lab Control Sample	Total/NA	Water	351.2	
MB 490-170284/1-A	Method Blank	Total/NA	Water	351.2	

Prep Batch: 170297

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-54519-B-3-D MS	Matrix Spike	Total/NA	Water	365.2/365.3/365	
490-54519-B-3-E MSD	Matrix Spike Duplicate	Total/NA	Water	365.2/365.3/365	
490-54599-1	EF001	Total/NA	Water	365.2/365.3/365	
490-54599-2	EF002	Total/NA	Water	365.2/365.3/365	
490-54599-3	EF003	Total/NA	Water	365.2/365.3/365	
490-54599-4	EF004	Total/NA	Water	365.2/365.3/365	
490-54599-5	EF005	Total/NA	Water	365.2/365.3/365	
490-54599-6	EF004-Dup	Total/NA	Water	365.2/365.3/365	
490-54803-D-10-B DU	Duplicate	Total/NA	Water	365.2/365.3/365	
LCS 490-170297/2-A	Lab Control Sample	Total/NA	Water	365.2/365.3/365	
MB 490-170297/1-A	Method Blank	Total/NA	Water	365.2/365.3/365	

Analysis Batch: 170304

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-54567-B-1 MS	Matrix Spike	Total/NA	Water	353.2	
490-54567-B-1 MSD	Matrix Spike Duplicate	Total/NA	Water	353.2	
490-54599-1	EF001	Total/NA	Water	353.2	
490-54599-2	EF002	Total/NA	Water	353.2	
490-54599-3	EF003	Total/NA	Water	353.2	
490-54599-3 MS	EF003	Total/NA	Water	353.2	
490-54599-4	EF004	Total/NA	Water	353.2	
490-54599-5	EF005	Total/NA	Water	353.2	
490-54599-6	EF004-Dup	Total/NA	Water	353.2	
LCS 490-170304/4	Lab Control Sample	Total/NA	Water	353.2	
LCSD 490-170304/5	Lab Control Sample Dup	Total/NA	Water	353.2	
MB 490-170304/3	Method Blank	Total/NA	Water	353.2	

Analysis Batch: 170339

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-54567-A-1-B MS	Matrix Spike	Total/NA	Water	350.1	170262
490-54599-1	EF001	Total/NA	Water	350.1	170262
490-54599-2	EF002	Total/NA	Water	350.1	170262
490-54599-3	EF003	Total/NA	Water	350.1	170262
490-54599-4	EF004	Total/NA	Water	350.1	170262
490-54599-5	EF005	Total/NA	Water	350.1	170262
490-54599-6	EF004-Dup	Total/NA	Water	350.1	170262
490-54704-F-4-B MS	Matrix Spike	Total/NA	Water	350.1	170262
LCS 490-170262/2-A	Lab Control Sample	Total/NA	Water	350.1	170262
MB 490-170262/1-A	Method Blank	Total/NA	Water	350.1	170262

QC Association Summary

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54599-1

General Chemistry (Continued)

Analysis Batch: 170759

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-54599-1	EF001	Total/NA	Water	351.2	170284
490-54599-2	EF002	Total/NA	Water	351.2	170284
490-54599-3	EF003	Total/NA	Water	351.2	170284
490-54599-4	EF004	Total/NA	Water	351.2	170284
490-54599-5	EF005	Total/NA	Water	351.2	170284
490-54599-6	EF004-Dup	Total/NA	Water	351.2	170284
490-54607-F-1-B MS	Matrix Spike	Total/NA	Water	351.2	170284
490-54607-F-1-C MSD	Matrix Spike Duplicate	Total/NA	Water	351.2	170284
490-54896-D-2-B MS	Matrix Spike	Total/NA	Water	351.2	170284
490-54896-D-2-C MSD	Matrix Spike Duplicate	Total/NA	Water	351.2	170284
LCS 490-170284/2-A	Lab Control Sample	Total/NA	Water	351.2	170284
MB 490-170284/1-A	Method Blank	Total/NA	Water	351.2	170284

Analysis Batch: 170996

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-54519-B-3-D MS	Matrix Spike	Total/NA	Water	365.4	170297
490-54519-B-3-E MSD	Matrix Spike Duplicate	Total/NA	Water	365.4	170297
490-54599-1	EF001	Total/NA	Water	365.4	170297
490-54599-2	EF002	Total/NA	Water	365.4	170297
490-54599-3	EF003	Total/NA	Water	365.4	170297
490-54599-4	EF004	Total/NA	Water	365.4	170297
490-54599-5	EF005	Total/NA	Water	365.4	170297
490-54599-6	EF004-Dup	Total/NA	Water	365.4	170297
490-54803-D-10-B DU	Duplicate	Total/NA	Water	365.4	170297
LCS 490-170297/2-A	Lab Control Sample	Total/NA	Water	365.4	170297
MB 490-170297/1-A	Method Blank	Total/NA	Water	365.4	170297

Lab Chronicle

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54599-1

Client Sample ID: EF001

Lab Sample ID: 490-54599-1

Date Collected: 06/05/14 10:20
Matrix: Water
Date Received: 06/05/14 15:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	170262	06/17/14 13:45	AHN	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	170339	06/17/14 16:19	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	170284	06/17/14 13:06	REM	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	170759	06/18/14 22:42	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	170304	06/17/14 14:42	RKG	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	170297	06/17/14 14:54	REM	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	170996	06/19/14 11:35	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	169388	06/13/14 04:47	PHB	TAL NSH
Total/NA	Analysis	SM 2540D		1	940 mL	1000 mL	167319	06/06/14 11:56	CRM	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	167357	06/06/14 08:22	CRM	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	169164	06/12/14 16:28	BLM	TAL NSH

Client Sample ID: EF002

Lab Sample ID: 490-54599-2

Date Collected: 06/05/14 09:48
Matrix: Water
Date Received: 06/05/14 15:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	170262	06/17/14 13:45	AHN	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	170339	06/17/14 16:20	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	170284	06/17/14 13:06	REM	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	170759	06/18/14 22:50	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	170304	06/17/14 14:43	RKG	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	170297	06/17/14 14:54	REM	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	170996	06/19/14 11:36	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	169670	06/13/14 17:11	PHB	TAL NSH
Total/NA	Analysis	SM 2540D		1	750 mL	1000 mL	167320	06/06/14 08:40	CRM	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	167357	06/06/14 08:22	CRM	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	169164	06/12/14 16:28	BLM	TAL NSH

Client Sample ID: EF003

Lab Sample ID: 490-54599-3

Date Collected: 06/05/14 09:27
Matrix: Water
Date Received: 06/05/14 15:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	170262	06/17/14 13:45	AHN	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	170339	06/17/14 16:20	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	170284	06/17/14 13:06	REM	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	170759	06/18/14 22:58	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	170304	06/17/14 14:46	RKG	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	170297	06/17/14 14:54	REM	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	170996	06/19/14 11:37	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	169670	06/13/14 17:17	PHB	TAL NSH

Lab Chronicle

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54599-1

Client Sample ID: EF003

Lab Sample ID: 490-54599-3

Date Collected: 06/05/14 09:27
Matrix: Water
Date Received: 06/05/14 15:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540D		1	700 mL	1000 mL	167320	06/06/14 08:40	CRM	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	167357	06/06/14 08:22	CRM	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	169164	06/12/14 16:08	BLM	TAL NSH

Client Sample ID: EF004

Lab Sample ID: 490-54599-4

Date Collected: 06/05/14 08:57
Matrix: Water
Date Received: 06/05/14 15:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	170262	06/17/14 13:45	AHN	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	170339	06/17/14 16:21	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	170284	06/17/14 13:06	REM	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	170759	06/18/14 23:06	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	170304	06/17/14 14:48	RKG	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	170297	06/17/14 14:54	REM	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	170996	06/19/14 11:38	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	169670	06/13/14 20:18	PHB	TAL NSH
Total/NA	Analysis	SM 2540D		1	700 mL	1000 mL	167320	06/06/14 08:40	CRM	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	167357	06/06/14 08:22	CRM	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	169164	06/12/14 16:29	BLM	TAL NSH

Client Sample ID: EF005

Lab Sample ID: 490-54599-5

Date Collected: 06/05/14 12:30
Matrix: Water
Date Received: 06/05/14 15:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	170262	06/17/14 13:45	AHN	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	170339	06/17/14 16:24	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	170284	06/17/14 13:06	REM	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	170759	06/18/14 23:14	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	170304	06/17/14 14:49	RKG	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	170297	06/17/14 14:54	REM	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	170996	06/19/14 11:39	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	169670	06/13/14 20:35	PHB	TAL NSH
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	167320	06/06/14 08:40	CRM	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	167357	06/06/14 08:22	CRM	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	169164	06/12/14 16:08	BLM	TAL NSH

Lab Chronicle

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54599-1

Client Sample ID: EF004-Dup

Date Collected: 06/05/14 09:00
Date Received: 06/05/14 15:00

Lab Sample ID: 490-54599-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	170262	06/17/14 13:45	AHN	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	170339	06/17/14 16:24	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	170284	06/17/14 13:06	REM	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	170759	06/18/14 23:22	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	170304	06/17/14 14:50	RKG	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	170297	06/17/14 14:54	REM	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	170996	06/19/14 11:41	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1		35 mL	168344	06/08/14 07:55	BMC	TAL NSH
Total/NA	Analysis	SM 2540D		1	750 mL	1000 mL	167320	06/06/14 08:40	CRM	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	167357	06/06/14 08:22	CRM	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	169164	06/12/14 16:08	BLM	TAL NSH

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Method Summary

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54599-1

Method	Method Description	Protocol	Laboratory
350.1	Nitrogen, Ammonia	MCAWW	TAL NSH
351.2	Nitrogen, Total Kjeldahl	MCAWW	TAL NSH
353.2	Nitrogen, Nitrate-Nitrite	MCAWW	TAL NSH
365.4	Phosphorus, Total	EPA	TAL NSH
SM 2320B	Alkalinity	SM	TAL NSH
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL NSH
SM 4500 P E	Orthophosphate	SM	TAL NSH
SM4500 SiO2 C	Silica, Molybdosilicate Method	SM	TAL NSH

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "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",

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Certification Summary

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54599-1

Laboratory: TestAmerica Nashville

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	ISO/IEC 17025		0453.07	12-31-15
Alaska (UST)	State Program	10	UST-087	07-24-14
Arizona	State Program	9	AZ0473	05-05-15
Arkansas DEQ	State Program	6	88-0737	04-25-15
California	NELAP	9	1168CA	10-31-14
Connecticut	State Program	1	PH-0220	12-31-15
Florida	NELAP	4	E87358	06-30-14 *
Illinois	NELAP	5	200010	12-09-14
Iowa	State Program	7	131	05-01-14 *
Kansas	NELAP	7	E-10229	10-31-14
Kentucky (UST)	State Program	4	19	06-30-14 *
Louisiana	NELAP	6	30613	06-30-14 *
Maryland	State Program	3	316	03-31-15
Massachusetts	State Program	1	M-TN032	06-30-14 *
Minnesota	NELAP	5	047-999-345	12-31-14
Mississippi	State Program	4	N/A	06-30-14 *
Montana (UST)	State Program	8	NA	02-24-20
Nevada	State Program	9	TN00032	07-31-14
New Hampshire	NELAP	1	2963	10-09-14
New Jersey	NELAP	2	TN965	06-30-14 *
New York	NELAP	2	11342	03-31-15
North Carolina DENR	State Program	4	387	12-31-14
North Dakota	State Program	8	R-146	06-30-14 *
Ohio VAP	State Program	5	CL0033	10-16-15
Oklahoma	State Program	6	9412	08-31-14
Oregon	NELAP	10	TN200001	04-29-15
Pennsylvania	NELAP	3	68-00585	06-30-15
Rhode Island	State Program	1	LAO00268	12-30-14
South Carolina	State Program	4	84009 (002)	02-23-17
Tennessee	State Program	4	2008	02-23-17
Texas	NELAP	6	T104704077	08-31-14
USDA	Federal		S-48469	10-30-16
Utah	NELAP	8	TN00032	07-31-14
Virginia	NELAP	3	460152	06-14-15
Washington	State Program	10	C789	07-19-14
West Virginia DEP	State Program	3	219	02-28-15
Wisconsin	State Program	5	998020430	08-31-14
Wyoming (UST)	A2LA	8	453.07	12-31-15

* Certification renewal pending - certification considered valid.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

COOLER RECEIPT FORM

490-54599 Chain of Custody

Cooler Received/Opened On 6/5/2014 @ 1500

1. Tracking # N/A

Courier: Off-Street IR Gun ID Raynger

2. Temperature of rep. sample or temp blank when opened: 2.7 *Degrees Celsius* On ice

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO...NA

4. Were custody seals on outside of cooler? YES...NO...NA

If yes, how many and where: NA

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (intial) D

7. Were custody seals on containers: YES NO and Intact YES...NO...NA

Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES...NO...NA

b. Was there any observable headspace present in any VOA vial? YES...NO...NA

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence # NA

I certify that I unloaded the cooler and answered questions 7-14 (intial) M

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA

b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial) M

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial) M

I certify that I attached a label with the unique LIMS number to each container (intial) D

21. Were there Non-Conformance issues at login? YES...NO Was a NCM generated? YES...NO...#_____

BIS = Broken in shipment

TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Phone (615) 726-0177 Fax (615) 726-3404

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

6/19/2014

Client Information	Sampler: NJC, ROM	Lab PM: Baker, Heather	Carrier Tracking No(s):	COC No: 490-25561-9400.1
Client Contact: Nick Carmean	Phone: 615-373-8532	E-Mail: heather.baker@testamericainc.com		Page: Page 1 of 1
Company: Aquaeter Inc				Job #:
Address: 215 Jamestown Park Suite 204	Due Date Requested:			
City: Brentwood	TAT Requested (days):			
State, Zip: TN, 37027				
Phone:	PO #: Purchase Order Requested			
Email: ncarmean@aquaeter.com	WO #:			
Project Name:	Project #: 49007047			
Site:	SSOW#:			

Analysis Requested

Loc: 490
54599

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2SO3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - ph 4-5
L - EDA	Z - other (specify)

Other:

	Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	350.1 - Ammonia	351.2 - TKN	353.2 - Nitrate-Nitrite	365.4 - Total Phosphorus	SM2320B - Bicarbonate Alkalinity	SM5600 - Ortho-phosphate	SM4500 - Silica	SM2540D - Total Suspended Solids					Total Number of containers	Special Instructions/Note:
				Preservation Code:				S	S	S	S	N	N	N	N						
1	EF001	6/5/14	1020	G	Water			X	X	X	X	X	X	X	X						
2	EF002	6/5/14	0948	G	Water			X	X	X	X	X	X	X	X						
3	EF003	6/5/14	0927	G	Water			X	X	X	X	X	X	X	X						
4	EF004	6/5/14	0857	G	Water			X	X	X	X	X	X	X	X						
5	EF005	6/5/14	1230	G	Water			X	X	X	X	X	X	X	X						
6	EF004-DUP	6/5/14	0900	G	Water			X	X	X	X	X	X	X	X						
					Water																
					Water																
					Water																
					Water																
					Water																

Possible Hazard Identification
☑ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* ☐ *Poison B* ☐ *Unknown* ☐ *Radiological*

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by: Nick Carmean Date: 6/5/14 Time: Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Nick Carmean	6/5/14		TAN	6/5/14 1500	T.T
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: Aquaeter Inc

Job Number: 490-54599-1

Login Number: 54599

List Source: TestAmerica Nashville

List Number: 1

Creator: Buckingham, Paul

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	True	

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ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Tel: (615)726-0177

TestAmerica Job ID: 490-54720-1
Client Project/Site: Aquaeter Treated Wastewater

For:
Aquaeter Inc
215 Jamestown Park
Suite 204
Brentwood, Tennessee 37027

Attn: Nick Carmean

Heather Baker

Authorized for release by:
7/1/2014 3:41:59 PM

Heather Baker, Project Manager I
(615)301-5043
heather.baker@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Sample Summary

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54720-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-54720-1	WF001	Water	06/06/14 11:15	06/06/14 12:45
490-54720-2	WF002	Water	06/06/14 10:45	06/06/14 12:45
490-54720-3	WF003	Water	06/06/14 09:55	06/06/14 12:45
490-54720-4	WF004	Water	06/06/14 08:02	06/06/14 12:45
490-54720-5	WF005	Water	06/06/14 08:26	06/06/14 12:45
490-54720-6	WF002-Dup	Water	06/06/14 10:47	06/06/14 12:45

Case Narrative

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54720-1

Job ID: 490-54720-1

Laboratory: TestAmerica Nashville

Narrative

Job Narrative
490-54720-1

Comments
No additional comments.

Receipt
The samples were received on 6/6/2014 12:45 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 12.3º C and 15.9º C.

General Chemistry
Method(s) 350.1: The matrix spike (MS) recovery for batch 170940 was outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method(s) 351.2: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for batch 171062 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method(s) 353.2: The matrix spike (MS) recovery for batch 170378 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method(s) 365.4: Due to the high concentration of phosphorus, the matrix spike / matrix spike duplicate (MS/MSD) for batch 171086 could not be evaluated for accuracy and precision. The associated laboratory control sample (LCS) met acceptance criteria.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Definitions/Glossary

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54720-1

Qualifiers

General Chemistry

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery exceeds the control limits

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client Sample Results

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54720-1

Client Sample ID: WF001

Lab Sample ID: 490-54720-1

Date Collected: 06/06/14 11:15
Matrix: Water
Date Received: 06/06/14 12:45

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	0.160		0.100		mg/L		06/19/14 10:24	06/19/14 12:18	1
Kjeldahl Nitrogen as N	0.730		0.250		mg/L		06/19/14 11:54	06/19/14 16:59	1
Nitrate Nitrite as N	0.211		0.100		mg/L			06/17/14 16:11	1
Phosphorus, Total	0.189		0.100		mg/L		06/18/14 11:39	06/19/14 17:51	1
Bicarbonate Alkalinity	175		10.0		mg/L			06/15/14 00:00	1
Total Suspended Solids	16.0		1.82		mg/L			06/10/14 15:00	1
Orthophosphate as P, Dissolved	0.136		0.100		mg/L			06/07/14 11:52	1
Silica	5.76		1.00		mg/L			06/12/14 16:47	1

Client Sample Results

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54720-1

Client Sample ID: WF002

Lab Sample ID: 490-54720-2

Date Collected: 06/06/14 10:45
Matrix: Water
Date Received: 06/06/14 12:45

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	0.190		0.100		mg/L		06/19/14 10:24	06/19/14 12:19	1
Kjeldahl Nitrogen as N	0.626		0.250		mg/L		06/19/14 11:54	06/19/14 16:58	1
Nitrate Nitrite as N	0.791		0.100		mg/L			06/17/14 16:14	1
Phosphorus, Total	0.441		0.100		mg/L		06/18/14 11:39	06/19/14 17:52	1
Bicarbonate Alkalinity	192		10.0		mg/L			06/15/14 00:06	1
Total Suspended Solids	37.2		1.00		mg/L			06/10/14 15:00	1
Orthophosphate as P, Dissolved	0.728		0.100		mg/L			06/07/14 11:52	1
Silica	8.16		1.00		mg/L			06/12/14 16:47	1

Client Sample Results

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54720-1

Client Sample ID: WF003

Lab Sample ID: 490-54720-3

Date Collected: 06/06/14 09:55
Matrix: Water
Date Received: 06/06/14 12:45

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	0.119		0.100		mg/L		06/19/14 10:24	06/19/14 12:20	1
Kjeldahl Nitrogen as N	0.484		0.250		mg/L		06/19/14 11:54	06/19/14 16:44	1
Nitrate Nitrite as N	0.749		0.100		mg/L			06/17/14 16:15	1
Phosphorus, Total	0.822		0.100		mg/L		06/18/14 11:39	06/19/14 17:53	1
Bicarbonate Alkalinity	191		10.0		mg/L			06/15/14 00:13	1
Total Suspended Solids	8.00		1.00		mg/L			06/10/14 15:00	1
Orthophosphate as P, Dissolved	0.917		0.100		mg/L			06/07/14 11:52	1
Silica	8.11		1.00		mg/L			06/12/14 16:18	1

Client Sample Results

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54720-1

Client Sample ID: WF004

Lab Sample ID: 490-54720-4

Date Collected: 06/06/14 08:02
Matrix: Water
Date Received: 06/06/14 12:45

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	**0.133**		0.100		mg/L		06/19/14 10:24	06/19/14 12:21	1
Kjeldahl Nitrogen as N	**0.653**		0.250		mg/L		06/19/14 11:54	06/19/14 16:47	1
Nitrate Nitrite as N	**0.351**		0.100		mg/L			06/17/14 16:16	1
Phosphorus, Total	ND		0.100		mg/L		06/18/14 11:39	06/19/14 17:54	1
Bicarbonate Alkalinity	**173**		10.0		mg/L			06/15/14 00:18	1
Total Suspended Solids	**13.3**		1.00		mg/L			06/10/14 15:00	1
Orthophosphate as P, Dissolved	ND		0.100		mg/L			06/07/14 11:52	1
Silica	**8.44**		1.00		mg/L			06/12/14 16:29	1

Client Sample Results

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54720-1

Client Sample ID: WF005

Lab Sample ID: 490-54720-5

Date Collected: 06/06/14 08:26
Date Received: 06/06/14 12:45

Matrix: Water

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	**0.163**		0.100		mg/L		06/19/14 10:24	06/19/14 12:21	1
Kjeldahl Nitrogen as N	**0.429**		0.250		mg/L		06/19/14 11:54	06/19/14 16:48	1
Nitrate Nitrite as N	**0.338**		0.100		mg/L			06/17/14 16:17	1
Phosphorus, Total	ND		0.100		mg/L		06/18/14 11:39	06/19/14 17:55	1
Bicarbonate Alkalinity	**175**		10.0		mg/L			06/15/14 00:24	1
Total Suspended Solids	**8.40**		1.00		mg/L			06/10/14 15:00	1
Orthophosphate as P, Dissolved	ND		0.100		mg/L			06/07/14 11:54	1
Silica	**7.74**		1.00		mg/L			06/12/14 16:29	1

Client Sample Results

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54720-1

Client Sample ID: WF002-Dup

Lab Sample ID: 490-54720-6

Date Collected: 06/06/14 10:47
Matrix: Water
Date Received: 06/06/14 12:45

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	0.335		0.100		mg/L		06/19/14 10:24	06/19/14 12:22	1
Kjeldahl Nitrogen as N	0.813		0.250		mg/L		06/19/14 11:54	06/19/14 16:49	1
Nitrate Nitrite as N	0.804		0.100		mg/L			06/17/14 16:18	1
Phosphorus, Total	0.602		0.100		mg/L		06/18/14 11:39	06/19/14 17:56	1
Bicarbonate Alkalinity	192		10.0		mg/L			06/15/14 00:30	1
Total Suspended Solids	44.7		1.33		mg/L			06/10/14 15:00	1
Orthophosphate as P, Dissolved	0.729		0.100		mg/L			06/07/14 11:54	1
Silica	7.86		1.00		mg/L			06/12/14 16:29	1

QC Sample Results

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54720-1

Method: 350.1 - Nitrogen, Ammonia

Lab Sample ID: MB 490-170891/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 170940 — **Prep Batch: 170891**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	ND		0.100		mg/L		06/19/14 10:24	06/19/14 12:16	1

Lab Sample ID: LCS 490-170891/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 170940 — **Prep Batch: 170891**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia (as N)	5.00	4.545		mg/L		91	90 - 110

Lab Sample ID: 490-54720-1 MS — **Client Sample ID: WF001**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 170940 — **Prep Batch: 170891**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia (as N)	0.160		5.00	4.733		mg/L		91	90 - 110

Lab Sample ID: 490-55027-D-2-D MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 170940 — **Prep Batch: 170891**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia (as N)	1.10		5.00	4.922	F1	mg/L		76	90 - 110

Method: 351.2 - Nitrogen, Total Kjeldahl

Lab Sample ID: MB 490-170987/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 171062 — **Prep Batch: 170987**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Kjeldahl Nitrogen as N	ND		0.250		mg/L		06/19/14 11:54	06/19/14 16:17	1

Lab Sample ID: LCS 490-170987/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 171062 — **Prep Batch: 170987**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Kjeldahl Nitrogen as N	2.50	2.272		mg/L		91	90 - 110

Lab Sample ID: 490-54670-A-1-G MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 171062 — **Prep Batch: 170987**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Kjeldahl Nitrogen as N	1.29		2.50	3.047	F1	mg/L		70	90 - 110

Method: 351.2 - Nitrogen, Total Kjeldahl (Continued)

Lab Sample ID: 490-54670-A-1-H MSD — **Client Sample ID: Matrix Spike Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 171062 — **Prep Batch: 170987**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Kjeldahl Nitrogen as N	1.29		2.50	2.724	F1	mg/L		57	90 - 110	11	20

Lab Sample ID: 490-54720-1 MS — **Client Sample ID: WF001**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 171062 — **Prep Batch: 170987**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Kjeldahl Nitrogen as N	0.730		2.50	2.969		mg/L		90	90 - 110

Lab Sample ID: 490-54720-1 MSD — **Client Sample ID: WF001**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 171062 — **Prep Batch: 170987**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Kjeldahl Nitrogen as N	0.730		2.50	3.064		mg/L		93	90 - 110	3	20

Method: 353.2 - Nitrogen, Nitrate-Nitrite

Lab Sample ID: MB 490-170378/4 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 170378

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate Nitrite as N	ND		0.100		mg/L			06/17/14 15:58	1

Lab Sample ID: LCS 490-170378/5 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 170378

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate Nitrite as N	0.996	0.9770		mg/L		98	90 - 110

Lab Sample ID: LCSD 490-170378/6 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 170378

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate Nitrite as N	0.996	0.9790		mg/L		98	90 - 110	0	20

Lab Sample ID: 490-54704-G-4 MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 170378

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate Nitrite as N	2.54		0.996	3.431	F1	mg/L		89	90 - 110

Method: 353.2 - Nitrogen, Nitrate-Nitrite (Continued)

Lab Sample ID: 490-54704-G-4 MSD — **Client Sample ID: Matrix Spike Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 170378

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate Nitrite as N	2.54		0.996	3.453		mg/L		92	90 - 110	1	20

Lab Sample ID: 490-54720-2 MS — **Client Sample ID: WF002**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 170378

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate Nitrite as N	0.791		0.996	1.698		mg/L		91	90 - 110

Lab Sample ID: MB 490-170681/4 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 170681

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate Nitrite as N	ND		0.100		mg/L			06/18/14 13:16	1

Lab Sample ID: LCS 490-170681/5 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 170681

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate Nitrite as N	0.996	0.9870		mg/L		99	90 - 110

Lab Sample ID: LCSD 490-170681/6 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 170681

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate Nitrite as N	0.996	0.9840		mg/L		99	90 - 110	0	20

Lab Sample ID: 490-54665-L-1 MSD — **Client Sample ID: Matrix Spike Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 170681

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate Nitrite as N	ND		0.996	0.8210	F1	mg/L		82	90 - 110	0	20

Lab Sample ID: 490-54845-E-1 MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 170681

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate Nitrite as N	0.112		0.996	1.032		mg/L		92	90 - 110

QC Sample Results

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54720-1

Method: 365.4 - Phosphorus, Total

Lab Sample ID: MB 490-170737/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 171086 — **Prep Batch: 170737**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	ND		0.100		mg/L		06/18/14 11:39	06/19/14 17:49	1

Lab Sample ID: LCS 490-170737/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 171086 — **Prep Batch: 170737**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phosphorus, Total	2.00	1.946		mg/L		97	90 - 110

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 490-170257/45 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 170257

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity	ND		10.0		mg/L			06/14/14 23:42	1

Lab Sample ID: 490-55331-D-1 DU — **Client Sample ID: Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 170257

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Bicarbonate Alkalinity	109		108.5		mg/L		0.5	20

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 490-168218/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 168218

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		1.00		mg/L			06/10/14 15:00	1

Lab Sample ID: LCS 490-168218/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 168218

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	100	97.90		mg/L		98	90 - 110

Lab Sample ID: LCSD 490-168218/3 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 168218

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Suspended Solids	100	95.40		mg/L		95	90 - 110	3	20

Method: SM 2540D - Solids, Total Suspended (TSS) (Continued)

Lab Sample ID: 490-54738-A-1 DU — **Client Sample ID: Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 168218

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Suspended Solids	26.4			28.00		mg/L				6	20

Lab Sample ID: 490-54805-O-1 DU — **Client Sample ID: Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 168218

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Suspended Solids	734			812.0		mg/L				10	20

Method: SM 4500 P E - Orthophosphate

Lab Sample ID: MB 490-167719/4 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 167719

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Orthophosphate as P, Dissolved	ND		0.100		mg/L			06/07/14 11:52	1

Lab Sample ID: LCS 490-167719/7 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 167719

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Orthophosphate as P, Dissolved			0.250	0.2587		mg/L		103	90 - 110		

Lab Sample ID: 490-54720-1 MS — **Client Sample ID: WF001**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 167719

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Orthophosphate as P, Dissolved	0.136		0.250	0.3805		mg/L		98	72 - 129		

Lab Sample ID: 490-54720-1 MSD — **Client Sample ID: WF001**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 167719

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Orthophosphate as P, Dissolved	0.136		0.250	0.3807		mg/L		98	72 - 129	0	20

Lab Sample ID: 490-54720-1 DU — **Client Sample ID: WF001**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 167719

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Orthophosphate as P, Dissolved	0.136			0.1365		mg/L				0.4	20

QC Sample Results

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54720-1

Method: SM4500 SiO2 C - Silica, Molybdosilicate Method

Lab Sample ID: MB 490-169164/18 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 169164

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silica	ND		1.00		mg/L			06/12/14 16:18	1

Lab Sample ID: LCS 490-169164/20 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 169164

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Silica	25.0	27.56		mg/L		110	90 - 110

Lab Sample ID: LCS 490-169164/7 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 169164

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Silica	25.0	26.02		mg/L		104	90 - 110

Lab Sample ID: LCSD 490-169164/8 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 169164

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Silica	25.0	26.15		mg/L		105	90 - 110	1	10

Lab Sample ID: 490-54599-D-1 MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 169164

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Silica	3.34		25.0	28.68		mg/L		101	80 - 120

Lab Sample ID: 490-54599-D-1 MSD — **Client Sample ID: Matrix Spike Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 169164

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Silica	3.34		25.0	30.18		mg/L		107	80 - 120	5	20

Lab Sample ID: 490-54599-D-1 DU — **Client Sample ID: Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 169164

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Silica	3.34		3.376		mg/L		1	20

QC Association Summary

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54720-1

General Chemistry

Analysis Batch: 167719

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-54720-1	WF001	Total/NA	Water	SM 4500 P E	
490-54720-1 DU	WF001	Total/NA	Water	SM 4500 P E	
490-54720-1 MS	WF001	Total/NA	Water	SM 4500 P E	
490-54720-1 MSD	WF001	Total/NA	Water	SM 4500 P E	
490-54720-2	WF002	Total/NA	Water	SM 4500 P E	
490-54720-3	WF003	Total/NA	Water	SM 4500 P E	
490-54720-4	WF004	Total/NA	Water	SM 4500 P E	
490-54720-5	WF005	Total/NA	Water	SM 4500 P E	
490-54720-6	WF002-Dup	Total/NA	Water	SM 4500 P E	
LCS 490-167719/7	Lab Control Sample	Total/NA	Water	SM 4500 P E	
MB 490-167719/4	Method Blank	Total/NA	Water	SM 4500 P E	

Analysis Batch: 168218

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-54720-1	WF001	Total/NA	Water	SM 2540D	
490-54720-2	WF002	Total/NA	Water	SM 2540D	
490-54720-3	WF003	Total/NA	Water	SM 2540D	
490-54720-4	WF004	Total/NA	Water	SM 2540D	
490-54720-5	WF005	Total/NA	Water	SM 2540D	
490-54720-6	WF002-Dup	Total/NA	Water	SM 2540D	
490-54738-A-1 DU	Duplicate	Total/NA	Water	SM 2540D	
490-54805-O-1 DU	Duplicate	Total/NA	Water	SM 2540D	
LCS 490-168218/2	Lab Control Sample	Total/NA	Water	SM 2540D	
LCSD 490-168218/3	Lab Control Sample Dup	Total/NA	Water	SM 2540D	
MB 490-168218/1	Method Blank	Total/NA	Water	SM 2540D	

Analysis Batch: 169164

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-54599-D-1 DU	Duplicate	Total/NA	Water	SM4500 SiO2 C	
490-54599-D-1 MS	Matrix Spike	Total/NA	Water	SM4500 SiO2 C	
490-54599-D-1 MSD	Matrix Spike Duplicate	Total/NA	Water	SM4500 SiO2 C	
490-54720-1	WF001	Total/NA	Water	SM4500 SiO2 C	
490-54720-2	WF002	Total/NA	Water	SM4500 SiO2 C	
490-54720-3	WF003	Total/NA	Water	SM4500 SiO2 C	
490-54720-4	WF004	Total/NA	Water	SM4500 SiO2 C	
490-54720-5	WF005	Total/NA	Water	SM4500 SiO2 C	
490-54720-6	WF002-Dup	Total/NA	Water	SM4500 SiO2 C	
LCS 490-169164/20	Lab Control Sample	Total/NA	Water	SM4500 SiO2 C	
LCS 490-169164/7	Lab Control Sample	Total/NA	Water	SM4500 SiO2 C	
LCSD 490-169164/8	Lab Control Sample Dup	Total/NA	Water	SM4500 SiO2 C	
MB 490-169164/18	Method Blank	Total/NA	Water	SM4500 SiO2 C	

Analysis Batch: 170257

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-54720-1	WF001	Total/NA	Water	SM 2320B	
490-54720-2	WF002	Total/NA	Water	SM 2320B	
490-54720-3	WF003	Total/NA	Water	SM 2320B	
490-54720-4	WF004	Total/NA	Water	SM 2320B	
490-54720-5	WF005	Total/NA	Water	SM 2320B	
490-54720-6	WF002-Dup	Total/NA	Water	SM 2320B	
490-55331-D-1 DU	Duplicate	Total/NA	Water	SM 2320B	

QC Association Summary

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54720-1

General Chemistry (Continued)

Analysis Batch: 170257 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 490-170257/46	Lab Control Sample	Total/NA	Water	SM 2320B	
LCSD 490-170257/47	Lab Control Sample Dup	Total/NA	Water	SM 2320B	
MB 490-170257/45	Method Blank	Total/NA	Water	SM 2320B	

Analysis Batch: 170378

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-54704-G-4 MS	Matrix Spike	Total/NA	Water	353.2	
490-54704-G-4 MSD	Matrix Spike Duplicate	Total/NA	Water	353.2	
490-54720-1	WF001	Total/NA	Water	353.2	
490-54720-2	WF002	Total/NA	Water	353.2	
490-54720-2 MS	WF002	Total/NA	Water	353.2	
490-54720-3	WF003	Total/NA	Water	353.2	
490-54720-4	WF004	Total/NA	Water	353.2	
490-54720-5	WF005	Total/NA	Water	353.2	
490-54720-6	WF002-Dup	Total/NA	Water	353.2	
LCS 490-170378/5	Lab Control Sample	Total/NA	Water	353.2	
LCSD 490-170378/6	Lab Control Sample Dup	Total/NA	Water	353.2	
MB 490-170378/4	Method Blank	Total/NA	Water	353.2	

Analysis Batch: 170681

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-54665-L-1 MSD	Matrix Spike Duplicate	Total/NA	Water	353.2	
490-54845-E-1 MS	Matrix Spike	Total/NA	Water	353.2	
LCS 490-170681/5	Lab Control Sample	Total/NA	Water	353.2	
LCSD 490-170681/6	Lab Control Sample Dup	Total/NA	Water	353.2	
MB 490-170681/4	Method Blank	Total/NA	Water	353.2	

Prep Batch: 170737

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-54720-1	WF001	Total/NA	Water	365.2/365.3/365	
490-54720-2	WF002	Total/NA	Water	365.2/365.3/365	
490-54720-3	WF003	Total/NA	Water	365.2/365.3/365	
490-54720-4	WF004	Total/NA	Water	365.2/365.3/365	
490-54720-5	WF005	Total/NA	Water	365.2/365.3/365	
490-54720-6	WF002-Dup	Total/NA	Water	365.2/365.3/365	
LCS 490-170737/2-A	Lab Control Sample	Total/NA	Water	365.2/365.3/365	
MB 490-170737/1-A	Method Blank	Total/NA	Water	365.2/365.3/365	

Prep Batch: 170891

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-54720-1	WF001	Total/NA	Water	Distill/Ammonia	
490-54720-1 MS	WF001	Total/NA	Water	Distill/Ammonia	
490-54720-2	WF002	Total/NA	Water	Distill/Ammonia	
490-54720-3	WF003	Total/NA	Water	Distill/Ammonia	
490-54720-4	WF004	Total/NA	Water	Distill/Ammonia	
490-54720-5	WF005	Total/NA	Water	Distill/Ammonia	
490-54720-6	WF002-Dup	Total/NA	Water	Distill/Ammonia	
490-55027-D-2-D MS	Matrix Spike	Total/NA	Water	Distill/Ammonia	
LCS 490-170891/2-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 490-170891/1-A	Method Blank	Total/NA	Water	Distill/Ammonia	

QC Association Summary

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54720-1

General Chemistry (Continued)

Analysis Batch: 170940

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-54720-1	WF001	Total/NA	Water	350.1	170891
490-54720-1 MS	WF001	Total/NA	Water	350.1	170891
490-54720-2	WF002	Total/NA	Water	350.1	170891
490-54720-3	WF003	Total/NA	Water	350.1	170891
490-54720-4	WF004	Total/NA	Water	350.1	170891
490-54720-5	WF005	Total/NA	Water	350.1	170891
490-54720-6	WF002-Dup	Total/NA	Water	350.1	170891
490-55027-D-2-D MS	Matrix Spike	Total/NA	Water	350.1	170891
LCS 490-170891/2-A	Lab Control Sample	Total/NA	Water	350.1	170891
MB 490-170891/1-A	Method Blank	Total/NA	Water	350.1	170891

Prep Batch: 170987

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-54670-A-1-G MS	Matrix Spike	Total/NA	Water	351.2	
490-54670-A-1-H MSD	Matrix Spike Duplicate	Total/NA	Water	351.2	
490-54720-1	WF001	Total/NA	Water	351.2	
490-54720-1 MS	WF001	Total/NA	Water	351.2	
490-54720-1 MSD	WF001	Total/NA	Water	351.2	
490-54720-2	WF002	Total/NA	Water	351.2	
490-54720-3	WF003	Total/NA	Water	351.2	
490-54720-4	WF004	Total/NA	Water	351.2	
490-54720-5	WF005	Total/NA	Water	351.2	
490-54720-6	WF002-Dup	Total/NA	Water	351.2	
LCS 490-170987/2-A	Lab Control Sample	Total/NA	Water	351.2	
MB 490-170987/1-A	Method Blank	Total/NA	Water	351.2	

Analysis Batch: 171062

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-54670-A-1-G MS	Matrix Spike	Total/NA	Water	351.2	170987
490-54670-A-1-H MSD	Matrix Spike Duplicate	Total/NA	Water	351.2	170987
490-54720-1	WF001	Total/NA	Water	351.2	170987
490-54720-1 MS	WF001	Total/NA	Water	351.2	170987
490-54720-1 MSD	WF001	Total/NA	Water	351.2	170987
490-54720-2	WF002	Total/NA	Water	351.2	170987
490-54720-3	WF003	Total/NA	Water	351.2	170987
490-54720-4	WF004	Total/NA	Water	351.2	170987
490-54720-5	WF005	Total/NA	Water	351.2	170987
490-54720-6	WF002-Dup	Total/NA	Water	351.2	170987
LCS 490-170987/2-A	Lab Control Sample	Total/NA	Water	351.2	170987
MB 490-170987/1-A	Method Blank	Total/NA	Water	351.2	170987

Analysis Batch: 171086

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-54720-1	WF001	Total/NA	Water	365.4	170737
490-54720-2	WF002	Total/NA	Water	365.4	170737
490-54720-3	WF003	Total/NA	Water	365.4	170737
490-54720-4	WF004	Total/NA	Water	365.4	170737
490-54720-5	WF005	Total/NA	Water	365.4	170737
490-54720-6	WF002-Dup	Total/NA	Water	365.4	170737
LCS 490-170737/2-A	Lab Control Sample	Total/NA	Water	365.4	170737
MB 490-170737/1-A	Method Blank	Total/NA	Water	365.4	170737

Lab Chronicle

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54720-1

Client Sample ID: WF001

Lab Sample ID: 490-54720-1

Date Collected: 06/06/14 11:15
Matrix: Water
Date Received: 06/06/14 12:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	170891	06/19/14 10:24	SDJ	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	170940	06/19/14 12:18	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	170987	06/19/14 11:54	REM	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	171062	06/19/14 16:59	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	170378	06/17/14 16:11	RKG	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	170737	06/18/14 11:39	REM	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	171086	06/19/14 17:51	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	170257	06/15/14 00:00	PHB	TAL NSH
Total/NA	Analysis	SM 2540D		1	550 mL	1000 mL	168218	06/10/14 15:00	CRM	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	167719	06/07/14 11:52	CRM	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	169164	06/12/14 16:47	BLM	TAL NSH

Client Sample ID: WF002

Lab Sample ID: 490-54720-2

Date Collected: 06/06/14 10:45
Matrix: Water
Date Received: 06/06/14 12:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	170891	06/19/14 10:24	SDJ	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	170940	06/19/14 12:19	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	170987	06/19/14 11:54	REM	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	171062	06/19/14 16:58	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	170378	06/17/14 16:14	RKG	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	170737	06/18/14 11:39	REM	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	171086	06/19/14 17:52	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	170257	06/15/14 00:06	PHB	TAL NSH
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	168218	06/10/14 15:00	CRM	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	167719	06/07/14 11:52	CRM	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	169164	06/12/14 16:47	BLM	TAL NSH

Client Sample ID: WF003

Lab Sample ID: 490-54720-3

Date Collected: 06/06/14 09:55
Matrix: Water
Date Received: 06/06/14 12:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	170891	06/19/14 10:24	SDJ	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	170940	06/19/14 12:20	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	170987	06/19/14 11:54	REM	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	171062	06/19/14 16:44	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	170378	06/17/14 16:15	RKG	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	170737	06/18/14 11:39	REM	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	171086	06/19/14 17:53	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	170257	06/15/14 00:13	PHB	TAL NSH

Lab Chronicle

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54720-1

Client Sample ID: WF003 — Lab Sample ID: 490-54720-3

Date Collected: 06/06/14 09:55 — **Matrix: Water**
Date Received: 06/06/14 12:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	168218	06/10/14 15:00	CRM	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	167719	06/07/14 11:52	CRM	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	169164	06/12/14 16:18	BLM	TAL NSH

Client Sample ID: WF004 — Lab Sample ID: 490-54720-4

Date Collected: 06/06/14 08:02 — **Matrix: Water**
Date Received: 06/06/14 12:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	170891	06/19/14 10:24	SDJ	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	170940	06/19/14 12:21	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	170987	06/19/14 11:54	REM	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	171062	06/19/14 16:47	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	170378	06/17/14 16:16	RKG	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	170737	06/18/14 11:39	REM	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	171086	06/19/14 17:54	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	170257	06/15/14 00:18	PHB	TAL NSH
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	168218	06/10/14 15:00	CRM	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	167719	06/07/14 11:52	CRM	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	169164	06/12/14 16:29	BLM	TAL NSH

Client Sample ID: WF005 — Lab Sample ID: 490-54720-5

Date Collected: 06/06/14 08:26 — **Matrix: Water**
Date Received: 06/06/14 12:45

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	170891	06/19/14 10:24	SDJ	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	170940	06/19/14 12:21	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	170987	06/19/14 11:54	REM	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	171062	06/19/14 16:48	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	170378	06/17/14 16:17	RKG	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	170737	06/18/14 11:39	REM	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	171086	06/19/14 17:55	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	170257	06/15/14 00:24	PHB	TAL NSH
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	168218	06/10/14 15:00	CRM	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	167719	06/07/14 11:54	CRM	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	169164	06/12/14 16:29	BLM	TAL NSH

Lab Chronicle

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54720-1

Client Sample ID: WF002-Dup

Date Collected: 06/06/14 10:47
Date Received: 06/06/14 12:45

Lab Sample ID: 490-54720-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	170891	06/19/14 10:24	SDJ	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	170940	06/19/14 12:22	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	170987	06/19/14 11:54	REM	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	171062	06/19/14 16:49	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	170378	06/17/14 16:18	RKG	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	170737	06/18/14 11:39	REM	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	171086	06/19/14 17:56	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	170257	06/15/14 00:30	PHB	TAL NSH
Total/NA	Analysis	SM 2540D		1	750 mL	1000 mL	168218	06/10/14 15:00	CRM	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	167719	06/07/14 11:54	CRM	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	169164	06/12/14 16:29	BLM	TAL NSH

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Method Summary

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54720-1

Method	Method Description	Protocol	Laboratory
350.1	Nitrogen, Ammonia	MCAWW	TAL NSH
351.2	Nitrogen, Total Kjeldahl	MCAWW	TAL NSH
353.2	Nitrogen, Nitrate-Nitrite	MCAWW	TAL NSH
365.4	Phosphorus, Total	EPA	TAL NSH
SM 2320B	Alkalinity	SM	TAL NSH
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL NSH
SM 4500 P E	Orthophosphate	SM	TAL NSH
SM4500 SiO2 C	Silica, Molybdosilicate Method	SM	TAL NSH

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "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",

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Certification Summary

Client: Aquaeter Inc
Project/Site: Aquaeter Treated Wastewater

TestAmerica Job ID: 490-54720-1

Laboratory: TestAmerica Nashville

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	A2LA		NA: NELAP & A2LA	12-31-15
A2LA	ISO/IEC 17025		0453.07	12-31-15
Alaska (UST)	State Program	10	UST-087	07-24-14
Arizona	State Program	9	AZ0473	05-05-15
Arkansas DEQ	State Program	6	88-0737	04-25-15
California	NELAP	9	1168CA	10-31-14
Connecticut	State Program	1	PH-0220	12-31-15
Florida	NELAP	4	E87358	06-30-15
Illinois	NELAP	5	200010	12-09-14
Iowa	State Program	7	131	05-01-14 *
Kansas	NELAP	7	E-10229	10-31-14
Kentucky (UST)	State Program	4	19	06-30-14 *
Louisiana	NELAP	6	30613	06-30-15
Maryland	State Program	3	316	03-31-15
Massachusetts	State Program	1	M-TN032	06-30-15
Minnesota	NELAP	5	047-999-345	12-31-14
Mississippi	State Program	4	N/A	06-30-14 *
Montana (UST)	State Program	8	NA	02-24-20
Nevada	State Program	9	TN00032	07-31-14
New Hampshire	NELAP	1	2963	10-09-14
New Jersey	NELAP	2	TN965	06-30-15
New York	NELAP	2	11342	03-31-15
North Carolina (WW/SW)	State Program	4	387	12-31-14
North Dakota	State Program	8	R-146	06-30-14 *
Ohio VAP	State Program	5	CL0033	10-16-15
Oklahoma	State Program	6	9412	08-31-14
Oregon	NELAP	10	TN200001	04-29-15
Pennsylvania	NELAP	3	68-00585	06-30-15
Rhode Island	State Program	1	LAO00268	12-30-14
South Carolina	State Program	4	84009 (001)	02-28-14 *
South Carolina (DW)	State Program	4	84009 (002)	02-23-17
Tennessee	State Program	4	2008	02-23-17
Texas	NELAP	6	T104704077	08-31-14
USDA	Federal		S-48469	10-30-16
Utah	NELAP	8	TN00032	07-31-14
Virginia	NELAP	3	460152	06-14-15
Washington	State Program	10	C789	07-19-14
West Virginia DEP	State Program	3	219	02-28-15
Wisconsin	State Program	5	998020430	08-31-14
Wyoming (UST)	A2LA	8	453.07	12-31-15

* Certification renewal pending - certification considered valid.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

COOLER RECEIPT FORM

490-54720 Chain of Custody

Cooler Received/Opened On 6/6/2014 @ 1245

1. Tracking # N/A

Courier: Off-Street IR Gun ID Raynger

2. Temperature of rep. sample or temp blank when opened: 12.3 *Degrees Celsius*

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO...NA

4. Were custody seals on outside of cooler? YES...NO...NA

If yes, how many and where: NA

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (intial) D

7. Were custody seals on containers: YES NO and Intact YES...NO...NA

Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES...NO...NA

b. Was there any observable headspace present in any VOA vial? YES...NO...NA

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence # NA

I certify that I unloaded the cooler and answered questions 7-14 (intial) M

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA

b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial) M

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial) M

I certify that I attached a label with the unique LIMS number to each container (intial) D

21. Were there Non-Conformance issues at login? YES...NO Was a NCM generated? YES...NO...#_____

BIS = Broken in shipment

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

Loc: 490
54720

COOLER RECEIPT FORM

Cooler Received/Opened On 6/6/2014 @ 1245

1. Tracking # N/A

Courier: Off-Street IR Gun ID Raynger

2. Temperature of rep. sample or temp blank when opened: 15.9 *Degrees Celsius*

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO...NA

4. Were custody seals on outside of cooler? YES...NO...NA

If yes, how many and where: NA

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (intial) D

7. Were custody seals on containers: YES NO and Intact YES...NO...NA

Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES...NO...NA

b. Was there any observable headspace present in any VOA vial? YES...NO...NA

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence # NA

I certify that I unloaded the cooler and answered questions 7-14 (intial) M

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA

b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial) M

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial) M

I certify that I attached a label with the unique LIMS number to each container (intial) D

21. Were there Non-Conformance issues at login? YES...NO Was a NCM generated? YES...NO...#_____

BIS = Broken in shipment
Cooler Receipt Form.doc

LF-1
End of Form

Revised 11/28/12

49007047

Loc: 490
54720

7/1/2014

TestAmerica ANALYTICAL TESTING CORPORATION

Nashville Division
2960 Foster Creighton
Nashville, TN 37204

Phone: 615-726-0177
Fax: 615-726-3404

To assist us in using the proper analytical methods, is this work being conducted for regulatory purposes?
Compliance Monitoring _____

Client Name: AquAe Ter, Inc. Client #: _____
Address: 215 Jamestown Park, Suite 100
City/State/Zip Code: Brentwood TN 37027
Project Manager: Nick Carmean
Telephone Number: (615) 373-8532 Fax: (615) 373-8512
Sampler Name: (Print Name) Nick Carmean Rachel Meadors
Sampler Signature: Rachel Meadors

Project Name: _____
Project #: _____
Site/Location ID: _____ State: _____
Report To: _____
Invoice To: _____
Quote #: _____ PO#: _____

TAT
___ Standard
___ Rush (surcharges may apply)
Date Needed: _____
Fax Results: Y N

SAMPLE ID	Date Sampled	Time Sampled	G = Grab, C = Composite	Field Filtered	Matrix (SL - Sludge, DW - Drinking Water, GW - Groundwater, S - Soil/Solid, WW - Wastewater, Specify Other)	Preservation & # of Containers: HNO_3	HCl	NaOH	H_2SO_4	Methanol	None	Other (Specify)	Analyze For: 350.1-Ammonia	351.2-TKN	353.2-Nitrate Nitrite	365.4-Total Phosphorus	SM2320-Bicarbonate Alkalinity	SM5600 Ortho phosphate	SM4500-Silica	SM2540D Total suspended solids			REMARKS
WF001	6/6/14	1115	G		W																		
WF002	6/6/14	1045	G		W																		
WF003	6/6/14	0955	G		W																		
WF004	6/6/14	0802	G		W																		
WF005	6/6/14	0826	G		W																		
WF002-DUP	6/6/14	1047	G		W																		

QC Deliverables
___ None
___ Level 2 (Batch QC)
___ Level 3
___ Level 4
Other: _____

Special Instructions:

12.3 / 5.9

Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Nick Carmean	6/6		TSW	6/6/14	1245
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:

LABORATORY COMMENTS:
Init Lab Temp:
Rec Lab Temp:
Custody Seals: Y N N/A
Bottles Supplied by Test America: Y N
Method of Shipment:

Login Sample Receipt Checklist

Client: Aquaeter Inc

Job Number: 490-54720-1

Login Number: 54720

List Source: TestAmerica Nashville

List Number: 1

Creator: Buckingham, Paul

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	True	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Tel: (615)726-0177

TestAmerica Job ID: 490-65411-1
Client Project/Site: Stones River

For:
Aquaeter Inc
215 Jamestown Park
Suite 204
Brentwood, Tennessee 37027

Attn: Nick Carmean

Heather Baker

Authorized for release by:
12/1/2014 10:10:16 AM

Heather Baker, Project Manager I
(615)301-5043
heather.baker@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Sample Summary

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-65411-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-65411-1	EF001	Water	11/04/14 09:20	11/04/14 16:25
490-65411-2	EF002	Water	11/04/14 09:35	11/04/14 16:25
490-65411-3	EF003	Water	11/04/14 10:05	11/04/14 16:25
490-65411-4	EF004	Water	11/04/14 10:20	11/04/14 16:25
490-65411-5	EF005	Water	11/04/14 11:30	11/04/14 16:25
490-65411-6	WF004	Water	11/04/14 12:05	11/04/14 16:25
490-65411-7	WF005	Water	11/04/14 12:30	11/04/14 16:25
490-65411-8	WF005DUP	Water	11/04/14 12:35	11/04/14 16:25
490-65411-9	WF003	Water	11/04/14 13:30	11/04/14 16:25
490-65411-10	WF002	Water	11/04/14 14:55	11/04/14 16:25
490-65411-11	WF001	Water	11/04/14 15:25	11/04/14 16:25

Case Narrative

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-65411-1

Job ID: 490-65411-1

Laboratory: TestAmerica Nashville

Narrative

Job Narrative
490-65411-1

Comments
No additional comments.

Receipt
The samples were received on 11/4/2014 4:25 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 3.0º C and 5.9º C.

General Chemistry
Method(s) SM 4500 P E: Reanalysis of the following sample(s) was performed outside of the analytical holding time due to client requested lab filtration not performed: EF004 (490-65411-4), EF005 (490-65411-5), WF001 (490-65411-11), WF002 (490-65411-10), WF003 (490-65411-9), WF004 (490-65411-6), WF005 (490-65411-7), WF005DUP (490-65411-8).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Definitions/Glossary

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-65411-1

Qualifiers

General Chemistry

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
F1	MS and/or MSD Recovery exceeds the control limits
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-65411-1

Client Sample ID: EF001 — Lab Sample ID: 490-65411-1

Date Collected: 11/04/14 09:20
Date Received: 11/04/14 16:25
Matrix: Water

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	ND		0.100		mg/L		11/14/14 13:06	11/14/14 14:50	1
Kjeldahl Nitrogen as N	**0.529**		0.250		mg/L		11/13/14 11:00	11/14/14 15:38	1
Nitrate Nitrite as N	**0.876**		0.100		mg/L			11/13/14 14:17	1
Phosphorus, Total	ND		0.100		mg/L		11/12/14 09:33	11/13/14 19:53	1
Bicarbonate Alkalinity	**191**		10.0		mg/L			11/05/14 23:06	1
Total Suspended Solids	**5.30**		1.00		mg/L			11/05/14 23:41	1
Orthophosphate as P, Dissolved	ND	H	0.100		mg/L			11/21/14 16:41	1
Silica	**6.78**		1.00		mg/L			11/11/14 16:51	1

Client Sample ID: EF002 — Lab Sample ID: 490-65411-2

Date Collected: 11/04/14 09:35
Date Received: 11/04/14 16:25
Matrix: Water

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	ND		0.100		mg/L		11/14/14 13:06	11/14/14 14:51	1
Kjeldahl Nitrogen as N	**0.570**		0.250		mg/L		11/13/14 11:00	11/14/14 15:38	1
Nitrate Nitrite as N	**0.889**		0.100		mg/L			11/13/14 14:18	1
Phosphorus, Total	**0.280**		0.100		mg/L		11/12/14 09:33	11/13/14 19:54	1
Bicarbonate Alkalinity	**196**		10.0		mg/L			11/05/14 23:18	1
Total Suspended Solids	**4.70**		1.00		mg/L			11/05/14 23:41	1
Orthophosphate as P, Dissolved	ND	H	0.100		mg/L			11/21/14 16:41	1
Silica	**6.63**		1.00		mg/L			11/11/14 16:51	1

Client Sample ID: EF003 — Lab Sample ID: 490-65411-3

Date Collected: 11/04/14 10:05
Date Received: 11/04/14 16:25
Matrix: Water

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	ND		0.100		mg/L		11/14/14 13:06	11/14/14 14:52	1
Kjeldahl Nitrogen as N	**0.389**		0.250		mg/L		11/13/14 11:00	11/14/14 15:38	1
Nitrate Nitrite as N	**0.884**		0.100		mg/L			11/13/14 14:23	1
Phosphorus, Total	ND		0.100		mg/L		11/12/14 09:33	11/13/14 19:55	1
Bicarbonate Alkalinity	**203**		10.0		mg/L			11/05/14 23:24	1
Total Suspended Solids	**3.10**		1.00		mg/L			11/05/14 23:41	1
Orthophosphate as P, Dissolved	ND	H	0.100		mg/L			11/21/14 16:41	1
Silica	**6.45**		1.00		mg/L			11/11/14 16:51	1

Client Sample ID: EF004 — Lab Sample ID: 490-65411-4

Date Collected: 11/04/14 10:20
Date Received: 11/04/14 16:25
Matrix: Water

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	ND		0.100		mg/L		11/14/14 13:06	11/14/14 14:53	1
Kjeldahl Nitrogen as N	**0.542**		0.250		mg/L		11/13/14 11:00	11/14/14 15:38	1
Nitrate Nitrite as N	**0.907**		0.100		mg/L			11/13/14 14:23	1
Phosphorus, Total	ND		0.100		mg/L		11/12/14 09:33	11/13/14 19:56	1
Bicarbonate Alkalinity	**205**		10.0		mg/L			11/05/14 23:30	1

Client Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-65411-1

Client Sample ID: EF004 — Lab Sample ID: 490-65411-4

Date Collected: 11/04/14 10:20 — **Matrix: Water**
Date Received: 11/04/14 16:25

General Chemistry (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	2.40		1.00		mg/L			11/05/14 23:41	1
Orthophosphate as P, Dissolved	ND	H	0.100		mg/L			11/29/14 19:11	1
Silica	6.45		1.00		mg/L			11/11/14 16:51	1

Client Sample ID: EF005 — Lab Sample ID: 490-65411-5

Date Collected: 11/04/14 11:30 — **Matrix: Water**
Date Received: 11/04/14 16:25

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	ND		0.100		mg/L		11/14/14 13:06	11/14/14 14:54	1
Kjeldahl Nitrogen as N	0.355		0.250		mg/L		11/13/14 11:00	11/14/14 15:38	1
Nitrate Nitrite as N	0.863		0.100		mg/L			11/13/14 14:24	1
Phosphorus, Total	ND		0.100		mg/L		11/12/14 09:33	11/13/14 19:59	1
Bicarbonate Alkalinity	206		10.0		mg/L			11/05/14 23:35	1
Total Suspended Solids	2.60		1.00		mg/L			11/05/14 23:41	1
Orthophosphate as P, Dissolved	ND	H	0.100		mg/L			11/29/14 19:11	1
Silica	6.65		1.00		mg/L			11/11/14 16:55	1

Client Sample ID: WF004 — Lab Sample ID: 490-65411-6

Date Collected: 11/04/14 12:05 — **Matrix: Water**
Date Received: 11/04/14 16:25

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	ND		0.100		mg/L		11/14/14 13:06	11/14/14 14:55	1
Kjeldahl Nitrogen as N	0.311		0.250		mg/L		11/13/14 11:00	11/14/14 15:38	1
Nitrate Nitrite as N	0.635		0.100		mg/L			11/13/14 14:25	1
Phosphorus, Total	ND		0.100		mg/L		11/12/14 09:33	11/13/14 20:00	1
Bicarbonate Alkalinity	201		10.0		mg/L			11/05/14 23:41	1
Total Suspended Solids	3.00		1.00		mg/L			11/06/14 15:46	1
Orthophosphate as P, Dissolved	ND	H	0.100		mg/L			11/29/14 19:11	1
Silica	4.78		1.00		mg/L			11/11/14 17:17	1

Client Sample ID: WF005 — Lab Sample ID: 490-65411-7

Date Collected: 11/04/14 12:30 — **Matrix: Water**
Date Received: 11/04/14 16:25

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	0.104		0.100		mg/L		11/14/14 13:06	11/14/14 14:58	1
Kjeldahl Nitrogen as N	0.365		0.250		mg/L		11/13/14 11:00	11/14/14 15:38	1
Nitrate Nitrite as N	0.633		0.100		mg/L			11/13/14 14:26	1
Phosphorus, Total	ND		0.100		mg/L		11/12/14 09:33	11/13/14 20:01	1
Bicarbonate Alkalinity	198		10.0		mg/L			11/05/14 23:58	1
Total Suspended Solids	1.70		1.00		mg/L			11/06/14 15:46	1
Orthophosphate as P, Dissolved	ND	H	0.100		mg/L			11/29/14 19:11	1
Silica	5.04		1.00		mg/L			11/11/14 17:17	1

Client Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-65411-1

Client Sample ID: WF005DUP — Lab Sample ID: 490-65411-8

Date Collected: 11/04/14 12:35 — **Matrix: Water**
Date Received: 11/04/14 16:25

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	ND		0.100		mg/L		11/14/14 13:06	11/14/14 14:59	1
Kjeldahl Nitrogen as N	**0.294**		0.250		mg/L		11/13/14 11:00	11/14/14 15:38	1
Nitrate Nitrite as N	**0.624**		0.100		mg/L			11/13/14 14:27	1
Phosphorus, Total	ND		0.100		mg/L		11/12/14 09:33	11/13/14 20:28	1
Bicarbonate Alkalinity	**199**		10.0		mg/L			11/06/14 00:04	1
Total Suspended Solids	**1.70**		1.00		mg/L			11/06/14 15:46	1
Orthophosphate as P, Dissolved	ND	H	0.100		mg/L			11/29/14 19:11	1
Silica	**5.14**		1.00		mg/L			11/11/14 17:43	1

Client Sample ID: WF003 — Lab Sample ID: 490-65411-9

Date Collected: 11/04/14 13:30 — **Matrix: Water**
Date Received: 11/04/14 16:25

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	**0.104**		0.100		mg/L		11/14/14 13:06	11/14/14 15:00	1
Kjeldahl Nitrogen as N	**0.262**		0.250		mg/L		11/13/14 11:00	11/14/14 15:38	1
Nitrate Nitrite as N	**1.51**		0.100		mg/L			11/13/14 14:28	1
Phosphorus, Total	ND		0.100		mg/L		11/12/14 09:33	11/13/14 20:29	1
Bicarbonate Alkalinity	**213**		10.0		mg/L			11/06/14 00:10	1
Total Suspended Solids	**2.20**		1.00		mg/L			11/06/14 15:46	1
Orthophosphate as P, Dissolved	ND	H	0.100		mg/L			11/29/14 19:11	1
Silica	**7.05**		1.00		mg/L			11/11/14 17:43	1

Client Sample ID: WF002 — Lab Sample ID: 490-65411-10

Date Collected: 11/04/14 14:55 — **Matrix: Water**
Date Received: 11/04/14 16:25

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	**0.126**		0.100		mg/L		11/14/14 13:06	11/14/14 15:00	1
Kjeldahl Nitrogen as N	**0.348**		0.250		mg/L		11/13/14 11:00	11/14/14 15:38	1
Nitrate Nitrite as N	**1.03**		0.100		mg/L			11/13/14 14:29	1
Phosphorus, Total	**0.211**		0.100		mg/L		11/19/14 13:59	11/21/14 13:48	1
Bicarbonate Alkalinity	**209**		10.0		mg/L			11/06/14 00:15	1
Total Suspended Solids	**12.8**		1.00		mg/L			11/06/14 15:46	1
Orthophosphate as P, Dissolved	**0.220**	**H**	0.100		mg/L			11/29/14 19:11	1
Silica	**5.86**		1.00		mg/L			11/11/14 17:43	1

Client Sample ID: WF001 — Lab Sample ID: 490-65411-11

Date Collected: 11/04/14 15:25 — **Matrix: Water**
Date Received: 11/04/14 16:25

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	ND		0.100		mg/L		11/14/14 13:06	11/14/14 15:01	1
Kjeldahl Nitrogen as N	**0.317**		0.250		mg/L		11/13/14 11:00	11/14/14 15:38	1
Nitrate Nitrite as N	**0.956**		0.100		mg/L			11/13/14 14:30	1
Phosphorus, Total	**0.169**		0.100		mg/L		11/19/14 13:59	11/21/14 13:51	1
Bicarbonate Alkalinity	**209**		10.0		mg/L			11/06/14 00:21	1

Client Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-65411-1

Client Sample ID: WF001

Date Collected: 11/04/14 15:25
Date Received: 11/04/14 16:25

Lab Sample ID: 490-65411-11

Matrix: Water

General Chemistry (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	3.10		1.00		mg/L			11/06/14 15:46	1
Orthophosphate as P, Dissolved	0.149	H	0.100		mg/L			11/29/14 19:11	1
Silica	5.49		1.00		mg/L			11/11/14 17:43	1

QC Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-65411-1

Method: 350.1 - Nitrogen, Ammonia

Lab Sample ID: MB 490-206267/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 206293 — **Prep Batch: 206267**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	ND		0.100		mg/L		11/14/14 13:06	11/14/14 14:48	1

Lab Sample ID: LCS 490-206267/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 206293 — **Prep Batch: 206267**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia (as N)	5.00	4.506		mg/L		90	90 - 110

Lab Sample ID: 490-65411-1 MS — **Client Sample ID: EF001**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 206293 — **Prep Batch: 206267**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia (as N)	ND		5.00	4.856		mg/L		97	90 - 110

Lab Sample ID: 490-65411-11 MS — **Client Sample ID: WF001**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 206293 — **Prep Batch: 206267**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia (as N)	ND		5.00	4.985		mg/L		100	90 - 110

Method: 351.2 - Nitrogen, Total Kjeldahl

Lab Sample ID: MB 490-205810/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 207061 — **Prep Batch: 205810**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Kjeldahl Nitrogen as N	ND		0.250		mg/L		11/13/14 11:00	11/14/14 15:38	1

Lab Sample ID: LCS 490-205810/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 207061 — **Prep Batch: 205810**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Kjeldahl Nitrogen as N	2.50	2.432		mg/L		97	90 - 110

Lab Sample ID: 490-65411-11 MS — **Client Sample ID: WF001**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 207061 — **Prep Batch: 205810**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Kjeldahl Nitrogen as N	0.317		2.50	2.718		mg/L		96	90 - 110

QC Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-65411-1

Method: 351.2 - Nitrogen, Total Kjeldahl (Continued)

Lab Sample ID: 490-65411-11 MSD — **Client Sample ID: WF001**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 207061 — **Prep Batch: 205810**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Kjeldahl Nitrogen as N	0.317		2.50	2.680		mg/L		95	90 - 110	1	20

Method: 353.2 - Nitrogen, Nitrate-Nitrite

Lab Sample ID: MB 490-205955/5 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 205955

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate Nitrite as N	ND		0.100		mg/L			11/13/14 14:05	1

Lab Sample ID: LCS 490-205955/6 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 205955

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate Nitrite as N	6.00	6.299		mg/L		105	90 - 110

Lab Sample ID: LCSD 490-205955/7 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 205955

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate Nitrite as N	6.00	6.339		mg/L		106	90 - 110	1	20

Lab Sample ID: 490-65348-L-3 MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 205955

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate Nitrite as N	3.62		6.00	9.330		mg/L		95	90 - 110

Lab Sample ID: 490-65348-L-3 MSD — **Client Sample ID: Matrix Spike Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 205955

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate Nitrite as N	3.62		6.00	9.048		mg/L		90	90 - 110	3	20

Lab Sample ID: 490-65348-L-6 MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 205955

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate Nitrite as N	3.63		6.00	9.275		mg/L		94	90 - 110

QC Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-65411-1

Method: 365.4 - Phosphorus, Total

Lab Sample ID: MB 490-205413/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 206207 — **Prep Batch: 205413**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	ND		0.100		mg/L		11/12/14 09:33	11/13/14 19:49	1

Lab Sample ID: LCS 490-205413/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 206207 — **Prep Batch: 205413**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phosphorus, Total	2.00	2.007		mg/L		100	90 - 110

Lab Sample ID: 490-65599-B-4-B MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 206208 — **Prep Batch: 205413**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Phosphorus, Total	69.9		2.00	124.0	4	mg/L		2703	73 - 119

Lab Sample ID: 490-65599-B-4-C MSD — **Client Sample ID: Matrix Spike Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 206208 — **Prep Batch: 205413**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Phosphorus, Total	69.9		2.00	133.7	4	mg/L		3189	73 - 119	8	20

Lab Sample ID: 490-65411-4 DU — **Client Sample ID: EF004**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 206207 — **Prep Batch: 205413**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Phosphorus, Total	ND		ND		mg/L		NC	20

Lab Sample ID: MB 490-207419/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 208221 — **Prep Batch: 207419**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	ND		0.100		mg/L		11/19/14 13:59	11/21/14 13:46	1

Lab Sample ID: LCS 490-207419/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 208221 — **Prep Batch: 207419**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phosphorus, Total	2.00	2.101		mg/L		105	90 - 110

Lab Sample ID: 490-65411-10 MS — **Client Sample ID: WF002**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 208221 — **Prep Batch: 207419**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Phosphorus, Total	0.211		2.00	1.537	F1	mg/L		66	73 - 119

QC Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-65411-1

Lab Sample ID: 490-65411-10 MSD — **Client Sample ID: WF002**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 208221 — **Prep Batch: 207419**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Phosphorus, Total	0.211		2.00	1.598	F1	mg/L		69	73 - 119	4	20

Lab Sample ID: 490-65411-11 DU — **Client Sample ID: WF001**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 208221 — **Prep Batch: 207419**

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Phosphorus, Total	0.169			0.2050		mg/L				19	20

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 490-204090/5 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 204090

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity	ND		10.0		mg/L			11/05/14 16:37	1

Lab Sample ID: 490-65411-1 DU — **Client Sample ID: EF001**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 204090

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Bicarbonate Alkalinity	191			194.4		mg/L				2	20

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 490-203730/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 203730

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		1.00		mg/L			11/05/14 23:41	1

Lab Sample ID: LCS 490-203730/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 203730

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Suspended Solids			100	91.30		mg/L		91	90 - 110		

Lab Sample ID: 490-65364-B-4 DU — **Client Sample ID: Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 203730

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Suspended Solids	80.0			83.00		mg/L				4	20

Method: SM 2540D - Solids, Total Suspended (TSS) (Continued)

Lab Sample ID: 490-65416-O-1 DU — **Client Sample ID: Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 203730

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Suspended Solids	ND			ND		mg/L				NC	20

Lab Sample ID: MB 490-204029/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 204029

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		1.00		mg/L			11/06/14 15:46	1

Lab Sample ID: LCS 490-204029/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 204029

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Suspended Solids			100	100.1		mg/L		100	90 - 110		

Lab Sample ID: LCSD 490-204029/3 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 204029

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Suspended Solids			100	101.1		mg/L		101	90 - 110	1	20

Lab Sample ID: 490-65435-C-1 DU — **Client Sample ID: Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 204029

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Suspended Solids	4.32			4.632		mg/L				7	20

Lab Sample ID: 490-65451-G-1 DU — **Client Sample ID: Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 204029

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Suspended Solids	337			340.0		mg/L				0.9	20

Method: SM 4500 P E - Orthophosphate

Lab Sample ID: MB 490-208270/2 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 208270

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Orthophosphate as P, Dissolved	ND		0.100		mg/L			11/21/14 16:01	1

Method: SM 4500 P E - Orthophosphate (Continued)

Lab Sample ID: LCS 490-208270/5 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 208270

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Orthophosphate as P, Dissolved	0.250	0.2404		mg/L		96	90 - 110

Lab Sample ID: 490-65411-1 MS — **Client Sample ID: EF001**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 208270

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Orthophosphate as P, Dissolved	ND	H	0.250	0.3023		mg/L		87	72 - 129

Lab Sample ID: 490-65411-1 MSD — **Client Sample ID: EF001**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 208270

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Orthophosphate as P, Dissolved	ND	H	0.250	0.3101		mg/L		90	72 - 129	3	20

Lab Sample ID: 490-65411-1 DU — **Client Sample ID: EF001**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 208270

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Orthophosphate as P, Dissolved	ND	H	ND		mg/L		NC	20

Method: SM4500 SiO2 C - Silica, Molybdosilicate Method

Lab Sample ID: MB 490-205316/37 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 205316

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silica	ND		1.00		mg/L			11/11/14 17:17	1

Lab Sample ID: MB 490-205316/6 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 205316

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silica	ND		1.00		mg/L			11/11/14 15:53	1

Lab Sample ID: LCS 490-205316/38 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 205316

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Silica	25.0	24.88		mg/L		100	90 - 110

Method: SM4500 SiO2 C - Silica, Molybdosilicate Method (Continued)

Lab Sample ID: LCS 490-205316/7 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 205316

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Silica	25.0	24.39		mg/L		98	90 - 110

Lab Sample ID: LCSD 490-205316/39 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 205316

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Silica	25.0	24.91		mg/L		100	90 - 110	0	10

Lab Sample ID: LCSD 490-205316/8 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 205316

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Silica	25.0	24.37		mg/L		97	90 - 110	0	10

Lab Sample ID: 490-65411-8 MS — **Client Sample ID: WF005DUP**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 205316

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Silica	5.14		25.0	29.45		mg/L		97	80 - 120

Lab Sample ID: 490-65411-8 MSD — **Client Sample ID: WF005DUP**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 205316

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Silica	5.14		25.0	29.76		mg/L		98	80 - 120	1	20

Lab Sample ID: 490-65411-8 DU — **Client Sample ID: WF005DUP**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 205316

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Silica	5.14		5.003		mg/L		3	20

QC Association Summary

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-65411-1

General Chemistry

Analysis Batch: 203730

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-65364-B-4 DU	Duplicate	Total/NA	Water	SM 2540D	
490-65411-1	EF001	Total/NA	Water	SM 2540D	
490-65411-2	EF002	Total/NA	Water	SM 2540D	
490-65411-3	EF003	Total/NA	Water	SM 2540D	
490-65411-4	EF004	Total/NA	Water	SM 2540D	
490-65411-5	EF005	Total/NA	Water	SM 2540D	
490-65416-O-1 DU	Duplicate	Total/NA	Water	SM 2540D	
LCS 490-203730/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 490-203730/1	Method Blank	Total/NA	Water	SM 2540D	

Analysis Batch: 204029

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-65411-6	WF004	Total/NA	Water	SM 2540D	
490-65411-7	WF005	Total/NA	Water	SM 2540D	
490-65411-8	WF005DUP	Total/NA	Water	SM 2540D	
490-65411-9	WF003	Total/NA	Water	SM 2540D	
490-65411-10	WF002	Total/NA	Water	SM 2540D	
490-65411-11	WF001	Total/NA	Water	SM 2540D	
490-65435-C-1 DU	Duplicate	Total/NA	Water	SM 2540D	
490-65451-G-1 DU	Duplicate	Total/NA	Water	SM 2540D	
LCS 490-204029/2	Lab Control Sample	Total/NA	Water	SM 2540D	
LCSD 490-204029/3	Lab Control Sample Dup	Total/NA	Water	SM 2540D	
MB 490-204029/1	Method Blank	Total/NA	Water	SM 2540D	

Analysis Batch: 204090

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-65411-1	EF001	Total/NA	Water	SM 2320B	
490-65411-1 DU	EF001	Total/NA	Water	SM 2320B	
490-65411-2	EF002	Total/NA	Water	SM 2320B	
490-65411-3	EF003	Total/NA	Water	SM 2320B	
490-65411-4	EF004	Total/NA	Water	SM 2320B	
490-65411-5	EF005	Total/NA	Water	SM 2320B	
490-65411-6	WF004	Total/NA	Water	SM 2320B	
490-65411-7	WF005	Total/NA	Water	SM 2320B	
490-65411-8	WF005DUP	Total/NA	Water	SM 2320B	
490-65411-9	WF003	Total/NA	Water	SM 2320B	
490-65411-10	WF002	Total/NA	Water	SM 2320B	
490-65411-11	WF001	Total/NA	Water	SM 2320B	
LCS 490-204090/6	Lab Control Sample	Total/NA	Water	SM 2320B	
LCSD 490-204090/7	Lab Control Sample Dup	Total/NA	Water	SM 2320B	
MB 490-204090/5	Method Blank	Total/NA	Water	SM 2320B	

Analysis Batch: 205316

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-65411-1	EF001	Total/NA	Water	SM4500 SiO2 C	
490-65411-2	EF002	Total/NA	Water	SM4500 SiO2 C	
490-65411-3	EF003	Total/NA	Water	SM4500 SiO2 C	
490-65411-4	EF004	Total/NA	Water	SM4500 SiO2 C	
490-65411-5	EF005	Total/NA	Water	SM4500 SiO2 C	
490-65411-6	WF004	Total/NA	Water	SM4500 SiO2 C	
490-65411-7	WF005	Total/NA	Water	SM4500 SiO2 C	

QC Association Summary

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-65411-1

General Chemistry (Continued)

Analysis Batch: 205316 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-65411-8	WF005DUP	Total/NA	Water	SM4500 SiO2 C	
490-65411-8 DU	WF005DUP	Total/NA	Water	SM4500 SiO2 C	
490-65411-8 MS	WF005DUP	Total/NA	Water	SM4500 SiO2 C	
490-65411-8 MSD	WF005DUP	Total/NA	Water	SM4500 SiO2 C	
490-65411-9	WF003	Total/NA	Water	SM4500 SiO2 C	
490-65411-10	WF002	Total/NA	Water	SM4500 SiO2 C	
490-65411-11	WF001	Total/NA	Water	SM4500 SiO2 C	
LCS 490-205316/38	Lab Control Sample	Total/NA	Water	SM4500 SiO2 C	
LCS 490-205316/7	Lab Control Sample	Total/NA	Water	SM4500 SiO2 C	
LCSD 490-205316/39	Lab Control Sample Dup	Total/NA	Water	SM4500 SiO2 C	
LCSD 490-205316/8	Lab Control Sample Dup	Total/NA	Water	SM4500 SiO2 C	
MB 490-205316/37	Method Blank	Total/NA	Water	SM4500 SiO2 C	
MB 490-205316/6	Method Blank	Total/NA	Water	SM4500 SiO2 C	

Prep Batch: 205413

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-65411-1	EF001	Total/NA	Water	365.2/365.3/365	
490-65411-2	EF002	Total/NA	Water	365.2/365.3/365	
490-65411-3	EF003	Total/NA	Water	365.2/365.3/365	
490-65411-4	EF004	Total/NA	Water	365.2/365.3/365	
490-65411-4 DU	EF004	Total/NA	Water	365.2/365.3/365	
490-65411-5	EF005	Total/NA	Water	365.2/365.3/365	
490-65411-6	WF004	Total/NA	Water	365.2/365.3/365	
490-65411-7	WF005	Total/NA	Water	365.2/365.3/365	
490-65411-8	WF005DUP	Total/NA	Water	365.2/365.3/365	
490-65411-9	WF003	Total/NA	Water	365.2/365.3/365	
490-65599-B-4-B MS	Matrix Spike	Total/NA	Water	365.2/365.3/365	
490-65599-B-4-C MSD	Matrix Spike Duplicate	Total/NA	Water	365.2/365.3/365	
LCS 490-205413/2-A	Lab Control Sample	Total/NA	Water	365.2/365.3/365	
MB 490-205413/1-A	Method Blank	Total/NA	Water	365.2/365.3/365	

Prep Batch: 205810

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-65411-1	EF001	Total/NA	Water	351.2	
490-65411-2	EF002	Total/NA	Water	351.2	
490-65411-3	EF003	Total/NA	Water	351.2	
490-65411-4	EF004	Total/NA	Water	351.2	
490-65411-5	EF005	Total/NA	Water	351.2	
490-65411-6	WF004	Total/NA	Water	351.2	
490-65411-7	WF005	Total/NA	Water	351.2	
490-65411-8	WF005DUP	Total/NA	Water	351.2	
490-65411-9	WF003	Total/NA	Water	351.2	
490-65411-10	WF002	Total/NA	Water	351.2	
490-65411-11	WF001	Total/NA	Water	351.2	
490-65411-11 MS	WF001	Total/NA	Water	351.2	
490-65411-11 MSD	WF001	Total/NA	Water	351.2	
LCS 490-205810/2-A	Lab Control Sample	Total/NA	Water	351.2	
MB 490-205810/1-A	Method Blank	Total/NA	Water	351.2	

QC Association Summary

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-65411-1

General Chemistry (Continued)

Analysis Batch: 205955

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-65348-L-3 MS	Matrix Spike	Total/NA	Water	353.2	
490-65348-L-3 MSD	Matrix Spike Duplicate	Total/NA	Water	353.2	
490-65348-L-6 MS	Matrix Spike	Total/NA	Water	353.2	
490-65411-1	EF001	Total/NA	Water	353.2	
490-65411-2	EF002	Total/NA	Water	353.2	
490-65411-3	EF003	Total/NA	Water	353.2	
490-65411-4	EF004	Total/NA	Water	353.2	
490-65411-5	EF005	Total/NA	Water	353.2	
490-65411-6	WF004	Total/NA	Water	353.2	
490-65411-7	WF005	Total/NA	Water	353.2	
490-65411-8	WF005DUP	Total/NA	Water	353.2	
490-65411-9	WF003	Total/NA	Water	353.2	
490-65411-10	WF002	Total/NA	Water	353.2	
490-65411-11	WF001	Total/NA	Water	353.2	
LCS 490-205955/6	Lab Control Sample	Total/NA	Water	353.2	
LCSD 490-205955/7	Lab Control Sample Dup	Total/NA	Water	353.2	
MB 490-205955/5	Method Blank	Total/NA	Water	353.2	

Analysis Batch: 206207

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-65411-1	EF001	Total/NA	Water	365.4	205413
490-65411-2	EF002	Total/NA	Water	365.4	205413
490-65411-3	EF003	Total/NA	Water	365.4	205413
490-65411-4	EF004	Total/NA	Water	365.4	205413
490-65411-4 DU	EF004	Total/NA	Water	365.4	205413
490-65411-5	EF005	Total/NA	Water	365.4	205413
490-65411-6	WF004	Total/NA	Water	365.4	205413
490-65411-7	WF005	Total/NA	Water	365.4	205413
LCS 490-205413/2-A	Lab Control Sample	Total/NA	Water	365.4	205413
MB 490-205413/1-A	Method Blank	Total/NA	Water	365.4	205413

Analysis Batch: 206208

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-65411-8	WF005DUP	Total/NA	Water	365.4	205413
490-65411-9	WF003	Total/NA	Water	365.4	205413
490-65599-B-4-B MS	Matrix Spike	Total/NA	Water	365.4	205413
490-65599-B-4-C MSD	Matrix Spike Duplicate	Total/NA	Water	365.4	205413

Prep Batch: 206267

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-65411-1	EF001	Total/NA	Water	Distill/Ammonia	
490-65411-1 MS	EF001	Total/NA	Water	Distill/Ammonia	
490-65411-2	EF002	Total/NA	Water	Distill/Ammonia	
490-65411-3	EF003	Total/NA	Water	Distill/Ammonia	
490-65411-4	EF004	Total/NA	Water	Distill/Ammonia	
490-65411-5	EF005	Total/NA	Water	Distill/Ammonia	
490-65411-6	WF004	Total/NA	Water	Distill/Ammonia	
490-65411-7	WF005	Total/NA	Water	Distill/Ammonia	
490-65411-8	WF005DUP	Total/NA	Water	Distill/Ammonia	
490-65411-9	WF003	Total/NA	Water	Distill/Ammonia	
490-65411-10	WF002	Total/NA	Water	Distill/Ammonia	

QC Association Summary

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-65411-1

General Chemistry (Continued)

Prep Batch: 206267 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-65411-11	WF001	Total/NA	Water	Distill/Ammonia	
490-65411-11 MS	WF001	Total/NA	Water	Distill/Ammonia	
LCS 490-206267/2-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 490-206267/1-A	Method Blank	Total/NA	Water	Distill/Ammonia	

Analysis Batch: 206293

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-65411-1	EF001	Total/NA	Water	350.1	206267
490-65411-1 MS	EF001	Total/NA	Water	350.1	206267
490-65411-2	EF002	Total/NA	Water	350.1	206267
490-65411-3	EF003	Total/NA	Water	350.1	206267
490-65411-4	EF004	Total/NA	Water	350.1	206267
490-65411-5	EF005	Total/NA	Water	350.1	206267
490-65411-6	WF004	Total/NA	Water	350.1	206267
490-65411-7	WF005	Total/NA	Water	350.1	206267
490-65411-8	WF005DUP	Total/NA	Water	350.1	206267
490-65411-9	WF003	Total/NA	Water	350.1	206267
490-65411-10	WF002	Total/NA	Water	350.1	206267
490-65411-11	WF001	Total/NA	Water	350.1	206267
490-65411-11 MS	WF001	Total/NA	Water	350.1	206267
LCS 490-206267/2-A	Lab Control Sample	Total/NA	Water	350.1	206267
MB 490-206267/1-A	Method Blank	Total/NA	Water	350.1	206267

Analysis Batch: 207061

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-65411-1	EF001	Total/NA	Water	351.2	205810
490-65411-2	EF002	Total/NA	Water	351.2	205810
490-65411-3	EF003	Total/NA	Water	351.2	205810
490-65411-4	EF004	Total/NA	Water	351.2	205810
490-65411-5	EF005	Total/NA	Water	351.2	205810
490-65411-6	WF004	Total/NA	Water	351.2	205810
490-65411-7	WF005	Total/NA	Water	351.2	205810
490-65411-8	WF005DUP	Total/NA	Water	351.2	205810
490-65411-9	WF003	Total/NA	Water	351.2	205810
490-65411-10	WF002	Total/NA	Water	351.2	205810
490-65411-11	WF001	Total/NA	Water	351.2	205810
490-65411-11 MS	WF001	Total/NA	Water	351.2	205810
490-65411-11 MSD	WF001	Total/NA	Water	351.2	205810
LCS 490-205810/2-A	Lab Control Sample	Total/NA	Water	351.2	205810
MB 490-205810/1-A	Method Blank	Total/NA	Water	351.2	205810

Prep Batch: 207419

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-65411-10	WF002	Total/NA	Water	365.2/365.3/365	
490-65411-10 MS	WF002	Total/NA	Water	365.2/365.3/365	
490-65411-10 MSD	WF002	Total/NA	Water	365.2/365.3/365	
490-65411-11	WF001	Total/NA	Water	365.2/365.3/365	
490-65411-11 DU	WF001	Total/NA	Water	365.2/365.3/365	
LCS 490-207419/2-A	Lab Control Sample	Total/NA	Water	365.2/365.3/365	
MB 490-207419/1-A	Method Blank	Total/NA	Water	365.2/365.3/365	

QC Association Summary

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-65411-1

General Chemistry (Continued)

Analysis Batch: 208221

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-65411-10	WF002	Total/NA	Water	365.4	207419
490-65411-10 MS	WF002	Total/NA	Water	365.4	207419
490-65411-10 MSD	WF002	Total/NA	Water	365.4	207419
490-65411-11	WF001	Total/NA	Water	365.4	207419
490-65411-11 DU	WF001	Total/NA	Water	365.4	207419
LCS 490-207419/2-A	Lab Control Sample	Total/NA	Water	365.4	207419
MB 490-207419/1-A	Method Blank	Total/NA	Water	365.4	207419

Analysis Batch: 208270

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-65411-1	EF001	Total/NA	Water	SM 4500 P E	
490-65411-1 DU	EF001	Total/NA	Water	SM 4500 P E	
490-65411-1 MS	EF001	Total/NA	Water	SM 4500 P E	
490-65411-1 MSD	EF001	Total/NA	Water	SM 4500 P E	
490-65411-2	EF002	Total/NA	Water	SM 4500 P E	
490-65411-3	EF003	Total/NA	Water	SM 4500 P E	
LCS 490-208270/5	Lab Control Sample	Total/NA	Water	SM 4500 P E	
MB 490-208270/2	Method Blank	Total/NA	Water	SM 4500 P E	

Analysis Batch: 210133

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-65411-4	EF004	Total/NA	Water	SM 4500 P E	
490-65411-5	EF005	Total/NA	Water	SM 4500 P E	
490-65411-6	WF004	Total/NA	Water	SM 4500 P E	
490-65411-7	WF005	Total/NA	Water	SM 4500 P E	
490-65411-8	WF005DUP	Total/NA	Water	SM 4500 P E	
490-65411-9	WF003	Total/NA	Water	SM 4500 P E	
490-65411-10	WF002	Total/NA	Water	SM 4500 P E	
490-65411-11	WF001	Total/NA	Water	SM 4500 P E	

Lab Chronicle

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-65411-1

Client Sample ID: EF001 — Lab Sample ID: 490-65411-1

Date Collected: 11/04/14 09:20 — **Matrix: Water**
Date Received: 11/04/14 16:25

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	206267	11/14/14 13:06	ADJ	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	206293	11/14/14 14:50	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	205810	11/13/14 11:00	SDL	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	207061	11/14/14 15:38	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	205955	11/13/14 14:17	TEM	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	205413	11/12/14 09:33	SDL	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	206207	11/13/14 19:53	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	204090	11/05/14 23:06	PHB	TAL NSH
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	203730	11/05/14 23:41	PHB	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	208270	11/21/14 16:41	CRM	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	205316	11/11/14 16:51	BLM	TAL NSH

Client Sample ID: EF002 — Lab Sample ID: 490-65411-2

Date Collected: 11/04/14 09:35 — **Matrix: Water**
Date Received: 11/04/14 16:25

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	206267	11/14/14 13:06	ADJ	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	206293	11/14/14 14:51	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	205810	11/13/14 11:00	SDL	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	207061	11/14/14 15:38	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	205955	11/13/14 14:18	TEM	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	205413	11/12/14 09:33	SDL	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	206207	11/13/14 19:54	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	204090	11/05/14 23:18	PHB	TAL NSH
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	203730	11/05/14 23:41	PHB	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	208270	11/21/14 16:41	CRM	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	205316	11/11/14 16:51	BLM	TAL NSH

Client Sample ID: EF003 — Lab Sample ID: 490-65411-3

Date Collected: 11/04/14 10:05 — **Matrix: Water**
Date Received: 11/04/14 16:25

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	206267	11/14/14 13:06	ADJ	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	206293	11/14/14 14:52	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	205810	11/13/14 11:00	SDL	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	207061	11/14/14 15:38	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	205955	11/13/14 14:23	TEM	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	205413	11/12/14 09:33	SDL	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	206207	11/13/14 19:55	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	204090	11/05/14 23:24	PHB	TAL NSH

Lab Chronicle

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-65411-1

Client Sample ID: EF003 — Lab Sample ID: 490-65411-3

Date Collected: 11/04/14 10:05 — **Matrix: Water**
Date Received: 11/04/14 16:25

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	203730	11/05/14 23:41	PHB	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	208270	11/21/14 16:41	CRM	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	205316	11/11/14 16:51	BLM	TAL NSH

Client Sample ID: EF004 — Lab Sample ID: 490-65411-4

Date Collected: 11/04/14 10:20 — **Matrix: Water**
Date Received: 11/04/14 16:25

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	206267	11/14/14 13:06	ADJ	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	206293	11/14/14 14:53	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	205810	11/13/14 11:00	SDL	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	207061	11/14/14 15:38	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	205955	11/13/14 14:23	TEM	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	205413	11/12/14 09:33	SDL	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	206207	11/13/14 19:56	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	204090	11/05/14 23:30	PHB	TAL NSH
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	203730	11/05/14 23:41	PHB	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	210133	11/29/14 19:11	BMC	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	205316	11/11/14 16:51	BLM	TAL NSH

Client Sample ID: EF005 — Lab Sample ID: 490-65411-5

Date Collected: 11/04/14 11:30 — **Matrix: Water**
Date Received: 11/04/14 16:25

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	206267	11/14/14 13:06	ADJ	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	206293	11/14/14 14:54	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	205810	11/13/14 11:00	SDL	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	207061	11/14/14 15:38	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	205955	11/13/14 14:24	TEM	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	205413	11/12/14 09:33	SDL	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	206207	11/13/14 19:59	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	204090	11/05/14 23:35	PHB	TAL NSH
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	203730	11/05/14 23:41	PHB	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	210133	11/29/14 19:11	BMC	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	205316	11/11/14 16:55	BLM	TAL NSH

Lab Chronicle

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-65411-1

Client Sample ID: WF004

Lab Sample ID: 490-65411-6

Date Collected: 11/04/14 12:05
Matrix: Water
Date Received: 11/04/14 16:25

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	206267	11/14/14 13:06	ADJ	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	206293	11/14/14 14:55	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	205810	11/13/14 11:00	SDL	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	207061	11/14/14 15:38	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	205955	11/13/14 14:25	TEM	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	205413	11/12/14 09:33	SDL	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	206207	11/13/14 20:00	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	204090	11/05/14 23:41	PHB	TAL NSH
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	204029	11/06/14 15:46	BMC	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	210133	11/29/14 19:11	BMC	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	205316	11/11/14 17:17	BLM	TAL NSH

Client Sample ID: WF005

Lab Sample ID: 490-65411-7

Date Collected: 11/04/14 12:30
Matrix: Water
Date Received: 11/04/14 16:25

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	206267	11/14/14 13:06	ADJ	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	206293	11/14/14 14:58	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	205810	11/13/14 11:00	SDL	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	207061	11/14/14 15:38	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	205955	11/13/14 14:26	TEM	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	205413	11/12/14 09:33	SDL	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	206207	11/13/14 20:01	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	204090	11/05/14 23:58	PHB	TAL NSH
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	204029	11/06/14 15:46	BMC	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	210133	11/29/14 19:11	BMC	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	205316	11/11/14 17:17	BLM	TAL NSH

Client Sample ID: WF005DUP

Lab Sample ID: 490-65411-8

Date Collected: 11/04/14 12:35
Matrix: Water
Date Received: 11/04/14 16:25

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	206267	11/14/14 13:06	ADJ	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	206293	11/14/14 14:59	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	205810	11/13/14 11:00	SDL	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	207061	11/14/14 15:38	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	205955	11/13/14 14:27	TEM	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	205413	11/12/14 09:33	SDL	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	206208	11/13/14 20:28	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	204090	11/06/14 00:04	PHB	TAL NSH

Lab Chronicle

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-65411-1

Client Sample ID: WF005DUP — Lab Sample ID: 490-65411-8

Date Collected: 11/04/14 12:35 — **Matrix: Water**
Date Received: 11/04/14 16:25

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	204029	11/06/14 15:46	BMC	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	210133	11/29/14 19:11	BMC	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	205316	11/11/14 17:43	BLM	TAL NSH

Client Sample ID: WF003 — Lab Sample ID: 490-65411-9

Date Collected: 11/04/14 13:30 — **Matrix: Water**
Date Received: 11/04/14 16:25

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	206267	11/14/14 13:06	ADJ	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	206293	11/14/14 15:00	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	205810	11/13/14 11:00	SDL	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	207061	11/14/14 15:38	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	205955	11/13/14 14:28	TEM	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	205413	11/12/14 09:33	SDL	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	206208	11/13/14 20:29	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	204090	11/06/14 00:10	PHB	TAL NSH
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	204029	11/06/14 15:46	BMC	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	210133	11/29/14 19:11	BMC	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	205316	11/11/14 17:43	BLM	TAL NSH

Client Sample ID: WF002 — Lab Sample ID: 490-65411-10

Date Collected: 11/04/14 14:55 — **Matrix: Water**
Date Received: 11/04/14 16:25

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	206267	11/14/14 13:06	ADJ	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	206293	11/14/14 15:00	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	205810	11/13/14 11:00	SDL	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	207061	11/14/14 15:38	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	205955	11/13/14 14:29	TEM	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	207419	11/19/14 13:59	SDL	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	208221	11/21/14 13:48	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	204090	11/06/14 00:15	PHB	TAL NSH
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	204029	11/06/14 15:46	BMC	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	210133	11/29/14 19:11	BMC	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	205316	11/11/14 17:43	BLM	TAL NSH

Lab Chronicle

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-65411-1

Client Sample ID: WF001
Date Collected: 11/04/14 15:25
Date Received: 11/04/14 16:25

Lab Sample ID: 490-65411-11
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	206267	11/14/14 13:06	ADJ	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	206293	11/14/14 15:01	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	205810	11/13/14 11:00	SDL	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	207061	11/14/14 15:38	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	205955	11/13/14 14:30	TEM	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	207419	11/19/14 13:59	SDL	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	208221	11/21/14 13:51	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	204090	11/06/14 00:21	PHB	TAL NSH
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	204029	11/06/14 15:46	BMC	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	210133	11/29/14 19:11	BMC	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	205316	11/11/14 17:43	BLM	TAL NSH

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Method Summary

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-65411-1

Method	Method Description	Protocol	Laboratory
350.1	Nitrogen, Ammonia	MCAWW	TAL NSH
351.2	Nitrogen, Total Kjeldahl	MCAWW	TAL NSH
353.2	Nitrogen, Nitrate-Nitrite	MCAWW	TAL NSH
365.4	Phosphorus, Total	EPA	TAL NSH
SM 2320B	Alkalinity	SM	TAL NSH
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL NSH
SM 4500 P E	Orthophosphate	SM	TAL NSH
SM4500 SiO2 C	Silica, Molybdosilicate Method	SM	TAL NSH

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "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",

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Certification Summary

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-65411-1

Laboratory: TestAmerica Nashville

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	A2LA		NA: NELAP & A2LA	12-31-15
A2LA	ISO/IEC 17025		0453.07	12-31-15
Alaska (UST)	State Program	10	UST-087	10-31-15
Arizona	State Program	9	AZ0473	05-05-15
Arkansas DEQ	State Program	6	88-0737	04-25-15
California	NELAP	9	1168CA	10-31-14 *
Connecticut	State Program	1	PH-0220	12-31-15
Florida	NELAP	4	E87358	06-30-15
Illinois	NELAP	5	200010	12-09-14
Iowa	State Program	7	131	04-01-16
Kansas	NELAP	7	E-10229	01-31-15
Kentucky (UST)	State Program	4	19	06-30-15
Kentucky (WW)	State Program	4	90038	12-31-14
Louisiana	NELAP	6	30613	06-30-15
Maryland	State Program	3	316	03-31-15
Massachusetts	State Program	1	M-TN032	06-30-15
Minnesota	NELAP	5	047-999-345	12-31-14
Mississippi	State Program	4	N/A	06-30-15
Montana (UST)	State Program	8	NA	02-24-20
Nevada	State Program	9	TN00032	07-31-15
New Hampshire	NELAP	1	2963	10-09-15
New Jersey	NELAP	2	TN965	06-30-15
New York	NELAP	2	11342	03-31-15
North Carolina (WW/SW)	State Program	4	387	12-31-14
North Dakota	State Program	8	R-146	06-30-15
Ohio VAP	State Program	5	CL0033	10-16-15
Oklahoma	State Program	6	9412	08-31-15
Oregon	NELAP	10	TN200001	04-29-15
Pennsylvania	NELAP	3	68-00585	06-30-15
Rhode Island	State Program	1	LAO00268	12-30-14
South Carolina	State Program	4	84009 (001)	02-28-15
South Carolina (DW)	State Program	4	84009 (002)	02-23-17
Tennessee	State Program	4	2008	02-23-17
Texas	NELAP	6	T104704077	08-31-15
USDA	Federal		S-48469	10-30-16
Utah	NELAP	8	TN00032	07-31-15
Virginia	NELAP	3	460152	06-14-15
Washington	State Program	10	C789	07-19-15
West Virginia DEP	State Program	3	219	02-28-15
Wisconsin	State Program	5	998020430	08-31-15
Wyoming (UST)	A2LA	8	453.07	12-31-15

* Certification renewal pending - certification considered valid.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

COOLER RECEIPT FORM

490-65411 Chain of Custody

Cooler Received/Opened On: 11-4-14 /1625

1. Tracking #_____(last 4 digits, FedEx)

Courier: Client IR Gun ID: 14740456

2. Temperature of rep. sample or temp blank when opened: 5.9 *Degrees Celsius*

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO...NA

4. Were custody seals on outside of cooler? YES...NO...NA

If yes, how many and where:_____

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (intial) _____

7. Were custody seals on containers: YES NO and Intact YES...NO...NA

Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES...NO...NA

b. Was there any observable headspace present in any VOA vial? YES...NO...NA

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence #_____

I certify that I unloaded the cooler and answered questions 7-14 (intial) _____

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA

b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial) _____

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial) _____

I certify that I attached a label with the unique LIMS number to each container (intial) _____

21. Were there Non-Conformance issues at login? YES...NO Was a NCM generated? YES...NO...#_____

BIS = Broken in shipment

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

Loc: 490
65411

COOLER RECEIPT FORM

Cooler Received/Opened On: 11-4-14/1625

1. Tracking #_____(last 4 digits, FedEx)

Courier: Client IR Gun ID: 14740456

2. Temperature of rep. sample or temp blank when opened: 3.0 *Degrees Celsius*

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO...NA

4. Were custody seals on outside of cooler? YES...NO...NA

   If yes, how many and where:_____

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (intial) _____

7. Were custody seals on containers: YES NO and Intact YES...NO...NA

   Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES...NO...NA

   b. Was there any observable headspace present in any VOA vial? YES...NO...NA

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence #_____

I certify that I unloaded the cooler and answered questions 7-14 (intial) _____

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA

   b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial) _____

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial) _____

I certify that I attached a label with the unique LIMS number to each container (intial) _____

21. Were there Non-Conformance issues at login? YES...NO Was a NCM generated? YES...NO...#_____

BIS = Broken in shipment
Cooler Receipt Form.doc

LF-1
End of Form

Revised 11/28/12

TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Phone (615) 726-0177 Fax (615) 726-3404

Chain of Custody Record

Loc: 490
65411

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

12/1/2014

Client Information	Sampler: NJC/ JWM	Lab PM: Baker, Heather	Carrier:	COC No: 490-25561-9400.1
Client Contact: Nick Carmean	Phone:	E-Mail: heather.baker@testamericainc.com		Page: Page 1 of 1
Company: Aquaeter Inc				Job #:
Address: 215 Jamestown Park Suite 204	Due Date Requested: ASAP			
City: Brentwood	TAT Requested (days): (NO RUSH			
State, Zip: TN, 37027				
Phone:	PO #: Purchase Order Requested 142299			
Email: ncarmean@aquaeter.com	WO #:			
Project Name: Stones River	Project #: 49007047			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	360.1 - Ammonia	351.2 - TKN	353.2 - Nitrate-Nitrite	365.4 - Total Phosphorus	SM2320B - Bicarbonate Alkalinity	SM6600 - Ortho-phosphate	SM4500 - Silica	SM2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:	
			Preservation Code:				S	S	S	S	N	N	N	N			
EF001	11/4/14	0920	G	Water			X	X	X	X	X	X	X	X			-1
EF002	11/4/14	0935	G	Water			X	X	X	X	X	X	X	X			-2
EF003	11/4/14	1005	G	Water			X	X	X	X	X	X	X	X			-3
EF004	11/4/14	1020	G	Water			X	X	X	X	X	X	X	X			-4
EF005	11/4/14	1130	G	Water			X	X	X	X	X	X	X	X			-5
WF004	11/4/14	1205	G	Water			X	X	X	X	X	X	X	X			-6
WF005	11/4/14	1230	G	Water			X	X	X	X	X	X	X	X			-7
WF005 DUP	11/4/14	1235	G	Water			X	X	X	X	X	X	X	X			-8
WF003	11/4/14	1330	G	Water			X	X	X	X	X	X	X	X			-9
WF002	11/4/14	1455	G	Water			X	X	X	X	X	X	X	X			-10
WF001	11/4/14	1525	G	Water			X	X	X	X	X	X	X	X			-11

Possible Hazard Identification
☐ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* ☐ *Poison B* ☐ *Unknown* ☐ *Radiological*

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by:	Date/Time: 11/4/14 1625	Company	Received by: 5.9, 3.0	Date/Time: 11-4-14 16:25	Company TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: Aquaeter Inc

Job Number: 490-65411-1

Login Number: 65411

List Source: TestAmerica Nashville

List Number: 1

Creator: Huckaba, Jimmy

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	True	

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Tel: (615)726-0177

TestAmerica Job ID: 490-70785-1
Client Project/Site: Stones River

For:
Aquaeter Inc
215 Jamestown Park
Suite 204
Brentwood, Tennessee 37027

Attn: Nick Carmean

Heather Baker

Authorized for release by:
2/2/2015 1:30:41 PM

Heather Baker, Project Manager I
(615)301-5043
heather.baker@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Sample Summary

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-70785-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
490-70785-1	WF-005	Water	01/20/15 09:50	01/21/15 08:30
490-70785-2	WF-005-D	Water	01/20/15 09:48	01/21/15 08:30
490-70785-3	WF-004	Water	01/20/15 10:28	01/21/15 08:30
490-70785-4	WF-002	Water	01/20/15 11:10	01/21/15 08:30
490-70785-5	WF-003	Water	01/20/15 11:45	01/21/15 08:30
490-70785-6	WF-001	Water	01/20/15 12:45	01/21/15 08:30
490-70785-7	EF-004	Water	01/20/15 13:20	01/21/15 08:30
490-70785-8	EF-005	Water	01/20/15 13:50	01/21/15 08:30
490-70785-9	EF-003	Water	01/20/15 15:00	01/21/15 08:30
490-70785-10	EF-002	Water	01/20/15 15:28	01/21/15 08:30
490-70785-11	EF-001	Water	01/20/15 15:40	01/21/15 08:30

Case Narrative

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-70785-1

Job ID: 490-70785-1

Laboratory: TestAmerica Nashville

Narrative

Job Narrative
490-70785-1

Comments
No additional comments.

Receipt
The samples were received on 1/21/2015 8:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice.
The temperatures of the 3 coolers at receipt time were 1.5º C, 2.4º C and 3.5º C.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Definitions/Glossary

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-70785-1

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative error ratio
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Client Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-70785-1

Client Sample ID: WF-005

Lab Sample ID: 490-70785-1

Date Collected: 01/20/15 09:50

Matrix: Water

Date Received: 01/21/15 08:30

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	ND		0.100		mg/L		01/23/15 11:01	01/26/15 12:18	1
Kjeldahl Nitrogen as N	ND		0.250		mg/L		01/23/15 10:35	01/29/15 17:30	1
Nitrate Nitrite as N	**0.782**		0.100		mg/L			01/21/15 11:43	1
Phosphorus, Total	ND		0.100		mg/L		01/23/15 10:36	01/23/15 20:21	1
Bicarbonate Alkalinity	**190**		10.0		mg/L			01/21/15 16:55	1
Total Suspended Solids	**2.40**		1.00		mg/L			01/21/15 15:05	1
Orthophosphate as P	ND		0.100		mg/L			01/21/15 21:10	1
Silica	**4.54**		1.00		mg/L			01/23/15 15:10	1

Client Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-70785-1

Client Sample ID: WF-005-D

Lab Sample ID: 490-70785-2

Date Collected: 01/20/15 09:48

Matrix: Water

Date Received: 01/21/15 08:30

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	ND		0.100		mg/L		01/23/15 11:01	01/26/15 12:19	1
Kjeldahl Nitrogen as N	ND		0.250		mg/L		01/23/15 10:35	01/29/15 17:32	1
Nitrate Nitrite as N	**0.784**		0.100		mg/L			01/21/15 11:45	1
Phosphorus, Total	ND		0.100		mg/L		01/23/15 10:36	01/23/15 20:25	1
Bicarbonate Alkalinity	**189**		10.0		mg/L			01/21/15 17:00	1
Total Suspended Solids	**1.80**		1.00		mg/L			01/21/15 15:05	1
Orthophosphate as P	ND		0.100		mg/L			01/21/15 21:10	1
Silica	**4.51**		1.00		mg/L			01/23/15 15:10	1

Client Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-70785-1

Client Sample ID: WF-004

Lab Sample ID: 490-70785-3

Date Collected: 01/20/15 10:28

Matrix: Water

Date Received: 01/21/15 08:30

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	ND		0.100		mg/L		01/23/15 11:01	01/26/15 12:21	1
Kjeldahl Nitrogen as N	ND		0.250		mg/L		01/23/15 10:35	01/29/15 17:33	1
Nitrate Nitrite as N	**0.774**		0.100		mg/L			01/21/15 11:46	1
Phosphorus, Total	ND		0.100		mg/L		01/23/15 10:36	01/23/15 20:26	1
Bicarbonate Alkalinity	**190**		10.0		mg/L			01/21/15 17:06	1
Total Suspended Solids	**1.80**		1.00		mg/L			01/21/15 15:05	1
Orthophosphate as P	ND		0.100		mg/L			01/21/15 21:10	1
Silica	**4.17**		1.00		mg/L			01/27/15 14:53	1

Client Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-70785-1

Client Sample ID: WF-002

Lab Sample ID: 490-70785-4

Date Collected: 01/20/15 11:10

Matrix: Water

Date Received: 01/21/15 08:30

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	ND		0.100		mg/L		01/23/15 11:01	01/26/15 12:22	1
Kjeldahl Nitrogen as N	ND		0.250		mg/L		01/23/15 10:35	01/29/15 17:34	1
Nitrate Nitrite as N	**1.01**		0.100		mg/L			01/21/15 11:47	1
Phosphorus, Total	**0.102**		0.100		mg/L		01/23/15 10:36	01/23/15 20:27	1
Bicarbonate Alkalinity	**198**		10.0		mg/L			01/21/15 17:12	1
Total Suspended Solids	**1.40**		1.00		mg/L			01/21/15 15:05	1
Orthophosphate as P	ND		0.100		mg/L			01/21/15 21:10	1
Silica	**4.72**		1.00		mg/L			01/23/15 15:10	1

Client Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-70785-1

Client Sample ID: WF-003

Lab Sample ID: 490-70785-5

Date Collected: 01/20/15 11:45

Matrix: Water

Date Received: 01/21/15 08:30

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	ND		0.100		mg/L		01/23/15 11:01	01/26/15 12:24	1
Kjeldahl Nitrogen as N	**0.914**		0.250		mg/L		01/23/15 10:35	01/29/15 17:35	1
Nitrate Nitrite as N	**0.837**		0.100		mg/L			01/21/15 11:48	1
Phosphorus, Total	ND		0.100		mg/L		01/23/15 10:36	01/23/15 20:28	1
Bicarbonate Alkalinity	**194**		10.0		mg/L			01/21/15 17:17	1
Total Suspended Solids	**1.60**		1.00		mg/L			01/21/15 15:05	1
Orthophosphate as P	**0.102**		0.100		mg/L			01/21/15 21:10	1
Silica	**4.14**		1.00		mg/L			01/23/15 15:10	1

Client Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-70785-1

Client Sample ID: WF-001

Lab Sample ID: 490-70785-6

Date Collected: 01/20/15 12:45

Matrix: Water

Date Received: 01/21/15 08:30

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	ND		0.100		mg/L		01/23/15 11:01	01/26/15 12:25	1
Kjeldahl Nitrogen as N	ND		0.250		mg/L		01/23/15 10:35	01/29/15 17:37	1
Nitrate Nitrite as N	**1.03**		0.100		mg/L			01/21/15 11:49	1
Phosphorus, Total	**0.159**		0.100		mg/L		01/23/15 10:36	01/23/15 20:29	1
Bicarbonate Alkalinity	**202**		10.0		mg/L			01/21/15 17:23	1
Total Suspended Solids	**7.40**		1.00		mg/L			01/21/15 15:05	1
Orthophosphate as P	**0.123**		0.100		mg/L			01/21/15 21:10	1
Silica	**4.70**		1.00		mg/L			01/23/15 15:10	1

Client Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-70785-1

Client Sample ID: EF-004

Lab Sample ID: 490-70785-7

Date Collected: 01/20/15 13:20

Matrix: Water

Date Received: 01/21/15 08:30

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	ND		0.100		mg/L		01/22/15 13:10	01/26/15 15:47	1
Kjeldahl Nitrogen as N	ND		0.250		mg/L		01/23/15 10:35	01/29/15 17:37	1
Nitrate Nitrite as N	**0.701**		0.100		mg/L			01/21/15 11:50	1
Phosphorus, Total	ND		0.100		mg/L		01/23/15 10:36	01/23/15 20:30	1
Bicarbonate Alkalinity	**183**		10.0		mg/L			01/21/15 17:28	1
Total Suspended Solids	**3.00**		1.00		mg/L			01/21/15 15:05	1
Orthophosphate as P	ND		0.100		mg/L			01/21/15 21:10	1
Silica	**4.80**		1.00		mg/L			01/23/15 15:10	1

Client Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-70785-1

Client Sample ID: EF-005

Lab Sample ID: 490-70785-8

Date Collected: 01/20/15 13:50

Matrix: Water

Date Received: 01/21/15 08:30

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	ND		0.100		mg/L		01/23/15 11:01	01/26/15 12:26	1
Kjeldahl Nitrogen as N	ND		0.250		mg/L		01/23/15 10:35	01/29/15 17:38	1
Nitrate Nitrite as N	**0.739**		0.100		mg/L			01/21/15 11:51	1
Phosphorus, Total	ND		0.100		mg/L		01/23/15 10:36	01/23/15 20:31	1
Bicarbonate Alkalinity	**186**		10.0		mg/L			01/21/15 17:33	1
Total Suspended Solids	**1.40**		1.00		mg/L			01/21/15 15:05	1
Orthophosphate as P	ND		0.100		mg/L			01/21/15 21:14	1
Silica	**5.07**		1.00		mg/L			01/23/15 15:13	1

Client Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-70785-1

Client Sample ID: EF-003

Lab Sample ID: 490-70785-9

Date Collected: 01/20/15 15:00

Matrix: Water

Date Received: 01/21/15 08:30

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	ND		0.100		mg/L		01/23/15 11:01	01/26/15 12:27	1
Kjeldahl Nitrogen as N	**0.323**		0.250		mg/L		01/23/15 10:35	01/29/15 17:39	1
Nitrate Nitrite as N	**0.718**		0.100		mg/L			01/21/15 11:52	1
Phosphorus, Total	ND		0.100		mg/L		01/23/15 10:36	01/23/15 20:35	1
Bicarbonate Alkalinity	**188**		10.0		mg/L			01/21/15 17:39	1
Total Suspended Solids	**1.90**		1.00		mg/L			01/21/15 15:05	1
Orthophosphate as P	ND		0.100		mg/L			01/21/15 21:14	1
Silica	**4.70**		1.00		mg/L			01/23/15 15:29	1

Client Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-70785-1

Client Sample ID: EF-002

Lab Sample ID: 490-70785-10

Date Collected: 01/20/15 15:28

Matrix: Water

Date Received: 01/21/15 08:30

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	ND		0.100		mg/L		01/23/15 11:01	01/26/15 12:28	1
Kjeldahl Nitrogen as N	**0.548**		0.250		mg/L		01/23/15 10:35	01/29/15 17:39	1
Nitrate Nitrite as N	**0.773**		0.100		mg/L			01/21/15 11:53	1
Phosphorus, Total	ND		0.100		mg/L		01/23/15 10:36	01/23/15 20:37	1
Bicarbonate Alkalinity	**188**		10.0		mg/L			01/21/15 17:45	1
Total Suspended Solids	**1.80**		1.00		mg/L			01/21/15 15:05	1
Orthophosphate as P	ND		0.100		mg/L			01/21/15 21:14	1
Silica	**4.81**		1.00		mg/L			01/23/15 15:29	1

Client Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-70785-1

Client Sample ID: EF-001

Lab Sample ID: 490-70785-11

Date Collected: 01/20/15 15:40

Matrix: Water

Date Received: 01/21/15 08:30

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	**0.122**		0.100		mg/L		01/23/15 11:01	01/26/15 12:29	1
Kjeldahl Nitrogen as N	ND		0.250		mg/L		01/23/15 14:42	01/23/15 18:20	1
Nitrate Nitrite as N	**0.775**		0.100		mg/L			01/21/15 11:56	1
Phosphorus, Total	ND		0.100		mg/L		01/23/15 10:36	01/23/15 20:38	1
Bicarbonate Alkalinity	**186**		10.0		mg/L			01/22/15 15:31	1
Total Suspended Solids	**2.50**		1.00		mg/L			01/22/15 13:15	1
Orthophosphate as P	ND		0.100		mg/L			01/21/15 21:14	1
Silica	**4.86**		1.00		mg/L			01/23/15 15:29	1

QC Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-70785-1

Method: 350.1 - Nitrogen, Ammonia

Lab Sample ID: MB 490-222282/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 223105 — **Prep Batch: 222282**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	ND		0.100		mg/L		01/22/15 13:10	01/26/15 15:36	1

Lab Sample ID: LCS 490-222282/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 223105 — **Prep Batch: 222282**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia (as N)	5.00	5.100		mg/L		102	90 - 110

Lab Sample ID: 490-70732-A-2-B MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 223105 — **Prep Batch: 222282**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia (as N)	0.391		5.00	4.960		mg/L		91	90 - 110

Lab Sample ID: MB 490-222499/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 223048 — **Prep Batch: 222499**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia (as N)	ND		0.100		mg/L		01/23/15 11:01	01/26/15 12:14	1

Lab Sample ID: LCS 490-222499/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 223048 — **Prep Batch: 222499**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia (as N)	5.00	4.640		mg/L		93	90 - 110

Lab Sample ID: 490-70785-2 MS — **Client Sample ID: WF-005-D**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 223048 — **Prep Batch: 222499**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia (as N)	ND		5.00	4.720		mg/L		94	90 - 110

Lab Sample ID: 490-70785-11 MS — **Client Sample ID: EF-001**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 223048 — **Prep Batch: 222499**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Ammonia (as N)	0.122		5.00	4.860		mg/L		95	90 - 110

QC Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-70785-1

Method: 351.2 - Nitrogen, Total Kjeldahl

Lab Sample ID: MB 490-222464/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 224342 — **Prep Batch: 222464**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Kjeldahl Nitrogen as N	ND		0.250		mg/L		01/23/15 10:35	01/29/15 17:29	1

Lab Sample ID: LCS 490-222464/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 224342 — **Prep Batch: 222464**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Kjeldahl Nitrogen as N	2.50	2.376		mg/L		95	90 - 110

Lab Sample ID: 490-70785-1 MS — **Client Sample ID: WF-005**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 224342 — **Prep Batch: 222464**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Kjeldahl Nitrogen as N	ND		2.50	2.601		mg/L		104	90 - 110

Lab Sample ID: 490-70785-1 MSD — **Client Sample ID: WF-005**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 224342 — **Prep Batch: 222464**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Kjeldahl Nitrogen as N	ND		2.50	2.502		mg/L		100	90 - 110	4	20

Lab Sample ID: MB 490-222561/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 222597 — **Prep Batch: 222561**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Kjeldahl Nitrogen as N	ND		0.250		mg/L		01/23/15 14:42	01/23/15 18:17	1

Lab Sample ID: LCS 490-222561/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 222597 — **Prep Batch: 222561**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Kjeldahl Nitrogen as N	2.50	2.610		mg/L		104	90 - 110

Lab Sample ID: 490-71014-E-8-B MS — **Client Sample ID: Matrix Spike**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 222597 — **Prep Batch: 222561**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Kjeldahl Nitrogen as N	1.27		2.50	3.754		mg/L		100	90 - 110

Lab Sample ID: 490-71014-E-8-C MSD — **Client Sample ID: Matrix Spike Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 222597 — **Prep Batch: 222561**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Kjeldahl Nitrogen as N	1.27		2.50	3.676		mg/L		96	90 - 110	2	20

QC Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-70785-1

Method: 353.2 - Nitrogen, Nitrate-Nitrite

Lab Sample ID: MB 490-221918/6 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 221918

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate Nitrite as N	ND		0.100		mg/L			01/21/15 11:40	1

Lab Sample ID: LCS 490-221918/7 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 221918

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate Nitrite as N	0.996	1.013		mg/L		102	90 - 110

Lab Sample ID: LCSD 490-221918/8 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 221918

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate Nitrite as N	0.996	1.012		mg/L		102	90 - 110	0	20

Lab Sample ID: 490-70785-1 MS — **Client Sample ID: WF-005**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 221918

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate Nitrite as N	0.782		0.996	1.773		mg/L		99	90 - 110

Lab Sample ID: 490-70785-1 MSD — **Client Sample ID: WF-005**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 221918

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Nitrate Nitrite as N	0.782		0.996	1.774		mg/L		100	90 - 110	0	20

Lab Sample ID: 490-70785-11 MS — **Client Sample ID: EF-001**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 221918

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate Nitrite as N	0.775		0.996	1.757		mg/L		99	90 - 110

Method: 365.4 - Phosphorus, Total

Lab Sample ID: MB 490-222468/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 222740 — **Prep Batch: 222468**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Phosphorus, Total	ND		0.100		mg/L		01/23/15 10:36	01/23/15 20:19	1

QC Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-70785-1

Method: 365.4 - Phosphorus, Total (Continued)

Lab Sample ID: LCS 490-222468/2-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 222740 — **Prep Batch: 222468**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Phosphorus, Total	2.00	2.071		mg/L		104	90 - 110

Lab Sample ID: 490-70785-1 MS — **Client Sample ID: WF-005**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 222740 — **Prep Batch: 222468**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Phosphorus, Total	ND		2.00	2.055		mg/L		103	73 - 119

Lab Sample ID: 490-70785-1 MSD — **Client Sample ID: WF-005**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 222740 — **Prep Batch: 222468**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Phosphorus, Total	ND		2.00	2.032		mg/L		102	73 - 119	1	20

Lab Sample ID: 490-70785-9 DU — **Client Sample ID: EF-003**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 222740 — **Prep Batch: 222468**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Phosphorus, Total	ND		ND		mg/L		NC	20

Method: SM 2320B - Alkalinity

Lab Sample ID: MB 490-222228/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 222228

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity	ND		10.0		mg/L			01/21/15 16:43	1

Lab Sample ID: MB 490-222335/5 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 222335

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity	ND		10.0		mg/L			01/22/15 15:18	1

Lab Sample ID: 490-70849-J-2 DU — **Client Sample ID: Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 222335

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Bicarbonate Alkalinity	514		522.2		mg/L		2	20

QC Sample Results

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-70785-1

Method: SM 2320B - Alkalinity (Continued)

Lab Sample ID: MB 490-222669/67 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 222669

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity	ND		10.0		mg/L			01/24/15 05:56	1

Lab Sample ID: 490-70785-1 DU — **Client Sample ID: WF-005**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 222669

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Bicarbonate Alkalinity	191			192.3		mg/L				0.9	20

Lab Sample ID: 490-70785-11 DU — **Client Sample ID: EF-001**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 222669

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Bicarbonate Alkalinity	189			189.4		mg/L				0.08	20

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 490-221944/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 221944

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		1.00		mg/L			01/21/15 15:05	1

Lab Sample ID: LCS 490-221944/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 221944

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Total Suspended Solids			100	99.10		mg/L		99	90 - 110		

Lab Sample ID: 490-70790-R-1 DU — **Client Sample ID: Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 221944

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Suspended Solids	ND			ND		mg/L				NC	20

Lab Sample ID: MB 490-222166/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 222166

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		1.00		mg/L			01/22/15 13:15	1

Method: SM 2540D - Solids, Total Suspended (TSS) (Continued)

Lab Sample ID: LCS 490-222166/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 222166

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	100	97.90		mg/L		98	90 - 110

Lab Sample ID: 490-70794-C-2 DU — **Client Sample ID: Duplicate**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 222166

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Suspended Solids	302		320.0		mg/L		6	20

Method: SM 4500 P E - Orthophosphate

Lab Sample ID: MB 490-222130/11 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 222130

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Orthophosphate as P	ND		0.100		mg/L			01/21/15 21:10	1

Lab Sample ID: MB 490-222130/9 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 222130

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Orthophosphate as P	ND		0.100		mg/L			01/21/15 20:29	1

Lab Sample ID: LCS 490-222130/10 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 222130

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Orthophosphate as P	0.250	0.2597		mg/L		104	90 - 110

Lab Sample ID: 490-70785-1 MS — **Client Sample ID: WF-005**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 222130

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Orthophosphate as P	ND		0.250	0.2552		mg/L		102	72 - 129

Lab Sample ID: 490-70785-1 MSD — **Client Sample ID: WF-005**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 222130

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Orthophosphate as P	ND		0.250	0.2694		mg/L		108	72 - 129	5	20

Method: SM 4500 P E - Orthophosphate (Continued)

Lab Sample ID: 490-70785-1 DU — **Client Sample ID: WF-005**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 222130

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Orthophosphate as P	ND			ND		mg/L				NC	20

Lab Sample ID: 490-70785-11 DU — **Client Sample ID: EF-001**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 222130

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Orthophosphate as P	ND			ND		mg/L				NC	20

Method: SM4500 SiO2 C - Silica, Molybdosilicate Method

Lab Sample ID: MB 490-222574/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 222574

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silica	ND		1.00		mg/L			01/23/15 14:25	1

Lab Sample ID: LCS 490-222574/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 222574

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Silica			25.0	25.81		mg/L		103	90 - 110		

Lab Sample ID: LCSD 490-222574/3 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 222574

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Silica			25.0	26.11		mg/L		104	90 - 110	1	10

Lab Sample ID: 490-70785-1 MS — **Client Sample ID: WF-005**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 222574

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Silica	4.54		25.0	27.40		mg/L		91	80 - 120		

Lab Sample ID: 490-70785-1 MSD — **Client Sample ID: WF-005**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 222574

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Silica	4.54		25.0	27.32		mg/L		91	80 - 120	0	20

Method: SM4500 SiO2 C - Silica, Molybdosilicate Method (Continued)

Lab Sample ID: 490-70785-1 DU — **Client Sample ID: WF-005**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 222574

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Silica	4.54			4.479		mg/L				1	20

Lab Sample ID: MB 490-223366/2 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 223366

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Silica	ND		1.00		mg/L			01/27/15 13:01	1

Lab Sample ID: LCS 490-223366/3 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 223366

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Silica			25.0	23.68		mg/L		95	90 - 110		

Lab Sample ID: LCSD 490-223366/4 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 223366

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Silica			25.0	24.18		mg/L		97	90 - 110	2	10

Lab Sample ID: 490-70785-3 MS — **Client Sample ID: WF-004**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 223366

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Silica	4.17		25.0	28.18		mg/L		96	80 - 120		

Lab Sample ID: 490-70785-3 MSD — **Client Sample ID: WF-004**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 223366

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Silica	4.17		25.0	27.58		mg/L		94	80 - 120	2	20

Lab Sample ID: 490-70785-3 DU — **Client Sample ID: WF-004**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 223366

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Silica	4.17			4.261		mg/L				2	20

QC Association Summary

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-70785-1

General Chemistry

Analysis Batch: 221918

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-70785-1	WF-005	Total/NA	Water	353.2	
490-70785-1 MS	WF-005	Total/NA	Water	353.2	
490-70785-1 MSD	WF-005	Total/NA	Water	353.2	
490-70785-2	WF-005-D	Total/NA	Water	353.2	
490-70785-3	WF-004	Total/NA	Water	353.2	
490-70785-4	WF-002	Total/NA	Water	353.2	
490-70785-5	WF-003	Total/NA	Water	353.2	
490-70785-6	WF-001	Total/NA	Water	353.2	
490-70785-7	EF-004	Total/NA	Water	353.2	
490-70785-8	EF-005	Total/NA	Water	353.2	
490-70785-9	EF-003	Total/NA	Water	353.2	
490-70785-10	EF-002	Total/NA	Water	353.2	
490-70785-11	EF-001	Total/NA	Water	353.2	
490-70785-11 MS	EF-001	Total/NA	Water	353.2	
LCS 490-221918/7	Lab Control Sample	Total/NA	Water	353.2	
LCSD 490-221918/8	Lab Control Sample Dup	Total/NA	Water	353.2	
MB 490-221918/6	Method Blank	Total/NA	Water	353.2	

Analysis Batch: 221944

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-70785-1	WF-005	Total/NA	Water	SM 2540D	
490-70785-2	WF-005-D	Total/NA	Water	SM 2540D	
490-70785-3	WF-004	Total/NA	Water	SM 2540D	
490-70785-4	WF-002	Total/NA	Water	SM 2540D	
490-70785-5	WF-003	Total/NA	Water	SM 2540D	
490-70785-6	WF-001	Total/NA	Water	SM 2540D	
490-70785-7	EF-004	Total/NA	Water	SM 2540D	
490-70785-8	EF-005	Total/NA	Water	SM 2540D	
490-70785-9	EF-003	Total/NA	Water	SM 2540D	
490-70785-10	EF-002	Total/NA	Water	SM 2540D	
490-70790-R-1 DU	Duplicate	Total/NA	Water	SM 2540D	
LCS 490-221944/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 490-221944/1	Method Blank	Total/NA	Water	SM 2540D	

Analysis Batch: 222130

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-70785-1	WF-005	Total/NA	Water	SM 4500 P E	
490-70785-1 DU	WF-005	Total/NA	Water	SM 4500 P E	
490-70785-1 MS	WF-005	Total/NA	Water	SM 4500 P E	
490-70785-1 MSD	WF-005	Total/NA	Water	SM 4500 P E	
490-70785-2	WF-005-D	Total/NA	Water	SM 4500 P E	
490-70785-3	WF-004	Total/NA	Water	SM 4500 P E	
490-70785-4	WF-002	Total/NA	Water	SM 4500 P E	
490-70785-5	WF-003	Total/NA	Water	SM 4500 P E	
490-70785-6	WF-001	Total/NA	Water	SM 4500 P E	
490-70785-7	EF-004	Total/NA	Water	SM 4500 P E	
490-70785-8	EF-005	Total/NA	Water	SM 4500 P E	
490-70785-9	EF-003	Total/NA	Water	SM 4500 P E	
490-70785-10	EF-002	Total/NA	Water	SM 4500 P E	
490-70785-11	EF-001	Total/NA	Water	SM 4500 P E	
490-70785-11 DU	EF-001	Total/NA	Water	SM 4500 P E	

QC Association Summary

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-70785-1

General Chemistry (Continued)

Analysis Batch: 222130 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 490-222130/10	Lab Control Sample	Total/NA	Water	SM 4500 P E	
MB 490-222130/11	Method Blank	Total/NA	Water	SM 4500 P E	
MB 490-222130/9	Method Blank	Total/NA	Water	SM 4500 P E	

Analysis Batch: 222166

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-70785-11	EF-001	Total/NA	Water	SM 2540D	
490-70794-C-2 DU	Duplicate	Total/NA	Water	SM 2540D	
LCS 490-222166/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 490-222166/1	Method Blank	Total/NA	Water	SM 2540D	

Analysis Batch: 222228

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-70785-1	WF-005	Total/NA	Water	SM 2320B	
490-70785-2	WF-005-D	Total/NA	Water	SM 2320B	
490-70785-3	WF-004	Total/NA	Water	SM 2320B	
490-70785-4	WF-002	Total/NA	Water	SM 2320B	
490-70785-5	WF-003	Total/NA	Water	SM 2320B	
490-70785-6	WF-001	Total/NA	Water	SM 2320B	
490-70785-7	EF-004	Total/NA	Water	SM 2320B	
490-70785-8	EF-005	Total/NA	Water	SM 2320B	
490-70785-9	EF-003	Total/NA	Water	SM 2320B	
490-70785-10	EF-002	Total/NA	Water	SM 2320B	
LCS 490-222228/2	Lab Control Sample	Total/NA	Water	SM 2320B	
MB 490-222228/1	Method Blank	Total/NA	Water	SM 2320B	

Prep Batch: 222282

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-70732-A-2-B MS	Matrix Spike	Total/NA	Water	Distill/Ammonia	
490-70785-7	EF-004	Total/NA	Water	Distill/Ammonia	
LCS 490-222282/2-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 490-222282/1-A	Method Blank	Total/NA	Water	Distill/Ammonia	

Analysis Batch: 222335

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-70785-11	EF-001	Total/NA	Water	SM 2320B	
490-70849-J-2 DU	Duplicate	Total/NA	Water	SM 2320B	
LCS 490-222335/6	Lab Control Sample	Total/NA	Water	SM 2320B	
MB 490-222335/5	Method Blank	Total/NA	Water	SM 2320B	

Prep Batch: 222464

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-70785-1	WF-005	Total/NA	Water	351.2	
490-70785-1 MS	WF-005	Total/NA	Water	351.2	
490-70785-1 MSD	WF-005	Total/NA	Water	351.2	
490-70785-2	WF-005-D	Total/NA	Water	351.2	
490-70785-3	WF-004	Total/NA	Water	351.2	
490-70785-4	WF-002	Total/NA	Water	351.2	
490-70785-5	WF-003	Total/NA	Water	351.2	
490-70785-6	WF-001	Total/NA	Water	351.2	
490-70785-7	EF-004	Total/NA	Water	351.2	

QC Association Summary

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-70785-1

General Chemistry (Continued)

Prep Batch: 222464 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-70785-8	EF-005	Total/NA	Water	351.2	
490-70785-9	EF-003	Total/NA	Water	351.2	
490-70785-10	EF-002	Total/NA	Water	351.2	
LCS 490-222464/2-A	Lab Control Sample	Total/NA	Water	351.2	
MB 490-222464/1-A	Method Blank	Total/NA	Water	351.2	

Prep Batch: 222468

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-70785-1	WF-005	Total/NA	Water	365.2/365.3/365	
490-70785-1 MS	WF-005	Total/NA	Water	365.2/365.3/365	
490-70785-1 MSD	WF-005	Total/NA	Water	365.2/365.3/365	
490-70785-2	WF-005-D	Total/NA	Water	365.2/365.3/365	
490-70785-3	WF-004	Total/NA	Water	365.2/365.3/365	
490-70785-4	WF-002	Total/NA	Water	365.2/365.3/365	
490-70785-5	WF-003	Total/NA	Water	365.2/365.3/365	
490-70785-6	WF-001	Total/NA	Water	365.2/365.3/365	
490-70785-7	EF-004	Total/NA	Water	365.2/365.3/365	
490-70785-8	EF-005	Total/NA	Water	365.2/365.3/365	
490-70785-9	EF-003	Total/NA	Water	365.2/365.3/365	
490-70785-9 DU	EF-003	Total/NA	Water	365.2/365.3/365	
490-70785-10	EF-002	Total/NA	Water	365.2/365.3/365	
490-70785-11	EF-001	Total/NA	Water	365.2/365.3/365	
LCS 490-222468/2-A	Lab Control Sample	Total/NA	Water	365.2/365.3/365	
MB 490-222468/1-A	Method Blank	Total/NA	Water	365.2/365.3/365	

Prep Batch: 222499

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-70785-1	WF-005	Total/NA	Water	Distill/Ammonia	
490-70785-2	WF-005-D	Total/NA	Water	Distill/Ammonia	
490-70785-2 MS	WF-005-D	Total/NA	Water	Distill/Ammonia	
490-70785-3	WF-004	Total/NA	Water	Distill/Ammonia	
490-70785-4	WF-002	Total/NA	Water	Distill/Ammonia	
490-70785-5	WF-003	Total/NA	Water	Distill/Ammonia	
490-70785-6	WF-001	Total/NA	Water	Distill/Ammonia	
490-70785-8	EF-005	Total/NA	Water	Distill/Ammonia	
490-70785-9	EF-003	Total/NA	Water	Distill/Ammonia	
490-70785-10	EF-002	Total/NA	Water	Distill/Ammonia	
490-70785-11	EF-001	Total/NA	Water	Distill/Ammonia	
490-70785-11 MS	EF-001	Total/NA	Water	Distill/Ammonia	
LCS 490-222499/2-A	Lab Control Sample	Total/NA	Water	Distill/Ammonia	
MB 490-222499/1-A	Method Blank	Total/NA	Water	Distill/Ammonia	

Prep Batch: 222561

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-70785-11	EF-001	Total/NA	Water	351.2	
490-71014-E-8-B MS	Matrix Spike	Total/NA	Water	351.2	
490-71014-E-8-C MSD	Matrix Spike Duplicate	Total/NA	Water	351.2	
LCS 490-222561/2-A	Lab Control Sample	Total/NA	Water	351.2	
MB 490-222561/1-A	Method Blank	Total/NA	Water	351.2	

QC Association Summary

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-70785-1

General Chemistry (Continued)

Analysis Batch: 222574

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-70785-1	WF-005	Total/NA	Water	SM4500 SiO2 C	
490-70785-1 DU	WF-005	Total/NA	Water	SM4500 SiO2 C	
490-70785-1 MS	WF-005	Total/NA	Water	SM4500 SiO2 C	
490-70785-1 MSD	WF-005	Total/NA	Water	SM4500 SiO2 C	
490-70785-2	WF-005-D	Total/NA	Water	SM4500 SiO2 C	
490-70785-4	WF-002	Total/NA	Water	SM4500 SiO2 C	
490-70785-5	WF-003	Total/NA	Water	SM4500 SiO2 C	
490-70785-6	WF-001	Total/NA	Water	SM4500 SiO2 C	
490-70785-7	EF-004	Total/NA	Water	SM4500 SiO2 C	
490-70785-8	EF-005	Total/NA	Water	SM4500 SiO2 C	
490-70785-9	EF-003	Total/NA	Water	SM4500 SiO2 C	
490-70785-10	EF-002	Total/NA	Water	SM4500 SiO2 C	
490-70785-11	EF-001	Total/NA	Water	SM4500 SiO2 C	
LCS 490-222574/2	Lab Control Sample	Total/NA	Water	SM4500 SiO2 C	
LCSD 490-222574/3	Lab Control Sample Dup	Total/NA	Water	SM4500 SiO2 C	
MB 490-222574/1	Method Blank	Total/NA	Water	SM4500 SiO2 C	

Analysis Batch: 222597

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-70785-11	EF-001	Total/NA	Water	351.2	222561
490-71014-E-8-B MS	Matrix Spike	Total/NA	Water	351.2	222561
490-71014-E-8-C MSD	Matrix Spike Duplicate	Total/NA	Water	351.2	222561
LCS 490-222561/2-A	Lab Control Sample	Total/NA	Water	351.2	222561
MB 490-222561/1-A	Method Blank	Total/NA	Water	351.2	222561

Analysis Batch: 222669

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-70785-1 DU	WF-005	Total/NA	Water	SM 2320B	
490-70785-11 DU	EF-001	Total/NA	Water	SM 2320B	
LCS 490-222669/68	Lab Control Sample	Total/NA	Water	SM 2320B	
MB 490-222669/67	Method Blank	Total/NA	Water	SM 2320B	

Analysis Batch: 222740

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-70785-1	WF-005	Total/NA	Water	365.4	222468
490-70785-1 MS	WF-005	Total/NA	Water	365.4	222468
490-70785-1 MSD	WF-005	Total/NA	Water	365.4	222468
490-70785-2	WF-005-D	Total/NA	Water	365.4	222468
490-70785-3	WF-004	Total/NA	Water	365.4	222468
490-70785-4	WF-002	Total/NA	Water	365.4	222468
490-70785-5	WF-003	Total/NA	Water	365.4	222468
490-70785-6	WF-001	Total/NA	Water	365.4	222468
490-70785-7	EF-004	Total/NA	Water	365.4	222468
490-70785-8	EF-005	Total/NA	Water	365.4	222468
490-70785-9	EF-003	Total/NA	Water	365.4	222468
490-70785-9 DU	EF-003	Total/NA	Water	365.4	222468
490-70785-10	EF-002	Total/NA	Water	365.4	222468
490-70785-11	EF-001	Total/NA	Water	365.4	222468
LCS 490-222468/2-A	Lab Control Sample	Total/NA	Water	365.4	222468
MB 490-222468/1-A	Method Blank	Total/NA	Water	365.4	222468

QC Association Summary

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-70785-1

General Chemistry (Continued)

Analysis Batch: 223048

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-70785-1	WF-005	Total/NA	Water	350.1	222499
490-70785-2	WF-005-D	Total/NA	Water	350.1	222499
490-70785-2 MS	WF-005-D	Total/NA	Water	350.1	222499
490-70785-3	WF-004	Total/NA	Water	350.1	222499
490-70785-4	WF-002	Total/NA	Water	350.1	222499
490-70785-5	WF-003	Total/NA	Water	350.1	222499
490-70785-6	WF-001	Total/NA	Water	350.1	222499
490-70785-8	EF-005	Total/NA	Water	350.1	222499
490-70785-9	EF-003	Total/NA	Water	350.1	222499
490-70785-10	EF-002	Total/NA	Water	350.1	222499
490-70785-11	EF-001	Total/NA	Water	350.1	222499
490-70785-11 MS	EF-001	Total/NA	Water	350.1	222499
LCS 490-222499/2-A	Lab Control Sample	Total/NA	Water	350.1	222499
MB 490-222499/1-A	Method Blank	Total/NA	Water	350.1	222499

Analysis Batch: 223105

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-70732-A-2-B MS	Matrix Spike	Total/NA	Water	350.1	222282
490-70785-7	EF-004	Total/NA	Water	350.1	222282
LCS 490-222282/2-A	Lab Control Sample	Total/NA	Water	350.1	222282
MB 490-222282/1-A	Method Blank	Total/NA	Water	350.1	222282

Analysis Batch: 223366

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-70785-3	WF-004	Total/NA	Water	SM4500 SiO2 C	
490-70785-3 DU	WF-004	Total/NA	Water	SM4500 SiO2 C	
490-70785-3 MS	WF-004	Total/NA	Water	SM4500 SiO2 C	
490-70785-3 MSD	WF-004	Total/NA	Water	SM4500 SiO2 C	
LCS 490-223366/3	Lab Control Sample	Total/NA	Water	SM4500 SiO2 C	
LCSD 490-223366/4	Lab Control Sample Dup	Total/NA	Water	SM4500 SiO2 C	
MB 490-223366/2	Method Blank	Total/NA	Water	SM4500 SiO2 C	

Analysis Batch: 224342

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
490-70785-1	WF-005	Total/NA	Water	351.2	222464
490-70785-1 MS	WF-005	Total/NA	Water	351.2	222464
490-70785-1 MSD	WF-005	Total/NA	Water	351.2	222464
490-70785-2	WF-005-D	Total/NA	Water	351.2	222464
490-70785-3	WF-004	Total/NA	Water	351.2	222464
490-70785-4	WF-002	Total/NA	Water	351.2	222464
490-70785-5	WF-003	Total/NA	Water	351.2	222464
490-70785-6	WF-001	Total/NA	Water	351.2	222464
490-70785-7	EF-004	Total/NA	Water	351.2	222464
490-70785-8	EF-005	Total/NA	Water	351.2	222464
490-70785-9	EF-003	Total/NA	Water	351.2	222464
490-70785-10	EF-002	Total/NA	Water	351.2	222464
LCS 490-222464/2-A	Lab Control Sample	Total/NA	Water	351.2	222464
MB 490-222464/1-A	Method Blank	Total/NA	Water	351.2	222464

Lab Chronicle

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-70785-1

Client Sample ID: WF-005

Lab Sample ID: 490-70785-1

Date Collected: 01/20/15 09:50
Matrix: Water
Date Received: 01/21/15 08:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	222499	01/23/15 11:01	ADJ	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	223048	01/26/15 12:18	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	222464	01/23/15 10:35	SDL	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	224342	01/29/15 17:30	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	221918	01/21/15 11:43	MJA	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	222468	01/23/15 10:36	SDL	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	222740	01/23/15 20:21	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	222228	01/21/15 16:55	BMC	TAL NSH
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	221944	01/21/15 15:05	SJM	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	222130	01/21/15 21:10	BMC	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	222574	01/23/15 15:10	BLM	TAL NSH

Client Sample ID: WF-005-D

Lab Sample ID: 490-70785-2

Date Collected: 01/20/15 09:48
Matrix: Water
Date Received: 01/21/15 08:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	222499	01/23/15 11:01	ADJ	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	223048	01/26/15 12:19	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	222464	01/23/15 10:35	SDL	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	224342	01/29/15 17:32	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	221918	01/21/15 11:45	MJA	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	222468	01/23/15 10:36	SDL	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	222740	01/23/15 20:25	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	222228	01/21/15 17:00	BMC	TAL NSH
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	221944	01/21/15 15:05	SJM	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	222130	01/21/15 21:10	BMC	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	222574	01/23/15 15:10	BLM	TAL NSH

Client Sample ID: WF-004

Lab Sample ID: 490-70785-3

Date Collected: 01/20/15 10:28
Matrix: Water
Date Received: 01/21/15 08:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	222499	01/23/15 11:01	ADJ	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	223048	01/26/15 12:21	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	222464	01/23/15 10:35	SDL	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	224342	01/29/15 17:33	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	221918	01/21/15 11:46	MJA	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	222468	01/23/15 10:36	SDL	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	222740	01/23/15 20:26	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	222228	01/21/15 17:06	BMC	TAL NSH

Lab Chronicle

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-70785-1

Client Sample ID: WF-004 — Lab Sample ID: 490-70785-3

Date Collected: 01/20/15 10:28 — **Matrix: Water**
Date Received: 01/21/15 08:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	221944	01/21/15 15:05	SJM	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	222130	01/21/15 21:10	BMC	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	223366	01/27/15 14:53	BLM	TAL NSH

Client Sample ID: WF-002 — Lab Sample ID: 490-70785-4

Date Collected: 01/20/15 11:10 — **Matrix: Water**
Date Received: 01/21/15 08:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	222499	01/23/15 11:01	ADJ	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	223048	01/26/15 12:22	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	222464	01/23/15 10:35	SDL	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	224342	01/29/15 17:34	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	221918	01/21/15 11:47	MJA	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	222468	01/23/15 10:36	SDL	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	222740	01/23/15 20:27	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	222228	01/21/15 17:12	BMC	TAL NSH
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	221944	01/21/15 15:05	SJM	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	222130	01/21/15 21:10	BMC	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	222574	01/23/15 15:10	BLM	TAL NSH

Client Sample ID: WF-003 — Lab Sample ID: 490-70785-5

Date Collected: 01/20/15 11:45 — **Matrix: Water**
Date Received: 01/21/15 08:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	222499	01/23/15 11:01	ADJ	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	223048	01/26/15 12:24	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	222464	01/23/15 10:35	SDL	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	224342	01/29/15 17:35	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	221918	01/21/15 11:48	MJA	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	222468	01/23/15 10:36	SDL	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	222740	01/23/15 20:28	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	222228	01/21/15 17:17	BMC	TAL NSH
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	221944	01/21/15 15:05	SJM	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	222130	01/21/15 21:10	BMC	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	222574	01/23/15 15:10	BLM	TAL NSH

Lab Chronicle

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-70785-1

Client Sample ID: WF-001

Lab Sample ID: 490-70785-6

Date Collected: 01/20/15 12:45
Matrix: Water
Date Received: 01/21/15 08:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	222499	01/23/15 11:01	ADJ	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	223048	01/26/15 12:25	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	222464	01/23/15 10:35	SDL	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	224342	01/29/15 17:37	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	221918	01/21/15 11:49	MJA	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	222468	01/23/15 10:36	SDL	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	222740	01/23/15 20:29	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	222228	01/21/15 17:23	BMC	TAL NSH
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	221944	01/21/15 15:05	SJM	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	222130	01/21/15 21:10	BMC	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	222574	01/23/15 15:10	BLM	TAL NSH

Client Sample ID: EF-004

Lab Sample ID: 490-70785-7

Date Collected: 01/20/15 13:20
Matrix: Water
Date Received: 01/21/15 08:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	222282	01/22/15 13:10	ADJ	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	223105	01/26/15 15:47	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	222464	01/23/15 10:35	SDL	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	224342	01/29/15 17:37	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	221918	01/21/15 11:50	MJA	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	222468	01/23/15 10:36	SDL	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	222740	01/23/15 20:30	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	222228	01/21/15 17:28	BMC	TAL NSH
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	221944	01/21/15 15:05	SJM	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	222130	01/21/15 21:10	BMC	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	222574	01/23/15 15:10	BLM	TAL NSH

Client Sample ID: EF-005

Lab Sample ID: 490-70785-8

Date Collected: 01/20/15 13:50
Matrix: Water
Date Received: 01/21/15 08:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	222499	01/23/15 11:01	ADJ	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	223048	01/26/15 12:26	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	222464	01/23/15 10:35	SDL	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	224342	01/29/15 17:38	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	221918	01/21/15 11:51	MJA	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	222468	01/23/15 10:36	SDL	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	222740	01/23/15 20:31	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	222228	01/21/15 17:33	BMC	TAL NSH

Lab Chronicle

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-70785-1

Client Sample ID: EF-005

Lab Sample ID: 490-70785-8

Date Collected: 01/20/15 13:50
Matrix: Water
Date Received: 01/21/15 08:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	221944	01/21/15 15:05	SJM	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	222130	01/21/15 21:14	BMC	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	222574	01/23/15 15:13	BLM	TAL NSH

Client Sample ID: EF-003

Lab Sample ID: 490-70785-9

Date Collected: 01/20/15 15:00
Matrix: Water
Date Received: 01/21/15 08:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	222499	01/23/15 11:01	ADJ	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	223048	01/26/15 12:27	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	222464	01/23/15 10:35	SDL	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	224342	01/29/15 17:39	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	221918	01/21/15 11:52	MJA	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	222468	01/23/15 10:36	SDL	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	222740	01/23/15 20:35	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	222228	01/21/15 17:39	BMC	TAL NSH
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	221944	01/21/15 15:05	SJM	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	222130	01/21/15 21:14	BMC	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	222574	01/23/15 15:29	BLM	TAL NSH

Client Sample ID: EF-002

Lab Sample ID: 490-70785-10

Date Collected: 01/20/15 15:28
Matrix: Water
Date Received: 01/21/15 08:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	222499	01/23/15 11:01	ADJ	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	223048	01/26/15 12:28	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	222464	01/23/15 10:35	SDL	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	224342	01/29/15 17:39	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	221918	01/21/15 11:53	MJA	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	222468	01/23/15 10:36	SDL	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	222740	01/23/15 20:37	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	222228	01/21/15 17:45	BMC	TAL NSH
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	221944	01/21/15 15:05	SJM	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	222130	01/21/15 21:14	BMC	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	222574	01/23/15 15:29	BLM	TAL NSH

Lab Chronicle

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-70785-1

Client Sample ID: EF-001

Date Collected: 01/20/15 15:40
Date Received: 01/21/15 08:30

Lab Sample ID: 490-70785-11

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Distill/Ammonia			50 mL	50 mL	222499	01/23/15 11:01	ADJ	TAL NSH
Total/NA	Analysis	350.1		1	50 mL	50 mL	223048	01/26/15 12:29	KRB	TAL NSH
Total/NA	Prep	351.2			20 mL	20 mL	222561	01/23/15 14:42	SDL	TAL NSH
Total/NA	Analysis	351.2		1	20 mL	20 mL	222597	01/23/15 18:20	KRB	TAL NSH
Total/NA	Analysis	353.2		1	50 mL	50 mL	221918	01/21/15 11:56	MJA	TAL NSH
Total/NA	Prep	365.2/365.3/365			20 mL	20 mL	222468	01/23/15 10:36	SDL	TAL NSH
Total/NA	Analysis	365.4		1	20 mL	20 mL	222740	01/23/15 20:38	TEM	TAL NSH
Total/NA	Analysis	SM 2320B		1	35 mL	35 mL	222335	01/22/15 15:31	SOG	TAL NSH
Total/NA	Analysis	SM 2540D		1	1000 mL	1000 mL	222166	01/22/15 13:15	SJM	TAL NSH
Total/NA	Analysis	SM 4500 P E		1	10 mL	10 mL	222130	01/21/15 21:14	BMC	TAL NSH
Total/NA	Analysis	SM4500 SiO2 C		1	10 mL	10 mL	222574	01/23/15 15:29	BLM	TAL NSH

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Method Summary

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-70785-1

Method	Method Description	Protocol	Laboratory
350.1	Nitrogen, Ammonia	MCAWW	TAL NSH
351.2	Nitrogen, Total Kjeldahl	MCAWW	TAL NSH
353.2	Nitrogen, Nitrate-Nitrite	MCAWW	TAL NSH
365.4	Phosphorus, Total	EPA	TAL NSH
SM 2320B	Alkalinity	SM	TAL NSH
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL NSH
SM 4500 P E	Orthophosphate	SM	TAL NSH
SM4500 SiO2 C	Silica, Molybdosilicate Method	SM	TAL NSH

Protocol References:

EPA = US Environmental Protection Agency

MCAWW = "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",

Laboratory References:

TAL NSH = TestAmerica Nashville, 2960 Foster Creighton Drive, Nashville, TN 37204, TEL (615)726-0177

Certification Summary

Client: Aquaeter Inc
Project/Site: Stones River

TestAmerica Job ID: 490-70785-1

Laboratory: TestAmerica Nashville

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	A2LA		NA: NELAP & A2LA	12-31-15
A2LA	ISO/IEC 17025		0453.07	12-31-15
Alaska (UST)	State Program	10	UST-087	10-31-15
Arizona	State Program	9	AZ0473	05-05-15
Arkansas DEQ	State Program	6	88-0737	04-25-15
California	NELAP	9	1168CA	10-31-14 *
Connecticut	State Program	1	PH-0220	12-31-15
Florida	NELAP	4	E87358	06-30-15
Illinois	NELAP	5	200010	12-09-15
Iowa	State Program	7	131	04-01-16
Kansas	NELAP	7	E-10229	03-31-15 *
Kentucky (UST)	State Program	4	19	06-30-15
Kentucky (WW)	State Program	4	90038	12-31-15
Louisiana	NELAP	6	30613	06-30-15
Maryland	State Program	3	316	03-31-15
Massachusetts	State Program	1	M-TN032	06-30-15
Minnesota	NELAP	5	047-999-345	12-31-15
Mississippi	State Program	4	N/A	06-30-15
Montana (UST)	State Program	8	NA	02-24-20
Nevada	State Program	9	TN00032	07-31-15
New Hampshire	NELAP	1	2963	10-09-15
New Jersey	NELAP	2	TN965	06-30-15
New York	NELAP	2	11342	03-31-15
North Carolina (WW/SW)	State Program	4	387	12-31-15
North Dakota	State Program	8	R-146	06-30-15
Ohio VAP	State Program	5	CL0033	10-16-15
Oklahoma	State Program	6	9412	08-31-15
Oregon	NELAP	10	TN200001	04-29-15
Pennsylvania	NELAP	3	68-00585	06-30-15
Rhode Island	State Program	1	LAO00268	12-30-14 *
South Carolina	State Program	4	84009 (001)	02-28-15
South Carolina (DW)	State Program	4	84009 (002)	02-23-17
Tennessee	State Program	4	2008	02-23-17
Texas	NELAP	6	T104704077	08-31-15
USDA	Federal		S-48469	10-30-16
Utah	NELAP	8	TN00032	07-31-15
Virginia	NELAP	3	460152	06-14-15
Washington	State Program	10	C789	07-19-15
West Virginia DEP	State Program	3	219	02-28-15
Wisconsin	State Program	5	998020430	08-31-15
Wyoming (UST)	A2LA	8	453.07	12-31-15

* Certification renewal pending - certification considered valid.

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

COOLER RECEIPT FORM

490-70785 Chain of Custody

Cooler Received/Opened On 1/21/2015 @ 0830

1. Tracking #_____(last 4 digits, FedEx)

Courier: Street IR Gun ID 96210146

2. Temperature of rep. sample or temp blank when opened: 1.5 *Degrees Celsius*

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO...NA

4. Were custody seals on outside of cooler? YES...NO...NA

If yes, how many and where:_____

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (intial) _____

7. Were custody seals on containers: YES NO and Intact YES...NO...NA

Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES...NO...NA

b. Was there any observable headspace present in any VOA vial? YES...NO...NA

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence #_____

I certify that I unloaded the cooler and answered questions 7-14 (intial) _____

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA

b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial) _____

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial) _____

I certify that I attached a label with the unique LIMS number to each container (intial) _____

21. Were there Non-Conformance issues at login? YES...NO Was a PIPE generated? YES...NO...#_____

BIS = Broken in shipment

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

Loc: 490
70785

COOLER RECEIPT FORM

Cooler Received/Opened On 1/21/2015 @ 0830

1. Tracking #_____(last 4 digits, FedEx)

Courier: Street IR Gun ID 96210146

2. Temperature of rep. sample or temp blank when opened: 24 *Degrees Celsius*

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO...NA

4. Were custody seals on outside of cooler? YES...NO...NA

   If yes, how many and where:_____

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (intial) _____

7. Were custody seals on containers: YES NO and Intact YES...NO...NA

   Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES...NO...NA

   b. Was there any observable headspace present in any VOA vial? YES...NO...NA

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence #_____

I certify that I unloaded the cooler and answered questions 7-14 (intial) _____

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO..NA

   b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial) _____

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial) _____

I certify that I attached a label with the unique LIMS number to each container (intial) _____

21. Were there Non-Conformance issues at login? YES...NO Was a PIPE generated? YES...NO...#_____

BIS = Broken in shipment

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING
Nashville, TN

COOLER RECEIPT FORM

TAN 70785

Cooler Received/Opened On 1/21/2015 @ 0830

1. Tracking #_____(last 4 digits, FedEx)

Courier: Street IR Gun ID 96210146

2. Temperature of rep. sample or temp blank when opened: 3.5 *Degrees Celsius*

3. If Item #2 temperature is 0°C or less, was the representative sample or temp blank frozen? YES NO...NA

4. Were custody seals on outside of cooler? YES...NO...NA

If yes, how many and where:_____

5. Were the seals intact, signed, and dated correctly? YES...NO...NA

6. Were custody papers inside cooler? YES...NO...NA

I certify that I opened the cooler and answered questions 1-6 (intial) _____

7. Were custody seals on containers: YES NO and Intact YES...NO...NA

Were these signed and dated correctly? YES...NO...NA

8. Packing mat'l used? Bubblewrap Plastic bag Peanuts Vermiculite Foam Insert Paper Other None

9. Cooling process: Ice Ice-pack Ice (direct contact) Dry ice Other None

10. Did all containers arrive in good condition (unbroken)? YES...NO...NA

11. Were all container labels complete (#, date, signed, pres., etc)? YES...NO...NA

12. Did all container labels and tags agree with custody papers? YES...NO...NA

13a. Were VOA vials received? YES...NO...NA

b. Was there any observable headspace present in any VOA vial? YES...NO...NA

14. Was there a Trip Blank in this cooler? YES...NO...NA If multiple coolers, sequence #_____

I certify that I unloaded the cooler and answered questions 7-14 (intial) _____

15a. On pres'd bottles, did pH test strips suggest preservation reached the correct pH level? YES...NO...NA

b. Did the bottle labels indicate that the correct preservatives were used YES...NO...NA

16. Was residual chlorine present? YES...NO...NA

I certify that I checked for chlorine and pH as per SOP and answered questions 15-16 (intial) _____

17. Were custody papers properly filled out (ink, signed, etc)? YES...NO...NA

18. Did you sign the custody papers in the appropriate place? YES...NO...NA

19. Were correct containers used for the analysis requested? YES...NO...NA

20. Was sufficient amount of sample sent in each container? YES...NO...NA

I certify that I entered this project into LIMS and answered questions 17-20 (intial) _____

I certify that I attached a label with the unique LIMS number to each container (intial) _____

21. Were there Non-Conformance issues at login? YES...NO Was a PIPE generated? YES...NO...#_____

BIS = Broken in shipment
Cooler Receipt Form.doc

LF-1
End of Form

Revised 11/28/2012

TestAmerica Nashville
2960 Foster Creighton Drive
Nashville, TN 37204
Phone (615) 726-0177 Fax (615) 726-3404

Chain of Custody Record

TestAmerica
THE LEADER in ENVIRONMENTAL TESTING

Client Information	Sampler: NJL, RDS	Lab PM: Baker, Heather	Carrier Tracking No(s):	COC No: 490-25561-9400.1
Client Contact: Nick Carmean	Phone: 615-373-8532	E-Mail: heather.baker@testamericainc.com		Page: Page 1 of 1
Company: Aquaeter Inc				Job #:
Address: 215 Jamestown Park Suite 204	Due Date Requested: ASAP			
City: Brentwood	TAT Requested (days):			
State, Zip: TN, 37027				
Phone:	PO #: Purchase Order Requested 142299			
Email: ncarmean@aquaeter.com	WO #:			
Project Name: Stones River	Project #: 49007047			
Site:	SSOW#:			

Analysis Requested

Loc: 490
70785

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	350.1 - Ammonia	351.2 - TKN	353.2 - Nitrate-Nitrite	365.4 - Total Phosphorus	SM2320B - Bicarbonate Alkalinity	SM5600 - Ortho-phosphate	SM4500 - Silica	SM2540D - Total Suspended Solids	Total Number of containers	Special Instructions/Note:	
			Preservation Code:				S	S	S	S	N	N	N	N			
WF-005	0950	1/20	G	Water			X	X	X	X	X	X	X	X	5		-1
WF-005-D	0948	1/20	G	Water													-2
WF-004	1028	1/20	G	Water													-3
WF-002	1110	1/20	G	Water													-4
WF-003	1145	1/20	G	Water													-5
WF-001	1245	1/20	G	Water													-6
SF-004	1320	1/20	G	Water													-7
SF-005	1350	1/20	G	Water													-8
SF-003	1500	1/20	G	Water													-9
SF-002	1528	1/20	G	Water													-10
SF-001	1540	1/20	G	Water													-11

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by:	Date/Time: 1/21/15 0830	Company AAT	Received by:	Date/Time: 1-21-15 / 0830	Company TAN
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No
Custody Seal No.:
Cooler Temperature(s) °C and Other Remarks: 1.5, 2.4, 3.5

Login Sample Receipt Checklist

Client: Aquaeter Inc

Job Number: 490-70785-1

Login Number: 70785

List Number: 1

Creator: Huckaba, Jimmy

List Source: TestAmerica Nashville

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	True	

Collection Date: 6/15/2014

SPECIES	EF001		EF002		EF003		EF004		EF005		WF004		WF005		WF003		WF002		WF001	
	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL
CHLOROPHYTA																				
Chlorococcales																				
Oocystaceae																				
Ankistrodesmus sp.	3	0.27			4	80.26	6	47.78			2	56.88	3	144.14					2	48.71
Scenedesmaceae																				
Actinastrum sp.	3	0.33			1	30.72														
Scenedesmus sp.	2	0.20	2	6.51	1	21.57	2	13.34			1	33.16					3	20.29		
		0.80		6.51		132.55		61.13				90.04		144.14				20.29		48.71
EUGLENOPHYTA																				
Euglenales																				
Euglenaceae																				
Euglena sp.	1	0.13	1	3.93	1	14.62	3	21.26			1	24.38								
		0.13		3.93		14.62		21.26				24.38								
CHRYSOPHYTA																				
XANTHOPHYCEAE																				
Tribonematales																				
Tribonemataceae																				
Tribonema sp.	4	0.37															5	32.13		
		0.37																32.13		
CHRYSOPHYCEAE																				
Ochromonadales																				
Dinobyaceae																				
Dinobryon sp.											6	151.48			2	25.75			1	31.50
												151.48				25.75				31.50
BACILLARIOPHYCEAE																				
Centrales																				
Coscinodiscaceae																				
Cyclotella sp.	0	0.03													12	148.99			13	314.63
Melosira variens	43	4.30	21	81.15	3	72.50	8	61.47			8	192.41	6	267.51	14	178.97	39	263.54	44	1053.46
Pennales																				
Cymbellaceae																				
Amphora sp.							2	16.01									4	25.26	4	101.29
Cymbella sp.	7	0.70	8	31.61	4	87.20	9	71.88	6	0.60	7	169.33	4	174.44	8	106.36	13	90.63	11	251.96
Gomphonemaceae																	2	13.25		
Gomphonema sp.	8	0.80	9	35.55	20	439.72	18	146.68	11	1.10	3	66.31	6	286.13	23	298.10	21	142.99	12	277.41
Achnanthaceae																				
Achnanthes sp.	4	0.43	3	13.12	17	366.68	7	56.13	10	0.97	8	196.95	14	668.83	9	111.02	18	124.96	10	240.14
Achnanthes cf. minnutissima							4	32.12												
Cocconeis cf. placentula	4	0.37	2	9.21	2	43.79	8	61.20	6	0.60	4	90.69	3	141.33	6	76.61	8	54.33	6	133.99
Rhoicosphenia curvata			0	1.32																
Fragillariaceae																				
Diatoma vulgare	14	1.43	13	52.71	3	58.23			3	0.33							12	84.37	4	105.00
Synedra ulna	44	4.40	13	52.58	3	57.95	16	130.59	9	0.90	17	416.34	10	483.32	14	178.64	34	231.24	29	682.70
Fragilaria sp.															3	42.19				
Tabellaria sp.	1	0.10																		
Nitzschiaceae																				
Nitzschia spp.	40	4.03	102	401.37	103	2276.82	105	843.49	101	10.10	104	2525.67	104	5030.05	106	1349.39	102	692.01	103	2428.66
Nitzschia sigmoida	1	0.13			5	102.48	2	18.77												
Naviculaceae																				
Gyrosigma sp.	2	0.23	3	11.80	2	36.38	6	45.28	4	0.37	1	31.85			3	38.19	6	43.16		
Navicula spp.	15	1.47	25	97.31	39	851.77	79	634.99	56	5.57	58	1403.74	30	1451.28	26	331.85	19	131.46	26	613.12
Pinnularia sp.			2	9.21																
Surirellaceae																				
Surirella sp.	3	0.33									2	39.98			4	51.18				
		18.77		796.94		4393.53		2118.59		20.53		5133.28		8502.89		2911.50		1897.19		6202.36

Collection Date: 6/15/2014

SPECIES	EF001		EF002		EF003		EF004		EF005		WF004		WF005		WF003		WF002		WF001	
	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL
CYANOPHYTA																				
Oscilliatoriales																				
Oscilliatoriaceae																				
Osicillatoria sp.			1	3.99			2	15.92	1	0.10	1	32.51	1	63.42	9	115.02			3	78.03
cf. Planklothrix sp.																			17	403.63
				3.99				15.92		0.10		32.51		63.42		115.02				481.66
TOTAL NO. OF ORGANISMS	**201**	**20**	**206**	**811**	**206**	**4541**	**277**	**2217**	**206**	**21**	**223**	**5431.68**	**181**	**8710**	**239**	**3052**	**286**	**1950**	**286**	**6764**
TOTAL NO. OF TAXA	**19**	**19**	**15**	**15**	**15**	**15**	**16**	**16**	**10**	**10**	**15**	**15**	**10**	**10**	**14**	**14**	**14**	**14**	**15**	**15**
NUMBER OF GENERA		**18**		**15**		**14**		**14**		**10**		**15**		**10**		**14**		**14**		**15**
NUMBER OF DIVISIONS		**3**		**4**		**3**		**4**		**3**		**5**		**3**		**3**		**3**		**4**
SHANNON DIVERSITY		**2.919**		**2.459**		**2.216**		**2.489**		**2.144**		**2.113**		**1.942**		**2.687**		**2.876**		**2.749**
POLLUTION TOLERANCE		**2.74**		**2.38**		**2.30**		**2.37**		**2.31**		**2.30**		**2.28**		**2.39**		**2.59**		**2.44**
% motile diatoms		**29.73%**		**61.46%**		**71.16%**		**67.54%**		**75.93%**		**0.73**		**74.41%**		**56.76%**		**42.24%**		**44.97%**

Formula for Organisms/ml:

$$\frac{U}{A \times G \times C/B}$$

U=total number of organisms counted
A= area of grid
G=number of grids counted
C=sample volume used in chamber
B=total basal area of chamber

BACILLARIOP	7348.4	**BACILLARIOP**	24647.2
CHLOROPHYT	201.0	**CYANOPHYTA**	692.6
EUGLENOPHY	39.9	**CHLOROPHYT**	303.2
CYANOPHYTA	20.0	**CHRYSOPHYC**	208.7
XANTHOPHYC	0.4	**XANTHOPHYC**	32.1
CHRYSOPHYC		**EUGLENOPHY**	24.4

Collection Date: 8/12/2014

SPECIES							PA45577		PA45578		PA45579		PA45580		PA45581		PA45582		PA45583		PA45584		PA45585		PA45586	
							EF001		EF002		EF003		EF004		EF005		WF001		WF002		WF003		WF004		WF005	
	Sub 1	No./mL	Sub 2	No./mL	Sub 3	No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL
CHLOROPHYTA (Green Algae)																										
* *unknown Chlorophyta*																	100	1305.56					4	16.94		
Chlorophyceae																										
Volvocales																										
Volovocaceae																										
Gonium sp.																		4.17								
Pandorina sp.	51	309.09	45	473.68	49	350.00	48	377.59	17	139.87	8	32.99	3	29.53	2	27.43	20	258.89					2	6.54	8	15.61
Chlorococcales																										
Oocystaceae																										
Ankistrodesmus sp.	11	66.67	6	63.16	11	78.57	9	69.47	9	75.79	100	458.26	100	1006.73	100	1674.44	13	173.89			4	20.54	1	4.03	3	4.58
Scenedesmaceae																										
Actinastrum sp.																	1	13.06								
Scenedesmus sp.	11	66.67	5	52.63	4	28.57	7	49.29	13	113.69	16	52.44	4	37.17	8	136.36	7	95.28	1	10.71	3	14.12	5	14.72	19	37.87
Tetrastrum sp.	2	12.12			2	14.29	1	8.80									1	16.67								
Hydrodictyaceae																										
Pediastrum sp.																	2	21.94					1	2.58	0	0.46
Oedogoniales																										
cf.Oedogonium sp.																	21	103.33								
Zygnematales																										
Desmidiaceae																										
Closterium sp.																			1	5.16	0	1.52	0	1.00		
Cosmarium sp.																			1	8.73	1	3.03			0	
								505.15		329.35		543.69		1073.43		1838.23		1992.78		24.60		39.20		45.82		58.51
EUGLENOPHYTA																										
Euglenales																										
Euglenaceae																										
Euglena sp.	3	18.18	2	21.05	2	14.29	2	17.84	7	55.16	11	41.46	1	12.73	4	74.90	1	17.50	1	5.56					5	11.49
Trachelomonas sp.	2	12.12			1	7.14	1	6.42																		
								24.26		55.16		41.46		12.73		74.90		17.50		5.56		0.00		0.00		11.49
PYRROPHYTA																										
Dinophyceae																										
Dinococcales																										
Dinococcaceae																										
Hypnodinium sp.	11	66.67	3	31.58	13	92.86	9	63.70	10	83.25	4	13.01	1	10.07	1	10.68	9	113.33	1	5.95	0	1.85	1	3.30		
								63.70		83.25		13.01		10.07		10.68		113.33		5.95		1.85		3.30		0.00
CHRYSOPHYTA(Golden Algae)																										
XANTHOPHYCEAE (YG Algae)																										
Tribonematales																										
Tribonemataceae																										
Tribonema sp.	147	890.91	140	1473.68	91	650.00	126	1004.86	50	414.34	22	91.69	6	55.56							4	18.01	2	5.13	0	0.46
								1004.86		414.34		91.69		55.56		0.00		0.00		0.00		18.01		5.13		0.46
CHRYSOPHYCEAE (Golden Algae)																										
Ochromonadales																										
Dinobyaceae																										
Dinobryon sp.											3	6.85	1	9.76	1	16.24			0	3.17	2	9.16				
								0.00		0.00		6.85		9.76		16.24		0.00		3.17		9.16		0.00		0.00
BACILLARIOPHYCEAE (Brown Algae)																										
Centrales																										
Coscinodiscaceae																										
Melosira variens									0	2.47	29	104.24	6	59.43	2	33.49	7	95.56	25	213.10	16	77.44	7	23.33	10	26.24
Pennales																										
Cymbellaceae																										
Cymbella sp.											1	2.47	1	13.77	1	11.19			4	36.11	6	29.34	9	28.84	5	10.32
Gomphonemaceae																										
Gomphonema sp.											2	7.87	1	6.73			1	8.33	1	7.54	1	7.07	1	1.85	1	1.37
Achnanthaceae																										
Achnanthes sp.	2	12.12			1	7.14	1	6.42			2	5.76														
Cocconeis sp.					1	7.14	0	2.38			4	21.81	1	9.70	2	28.36	0	4.44	13	105.95	14	68.45	28	91.83	18	39.86
Fragillariaceae																										
Asterionella formosa																					55	275.69	1	6.35		
Fragillaria sp.																	8	104.44	5	35.71	22	103.87	1	2.56		
Diatoma vulgare																6.06			1	7.54			1	2.44		0.51
Synedra ulna	100	606.06	100	1052.63	100	714.29	100	790.99	100	827.72	53	192.84	18	175.42	19	326.42	2	21.94	2	13.89	6	31.05	6	22.35	5	12.15
Tabellaria sp.																			6	48.02						
Nitzschiaceae																										
Nitzschia sp.	54	327.27	34	357.89	49	350.00	46	345.06	8	68.80	55	215.20	23	221.01	26	433.45	5	59.17	7	53.97	15	72.46	25	78.50	54	105.16
Naviculaceae																										
Gyrosigma sp.											3	9.04	1	14.14				4.17	1	5.56	3	16.04	3	11.45	1	1.93
Navicula sp.											25	88.21	9	91.38	7	126.15	1	16.67	100	833.33	100	495.43	100	343.70	100	213.51
Surirellaceae																										
Surirella sp.											2	9.72			0	5.13	1	8.33	6	46.83	5	26.29	10	35.08	3	4.98
								1144.85		898.99		657.17		591.58		970.24		323.06		1407.54		1203.13		648.29		416.04

Collection Date: 8/12/2014

SPECIES							PA45577 EF001		PA45578 EF002		PA45579 EF003		PA45580 EF004		PA45581 EF005		PA45582 WF001		PA45583 WF002		PA45584 WF003		PA45585 WF004		PA45586 WF005	
	Sub 1	No./mL	Sub 2	No./mL	Sub 3	No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL
CYANOPHYTA (BG Algae)																										
Chroococcales																										
Chroococcaceae																										
Merismopedia sp.	1	6.06			1	7.14	1	4.40			1	2.19					1	12.78	1	5.56	1	3.37	0	1.00	1	2.14
								4.40		0.00		2.19		0.00		0.00		12.78		5.56		3.37		1.00		2.14
ROTIFERA																										
Eurotifera																										
Ploima																										
Brachionidae																										
Keratella sp.	2	12.12					1	4.04	0	2.78																
MISC.																										
**unknown Ciliate*	5	30.30	2	21.05	4	28.57	4	26.64			1	3.56	0	3.70									0	0.85		
TOTAL NO. OF ORGANISMS	397	2406	335	3526	325	2321	352	5498	215	3565	341	2712	176	3506	173	5821	101	3613	175	2905	258	2549	205	1390	234	977
TOTAL NO. OF TAXA	13	13	8	8	13	13	14	20	10	15	18	25	15	21	13	19	18	25	19	25	19	25	20	25	17	22
NUMBER OF GENERA								14		10		18		15		14		19		19		19		20		17
NUMBER OF DIVISIONS								6		5		5		4		4		5		5		4		4		4
SHANNON DIVERSITY								2.346		2.276		3.139		2.256		2.088		3.297		2.378		2.87		2.612		2.575
POLLUTION TOLERANCE								2.70		2.92		2.37		2.39		2.39		2.39		2.24		2.47		2.30		2.18
% motile diatoms	13.60%		10.15%		15.08%			12.94%		3.90%		23.55%		17.55%		19.13%		5.02%		64.41%		46.85%		66.18%		66.99%

***not included in analysis**

Formula used for no. /mL:

$$\frac{U}{A \times G \times C/B}$$

Where:
U = total number of Taxon A units counted in all grids
A = area of the grid used
G = number of grids counted
C = volume of Utermohl chamber used
B = total basal area of the Utermohl chamber

71
504
713
32237

* unknown Chlorophyta could be zoospores of Oedogonium sp.

Collection Date: 11/4/2014

SPECIES	EF001		EF002		EF003		EF004-MID		EF005		WF001		WF002		WF002 D		WF003		WF004		WF005	
	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL
CHLOROPHYTA																						
** unknown Chlorophyta*			7	359.30							18	865.59										
Odegonium sp.															2	114.32						
Chlorophyceae																						
Volvocales																						
Volovocaceae																						
Gonium sp.			0	16.33			1	32.66					1	32.66								
Pandorina sp.	7	11.06	3	130.65					3	130.65	8	375.63	1	32.66								
Chlorococcales																						
Oocystaceae																						
Ankistrodesmus sp.	3	4.53	13	636.94			22	1077.90	8	391.96	35	1714.85	40	1976.16	661	1012.58	23	41.18	2.00	97.99	3	57.91
Selenastrum sp.	2	3.23																				
Scenedesmaceae																						
Actinastrum sp.	6	9.75															2	3.66			5	97.19
Crucigenia sp.																					1	25.69
Scenedesmus sp.	7	10.51	23	1126.90	8	391.96	20	979.91	12	587.95	10	506.29	12	587.95	131	163.32	10	17.89	1.33	65.33	2	45.42
Hydrodictyaceae																						
Pediastrum sp.													1	49.00			2	4.16			1	12.49
Microsporaceae																						
Microspora sp.					13	620.61																
Zygnematales																						
Desmidiaceae																						
Closterium sp.	4	6.76	24	1192.23	18	881.92	3	130.65					1	32.66	17	32.66						
Cosmarium sp.							2	81.66					1	49.00	17	32.66						
Staurastrum sp.																					1	12.49
		45.85		3462.36		1894.50		2302.79		1110.57		3462.36		2760.08		1355.54		66.90		163.32		251.18
EUGLENOPHYTA																						
Euglenales																						
Euglenaceae																						
Euglena sp.	22	34.97	63	3070.39	15	734.93	13	636.94	8	391.96	7	342.97	4	212.31	33	65.33					3	54.67
Strombomonas sp.	6	8.94	7	342.97					2	114.32	2	114.32										
		44		3413		735		637		506		457		212		65						55
CRYPTOPHYTA																						
Cryptophyceae																						
Cryptomonadaceae																						
Cryptomonas sp.	18	27.95	104	5111.87			13	620.61	8	408.30	10	489.96	2	114.32	33	65.33					6	115.69
		27.95		5111.87				620.61		408.30		489.96		114.32		65.33						115.69
PYRROPHYTA																						
Dinophyceae																						
Dinokontae																						
Gymnodiniaceae																						
Peridinium sp.	1	1.49											35	1698.51	165	228.65					7	140.86
		1.49												1698.51		228.65						140.86
CHRYSOPHYTA																						
XANTHOPHYCEAE																						
Tribonematales																						
Tribonemataceae																						
Tribonema sp.	137	219.27	16	767.60																		
		219.27		767.60																		
CHRYSOPHYCEAE																						
Ochromonadales																						
Dinobyaceae																						
Dinobryon sp.	4	6.04	1	65.33			1	65.33	1	32.66							0	0.61				
		6.04		65.33				65.33		32.66								0.61				

Collection Date: 11/4/2014

SPECIES	EF001		EF002		EF003		EF004-MID		EF005		WF001		WF002		WF002 D		WF003		WF004		WF005	
	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL
BACILLARIOPHYCEAE																						
Centrales																						
Coscinodiscaceae																						
Cyclotella sp.	108	171.64	7	326.64	4	179.65	29	1420.87	47	2302.79	12	604.28	5	261.31			1	1.22			10	198.51
Melosira variens	25	40.55	13	636.94	18	898.25	11	555.28	8	375.63	14	669.61			34	97.99	13	22.67				
Pennales																						
Cymbellaceae																						
Amphora sp.	1	1.58			5	244.98	3	163.32	1	65.33					83	130.65	4	7.14				
Cymbella sp.	9	13.60	11	555.28	9	440.96	8	375.63	23	1110.57	6	277.64	34	1682.18	198	293.97	19	34.53	6.67	326.64		
Gomphonemaceae																						
Gomphonema sp.	8	12.32	17	849.26	32	1551.53	31	1502.53	23	1126.90	8	375.63	51	2482.44	989	1437.20	11	19.68	6.67	326.64		
Achnanthaceae																						
Achnanthes sp.	7	10.43	15	734.93	21	1045.24	31	1535.20	40	1959.82	10	506.29	14	702.27	131	146.99	13	22.62	3.67	179.65		
Cocconeis cf. placentula	0	0.55	1	49.00			4	212.31	11	555.28	10	489.96	24	1159.56	644	996.24	16	27.97	1.33	65.33		
Rhoicosphenia curvata									6	293.97	95	4638.25					5	9.49	1.33	65.33		
Fragillariaceae																						
Asterionella formosa	1	1.01																				
Diatoma vulgare	8	13.05	6	277.64	35	1698.51			13	620.61			4	179.65			5	8.32				
Synedra ulna	30	47.26	36	1763.84	104	5111.87	65	3168.38	35	1698.51	5	261.31	10	489.96	197	261.31	7	13.14	1.67	81.66		
Fragilaria sp.			4	195.98																		
Tabellaria sp.	3	4.98											3	163.32			3	6.00				
Nitzschiaceae																						
Nitzschia spp.	17	27.26	72	3511.35	18	881.92	134	6549.08	107	5258.86	12	587.95	44	2155.81	988	1388.21	56	99.50	6.67	326.64	9	171.79
Naviculaceae																						
Gyrosigma sp.	2	3.72	7	342.97	14	669.61	8	375.63	4	212.31			4	195.98	17	49.00	3	5.38	1.33	65.33		
Navicula spp.	18	27.75	35	1698.51	37	1796.50	85	4180.96	35	1714.85	19	930.92	26	1273.89	478	702.27	104	185.48	6.33	310.31		
Pinnularia sp.					1	32.66			0	16.33			1	65.33								
Surirellaceae																						
Surirella sp.	3	4.73	4	179.65	22	1077.90	6	293.97	6	293.97							1	1.20				
		380.45		11122.00		15629.59		20333.17		17605.75		9341.83		10811.69		5503.84		464.35		1747.51		370.30
CYANOPHYTA																						
Chroococcales																						
Chroococcaceae																						
Merismopedia sp.							2	81.66			9	440.96	1	49.00			1	1.20			3	57.91
Oscilliatoriales																						
Oscilliatoriaceae																						
Osicillatoria sp.	3	4.85	3	163.32	2	114.32	7	326.64	5	228.65	3	130.65	22	1061.57	296	391.96	21	38.23				
Nostocales																						
Hammatoideaceae																						
Raphidiopsis sp.																					28	553.28
Nostocaceae																						
Anabaena sp.											1	49.00							1.00	49.00		
Anabaenopsis sp.																					7	138.73
Cylindrospermopsis sp.																					45	893.05
Pseudoanabaena sp.																					746	14883.61
		4.85		163.32		114.32		408.30		228.65		620.61		1110.57		391.96		39.43		49.00		16526.58
ROTIFERA	1	1.01																				
MISC.																						
**unknown Ciliate*	7	11.68	7	342.97	9	457.29			4	212.31	12	604.28										
TOTAL NO. OF ORGANISMS	**460**	**1461**	**485**	**47852**	**375**	**36747**	**497**	**48734**	**406**	**39784**	**276**	**27878**	**341**	**33415**	**5115**	**15221**	**319**	**1143**	**40**	**3920**	**876**	**34919**
TOTAL NO. OF TAXA		**35**		**30**		**21**		**27**		**28**		**23**		**29**		**24**		**25**		**14**		**21**
NUMBER OF GENERA		**28**		**28**		**18**		**22**		**23**		**19**		**24**		**18**		**22**		**12**		**16**
NUMBER OF DIVISIONS		**6**		**6**		**4**		**5**		**5**		**5**		**6**		**6**		**3**		**3**		**6**
SHANNON DIVERSITY		**3.427**		**3.723**		**3.552**		**3.434**		**3.633**		**3.449**		**3.729**		**3.445**		**3.34**		**3.224**		**1.046**
POLLUTION TOLERANCE		**2.61**		**2.49**		**2.73**		**2.41**		**2.57**		**2.78**		**2.85**		**2.66**		**2.42**		**2.82**		**2.00**
% motile diatoms		**15.70%**		**48.46%**		**24.03%**		**54.22%**		**41.28%**		**16.26%**		**31.72%**		**37.98%**		**61.63%**		**36.45%**		**46.39%**

Cell: A108

Comment: Colleen:

*not included in analyses

* unknown Chlorophyta could be zoospores of Oedogonium sp.

Formula used for no. /mL:

$$\frac{U}{A \times G \times C/B}$$

Where:

U = total number of Taxon A units counted in all grids

A = area of the grid used

G = number of grids counted

C = volume of Utermohl chamber used

B = total basal area of the Utermohl chamber

Collection Date: 1/20/2015

SPECIES	PA46680		PA46681		PA46682		PA46683		PA46684		PA46685		PA46686		PA46687		PA46688		PA46689	
	WF005		WF004		WF-002		WF-003		WF-001		EF-004		EF-005		EF-003		EF-002		EF-001	
	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL	Avg. Cells	Avg. No./mL
CHLOROPHYTA																				
Chlorococcales																				
Oocystaceae																				
Ankistrodesmus sp.	3	0.27	1	0.07	2	0.20	2	0.17					3.33	0.33					3	0.27
Scenedesmaceae																				
Scenedesmus sp.			1	0.10															1	0.10
Zygnematales																				
Desmidiaceae																				
Closterium sp.							1	0.10	1	0.13										
Euastrum sp.									0	0.03										
Siphonocladales																				
Cladophoraceae																				
Cladophora sp.			5	0.50																
	3	0	7	1	2	0	3	0	2	0			3	0					4	0
EUGLENOPHYTA																				
Euglenales																				
Euglenaceae																				
Euglena sp.	1	0.10					2	0.17			1	0.07							1	0.10
CHRYSOPHYCEAE																				
Ochromonadales																				
Dinobyaceae																				
Dinobryon sp.							3	0.30	3	0.30										
							3	0	3	0										
BACILLARIOPHYCEAE																				
Centrales																				
Coscinodiscaceae																				
Melosira varians	48	4.80	14	1.40	24	2.40	28	2.77	29	2.90	21	2.07	7.00	0.70	47	4.67	17	1.73	10	1.00
Pennales																				
Cymbellaceae																				
Amphora sp.							3	0.27											3	0.27
Cymbella sp.	3	0.33	6	0.60	6	0.57	3	0.33	9	0.87	5	0.47	4.67	0.47	3	0.30	8	0.77	2	0.23
Gomphonemaceae																				
Gomphonema sp.	28	2.83	21	2.10	17	1.73	13	1.33	18	1.80	34	3.40	31.33	3.13	17	1.70	45	4.47	15	1.53
Achnanthaceae																				
Achnanthes sp.	10	0.97	10	0.97	5	0.53			4	0.37	3	0.27	2.67	0.27	3	0.33			3	0.30
Cocconeis cf. placentula	13	1.33	28	2.80	34	3.40	56	5.63	22	2.20	13	1.27	14.33	1.43	9	0.90	13	1.33	4	0.43
Rhoicosphenia curvata	3	0.30	2	0.17	3	0.27	4	0.40	3	0.30	7	0.67	3.67	0.37	2	0.20	5	0.53		
Eunotiaceae																				
Eunotia sp.									1	0.10	1	0.13	1.00	0.10						
Fragillariaceae																				
Diatoma vulgare	69	6.87	74	7.43	72	7.20	93	9.30	64	6.43	87	8.67	10.00	1.00	37	3.67	72	7.17	21	2.10

Collection Date: 1/20/2015

SPECIES	PA46680		PA46681		PA46682		PA46683		PA46684		PA46685		PA46686		PA46687		PA46688		PA46689	
	WF005		**WF004**		**WF-002**		**WF-003**		**WF-001**		**EF-004**		**EF-005**		**EF-003**		**EF-002**		**EF-001**	
	Avg. Cells	**Avg. No./mL**	**Avg. Cells**	**Avg. No./mL**	**Avg. Cells**	**Avg. No./mL**	**Avg. Cells**	**Avg. No./mL**	**Avg. Cells**	**Avg. No./mL**	**Avg. Cells**	**Avg. No./mL**	**Avg. Cells**	**Avg. No./mL**	**Avg. Cells**	**Avg. No./mL**	**Avg. Cells**	**Avg. No./mL**	**Avg. Cells**	**Avg. No./mL**
Synedra ulna	8	0.80	6	0.57	7	0.73	6	0.60	11	1.10	13	1.27	15.33	1.53	13	1.27	12	1.20	10	1.03
Fragilaria sp.					4	0.40	1	0.10	5	0.53										
Nitzschiaceae																				
Nitzschia spp.	40	3.97	81	8.13	57	5.70	18	1.83	44	4.37	55	5.53	91.00	9.10	27	2.70	82	8.20	49	4.90
Nitzschia sigmoida					2	0.17			2	0.17			1.67	0.17	1	0.13				
Naviculaceae																				
Gyrosigma sp.	3	0.33	4	0.43	3	0.27	3	0.27	4	0.40	2	0.17	2.00	0.20	5	0.50	4	0.37	2	0.20
Navicula spp.	101	10.07	74	7.37	94	9.40	80	8.03	43	4.30	70	7.03	81.67	8.17	42	4.17	142	14.17	56	5.57
Pinnularia sp.					1	0.10	1	0.10	2	0.17	2	0.17			1	0.07				
Surirellaceae																				
Surirella sp.	2	0.23	1	0.13							6	0.63	6.33	0.63	1	0.13	5	0.47	1	0.13
	326	33	320	32	329	33	310	31	260	26	311	31	266	27	206	21	399	40	176	18
CYANOPHYTA																				
Oscilliatoriales																				
Oscilliatoriaceae																				
Oscillatoria sp.			3	0.33	5	0.53	5	0.47	2	0.23	4	0.37							3	0.27
Spirulina sp.																				
Pseudanabaenaceae																				
Pseudanabaenoideae																				
Pseudanabaena sp.											1	0.13	1.00	0.10						
			3	0	5	1	5	0	2	0	5	1	1	0					3	0
TOTAL NO. OF ORGANISMS	661	66	657	66	667	67	637	64	532	53	634	63	547	55	413	41	803	80	364	36
TOTAL NO. OF TAXA		16		18		18		21		22		18		18		15		12		18
NUMBER OF GENERA		14		16		15		18		18		17		15		13		11		16
NUMBER OF DIVISIONS		3		3		4		5		4		3		3		1		1		4
SHANNON DIVERSITY		2.79		2.758		2.848		2.655		3.132		2.897		2.679		3		2.626		2.71
POLLUTION TOLERANCE		2.43		2.49		2.48		2.60		2.59		2.53		2.33		2.45		2.41		2.36
% motile diatoms		21.59%		23.78%		22.90%		15.49%		16.61%		20.82%		33.05%		17.26%		28.42%		29.15%

Formula for Organisms/ml:

$$\frac{U}{A \times G \times C/B}$$

U=total number of organisms counted

A= area of grid

G=number of grids counted

C=sample volume used in chamber

B=total basal area of chamber

					Primary pigments				
					ug/l	ug/l	ug/l	ug/l	ug/l
Date	Sample #	Volume Filtered (ml)	date extracted at Horn Point (month/day/year)	Vx (ml)	[TChl a]	[TChl b]	[TChl c]	[Caro]	[But fuco]
6/5/14	EF001	500	6/17/14	5.556	23.414	2.601	1.320	0.931	0.001
6/5/14	EF001	500	6/17/14	5.524	23.448	2.665	1.317	0.937	0.001
6/5/14	EF002	500	6/17/14	5.588	33.647	2.512	2.574	1.130	0.001
6/5/14	EF003	500	6/17/14	5.592	9.584	1.047	0.419	0.494	0.001
6/5/14	EF004	500	6/17/14	5.614	9.033	0.983	0.399	0.505	0.001
6/5/14	EF005	500	6/17/14	5.610	16.836	2.383	0.803	0.871	0.001
6/5/14	EF004 dup	500	6/17/14	5.651	8.916	0.951	0.370	0.527	0.001
6/6/14	WF001	500	6/17/14	5.576	28.895	4.294	1.231	1.498	0.001
6/6/14	WF002	500	6/17/14	5.592	2.941	0.306	0.167	0.227	0.001
6/6/14	WF003	500	6/17/14	5.557	1.954	0.259	0.101	0.213	0.001
6/6/14	WF004	500	6/17/14	5.641	2.833	0.343	0.124	0.389	0.001
6/6/14	WF005	500	6/17/14	5.604	6.140	0.821	0.216	0.540	0.001

									Secondary pigments		
		ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
Date	Sample #	[Hex fuco]	[Allo]	[Diad]	[Diato]	[Fuco]	[Perid]	[Zea]	[Chl a]	[DVChl a]	[Chlide a]
6/5/14	EF001	0.001	1.915	0.353	0.077	2.301	0.085	0.727	23.125	0.001	0.289
6/5/14	EF001	0.001	1.896	0.350	0.064	2.302	0.078	0.720	23.157	0.001	0.291
6/5/14	EF002	0.001	1.414	0.880	0.280	7.934	0.068	0.454	33.323	0.001	0.324
6/5/14	EF003	0.001	0.334	0.163	0.019	1.264	0.001	0.544	9.506	0.001	0.078
6/5/14	EF004	0.001	0.433	0.120	0.018	0.953	0.001	0.603	8.971	0.001	0.061
6/5/14	EF005	0.001	0.792	0.352	0.066	1.878	0.010	0.448	16.635	0.001	0.201
6/5/14	EF004 dup	0.001	0.467	0.111	0.020	0.838	0.001	0.541	8.841	0.001	0.075
6/6/14	WF001	0.001	0.957	0.686	0.503	3.671	0.144	1.814	28.497	0.001	0.398
6/6/14	WF002	0.001	0.098	0.123	0.025	0.673	0.001	0.075	2.899	0.001	0.041
6/6/14	WF003	0.001	0.048	0.062	0.011	0.392	0.001	0.091	1.921	0.001	0.033
6/6/14	WF004	0.001	0.105	0.048	0.014	0.329	0.001	0.280	2.785	0.001	0.048
6/6/14	WF005	0.001	0.203	0.112	0.029	0.695	0.001	0.420	6.037	0.001	0.103

								Tertiary pigments			
		ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
Date	Sample #	[Chl b]	[DVChl b]	[Chl c_1]	[Chl c_2]	[Chl c_{12}]	[Chl c_3]	[Lut]	[Neo]	[Viola]	[Phytin a]
6/5/14	EF001	2.601	0.001			1.293	0.027	0.885	0.314	0.391	1.077
6/5/14	EF001	2.665	0.001			1.289	0.028	0.886	0.311	0.396	1.083
6/5/14	EF002	2.512	0.001			2.574	0.001	0.871	0.273	0.299	2.138
6/5/14	EF003	1.047	0.001			0.419	0.001	0.582	0.133	0.169	1.002
6/5/14	EF004	0.983	0.001			0.399	0.001	0.462	0.111	0.147	0.717
6/5/14	EF005	2.383	0.001			0.803	0.001	1.012	0.293	0.347	1.236
6/5/14	EF004 dup	0.951	0.001			0.370	0.001	0.494	0.125	0.157	0.698
6/6/14	WF001	4.294	0.001			1.183	0.048	2.289	0.591	0.707	1.992
6/6/14	WF002	0.306	0.001			0.167	0.001	0.123	0.036	0.051	0.493
6/6/14	WF003	0.259	0.001			0.101	0.001	0.105	0.033	0.033	0.312
6/6/14	WF004	0.343	0.001			0.124	0.001	0.192	0.040	0.057	0.495
6/6/14	WF005	0.821	0.001			0.216	0.001	0.433	0.120	0.159	0.793

				Ancillary pigment		Pigment Sums			
		ug/l	ug/l	ug/l					
Date	Sample #	[Phide a]	[Pras]	[Gyr diester]	blank intentionally	[TChl]	[PPC]	[PSC]	[PSP]
6/5/14	EF001	0.795	0.001	0.001		27.335	4.003	2.386	29.721
6/5/14	EF001	0.811	0.001	0.001		27.430	3.967	2.380	29.810
6/5/14	EF002	1.311	0.001	0.001		38.733	4.158	8.002	46.735
6/5/14	EF003	0.767	0.001	0.001		11.050	1.554	1.264	12.314
6/5/14	EF004	0.810	0.001	0.001		10.415	1.679	0.953	11.368
6/5/14	EF005	1.323	0.001	0.001		20.022	2.529	1.888	21.910
6/5/14	EF004 dup	0.823	0.001	0.001		10.237	1.666	0.838	11.075
6/6/14	WF001	1.063	0.001	0.001		34.420	5.458	3.815	38.235
6/6/14	WF002	0.766	0.001	0.001		3.414	0.548	0.673	4.087
6/6/14	WF003	0.737	0.001	0.001		2.314	0.425	0.392	2.706
6/6/14	WF004	1.063	0.001	0.001		3.300	0.836	0.329	3.629
6/6/14	WF005	1.248	0.001	0.001		7.177	1.304	0.695	7.872

						Pigment ratios		
Date	Sample #	[TCaro]	[TAcc]	[TPig]	[DP]	[TAcc]/[Tchla]	[PSC]/[TCaro]	[PPC]/[TCaro]
6/5/14	EF001	6.389	10.310	33.724	7.629	0.44	0.37	0.63
6/5/14	EF001	6.347	10.329	33.777	7.661	0.44	0.37	0.63
6/5/14	EF002	12.160	17.246	50.893	12.382	0.51	0.66	0.34
6/5/14	EF003	2.818	4.284	13.868	3.189	0.45	0.45	0.55
6/5/14	EF004	2.632	4.014	13.047	2.972	0.44	0.36	0.64
6/5/14	EF005	4.417	7.603	24.439	5.511	0.45	0.43	0.57
6/5/14	EF004 dup	2.504	3.825	12.741	2.797	0.43	0.33	0.67
6/6/14	WF001	9.273	14.798	43.693	10.880	0.51	0.41	0.59
6/6/14	WF002	1.221	1.694	4.635	1.152	0.58	0.55	0.45
6/6/14	WF003	0.817	1.177	3.131	0.790	0.60	0.48	0.52
6/6/14	WF004	1.165	1.632	4.465	1.057	0.58	0.28	0.72
6/6/14	WF005	1.999	3.036	9.176	2.139	0.49	0.35	0.65

						Pigment indices		
Date	Sample #	[TChl]/[TCaro]	[PPC]/[Tpig]	[PSP]/[TPig]	[TChl a]/[TPig]	microplankton [mPF]	nanoplankton [nPF]	picoplankton [pPF]
6/5/14	EF001	4.28	0.12	0.88	0.69	0.31	0.25	0.44
6/5/14	EF001	4.32	0.12	0.88	0.69	0.31	0.25	0.44
6/5/14	EF002	3.19	0.08	0.92	0.66	0.65	0.11	0.24
6/5/14	EF003	3.92	0.11	0.89	0.69	0.40	0.10	0.50
6/5/14	EF004	3.96	0.13	0.87	0.69	0.32	0.15	0.53
6/5/14	EF005	4.53	0.10	0.90	0.69	0.34	0.14	0.51
6/5/14	EF004 dup	4.09	0.13	0.87	0.70	0.30	0.17	0.53
6/6/14	WF001	3.71	0.12	0.88	0.66	0.35	0.09	0.56
6/6/14	WF002	2.80	0.12	0.88	0.63	0.58	0.09	0.33
6/6/14	WF003	2.83	0.14	0.86	0.62	0.50	0.06	0.44
6/6/14	WF004	2.83	0.19	0.81	0.63	0.31	0.10	0.59
6/6/14	WF005	3.59	0.14	0.86	0.67	0.32	0.09	0.58

Date	Sample #	comments
6/5/14	EF001	no comments
6/5/14	EF001	
6/5/14	EF002	
6/5/14	EF003	
6/5/14	EF004	
6/5/14	EF005	
6/5/14	EF004 dup	
6/6/14	WF001	
6/6/14	WF002	
6/6/14	WF003	
6/6/14	WF004	
6/6/14	WF005	

						Primary pigments			
						ug/l	ug/l	ug/l	ug/l
Horn Point Lab sample code	date	sample #	Vf (ml)	date extracted at Horn Point (month/day/year)	Vx (ml)	[TChl a]	[TChl b]	[TChl c]	[Caro]
Aq 1	8/12/14	WF002	250	10/16/14	5.520	2.288	0.271	0.129	0.174
Aq 2	8/12/14	WF004	250	10/16/14	5.522	0.990	0.165	0.047	0.111
Aq 3	8/12/14	WF003	250	10/16/14	5.555	2.077	0.252	0.089	0.184
Aq 4	8/12/14	WF001	250	10/16/14	5.568	7.570	1.069	0.312	0.542
Aq 5	8/12/14	WF005	250	10/16/14	5.540	34.163	2.126	1.184	2.697
Aq 6	8/12/14	EF002	250	10/16/14	5.552	9.814	1.007	0.552	0.462
Aq 7	8/12/14	EF003	250	10/16/14	5.578	5.087	0.661	0.263	0.298
Aq 8	8/12/14	EF004	250	10/16/14	5.595	3.026	0.361	0.166	0.237
Aq 9	8/12/14	EF001	250	10/16/14	5.605	16.693	1.000	1.022	0.742
Aq 10	8/12/14	EF005	250	10/16/14	5.622	3.675	0.472	0.193	0.293

								Secondary pigments				
ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
[But fuco]	[Hex fuco]	[Allo]	[Diad]	[Diato]	[Fuco]	[Perid]	[Zea]	[Chl a]	[DVChl a]	[Chlide a]	[Chl b]	[DVChl b]
0.001	0.001	0.198	0.052	0.024	0.269	0.001	0.114	2.267	0.001	0.021	0.271	0.001
0.001	0.001	0.018	0.039	0.008	0.171	0.001	0.042	0.970	0.001	0.020	0.165	0.001
0.001	0.001	0.091	0.094	0.022	0.385	0.001	0.060	2.026	0.001	0.051	0.252	0.001
0.001	0.001	0.468	0.148	0.041	0.809	0.001	0.474	7.490	0.001	0.080	1.069	0.001
0.001	0.001	2.242	2.496	0.636	2.164	0.432	4.061	33.659	0.001	0.504	2.126	0.001
0.001	0.001	0.952	0.387	0.066	1.105	0.001	0.051	9.700	0.001	0.114	1.007	0.001
0.001	0.001	0.338	0.224	0.039	0.737	0.001	0.043	5.025	0.001	0.062	0.661	0.001
0.001	0.001	0.173	0.112	0.025	0.520	0.001	0.042	2.989	0.001	0.037	0.361	0.001
0.001	0.001	1.422	0.742	0.153	3.067	0.001	0.187	16.324	0.001	0.369	1.000	0.001
0.001	0.001	0.177	0.117	0.041	0.760	0.001	0.053	3.605	0.001	0.070	0.472	0.001

				Tertiary pigments						Ancillary pigment	
ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	
[Chl c_1]	[Chl c_2]	[Chl c_{12}]	[Chl c_3]	[Lut]	[Neo]	[Viola]	[Phytin a]	[Phide a]	[Pras]	[Gyr diester]	blank intentionally
		0.129	0.001	0.151	0.044	0.089	0.093	0.150	0.001	0.001	
		0.047	0.001	0.077	0.024	0.040	0.108	0.349	0.001	0.001	
		0.089	0.001	0.133	0.036	0.074	0.262	0.439	0.001	0.001	
		0.312	0.001	0.576	0.165	0.343	0.238	0.283	0.001	0.001	
		1.105	0.079	1.145	0.336	0.389	0.364	0.510	0.001	0.001	
		0.552	0.001	0.338	0.138	0.130	0.768	0.302	0.001	0.001	
		0.263	0.001	0.225	0.089	0.092	0.648	0.368	0.001	0.001	
		0.166	0.001	0.162	0.045	0.063	0.538	0.360	0.001	0.001	
		1.022	0.001	0.523	0.143	0.190	1.210	0.556	0.001	0.001	
		0.193	0.001	0.246	0.064	0.073	0.772	0.440	0.001	0.001	

Pigment Sums								Pigment ratios	
[TChl]	[PPC]	[PSC]	[PSP]	[TCaro]	[TAcc]	[TPig]	[DP]	[TAcc]/[Tchla]	[PSC]/[TCaro]
2.688	0.562	0.269	2.957	0.831	1.231	3.519	0.852	0.54	0.32
1.202	0.218	0.171	1.373	0.389	0.601	1.591	0.396	0.61	0.44
2.418	0.451	0.385	2.803	0.836	1.177	3.254	0.788	0.57	0.46
8.951	1.673	0.809	9.760	2.482	3.863	11.433	2.820	0.51	0.33
37.473	12.132	2.596	40.069	14.728	18.038	52.201	11.025	0.53	0.18
11.373	1.918	1.105	12.478	3.023	4.582	14.396	3.115	0.47	0.37
6.011	0.942	0.737	6.748	1.679	2.603	7.690	1.779	0.51	0.44
3.553	0.589	0.520	4.073	1.109	1.636	4.662	1.096	0.54	0.47
18.715	3.246	3.067	21.782	6.313	8.335	25.028	5.676	0.50	0.49
4.340	0.681	0.760	5.100	1.441	2.106	5.781	1.462	0.57	0.53

					Pigment indices		
[PPC]/[TCaro]	[TChl]/[TCaro]	[PPC]/[Tpig]	[PSP]/[TPig]	[TChl a]/[TPig]	microplankton [mPF]	nanoplankton [nPF]	picoplankton [pPF]
0.68	3.23	0.16	0.84	0.65	0.32	0.23	0.45
0.56	3.09	0.14	0.86	0.62	0.43	0.05	0.52
0.54	2.89	0.14	0.86	0.64	0.49	0.12	0.40
0.67	3.61	0.15	0.85	0.66	0.29	0.17	0.55
0.82	2.54	0.23	0.77	0.65	0.24	0.20	0.56
0.63	3.76	0.13	0.87	0.68	0.35	0.31	0.34
0.56	3.58	0.12	0.88	0.66	0.41	0.19	0.40
0.53	3.20	0.13	0.87	0.65	0.47	0.16	0.37
0.51	2.96	0.13	0.87	0.67	0.54	0.25	0.21
0.47	3.01	0.12	0.88	0.64	0.52	0.12	0.36

comments

						Primary pigments		
						ug/l	ug/l	ug/l
Horn Point Lab sample code	date	sample #	Volume filtered (ml)	date extracted at Horn Point (month/day/year)	Vx (ml)	[TChl a]	[TChl b]	[TChl c]
AQ 1	11/4/14	EF001	750	1/13/15	5.609	1.047	0.056	0.063
AQ 1.5	11/4/14	EF001	750	1/13/15	5.621	1.046	0.054	0.064
AQ 2	11/4/14	EF002	750	1/13/15	5.606	0.657	0.045	0.040
AQ 3	11/4/14	EF003	750	1/13/15	5.585	0.595	0.036	0.049
AQ 4	11/4/14	EF004	750	1/13/15	5.545	2.488	0.076	0.228
AQ 5	11/4/14	EF005	750	1/13/15	5.609	0.473	0.043	0.031
AQ 5.2	11/4/14	EF005	750	1/13/15	5.579	0.479	0.040	0.031
AQ 6	11/4/14	WF004	750	1/13/15	5.721	2.121	0.122	0.159
AQ 7	11/4/14	WF005	750	1/13/15	5.671	2.150	0.113	0.181
AQ 8	11/4/14	WF005 dup	750	1/13/15	5.651	1.993	0.103	0.165
AQ 9	11/4/14	WF003	750	1/13/15	5.615	0.898	0.065	0.048
AQ 10	11/4/14	WF002	750	1/13/15	5.645	2.400	0.112	0.192
AQ 11	11/4/14	WF 001	750	1/13/15	5.688	2.569	0.113	0.138

									Secondary pigments			
ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
[Caro]	[But fuco]	[Hex fuco]	[Allo]	[Diad]	[Diato]	[Fuco]	[Perid]	[Zea]	[Chl a]	[DVChl a]	[Chlide a]	[Chl b]
0.046	0.001	0.001	0.080	0.038	0.023	0.189	0.001	0.016	1.031	0.001	0.016	0.056
0.047	0.001	0.001	0.080	0.036	0.023	0.190	0.001	0.016	1.031	0.001	0.015	0.054
0.032	0.001	0.004	0.040	0.028	0.013	0.136	0.001	0.013	0.646	0.001	0.010	0.045
0.027	0.001	0.001	0.020	0.028	0.013	0.183	0.001	0.014	0.586	0.001	0.008	0.036
0.082	0.001	0.001	0.038	0.159	0.029	0.869	0.001	0.017	2.446	0.001	0.042	0.076
0.024	0.001	0.001	0.016	0.015	0.015	0.125	0.001	0.019	0.467	0.001	0.006	0.043
0.025	0.001	0.001	0.017	0.013	0.016	0.124	0.001	0.018	0.473	0.001	0.006	0.040
0.084	0.001	0.001	0.079	0.058	0.031	0.616	0.001	0.022	2.091	0.001	0.030	0.122
0.078	0.001	0.001	0.088	0.086	0.031	0.662	0.001	0.023	2.121	0.001	0.029	0.113
0.090	0.001	0.001	0.079	0.072	0.035	0.619	0.001	0.021	1.966	0.001	0.027	0.103
0.051	0.001	0.001	0.019	0.021	0.005	0.190	0.001	0.015	0.889	0.001	0.010	0.065
0.109	0.001	0.001	0.071	0.093	0.018	0.700	0.001	0.022	2.355	0.001	0.045	0.112
0.144	0.001	0.004	0.229	0.057	0.022	0.421	0.001	0.049	2.537	0.001	0.032	0.113

			Tertiary pigments						Ancillary pigment		Pigment S
ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l		
[DVChl b]	[Chl c_{12}]	[Chl c_3]	[Lut]	[Neo]	[Viola]	[Phytin a]	[Phide a]	[Pras]	[Gyr diester]	blank intentionally	[TChl]
0.001	0.063	0.001	0.037	0.006	0.013	0.041	0.040	0.001	0.001		1.166
0.001	0.064	0.001	0.035	0.006	0.011	0.047	0.042	0.001	0.001		1.164
0.001	0.040	0.001	0.027	0.005	0.008	0.031	0.033	0.001	0.001		0.742
0.001	0.049	0.001	0.015	0.004	0.005	0.033	0.053	0.001	0.001		0.680
0.001	0.228	0.001	0.027	0.005	0.011	0.055	0.072	0.001	0.001		2.792
0.001	0.031	0.001	0.018	0.003	0.005	0.026	0.043	0.001	0.001		0.547
0.001	0.031	0.001	0.018	0.004	0.004	0.030	0.049	0.001	0.001		0.550
0.001	0.159	0.001	0.055	0.012	0.038	0.131	0.166	0.001	0.001		2.402
0.001	0.181	0.001	0.046	0.008	0.029	0.102	0.120	0.001	0.001		2.444
0.001	0.165	0.001	0.043	0.010	0.026	0.103	0.114	0.001	0.001		2.261
0.001	0.048	0.001	0.020	0.007	0.012	0.049	0.067	0.001	0.001		1.011
0.001	0.192	0.001	0.044	0.012	0.031	0.188	0.165	0.001	0.001		2.704
0.001	0.138	0.001	0.059	0.006	0.070	0.170	0.163	0.001	0.001		2.820

Sums							Pigment ratios		
[PPC]	[PSC]	[PSP]	[TCaro]	[TAcc]	[TPig]	[DP]	[TAcc]/[Tchla]	[PSC]/[TCaro]	[PPC]/[TCaro]
0.203	0.192	1.358	0.395	0.514	1.561	0.344	0.49	0.49	0.51
0.202	0.190	1.354	0.392	0.510	1.556	0.340	0.49	0.48	0.52
0.126	0.140	0.882	0.266	0.351	1.008	0.238	0.53	0.53	0.47
0.102	0.183	0.863	0.285	0.370	0.965	0.253	0.62	0.64	0.36
0.325	0.869	3.661	1.194	1.498	3.986	1.000	0.60	0.73	0.27
0.089	0.125	0.672	0.214	0.288	0.761	0.203	0.61	0.58	0.42
0.089	0.126	0.676	0.215	0.286	0.765	0.201	0.60	0.59	0.41
0.274	0.616	3.018	0.890	1.171	3.292	0.839	0.55	0.69	0.31
0.306	0.662	3.106	0.968	1.262	3.412	0.886	0.59	0.68	0.32
0.297	0.619	2.880	0.916	1.184	3.177	0.822	0.59	0.68	0.32
0.111	0.190	1.201	0.301	0.414	1.312	0.289	0.46	0.63	0.37
0.313	0.700	3.404	1.013	1.317	3.717	0.905	0.55	0.69	0.31
0.501	0.425	3.245	0.926	1.177	3.746	0.816	0.46	0.46	0.54

[TChl]/[TCaro]	[PPC]/[Tpig]	[PSP]/[TPig]	[TChl a]/[TPig]	comments
2.95	0.13	0.87	0.67	no comments
2.97	0.13	0.87	0.67	
2.79	0.13	0.88	0.65	
2.39	0.11	0.89	0.62	
2.34	0.08	0.92	0.62	
2.56	0.12	0.88	0.62	
2.56	0.12	0.88	0.63	
2.70	0.08	0.92	0.64	
2.52	0.09	0.91	0.63	
2.47	0.09	0.91	0.63	
3.36	0.08	0.92	0.68	
2.67	0.08	0.92	0.65	
3.05	0.13	0.87	0.69	

						Primary pigments			
						ug/l	ug/l	ug/l	ug/l
Horn Point Lab sample code	date	sample #	Vf (ml)	date extracted at Horn Point (month/day/year)	Vx (ml)	[TChl a]	[TChl b]	[TChl c]	[Caro]
AQ 1	1/20/15	EF-001	750	2/24/15	5.623	0.351	0.008	0.029	0.012
AQ 1.5	1/20/15	EF-001	750	2/24/15	5.748	0.350	0.007	0.030	0.012
AQ 2	1/20/15	EF-002	750	2/24/15	5.507	0.512	0.011	0.044	0.016
AQ 3	1/20/15	EF-003	750	2/24/15	5.584	0.716	0.014	0.072	0.020
AQ 4	1/20/15	EF-004	750	2/24/15	5.610	0.614	0.014	0.058	0.019
AQ 5	1/20/15	EF-005	750	2/24/15	5.610	0.492	0.016	0.043	0.017
AQ 6	1/20/15	WF-001	750	2/24/15	5.621	1.032	0.062	0.071	0.057
AQ 7	1/20/15	WF-002	750	2/24/15	5.580	1.136	0.116	0.088	0.049
AQ 8	1/20/15	WF-003	750	2/24/15	5.585	1.030	0.060	0.104	0.036
AQ 9	1/20/15	WF-004	750	2/24/15	5.542	0.996	0.059	0.099	0.034
AQ 10	1/20/15	WF-005	750	2/24/15	5.629	1.092	0.052	0.104	0.036
AQ 11	1/20/15	WF-005 D	750	2/24/15	5.542	1.182	0.056	0.119	0.040

								Secondary pigments				
ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
[But fuco]	[Hex fuco]	[Allo]	[Diad]	[Diato]	[Fuco]	[Perid]	[Zea]	[Chl a]	[DVChl a]	[Chlide a]	[Chl b]	[DVChl b]
0.001	0.001	0.012	0.023	0.003	0.141	0.001	0.015	0.344	0.001	0.007	0.008	0.001
0.001	0.001	0.012	0.023	0.003	0.140	0.001	0.015	0.343	0.001	0.007	0.007	0.001
0.001	0.001	0.012	0.031	0.004	0.219	0.001	0.012	0.504	0.001	0.008	0.011	0.001
0.001	0.001	0.015	0.045	0.004	0.317	0.001	0.009	0.706	0.001	0.010	0.014	0.001
0.001	0.001	0.010	0.042	0.004	0.256	0.001	0.010	0.601	0.001	0.014	0.014	0.001
0.001	0.001	0.013	0.025	0.003	0.197	0.001	0.009	0.485	0.001	0.007	0.016	0.001
0.001	0.001	0.022	0.058	0.014	0.360	0.001	0.033	1.014	0.001	0.018	0.062	0.001
0.001	0.001	0.019	0.052	0.006	0.388	0.001	0.026	1.123	0.001	0.013	0.116	0.001
0.001	0.001	0.005	0.058	0.005	0.442	0.001	0.017	1.016	0.001	0.014	0.060	0.001
0.001	0.001	0.003	0.057	0.007	0.436	0.001	0.021	0.980	0.001	0.015	0.059	0.001
0.001	0.001	0.004	0.064	0.008	0.478	0.001	0.024	1.069	0.001	0.023	0.052	0.001
0.001	0.001	0.004	0.069	0.009	0.514	0.001	0.021	1.165	0.001	0.017	0.056	0.001

		Tertiary pigments						Ancillary pigment		Pigment Sums	
ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l			
[Chl c_{12}]	[Chl c_3]	[Lut]	[Neo]	[Viola]	[Phytin a]	[Phide a]	[Pras]	[Gyr diester]	blank intentionally	[TChl]	[PPC]
0.029	0.001	0.006	0.001	0.001	0.099	0.037	0.001	0.001		0.388	0.065
0.030	0.001	0.006	0.001	0.001	0.098	0.033	0.001	0.001		0.387	0.065
0.044	0.001	0.007	0.001	0.001	0.155	0.050	0.001	0.001		0.567	0.075
0.072	0.001	0.006	0.001	0.005	0.155	0.052	0.001	0.001		0.802	0.093
0.058	0.001	0.007	0.001	0.005	0.100	0.060	0.001	0.001		0.686	0.085
0.043	0.001	0.008	0.001	0.001	0.097	0.052	0.001	0.001		0.551	0.067
0.071	0.001	0.029	0.004	0.010	0.180	0.165	0.001	0.001		1.165	0.184
0.088	0.001	0.033	0.011	0.014	0.069	0.118	0.001	0.001		1.340	0.152
0.104	0.001	0.018	0.006	0.007	0.074	0.106	0.001	0.001		1.194	0.121
0.099	0.001	0.018	0.006	0.001	0.075	0.116	0.001	0.001		1.154	0.122
0.104	0.001	0.017	0.005	0.007	0.067	0.105	0.001	0.001		1.248	0.136
0.119	0.001	0.018	0.006	0.001	0.081	0.128	0.001	0.001		1.357	0.143

						Pigment ratios			
[PSC]	[PSP]	[TCaro]	[TAcc]	[TPig]	[DP]	[TAcc]/[Tchla]	[PSC]/[TCaro]	[PPC]/[TCaro]	[TChl]/[TCaro]
0.141	0.529	0.206	0.243	0.594	0.176	0.69	0.68	0.32	1.88
0.140	0.527	0.205	0.242	0.592	0.174	0.69	0.68	0.32	1.89
0.219	0.786	0.294	0.349	0.861	0.254	0.68	0.74	0.26	1.93
0.317	1.119	0.410	0.496	1.212	0.355	0.69	0.77	0.23	1.96
0.256	0.942	0.341	0.413	1.027	0.290	0.67	0.75	0.25	2.01
0.197	0.748	0.264	0.323	0.815	0.235	0.66	0.75	0.25	2.09
0.360	1.525	0.544	0.677	1.709	0.477	0.66	0.66	0.34	2.14
0.388	1.728	0.540	0.744	1.880	0.549	0.65	0.72	0.28	2.48
0.442	1.636	0.563	0.727	1.757	0.524	0.71	0.79	0.21	2.12
0.436	1.590	0.558	0.716	1.712	0.519	0.72	0.78	0.22	2.07
0.478	1.726	0.614	0.770	1.862	0.558	0.71	0.78	0.22	2.03
0.514	1.871	0.657	0.832	2.014	0.595	0.70	0.78	0.22	2.07

[PPC]/[Tpig]	[PSP]/[TPig]	[TChl a]/[TPig]	comments
0.11	0.89	0.59	no comments
0.11	0.89	0.59	
0.09	0.91	0.59	
0.08	0.92	0.59	
0.08	0.92	0.60	
0.08	0.92	0.60	
0.11	0.89	0.60	
0.08	0.92	0.60	
0.07	0.93	0.59	
0.07	0.93	0.58	
0.07	0.93	0.59	
0.07	0.93	0.59	

Pace Analytical Services, Inc.
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January 06, 2016

Mr. John Michael Corn, P.E.
Aquaeter
215 Jamestown Park
Suite 100
Brentwood, TN 37027

RE: Project: Stones BOD 152384
Pace Project No.: 92281289

Dear Mr. Corn, P.E.:
Enclosed are the analytical results for sample(s) received by the laboratory on December 29, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Chris Derouen
christopher.derouen@pacelabs.com
Project Manager

Enclosures

cc: Katie Lopez, Aquaeter
Kelley Spence, Aquaeter
Rachel Stribling, Aquaeter

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CERTIFICATIONS

Project: Stones BOD 152384
Pace Project No.: 92281289

Asheville Certification IDs
2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
West Virginia Certification #: 356
Virginia/VELAP Certification #: 460222

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SAMPLE SUMMARY

Project: Stones BOD 152384
Pace Project No.: 92281289

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92281289001	**WFSRDown-09**	Water	12/28/15 12:20	12/29/15 10:45
92281289002	**WFSREff-09**	Water	12/28/15 12:26	12/29/15 10:45
92281289003	**WFSRUP-09**	Water	12/28/15 12:33	12/29/15 10:45
92281289004	**WFSRUP-09-DUP**	Water	12/28/15 12:41	12/29/15 10:45

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SAMPLE ANALYTE COUNT

Project: Stones BOD 152384
Pace Project No.: 92281289

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92281289001	**WFSRDown-09**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	AES2	1	PASI-A
		EPA 353.2	SER	1	PASI-A
		EPA 365.1	SER	1	PASI-A
		SM 4500-P E	WRC	1	PASI-A
92281289002	**WFSREff-09**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	AES2	1	PASI-A
		EPA 353.2	SER	1	PASI-A
		EPA 365.1	SER	1	PASI-A
		SM 4500-P E	WRC	1	PASI-A
92281289003	**WFSRUP-09**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	AES2	1	PASI-A
		EPA 353.2	SER	1	PASI-A
		EPA 365.1	SER	1	PASI-A
		SM 4500-P E	WRC	1	PASI-A
92281289004	**WFSRUP-09-DUP**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	AES2	1	PASI-A
		EPA 353.2	SER	1	PASI-A
		EPA 365.1	SER	1	PASI-A
		SM 4500-P E	WRC	1	PASI-A

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ANALYTICAL RESULTS

Project: Stones BOD 152384
Pace Project No.: 92281289

Sample: WFSRDown-09 **Lab ID: 92281289001** Collected: 12/28/15 12:20 Received: 12/29/15 10:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	ND	mg/L	0.010	1		01/05/16 16:30	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		12/31/15 13:33	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.55**	mg/L	0.020	1		01/02/16 04:37		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**1.4**	mg/L	0.050	1		12/30/15 06:56	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**1.5**	mg/L	0.50	10		12/29/15 13:00		

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ANALYTICAL RESULTS

Project: Stones BOD 152384
Pace Project No.: 92281289

Sample: WFSREff-09 **Lab ID: 92281289002** Collected: 12/28/15 12:26 Received: 12/29/15 10:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	ND	mg/L	0.010	1		01/05/16 16:30	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	**0.86**	mg/L	0.50	1		12/31/15 13:34	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**1.3**	mg/L	0.020	1		01/02/16 04:38		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**4.1**	mg/L	0.050	1		12/30/15 06:58	7723-14-0	M1
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**4.6**	mg/L	0.50	10		12/29/15 13:00		

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ANALYTICAL RESULTS

Project: Stones BOD 152384
Pace Project No.: 92281289

Sample: WFSRUP-09 **Lab ID: 92281289003** Collected: 12/28/15 12:33 Received: 12/29/15 10:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	ND	mg/L	0.010	1		01/05/16 16:30	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		12/31/15 13:34	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.26**	mg/L	0.020	1		01/02/16 04:39		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**0.056**	mg/L	0.050	1		12/30/15 07:01	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**0.088**	mg/L	0.050	1		12/29/15 13:00		

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ANALYTICAL RESULTS

Project: Stones BOD 152384
Pace Project No.: 92281289

Sample: WFSRUP-09-DUP **Lab ID: 92281289004** Collected: 12/28/15 12:41 Received: 12/29/15 10:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	ND	mg/L	0.010	1		01/05/16 16:30	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		12/31/15 13:35	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.27**	mg/L	0.020	1		01/02/16 04:40		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**0.058**	mg/L	0.050	1		12/30/15 07:01	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**0.079**	mg/L	0.050	1		12/29/15 13:00		

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QUALITY CONTROL DATA

Project: Stones BOD 152384
Pace Project No.: 92281289

QC Batch: WETA/25996 | Analysis Method: EPA 350.1
QC Batch Method: EPA 350.1 | Analysis Description: 350.1 Ammonia, Low Level
Associated Lab Samples: 92281289001, 92281289002, 92281289003, 92281289004

METHOD BLANK: 1641270 | Matrix: Water
Associated Lab Samples: 92281289001, 92281289002, 92281289003, 92281289004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.010	01/05/16 16:30	

LABORATORY CONTROL SAMPLE: 1641271

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	1	0.94	94	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1641272 1641273

Parameter	Units	92281131001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	0.034	1	1	0.80	0.81	77	78	90-110	1	10	M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Stones BOD 152384
Pace Project No.: 92281289

QC Batch: WETA/25971 Analysis Method: EPA 351.2
QC Batch Method: EPA 351.2 Analysis Description: 351.2 TKN
Associated Lab Samples: 92281289001, 92281289002, 92281289003, 92281289004

METHOD BLANK: 1639691 Matrix: Water
Associated Lab Samples: 92281289001, 92281289002, 92281289003, 92281289004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	ND	0.50	12/31/15 13:22	

LABORATORY CONTROL SAMPLE: 1639692

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	10	10.1	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1639693 1639694

Parameter	Units	92281062001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	760	500	500	1310	1260	111	101	90-110	4	10	M6

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1639695 1639696

Parameter	Units	92281347001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	1.2	10	10	11.2	11.3	100	101	90-110	1	10	

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QUALITY CONTROL DATA

Project: Stones BOD 152384
Pace Project No.: 92281289

QC Batch: WETA/25984 | Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 | Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 92281289001, 92281289002, 92281289003, 92281289004

METHOD BLANK: 1640308 | Matrix: Water
Associated Lab Samples: 92281289001, 92281289002, 92281289003, 92281289004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	01/02/16 04:08	

LABORATORY CONTROL SAMPLE: 1640309

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.5	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1640310 1640311

Parameter	Units	92281083001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	4.4	12.5	12.5	16.6	16.6	98	98	75-125	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1640312 1640313

Parameter	Units	92281163002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	ND	2.5	2.5	2.5	2.4	99	94	75-125	5	10	

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QUALITY CONTROL DATA

Project: Stones BOD 152384
Pace Project No.: 92281289

QC Batch: WETA/25962 Analysis Method: EPA 365.1
QC Batch Method: EPA 365.1 Analysis Description: 365.1 Phosphorus, Total
Associated Lab Samples: 92281289001, 92281289002, 92281289003, 92281289004

METHOD BLANK: 1638877 Matrix: Water
Associated Lab Samples: 92281289001, 92281289002, 92281289003, 92281289004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	12/30/15 06:45	

LABORATORY CONTROL SAMPLE: 1638878

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	2.5	2.6	105	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1638879 1638880

Parameter	Units	92281050002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	66.2	2.5	2.5	72.4	72.9	248	269	90-110	1	10	M6

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1638881 1638882

Parameter	Units	92281289002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	4.1	2.5	2.5	7.1	7.4	120	131	90-110	4	10	M1

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QUALITY CONTROL DATA

Project: Stones BOD 152384
Pace Project No.: 92281289

QC Batch: WETA/25959 | Analysis Method: SM 4500-P E
QC Batch Method: SM 4500-P E | Analysis Description: SM4500P-E Phosphorus, Ortho
Associated Lab Samples: 92281289001, 92281289002, 92281289003, 92281289004

METHOD BLANK: 1638552 | Matrix: Water
Associated Lab Samples: 92281289001, 92281289002, 92281289003, 92281289004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Orthophosphate as P	mg/L	ND	0.050	12/29/15 13:00	

LABORATORY CONTROL SAMPLE: 1638553

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Orthophosphate as P	mg/L	.25	0.26	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1638554 1638555

Parameter	Units	92281289001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Orthophosphate as P	mg/L	1.5	2.5	2.5	4.2	4.2	105	105	90-110	0	10	

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QUALIFIERS

Project: Stones BOD 152384
Pace Project No.: 92281289

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville

ANALYTE QUALIFIERS

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Stones BOD 152384
Pace Project No.: 92281289

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92281289001	**WFSRDown-09**	EPA 350.1	WETA/25996		
92281289002	**WFSREff-09**	EPA 350.1	WETA/25996		
92281289003	**WFSRUP-09**	EPA 350.1	WETA/25996		
92281289004	**WFSRUP-09-DUP**	EPA 350.1	WETA/25996		
92281289001	**WFSRDown-09**	EPA 351.2	WETA/25971		
92281289002	**WFSREff-09**	EPA 351.2	WETA/25971		
92281289003	**WFSRUP-09**	EPA 351.2	WETA/25971		
92281289004	**WFSRUP-09-DUP**	EPA 351.2	WETA/25971		
92281289001	**WFSRDown-09**	EPA 353.2	WETA/25984		
92281289002	**WFSREff-09**	EPA 353.2	WETA/25984		
92281289003	**WFSRUP-09**	EPA 353.2	WETA/25984		
92281289004	**WFSRUP-09-DUP**	EPA 353.2	WETA/25984		
92281289001	**WFSRDown-09**	EPA 365.1	WETA/25962		
92281289002	**WFSREff-09**	EPA 365.1	WETA/25962		
92281289003	**WFSRUP-09**	EPA 365.1	WETA/25962		
92281289004	**WFSRUP-09-DUP**	EPA 365.1	WETA/25962		
92281289001	**WFSRDown-09**	SM 4500-P E	WETA/25959		
92281289002	**WFSREff-09**	SM 4500-P E	WETA/25959		
92281289003	**WFSRUP-09**	SM 4500-P E	WETA/25959		
92281289004	**WFSRUP-09-DUP**	SM 4500-P E	WETA/25959		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

Section A Required Client Information:

Company:	AquAeTer, Inc.
Address:	215 Jamestown Park Ste 100
	Brentwood, TN 37027
Email To:	jmcorn@aquaeter.com
Phone: 615-373-8532	Fax: 615-373-8512
Requested Due Date/TAT:	

Section B Required Project Information:

Report To:	John Michael Corn
Copy To:	
Purchase Order No.:	152384
Project Name:	Stones BOD
Project Number:	152384

Section C Invoice Information:

Attention:	Cindy Corn
Company Name:	AquAeTer, Inc.
Address:	See client information
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY: ☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: TN

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Tissue TS, Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	Orthophosphate	$NO_3 + NO_2$, TP, Ammonia	TKN	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Y/N	N	N	N		
1	WFSR Down - 09	WT	G	12/28	1220				2	1	1								1	1	1		92281284-001
2	WFSR Eff - 09	WT	G	12/28	1220				2	1	1								1	1	1		002
3	WFSR Up - 09	WT	G	12/28	1233				2	1	1								1	1	1		003
4	WFSR Up - 09 - DUP	WT	G	12/28	1241																		
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
* Use lowest detection limits possible *	Rachel O Steibling / AAT	12/28/15	1151	Matt Steiner AVL	12/29/15	1045	3.6	Y	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Rachel O. Steibling

SIGNATURE of SAMPLER: Rachel O. Steibling

DATE Signed (MM/DD/YY): 12/28/15

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Pace Analytical® www.pacelabs.com	Document Name: **Sample Condition Upon Receipt (SCUR)**	Document Revised: November 06, 2015 Page 1 of 2*
	Document No.: F-ASV-CS-003-rev.15	Issuing Authorities: Pace Asheville Quality Office

Client Name: AquAeter

* Page 2 of 2 is for Internal Use Only

Courier (Circle): (Fed Ex) UPS USPS Client Commercial Pace Other_____

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☑ yes ☐ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other_____

Thermometer Used: (IR Gun#5 - 155271998) **Type of Ice:** (Wet) Blue None ☑ Samples on ice, cooling process has begun

IR Gun #4 SN:140290365 Other:_____

Temp Correction Factor: Add / Subtract 0 C

Corrected Cooler Temp.: 3.6 C **Biological Tissue is Frozen:** Yes No (N/A)

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 12/29 MS

				Comments:
Chain of Custody Present:	☑Yes	☐No	☐N/A	1.
Chain of Custody Filled Out:	☑Yes	☐No	☐N/A	2.
Chain of Custody Relinquished:	☑Yes	☐No	☐N/A	3.
Sampler Name & Signature on COC:	☑Yes	☐No	☐N/A	4.
Samples Arrived within Hold Time:	☑Yes	☐No	☐N/A	5.
Short Hold Time Analysis (<72hr):	☑Yes	☐No	☐N/A	6. Orthophoshate
Rush Turn Around Time Requested:	☐Yes	☑No	☐N/A	7.
Sufficient Volume:	☑Yes	☐No	☐N/A	8.
Correct Containers Used:	☑Yes	☐No	☐N/A	9.
-Pace Containers Used:	☑Yes	☐No	☐N/A	
Containers Intact:	☑Yes	☐No	☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes	☐No	☑N/A	11.
Sample Labels match COC:	☑Yes	☐No	☐N/A	12.
-Includes date/time/ID/Analysis Matrix: WT				
All containers needing preservation have been checked.	☑Yes	☐No	☐N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☑Yes	☐No	☐N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes	☑No		
Samples checked for dechlorination:	☑Yes	☐No	☐N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes	☐No	☑N/A	15.
Trip Blank Present:	☐Yes	☐No	☑N/A	16.
Trip Blank Custody Seals Present	☐Yes	☐No	☑N/A	
Pace Trip Blank Lot # (if purchased):_____				

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

SCURF Review: [signature] Date: 12/30/19

SRF Review: [signature] Date: 12/30/19

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

WO# : 92281289

92281289

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

December 11, 2015

Mr. John Michael Corn, P.E.
Aquaeter
215 Jamestown Park
Suite 100
Brentwood, TN 37027

RE: Project: Stones BOD 152384 11/30
Pace Project No.: 92277828

Dear Mr. Corn, P.E.:
Enclosed are the analytical results for sample(s) received by the laboratory on December 01, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Chris Derouen
christopher.derouen@pacelabs.com
Project Manager

Enclosures

cc: Katie Lopez, Aquaeter
Kelley Spence, Aquaeter
Rachel Stribling, Aquaeter

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CERTIFICATIONS

Project: Stones BOD 152384 11/30
Pace Project No.: 92277828

Asheville Certification IDs
2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
West Virginia Certification #: 356
Virginia/VELAP Certification #: 460222

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SAMPLE SUMMARY

Project: Stones BOD 152384 11/30
Pace Project No.: 92277828

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92277828001	**WFSRDown-08**	Water	11/30/15 12:44	12/01/15 10:30
92277828002	**WFSRUP-08**	Water	11/30/15 13:04	12/01/15 10:30
92277828003	**WFSREff-08**	Water	11/30/15 12:58	12/01/15 10:30
92277828004	**WFSRDown-09**	Water	11/30/15 13:20	12/01/15 10:30
92277828005	**WFSREff-09**	Water	11/30/15 13:34	12/01/15 10:30
92277828006	**WFSRUP-09**	Water	11/30/15 13:44	12/01/15 10:30
92277828007	**WFSRUP-09-DUP**	Water	11/30/15 00:00	12/01/15 10:30

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SAMPLE ANALYTE COUNT

Project: Stones BOD 152384 11/30
Pace Project No.: 92277828

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92277828001	**WFSRDown-08**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	AES2	1	PASI-A
		SM 4500-P E	WRC	1	PASI-A
92277828002	**WFSRUP-08**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	AES2	1	PASI-A
		SM 4500-P E	WRC	1	PASI-A
92277828003	**WFSREff-08**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	AES2	1	PASI-A
		SM 4500-P E	WRC	1	PASI-A
92277828004	**WFSRDown-09**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	AES2	1	PASI-A
		SM 4500-P E	WRC	1	PASI-A
92277828005	**WFSREff-09**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	AES2	1	PASI-A
		SM 4500-P E	WRC	1	PASI-A
92277828006	**WFSRUP-09**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	AES2	1	PASI-A
		SM 4500-P E	WRC	1	PASI-A
92277828007	**WFSRUP-09-DUP**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	AES2	1	PASI-A
		SM 4500-P E	WRC	1	PASI-A

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ANALYTICAL RESULTS

Project: Stones BOD 152384 11/30
Pace Project No.: 92277828

Sample: WFSRDown-08 **Lab ID: 92277828001** Collected: 11/30/15 12:44 Received: 12/01/15 10:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.041**	mg/L	0.010	1		12/09/15 01:00	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		12/03/15 03:56	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**1.2**	mg/L	0.020	1		12/09/15 15:28		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**0.55**	mg/L	0.050	1		12/03/15 10:41	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**1.3**	mg/L	0.25	5		12/01/15 13:30		M1

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ANALYTICAL RESULTS

Project: Stones BOD 152384 11/30
Pace Project No.: 92277828

Sample: WFSRUP-08 **Lab ID: 92277828002** Collected: 11/30/15 13:04 Received: 12/01/15 10:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.035**	mg/L	0.010	1		12/09/15 01:00	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		12/03/15 03:57	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.83**	mg/L	0.020	1		12/09/15 15:32		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**0.061**	mg/L	0.050	1		12/03/15 10:42	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**0.076**	mg/L	0.050	1		12/01/15 13:30		

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ANALYTICAL RESULTS

Project: Stones BOD 152384 11/30
Pace Project No.: 92277828

Sample: WFSREff-08 **Lab ID: 92277828003** Collected: 11/30/15 12:58 Received: 12/01/15 10:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.035**	mg/L	0.010	1		12/09/15 01:00	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	**0.94**	mg/L	0.50	1		12/03/15 03:58	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**3.9**	mg/L	0.020	1		12/09/15 15:33		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**5.3**	mg/L	0.10	2		12/03/15 11:40	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**5.8**	mg/L	1.2	25		12/01/15 13:30		M6

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ANALYTICAL RESULTS

Project: Stones BOD 152384 11/30
Pace Project No.: 92277828

Sample: WFSRDown-09 **Lab ID: 92277828004** Collected: 11/30/15 13:20 Received: 12/01/15 10:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.032**	mg/L	0.010	1		12/09/15 01:00	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		12/03/15 03:59	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.55**	mg/L	0.020	1		12/09/15 15:34		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**1.5**	mg/L	0.050	1		12/03/15 10:43	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**2.4**	mg/L	0.50	10		12/01/15 13:30		

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ANALYTICAL RESULTS

Project: Stones BOD 152384 11/30
Pace Project No.: 92277828

Sample: WFSREff-09 **Lab ID: 92277828005** Collected: 11/30/15 13:34 Received: 12/01/15 10:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.027**	mg/L	0.010	1		12/09/15 01:00	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	**0.92**	mg/L	0.50	1		12/03/15 03:59	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**1.3**	mg/L	0.020	1		12/10/15 16:10		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**4.4**	mg/L	0.050	1		12/03/15 10:46	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**2.7**	mg/L	0.50	10		12/01/15 13:30		

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ANALYTICAL RESULTS

Project: Stones BOD 152384 11/30
Pace Project No.: 92277828

Sample: WFSRUP-09 **Lab ID: 92277828006** Collected: 11/30/15 13:44 Received: 12/01/15 10:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.029**	mg/L	0.010	1		12/09/15 01:00	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		12/03/15 04:00	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.25**	mg/L	0.020	1		12/10/15 16:13		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**0.064**	mg/L	0.050	1		12/03/15 10:48	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**0.19**	mg/L	0.050	1		12/01/15 13:30		

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ANALYTICAL RESULTS

Project: Stones BOD 152384 11/30
Pace Project No.: 92277828

Sample: WFSRUP-09-DUP **Lab ID: 92277828007** Collected: 11/30/15 00:00 Received: 12/01/15 10:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.026**	mg/L	0.010	1		12/09/15 01:00	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		12/03/15 04:01	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.26**	mg/L	0.020	1		12/10/15 16:17		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**0.064**	mg/L	0.050	1		12/03/15 10:48	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**0.27**	mg/L	0.050	1		12/01/15 13:30		

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QUALITY CONTROL DATA

Project: Stones BOD 152384 11/30
Pace Project No.: 92277828

QC Batch: WETA/25661 Analysis Method: EPA 350.1
QC Batch Method: EPA 350.1 Analysis Description: 350.1 Ammonia, Low Level
Associated Lab Samples: 92277828001, 92277828002, 92277828003, 92277828004, 92277828005, 92277828006, 92277828007

METHOD BLANK: 1621670 Matrix: Water
Associated Lab Samples: 92277828001, 92277828002, 92277828003, 92277828004, 92277828005, 92277828006, 92277828007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.010	12/09/15 01:00	

LABORATORY CONTROL SAMPLE: 1621671

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	1	0.92	92	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1621672 1621673

Parameter	Units	92277933001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	0.72	1	1	1.1	1.1	36	36	90-110	0	10	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1621674 1621675

Parameter	Units	92278045012 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	0.050	1	1	0.71	0.71	66	66	90-110	1	10	M1

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QUALITY CONTROL DATA

Project: Stones BOD 152384 11/30
Pace Project No.: 92277828

QC Batch: WETA/25600 Analysis Method: EPA 351.2
QC Batch Method: EPA 351.2 Analysis Description: 351.2 TKN
Associated Lab Samples: 92277828001, 92277828002, 92277828003, 92277828004, 92277828005, 92277828006, 92277828007

METHOD BLANK: 1617674 Matrix: Water
Associated Lab Samples: 92277828001, 92277828002, 92277828003, 92277828004, 92277828005, 92277828006, 92277828007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	ND	0.50	12/03/15 03:36	

LABORATORY CONTROL SAMPLE: 1617675

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	10	9.9	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1617676 1617677

Parameter	Units	92276407001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	ND	10	10	8.4	11.4	84	114	90-110	30	10	M1,R1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1617678 1617679

Parameter	Units	92277826005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	0.59	10	10	11.2	11.1	106	105	90-110	1	10	

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QUALITY CONTROL DATA

Project: Stones BOD 152384 11/30
Pace Project No.: 92277828

QC Batch: WETA/25683 | Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 | Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 92277828001, 92277828002, 92277828003, 92277828004

METHOD BLANK: 1623291 | Matrix: Water
Associated Lab Samples: 92277828001, 92277828002, 92277828003, 92277828004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	12/09/15 15:01	

LABORATORY CONTROL SAMPLE: 1623292

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.4	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1623293 1623294

Parameter	Units	92278887025 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.33	2.5	2.5	2.7	2.7	96	96	75-125	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1623295 1623296

Parameter	Units	92278887026 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	ND	2.5	2.5	2.4	2.4	95	95	75-125	0	10	

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QUALITY CONTROL DATA

Project: Stones BOD 152384 11/30
Pace Project No.: 92277828

QC Batch: WETA/25706 — Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 — Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 92277828005, 92277828006, 92277828007

METHOD BLANK: 1624801 — Matrix: Water
Associated Lab Samples: 92277828005, 92277828006, 92277828007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	12/10/15 15:54	

LABORATORY CONTROL SAMPLE: 1624802

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.5	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1624803 1624804

Parameter	Units	92279154019 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.14	2.5	2.5	2.6	2.6	98	98	75-125	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1624805 1624806

Parameter	Units	92277828006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.25	2.5	2.5	2.7	2.7	98	98	75-125	0	10	

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QUALITY CONTROL DATA

Project: Stones BOD 152384 11/30
Pace Project No.: 92277828

QC Batch: WETA/25598 | Analysis Method: EPA 365.1
QC Batch Method: EPA 365.1 | Analysis Description: 365.1 Phosphorus, Total
Associated Lab Samples: 92277828001, 92277828002, 92277828003, 92277828004, 92277828005, 92277828006, 92277828007

METHOD BLANK: 1617644 | Matrix: Water
Associated Lab Samples: 92277828001, 92277828002, 92277828003, 92277828004, 92277828005, 92277828006, 92277828007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	12/03/15 10:33	

LABORATORY CONTROL SAMPLE: 1617645

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	2.5	2.5	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1617646 1617647

Parameter	Units	92277614002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	0.86	2.5	2.5	3.4	3.4	101	101	90-110	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1617648 1617649

Parameter	Units	92277828005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	4.4	2.5	2.5	6.9	6.8	99	96	90-110	1	10	

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QUALITY CONTROL DATA

Project: Stones BOD 152384 11/30
Pace Project No.: 92277828

QC Batch: WETA/25588 | Analysis Method: SM 4500-P E
QC Batch Method: SM 4500-P E | Analysis Description: SM4500P-E Phosphorus, Ortho
Associated Lab Samples: 92277828001, 92277828002, 92277828003, 92277828004, 92277828005, 92277828006, 92277828007

METHOD BLANK: 1617213 | Matrix: Water
Associated Lab Samples: 92277828001, 92277828002, 92277828003, 92277828004, 92277828005, 92277828006, 92277828007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Orthophosphate as P	mg/L	ND	0.050	12/01/15 13:30	

LABORATORY CONTROL SAMPLE: 1617214

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Orthophosphate as P	mg/L	.25	0.25	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1617215 1617216

Parameter	Units	92277828001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Orthophosphate as P	mg/L	1.3	1.2	1.2	2.1	2.1	65	65	90-110	0	10	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1617217 1617218

Parameter	Units	92277828003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Orthophosphate as P	mg/L	5.8	12.5	12.5	20.6	20.6	118	118	90-110	0	10	M6

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QUALIFIERS

Project: Stones BOD 152384 11/30
Pace Project No.: 92277828

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville

ANALYTE QUALIFIERS

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
R1	RPD value was outside control limits.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Stones BOD 152384 11/30
Pace Project No.: 92277828

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92277828001	**WFSRDown-08**	EPA 350.1	WETA/25661		
92277828002	**WFSRUP-08**	EPA 350.1	WETA/25661		
92277828003	**WFSREff-08**	EPA 350.1	WETA/25661		
92277828004	**WFSRDown-09**	EPA 350.1	WETA/25661		
92277828005	**WFSREff-09**	EPA 350.1	WETA/25661		
92277828006	**WFSRUP-09**	EPA 350.1	WETA/25661		
92277828007	**WFSRUP-09-DUP**	EPA 350.1	WETA/25661		
92277828001	**WFSRDown-08**	EPA 351.2	WETA/25600		
92277828002	**WFSRUP-08**	EPA 351.2	WETA/25600		
92277828003	**WFSREff-08**	EPA 351.2	WETA/25600		
92277828004	**WFSRDown-09**	EPA 351.2	WETA/25600		
92277828005	**WFSREff-09**	EPA 351.2	WETA/25600		
92277828006	**WFSRUP-09**	EPA 351.2	WETA/25600		
92277828007	**WFSRUP-09-DUP**	EPA 351.2	WETA/25600		
92277828001	**WFSRDown-08**	EPA 353.2	WETA/25683		
92277828002	**WFSRUP-08**	EPA 353.2	WETA/25683		
92277828003	**WFSREff-08**	EPA 353.2	WETA/25683		
92277828004	**WFSRDown-09**	EPA 353.2	WETA/25683		
92277828005	**WFSREff-09**	EPA 353.2	WETA/25706		
92277828006	**WFSRUP-09**	EPA 353.2	WETA/25706		
92277828007	**WFSRUP-09-DUP**	EPA 353.2	WETA/25706		
92277828001	**WFSRDown-08**	EPA 365.1	WETA/25598		
92277828002	**WFSRUP-08**	EPA 365.1	WETA/25598		
92277828003	**WFSREff-08**	EPA 365.1	WETA/25598		
92277828004	**WFSRDown-09**	EPA 365.1	WETA/25598		
92277828005	**WFSREff-09**	EPA 365.1	WETA/25598		
92277828006	**WFSRUP-09**	EPA 365.1	WETA/25598		
92277828007	**WFSRUP-09-DUP**	EPA 365.1	WETA/25598		
92277828001	**WFSRDown-08**	SM 4500-P E	WETA/25588		
92277828002	**WFSRUP-08**	SM 4500-P E	WETA/25588		
92277828003	**WFSREff-08**	SM 4500-P E	WETA/25588		
92277828004	**WFSRDown-09**	SM 4500-P E	WETA/25588		
92277828005	**WFSREff-09**	SM 4500-P E	WETA/25588		
92277828006	**WFSRUP-09**	SM 4500-P E	WETA/25588		
92277828007	**WFSRUP-09-DUP**	SM 4500-P E	WETA/25588		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

Section A Required Client Information:

Company:	AquAeTer, Inc.
Address:	215 Jamestown Park Ste 100
	Brentwood, TN 37027
Email To:	jmcorn@aquaeter.com
Phone: 615-373-8532	Fax: 615-373-8512
Requested Due Date/TAT:	

Section B Required Project Information:

Report To:	John Michael Corn
Copy To:	
Purchase Order No.:	152384
Project Name:	Stones BOD
Project Number:	152384

Section C Invoice Information:

Attention:	Cindy Corn
Company Name:	AquAeTer, Inc.
Address:	See client information
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY: ☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: TN

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Orthophosphate	$NO_3 + NO_2$, TP, Ammonia	TKN	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		N	N	N		
1	WFSRDown-08	WT	G	11/30/15	1242				2	1	1							1	1	1		92277828-001
2	WFSRUP-08	WT	G	11/30/15	1304				2	1	1							1	1	1		002
3	WFSREFF-08	WT	G	11/30/15	1258				2	1	1							1	1	1		003
4	WFSRDown-09	WT	G	11/30/15	1320				2	1	1											004
5	WFSREFF-09	WT	G	11/30/15	1334				2	1	1											005
6	WFSRUP-09	WT	G	11/30/15	1344				2	1	1											006
7	WFSRUP-09-DUP	WT	G	11/30/15					2	1	1											007
8																						
9																						
10																						
11																						
12																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Use lowest detection limits possible		11/30/15	1400	[illegible] AVL	12/1/15	1030	1.3	Y	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Rachel O. Steiblind

SIGNATURE of SAMPLER: Rachel O. Steiblind DATE Signed (MM/DD/YY): 11/30/15

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Pace Analytical® www.pacelabs.com	Document Name: **Sample Condition Upon Receipt (SCUR)**	Document Revised: November 06, 2015 Page 1 of 2*
	Document No.: F-ASV-CS-003-rev.15	Issuing Authorities: Pace Asheville Quality Office

Client Name: AquAeTer

* Page 2 of 2 is for Internal Use Only

Courier (Circle): Fed Ex UPS USPS Client Commercial Pace Other_____

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☑ yes ☐ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other_____

Thermometer Used: IR Gun#5 - 155271998 **Type of Ice:** Wet Blue None ☑ Samples on ice, cooling process has begun

IR Gun #4 SN:140290365 Other:_____

Temp Correction Factor: Add / Subtract 0 C

Corrected Cooler Temp.: 1.3 C **Biological Tissue is Frozen:** Yes No N/A

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 12/1 MS

		Comments:
Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☑Yes ☐No ☐N/A	6. Orthophosate
Rush Turn Around Time Requested:	☐Yes ☑No ☐N/A	7.
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9.
-Pace Containers Used:	☑Yes ☐No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC:	☑Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: WT		
All containers needing preservation have been checked.	☑Yes ☐No ☐N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☑Yes ☐No ☐N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes ☑No	
Samples checked for dechlorination:	☑Yes ☐No ☐N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☑N/A	15.
Trip Blank Present:	☐Yes ☐No ☑N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased):_____		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

SCURF Review: [signature] Date: 12/1/15

SRF Review: [signature] Date: 12/1/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

WO# : 92277828

92277828

Pace Analytical Services, Inc.
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(704)875-9092

November 30, 2015

Mr. John Michael Corn, P.E.
Aquaeter
215 Jamestown Park
Suite 100
Brentwood, TN 37027

RE: Project: Stones BOD 11/12
Pace Project No.: 92276107

Dear Mr. Corn, P.E.:
Enclosed are the analytical results for sample(s) received by the laboratory on November 13, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Chris Derouen
christopher.derouen@pacelabs.com
Project Manager

Enclosures

cc: Katie Lopez, Aquaeter
Kelley Spence, Aquaeter
Rachel Stribling, Aquaeter

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CERTIFICATIONS

Project: Stones BOD 11/12
Pace Project No.: 92276107

Asheville Certification IDs
2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
West Virginia Certification #: 356
Virginia/VELAP Certification #: 460222

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SAMPLE SUMMARY

Project: Stones BOD 11/12
Pace Project No.: 92276107

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92276107001	**WFSRDOWN-09**	Water	11/12/15 12:14	11/13/15 12:45
92276107002	**WFSREFF-09**	Water	11/12/15 12:21	11/13/15 12:45
92276107003	**WFSRUP-09**	Water	11/12/15 12:28	11/13/15 12:45
92276107004	**WFSRUP-09-DUP**	Water	11/12/15 12:37	11/13/15 12:45

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SAMPLE ANALYTE COUNT

Project: Stones BOD 11/12
Pace Project No.: 92276107

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92276107001	**WFSRDOWN-09**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	BRJ	1	PASI-A
		SM 4500-P E	SER	1	PASI-A
92276107002	**WFSREFF-09**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	BRJ	1	PASI-A
		SM 4500-P E	SER	1	PASI-A
92276107003	**WFSRUP-09**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	BRJ	1	PASI-A
		SM 4500-P E	SER	1	PASI-A
92276107004	**WFSRUP-09-DUP**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	BRJ	1	PASI-A
		SM 4500-P E	SER	1	PASI-A

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ANALYTICAL RESULTS

Project: Stones BOD 11/12
Pace Project No.: 92276107

Sample: WFSRDOWN-09 **Lab ID: 92276107001** Collected: 11/12/15 12:14 Received: 11/13/15 12:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.13**	mg/L	0.010	1		11/17/15 13:00	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		11/18/15 02:07	7727-37-9	M1
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.54**	mg/L	0.020	1		11/25/15 17:00		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**1.4**	mg/L	0.050	1		11/18/15 03:12	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**1.6**	mg/L	0.50	10		11/14/15 10:32		M6

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ANALYTICAL RESULTS

Project: Stones BOD 11/12
Pace Project No.: 92276107

Sample: WFSREFF-09 **Lab ID: 92276107002** Collected: 11/12/15 12:21 Received: 11/13/15 12:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.11**	mg/L	0.010	1		11/17/15 13:00	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	**0.71**	mg/L	0.50	1		11/18/15 02:09	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**1.3**	mg/L	0.020	1		11/25/15 17:03		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**4.2**	mg/L	0.050	1		11/18/15 03:13	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**4.0**	mg/L	0.50	10		11/14/15 10:32		

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ANALYTICAL RESULTS

Project: Stones BOD 11/12
Pace Project No.: 92276107

Sample: WFSRUP-09 **Lab ID: 92276107003** Collected: 11/12/15 12:28 Received: 11/13/15 12:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.11**	mg/L	0.010	1		11/17/15 13:00	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		11/18/15 02:10	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.23**	mg/L	0.020	1		11/25/15 17:06		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**0.062**	mg/L	0.050	1		11/18/15 03:14	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**0.12**	mg/L	0.050	1		11/14/15 10:32		

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ANALYTICAL RESULTS

Project: Stones BOD 11/12
Pace Project No.: 92276107

Sample: WFSRUP-09-DUP **Lab ID: 92276107004** Collected: 11/12/15 12:37 Received: 11/13/15 12:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.16**	mg/L	0.010	1		11/17/15 13:00	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		11/18/15 02:11	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.25**	mg/L	0.020	1		11/25/15 17:07		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**0.052**	mg/L	0.050	1		11/18/15 03:16	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**0.13**	mg/L	0.050	1		11/14/15 10:32		

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QUALITY CONTROL DATA

Project: Stones BOD 11/12
Pace Project No.: 92276107

QC Batch: WETA/25430 | Analysis Method: EPA 350.1
QC Batch Method: EPA 350.1 | Analysis Description: 350.1 Ammonia, Low Level
Associated Lab Samples: 92276107001, 92276107002, 92276107003, 92276107004

METHOD BLANK: 1608286 | Matrix: Water
Associated Lab Samples: 92276107001, 92276107002, 92276107003, 92276107004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.010	11/17/15 13:00	

LABORATORY CONTROL SAMPLE: 1608287

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	1	0.91	91	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1608288 1608289

Parameter	Units	92275827001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	0.14	1	1	0.51	0.51	37	38	90-110	0	10	M1

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL DATA

Project: Stones BOD 11/12
Pace Project No.: 92276107

QC Batch: WETA/25409 Analysis Method: EPA 351.2
QC Batch Method: EPA 351.2 Analysis Description: 351.2 TKN
Associated Lab Samples: 92276107001, 92276107002, 92276107003, 92276107004

METHOD BLANK: 1607259 Matrix: Water
Associated Lab Samples: 92276107001, 92276107002, 92276107003, 92276107004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	ND	0.50	11/18/15 01:51	

LABORATORY CONTROL SAMPLE: 1607260

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	10	9.5	95	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1607261 1607262

Parameter	Units	92275926002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	3.5	10	10	12.7	13.3	92	97	90-110	4	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1607263 1607264

Parameter	Units	92276107001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	ND	10	10	9.2	9.5	89	92	90-110	3	10	M1

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL DATA

Project: Stones BOD 11/12
Pace Project No.: 92276107

QC Batch: WETA/25534 — Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 — Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 92276107001, 92276107002, 92276107003, 92276107004

METHOD BLANK: 1614722 — Matrix: Water
Associated Lab Samples: 92276107001, 92276107002, 92276107003, 92276107004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	11/25/15 16:57	

LABORATORY CONTROL SAMPLE: 1614723

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.5	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1614724 — 1614725

Parameter	Units	92276107001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.54	2.5	2.5	2.8	2.9	92	92	75-125	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1614726 — 1614727

Parameter	Units	92276107002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	1.3	2.5	2.5	3.6	3.6	92	92	75-125	0	10	

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QUALITY CONTROL DATA

Project: Stones BOD 11/12
Pace Project No.: 92276107

QC Batch: WETA/25413 Analysis Method: EPA 365.1
QC Batch Method: EPA 365.1 Analysis Description: 365.1 Phosphorus, Total
Associated Lab Samples: 92276107001, 92276107002, 92276107003, 92276107004

METHOD BLANK: 1607525 Matrix: Water
Associated Lab Samples: 92276107001, 92276107002, 92276107003, 92276107004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	11/18/15 02:54	

LABORATORY CONTROL SAMPLE: 1607526

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	2.5	2.7	107	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1607527 1607528

Parameter	Units	92275784001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	0.77	2.5	2.5	3.4	3.3	104	101	90-110	2	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1607529 1607530

Parameter	Units	92276004002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	0.73	2.5	2.5	3.2	3.2	101	100	90-110	1	10	

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QUALITY CONTROL DATA

Project: Stones BOD 11/12
Pace Project No.: 92276107

QC Batch: WETA/25403 | Analysis Method: SM 4500-P E
QC Batch Method: SM 4500-P E | Analysis Description: SM4500P-E Phosphorus, Ortho
Associated Lab Samples: 92276107001, 92276107002, 92276107003, 92276107004

METHOD BLANK: 1607059 | Matrix: Water
Associated Lab Samples: 92276107001, 92276107002, 92276107003, 92276107004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Orthophosphate as P	mg/L	ND	0.050	11/14/15 10:32	

LABORATORY CONTROL SAMPLE: 1607060

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Orthophosphate as P	mg/L	.25	0.23	91	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1607061 1607062

Parameter	Units	92276107001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Orthophosphate as P	mg/L	1.6	2.5	2.5	3.7	3.7	85	86	90-110	1	10	M6

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QUALIFIERS

Project: Stones BOD 11/12
Pace Project No.: 92276107

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville

ANALYTE QUALIFIERS

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Stones BOD 11/12
Pace Project No.: 92276107

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92276107001	**WFSRDOWN-09**	EPA 350.1	WETA/25430		
92276107002	**WFSREFF-09**	EPA 350.1	WETA/25430		
92276107003	**WFSRUP-09**	EPA 350.1	WETA/25430		
92276107004	**WFSRUP-09-DUP**	EPA 350.1	WETA/25430		
92276107001	**WFSRDOWN-09**	EPA 351.2	WETA/25409		
92276107002	**WFSREFF-09**	EPA 351.2	WETA/25409		
92276107003	**WFSRUP-09**	EPA 351.2	WETA/25409		
92276107004	**WFSRUP-09-DUP**	EPA 351.2	WETA/25409		
92276107001	**WFSRDOWN-09**	EPA 353.2	WETA/25534		
92276107002	**WFSREFF-09**	EPA 353.2	WETA/25534		
92276107003	**WFSRUP-09**	EPA 353.2	WETA/25534		
92276107004	**WFSRUP-09-DUP**	EPA 353.2	WETA/25534		
92276107001	**WFSRDOWN-09**	EPA 365.1	WETA/25413		
92276107002	**WFSREFF-09**	EPA 365.1	WETA/25413		
92276107003	**WFSRUP-09**	EPA 365.1	WETA/25413		
92276107004	**WFSRUP-09-DUP**	EPA 365.1	WETA/25413		
92276107001	**WFSRDOWN-09**	SM 4500-P E	WETA/25403		
92276107002	**WFSREFF-09**	SM 4500-P E	WETA/25403		
92276107003	**WFSRUP-09**	SM 4500-P E	WETA/25403		
92276107004	**WFSRUP-09-DUP**	SM 4500-P E	WETA/25403		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

Section A Required Client Information:

Company:	AquAeTer, Inc.
Address:	215 Jamestown Park Ste 100
	Brentwood, TN 37027
Email To:	jmcorn@aquaeter.com
Phone: 615-373-8532	Fax: 615-373-8512
Requested Due Date/TAT:	ASAP

Section B Required Project Information:

Report To:	John Michael Corn
Copy To:	
Purchase Order No.:	152384
Project Name:	Stones BOD
Project Number:	152384

Section C Invoice Information:

Attention:	Cindy Corn
Company Name:	AquAeTer, Inc.
Address:	See client information
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: TN

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	Orthophosphate	$NO_3 + NO_2$, TP, Ammonia	TKN	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	WFSRDown-09	WT	G			11/2/15	1214		2	1	1							N	1	1	1		92276107-001
2	WFSREff-09	WT	G			11/2/15	1221		2	1	1							N	1	1	1		002
3	WFSRUp-09	WT	G			11/2/15	1228		2	1	1							N	1	1	1		003
4	WFSRUp-09-DUP	WT	G			11/2/15	1237		2	1	1							N	1	1	1		004
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
☆ Use lowest detection limits possible ☆	Kate Lopez/AAT	11/2/15	1245	Matt Stewart AVL	11/3/15	1600	2.5	Y	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Kate Lopez

SIGNATURE of SAMPLER: Kate Lopez — DATE Signed (MM/DD/YY): 11/2/15

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Pace Analytical® www.pacelabs.com	Document Name: **Sample Condition Upon Receipt (SCUR)**	Document Revised: November 06, 2015 Page 1 of 2*
	Document No.: F-ASV-CS-003-rev.15	Issuing Authorities: Pace Asheville Quality Office

Client Name: AquAeFer Inc.

* Page 2 of 2 is for Internal Use Only

Courier (Circle): (Fed Ex) UPS USPS Client Commercial Pace Other_____

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☑ yes ☐ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other_____

Thermometer Used: (IR Gun#5 - 155271998) **Type of Ice:** (Wet) Blue None ☑ Samples on ice, cooling process has begun

IR Gun #4 SN:140290365 Other:_____

Temp Correction Factor: Add / Subtract 0 C

Corrected Cooler Temp.: 2.5 C **Biological Tissue is Frozen:** Yes No (N/A)

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 11/13 MS

		Comments:
Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☑Yes ☐No ☐N/A	6. Orthophosphate
Rush Turn Around Time Requested:	☑Yes ☐No ☐N/A	7. ASAP
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9.
-Pace Containers Used:	☑Yes ☐No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC:	☑Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: WT		
All containers needing preservation have been checked.	☑Yes ☐No ☐N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☑Yes ☐No ☐N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes ☑No	
Samples checked for dechlorination:	☑Yes ☐No ☐N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☑N/A	15.
Trip Blank Present:	☐Yes ☐No ☑N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased):_____		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

SCURF Review: [signature] Date: 11/16/15

SRF Review: [signature] Date: 11/16/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Place label here

WO# : 92276107

92276107

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

November 11, 2015

Mr. John Michael Corn, P.E.
Aquaeter
215 Jamestown Park
Suite 100
Brentwood, TN 37027

RE: Project: Stones BOD 10/27
Pace Project No.: 92273658

Dear Mr. Corn, P.E.:
Enclosed are the analytical results for sample(s) received by the laboratory on October 28, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Chris Derouen
christopher.derouen@pacelabs.com
Project Manager

Enclosures

cc: Katie Lopez, Aquaeter
Kelley Spence, Aquaeter
Rachel Stribling, Aquaeter

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CERTIFICATIONS

Project: Stones BOD 10/27
Pace Project No.: 92273658

Asheville Certification IDs
2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
West Virginia Certification #: 356
Virginia/VELAP Certification #: 460222

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SAMPLE SUMMARY

Project: Stones BOD 10/27
Pace Project No.: 92273658

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92273658001	**WFSRDown-07**	Water	10/27/15 12:50	10/28/15 10:30
92273658002	**WFSREFF-07**	Water	10/27/15 13:05	10/28/15 10:30
92273658003	**WFSRUP-07**	Water	10/27/15 13:14	10/28/15 10:30
92273658004	**WFSRDOWN-08**	Water	10/27/15 13:21	10/28/15 10:30
92273658005	**WFSRUP-08**	Water	10/27/15 13:30	10/28/15 10:30
92273658006	**WFSREFF-08**	Water	10/27/15 13:35	10/28/15 10:30
92273658007	**WFSRDOWN-09**	Water	10/27/15 13:51	10/28/15 10:30
92273658008	**WFSREFF-09**	Water	10/27/15 13:59	10/28/15 10:30
92273658009	**WFSRUP-09**	Water	10/27/15 14:06	10/28/15 10:30
92273658010	**WFSRUP-09-DUP**	Water	10/27/15 14:15	10/28/15 10:30

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SAMPLE ANALYTE COUNT

Project: Stones BOD 10/27
Pace Project No.: 92273658

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92273658001	**WFSRDown-07**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	SER	1	PASI-A
		SM 4500-P E	WRC	1	PASI-A
92273658002	**WFSREFF-07**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	SER	1	PASI-A
		SM 4500-P E	WRC	1	PASI-A
92273658003	**WFSRUP-07**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	SER	1	PASI-A
		SM 4500-P E	WRC	1	PASI-A
92273658004	**WFSRDOWN-08**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	SER	1	PASI-A
		SM 4500-P E	WRC	1	PASI-A
92273658005	**WFSRUP-08**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	SER	1	PASI-A
		SM 4500-P E	WRC	1	PASI-A
92273658006	**WFSREFF-08**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	SER	1	PASI-A
		SM 4500-P E	WRC	1	PASI-A
92273658007	**WFSRDOWN-09**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	SER	1	PASI-A
		SM 4500-P E	WRC	1	PASI-A
92273658008	**WFSREFF-09**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	SER	1	PASI-A

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SAMPLE ANALYTE COUNT

Project: Stones BOD 10/27
Pace Project No.: 92273658

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	SER	1	PASI-A
		SM 4500-P E	WRC	1	PASI-A
92273658009	**WFSRUP-09**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	SER	1	PASI-A
		SM 4500-P E	WRC	1	PASI-A
92273658010	**WFSRUP-09-DUP**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	SER	1	PASI-A
		SM 4500-P E	WRC	1	PASI-A

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ANALYTICAL RESULTS

Project: Stones BOD 10/27
Pace Project No.: 92273658

Sample: WFSRDown-07 **Lab ID: 92273658001** Collected: 10/27/15 12:50 Received: 10/28/15 10:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	ND	mg/L	0.010	1		11/04/15 12:20	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		11/03/15 03:45	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.47**	mg/L	0.020	1		11/10/15 10:26		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**0.48**	mg/L	0.050	1		11/03/15 04:02	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**0.81**	mg/L	0.25	5		10/28/15 14:00		M1

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ANALYTICAL RESULTS

Project: Stones BOD 10/27
Pace Project No.: 92273658

Sample: WFSREFF-07 **Lab ID: 92273658002** Collected: 10/27/15 13:05 Received: 10/28/15 10:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	ND	mg/L	0.010	1		11/04/15 12:20	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	**0.62**	mg/L	0.50	1		11/03/15 03:46	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.95**	mg/L	0.020	1		11/10/15 10:28		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**3.3**	mg/L	0.050	1		11/03/15 04:08	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**4.8**	mg/L	1.0	20		10/28/15 14:00		

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ANALYTICAL RESULTS

Project: Stones BOD 10/27
Pace Project No.: 92273658

Sample: WFSRUP-07 **Lab ID: 92273658003** Collected: 10/27/15 13:14 Received: 10/28/15 10:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	ND	mg/L	0.010	1		11/04/15 12:20	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		11/03/15 03:47	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.24**	mg/L	0.020	1		11/10/15 10:31		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	ND	mg/L	0.050	1		11/03/15 04:02	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**0.19**	mg/L	0.050	1		10/28/15 14:00		

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ANALYTICAL RESULTS

Project: Stones BOD 10/27
Pace Project No.: 92273658

Sample: WFSRDOWN-08 **Lab ID: 92273658004** Collected: 10/27/15 13:21 Received: 10/28/15 10:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	ND	mg/L	0.010	1		11/04/15 12:20	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		11/03/15 03:47	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**1.1**	mg/L	0.020	1		11/10/15 10:32		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**0.51**	mg/L	0.050	1		11/03/15 04:10	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**0.64**	mg/L	0.25	5		10/28/15 14:00		

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ANALYTICAL RESULTS

Project: Stones BOD 10/27
Pace Project No.: 92273658

Sample: WFSRUP-08 **Lab ID: 92273658005** Collected: 10/27/15 13:30 Received: 10/28/15 10:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	ND	mg/L	0.010	1		11/04/15 12:20	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		11/03/15 03:48	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.81**	mg/L	0.020	1		11/10/15 10:33		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	ND	mg/L	0.050	1		11/03/15 04:11	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**0.22**	mg/L	0.050	1		10/28/15 14:00		

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ANALYTICAL RESULTS

Project: Stones BOD 10/27
Pace Project No.: 92273658

Sample: WFSREFF-08 **Lab ID: 92273658006** Collected: 10/27/15 13:35 Received: 10/28/15 10:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	ND	mg/L	0.010	1		11/04/15 12:20	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	**0.60**	mg/L	0.50	1		11/03/15 03:49	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**3.8**	mg/L	0.020	1		11/10/15 10:35		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**5.2**	mg/L	0.25	5		11/03/15 05:34	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**6.0**	mg/L	1.2	25		10/28/15 14:00		

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ANALYTICAL RESULTS

Project: Stones BOD 10/27
Pace Project No.: 92273658

Sample: WFSRDOWN-09 **Lab ID: 92273658007** Collected: 10/27/15 13:51 Received: 10/28/15 10:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	ND	mg/L	0.010	1		11/04/15 12:20	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		11/03/15 03:50	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.51**	mg/L	0.020	1		11/10/15 10:36		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**1.4**	mg/L	0.050	1		11/03/15 04:12	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**1.6**	mg/L	0.50	10		10/28/15 14:00		

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ANALYTICAL RESULTS

Project: Stones BOD 10/27
Pace Project No.: 92273658

Sample: WFSREFF-09 **Lab ID: 92273658008** Collected: 10/27/15 13:59 Received: 10/28/15 10:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.032**	mg/L	0.010	1		11/04/15 12:20	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	**0.96**	mg/L	0.50	1		11/05/15 03:13	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**1.2**	mg/L	0.020	1		11/10/15 10:37		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**4.3**	mg/L	0.050	1		11/03/15 04:13	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**4.1**	mg/L	0.50	10		10/28/15 14:00		

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ANALYTICAL RESULTS

Project: Stones BOD 10/27
Pace Project No.: 92273658

Sample: WFSRUP-09 **Lab ID: 92273658009** Collected: 10/27/15 14:06 Received: 10/28/15 10:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	ND	mg/L	0.010	1		11/04/15 12:20	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		11/05/15 03:18	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.20**	mg/L	0.020	1		11/10/15 17:06		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	ND	mg/L	0.050	1		11/03/15 04:14	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**0.10**	mg/L	0.050	1		10/28/15 14:00		

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ANALYTICAL RESULTS

Project: Stones BOD 10/27
Pace Project No.: 92273658

Sample: WFSRUP-09-DUP **Lab ID: 92273658010** Collected: 10/27/15 14:15 Received: 10/28/15 10:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	ND	mg/L	0.010	1		11/04/15 12:20	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		11/05/15 03:18	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.22**	mg/L	0.020	1		11/10/15 17:09		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	ND	mg/L	0.050	1		11/03/15 04:15	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**0.18**	mg/L	0.050	1		10/28/15 14:00		

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QUALITY CONTROL DATA

Project: Stones BOD 10/27
Pace Project No.: 92273658

QC Batch: WETA/25256 — Analysis Method: EPA 350.1
QC Batch Method: EPA 350.1 — Analysis Description: 350.1 Ammonia, Low Level
Associated Lab Samples: 92273658001, 92273658002, 92273658003, 92273658004, 92273658005, 92273658006, 92273658007, 92273658008, 92273658009, 92273658010

METHOD BLANK: 1598468 — Matrix: Water
Associated Lab Samples: 92273658001, 92273658002, 92273658003, 92273658004, 92273658005, 92273658006, 92273658007, 92273658008, 92273658009, 92273658010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.010	11/04/15 12:20	

LABORATORY CONTROL SAMPLE: 1598469

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	1	0.97	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1598470 — 1598471

Parameter	Units	92274192001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	ND	1	1	0.65	0.65	65	65	90-110	0	10	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1598472 — 1598473

Parameter	Units	92274192002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	ND	1	1	0.66	0.67	66	67	90-110	2	10	M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Stones BOD 10/27
Pace Project No.: 92273658

QC Batch: WETA/25208 Analysis Method: EPA 351.2
QC Batch Method: EPA 351.2 Analysis Description: 351.2 TKN
Associated Lab Samples: 92273658001, 92273658002, 92273658003, 92273658004, 92273658005, 92273658006, 92273658007

METHOD BLANK: 1596250 Matrix: Water
Associated Lab Samples: 92273658001, 92273658002, 92273658003, 92273658004, 92273658005, 92273658006, 92273658007

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	ND	0.50	11/03/15 03:37	

LABORATORY CONTROL SAMPLE: 1596251

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	10	9.7	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1596252 1596253

Parameter	Units	92273646007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	0.61	10	10	10.3	11.0	97	104	90-110	7	10	

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QUALITY CONTROL DATA

Project: Stones BOD 10/27
Pace Project No.: 92273658

QC Batch: WETA/25215 Analysis Method: EPA 351.2
QC Batch Method: EPA 351.2 Analysis Description: 351.2 TKN
Associated Lab Samples: 92273658008, 92273658009, 92273658010

METHOD BLANK: 1596566 Matrix: Water
Associated Lab Samples: 92273658008, 92273658009, 92273658010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	ND	0.50	11/05/15 03:11	

LABORATORY CONTROL SAMPLE: 1596567

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	10	9.1	91	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1596568 1596569

Parameter	Units	92273658008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	0.96	10	10	11.5	11.3	105	103	90-110	2	10	

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QUALITY CONTROL DATA

Project: Stones BOD 10/27
Pace Project No.: 92273658

QC Batch: WETA/25325 — Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 — Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 92273658001, 92273658002, 92273658003, 92273658004, 92273658005, 92273658006, 92273658007, 92273658008

METHOD BLANK: 1602429 — Matrix: Water
Associated Lab Samples: 92273658001, 92273658002, 92273658003, 92273658004, 92273658005, 92273658006, 92273658007, 92273658008

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	11/10/15 10:04	

LABORATORY CONTROL SAMPLE: 1602430

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.5	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1602431 1602432

Parameter	Units	92273568001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	6.2	2.5	2.5	9.3	9.3	124	124	75-125	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1602433 1602434

Parameter	Units	92274121003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.22	2.5	2.5	2.5	2.5	91	92	75-125	1	10	

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QUALITY CONTROL DATA

Project: Stones BOD 10/27
Pace Project No.: 92273658

QC Batch: WETA/25336 | Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 | Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 92273658009, 92273658010

METHOD BLANK: 1602993 | Matrix: Water
Associated Lab Samples: 92273658009, 92273658010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	11/10/15 17:04	

LABORATORY CONTROL SAMPLE: 1602994

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.4	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1602995 1602996

Parameter	Units	92273658009 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.20	2.5	2.5	2.7	2.7	101	101	75-125	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1602997 1602998

Parameter	Units	92273658010 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.22	2.5	2.5	2.7	2.7	99	99	75-125	1	10	

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QUALITY CONTROL DATA

Project: Stones BOD 10/27
Pace Project No.: 92273658

QC Batch: WETA/25185 — Analysis Method: EPA 365.1
QC Batch Method: EPA 365.1 — Analysis Description: 365.1 Phosphorus, Total
Associated Lab Samples: 92273658001, 92273658002, 92273658003, 92273658004, 92273658005, 92273658006, 92273658007, 92273658008, 92273658009, 92273658010

METHOD BLANK: 1595330 — Matrix: Water
Associated Lab Samples: 92273658001, 92273658002, 92273658003, 92273658004, 92273658005, 92273658006, 92273658007, 92273658008, 92273658009, 92273658010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	11/03/15 03:55	

LABORATORY CONTROL SAMPLE: 1595331

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	2.5	2.5	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1595332 — 1595333

Parameter	Units	92273568001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	5.0	2.5	2.5	7.6	7.6	105	107	90-110	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1595334 — 1595335

Parameter	Units	92273658002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	3.3	2.5	2.5	5.7	5.7	97	95	90-110	1	10	

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QUALITY CONTROL DATA

Project: Stones BOD 10/27
Pace Project No.: 92273658

QC Batch: WETA/25155 — Analysis Method: SM 4500-P E
QC Batch Method: SM 4500-P E — Analysis Description: SM4500P-E Phosphorus, Ortho
Associated Lab Samples: 92273658001, 92273658002, 92273658003, 92273658004, 92273658005, 92273658006, 92273658007, 92273658008, 92273658009, 92273658010

METHOD BLANK: 1593428 — Matrix: Water
Associated Lab Samples: 92273658001, 92273658002, 92273658003, 92273658004, 92273658005, 92273658006, 92273658007, 92273658008, 92273658009, 92273658010

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Orthophosphate as P	mg/L	ND	0.050	10/28/15 14:00	

LABORATORY CONTROL SAMPLE: 1593429

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Orthophosphate as P	mg/L	.25	0.26	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1593430 — 1593431

Parameter	Units	92273658001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Orthophosphate as P	mg/L	0.81	1.2	1.2	1.9	1.9	88	88	90-110	0	10	M1

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QUALIFIERS

Project: Stones BOD 10/27
Pace Project No.: 92273658

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville

ANALYTE QUALIFIERS

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Stones BOD 10/27
Pace Project No.: 92273658

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92273658001	**WFSRDown-07**	EPA 350.1	WETA/25256		
92273658002	**WFSREFF-07**	EPA 350.1	WETA/25256		
92273658003	**WFSRUP-07**	EPA 350.1	WETA/25256		
92273658004	**WFSRDOWN-08**	EPA 350.1	WETA/25256		
92273658005	**WFSRUP-08**	EPA 350.1	WETA/25256		
92273658006	**WFSREFF-08**	EPA 350.1	WETA/25256		
92273658007	**WFSRDOWN-09**	EPA 350.1	WETA/25256		
92273658008	**WFSREFF-09**	EPA 350.1	WETA/25256		
92273658009	**WFSRUP-09**	EPA 350.1	WETA/25256		
92273658010	**WFSRUP-09-DUP**	EPA 350.1	WETA/25256		
92273658001	**WFSRDown-07**	EPA 351.2	WETA/25208		
92273658002	**WFSREFF-07**	EPA 351.2	WETA/25208		
92273658003	**WFSRUP-07**	EPA 351.2	WETA/25208		
92273658004	**WFSRDOWN-08**	EPA 351.2	WETA/25208		
92273658005	**WFSRUP-08**	EPA 351.2	WETA/25208		
92273658006	**WFSREFF-08**	EPA 351.2	WETA/25208		
92273658007	**WFSRDOWN-09**	EPA 351.2	WETA/25208		
92273658008	**WFSREFF-09**	EPA 351.2	WETA/25215		
92273658009	**WFSRUP-09**	EPA 351.2	WETA/25215		
92273658010	**WFSRUP-09-DUP**	EPA 351.2	WETA/25215		
92273658001	**WFSRDown-07**	EPA 353.2	WETA/25325		
92273658002	**WFSREFF-07**	EPA 353.2	WETA/25325		
92273658003	**WFSRUP-07**	EPA 353.2	WETA/25325		
92273658004	**WFSRDOWN-08**	EPA 353.2	WETA/25325		
92273658005	**WFSRUP-08**	EPA 353.2	WETA/25325		
92273658006	**WFSREFF-08**	EPA 353.2	WETA/25325		
92273658007	**WFSRDOWN-09**	EPA 353.2	WETA/25325		
92273658008	**WFSREFF-09**	EPA 353.2	WETA/25325		
92273658009	**WFSRUP-09**	EPA 353.2	WETA/25336		
92273658010	**WFSRUP-09-DUP**	EPA 353.2	WETA/25336		
92273658001	**WFSRDown-07**	EPA 365.1	WETA/25185		
92273658002	**WFSREFF-07**	EPA 365.1	WETA/25185		
92273658003	**WFSRUP-07**	EPA 365.1	WETA/25185		
92273658004	**WFSRDOWN-08**	EPA 365.1	WETA/25185		
92273658005	**WFSRUP-08**	EPA 365.1	WETA/25185		
92273658006	**WFSREFF-08**	EPA 365.1	WETA/25185		
92273658007	**WFSRDOWN-09**	EPA 365.1	WETA/25185		
92273658008	**WFSREFF-09**	EPA 365.1	WETA/25185		
92273658009	**WFSRUP-09**	EPA 365.1	WETA/25185		
92273658010	**WFSRUP-09-DUP**	EPA 365.1	WETA/25185		
92273658001	**WFSRDown-07**	SM 4500-P E	WETA/25155		
92273658002	**WFSREFF-07**	SM 4500-P E	WETA/25155		
92273658003	**WFSRUP-07**	SM 4500-P E	WETA/25155		
92273658004	**WFSRDOWN-08**	SM 4500-P E	WETA/25155		
92273658005	**WFSRUP-08**	SM 4500-P E	WETA/25155		
92273658006	**WFSREFF-08**	SM 4500-P E	WETA/25155		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Stones BOD 10/27
Pace Project No.: 92273658

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92273658007	**WFSRDOWN-09**	SM 4500-P E	WETA/25155		
92273658008	**WFSREFF-09**	SM 4500-P E	WETA/25155		
92273658009	**WFSRUP-09**	SM 4500-P E	WETA/25155		
92273658010	**WFSRUP-09-DUP**	SM 4500-P E	WETA/25155		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

Section A Required Client Information:

Company:	AquAeTer, Inc.
Address:	215 Jamestown Park Ste 100
	Brentwood, TN 37027
Email To:	jmcorn@aquaeter.com
Phone: 615-373-8532	Fax: 615-373-8512
Requested Due Date/TAT:	ASAP

Section B Required Project Information:

Report To:	John Michael Corn
Copy To:	
Purchase Order No.:	152384
Project Name:	Stones BOD
Project Number:	152384

Section C Invoice Information:

Attention:	Cindy Corn
Company Name:	AquAeTer, Inc.
Address:	See client information
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY: ☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: TN

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N): Y/N

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test: Orthophosphate (N)	$NO_3 + NO_2$, TP, Ammonia (N)	TKN (N)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	WFSRDown-07	WT	G	10/27	1250				2	1	1							1	1	1		92273658-001
2	WFSREFF-07	WT	G	10/27	1305				2	1	1							1	1	1		002
3	WFSRUP-07	WT	G	10/27	1314				2	1	1							1	1	1		003
4	WFSRDOWN-08	WT	G	10/27	1321				2	1	1							1	1	1		004
5	WFSRUP-08	WT	G	10/27	1330				2	1	1							1	1	1		005
6	WFSREFF-08	WT	G	10/27	1335				2	1	1							1	1	1		006
7	WFSRDown-09	WT	G	10/27	1351				2	1	1							1	1	1		007
8	WFSREFF-09	WT	G	10/27	1359				2	1	1							1	1	1		008
9	WFSRUP-09	WT	G	10/27	1406				2	1	1							1	1	1		009
10	WFSRUP-09-DUP	WT	G	10/27	1415				2	1	1							1	1	1		010
11																						
12																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
* Use lowest detection limits possible *	Rachel O. Steinling / AET	10/27/15	1420	Matt Stearns / AVL	10/28/15	1030	2.7	Y	N	Y
							Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Rachel O. Steinling

SIGNATURE of SAMPLER: Rachel O. Steinling

DATE Signed (MM/DD/YY): 10/27/15

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Pace Analytical® www.pacelabs.com	Document Name: **Sample Condition Upon Receipt (SCUR)**	Document Revised: May 15, 2015 Page 1 of 2*
	Document No.: F-ASV-CS-003-rev.14	Issuing Authorities: Pace Asheville Quality Office

Client Name: AquAeTer

* Page 2 of 2 is for Internal Use Only

Courier (Circle): Fed Ex UPS USPS Client Commercial Pace Other_____

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☑ yes ☐ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other_____

Thermometer Used: IR Gun#3 -130265963 **Type of Ice:** Wet Blue None ☑ Samples on ice, cooling process has begun

IR Gun #4 SN:140290365 Other:_____

Temp Correction Factor: Add / Subtract 0 C

Corrected Cooler Temp.: 2.7 C **Biological Tissue is Frozen:** Yes No N/A

Date and Initials of person examining contents: 10/28 MS

Temp should be above freezing to 6°C

Comments:

Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☑Yes ☐No ☐N/A	6. Orthophosate
Rush Turn Around Time Requested:	☑Yes ☐No ☐N/A	7. ASAP
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9.
-Pace Containers Used:	☑Yes ☐No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC:	☑Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: WT		
All containers needing preservation have been checked.	☑Yes ☐No ☐N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☑Yes ☐No ☐N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes ☑No	
Samples checked for dechlorination:	☑Yes ☐No ☐N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☑N/A	15.
Trip Blank Present:	☐Yes ☐No ☑N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased):_____		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

SCURF Review: [signature] Date: 10/28/15

SRF Review: [signature] Date: 10/28/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

WO#: 92273658

92273658

Pace Analytical Services, Inc.
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(704)875-9092

November 02, 2015

Mr. John Michael Corn, P.E.
Aquaeter
215 Jamestown Park
Suite 100
Brentwood, TN 37027

RE: Project: Stones BOD 152384 10/19
Pace Project No.: 92272448

Dear Mr. Corn, P.E.:
Enclosed are the analytical results for sample(s) received by the laboratory on October 20, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Chris Derouen
christopher.derouen@pacelabs.com
Project Manager

Enclosures

cc: Katie Lopez, Aquaeter
Kelley Spence, Aquaeter
Rachel Stribling, Aquaeter

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CERTIFICATIONS

Project: Stones BOD 152384 10/19
Pace Project No.: 92272448

Asheville Certification IDs
2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
West Virginia Certification #: 356
Virginia/VELAP Certification #: 460222

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SAMPLE SUMMARY

Project: Stones BOD 152384 10/19
Pace Project No.: 92272448

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92272448001	**WFSRDOWN-09**	Water	10/19/15 08:50	10/20/15 10:30
92272448002	**WFSR Eff-09**	Water	10/19/15 09:02	10/20/15 10:30
92272448003	**WFSR UP-09**	Water	10/19/15 09:13	10/20/15 10:30
92272448004	**WFSUP-09-DUP**	Water	10/19/15 09:20	10/20/15 10:30

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SAMPLE ANALYTE COUNT

Project: Stones BOD 152384 10/19
Pace Project No.: 92272448

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92272448001	**WFSRDOWN-09**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	BRJ	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	AES2	1	PASI-A
		SM 4500-P E	WRC	1	PASI-A
92272448002	**WFSR Eff-09**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	BRJ	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	AES2	1	PASI-A
		SM 4500-P E	WRC	1	PASI-A
92272448003	**WFSR UP-09**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	AES2	1	PASI-A
		SM 4500-P E	WRC	1	PASI-A
92272448004	**WFSUP-09-DUP**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	AES2	1	PASI-A
		SM 4500-P E	WRC	1	PASI-A

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ANALYTICAL RESULTS

Project: Stones BOD 152384 10/19
Pace Project No.: 92272448

Sample: WFSRDOWN-09 **Lab ID: 92272448001** Collected: 10/19/15 08:50 Received: 10/20/15 10:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	ND	mg/L	0.010	1		10/28/15 13:50	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		10/23/15 04:33	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.48**	mg/L	0.020	1		10/30/15 12:18		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**1.4**	mg/L	0.050	1		10/24/15 12:18	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**1.8**	mg/L	0.50	10		10/20/15 15:45		M6

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ANALYTICAL RESULTS

Project: Stones BOD 152384 10/19
Pace Project No.: 92272448

Sample: WFSR Eff-09 **Lab ID: 92272448002** Collected: 10/19/15 09:02 Received: 10/20/15 10:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.054**	mg/L	0.010	1		10/28/15 13:50	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	**0.72**	mg/L	0.50	1		10/23/15 04:34	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**1.1**	mg/L	0.020	1		10/30/15 12:19		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**4.4**	mg/L	0.050	1		10/24/15 12:19	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**4.0**	mg/L	0.50	10		10/20/15 15:45		

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ANALYTICAL RESULTS

Project: Stones BOD 152384 10/19
Pace Project No.: 92272448

Sample: WFSR UP-09 **Lab ID: 92272448003** Collected: 10/19/15 09:13 Received: 10/20/15 10:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	ND	mg/L	0.010	1		10/28/15 13:50	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		10/28/15 02:06	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.19**	mg/L	0.020	1		11/02/15 14:38		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**0.057**	mg/L	0.050	1		10/24/15 12:21	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**0.11**	mg/L	0.050	1		10/20/15 15:45		

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ANALYTICAL RESULTS

Project: Stones BOD 152384 10/19
Pace Project No.: 92272448

Sample: WFSUP-09-DUP **Lab ID: 92272448004** Collected: 10/19/15 09:20 Received: 10/20/15 10:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	ND	mg/L	0.010	1		10/28/15 13:50	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		10/28/15 02:07	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.21**	mg/L	0.020	1		11/02/15 14:42		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**0.054**	mg/L	0.050	1		10/24/15 12:22	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**0.12**	mg/L	0.050	1		10/20/15 15:45		

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QUALITY CONTROL DATA

Project: Stones BOD 152384 10/19
Pace Project No.: 92272448

QC Batch: WETA/25143 Analysis Method: EPA 350.1
QC Batch Method: EPA 350.1 Analysis Description: 350.1 Ammonia, Low Level
Associated Lab Samples: 92272448001, 92272448002, 92272448003, 92272448004

METHOD BLANK: 1592970 Matrix: Water
Associated Lab Samples: 92272448001, 92272448002, 92272448003, 92272448004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.010	10/28/15 13:50	

LABORATORY CONTROL SAMPLE: 1592971

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	1	1.0	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1592972 1592973

Parameter	Units	92271952016 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	0.010	1	1	0.44	0.44	43	43	90-110	2	10	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1592974 1592975

Parameter	Units	92272162001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	ND	1	1	0.83	0.83	83	83	90-110	0	10	M1

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Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: Stones BOD 152384 10/19
Pace Project No.: 92272448

QC Batch: WETA/25069 | Analysis Method: EPA 351.2
QC Batch Method: EPA 351.2 | Analysis Description: 351.2 TKN
Associated Lab Samples: 92272448001, 92272448002

METHOD BLANK: 1588625 | Matrix: Water
Associated Lab Samples: 92272448001, 92272448002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	ND	0.50	10/23/15 04:19	

LABORATORY CONTROL SAMPLE: 1588626

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	10	10.1	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1588627 1588628

Parameter	Units	92272353006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	0.54	10	10	10.7	11.0	101	104	90-110	3	10	

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QUALITY CONTROL DATA

Project: Stones BOD 152384 10/19
Pace Project No.: 92272448

QC Batch: WETA/25113 — Analysis Method: EPA 351.2
QC Batch Method: EPA 351.2 — Analysis Description: 351.2 TKN
Associated Lab Samples: 92272448003, 92272448004

METHOD BLANK: 1591211 — Matrix: Water
Associated Lab Samples: 92272448003, 92272448004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	ND	0.50	10/28/15 01:55	

LABORATORY CONTROL SAMPLE: 1591212

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	10	9.5	95	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1591213 — 1591214

Parameter	Units	92273018001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	3.9	10	10	15.0	14.0	111	100	90-110	7	10	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1591215 — 1591216

Parameter	Units	92272569001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	16.9	10	10	28.8	27.6	119	106	90-110	5	10	M1

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QUALITY CONTROL DATA

Project: Stones BOD 152384 10/19
Pace Project No.: 92272448

QC Batch: WETA/25200 — Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 — Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 92272448001, 92272448002

METHOD BLANK: 1595589 — Matrix: Water
Associated Lab Samples: 92272448001, 92272448002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	10/30/15 11:48	

LABORATORY CONTROL SAMPLE: 1595590

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.4	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1595591 1595592

Parameter	Units	92272350005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.034	2.5	2.5	2.3	2.3	92	92	75-125	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1595593 1595594

Parameter	Units	92272350006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	2.8	2.5	2.5	5.1	5.1	92	92	75-125	0	10	

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QUALITY CONTROL DATA

Project: Stones BOD 152384 10/19
Pace Project No.: 92272448

QC Batch: WETA/25221 — Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 — Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 92272448003, 92272448004

METHOD BLANK: 1596819 — Matrix: Water
Associated Lab Samples: 92272448003, 92272448004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	11/02/15 14:36	

LABORATORY CONTROL SAMPLE: 1596820

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.5	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1596821 1596822

Parameter	Units	92272448003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.19	2.5	2.5	2.7	2.7	99	99	75-125	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1596823 1596824

Parameter	Units	92272448004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.21	2.5	2.5	2.8	2.8	102	102	75-125	0	10	

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QUALITY CONTROL DATA

Project: Stones BOD 152384 10/19
Pace Project No.: 92272448

QC Batch: WETA/25093 Analysis Method: EPA 365.1
QC Batch Method: EPA 365.1 Analysis Description: 365.1 Phosphorus, Total
Associated Lab Samples: 92272448001, 92272448002, 92272448003, 92272448004

METHOD BLANK: 1589985 Matrix: Water
Associated Lab Samples: 92272448001, 92272448002, 92272448003, 92272448004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	10/24/15 11:59	

LABORATORY CONTROL SAMPLE: 1589986

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	2.5	2.5	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1589987 1589988

Parameter	Units	92271697007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	28.8	2.5	2.5	30.8	31.0	79	89	90-110	1	10	M6

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1589989 1589990

Parameter	Units	92272353007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	11.0	2.5	2.5	13.5	13.4	99	93	90-110	1	10	

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QUALITY CONTROL DATA

Project: Stones BOD 152384 10/19
Pace Project No.: 92272448

QC Batch: WETA/25044 — Analysis Method: SM 4500-P E
QC Batch Method: SM 4500-P E — Analysis Description: SM4500P-E Phosphorus, Ortho
Associated Lab Samples: 92272448001, 92272448002, 92272448003, 92272448004

METHOD BLANK: 1586853 — Matrix: Water
Associated Lab Samples: 92272448001, 92272448002, 92272448003, 92272448004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Orthophosphate as P	mg/L	ND	0.050	10/20/15 15:45	

LABORATORY CONTROL SAMPLE: 1586854

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Orthophosphate as P	mg/L	.25	0.22	90	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1586855 1586856

Parameter	Units	92272448001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Orthophosphate as P	mg/L	1.8	2.5	2.5	3.7	3.7	79	79	90-110	0	10	M6

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: Stones BOD 152384 10/19
Pace Project No.: 92272448

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville

ANALYTE QUALIFIERS

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Stones BOD 152384 10/19
Pace Project No.: 92272448

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92272448001	**WFSRDOWN-09**	EPA 350.1	WETA/25143		
92272448002	**WFSR Eff-09**	EPA 350.1	WETA/25143		
92272448003	**WFSR UP-09**	EPA 350.1	WETA/25143		
92272448004	**WFSUP-09-DUP**	EPA 350.1	WETA/25143		
92272448001	**WFSRDOWN-09**	EPA 351.2	WETA/25069		
92272448002	**WFSR Eff-09**	EPA 351.2	WETA/25069		
92272448003	**WFSR UP-09**	EPA 351.2	WETA/25113		
92272448004	**WFSUP-09-DUP**	EPA 351.2	WETA/25113		
92272448001	**WFSRDOWN-09**	EPA 353.2	WETA/25200		
92272448002	**WFSR Eff-09**	EPA 353.2	WETA/25200		
92272448003	**WFSR UP-09**	EPA 353.2	WETA/25221		
92272448004	**WFSUP-09-DUP**	EPA 353.2	WETA/25221		
92272448001	**WFSRDOWN-09**	EPA 365.1	WETA/25093		
92272448002	**WFSR Eff-09**	EPA 365.1	WETA/25093		
92272448003	**WFSR UP-09**	EPA 365.1	WETA/25093		
92272448004	**WFSUP-09-DUP**	EPA 365.1	WETA/25093		
92272448001	**WFSRDOWN-09**	SM 4500-P E	WETA/25044		
92272448002	**WFSR Eff-09**	SM 4500-P E	WETA/25044		
92272448003	**WFSR UP-09**	SM 4500-P E	WETA/25044		
92272448004	**WFSUP-09-DUP**	SM 4500-P E	WETA/25044		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

Section A Required Client Information:

Company:	AquAeTer, Inc.
Address:	215 Jamestown Park Ste 100
	Brentwood, TN 37027
Email To:	jmcorn@aquaeter.com
Phone: 615-373-8532	Fax: 615-373-8512
Requested Due Date/TAT:	ASAP

Section B Required Project Information:

Report To:	John Michael Corn
Copy To:	
Purchase Order No.:	152384
Project Name:	Stones BOD
Project Number:	152384

Section C Invoice Information:

Attention:	Cindy Corn
Company Name:	AquAeTer, Inc.
Address:	See client information
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: TN

Section D Required Client Information

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test ↓ Y/N	Orthophosphate N	NO_3+NO_2, TP, Ammonia N	TKN N								Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	WFSR DOWN-09	WT	G			10/19/15	0850		2	1	1								1	1	1								92272448-001
2	WFSR EFF-09	WT	G			10/19/15	0902		2	1	1								1	1	1								002
3	WFSR UP-09	WT	G			10/19/15	0913		2	1	1								1	1	1								003
4	WFSR UP-09-DUP	WT	G			10/19/15	0920		2	1	1								1	1	1								004
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Use lowest detection limits possible	Katie Lopez / AAT	10/19/15	0925	[signature]	10/20/15	10:30	0.4	Y	N	Y
							Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Katie Lopez

SIGNATURE of SAMPLER: Katie Lopez

DATE Signed (MM/DD/YY): 10/19/15

F-ALL-Q-020rev.07, 15-May-2007

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pace Analytical® www.pacelabs.com	Document Name: **Sample Condition Upon Receipt (SCUR)**	Document Revised: May 15, 2015 Page 1 of 2*
	Document No.: F-ASV-CS-003-rev.14	Issuing Authorities: Pace Asheville Quality Office

* Page 2 of 2 is for Internal Use Only

Client Name: Aquaeter

Courier (Circle): Fed Ex UPS USPS Client Commercial Pace Other_____

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other_____

Thermometer Used: IR Gun#3 -130265963 **Type of Ice:** Wet Blue None ☑ Samples on ice, cooling process has begun

IR Gun #4 SN:140290365 Other:_____

Temp Correction Factor: Add / Subtract 0.0 C

Corrected Cooler Temp.: 0.4 C **Biological Tissue is Frozen:** Yes No N/A

Date and Initials of person examining contents: RDB 10/20/15

Temp should be above freezing to 6°C

		Comments:
Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☑Yes ☐No ☐N/A	6. ortho
Rush Turn Around Time Requested:	☐Yes ☑No ☐N/A	7.
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9.
-Pace Containers Used:	☑Yes ☐No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☑Yes ☐No ☐N/A	11.
Sample Labels match COC:	☑Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: WW		
All containers needing preservation have been checked.	☑Yes ☐No ☐N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☑Yes ☐No ☐N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes ☑No	RDB 10/20/15
Samples checked for dechlorination:	☑Yes ☐No ☐N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☑N/A	15.
Trip Blank Present:	☐Yes ☐No ☑N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased):_____		

Field Data Required? Y / N

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

SCURF Review: [signature] Date: 10/21/15

SRF Review: [signature] Date: 10/21/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

WO#: 92272448

92272448

Pace Analytical Services, Inc.
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(704)875-9092

October 26, 2015

Mr. John Michael Corn, P.E.
Aquaeter
215 Jamestown Park
Suite 100
Brentwood, TN 37027

RE: Project: Stones BOD 10/12
Pace Project No.: 92271513

Dear Mr. Corn, P.E.:
Enclosed are the analytical results for sample(s) received by the laboratory on October 13, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Chris Derouen
christopher.derouen@pacelabs.com
Project Manager

Enclosures

cc: Katie Lopez, Aquaeter
Kelley Spence, Aquaeter
Rachel Stribling, Aquaeter

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CERTIFICATIONS

Project: Stones BOD 10/12
Pace Project No.: 92271513

Asheville Certification IDs
2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
West Virginia Certification #: 356
Virginia/VELAP Certification #: 460222

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SAMPLE SUMMARY

Project: Stones BOD 10/12
Pace Project No.: 92271513

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92271513001	**WFSRDown-08**	Water	10/12/15 12:20	10/13/15 10:30
92271513002	**WFSRUP-08**	Water	10/12/15 12:35	10/13/15 10:30
92271513003	**WFSREff-08**	Water	10/12/15 12:43	10/13/15 10:30

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SAMPLE ANALYTE COUNT

Project: Stones BOD 10/12
Pace Project No.: 92271513

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92271513001	**WFSRDown-08**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	SER	1	PASI-A
		SM 4500-P E	WRC	1	PASI-A
92271513002	**WFSRUP-08**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	SER	1	PASI-A
		SM 4500-P E	WRC	1	PASI-A
92271513003	**WFSREff-08**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	SER	1	PASI-A
		SM 4500-P E	WRC	1	PASI-A

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ANALYTICAL RESULTS

Project: Stones BOD 10/12
Pace Project No.: 92271513

Sample: WFSRDown-08 **Lab ID: 92271513001** Collected: 10/12/15 12:20 Received: 10/13/15 10:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.19**	mg/L	0.010	1		10/15/15 14:30	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		10/22/15 07:11	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**1.2**	mg/L	0.020	1		10/24/15 08:54		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**0.51**	mg/L	0.050	1		10/21/15 05:52	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**0.61**	mg/L	0.25	5		10/13/15 17:30		

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ANALYTICAL RESULTS

Project: Stones BOD 10/12
Pace Project No.: 92271513

Sample: WFSRUP-08 **Lab ID: 92271513002** Collected: 10/12/15 12:35 Received: 10/13/15 10:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.16**	mg/L	0.010	1		10/15/15 14:30	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		10/22/15 07:12	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.81**	mg/L	0.020	1		10/24/15 08:56		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**0.068**	mg/L	0.050	1		10/21/15 05:53	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**0.077**	mg/L	0.050	1		10/13/15 17:30		

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ANALYTICAL RESULTS

Project: Stones BOD 10/12
Pace Project No.: 92271513

Sample: WFSREff-08 **Lab ID: 92271513003** Collected: 10/12/15 12:43 Received: 10/13/15 10:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.11**	mg/L	0.010	1		10/15/15 14:30	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		10/22/15 07:12	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**3.8**	mg/L	0.020	1		10/24/15 08:57		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**5.1**	mg/L	0.10	2		10/21/15 06:12	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**5.2**	mg/L	1.2	25		10/13/15 17:30		

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QUALITY CONTROL DATA

Project: Stones BOD 10/12
Pace Project No.: 92271513

QC Batch: WETA/24985 — Analysis Method: EPA 350.1
QC Batch Method: EPA 350.1 — Analysis Description: 350.1 Ammonia, Low Level
Associated Lab Samples: 92271513001, 92271513002, 92271513003

METHOD BLANK: 1583714 — Matrix: Water
Associated Lab Samples: 92271513001, 92271513002, 92271513003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.010	10/15/15 14:30	

LABORATORY CONTROL SAMPLE: 1583715

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	1	1.0	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1583716 1583717

Parameter	Units	92271226001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	0.10	1	1	0.42	0.43	31	32	90-110	2	10	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1583718 1583719

Parameter	Units	92271952013 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	0.28	1	1	0.37	0.38	10	10	90-110	2	10	M1

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QUALITY CONTROL DATA

Project: Stones BOD 10/12
Pace Project No.: 92271513

QC Batch: WETA/25053 Analysis Method: EPA 351.2
QC Batch Method: EPA 351.2 Analysis Description: 351.2 TKN
Associated Lab Samples: 92271513001, 92271513002, 92271513003

METHOD BLANK: 1587327 Matrix: Water
Associated Lab Samples: 92271513001, 92271513002, 92271513003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	ND	0.50	10/22/15 07:03	

LABORATORY CONTROL SAMPLE: 1587328

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	10	9.4	94	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1587329 1587330

Parameter	Units	92272370001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	20.2	10	10	31.5	32.4	114	123	90-110	3	10	M1

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QUALITY CONTROL DATA

Project: Stones BOD 10/12
Pace Project No.: 92271513

QC Batch: WETA/25095 | Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 | Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 92271513001, 92271513002, 92271513003

METHOD BLANK: 1589995 | Matrix: Water
Associated Lab Samples: 92271513001, 92271513002, 92271513003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	10/24/15 08:47	

LABORATORY CONTROL SAMPLE: 1589996

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.4	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1589997 1589998

Parameter	Units	92272049001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.054	2.5	2.5	2.3	2.3	88	88	75-125	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1589999 1590000

Parameter	Units	92271578009 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	ND	2.5	2.5	2.4	2.4	94	95	75-125	1	10	

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QUALITY CONTROL DATA

Project: Stones BOD 10/12
Pace Project No.: 92271513

QC Batch: WETA/25037 | Analysis Method: EPA 365.1
QC Batch Method: EPA 365.1 | Analysis Description: 365.1 Phosphorus, Total
Associated Lab Samples: 92271513001, 92271513002, 92271513003

METHOD BLANK: 1586571 | Matrix: Water
Associated Lab Samples: 92271513001, 92271513002, 92271513003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	10/21/15 05:44	

LABORATORY CONTROL SAMPLE: 1586572

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	2.5	2.4	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1586573 1586574

Parameter	Units	92272242001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	262	2.5	2.5	260	260	-56	-61	90-110	0	10	M6

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1586575 1586576

Parameter	Units	92271582001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	11.4	2.5	2.5	13.8	14.1	94	107	90-110	2	10	

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QUALITY CONTROL DATA

Project: Stones BOD 10/12
Pace Project No.: 92271513

QC Batch: WETA/24952 | Analysis Method: SM 4500-P E
QC Batch Method: SM 4500-P E | Analysis Description: SM4500P-E Phosphorus, Ortho
Associated Lab Samples: 92271513001, 92271513002, 92271513003

METHOD BLANK: 1581807 | Matrix: Water
Associated Lab Samples: 92271513001, 92271513002, 92271513003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Orthophosphate as P	mg/L	ND	0.050	10/13/15 17:30	

LABORATORY CONTROL SAMPLE: 1581808

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Orthophosphate as P	mg/L	.25	0.25	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1581809 1581810

Parameter	Units	92271513001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Orthophosphate as P	mg/L	0.61	1.2	1.2	1.8	1.8	98	98	90-110	0	10	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: Stones BOD 10/12
Pace Project No.: 92271513

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville

ANALYTE QUALIFIERS

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Stones BOD 10/12
Pace Project No.: 92271513

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92271513001	**WFSRDown-08**	EPA 350.1	WETA/24985		
92271513002	**WFSRUP-08**	EPA 350.1	WETA/24985		
92271513003	**WFSREff-08**	EPA 350.1	WETA/24985		
92271513001	**WFSRDown-08**	EPA 351.2	WETA/25053		
92271513002	**WFSRUP-08**	EPA 351.2	WETA/25053		
92271513003	**WFSREff-08**	EPA 351.2	WETA/25053		
92271513001	**WFSRDown-08**	EPA 353.2	WETA/25095		
92271513002	**WFSRUP-08**	EPA 353.2	WETA/25095		
92271513003	**WFSREff-08**	EPA 353.2	WETA/25095		
92271513001	**WFSRDown-08**	EPA 365.1	WETA/25037		
92271513002	**WFSRUP-08**	EPA 365.1	WETA/25037		
92271513003	**WFSREff-08**	EPA 365.1	WETA/25037		
92271513001	**WFSRDown-08**	SM 4500-P E	WETA/24952		
92271513002	**WFSRUP-08**	SM 4500-P E	WETA/24952		
92271513003	**WFSREff-08**	SM 4500-P E	WETA/24952		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

Section A Required Client Information:

Company:	AquAeTer, Inc.
Address:	215 Jamestown Park Ste 100
	Brentwood, TN 37027
Email To:	jmcorn@aquaeter.com
Phone: 615-373-8532	Fax: 615-373-8512
Requested Due Date/TAT:	

Section B Required Project Information:

Report To:	John Michael Corn
Copy To:	
Purchase Order No.:	152384
Project Name:	Stones BOD
Project Number:	152384

Section C Invoice Information:

Attention:	Cindy Corn
Company Name:	AquAeTer, Inc.
Address:	See client information
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY: ☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: TN

Section D Required Client Information

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED Composite Start DATE	COLLECTED Composite Start TIME	COLLECTED Composite End/Grab DATE	COLLECTED Composite End/Grab TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	Orthophosphate	$NO_3 + NO_2$, TP, Ammonia	TKN	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	WFSRDown - 08	WT	G	10/12/15	1220				2	1	1							N	1	1	1		92371513-001
2	WFSRUp-08	WT	G	10/12/15	1235				2	1	1							N	1	1	1		002
3	WFSREFF-08	WT	G	10/12/15	1243				2	1	1							N	1	1	1		003
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
* Use lowest detection limits possible *				[illegible]	10/13/15	1036	3.3	Y	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: JERROD MANNING

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 10/12/15

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Pace Analytical® www.pacelabs.com	Document Name: **Sample Condition Upon Receipt (SCUR)**	Document Revised: May 15, 2015 Page 1 of 2*
	Document No.: F-ASV-CS-003-rev.14	Issuing Authorities: Pace Asheville Quality Office

Client Name: AquaTer

* Page 2 of 2 is for Internal Use Only

Courier (Circle): Fed Ex UPS USPS Client Commercial Pace Other_____

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☑ yes ☐ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other_____

Thermometer Used: IR Gun#3 -130265963 **Type of Ice:** Wet Blue None ☑ Samples on ice, cooling process has begun

IR Gun #4 SN:140290365 Other:_____

Temp Correction Factor: Add / Subtract 0 C

Corrected Cooler Temp.: 3.3 C **Biological Tissue is Frozen:** Yes No N/A **Date and Initials of person examining contents:** 10/13 MD

Temp should be above freezing to 6°C

		Comments:
Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☑Yes ☐No ☐N/A	6. Ortho Phosphate
Rush Turn Around Time Requested:	☐Yes ☑No ☐N/A	7.
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9.
-Pace Containers Used:	☑Yes ☐No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC:	☑Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: WT		
All containers needing preservation have been checked.	☑Yes ☐No ☐N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☑Yes ☐No ☐N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes ☑No	
Samples checked for dechlorination:	☑Yes ☐No ☐N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☑N/A	15.
Trip Blank Present:	☐Yes ☐No ☑N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased):_____		

Field Data Required? Y / N

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

SCURF Review: [signature] **Date:** 10/13/15

SRF Review: [signature] **Date:** 10/13/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

WO# : 92271513

92271513

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

October 23, 2015

Mr. John Michael Corn, P.E.
Aquaeter
215 Jamestown Park
Suite 100
Brentwood, TN 37027

RE: Project: Stones BOD 10/8
Pace Project No.: 92271226

Dear Mr. Corn, P.E.:
Enclosed are the analytical results for sample(s) received by the laboratory on October 09, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Chris Derouen
christopher.derouen@pacelabs.com
Project Manager

Enclosures

cc: Katie Lopez, Aquaeter
Kelley Spence, Aquaeter
Rachel Stribling, Aquaeter

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CERTIFICATIONS

Project: Stones BOD 10/8
Pace Project No.: 92271226

Asheville Certification IDs
2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
West Virginia Certification #: 356
Virginia/VELAP Certification #: 460222

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SAMPLE SUMMARY

Project: Stones BOD 10/8
Pace Project No.: 92271226

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92271226001	**WFSRDOWN-09**	Water	10/08/15 14:08	10/09/15 10:15
92271226002	**WFSREFF-09**	Water	10/08/15 14:14	10/09/15 10:15
92271226003	**WFSRUP-09**	Water	10/08/15 14:22	10/09/15 10:15
92271226004	**WFSRUP-09-DUP**	Water	10/08/15 14:28	10/09/15 10:15

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SAMPLE ANALYTE COUNT

Project: Stones BOD 10/8
Pace Project No.: 92271226

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92271226001	**WFSRDOWN-09**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	SER	1	PASI-A
		EPA 365.1	SER	1	PASI-A
		SM 4500-P E	DMN	1	PASI-A
92271226002	**WFSREFF-09**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	SER	1	PASI-A
		EPA 365.1	SER	1	PASI-A
		SM 4500-P E	DMN	1	PASI-A
92271226003	**WFSRUP-09**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	SER	1	PASI-A
		EPA 365.1	SER	1	PASI-A
		SM 4500-P E	DMN	1	PASI-A
92271226004	**WFSRUP-09-DUP**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	SER	1	PASI-A
		EPA 365.1	SER	1	PASI-A
		SM 4500-P E	DMN	1	PASI-A

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ANALYTICAL RESULTS

Project: Stones BOD 10/8
Pace Project No.: 92271226

Sample: WFSRDOWN-09 **Lab ID: 92271226001** Collected: 10/08/15 14:08 Received: 10/09/15 10:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.10**	mg/L	0.010	1		10/15/15 14:30	7664-41-7	M1
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		10/22/15 06:00	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.41**	mg/L	0.020	1		10/15/15 08:23		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**1.4**	mg/L	0.050	1		10/21/15 04:41	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**0.15**	mg/L	0.050	1		10/09/15 20:00		

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ANALYTICAL RESULTS

Project: Stones BOD 10/8
Pace Project No.: 92271226

Sample: WFSREFF-09 **Lab ID: 92271226002** Collected: 10/08/15 14:14 Received: 10/09/15 10:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.18**	mg/L	0.010	1		10/15/15 14:30	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	**0.88**	mg/L	0.50	1		10/22/15 06:01	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**1.1**	mg/L	0.020	1		10/15/15 08:24		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**4.3**	mg/L	0.050	1		10/21/15 04:42	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**0.44**	mg/L	0.050	1		10/09/15 20:00		

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ANALYTICAL RESULTS

Project: Stones BOD 10/8
Pace Project No.: 92271226

Sample: WFSRUP-09 **Lab ID: 92271226003** Collected: 10/08/15 14:22 Received: 10/09/15 10:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.18**	mg/L	0.010	1		10/15/15 14:30	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		10/22/15 06:02	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.13**	mg/L	0.020	1		10/15/15 08:25		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**0.079**	mg/L	0.050	1		10/21/15 04:42	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**0.081**	mg/L	0.050	1		10/09/15 20:00		

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ANALYTICAL RESULTS

Project: Stones BOD 10/8
Pace Project No.: 92271226

Sample: WFSRUP-09-DUP **Lab ID: 92271226004** Collected: 10/08/15 14:28 Received: 10/09/15 10:15 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.15**	mg/L	0.010	1		10/15/15 14:30	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		10/22/15 06:05	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.13**	mg/L	0.020	1		10/15/15 08:26		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**0.068**	mg/L	0.050	1		10/21/15 04:43	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**0.085**	mg/L	0.050	1		10/09/15 20:00		

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QUALITY CONTROL DATA

Project: Stones BOD 10/8
Pace Project No.: 92271226

QC Batch: WETA/24985 | Analysis Method: EPA 350.1
QC Batch Method: EPA 350.1 | Analysis Description: 350.1 Ammonia, Low Level
Associated Lab Samples: 92271226001, 92271226002, 92271226003, 92271226004

METHOD BLANK: 1583714 | Matrix: Water
Associated Lab Samples: 92271226001, 92271226002, 92271226003, 92271226004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.010	10/15/15 14:30	

LABORATORY CONTROL SAMPLE: 1583715

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	1	1.0	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1583716 1583717

Parameter	Units	92271226001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	0.10	1	1	0.42	0.43	31	32	90-110	2	10	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1583718 1583719

Parameter	Units	92271952013 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	0.28	1	1	0.37	0.38	10	10	90-110	2	10	M1

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QUALITY CONTROL DATA

Project: Stones BOD 10/8
Pace Project No.: 92271226

QC Batch: WETA/25050 Analysis Method: EPA 351.2
QC Batch Method: EPA 351.2 Analysis Description: 351.2 TKN
Associated Lab Samples: 92271226001, 92271226002, 92271226003, 92271226004

METHOD BLANK: 1587311 Matrix: Water
Associated Lab Samples: 92271226001, 92271226002, 92271226003, 92271226004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	ND	0.50	10/22/15 05:46	

LABORATORY CONTROL SAMPLE: 1587312

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	10	9.5	95	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1587313 1587314

Parameter	Units	92272205001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	4.3	10	10	13.0	14.7	86	104	90-110	12	10	M1,R1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1587315 1587316

Parameter	Units	92271226003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	ND	10	10	9.9	9.5	99	95	90-110	4	10	

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QUALITY CONTROL DATA

Project: Stones BOD 10/8
Pace Project No.: 92271226

QC Batch: WETA/24971 Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 92271226001, 92271226002, 92271226003, 92271226004

METHOD BLANK: 1582342 Matrix: Water
Associated Lab Samples: 92271226001, 92271226002, 92271226003, 92271226004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	10/15/15 08:07	

LABORATORY CONTROL SAMPLE: 1582343

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.3	94	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1582344 1582345

Parameter	Units	92271154002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	<0.020	2.5	2.5	2.2	2.2	90	89	75-125	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1582346 1582347

Parameter	Units	92271319010 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	ND	2.5	2.5	2.2	2.2	87	87	75-125	0	10	

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QUALITY CONTROL DATA

Project: Stones BOD 10/8
Pace Project No.: 92271226

QC Batch: WETA/25022 Analysis Method: EPA 365.1
QC Batch Method: EPA 365.1 Analysis Description: 365.1 Phosphorus, Total
Associated Lab Samples: 92271226001, 92271226002, 92271226003, 92271226004

METHOD BLANK: 1586193 Matrix: Water
Associated Lab Samples: 92271226001, 92271226002, 92271226003, 92271226004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	10/21/15 04:23	

LABORATORY CONTROL SAMPLE: 1586194

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	2.5	2.5	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1586195 1586196

Parameter	Units	92271804005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	3.4	2.5	2.5	5.8	5.8	98	97	90-110	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1586197 1586198

Parameter	Units	92272013004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	0.070	2.5	2.5	2.4	2.5	95	96	90-110	2	10	

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QUALITY CONTROL DATA

Project: Stones BOD 10/8
Pace Project No.: 92271226

QC Batch: WETA/24906 | Analysis Method: SM 4500-P E
QC Batch Method: SM 4500-P E | Analysis Description: SM4500P-E Phosphorus, Ortho
Associated Lab Samples: 92271226001, 92271226002, 92271226003, 92271226004

METHOD BLANK: 1579940 | Matrix: Water
Associated Lab Samples: 92271226001, 92271226002, 92271226003, 92271226004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Orthophosphate as P	mg/L	ND	0.050	10/09/15 20:00	

LABORATORY CONTROL SAMPLE: 1579941

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Orthophosphate as P	mg/L	.25	0.25	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1579942 1579943

Parameter	Units	92271026001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Orthophosphate as P	mg/L	0.030J	.25	.25	0.27	0.27	96	95	90-110	0	10	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: Stones BOD 10/8
Pace Project No.: 92271226

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville

ANALYTE QUALIFIERS

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
R1	RPD value was outside control limits.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Stones BOD 10/8
Pace Project No.: 92271226

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92271226001	**WFSRDOWN-09**	EPA 350.1	WETA/24985		
92271226002	**WFSREFF-09**	EPA 350.1	WETA/24985		
92271226003	**WFSRUP-09**	EPA 350.1	WETA/24985		
92271226004	**WFSRUP-09-DUP**	EPA 350.1	WETA/24985		
92271226001	**WFSRDOWN-09**	EPA 351.2	WETA/25050		
92271226002	**WFSREFF-09**	EPA 351.2	WETA/25050		
92271226003	**WFSRUP-09**	EPA 351.2	WETA/25050		
92271226004	**WFSRUP-09-DUP**	EPA 351.2	WETA/25050		
92271226001	**WFSRDOWN-09**	EPA 353.2	WETA/24971		
92271226002	**WFSREFF-09**	EPA 353.2	WETA/24971		
92271226003	**WFSRUP-09**	EPA 353.2	WETA/24971		
92271226004	**WFSRUP-09-DUP**	EPA 353.2	WETA/24971		
92271226001	**WFSRDOWN-09**	EPA 365.1	WETA/25022		
92271226002	**WFSREFF-09**	EPA 365.1	WETA/25022		
92271226003	**WFSRUP-09**	EPA 365.1	WETA/25022		
92271226004	**WFSRUP-09-DUP**	EPA 365.1	WETA/25022		
92271226001	**WFSRDOWN-09**	SM 4500-P E	WETA/24906		
92271226002	**WFSREFF-09**	SM 4500-P E	WETA/24906		
92271226003	**WFSRUP-09**	SM 4500-P E	WETA/24906		
92271226004	**WFSRUP-09-DUP**	SM 4500-P E	WETA/24906		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

Section A Required Client Information:

Company:	AquAeTer, Inc.
Address:	215 Jamestown Park Ste 100
	Brentwood, TN 37027
Email To:	jmcorn@aquaeter.com
Phone: 615-373-8532	Fax: 615-373-8512
Requested Due Date/TAT:	

Section B Required Project Information:

Report To:	John Michael Corn
Copy To:	
Purchase Order No.:	152384
Project Name:	Stones BOD
Project Number:	152384

Section C Invoice Information:

Attention:	Cindy Corn
Company Name:	AquAeTer, Inc.
Address:	See client information
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY: ☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: TN

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N): Y/N

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED Composite Start DATE	COLLECTED Composite Start TIME	COLLECTED Composite End/Grab DATE	COLLECTED Composite End/Grab TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test: Orthophosphate	$NO_3 + NO_2$, TP, Ammonia	TKN	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	WFSRDOWN-09	WT	G	10/8/15	1408				2	1	1							1	1	1		92271226-001
2	WFSREFF-09	WT	G	10/8/15	1414				2	1	1							1	1	1		002
3	WFSRUP-09	WT	G	10/8/15	1422				2	1	1							1	1	1		003
4	WFSRUP-09-DUP	WT	G	10/8/15	1428																	
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
* Use lowest detection limits possible				Mark Stevens AVL	10/9/15	1015	2.8	Y	N	Y

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Rachel A. Stribling

SIGNATURE of SAMPLER: Rachel A. Stribling

DATE Signed (MM/DD/YY): 10/08/15

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Pace Analytical® www.pacelabs.com	Document Name: **Sample Condition Upon Receipt (SCUR)**	Document Revised: May 15, 2015 Page 1 of 2*
	Document No.: F-ASV-CS-003-rev.14	Issuing Authorities: Pace Asheville Quality Office

Client Name: AquAeter

* Page 2 of 2 is for Internal Use Only

Courier (Circle): Fed Ex UPS USPS Client Commercial Pace Other_____

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☑ yes ☐ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other_____

Thermometer Used: IR Gun#3 -130265963 **Type of Ice:** Wet Blue None ☑ Samples on ice, cooling process has begun

IR Gun #4 SN:140290365 Other:_____

Temp Correction Factor: Add / Subtract 0 C

Corrected Cooler Temp.: 2.8 C **Biological Tissue is Frozen:** Yes No N/A

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 10/4 MX

Comments:

Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☑Yes ☐No ☐N/A	6. Orthophosate
Rush Turn Around Time Requested:	☐Yes ☑No ☐N/A	7.
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9.
-Pace Containers Used:	☑Yes ☐No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC:	☑Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: WT		
All containers needing preservation have been checked.	☑Yes ☐No ☐N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☑Yes ☐No ☐N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes ☑No	
Samples checked for dechlorination:	☐Yes ☐No ☑N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☑N/A	15.
Trip Blank Present:	☐Yes ☐No ☑N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased):_____		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

SCURF Review:	[illegible]	**Date:**	10/9/15
SRF Review:	[illegible]	**Date:**	10/9/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

WO#: 92271226

92271226

Pace Analytical Services, Inc.
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Huntersville, NC 28078
(704)875-9092

October 20, 2015

Mr. John Michael Corn, P.E.
Aquaeter
215 Jamestown Park
Suite 100
Brentwood, TN 37027

RE: Project: Stones BOD 152384
Pace Project No.: 92270233

Dear Mr. Corn, P.E.:
Enclosed are the analytical results for sample(s) received by the laboratory on October 02, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Chris Derouen
christopher.derouen@pacelabs.com
Project Manager

Enclosures

cc: Katie Lopez, Aquaeter
Kelley Spence, Aquaeter
Rachel Stribling, Aquaeter

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CERTIFICATIONS

Project: Stones BOD 152384
Pace Project No.: 92270233

Asheville Certification IDs
2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
West Virginia Certification #: 356
Virginia/VELAP Certification #: 460222

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SAMPLE SUMMARY

Project: Stones BOD 152384
Pace Project No.: 92270233

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92270233001	**WFSRDOWN-09**	Water	10/01/15 11:00	10/02/15 10:50
92270233002	**WFSREff-09**	Water	10/01/15 11:15	10/02/15 10:50
92270233003	**WFSRUP-09**	Water	10/01/15 11:25	10/02/15 10:50
92270233004	**WFSRUP-09-DUP**	Water	10/01/15 11:30	10/02/15 10:50

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SAMPLE ANALYTE COUNT

Project: Stones BOD 152384
Pace Project No.: 92270233

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92270233001	**WFSRDOWN-09**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	AES2	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	AES2	1	PASI-A
		SM 4500-P E	DMN	1	PASI-A
92270233002	**WFSREff-09**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	AES2	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	AES2	1	PASI-A
		SM 4500-P E	DMN	1	PASI-A
92270233003	**WFSRUP-09**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	AES2	1	PASI-A
		EPA 353.2	SER	1	PASI-A
		EPA 365.1	AES2	1	PASI-A
		SM 4500-P E	DMN	1	PASI-A
92270233004	**WFSRUP-09-DUP**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	AES2	1	PASI-A
		EPA 353.2	SER	1	PASI-A
		EPA 365.1	AES2	1	PASI-A
		SM 4500-P E	DMN	1	PASI-A

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ANALYTICAL RESULTS

Project: Stones BOD 152384
Pace Project No.: 92270233

Sample: WFSRDOWN-09 **Lab ID: 92270233001** Collected: 10/01/15 11:00 Received: 10/02/15 10:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.16**	mg/L	0.010	1		10/15/15 14:30	7664-41-7	M1
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		10/10/15 14:46	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.39**	mg/L	0.020	1		10/08/15 15:10		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**1.5**	mg/L	0.050	1		10/09/15 10:28	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**1.6**	mg/L	0.50	10		10/02/15 21:45		

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ANALYTICAL RESULTS

Project: Stones BOD 152384
Pace Project No.: 92270233

Sample: WFSREff-09 **Lab ID: 92270233002** Collected: 10/01/15 11:15 Received: 10/02/15 10:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.19**	mg/L	0.010	1		10/15/15 14:30	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	**0.94**	mg/L	0.50	1		10/10/15 14:47	7727-37-9	M1
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**1.1**	mg/L	0.020	1		10/08/15 15:11		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**4.5**	mg/L	0.050	1		10/09/15 10:29	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**4.4**	mg/L	0.50	10		10/02/15 21:45		

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ANALYTICAL RESULTS

Project: Stones BOD 152384
Pace Project No.: 92270233

Sample: WFSRUP-09 **Lab ID: 92270233003** Collected: 10/01/15 11:25 Received: 10/02/15 10:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.15**	mg/L	0.010	1		10/15/15 14:30	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		10/10/15 14:50	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.12**	mg/L	0.020	1		10/14/15 04:49		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**0.066**	mg/L	0.050	1		10/09/15 10:29	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**0.077**	mg/L	0.050	1		10/02/15 21:45		

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ANALYTICAL RESULTS

Project: Stones BOD 152384
Pace Project No.: 92270233

Sample: WFSRUP-09-DUP **Lab ID: 92270233004** Collected: 10/01/15 11:30 Received: 10/02/15 10:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.13**	mg/L	0.010	1		10/15/15 14:30	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		10/10/15 14:51	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.11**	mg/L	0.020	1		10/14/15 04:50		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**0.064**	mg/L	0.050	1		10/09/15 10:30	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**0.067**	mg/L	0.050	1		10/02/15 21:45		

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QUALITY CONTROL DATA

Project: Stones BOD 152384
Pace Project No.: 92270233

QC Batch: WETA/24984 — Analysis Method: EPA 350.1
QC Batch Method: EPA 350.1 — Analysis Description: 350.1 Ammonia, Low Level
Associated Lab Samples: 92270233001, 92270233002, 92270233003, 92270233004

METHOD BLANK: 1583708 — Matrix: Water
Associated Lab Samples: 92270233001, 92270233002, 92270233003, 92270233004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.010	10/15/15 14:30	

LABORATORY CONTROL SAMPLE: 1583709

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	1	0.95	95	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1583710 1583711

Parameter	Units	92270233001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	0.16	1	1	0.40	0.39	24	23	90-110	3	10	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1583712 1583713

Parameter	Units	92271180001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	0.17	1	1	0.39	0.39	22	22	90-110	1	10	M1

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QUALITY CONTROL DATA

Project: Stones BOD 152384
Pace Project No.: 92270233

QC Batch: WETA/24885 Analysis Method: EPA 351.2
QC Batch Method: EPA 351.2 Analysis Description: 351.2 TKN
Associated Lab Samples: 92270233001, 92270233002, 92270233003, 92270233004

METHOD BLANK: 1577359 Matrix: Water
Associated Lab Samples: 92270233001, 92270233002, 92270233003, 92270233004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	ND	0.50	10/10/15 13:57	

LABORATORY CONTROL SAMPLE: 1577360

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	10	10.4	104	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1577361 1577362

Parameter	Units	92270162001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	ND	10	10	10	10.3	97	101	90-110	3	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1577363 1577364

Parameter	Units	92270233002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	0.94	10	10	13.0	13.9	120	130	90-110	7	10	M1

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QUALITY CONTROL DATA

Project: Stones BOD 152384
Pace Project No.: 92270233

QC Batch: WETA/24863 | Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 | Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 92270233001, 92270233002

METHOD BLANK: 1576477 | Matrix: Water
Associated Lab Samples: 92270233001, 92270233002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	10/08/15 14:37	

LABORATORY CONTROL SAMPLE: 1576478

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.5	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1576479 1576480

Parameter	Units	92269873001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.035	2.5	2.5	2.4	2.4	93	93	75-125	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1576481 1576482

Parameter	Units	92270458001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.022	2.5	2.5	2.2	2.2	88	88	75-125	0	10	

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QUALITY CONTROL DATA

Project: Stones BOD 152384
Pace Project No.: 92270233

QC Batch: WETA/24958 | Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 | Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 92270233003, 92270233004

METHOD BLANK: 1582005 | Matrix: Water
Associated Lab Samples: 92270233003, 92270233004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	10/14/15 04:38	

LABORATORY CONTROL SAMPLE: 1582006

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.5	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1582007 1582008

Parameter	Units	92271002001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	10.7	2.5	2.5	13.5	13.4	115	111	75-125	1	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1582009 1582010

Parameter	Units	92270324002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.030	2.5	2.5	2.4	2.4	96	95	75-125	1	10	

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QUALITY CONTROL DATA

Project: Stones BOD 152384
Pace Project No.: 92270233

QC Batch: WETA/24839 Analysis Method: EPA 365.1
QC Batch Method: EPA 365.1 Analysis Description: 365.1 Phosphorus, Total
Associated Lab Samples: 92270233001, 92270233002, 92270233003, 92270233004

METHOD BLANK: 1575794 Matrix: Water
Associated Lab Samples: 92270233001, 92270233002, 92270233003, 92270233004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	10/09/15 10:19	

LABORATORY CONTROL SAMPLE: 1575795

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	2.5	2.7	109	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1575796 1575797

Parameter	Units	92269885001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	246 ug/L	2.5	2.5	2.9	2.9	107	107	90-110	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1575798 1575799

Parameter	Units	92270233004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	0.064	2.5	2.5	2.8	2.8	108	109	90-110	2	10	

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QUALITY CONTROL DATA

Project: Stones BOD 152384
Pace Project No.: 92270233

QC Batch: WETA/24801 | Analysis Method: SM 4500-P E
QC Batch Method: SM 4500-P E | Analysis Description: SM4500P-E Phosphorus, Ortho
Associated Lab Samples: 92270233001, 92270233002, 92270233003, 92270233004

METHOD BLANK: 1574075 | Matrix: Water
Associated Lab Samples: 92270233001, 92270233002, 92270233003, 92270233004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Orthophosphate as P	mg/L	ND	0.050	10/02/15 21:45	

LABORATORY CONTROL SAMPLE: 1574076

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Orthophosphate as P	mg/L	.25	0.25	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1574077 1574078

Parameter	Units	92270233001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Orthophosphate as P	mg/L	1.6	2.5	2.5	4.0	4.0	95	95	90-110	0	10	

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QUALIFIERS

Project: Stones BOD 152384
Pace Project No.: 92270233

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville

ANALYTE QUALIFIERS

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Stones BOD 152384
Pace Project No.: 92270233

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92270233001	**WFSRDOWN-09**	EPA 350.1	WETA/24984		
92270233002	**WFSREff-09**	EPA 350.1	WETA/24984		
92270233003	**WFSRUP-09**	EPA 350.1	WETA/24984		
92270233004	**WFSRUP-09-DUP**	EPA 350.1	WETA/24984		
92270233001	**WFSRDOWN-09**	EPA 351.2	WETA/24885		
92270233002	**WFSREff-09**	EPA 351.2	WETA/24885		
92270233003	**WFSRUP-09**	EPA 351.2	WETA/24885		
92270233004	**WFSRUP-09-DUP**	EPA 351.2	WETA/24885		
92270233001	**WFSRDOWN-09**	EPA 353.2	WETA/24863		
92270233002	**WFSREff-09**	EPA 353.2	WETA/24863		
92270233003	**WFSRUP-09**	EPA 353.2	WETA/24958		
92270233004	**WFSRUP-09-DUP**	EPA 353.2	WETA/24958		
92270233001	**WFSRDOWN-09**	EPA 365.1	WETA/24839		
92270233002	**WFSREff-09**	EPA 365.1	WETA/24839		
92270233003	**WFSRUP-09**	EPA 365.1	WETA/24839		
92270233004	**WFSRUP-09-DUP**	EPA 365.1	WETA/24839		
92270233001	**WFSRDOWN-09**	SM 4500-P E	WETA/24801		
92270233002	**WFSREff-09**	SM 4500-P E	WETA/24801		
92270233003	**WFSRUP-09**	SM 4500-P E	WETA/24801		
92270233004	**WFSRUP-09-DUP**	SM 4500-P E	WETA/24801		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

Section A Required Client Information:

Company: AquAeTer, Inc.
Address: 215 Jamestown Park Ste 100, Brentwood, TN 37027
Email To: jmcorn@aquaeter.com
Phone: 615-373-8532 Fax: 615-373-8512
Requested Due Date/TAT: ASAP

Section B Required Project Information:

Report To: John Michael Corn
Copy To:
Purchase Order No.: 152384
Project Name: Stones BOD
Project Number: 152384

Section C Invoice Information:

Attention: Cindy Corn
Company Name: AquAeTer, Inc.
Address: See client information
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: TN

Section D Required Client Information

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

Requested Analysis Filtered (Y/N): Orthophosphate N; $NO_3 + NO_2$, TP, Ammonia N; TKN N; N; N; N; N; N

ITEM #	SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED Composite Start DATE	Composite Start TIME	Composite End/Grab DATE	Composite End/Grab TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Orthophosphate	$NO_3 + NO_2$, TP, Ammonia	TKN	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	WFSRDOWN-09	WT	G			10/1/15	1100		2	1	1							1	1	1		92270233-
2	WFSREFF-09	WT	G			10/1/15	1115		2	1	1							1	1	1		922702330002
3	WFSRUP-09	WT	G			10/1/15	1125		2	1	1							1	1	1		003
4	WFSRUP-09-DUP	WT	G			10/1/15	1130		2	1	1							1	1	1		004
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
☆Use lowest detection limits possible☆	Katie Lopez/AAT	10/1/15	1135	Ruth Dave Tomb	10/2/15	~~11:32~~ 10:50	4.3	Y	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Katie Lopez
SIGNATURE of SAMPLER: Katie Lopez
DATE Signed (MM/DD/YY): 10/01/15

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Pace Analytical® www.pacelabs.com	Document Name: **Sample Condition Upon Receipt (SCUR)**	Document Revised: May 15, 2015 Page 1 of 2*
	Document No.: F-ASV-CS-003-rev.14	Issuing Authorities: Pace Asheville Quality Office

Client Name: Aquaeter

* Page 2 of 2 is for Internal Use Only

Courier (Circle): Fed Ex UPS USPS Client Commercial Pace Other_____

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other_____

Thermometer Used: IR Gun#3 -130265963 **Type of Ice:** Wet Blue None ☑ Samples on ice, cooling process has begun

IR Gun #4 SN:140290365 Other:_____

Temp Correction Factor: Add / Subtract 0.0 C

Corrected Cooler Temp.: 4.3 C **Biological Tissue is Frozen:** Yes No N/A

Temp should be above freezing to 6°C

Date and Initials of person examining contents: KDB 10/2/15

		Comments:
Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☑Yes ☐No ☐N/A	6. orthophos
Rush Turn Around Time Requested:	☐Yes ☑No ☐N/A	7.
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9.
-Pace Containers Used:	☑Yes ☐No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC:	☑Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: WW		
All containers needing preservation have been checked.	☑Yes ☐No ☐N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☑Yes ☐No ☐N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes ☑No	
Samples checked for dechlorination:	☑Yes ☐No ☐N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☑N/A	15.
Trip Blank Present:	☐Yes ☐No ☑N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased):_____		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

SCURF Review: [signature] Date: 10/2/15

SRF Review: [signature] Date: 10/2/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

WO#: 92270233

92270233

Pace Analytical Services, Inc.
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(704)875-9092

September 29, 2015

Mr. John Michael Corn, P.E.
Aquaeter
215 Jamestown Park
Suite 100
Brentwood, TN 37027

RE: Project: Stones BOD 152384 9/16
Pace Project No.: 92268033

Dear Mr. Corn, P.E.:
Enclosed are the analytical results for sample(s) received by the laboratory on September 17, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Chris Derouen
christopher.derouen@pacelabs.com
Project Manager

Enclosures

cc: Katie Lopez, Aquaeter
Kelley Spence, Aquaeter
Rachel Stribling, Aquaeter

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CERTIFICATIONS

Project: Stones BOD 152384 9/16
Pace Project No.: 92268033

Asheville Certification IDs
2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
West Virginia Certification #: 356
Virginia/VELAP Certification #: 460222

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SAMPLE SUMMARY

Project: Stones BOD 152384 9/16
Pace Project No.: 92268033

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92268033001	**WFSRDOWN-08**	Water	09/16/15 12:47	09/17/15 10:20
92268033002	**WFSREFF-08**	Water	09/16/15 12:55	09/17/15 10:20
92268033003	**WFSRUp-08**	Water	09/16/15 13:01	09/17/15 10:20

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SAMPLE ANALYTE COUNT

Project: Stones BOD 152384 9/16
Pace Project No.: 92268033

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92268033001	**WFSRDOWN-08**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	AES2	1	PASI-A
		SM 4500-P E	DMN	1	PASI-A
92268033002	**WFSREFF-08**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	AES2	1	PASI-A
		SM 4500-P E	DMN	1	PASI-A
92268033003	**WFSRUp-08**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	AES2	1	PASI-A
		SM 4500-P E	DMN	1	PASI-A

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ANALYTICAL RESULTS

Project: Stones BOD 152384 9/16
Pace Project No.: 92268033

Sample: WFSRDOWN-08 **Lab ID: 92268033001** Collected: 09/16/15 12:47 Received: 09/17/15 10:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.013**	mg/L	0.010	1		09/23/15 14:15	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	2.5	5		09/29/15 03:20	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**1.1**	mg/L	0.020	1		09/24/15 15:56		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**0.51**	mg/L	0.050	1		09/23/15 12:45	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**0.58**	mg/L	0.10	2		09/18/15 11:00		

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ANALYTICAL RESULTS

Project: Stones BOD 152384 9/16
Pace Project No.: 92268033

Sample: WFSREFF-08 **Lab ID: 92268033002** Collected: 09/16/15 12:55 Received: 09/17/15 10:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.068**	mg/L	0.010	1		09/23/15 14:15	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	**1.0**	mg/L	0.50	1		09/29/15 03:21	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**3.6**	mg/L	0.020	1		09/24/15 15:58		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**5.2**	mg/L	0.10	2		09/23/15 14:48	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**5.5**	mg/L	1.2	25		09/18/15 11:00		

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ANALYTICAL RESULTS

Project: Stones BOD 152384 9/16
Pace Project No.: 92268033

Sample: WFSRUp-08 **Lab ID: 92268033003** Collected: 09/16/15 13:01 Received: 09/17/15 10:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.020**	mg/L	0.010	1		09/23/15 14:15	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		09/29/15 03:23	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.78**	mg/L	0.020	1		09/24/15 15:59		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	ND	mg/L	0.050	1		09/23/15 12:47	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**0.11**	mg/L	0.050	1		09/18/15 11:00		

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QUALITY CONTROL DATA

Project: Stones BOD 152384 9/16
Pace Project No.: 92268033

QC Batch: WETA/24639 — Analysis Method: EPA 350.1
QC Batch Method: EPA 350.1 — Analysis Description: 350.1 Ammonia, Low Level
Associated Lab Samples: 92268033001, 92268033002, 92268033003

METHOD BLANK: 1564539 — Matrix: Water
Associated Lab Samples: 92268033001, 92268033002, 92268033003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.010	09/23/15 14:15	

LABORATORY CONTROL SAMPLE: 1564540

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	1	0.97	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1564541 — 1564542

Parameter	Units	92267512003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	0.011	1	1	0.69	0.68	68	67	90-110	2	10	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1564543 — 1564544

Parameter	Units	92267589001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	0.040	1	1	0.70	0.70	66	66	90-110	0	10	M1

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QUALITY CONTROL DATA

Project: Stones BOD 152384 9/16
Pace Project No.: 92268033

QC Batch: WETA/24703 Analysis Method: EPA 351.2
QC Batch Method: EPA 351.2 Analysis Description: 351.2 TKN
Associated Lab Samples: 92268033001, 92268033002, 92268033003

METHOD BLANK: 1568231 Matrix: Water
Associated Lab Samples: 92268033001, 92268033002, 92268033003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	ND	0.50	09/29/15 03:03	

LABORATORY CONTROL SAMPLE: 1568232

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	10	10.4	104	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1568233 1568234

Parameter	Units	92268806002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	ND	10	10	11.8	11.2	118	112	90-110	5	10	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1568235 1568236

Parameter	Units	92268807001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	ND	10	10	11.6	11.6	111	111	90-110	0	10	M1

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QUALITY CONTROL DATA

Project: Stones BOD 152384 9/16
Pace Project No.: 92268033

QC Batch: WETA/24651 — Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 — Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 92268033001, 92268033002, 92268033003

METHOD BLANK: 1565126 — Matrix: Water
Associated Lab Samples: 92268033001, 92268033002, 92268033003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	09/24/15 15:43	

LABORATORY CONTROL SAMPLE: 1565127

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.5	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1565128 1565129

Parameter	Units	92268806002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.33	2.5	2.5	2.8	2.8	98	98	75-125	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1565130 1565131

Parameter	Units	92268103006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	2.0	2.5	2.5	4.2	4.2	89	89	75-125	0	10	

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QUALITY CONTROL DATA

Project: Stones BOD 152384 9/16
Pace Project No.: 92268033

QC Batch: WETA/24609 — Analysis Method: EPA 365.1
QC Batch Method: EPA 365.1 — Analysis Description: 365.1 Phosphorus, Total
Associated Lab Samples: 92268033001, 92268033002, 92268033003

METHOD BLANK: 1563142 — Matrix: Water
Associated Lab Samples: 92268033001, 92268033002, 92268033003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	09/23/15 12:38	

LABORATORY CONTROL SAMPLE: 1563143

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	2.5	2.6	106	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1563144 1563145

Parameter	Units	92267877001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	4.7	2.5	2.5	6.9	7.2	88	104	90-110	5	10	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1563146 1563147

Parameter	Units	92268103008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	7.6	2.5	2.5	9.7	9.8	85	89	90-110	1	10	M1

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QUALITY CONTROL DATA

Project: Stones BOD 152384 9/16
Pace Project No.: 92268033

QC Batch: WETA/24542 | Analysis Method: SM 4500-P E
QC Batch Method: SM 4500-P E | Analysis Description: SM4500P-E Phosphorus, Ortho
Associated Lab Samples: 92268033001, 92268033002, 92268033003

METHOD BLANK: 1559917 | Matrix: Water
Associated Lab Samples: 92268033001, 92268033002, 92268033003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Orthophosphate as P	mg/L	ND	0.050	09/18/15 11:00	

LABORATORY CONTROL SAMPLE: 1559918

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Orthophosphate as P	mg/L	.25	0.26	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1559919 1559920

Parameter	Units	92268033001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Orthophosphate as P	mg/L	0.58	1.2	1.2	1.9	1.9	103	102	90-110	0	10	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: Stones BOD 152384 9/16
Pace Project No.: 92268033

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville

ANALYTE QUALIFIERS

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Stones BOD 152384 9/16
Pace Project No.: 92268033

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92268033001	**WFSRDOWN-08**	EPA 350.1	WETA/24639		
92268033002	**WFSREFF-08**	EPA 350.1	WETA/24639		
92268033003	**WFSRUp-08**	EPA 350.1	WETA/24639		
92268033001	**WFSRDOWN-08**	EPA 351.2	WETA/24703		
92268033002	**WFSREFF-08**	EPA 351.2	WETA/24703		
92268033003	**WFSRUp-08**	EPA 351.2	WETA/24703		
92268033001	**WFSRDOWN-08**	EPA 353.2	WETA/24651		
92268033002	**WFSREFF-08**	EPA 353.2	WETA/24651		
92268033003	**WFSRUp-08**	EPA 353.2	WETA/24651		
92268033001	**WFSRDOWN-08**	EPA 365.1	WETA/24609		
92268033002	**WFSREFF-08**	EPA 365.1	WETA/24609		
92268033003	**WFSRUp-08**	EPA 365.1	WETA/24609		
92268033001	**WFSRDOWN-08**	SM 4500-P E	WETA/24542		
92268033002	**WFSREFF-08**	SM 4500-P E	WETA/24542		
92268033003	**WFSRUp-08**	SM 4500-P E	WETA/24542		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

Section A Required Client Information:

Company:	AquAeTer, Inc.
Address:	215 Jamestown Park Ste 100
	Brentwood, TN 37027
Email To:	jmcorn@aquaeter.com
Phone: 615-373-8532	Fax: 615-373-8512
Requested Due Date/TAT:	

Section B Required Project Information:

Report To:	John Michael Corn
Copy To:	
Purchase Order No.:	152384
Project Name:	Stones BOD
Project Number:	152384

Section C Invoice Information:

Attention:	Cindy Corn
Company Name:	AquAeTer, Inc.
Address:	See client information
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY: ☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: TN

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	Orthophosphate	$NO_3 + NO_2$, TP, Ammonia	TKN	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	WFSRDOWN-08	WT	G	9/16	1247	9/16/15			2	1	1							1	1	1		92248033-001
2	WFSREFF-08	WT	G	9/16	1255	9/16/15			2	1	1							1	1	1		002
3	WFSR Up-08	WT	G	9/16	1301	9/16/15			2	1	1							1	1	1		003
4																						
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Use lowest detection limits possible				Mitch Stewart AVL	9/17/15	1020	3.6	Y	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Rachel Stribling

SIGNATURE of SAMPLER: Rachel Stribling

DATE Signed (MM/DD/YY): 9/16/15

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Pace Analytical® www.pacelabs.com	Document Name: **Sample Condition Upon Receipt (SCUR)**	Document Revised: May 15, 2015 Page 1 of 2*
	Document No.: F-ASV-CS-003-rev.14	Issuing Authorities: Pace Asheville Quality Office

Client Name: AquAeter

* Page 2 of 2 is for Internal Use Only

Courier (Circle): (Fed Ex) UPS USPS Client Commercial Pace Other_____

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☑ yes ☐ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other_____

Thermometer Used: (IR Gun#3 -130265963) **Type of Ice:** (Wet) Blue None ☑ Samples on ice, cooling process has begun

IR Gun #4 SN:140290365 Other:_____

Temp Correction Factor: Add / Subtract 0 C

Corrected Cooler Temp.: 3.6 C **Biological Tissue is Frozen:** Yes No (N/A)

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 9/17 MS

		Comments:
Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☑Yes ☐No ☐N/A	6. Orthophosphate
Rush Turn Around Time Requested:	☐Yes ☑No ☐N/A	7.
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9.
-Pace Containers Used:	☑Yes ☐No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC:	☑Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: WT		
All containers needing preservation have been checked.	☑Yes ☐No ☐N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☑Yes ☐No ☐N/A	
Exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes ☑No	
Samples checked for dechlorination:	☐Yes ☐No ☑N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☑N/A	15.
Trip Blank Present:	☐Yes ☐No ☑N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Trace Trip Blank Lot # (if purchased):_____		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted:_____ Date/Time:_____

Comments/ Resolution:_____

SCURF Review: [illegible] **Date:** 9/17/15

SRF Review: [illegible] **Date:** 9/17/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Place label here

WO# : 92268033

92268033

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

September 25, 2015

Mr. John Michael Corn, P.E.
Aquaeter
215 Jamestown Park
Suite 100
Brentwood, TN 37027

RE: Project: Stones BOD 152384
Pace Project No.: 92267512

Dear Mr. Corn, P.E.:
Enclosed are the analytical results for sample(s) received by the laboratory on September 15, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Chris Derouen
christopher.derouen@pacelabs.com
Project Manager

Enclosures

cc: Katie Lopez, Aquaeter
Kelley Spence, Aquaeter
Rachel Stribling, Aquaeter

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CERTIFICATIONS

Project: Stones BOD 152384
Pace Project No.: 92267512

Asheville Certification IDs
2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
West Virginia Certification #: 356
Virginia/VELAP Certification #: 460222

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SAMPLE SUMMARY

Project: Stones BOD 152384
Pace Project No.: 92267512

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92267512001	**WESRUP-07**	Water	09/14/15 12:45	09/15/15 10:30
92267512002	**WESREFF-07**	Water	09/14/15 12:36	09/15/15 10:30
92267512003	**WFSDOWN-07**	Water	09/14/15 12:26	09/15/15 10:30

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SAMPLE ANALYTE COUNT

Project: Stones BOD 152384
Pace Project No.: 92267512

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92267512001	**WESRUP-07**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	AES2	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	AES2	1	PASI-A
		SM 4500-P E	WRC	1	PASI-A
92267512002	**WESREFF-07**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	AES2	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	AES2	1	PASI-A
		SM 4500-P E	WRC	1	PASI-A
92267512003	**WFSDOWN-07**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	AES2	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	AES2	1	PASI-A
		SM 4500-P E	WRC	1	PASI-A

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ANALYTICAL RESULTS

Project: Stones BOD 152384
Pace Project No.: 92267512

Sample: WESRUP-07 **Lab ID: 92267512001** Collected: 09/14/15 12:45 Received: 09/15/15 10:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	ND	mg/L	0.010	1		09/21/15 18:50	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		09/24/15 18:57	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.22**	mg/L	0.020	1		09/23/15 14:30		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	ND	mg/L	0.050	1		09/23/15 12:02	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**0.098**	mg/L	0.050	1		09/15/15 16:25		

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ANALYTICAL RESULTS

Project: Stones BOD 152384
Pace Project No.: 92267512

Sample: WESREFF-07 **Lab ID: 92267512002** Collected: 09/14/15 12:36 Received: 09/15/15 10:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.013**	mg/L	0.010	1		09/21/15 18:50	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	**0.66**	mg/L	0.50	1		09/24/15 18:58	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.91**	mg/L	0.020	1		09/23/15 14:31		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**3.3**	mg/L	0.050	1		09/23/15 12:03	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**3.3**	mg/L	0.50	10		09/15/15 16:25		

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ANALYTICAL RESULTS

Project: Stones BOD 152384
Pace Project No.: 92267512

Sample: WFSDOWN-07 **Lab ID: 92267512003** Collected: 09/14/15 12:26 Received: 09/15/15 10:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.011**	mg/L	0.010	1		09/23/15 14:15	7664-41-7	M1
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		09/24/15 18:59	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.45**	mg/L	0.020	1		09/23/15 14:32		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**0.49**	mg/L	0.050	1		09/23/15 12:04	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**0.47**	mg/L	0.050	1		09/15/15 16:25		

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QUALITY CONTROL DATA

Project: Stones BOD 152384
Pace Project No.: 92267512

QC Batch: WETA/24579 | Analysis Method: EPA 350.1
QC Batch Method: EPA 350.1 | Analysis Description: 350.1 Ammonia, Low Level
Associated Lab Samples: 92267512001, 92267512002

METHOD BLANK: 1562419 | Matrix: Water
Associated Lab Samples: 92267512001, 92267512002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.010	09/21/15 18:50	

LABORATORY CONTROL SAMPLE: 1562420

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	1	0.96	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1562421 1562422

Parameter	Units	92266694001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	0.011	1	1	0.75	0.74	74	73	90-110	1	10	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1562423 1562424

Parameter	Units	92266694002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	0.071	1	1	0.75	0.75	68	68	90-110	0	10	M1

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QUALITY CONTROL DATA

Project: Stones BOD 152384
Pace Project No.: 92267512

QC Batch: WETA/24639
QC Batch Method: EPA 350.1
Analysis Method: EPA 350.1
Analysis Description: 350.1 Ammonia, Low Level
Associated Lab Samples: 92267512003

METHOD BLANK: 1564539
Matrix: Water
Associated Lab Samples: 92267512003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.010	09/23/15 14:15	

LABORATORY CONTROL SAMPLE: 1564540

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	1	0.97	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1564541 1564542

Parameter	Units	92267512003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	0.011	1	1	0.69	0.68	68	67	90-110	2	10	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1564543 1564544

Parameter	Units	92267589001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	0.040	1	1	0.70	0.70	66	66	90-110	0	10	M1

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QUALITY CONTROL DATA

Project: Stones BOD 152384
Pace Project No.: 92267512

QC Batch: WETA/24640 Analysis Method: EPA 351.2
QC Batch Method: EPA 351.2 Analysis Description: 351.2 TKN
Associated Lab Samples: 92267512001, 92267512002, 92267512003

METHOD BLANK: 1564604 Matrix: Water
Associated Lab Samples: 92267512001, 92267512002, 92267512003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	ND	0.50	09/24/15 18:36	

LABORATORY CONTROL SAMPLE: 1564605

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	10	10.8	108	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1564606 1564607

Parameter	Units	92268343005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	ND	10	10	10.9	10.8	109	108	90-110	1	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1564608 1564609

Parameter	Units	92268167001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	8.2	10	10	17.4	17.1	92	89	90-110	1	10	M1

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QUALITY CONTROL DATA

Project: Stones BOD 152384
Pace Project No.: 92267512

QC Batch: WETA/24627 | Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 | Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 92267512001, 92267512002, 92267512003

METHOD BLANK: 1563655 | Matrix: Water
Associated Lab Samples: 92267512001, 92267512002, 92267512003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	09/23/15 14:01	

LABORATORY CONTROL SAMPLE: 1563656

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.5	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1563657 1563658

Parameter	Units	92268446001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.15	2.5	2.5	2.4	2.4	90	90	75-125	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1563659 1563660

Parameter	Units	92268453005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	ND	2.5	2.5	2.3	2.3	92	92	75-125	0	10	

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QUALITY CONTROL DATA

Project: Stones BOD 152384
Pace Project No.: 92267512

QC Batch: WETA/24607 Analysis Method: EPA 365.1
QC Batch Method: EPA 365.1 Analysis Description: 365.1 Phosphorus, Total
Associated Lab Samples: 92267512001, 92267512002, 92267512003

METHOD BLANK: 1563125 Matrix: Water
Associated Lab Samples: 92267512001, 92267512002, 92267512003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	09/23/15 11:52	

LABORATORY CONTROL SAMPLE: 1563126

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	2.5	2.6	106	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1563127 1563128

Parameter	Units	92268239007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	0.19	2.5	2.5	2.7	2.7	99	102	90-110	2	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1563129 1563130

Parameter	Units	92267512003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	0.49	2.5	2.5	3.0	3.0	102	102	90-110	0	10	

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QUALITY CONTROL DATA

Project: Stones BOD 152384
Pace Project No.: 92267512

QC Batch: WETA/24494 | Analysis Method: SM 4500-P E
QC Batch Method: SM 4500-P E | Analysis Description: SM4500P-E Phosphorus, Ortho
Associated Lab Samples: 92267512001, 92267512002, 92267512003

METHOD BLANK: 1556795 | Matrix: Water
Associated Lab Samples: 92267512001, 92267512002, 92267512003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Orthophosphate as P	mg/L	ND	0.050	09/15/15 16:25	

LABORATORY CONTROL SAMPLE: 1556796

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Orthophosphate as P	mg/L	.25	0.24	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1556797 1556798

Parameter	Units	92267418001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Orthophosphate as P	mg/L	2.1	6.2	6.2	8.6	8.6	103	103	90-110	0	10	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: Stones BOD 152384
Pace Project No.: 92267512

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville

ANALYTE QUALIFIERS

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Stones BOD 152384
Pace Project No.: 92267512

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92267512001	**WESRUP-07**	EPA 350.1	WETA/24579		
92267512002	**WESREFF-07**	EPA 350.1	WETA/24579		
92267512003	**WFSDOWN-07**	EPA 350.1	WETA/24639		
92267512001	**WESRUP-07**	EPA 351.2	WETA/24640		
92267512002	**WESREFF-07**	EPA 351.2	WETA/24640		
92267512003	**WFSDOWN-07**	EPA 351.2	WETA/24640		
92267512001	**WESRUP-07**	EPA 353.2	WETA/24627		
92267512002	**WESREFF-07**	EPA 353.2	WETA/24627		
92267512003	**WFSDOWN-07**	EPA 353.2	WETA/24627		
92267512001	**WESRUP-07**	EPA 365.1	WETA/24607		
92267512002	**WESREFF-07**	EPA 365.1	WETA/24607		
92267512003	**WFSDOWN-07**	EPA 365.1	WETA/24607		
92267512001	**WESRUP-07**	SM 4500-P E	WETA/24494		
92267512002	**WESREFF-07**	SM 4500-P E	WETA/24494		
92267512003	**WFSDOWN-07**	SM 4500-P E	WETA/24494		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

Section A Required Client Information:

Company:	AquAeTer, Inc.
Address:	215 Jamestown Park Ste 100
	Brentwood, TN 37027
Email To:	jmcorn@aquaeter.com
Phone: 615-373-8532	Fax: 615-373-8512
Requested Due Date/TAT:	ASAP

Section B Required Project Information:

Report To:	John Michael Corn
Copy To:	
Purchase Order No.:	152384
Project Name:	Stones BOD
Project Number:	152384

Section C Invoice Information:

Attention:	Cindy Corn
Company Name:	AquAeTer, Inc.
Address:	See client information
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY: ☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: TN

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N): Orthophosphate, $NO_3 + NO_2$, TP, Ammonia, TKN

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Orthophosphate	$NO_3 + NO_2$	TKN	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	WFSRUP-07	WT	G			9/14/15	1245		2	1	1								1	1	1		92267512-001
2	WFSREF-07	WT	G			9/14/15	1236		2	1	1								1	1	1		002
3	WFSRDOWN-07	WT	G			9/14/15	1226		2	1	1								1	1	1		003
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
☆ Use lowest detection limits possible ☆	Katie Lopez / AAT	9/14/15	1255	[illegible] AVL	9/14/15	1030	4.2	Y	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE: Katie Lopez

PRINT Name of SAMPLER: Katie Lopez

SIGNATURE of SAMPLER: Katie Lopez

DATE Signed (MM/DD/YY): 09/14/15

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Pace Analytical® www.pacelabs.com	Document Name: **Sample Condition Upon Receipt (SCUR)**	Document Revised: May 15, 2015 Page 1 of 2*
	Document No.: F-ASV-CS-003-rev.14	Issuing Authorities: Pace Asheville Quality Office

Client Name: AquAeter

* Page 2 of 2 is for Internal Use Only

Courier (Circle): (Fed Ex) UPS USPS Client Commercial Pace Other_____

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☑ yes ☐ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other_____

Thermometer Used: (IR Gun#3 -130265963) **Type of Ice:** (Wet) Blue None ☑ Samples on ice, cooling process has begun

IR Gun #4 SN:140290365 Other:_____

Temp Correction Factor: Add / Subtract 0 C

Corrected Cooler Temp.: 4.2 C **Biological Tissue is Frozen:** Yes No (N/A) **Date and Initials of person examining contents:** 9/15 MS

Temp should be above freezing to 6°C

		Comments:
Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☑Yes ☐No ☐N/A	6. Orthophosate
Rush Turn Around Time Requested:	☑Yes ☐No ☐N/A	7. ASAP
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9.
-Pace Containers Used:	☑Yes ☐No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC: -Includes date/time/ID/Analysis Matrix: WT	☑Yes ☐No ☐N/A	12.
All containers needing preservation have been checked.	☑Yes ☐No ☐N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☑Yes ☐No ☐N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes ☑No	
Samples checked for dechlorination:	☐Yes ☐No ☑N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☑N/A	15.
Trip Blank Present:	☐Yes ☐No ☑N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased):_____		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

SCURF Review: [illegible] Date: 9/10/15

SRF Review: [illegible] Date: 9/10/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

Place label here

WO#: 92267512

92267512

Pace Analytical Services, Inc.
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September 24, 2015

Mr. John Michael Corn, P.E.
Aquaeter
215 Jamestown Park
Suite 100
Brentwood, TN 37027

RE: Project: Stones BOD 9/8
Pace Project No.: 92266694

Dear Mr. Corn, P.E.:
Enclosed are the analytical results for sample(s) received by the laboratory on September 09, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Chris Derouen
christopher.derouen@pacelabs.com
Project Manager

Enclosures

cc: Katie Lopez, Aquaeter
Kelley Spence, Aquaeter
Rachel Stribling, Aquaeter

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CERTIFICATIONS

Project: Stones BOD 9/8
Pace Project No.: 92266694

Asheville Certification IDs
2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
West Virginia Certification #: 356
Virginia/VELAP Certification #: 460222

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SAMPLE SUMMARY

Project: Stones BOD 9/8
Pace Project No.: 92266694

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92266694001	**WFSRUP-08**	Water	09/08/15 13:08	09/09/15 10:30
92266694002	**WFSREFF-08**	Water	09/08/15 13:04	09/09/15 10:30
92266694003	**WFSRDOWN-08**	Water	09/08/15 12:54	09/09/15 10:30

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SAMPLE ANALYTE COUNT

Project: Stones BOD 9/8
Pace Project No.: 92266694

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92266694001	**WFSRUP-08**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	AES2	1	PASI-A
		SM 4500-P E	WRC	1	PASI-A
92266694002	**WFSREFF-08**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	AES2	1	PASI-A
		SM 4500-P E	WRC	1	PASI-A
92266694003	**WFSRDOWN-08**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	AES2	1	PASI-A
		SM 4500-P E	WRC	1	PASI-A

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ANALYTICAL RESULTS

Project: Stones BOD 9/8
Pace Project No.: 92266694

Sample: WFSRUP-08 **Lab ID: 92266694001** Collected: 09/08/15 13:08 Received: 09/09/15 10:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.011**	mg/L	0.010	1		09/21/15 18:50	7664-41-7	M1
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		09/22/15 04:59	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.75**	mg/L	0.020	1		09/17/15 18:10		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**0.050**	mg/L	0.050	1		09/18/15 14:38	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**0.082**	mg/L	0.050	1		09/09/15 16:15		

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ANALYTICAL RESULTS

Project: Stones BOD 9/8
Pace Project No.: 92266694

Sample: WFSREFF-08 **Lab ID: 92266694002** Collected: 09/08/15 13:04 Received: 09/09/15 10:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.071**	mg/L	0.010	1		09/21/15 18:50	7664-41-7	M1
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	**0.93**	mg/L	0.50	1		09/22/15 05:00	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**3.7**	mg/L	0.020	1		09/17/15 18:11		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**5.1**	mg/L	0.10	2		09/18/15 15:43	7723-14-0	M1
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**6.1**	mg/L	1.2	25		09/09/15 16:15		

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ANALYTICAL RESULTS

Project: Stones BOD 9/8
Pace Project No.: 92266694

Sample: WFSRDOWN-08 **Lab ID: 92266694003** Collected: 09/08/15 12:54 Received: 09/09/15 10:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.012**	mg/L	0.010	1		09/21/15 18:50	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		09/22/15 05:01	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**1.1**	mg/L	0.020	1		09/17/15 18:12		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**0.52**	mg/L	0.050	1		09/18/15 14:44	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**0.61**	mg/L	0.25	5		09/09/15 16:15		M1

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QUALITY CONTROL DATA

Project: Stones BOD 9/8
Pace Project No.: 92266694

QC Batch: WETA/24579 | Analysis Method: EPA 350.1
QC Batch Method: EPA 350.1 | Analysis Description: 350.1 Ammonia, Low Level
Associated Lab Samples: 92266694001, 92266694002, 92266694003

METHOD BLANK: 1562419 | Matrix: Water
Associated Lab Samples: 92266694001, 92266694002, 92266694003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.010	09/21/15 18:50	

LABORATORY CONTROL SAMPLE: 1562420

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	1	0.96	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1562421 1562422

Parameter	Units	92266694001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	0.011	1	1	0.75	0.74	74	73	90-110	1	10	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1562423 1562424

Parameter	Units	92266694002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	0.071	1	1	0.75	0.75	68	68	90-110	0	10	M1

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL DATA

Project: Stones BOD 9/8
Pace Project No.: 92266694

QC Batch: WETA/24546 Analysis Method: EPA 351.2
QC Batch Method: EPA 351.2 Analysis Description: 351.2 TKN
Associated Lab Samples: 92266694001, 92266694002, 92266694003

METHOD BLANK: 1560801 Matrix: Water
Associated Lab Samples: 92266694001, 92266694002, 92266694003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	ND	0.50	09/22/15 04:37	

LABORATORY CONTROL SAMPLE: 1560802

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	10	10.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1560803 1560804

Parameter	Units	92267434001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	22.6	10	10	31.6	34.8	90	122	90-110	10	10	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1560805 1560806

Parameter	Units	92267453001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	590	1000	1000	829	809	24	22	90-110	3	10	M6

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QUALITY CONTROL DATA

Project: Stones BOD 9/8
Pace Project No.: 92266694

QC Batch: WETA/24511 — Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 — Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 92266694001, 92266694002, 92266694003

METHOD BLANK: 1558388 — Matrix: Water
Associated Lab Samples: 92266694001, 92266694002, 92266694003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	09/17/15 17:46	

LABORATORY CONTROL SAMPLE: 1558389

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.7	107	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1558390 — 1558391

Parameter	Units	92267767007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	ND	2.5	2.5	2.4	2.3	94	94	75-125	1	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1558392 — 1558393

Parameter	Units	92267774001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.25	2.5	2.5	2.6	2.6	93	93	75-125	0	10	

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QUALITY CONTROL DATA

Project: Stones BOD 9/8
Pace Project No.: 92266694

QC Batch: WETA/24531
QC Batch Method: EPA 365.1
Analysis Method: EPA 365.1
Analysis Description: 365.1 Phosphorus, Total
Associated Lab Samples: 92266694001

METHOD BLANK: 1559681
Matrix: Water
Associated Lab Samples: 92266694001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	09/18/15 14:17	

LABORATORY CONTROL SAMPLE: 1559682

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	2.5	2.5	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1559683 1559684

Parameter	Units	92267308012 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	0.45	5	5	6.8	7.0	127	131	90-110	3	10	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1559685 1559686

Parameter	Units	92266642001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	1.5	5	5	7.9	7.7	127	124	90-110	2	10	M1

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QUALITY CONTROL DATA

Project: Stones BOD 9/8
Pace Project No.: 92266694

QC Batch: WETA/24532 | Analysis Method: EPA 365.1
QC Batch Method: EPA 365.1 | Analysis Description: 365.1 Phosphorus, Total
Associated Lab Samples: 92266694002, 92266694003

METHOD BLANK: 1559687 | Matrix: Water
Associated Lab Samples: 92266694002, 92266694003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	09/18/15 14:39	

LABORATORY CONTROL SAMPLE: 1559688

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	2.5	2.5	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1559689 1559690

Parameter	Units	92266694002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	5.1	5	5	11.5	11.5	127	128	90-110	1	10	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1559691 1559692

Parameter	Units	92266826005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	0.24	5	5	6.6	6.5	127	125	90-110	2	10	M1

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QUALITY CONTROL DATA

Project: Stones BOD 9/8
Pace Project No.: 92266694

QC Batch: WETA/24420 | Analysis Method: SM 4500-P E
QC Batch Method: SM 4500-P E | Analysis Description: SM4500P-E Phosphorus, Ortho
Associated Lab Samples: 92266694001, 92266694002, 92266694003

METHOD BLANK: 1551951 | Matrix: Water
Associated Lab Samples: 92266694001, 92266694002, 92266694003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Orthophosphate as P	mg/L	ND	0.050	09/09/15 16:15	

LABORATORY CONTROL SAMPLE: 1551952

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Orthophosphate as P	mg/L	.25	0.26	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1551953 1551954

Parameter	Units	92266694003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Orthophosphate as P	mg/L	0.61	1.2	1.2	1.7	1.7	88	88	90-110	0	10	M1

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: Stones BOD 9/8
Pace Project No.: 92266694

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville

ANALYTE QUALIFIERS

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Stones BOD 9/8
Pace Project No.: 92266694

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92266694001	**WFSRUP-08**	EPA 350.1	WETA/24579		
92266694002	**WFSREFF-08**	EPA 350.1	WETA/24579		
92266694003	**WFSRDOWN-08**	EPA 350.1	WETA/24579		
92266694001	**WFSRUP-08**	EPA 351.2	WETA/24546		
92266694002	**WFSREFF-08**	EPA 351.2	WETA/24546		
92266694003	**WFSRDOWN-08**	EPA 351.2	WETA/24546		
92266694001	**WFSRUP-08**	EPA 353.2	WETA/24511		
92266694002	**WFSREFF-08**	EPA 353.2	WETA/24511		
92266694003	**WFSRDOWN-08**	EPA 353.2	WETA/24511		
92266694001	**WFSRUP-08**	EPA 365.1	WETA/24531		
92266694002	**WFSREFF-08**	EPA 365.1	WETA/24532		
92266694003	**WFSRDOWN-08**	EPA 365.1	WETA/24532		
92266694001	**WFSRUP-08**	SM 4500-P E	WETA/24420		
92266694002	**WFSREFF-08**	SM 4500-P E	WETA/24420		
92266694003	**WFSRDOWN-08**	SM 4500-P E	WETA/24420		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

Section A Required Client Information:

Company:	AquAeTer, Inc.
Address:	215 Jamestown Park Ste 100
	Brentwood, TN 37027
Email To:	jmcorn@aquaeter.com
Phone: 615-373-8532	Fax: 615-373-8512
Requested Due Date/TAT:	ASAP

Section B Required Project Information:

Report To:	John Michael Corn
Copy To:	
Purchase Order No.:	152384
Project Name:	Stones BOD
Project Number:	152384

Section C Invoice Information:

Attention:	Cindy Corn
Company Name:	AquAeTer, Inc.
Address:	See client information
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: TN

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED Composite Start DATE	Composite Start TIME	Composite End/Grab DATE	Composite End/Grab TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N) Orthophosphate	$NO_3 + NO_2$, TP, Ammonia	TKN	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	WFSRup-08	WT	G			9/8/15	1308		2	1	1							1	1	1		92266694-001
2	WFSR Eff-08	WT	G			9/8/15	1304		2	1	1							1	1	1		002
3	WFSR Down-08	WT	G			9/8/15	1254		2	1	1							1	1	1		003
4																						
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
☆ Use lowest detection limits possible ☆	Katie Lopez / AAT	9/8/15	1315	Matt Kincaid AVL	9/9/15	1030	3.5	Y	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Katie Lopez

SIGNATURE of SAMPLER: Katie Lopez DATE Signed (MM/DD/YY): 09/08/15

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Pace Analytical® www.pacelabs.com	Document Name: **Sample Condition Upon Receipt (SCUR)**	Document Revised: May 15, 2015 Page 1 of 2*
	Document No.: F-ASV-CS-003-rev.14	Issuing Authorities: Pace Asheville Quality Office

Client Name: AquaTer

* Page 2 of 2 is for Internal Use Only

Courier (Circle): (Fed Ex) UPS USPS Client Commercial Pace Other_____

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☑ yes ☐ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other_____

Thermometer Used: (IR Gun#3 -130265963) **Type of Ice:** (Wet) Blue None ☑ Samples on ice, cooling process has begun

IR Gun #4 SN:140290365 Other:_____

Temp Correction Factor: Add / Subtract 0 C

Corrected Cooler Temp.: 3.5 C **Biological Tissue is Frozen:** Yes No (N/A)

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 9/9 MS

		Comments:
Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☑Yes ☐No ☐N/A	6. Orthophosphate
Rush Turn Around Time Requested:	☑Yes ☐No ☐N/A	7. ASAP
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9.
-Pace Containers Used:	☑Yes ☐No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC:	☑Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: WT		
All containers needing preservation have been checked.	☑Yes ☐No ☐N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☑Yes ☐No ☐N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes ☑No	
Samples checked for dechlorination:	☐Yes ☐No ☑N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☑N/A	15.
Trip Blank Present:	☐Yes ☐No ☑N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased):_____		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

SCURF Review: [signature] Date: 9/9/15

SRF Review: [signature] Date: 9/9/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

WO# : 92266694

92266694

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

September 17, 2015

Mr. John Michael Corn, P.E.
Aquaeter
215 Jamestown Park
Suite 100
Brentwood, TN 37027

RE: Project: Stones BOD 9/1
Pace Project No.: 92265955

Dear Mr. Corn, P.E.:
Enclosed are the analytical results for sample(s) received by the laboratory on September 02, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Chris Derouen
christopher.derouen@pacelabs.com
Project Manager

Enclosures

cc: Kelley Spence, Aquaeter

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CERTIFICATIONS

Project: Stones BOD 9/1
Pace Project No.: 92265955

Asheville Certification IDs
2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
West Virginia Certification #: 356
Virginia/VELAP Certification #: 460222

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SAMPLE SUMMARY

Project: Stones BOD 9/1
Pace Project No.: 92265955

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92265955001	**WFSRDOWN-08**	Water	09/01/15 12:36	09/02/15 10:45
92265955002	**WFSREff-08**	Water	09/01/15 12:43	09/02/15 10:45
92265955003	**WFSRUP-08**	Water	09/01/15 12:47	09/02/15 10:45

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SAMPLE ANALYTE COUNT

Project: Stones BOD 9/1
Pace Project No.: 92265955

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92265955001	**WFSRDOWN-08**	EPA 350.1	SER	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	AES2	1	PASI-A
		SM 4500-P E	WRC	1	PASI-A
92265955002	**WFSREff-08**	EPA 350.1	SER	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	AES2	1	PASI-A
		SM 4500-P E	WRC	1	PASI-A
92265955003	**WFSRUP-08**	EPA 350.1	SER	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	AES2	1	PASI-A
		SM 4500-P E	WRC	1	PASI-A

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ANALYTICAL RESULTS

Project: Stones BOD 9/1
Pace Project No.: 92265955

Sample: WFSRDOWN-08 **Lab ID: 92265955001** Collected: 09/01/15 12:36 Received: 09/02/15 10:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.092**	mg/L	0.010	1		09/17/15 08:17	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		09/04/15 04:22	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.96**	mg/L	0.020	1		09/11/15 17:46		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**0.52**	mg/L	0.050	1		09/04/15 12:06	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**0.71**	mg/L	0.25	5		09/02/15 21:25		M1

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ANALYTICAL RESULTS

Project: Stones BOD 9/1
Pace Project No.: 92265955

Sample: WFSREff-08 **Lab ID: 92265955002** Collected: 09/01/15 12:43 Received: 09/02/15 10:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.12**	mg/L	0.010	1		09/17/15 08:17	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	**0.69**	mg/L	0.50	1		09/04/15 04:22	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**3.3**	mg/L	0.020	1		09/11/15 17:47		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**4.9**	mg/L	0.050	1		09/09/15 14:33	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**5.2**	mg/L	1.2	25		09/02/15 21:25		

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ANALYTICAL RESULTS

Project: Stones BOD 9/1
Pace Project No.: 92265955

Sample: WFSRUP-08 **Lab ID: 92265955003** Collected: 09/01/15 12:47 Received: 09/02/15 10:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.054**	mg/L	0.010	1		09/17/15 08:17	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		09/04/15 04:23	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.65**	mg/L	0.020	1		09/11/15 17:48		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	ND	mg/L	0.050	1		09/09/15 14:34	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**0.21**	mg/L	0.050	1		09/02/15 21:25		

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QUALITY CONTROL DATA

Project: Stones BOD 9/1
Pace Project No.: 92265955

QC Batch: WETA/24501 — Analysis Method: EPA 350.1
QC Batch Method: EPA 350.1 — Analysis Description: 350.1 Ammonia, Low Level
Associated Lab Samples: 92265955001, 92265955002, 92265955003

METHOD BLANK: 1557744 — Matrix: Water
Associated Lab Samples: 92265955001, 92265955002, 92265955003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.010	09/17/15 08:17	

LABORATORY CONTROL SAMPLE: 1557745

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	1	1.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1557746 1557747

Parameter	Units	92265600005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	0.074	1	1	0.99	0.98	92	90	90-110	1	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Stones BOD 9/1
Pace Project No.: 92265955

QC Batch: WETA/24361 Analysis Method: EPA 351.2
QC Batch Method: EPA 351.2 Analysis Description: 351.2 TKN
Associated Lab Samples: 92265955001, 92265955002, 92265955003

METHOD BLANK: 1548147 Matrix: Water
Associated Lab Samples: 92265955001, 92265955002, 92265955003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	ND	0.50	09/04/15 03:16	

LABORATORY CONTROL SAMPLE: 1548148

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	10	10.3	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1548149 1548150

Parameter	Units	92265826001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	251	10	10	261	258	100	68	90-110	1	10	M6

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1548151 1548152

Parameter	Units	92265946001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	56.6	10	10	65.7	67.1	91	104	90-110	2	10	

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QUALITY CONTROL DATA

Project: Stones BOD 9/1
Pace Project No.: 92265955

QC Batch: WETA/24442 — Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 — Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 92265955001, 92265955002, 92265955003

METHOD BLANK: 1553310 — Matrix: Water
Associated Lab Samples: 92265955001, 92265955002, 92265955003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	09/11/15 17:31	

LABORATORY CONTROL SAMPLE: 1553311

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.3	93	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1553312 — 1553313

Parameter	Units	92266918004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	ND	2.5	2.5	2.2	2.3	89	90	75-125	1	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1553314 — 1553315

Parameter	Units	92265982001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.042	2.5	2.5	2.3	2.2	90	88	75-125	2	10	

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QUALITY CONTROL DATA

Project: Stones BOD 9/1
Pace Project No.: 92265955

QC Batch: WETA/24363
QC Batch Method: EPA 365.1
Analysis Method: EPA 365.1
Analysis Description: 365.1 Phosphorus, Total
Associated Lab Samples: 92265955001

METHOD BLANK: 1548162
Matrix: Water
Associated Lab Samples: 92265955001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	09/04/15 11:43	

LABORATORY CONTROL SAMPLE: 1548163

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	2.5	2.7	108	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1548164 1548165

Parameter	Units	92265949007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	ND	2.5	2.5	2.9	2.7	113	109	90-110	4	10	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1548166 1548167

Parameter	Units	92266099001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	ND	2.5	2.5	1.9	1.9	78	75	90-110	4	10	M1

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QUALITY CONTROL DATA

Project: Stones BOD 9/1
Pace Project No.: 92265955

QC Batch: WETA/24407 | Analysis Method: EPA 365.1
QC Batch Method: EPA 365.1 | Analysis Description: 365.1 Phosphorus, Total
Associated Lab Samples: 92265955002, 92265955003

METHOD BLANK: 1550467 | Matrix: Water
Associated Lab Samples: 92265955002, 92265955003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	09/09/15 14:16	

LABORATORY CONTROL SAMPLE: 1550468

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	2.5	2.7	107	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1550469 1550470

Parameter	Units	92266352010 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	8.9	2.5	2.5	11.6	11.7	108	112	90-110	1	10	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1550534 1550535

Parameter	Units	92266355005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	109	2.5	2.5	111	114	81	202	90-110	3	10	M6

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QUALITY CONTROL DATA

Project: Stones BOD 9/1
Pace Project No.: 92265955

QC Batch: WETA/24349 | Analysis Method: SM 4500-P E
QC Batch Method: SM 4500-P E | Analysis Description: SM4500P-E Phosphorus, Ortho
Associated Lab Samples: 92265955001, 92265955002, 92265955003

METHOD BLANK: 1547651 | Matrix: Water
Associated Lab Samples: 92265955001, 92265955002, 92265955003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Orthophosphate as P	mg/L	ND	0.050	09/02/15 21:25	

LABORATORY CONTROL SAMPLE: 1547652

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Orthophosphate as P	mg/L	.25	0.25	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1547653 1547654

Parameter	Units	92265955001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Orthophosphate as P	mg/L	0.71	1.2	1.2	1.8	1.8	84	84	90-110	0	10	M1

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QUALIFIERS

Project: Stones BOD 9/1
Pace Project No.: 92265955

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville

ANALYTE QUALIFIERS

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Stones BOD 9/1
Pace Project No.: 92265955

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92265955001	**WFSRDOWN-08**	EPA 350.1	WETA/24501		
92265955002	**WFSREff-08**	EPA 350.1	WETA/24501		
92265955003	**WFSRUP-08**	EPA 350.1	WETA/24501		
92265955001	**WFSRDOWN-08**	EPA 351.2	WETA/24361		
92265955002	**WFSREff-08**	EPA 351.2	WETA/24361		
92265955003	**WFSRUP-08**	EPA 351.2	WETA/24361		
92265955001	**WFSRDOWN-08**	EPA 353.2	WETA/24442		
92265955002	**WFSREff-08**	EPA 353.2	WETA/24442		
92265955003	**WFSRUP-08**	EPA 353.2	WETA/24442		
92265955001	**WFSRDOWN-08**	EPA 365.1	WETA/24363		
92265955002	**WFSREff-08**	EPA 365.1	WETA/24407		
92265955003	**WFSRUP-08**	EPA 365.1	WETA/24407		
92265955001	**WFSRDOWN-08**	SM 4500-P E	WETA/24349		
92265955002	**WFSREff-08**	SM 4500-P E	WETA/24349		
92265955003	**WFSRUP-08**	SM 4500-P E	WETA/24349		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

Section A Required Client Information:

Company:	AquAeTer, Inc.
Address:	215 Jamestown Park Ste 100
	Brentwood, TN 37027
Email To:	jmcorn@aquaeter.com
Phone: 615-373-8532	Fax: 615-373-8512
Requested Due Date/TAT:	ASAP

Section B Required Project Information:

Report To:	John Michael Corn
Copy To:	
Purchase Order No.:	152384
Project Name:	Stones BOD
Project Number:	152384

Section C Invoice Information:

Attention:	Cindy Corn
Company Name:	AquAeTer, Inc.
Address:	See client information
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY: ☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: TN

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N): N	Orthophosphate	N	$NO_3 + NO_2$, TP, Ammonia	N	TKN	N	N	N	N	N	N	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	WFSRDOWN-08	WT	G			9/1/15	1236		2	1	1								1	1	1										0226595-001
2	WFSREFF-08	WT	G			9/1/15	1243		2	1	1								1	1	1										002
3	WFSRUP-08	WT	G			9/1/15	1247		2	1	1								1	1	1										003
4																															
5																															
6																															
7																															
8																															
9																															
10																															
11																															
12																															

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
☆ Use lowest detection limits possible ☆	Rachel O. Steibling AET	9/1/15	1300	Matt Steiner AVL	9/2/15	1045	2.1	Y	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Rachel O. Steibling

SIGNATURE of SAMPLER: Rachel O. Steibling

DATE Signed (MM/DD/YY): 9/1/15

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Pace Analytical® www.pacelabs.com	Document Name: **Sample Condition Upon Receipt (SCUR)**	Document Revised: May 15, 2015 Page 1 of 2*
	Document No.: F-ASV-CS-003-rev.14	Issuing Authorities: Pace Asheville Quality Office

Client Name: AquAeter

* Page 2 of 2 is for Internal Use Only

Courier (Circle): Fed Ex UPS USPS Client Commercial Pace Other_____

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☑ yes ☐ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other_____

Thermometer Used: IR Gun#3 -130265963 **Type of Ice:** Wet Blue None ☑ Samples on ice, cooling process has begun

IR Gun #4 SN:140290365 Other:_____

Temp Correction Factor: Add / Subtract 0 C

Corrected Cooler Temp.: 2.1 C **Biological Tissue is Frozen:** Yes No N/A

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 9/2 MS

		Comments:
Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☑Yes ☐No ☐N/A	6. Orthophosate
Rush Turn Around Time Requested:	☑Yes ☐No ☐N/A	7. ASAP
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9.
-Pace Containers Used:	☑Yes ☐No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC:	☑Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: WT		
All containers needing preservation have been checked.	☑Yes ☐No ☐N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☑Yes ☐No ☐N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes ☑No	
Samples checked for dechlorination:	☐Yes ☐No ☑N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☑N/A	15.
Trip Blank Present:	☐Yes ☐No ☑N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased):_____		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

SCURF Review: [signature] **Date:** 9/2/15

SRF Review: [signature] **Date:** 9/2/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

WO# : 92265955

92265955

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

August 28, 2015

Mr. John Michael Corn, P.E.
Aquaeter
215 Jamestown Park
Suite 100
Brentwood, TN 37027

RE: Project: Stones BOD 152384 8/18
Pace Project No.: 92263972

Dear Mr. Corn, P.E.:
Enclosed are the analytical results for sample(s) received by the laboratory on August 19, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Chris Derouen
christopher.derouen@pacelabs.com
Project Manager

Enclosures

cc: Kelley Spence, Aquaeter

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CERTIFICATIONS

Project: Stones BOD 152384 8/18
Pace Project No.: 92263972

Asheville Certification IDs
2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
West Virginia Certification #: 356
Virginia/VELAP Certification #: 460222

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SAMPLE SUMMARY

Project: Stones BOD 152384 8/18
Pace Project No.: 92263972

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92263972001	**WFSRDDWN-07**	Water	08/18/15 12:19	08/19/15 10:40
92263972002	**WFSREFF-07**	Water	08/18/15 12:29	08/19/15 10:40
92263972003	**WFSRUP-07**	Water	08/18/15 12:38	08/19/15 10:40

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SAMPLE ANALYTE COUNT

Project: Stones BOD 152384 8/18
Pace Project No.: 92263972

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92263972001	**WFSRDDWN-07**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	AES2	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	AES2	1	PASI-A
		SM 4500-P E	TEP	1	PASI-A
92263972002	**WFSREFF-07**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	AES2	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	AES2	1	PASI-A
		SM 4500-P E	TEP	1	PASI-A
92263972003	**WFSRUP-07**	EPA 350.1	WRC	1	PASI-A
		EPA 351.2	AES2	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	AES2	1	PASI-A
		SM 4500-P E	TEP	1	PASI-A

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ANALYTICAL RESULTS

Project: Stones BOD 152384 8/18
Pace Project No.: 92263972

Sample: WFSRDDWN-07 **Lab ID: 92263972001** Collected: 08/18/15 12:19 Received: 08/19/15 10:40 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.027**	mg/L	0.010	1		08/21/15 19:39	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		08/28/15 17:05	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.36**	mg/L	0.020	1		08/26/15 17:16		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**0.47**	mg/L	0.050	1		08/25/15 13:46	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	ND	mg/L	1.0	20		08/19/15 12:00		

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ANALYTICAL RESULTS

Project: Stones BOD 152384 8/18
Pace Project No.: 92263972

Sample: WFSREFF-07 **Lab ID: 92263972002** Collected: 08/18/15 12:29 Received: 08/19/15 10:40 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.076**	mg/L	0.010	1		08/21/15 19:39	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	**0.93**	mg/L	0.50	1		08/28/15 17:06	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.70**	mg/L	0.020	1		08/26/15 17:19		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**3.4**	mg/L	0.050	1		08/25/15 13:47	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**3.5**	mg/L	0.50	10		08/19/15 12:00		

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ANALYTICAL RESULTS

Project: Stones BOD 152384 8/18
Pace Project No.: 92263972

Sample: WFSRUP-07 **Lab ID: 92263972003** Collected: 08/18/15 12:38 Received: 08/19/15 10:40 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.023**	mg/L	0.010	1		08/21/15 19:41	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		08/28/15 17:07	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.15**	mg/L	0.020	1		08/26/15 17:21		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	ND	mg/L	0.050	1		08/25/15 13:47	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**0.081**	mg/L	0.050	1		08/19/15 12:00		

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QUALITY CONTROL DATA

Project: Stones BOD 152384 8/18
Pace Project No.: 92263972

QC Batch: WETA/24193 — Analysis Method: EPA 350.1
QC Batch Method: EPA 350.1 — Analysis Description: 350.1 Ammonia, Low Level
Associated Lab Samples: 92263972001, 92263972002, 92263972003

METHOD BLANK: 1538389 — Matrix: Water
Associated Lab Samples: 92263972001, 92263972002, 92263972003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.010	08/21/15 19:23	

LABORATORY CONTROL SAMPLE: 1538390

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	1	0.95	95	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1538391 — 1538392

Parameter	Units	92264017011 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	0.046	1	1	0.81	0.81	76	76	90-110	1	10	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1538393 — 1538394

Parameter	Units	92264017012 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	0.056	1	1	0.80	0.77	74	72	90-110	3	10	M1

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QUALITY CONTROL DATA

Project: Stones BOD 152384 8/18
Pace Project No.: 92263972

QC Batch: WETA/24250 Analysis Method: EPA 351.2
QC Batch Method: EPA 351.2 Analysis Description: 351.2 TKN
Associated Lab Samples: 92263972001, 92263972002, 92263972003

METHOD BLANK: 1541502 Matrix: Water
Associated Lab Samples: 92263972001, 92263972002, 92263972003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	ND	0.50	08/28/15 16:57	

LABORATORY CONTROL SAMPLE: 1541503

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	10	9.7	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1541504 1541505

Parameter	Units	92263969012 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	ND	10	10	1.4	0.88	11	6	90-110	46	10	M1,R1

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QUALITY CONTROL DATA

Project: Stones BOD 152384 8/18
Pace Project No.: 92263972

QC Batch: WETA/24261 — Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 — Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 92263972001, 92263972002, 92263972003

METHOD BLANK: 1541888 — Matrix: Water
Associated Lab Samples: 92263972001, 92263972002, 92263972003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	08/26/15 16:47	

LABORATORY CONTROL SAMPLE: 1541889

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.3	94	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1541890 — 1541891

Parameter	Units	92264769001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.047	2.5	2.5	2.4	2.3	95	92	75-125	3	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1541892 — 1541893

Parameter	Units	92264784002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.043	2.5	2.5	1.9	1.9	74	73	75-125	1	10	M1

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QUALITY CONTROL DATA

Project: Stones BOD 152384 8/18
Pace Project No.: 92263972

QC Batch: WETA/24221 — Analysis Method: EPA 365.1
QC Batch Method: EPA 365.1 — Analysis Description: 365.1 Phosphorus, Total
Associated Lab Samples: 92263972001, 92263972002, 92263972003

METHOD BLANK: 1540021 — Matrix: Water
Associated Lab Samples: 92263972001, 92263972002, 92263972003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	08/25/15 13:38	

LABORATORY CONTROL SAMPLE: 1540022

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	2.5	2.6	105	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1540023 1540024

Parameter	Units	92263857004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	ND	2.5	2.5	2.6	2.6	102	103	90-110	1	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1540025 1540026

Parameter	Units	92264119001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	6.3	2.5	2.5	8.3	9.2	83	118	90-110	10	10	M1

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QUALITY CONTROL DATA

Project: Stones BOD 152384 8/18
Pace Project No.: 92263972

QC Batch: WETA/24171 — Analysis Method: SM 4500-P E
QC Batch Method: SM 4500-P E — Analysis Description: SM4500P-E Phosphorus, Ortho
Associated Lab Samples: 92263972001, 92263972002, 92263972003

METHOD BLANK: 1536934 — Matrix: Water
Associated Lab Samples: 92263972001, 92263972002, 92263972003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Orthophosphate as P	mg/L	ND	0.050	08/19/15 12:00	

LABORATORY CONTROL SAMPLE: 1536935

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Orthophosphate as P	mg/L	.25	0.25	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1536936 1536937

Parameter	Units	92263754001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Orthophosphate as P	mg/L	ND	.25	.25	0.35	0.35	121	119	90-110	1	10	M1

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: Stones BOD 152384 8/18
Pace Project No.: 92263972

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville

ANALYTE QUALIFIERS

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
R1	RPD value was outside control limits.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Stones BOD 152384 8/18
Pace Project No.: 92263972

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92263972001	**WFSRDDWN-07**	EPA 350.1	WETA/24193		
92263972002	**WFSREFF-07**	EPA 350.1	WETA/24193		
92263972003	**WFSRUP-07**	EPA 350.1	WETA/24193		
92263972001	**WFSRDDWN-07**	EPA 351.2	WETA/24250		
92263972002	**WFSREFF-07**	EPA 351.2	WETA/24250		
92263972003	**WFSRUP-07**	EPA 351.2	WETA/24250		
92263972001	**WFSRDDWN-07**	EPA 353.2	WETA/24261		
92263972002	**WFSREFF-07**	EPA 353.2	WETA/24261		
92263972003	**WFSRUP-07**	EPA 353.2	WETA/24261		
92263972001	**WFSRDDWN-07**	EPA 365.1	WETA/24221		
92263972002	**WFSREFF-07**	EPA 365.1	WETA/24221		
92263972003	**WFSRUP-07**	EPA 365.1	WETA/24221		
92263972001	**WFSRDDWN-07**	SM 4500-P E	WETA/24171		
92263972002	**WFSREFF-07**	SM 4500-P E	WETA/24171		
92263972003	**WFSRUP-07**	SM 4500-P E	WETA/24171		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

Section A Required Client Information:

Company:	AquAeTer, Inc.
Address:	215 Jamestown Park Ste 100
	Brentwood, TN 37027
Email To:	jmcorn@aquaeter.com
Phone: 615-373-8532	Fax: 615-373-8512
Requested Due Date/TAT:	ASAP

Section B Required Project Information:

Report To:	John Michael Corn
Copy To:	
Purchase Order No.:	152384
Project Name:	Stones BOD
Project Number:	152384

Section C Invoice Information:

Attention:	Cindy Corn
Company Name:	AquAeTer, Inc.
Address:	See client information
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY: ☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: TN

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Tissue TS, Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	Orthophosphate	$NO_3 + NO_2$, TP, Ammonia	TKN	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	WFSRDMM-07	WT	G			8/18/15	1219		2	1	1								1	1	1		92263972-001
2	WFSREFF-07	WT	G			8/18/15	1229		2	1	1								1	1	1		002
3	WFSR UP-07	WT	G			8/18/15	1238		2	1	1								1	1	1		002
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
✱ Use lowest detection ✱ limits possible	Katie Lopez	8/18/15	1245		8/19/-	10:40	21	Y	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Katie Lopez

SIGNATURE of SAMPLER: Katie Lopez DATE Signed (MM/DD/YY): 08/18/15

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Pace Analytical® www.pacelabs.com	Document Name: **Sample Condition Upon Receipt (SCUR)**	Document Revised: May 15, 2015 Page 1 of 2*
	Document No.: F-ASV-CS-003-rev.14	Issuing Authorities: Pace Asheville Quality Office

Client Name: Aquaeter

* Page 2 of 2 is for Internal Use Only

Courier (Circle): (Fed Ex) UPS USPS Client Commercial Pace Other_____

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other_____

Thermometer Used: IR Gun#3 -130265963 **Type of Ice:** (Wet) Blue None ☑ Samples on ice, cooling process has begun

IR Gun #4 SN:140290365 Other:_____

Temp Correction Factor: Add / Subtract 0.0 C

Corrected Cooler Temp.: 2.1 C **Biological Tissue is Frozen:** Yes No N/A

Temp should be above freezing to 6°C

Date and Initials of person examining contents: RPB 8/19/15

Comments:

Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☑Yes ☐No ☐N/A	6.
Rush Turn Around Time Requested:	☐Yes ☑No ☐N/A	7.
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9.
-Pace Containers Used:	☐Yes ☐No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC:	☑Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: WW		
All containers needing preservation have been checked.	☑Yes ☐No ☐N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☑Yes ☐No ☐N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes ☑No	
Samples checked for dechlorination:	☑Yes ☐No ☐N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☑N/A	15.
Trip Blank Present:	☐Yes ☐No ☑N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased):_____		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

SCURF Review: [signature] Date: 8/19/15

SRF Review: [signature] Date: 8/19/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

WO#: 92263972

92263972

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

August 17, 2015

Mr. John Michael Corn, P.E.
Aquaeter
215 Jamestown Park
Suite 100
Brentwood, TN 37027

RE: Project: Stones BOD 152384 8/3
Pace Project No.: 92261609

Dear Mr. Corn, P.E.:
Enclosed are the analytical results for sample(s) received by the laboratory on August 04, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Chris Derouen
christopher.derouen@pacelabs.com
Project Manager

Enclosures

cc: Kelley Spence, Aquaeter

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CERTIFICATIONS

Project: Stones BOD 152384 8/3
Pace Project No.: 92261609

Asheville Certification IDs
2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
West Virginia Certification #: 356
Virginia/VELAP Certification #: 460222

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SAMPLE SUMMARY

Project: Stones BOD 152384 8/3
Pace Project No.: 92261609

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92261609001	**WFSRDOWN-07**	Water	08/03/15 12:38	08/04/15 10:30
92261609002	**WFSREFF-07**	Water	08/03/15 12:54	08/04/15 10:30
92261609003	**WFSRUP-07**	Water	08/03/15 13:01	08/04/15 10:30

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SAMPLE ANALYTE COUNT

Project: Stones BOD 152384 8/3
Pace Project No.: 92261609

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92261609001	**WFSRDOWN-07**	EPA 350.1	SER	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	SER	1	PASI-A
		EPA 365.1	SER	1	PASI-A
		SM 4500-P E	TEP	1	PASI-A
92261609002	**WFSREFF-07**	EPA 350.1	SER	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	SER	1	PASI-A
		EPA 365.1	SER	1	PASI-A
		SM 4500-P E	TEP	1	PASI-A
92261609003	**WFSRUP-07**	EPA 350.1	SER	1	PASI-A
		EPA 351.2	SER	1	PASI-A
		EPA 353.2	SER	1	PASI-A
		EPA 365.1	SER	1	PASI-A
		SM 4500-P E	TEP	1	PASI-A

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ANALYTICAL RESULTS

Project: Stones BOD 152384 8/3
Pace Project No.: 92261609

Sample: WFSRDOWN-07 **Lab ID: 92261609001** Collected: 08/03/15 12:38 Received: 08/04/15 10:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.043**	mg/L	0.010	1		08/16/15 00:25	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		08/13/15 07:26	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.35**	mg/L	0.020	1		08/11/15 07:22		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**0.50**	mg/L	0.050	1		08/08/15 06:01	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**0.62**	mg/L	0.25	5		08/05/15 11:50		

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ANALYTICAL RESULTS

Project: Stones BOD 152384 8/3
Pace Project No.: 92261609

Sample: WFSREFF-07 **Lab ID: 92261609002** Collected: 08/03/15 12:54 Received: 08/04/15 10:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.053**	mg/L	0.010	1		08/16/15 00:25	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	**0.95**	mg/L	0.50	1		08/13/15 07:27	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.77**	mg/L	0.020	1		08/11/15 07:24		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**3.4**	mg/L	0.050	1		08/08/15 06:02	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**3.3**	mg/L	0.50	10		08/05/15 11:50		

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ANALYTICAL RESULTS

Project: Stones BOD 152384 8/3
Pace Project No.: 92261609

Sample: WFSRUP-07 **Lab ID: 92261609003** Collected: 08/03/15 13:01 Received: 08/04/15 10:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.039**	mg/L	0.010	1		08/16/15 00:25	7664-41-7	
351.2 Total Kjeldahl Nitrogen	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.50	1		08/13/15 07:28	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.12**	mg/L	0.020	1		08/11/15 07:25		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	ND	mg/L	0.050	1		08/08/15 06:02	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**0.051**	mg/L	0.050	1		08/05/15 11:50		

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QUALITY CONTROL DATA

Project: Stones BOD 152384 8/3
Pace Project No.: 92261609

QC Batch: WETA/24133 | Analysis Method: EPA 350.1
QC Batch Method: EPA 350.1 | Analysis Description: 350.1 Ammonia, Low Level
Associated Lab Samples: 92261609001, 92261609002, 92261609003

METHOD BLANK: 1534932 | Matrix: Water
Associated Lab Samples: 92261609001, 92261609002, 92261609003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.010	08/16/15 00:25	

LABORATORY CONTROL SAMPLE: 1534933

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	1	0.97	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1534934 1534935

Parameter	Units	92261704001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	9.7	1	1	10.8	11.1	104	133	90-110	3	10	M6

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1534936 1534937

Parameter	Units	92262690003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	0.038	1	1	0.85	0.85	81	81	90-110	0	10	M1

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QUALITY CONTROL DATA

Project: Stones BOD 152384 8/3
Pace Project No.: 92261609

QC Batch: WETA/24075 Analysis Method: EPA 351.2
QC Batch Method: EPA 351.2 Analysis Description: 351.2 TKN
Associated Lab Samples: 92261609001, 92261609002, 92261609003

METHOD BLANK: 1531405 Matrix: Water
Associated Lab Samples: 92261609001, 92261609002, 92261609003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	ND	0.50	08/13/15 07:09	

LABORATORY CONTROL SAMPLE: 1531406

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	10	9.6	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1531407 1531408

Parameter	Units	92262044001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	2.4	10	10	12.7	12.6	102	102	90-110	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1531409 1531410

Parameter	Units	92261571001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	52.3	10	10	62.7	63.8	104	115	90-110	2	10	M1

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QUALITY CONTROL DATA

Project: Stones BOD 152384 8/3
Pace Project No.: 92261609

QC Batch: WETA/24046 — Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 — Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 92261609001, 92261609002, 92261609003

METHOD BLANK: 1529643 — Matrix: Water
Associated Lab Samples: 92261609001, 92261609002, 92261609003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	08/11/15 07:06	

LABORATORY CONTROL SAMPLE: 1529644

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.4	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1529645 — 1529646

Parameter	Units	92262305003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.050	2.5	2.5	2.6	2.6	101	101	75-125	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1529647 — 1529648

Parameter	Units	92261695001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	3.2	2.5	2.5	6.3	5.5	124	91	75-125	14	10	R1

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QUALITY CONTROL DATA

Project: Stones BOD 152384 8/3
Pace Project No.: 92261609

QC Batch: WETA/24019 — Analysis Method: EPA 365.1
QC Batch Method: EPA 365.1 — Analysis Description: 365.1 Phosphorus, Total
Associated Lab Samples: 92261609001, 92261609002, 92261609003

METHOD BLANK: 1528401 — Matrix: Water
Associated Lab Samples: 92261609001, 92261609002, 92261609003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	08/08/15 05:44	

LABORATORY CONTROL SAMPLE: 1528402

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	2.5	2.6	104	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1528403 1528404

Parameter	Units	92260653001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	0.60	2.5	2.5	3.2	3.2	105	105	90-110	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1528405 1528406

Parameter	Units	92261499001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	2.0	2.5	2.5	4.6	4.6	104	105	90-110	0	10	

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QUALITY CONTROL DATA

Project: Stones BOD 152384 8/3
Pace Project No.: 92261609

QC Batch: WETA/23984 — Analysis Method: SM 4500-P E
QC Batch Method: SM 4500-P E — Analysis Description: SM4500P-E Phosphorus, Ortho
Associated Lab Samples: 92261609001, 92261609002, 92261609003

METHOD BLANK: 1525602 — Matrix: Water
Associated Lab Samples: 92261609001, 92261609002, 92261609003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Orthophosphate as P	mg/L	ND	0.050	08/05/15 11:50	

LABORATORY CONTROL SAMPLE: 1525603

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Orthophosphate as P	mg/L	.25	0.23	91	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1526131 1526132

Parameter	Units	92261804001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Orthophosphate as P	mg/L	ND	.25	.25	0.24	0.24	91	90	90-110	2	10	

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QUALIFIERS

Project: Stones BOD 152384 8/3
Pace Project No.: 92261609

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville

ANALYTE QUALIFIERS

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
R1	RPD value was outside control limits.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Stones BOD 152384 8/3
Pace Project No.: 92261609

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92261609001	**WFSRDOWN-07**	EPA 350.1	WETA/24133		
92261609002	**WFSREFF-07**	EPA 350.1	WETA/24133		
92261609003	**WFSRUP-07**	EPA 350.1	WETA/24133		
92261609001	**WFSRDOWN-07**	EPA 351.2	WETA/24075		
92261609002	**WFSREFF-07**	EPA 351.2	WETA/24075		
92261609003	**WFSRUP-07**	EPA 351.2	WETA/24075		
92261609001	**WFSRDOWN-07**	EPA 353.2	WETA/24046		
92261609002	**WFSREFF-07**	EPA 353.2	WETA/24046		
92261609003	**WFSRUP-07**	EPA 353.2	WETA/24046		
92261609001	**WFSRDOWN-07**	EPA 365.1	WETA/24019		
92261609002	**WFSREFF-07**	EPA 365.1	WETA/24019		
92261609003	**WFSRUP-07**	EPA 365.1	WETA/24019		
92261609001	**WFSRDOWN-07**	SM 4500-P E	WETA/23984		
92261609002	**WFSREFF-07**	SM 4500-P E	WETA/23984		
92261609003	**WFSRUP-07**	SM 4500-P E	WETA/23984		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

1903725

Section A Required Client Information:

Company: AquaTer, Inc.
Address: 215 Jamestown Park, Ste 10
Brentwood, TN 37027
Email To: jmcorn@aquateter.com
Phone: 615-373-8532 Fax: 615-373-8512
Requested Due Date/TAT:

Section B Required Project Information:

Report To: John Michael Corn
Copy To:
Purchase Order No.: ~~142299~~ 152384
Project Name: Stones IGD
Project Number: ~~142299~~ 152384

Section C Invoice Information:

Attention: Cindy Corn
Company Name: AquaTer, Inc.
Address: see client information
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: TN

Section D Required Client Information

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

Requested Analysis Filtered (Y/N): Analysis Test: Orthophosphate (N); NO_3, NO_2, TP, Ammonia (N); TKN (N)

ITEM #	SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED Composite Start Date	Composite Start Time	Composite End/Grab Date	Composite End/Grab Time	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Orthophosphate	NO_3, NO_2, TP, Ammonia	TKN	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	WESRDWN-07	WT	G			8/3/15	1238		2	1	1							1	1	1		92261609-001
2	WESREff-07	WT	G			8/3/15	1254		2	1	1							1	1	1		002
3	WESRUp-07	WT	G			8/3/15	1301		2	1	1							1	1	1		003
4																						
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Use lowest possible detection limits	Katie Lopez	8/3/15	1310	Matt & Trevor AVL	8/4/15	1030	2.9	Y	N	Y

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Katie Lopez
SIGNATURE of SAMPLER: Katie Lopez
DATE Signed (MM/DD/YY): 08/03/15

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pace Analytical® www.pacelabs.com	Document Name: **Sample Condition Upon Receipt (SCUR)**	Document Revised: May 15, 2015 Page 1 of 2*
	Document No.: F-ASV-CS-003-rev.14	Issuing Authorities: Pace Asheville Quality Office

Client Name: Aquaeter, Inc.

* Page 2 of 2 is for Internal Use Only

Courier (Circle): Fed Ex UPS USPS Client Commercial Pace Other_____

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☑ yes ☐ no

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other_____

Thermometer Used: IR Gun#3 -130265963 **Type of Ice:** Wet Blue None ☑ Samples on ice, cooling process has begun

IR Gun #4 SN:140290365 Other:_____

Temp Correction Factor: Add / Subtract 0 C

Corrected Cooler Temp.: 2.9 C **Biological Tissue is Frozen:** Yes No N/A

Temp should be above freezing to 6°C

Date and Initials of person examining contents: 8/4/15 MS

		Comments:
Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☑Yes ☐No ☐N/A	6. Orthophosphate
Rush Turn Around Time Requested:	☐Yes ☑No ☐N/A	7.
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9.
-Pace Containers Used:	☑Yes ☐No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC:	☑Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: WT		
All containers needing preservation have been checked.	☑Yes ☐No ☐N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☑Yes ☐No ☐N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes ☑No	
Samples checked for dechlorination:	☐Yes ☐No ☑N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☑N/A	15.
Trip Blank Present:	☐Yes ☐No ☑N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased):_____		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

SCURF Review: [signature] Date: 8/4/15

SRF Review: [signature] Date: 8/4/15

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

WO# : 92261609

92261609

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

August 12, 2015

Mr. John Michael Corn, P.E.
Aquaeter
215 Jamestown Park
Suite 100
Brentwood, TN 37027

RE: Project: Stones BOD 152384
Pace Project No.: 92261025

Dear Mr. Corn, P.E.:
Enclosed are the analytical results for sample(s) received by the laboratory on July 30, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Chris Derouen
christopher.derouen@pacelabs.com
Project Manager

Enclosures

cc: Kelley Spence, Aquaeter

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CERTIFICATIONS

Project: Stones BOD 152384
Pace Project No.: 92261025

Asheville Certification IDs
2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
West Virginia Certification #: 356
Virginia/VELAP Certification #: 460222

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SAMPLE SUMMARY

Project: Stones BOD 152384
Pace Project No.: 92261025

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92261025001	**WFSRDOWN-07**	Water	07/29/15 12:37	07/30/15 10:45
92261025002	**WFSREFF-07**	Water	07/29/15 12:58	07/30/15 10:45
92261025003	**WFSRUP-07**	Water	07/29/15 13:17	07/30/15 10:45

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SAMPLE ANALYTE COUNT

Project: Stones BOD 152384
Pace Project No.: 92261025

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92261025001	**WFSRDOWN-07**	EPA 350.1	BRJ	1	PASI-A
		EPA 351.2	AES2	1	PASI-A
		EPA 353.2	DMN	1	PASI-A
		EPA 365.1	SER	1	PASI-A
		SM 4500-P E	MAB	1	PASI-A
92261025002	**WFSREFF-07**	EPA 350.1	BRJ	1	PASI-A
		EPA 351.2	AES2	1	PASI-A
		EPA 353.2	WRC	1	PASI-A
		EPA 365.1	SER	1	PASI-A
		SM 4500-P E	MAB	1	PASI-A
92261025003	**WFSRUP-07**	EPA 350.1	BRJ	1	PASI-A
		EPA 351.2	AES2	1	PASI-A
		EPA 353.2	WRC	1	PASI-A
		EPA 365.1	SER	1	PASI-A
		SM 4500-P E	MAB	1	PASI-A

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ANALYTICAL RESULTS

Project: Stones BOD 152384
Pace Project No.: 92261025

Sample: WFSRDOWN-07 **Lab ID: 92261025001** Collected: 07/29/15 12:37 Received: 07/30/15 10:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.034**	mg/L	0.010	1		08/05/15 06:16	7664-41-7	
351.2 TKN, Low Level	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	**0.36**	mg/L	0.10	1		08/06/15 17:27	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.28**	mg/L	0.020	1		08/06/15 18:11		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**0.48**	mg/L	0.050	1		08/05/15 05:15	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**0.46**	mg/L	0.25	5		07/30/15 13:20		

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ANALYTICAL RESULTS

Project: Stones BOD 152384
Pace Project No.: 92261025

Sample: WFSREFF-07 **Lab ID: 92261025002** Collected: 07/29/15 12:58 Received: 07/30/15 10:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.028**	mg/L	0.010	1		08/05/15 06:16	7664-41-7	
351.2 TKN, Low Level	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	**1.0**	mg/L	0.10	1		08/12/15 10:02	7727-37-9	M1
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.62**	mg/L	0.020	1		08/05/15 21:08		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	**3.2**	mg/L	0.050	1		08/05/15 05:16	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	**3.2**	mg/L	0.50	10		07/30/15 13:20		

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ANALYTICAL RESULTS

Project: Stones BOD 152384
Pace Project No.: 92261025

Sample: WFSRUP-07 **Lab ID: 92261025003** Collected: 07/29/15 13:17 Received: 07/30/15 10:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
350.1 Ammonia, Low Level	Analytical Method: EPA 350.1							
Nitrogen, Ammonia	**0.017**	mg/L	0.010	1		08/05/15 06:16	7664-41-7	
351.2 TKN, Low Level	Analytical Method: EPA 351.2							
Nitrogen, Kjeldahl, Total	ND	mg/L	0.10	1		08/12/15 10:05	7727-37-9	
353.2 Nitrogen, NO2/NO3 pres.	Analytical Method: EPA 353.2							
Nitrogen, NO2 plus NO3	**0.13**	mg/L	0.020	1		08/05/15 21:09		
365.1 Phosphorus, Total	Analytical Method: EPA 365.1							
Phosphorus	ND	mg/L	0.050	1		08/05/15 05:18	7723-14-0	
SM4500P-E, Phosphate, Ortho	Analytical Method: SM 4500-P E							
Orthophosphate as P	ND	mg/L	0.050	1		07/30/15 13:20		

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QUALITY CONTROL DATA

Project: Stones BOD 152384
Pace Project No.: 92261025

QC Batch: WETA/23983 Analysis Method: EPA 350.1
QC Batch Method: EPA 350.1 Analysis Description: 350.1 Ammonia, Low Level
Associated Lab Samples: 92261025001, 92261025002, 92261025003

METHOD BLANK: 1525460 Matrix: Water
Associated Lab Samples: 92261025001, 92261025002, 92261025003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.010	08/05/15 06:16	

LABORATORY CONTROL SAMPLE: 1525461

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	1	1.0	105	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1525462 1525463

Parameter	Units	92260672001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	0.035	1	1	0.55	0.80	52	76	90-110	36	10	M1,R1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1525464 1525465

Parameter	Units	92261010009 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	0.033	1	1	1.2	0.72	113	69	90-110	48	10	M1,R1

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QUALITY CONTROL DATA

Project: Stones BOD 152384
Pace Project No.: 92261025

QC Batch: WETA/23992
QC Batch Method: EPA 351.2
Analysis Method: EPA 351.2
Analysis Description: 351.2 TKN, Low Level
Associated Lab Samples: 92261025001

METHOD BLANK: 1525946
Matrix: Water
Associated Lab Samples: 92261025001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	ND	0.10	08/06/15 16:54	

LABORATORY CONTROL SAMPLE: 1525947

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	2.5	2.3	93	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1525948 1525949

Parameter	Units	92260672001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	0.50	2.5	2.5	3.1	2.9	103	95	90-110	7	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1525950 1525951

Parameter	Units	92261010009 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	0.15	2.5	2.5	2.4	2.5	90	95	90-110	6	10	

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QUALITY CONTROL DATA

Project: Stones BOD 152384
Pace Project No.: 92261025

QC Batch: WETA/24072 | Analysis Method: EPA 351.2
QC Batch Method: EPA 351.2 | Analysis Description: 351.2 TKN, Low Level
Associated Lab Samples: 92261025002, 92261025003

METHOD BLANK: 1530926 | Matrix: Water
Associated Lab Samples: 92261025002, 92261025003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	ND	0.10	08/12/15 10:30	

LABORATORY CONTROL SAMPLE: 1530927

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Kjeldahl, Total	mg/L	2.5	2.5	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1530928 1530929

Parameter	Units	92261025002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Kjeldahl, Total	mg/L	1.0	2.5	2.5	3.8	3.5	111	99	90-110	8	10	M1

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QUALITY CONTROL DATA

Project: Stones BOD 152384
Pace Project No.: 92261025

QC Batch: WETA/24004 | Analysis Method: EPA 353.2
QC Batch Method: EPA 353.2 | Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 92261025002, 92261025003

METHOD BLANK: 1527136 | Matrix: Water
Associated Lab Samples: 92261025002, 92261025003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	08/05/15 20:39	

LABORATORY CONTROL SAMPLE: 1527137

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.3	93	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1527138 1527139

Parameter	Units	92261623001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.065	2.5	2.5	2.7	2.7	105	105	75-125	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1527140 1527141

Parameter	Units	92261624001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	1.3	2.5	2.5	3.5	3.4	86	85	75-125	1	10	

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QUALITY CONTROL DATA

Project: Stones BOD 152384
Pace Project No.: 92261025

QC Batch: WETA/24009
QC Batch Method: EPA 353.2
Analysis Method: EPA 353.2
Analysis Description: 353.2 Nitrate + Nitrite, preserved
Associated Lab Samples: 92261025001

METHOD BLANK: 1527185
Matrix: Water
Associated Lab Samples: 92261025001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	ND	0.020	08/06/15 17:54	

LABORATORY CONTROL SAMPLE: 1527186

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, NO2 plus NO3	mg/L	2.5	2.3	91	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1527187 1527188

Parameter	Units	92261878001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	0.48	2.5	2.5	2.6	2.6	87	84	75-125	3	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1527189 1527190

Parameter	Units	92261058003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, NO2 plus NO3	mg/L	2.4	2.5	2.5	4.4	4.4	79	79	75-125	0	10	

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QUALITY CONTROL DATA

Project: Stones BOD 152384
Pace Project No.: 92261025

QC Batch: WETA/23963 Analysis Method: EPA 365.1
QC Batch Method: EPA 365.1 Analysis Description: 365.1 Phosphorus, Total
Associated Lab Samples: 92261025001, 92261025002, 92261025003

METHOD BLANK: 1524555 Matrix: Water
Associated Lab Samples: 92261025001, 92261025002, 92261025003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Phosphorus	mg/L	ND	0.050	08/05/15 05:02	

LABORATORY CONTROL SAMPLE: 1524556

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	2.5	2.4	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1524557 1524558

Parameter	Units	92260030004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	ND	2.5	2.5	2.4	2.4	95	96	90-110	1	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1524559 1524560

Parameter	Units	92260920001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Phosphorus	mg/L	13.4	2.5	2.5	15.4	15.7	80	90	90-110	2	10	M1

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QUALITY CONTROL DATA

Project: Stones BOD 152384
Pace Project No.: 92261025

QC Batch: WETA/23934 | Analysis Method: SM 4500-P E
QC Batch Method: SM 4500-P E | Analysis Description: SM4500P-E Phosphorus, Ortho
Associated Lab Samples: 92261025001, 92261025002, 92261025003

METHOD BLANK: 1522108 | Matrix: Water
Associated Lab Samples: 92261025001, 92261025002, 92261025003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Orthophosphate as P	mg/L	ND	0.050	07/30/15 13:20	

LABORATORY CONTROL SAMPLE: 1522109

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Orthophosphate as P	mg/L	.25	0.26	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1522110 1522111

Parameter	Units	92260846001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Orthophosphate as P	mg/L	ND	.25	.25	0.25	0.25	92	92	90-110	0	10	

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QUALIFIERS

Project: Stones BOD 152384
Pace Project No.: 92261025

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether, Styrene, and Vinyl chloride.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

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TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville

ANALYTE QUALIFIERS

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
R1	RPD value was outside control limits.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Stones BOD 152384
Pace Project No.: 92261025

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92261025001	**WFSRDOWN-07**	EPA 350.1	WETA/23983		
92261025002	**WFSREFF-07**	EPA 350.1	WETA/23983		
92261025003	**WFSRUP-07**	EPA 350.1	WETA/23983		
92261025001	**WFSRDOWN-07**	EPA 351.2	WETA/23992		
92261025002	**WFSREFF-07**	EPA 351.2	WETA/24072		
92261025003	**WFSRUP-07**	EPA 351.2	WETA/24072		
92261025001	**WFSRDOWN-07**	EPA 353.2	WETA/24009		
92261025002	**WFSREFF-07**	EPA 353.2	WETA/24004		
92261025003	**WFSRUP-07**	EPA 353.2	WETA/24004		
92261025001	**WFSRDOWN-07**	EPA 365.1	WETA/23963		
92261025002	**WFSREFF-07**	EPA 365.1	WETA/23963		
92261025003	**WFSRUP-07**	EPA 365.1	WETA/23963		
92261025001	**WFSRDOWN-07**	SM 4500-P E	WETA/23934		
92261025002	**WFSREFF-07**	SM 4500-P E	WETA/23934		
92261025003	**WFSRUP-07**	SM 4500-P E	WETA/23934		

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CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

Section A Required Client Information:

Company:	AquAeTer, Inc.
Address:	215 Jamestown Park Ste 100
	Brentwood, TN 37027
Email To:	jmcorn@aquaeter.com
Phone: 615-373-8532	Fax: 615-373-8512
Requested Due Date/TAT:	ASAP

Section B Required Project Information:

Report To:	John Michael Corn
Copy To:	
Purchase Order No.:	152384 ~~142299~~
Project Name:	Stones BOD
Project Number:	152384 ~~142299~~

Section C Invoice Information:

Attention:	Cindy Corn
Company Name:	AquAeTer, Inc.
Address:	See client information
Pace Quote Reference:	
Pace Project Manager:	
Pace Profile #:	

REGULATORY AGENCY: ☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: TN

Section D Required Client Information

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED Composite Start Date	Composite Start Time	Composite End/Grab Date	Composite End/Grab Time	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test ↓ (Y/N)	Orthophosphate	$NO_3 + NO_2$, TP, Ammonia	TKN	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	WFSR Down - 07	WT	G	7/29/15	1237				2	1	1								1	1	1		92261025-001
2	WFSREFF - 07	WT	G	7/29/15	1258				2	1	1								1	1	1		002
3	WFSR UP - 07	WT	G	7/29/15	1317				2	1	1								1	1	1		003
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
*Use lowest detection limits possible	Rachel O. Stribling	7/29/15	1520	RVL Denise TR	7/30/15	8:03 ~~15:20~~ 10:35	3.4	Y	N	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Rachel O. Stribling

SIGNATURE of SAMPLER: Rachel O. Stribling DATE Signed (MM/DD/YY): 7/29/15

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Pace Analytical® www.pacelabs.com	Document Name: **Sample Condition Upon Receipt (SCUR)**	Document Revised: May 15, 2015 Page 1 of 2*
	Document No.: F-ASV-CS-003-rev.14	Issuing Authorities: Pace Asheville Quality Office

Client Name: AquAeter

* Page 2 of 2 is for Internal Use Only

Courier (Circle): Fed Ex UPS USPS Client Commercial Pace Other_____

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other_____

Thermometer Used: IR Gun#3 -130265963 **Type of Ice:** Wet Blue None ☑ Samples on ice, cooling process has begun

IR Gun #4 SN:140290365 Other:_____

Temp Correction Factor: Add / Subtract 0.0 C

Corrected Cooler Temp.: 3.2 C **Biological Tissue is Frozen:** Yes No N/A

Temp should be above freezing to 6°C

Date and Initials of person examining contents: RBB 7/29/15

Comments:

Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out:	☑Yes ☐No ☐N/A	2.
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No ☐N/A	5.
Short Hold Time Analysis (<72hr):	☐Yes ☑No ☐N/A	6. orthophos 7/30
Rush Turn Around Time Requested:	☐Yes ☑No ☐N/A	7.
Sufficient Volume:	☑Yes ☐No ☐N/A	8.
Correct Containers Used:	☑Yes ☐No ☐N/A	9.
-Pace Containers Used:	☑Yes ☐No ☐N/A	
Containers Intact:	☑Yes ☐No ☐N/A	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC:	☐Yes ☐No ☐N/A	12.
-Includes date/time/ID/Analysis Matrix: WW		
All containers needing preservation have been checked.	☑Yes ☐No ☐N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	☑Yes ☐No ☐N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	☐Yes ☑No	
Samples checked for dechlorination:	☑Yes ☐No ☐N/A	14.
Headspace in VOA Vials (>6mm):	☐Yes ☐No ☑N/A	15.
Trip Blank Present:	☐Yes ☐No ☑N/A	16.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased):_____		

Client Notification/ Resolution: Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

SCURF Review: _____ **Date:** _____

SRF Review: _____ **Date:** _____

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e out of hold, incorrect preservative, out of temp, incorrect containers)

WO#: 92261025

92261025

APPENDIX 3

ALL IN SITU FIELD DATA

TABLE 13. IN-SITU WATER QUALITY MEASUREMENTS

DATE (mm.dd.yy)	TIME (military)	LOCATION	LOCATION IN CHANNEL (REW, MID, LEW)	DEPTH (ft)	DO (mg/L)	TEMP (ºC)	CONDUCTIVITY (umhos/cm)	pH (S.U.)	INSTRUMENT
6/5/2014	1020	EF001	MID	1.00	10.08	26.35	0.344	7.79	Horiba
6/5/2014	0948	EF002	MID	1.00	9.66	25.67	0.358	7.74	Horiba
6/5/2014	0927	EF003	MID	1.00	8.76	25.32	0.383	7.72	Horiba
6/5/2014	0900	EF004	MID	1.00	6.07	25.43	0.353	7.88	Horiba
6/5/2014	1230	EF005	MID	1.00	7.58	24.72	0.336	7.67	Horiba
6/6/2014	1115	WF001	MID	1.00	10.92	24.92	0.472	8.31	Horiba
6/6/2014	1045	WF002	MID	1.00	10.39	21.92	0.524	7.77	Horiba
6/6/2014	0955	WF003	MID	1.00	8.17	22.22	0.559	7.72	Horiba
6/6/2014	0802	WF004	MID	1.00	9.23	23.5	0.425	7.56	Horiba
6/6/2014	0826	WF005	MID	1.00	8.41	23.58	0.424	7.67	Horiba
8/12/2014	1108	EF001	MID	1.00	5.23	26.15	0.313	7.73	YSI
8/12/2014	1039	EF002	MID	1.00	5.48	25.65	0.319	7.72	YSI
8/12/2014	1018	EF003	MID	1.00	5.94	25.52	0.302	7.75	YSI
8/12/2014	1001	EF004	MID	1.00	6.37	25.32	0.302	7.75	YSI
8/12/2014	0756	EF005	MID	1.00	6.30	25.59	0.305	7.80	YSI
8/12/2014	1259	WF001	MID	1.00	7.45	28.26	0.410	7.87	YSI
8/12/2014	1317	WF002	MID	1.00	7.34	27.67	0.414	7.98	YSI
8/12/2014	1349	WF003	MID	1.00	6.83	26.22	0.603	7.93	YSI
8/12/2014	1448	WF004	MID	1.00	8.66	27.99	0.639	8.26	YSI
8/12/2014	1635	WF005	MID	1.00	8.80	26.72	0.305	8.23	YSI
11/4/2014	0920	EF001	MID	1.00	8.61	12.6	0.352	3.31	Orion/YSI
11/4/2014	0935	EF002	MID	1.00	9.54	12.5	0.354	7.96	Orion/YSI
11/4/2014	1005	EF003	MID	1.00	10.48	11.6	0.357	8.09	Orion/YSI
11/4/2014	1020	EF004	MID	1.00	11.94	12.2	0.351	8.16	Orion/YSI
11/4/2014	1130	EF005	MID	1.00	12.02	12.2	0.363	8.03	Orion/YSI
11/4/2014	1525	WF001	MID	1.00	10.50	14.3	0.443	8.03	Orion/YSI
11/4/2014	1455	WF002	MID	1.00	13.71	15.3	0.436	8.19	Orion/YSI

DATE (mm.dd.yy)	TIME (military)	LOCATION	LOCATION IN CHANNEL (REW, MID, LEW)	DEPTH (ft)	DO (mg/L)	TEMP (ºC)	CONDUCTIVITY (umhos/cm)	pH (S.U.)	INSTRUMENT
11/4/2014	1330	WF003	MID	1.00	12.10	15.5	0.431	8.03	Orion/YSI
11/4/2014	1205	WF004	MID	1.00	11.71	12.6	0.371	8.15	Orion/YSI
11/4/2014	1230	WF005	MID	1.00	12.44	13.3	0.362	8.33	Orion/YSI
1/20/2015	1540	EF001	MID	1.00	13.51	9.4	0.416	8.21	Orion/YSI
1/20/2015	1528	EF002	MID	1.00	13.63	9.3	0.416	8.07	Orion/YSI
1/20/2015	1500	EF003	MID	1.00	17.14	10.1	0.406	8.35	Orion/YSI
1/20/2015	1320	EF004	REW	1.00	17.09	10.4	0.393	8.38	Orion/YSI
1/20/2015	1350	EF005	LEW	1.00	14.85	9.6	0.406	8.22	Orion/YSI
1/20/2015	1245	WF001	REW	1.00	12.50	11.6	0.464	6.77	Orion/YSI
1/20/2015	1110	WF002	REW	1.00	15.44	10.5	0.460	8.33	Orion/YSI
1/20/2015	1145	WF003	REW	1.00	17.40	10.2	0.451	8.54	Orion/YSI
1/20/2015	1028	WF004	LEW	1.00	14.73	9.2	0.424	8.37	Orion/YSI
1/20/2015	0948	WF005	LEW	1.00	14.99	9.4	0.424	8.47	Orion/YSI

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (FRONT)
(See Protocol E for detailed descriptions and rank information)

STATION ID: EF001	HABITAT ASSESSED BY: NR CST
STREAM NAME: E Fork Stones River	DATE: 6/30/14 TIME: 1340
STATION LOCATION: E Fork	ECOREGION: QC: Consensus Duplicate
WBID/HUC: GROUP:	ASSOCIATED LOG #:

	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Over 70% of stream reach has natural stable habitat suitable for colonization by fish and/or macroinvertebrates. Four or more productive habitats are present.	Natural stable habitat covers 40-70% of stream reach. Three or more productive habitats present. (If near 70% and more than 3 go to optimal.)	Natural stable habitat covers 20 -40% of stream reach or only 1-2 productive habitats present. (If near 40% and more than 2 go to suboptimal.)	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
2.Embeddedness of Riffles	Gravel, cobble, and boulders 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. If near 25% drop to suboptimal if riffle not layered cobble.	Gravel, cobble and boulders 25-50% surrounded by fine sediment. Niches in bottom layers of cobble compromised. If near 50% & riffles not layered cobble drop to marginal.	Gravel, cobble, and boulder s are 50-75% surrounded by fine sediment. Niche space in middle layers of cobble is starting to fill with fine sediment.	Gravel, cobble, and boulders are more than 75% surrounded by fine sediment. Niche space is reduced to a single layer or is absent.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
3. Velocity/ Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow).	Only 3 of the 4 regimes present (if fast-shallow is missing score lower). If slow-deep missing score 15.	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/depth regime. Others regimes too small or infrequent to support aquatic populations.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
4. Sediment Deposition	Sediment deposition affects less than 5% of stream bottom in quiet areas. New deposition on islands and point bars is absent or minimal.	Sediment deposition affects 5-30% of stream bottom. Slight deposition in pool or slow areas. Some new deposition on islands and point bars. Move to marginal if build-up approaches 30%.	Sediment deposition affects 30-50% of stream bottom. Sediment deposits at obstruction, constrictions and bends. Moderate pool deposition.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
5. Channel Flow Status.	Water reaches base of both lower banks and streambed is covered by water throughout reach. Minimal productive habitat is exposed.	Water covers > 75% of streambed or 25% of productive habitat is exposed.	Water covers 25-75% of streambed and/or productive habitat is mostly exposed.	Very little water in channel and mostly present as standing pools. Little or no productive habitat due to lack of water.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (BACK)

Station ID EF002 Date 6/30/14 Initials WR

	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization, dredging rock removal or 4-wheel activity (past or present) absent or minimal; natural meander pattern. NO artificial structures in reach. Upstream or downstream structures do not affect reach. NE	Channelization, dredging or 4-wheel activity up to 40%. Channel has stabilized. If larger reach, channelization is historic and stable. Artificial structures in or out of reach do not affect natural flow patterns.	Channelization, dredging or 4-wheel activity 40-80% (or less that has not stabilized.) Artificial structures in or out of reach may have slight affect.	Over 80% of reach channelized, dredged or affected by 4-wheelers. Instream habitat greatly altered or removed. Artificial structures have greatly affected flow pattern.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
7. Frequency of re-oxygenation zones. Use frequency of riffle or bends for category. Rank by quality.	Occurrence of re-oxygenation zones relatively frequent; ratio of distance between areas divided by average stream width <7:1.	Occurrence of re-oxygenation zones infrequent; distance between areas divided by average stream width is 7 - 15.	Occasional re-oxygenation area. The distance between areas divided by average stream width is over 15 and up to 25.	Generally all flat water or flat bedrock; little opportunity for re-oxygenation. Distance between areas divided by average stream width >25.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
8. Bank Stability (score each bank) Determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. If approaching 30% score marginal if banks steep.	Moderately unstable; 30-60 % of bank in reach has areas of erosion; high erosion potential during floods, If approaching 60% score poor if banks steep.	Unstable; many eroded area; raw areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				
9. Vegetative Protective (score each bank) includes vegetation from top of bank to base of bank. Determine left or right side by facing downstream	More than 90% of the bank covered by undisturbed vegetation. All 4 classes (mature trees, understory trees, shrubs, groundcover) are represented and allowed to grow naturally. All plants are native.	70-90% of the bank covered by undisturbed vegetation. One class may not be well represented. Disruption evident but not effecting full plant growth. Non-natives are rare (< 30%)	50-70% of the bank covered by undisturbed vegetation. Two classes of vegetation may not be well represented. Non-native vegetation may be common (30-50%).	Less than 50% of the bank covered by undisturbed vegetation or more than 2 classes are not well represented or most vegetation has been cropped. Non-native vegetation may dominate (> 50%)
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				
10. Riparian Vegetative Zone Width (score each bank.) Zone begins at top of bank.	Average width of riparian zone > 18 meters. Unpaved footpaths may score 9 if run-off potential is negligible.	Average width of riparian zone 12-18 meters. Score high if areas < 18 meters are small or are minimally disturbed.	Average width of riparian zone 6-11 meters. Score high if areas less than 12 meters are small or are minimally disturbed.	Average width of riparian zone <6 meters. Score high if areas less than 6 meters are small or are minimally disturbed.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				

Total Score 112 **Comparison to Ecoregion Guidelines (circle): ABOVE or BELOW**

If score is below guidelines , result of (circle): Natural Conditions or Human Disturbance

Describe Percy Priest lake

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (FRONT)
(See Protocol E for detailed descriptions and rank information)

STATION ID: EF002	HABITAT ASSESSED BY: NR CST
STREAM NAME: E. Fork Stones River	DATE: 6/30/14 TIME: 1221
STATION LOCATION: EF	ECOREGION: QC: Consensus Duplicate
WBID/HUC: GROUP:	ASSOCIATED LOG #:

	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Over 70% of stream reach has natural stable habitat suitable for colonization by fish and/or macroinvertebrates. Four or more productive habitats are present.	Natural stable habitat covers 40-70% of stream reach. Three or more productive habitats present. (If near 70% and more than 3 go to optimal.)	Natural stable habitat covers 20 -40% of stream reach or only 1-2 productive habitats present. (If near 40% and more than 2 go to suboptimal.)	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
2.Embeddedness of Riffles	Gravel, cobble, and boulders 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. If near 25% drop to suboptimal if riffle not layered cobble.	Gravel, cobble and boulders 25-50% surrounded by fine sediment. Niches in bottom layers of cobble compromised. If near 50% & riffles not layered cobble drop to marginal.	Gravel, cobble, and boulder s are 50-75% surrounded by fine sediment. Niche space in middle layers of cobble is starting to fill with fine sediment.	Gravel, cobble, and boulders are more than 75% surrounded by fine sediment. Niche space is reduced to a single layer or is absent.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
3. Velocity/ Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow).	Only 3 of the 4 regimes present (if fast-shallow is missing score lower). If slow-deep missing score 15.	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/depth regime. Others regimes too small or infrequent to support aquatic populations.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
4. Sediment Deposition	Sediment deposition affects less than 5% of stream bottom in quiet areas. New deposition on islands and point bars is absent or minimal.	Sediment deposition affects 5-30% of stream bottom. Slight deposition in pool or slow areas. Some new deposition on islands and point bars. Move to marginal if build-up approaches 30%.	Sediment deposition affects 30-50% of stream bottom. Sediment deposits at obstruction, constrictions and bends. Moderate pool deposition.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
5. Channel Flow Status. .	Water reaches base of both lower banks and streambed is covered by water throughout reach. Minimal productive habitat is exposed.	Water covers > 75% of streambed or 25% of productive habitat is exposed.	Water covers 25-75% of streambed and/or productive habitat is mostly exposed.	Very little water in channel and mostly present as standing pools. Little or no productive habitat due to lack of water.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (BACK)

Station ID EF002 Date 6/30/14 Initials NR

	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization, dredging rock removal or 4-wheel activity (past or present) absent or minimal; natural meander pattern. NO artificial structures in reach. Upstream or downstream structures do not affect reach.	Channelization, dredging or 4-wheel activity up to 40%. Channel has stabilized. If larger reach, channelization is historic and stable. Artificial structures in or out of reach do not affect natural flow patterns.	Channelization, dredging or 4-wheel activity 40-80% (or less that has not stabilized.) Artificial structures in or out of reach may have slight affect.	Over 80% of reach channelized, dredged or affected by 4-wheelers. Instream habitat greatly altered or removed. Artificial structures have greatly affected flow pattern.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
7. Frequency of re-oxygenation zones. Use frequency of riffle or bends for category. Rank by quality.	Occurrence of re-oxygenation zones relatively frequent; ratio of distance between areas divided by average stream width <7:1.	Occurrence of re-oxygenation zones infrequent; distance between areas divided by average stream width is 7 - 15.	Occasional re-oxygenation area. The distance between areas divided by average stream width is over 15 and up to 25.	Generally all flat water or flat bedrock; little opportunity for re-oxygenation. Distance between areas divided by average stream width >25.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
8. Bank Stability (score each bank) Determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. If approaching 30% score marginal if banks steep.	Moderately unstable; 30-60 % of bank in reach has areas of erosion; high erosion potential during floods, If approaching 60% score poor if banks steep.	Unstable; many eroded area; raw areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				
9. Vegetative Protective (score each bank) includes vegetation from top of bank to base of bank. Determine left or right side by facing downstream	More than 90% of the bank covered by undisturbed vegetation. All 4 classes (mature trees, understory trees, shrubs, groundcover) are represented and allowed to grow naturally. All plants are native.	70-90% of the bank covered by undisturbed vegetation. One class may not be well represented. Disruption evident but not effecting full plant growth. Non-natives are rare (< 30%)	50-70% of the bank covered by undisturbed vegetation. Two classes of vegetation may not be well represented. Non-native vegetation may be common (30-50%).	Less than 50% of the bank covered by undisturbed vegetation or more than 2 classes are not well represented or most vegetation has been cropped. Non-native vegetation may dominate (> 50%)
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				
10. Riparian Vegetative Zone Width (score each bank.) Zone begins at top of bank.	Average width of riparian zone > 18 meters. Unpaved footpaths may score 9 if run-off potential is negligible.	Average width of riparian zone 12-18 meters. Score high if areas < 18 meters are small or are minimally disturbed.	Average width of riparian zone 6-11 meters. Score high if areas less than 12 meters are small or are minimally disturbed.	Average width of riparian zone <6 meters. Score high if areas less than 6 meters are small or are minimally disturbed.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				

Total Score 132 **Comparison to Ecoregion Guidelines (circle): ABOVE or BELOW**

If score is below guidelines , result of (circle): Natural Conditions or Human Disturbance

Describe

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (FRONT)
(See Protocol E for detailed descriptions and rank information)

STATION ID: EF003	HABITAT ASSESSED BY: NTR CST
STREAM NAME: E. Fork Stones River	DATE: 6/30/14 TIME: 1147
STATION LOCATION: EF003	ECOREGION: QC: Consensus Duplicate
WBID/HUC: GROUP:	ASSOCIATED LOG #:

	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Over 70% of stream reach has natural stable habitat suitable for colonization by fish and/or macroinvertebrates. Four or more productive habitats are present.	Natural stable habitat covers 40-70% of stream reach. Three or more productive habitats present. (If near 70% and more than 3 go to optimal.)	Natural stable habitat covers 20 -40% of stream reach or only 1-2 productive habitats present. (If near 40% and more than 2 go to suboptimal.)	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 (16)	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
2.Embeddedness of Riffles	Gravel, cobble, and boulders 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. If near 25% drop to suboptimal if riffle not layered cobble.	Gravel, cobble and boulders 25-50% surrounded by fine sediment. Niches in bottom layers of cobble compromised. If near 50% & riffles not layered cobble drop to marginal.	Gravel, cobble, and boulder s are 50-75% surrounded by fine sediment. Niche space in middle layers of cobble is starting to fill with fine sediment.	Gravel, cobble, and boulders are more than 75% surrounded by fine sediment. Niche space is reduced to a single layer or is absent.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
3. Velocity/ Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow).	Only 3 of the 4 regimes present (if fast-shallow is missing score lower). If slow-deep missing score 15.	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/depth regime. Others regimes too small or infrequent to support aquatic populations.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	(5) 4 3 2 1
Comments				
4. Sediment Deposition	Sediment deposition affects less than 5% of stream bottom in quiet areas. New deposition on islands and point bars is absent or minimal.	Sediment deposition affects 5-30% of stream bottom. Slight deposition in pool or slow areas. Some new deposition on islands and point bars. Move to marginal if build-up approaches 30%.	Sediment deposition affects 30-50% of stream bottom. Sediment deposits at obstruction, constrictions and bends. Moderate pool deposition.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 (18) 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
5. Channel Flow Status. .	Water reaches base of both lower banks and streambed is covered by water throughout reach. Minimal productive habitat is exposed.	Water covers > 75% of streambed or 25% of productive habitat is exposed.	Water covers 25-75% of streambed and/or productive habitat is mostly exposed.	Very little water in channel and mostly present as standing pools. Little or no productive habitat due to lack of water.
SCORE	(20) 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (BACK)

Station ID E003 Date 6/30/14 Initials NR

	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization, dredging rock removal or 4-wheel activity (past or present) absent or minimal; natural meander pattern. NO artificial structures in reach. Upstream or downstream structures do not affect reach.	Channelization, dredging or 4-wheel activity up to 40%. Channel has stabilized. If larger reach, channelization is historic and stable. Artificial structures in or out of reach do not affect natural flow patterns.	Channelization, dredging or 4-wheel activity 40-80% (or less that has not stabilized.) Artificial structures in or out of reach may have slight affect.	Over 80% of reach channelized, dredged or affected by 4-wheelers. Instream habitat greatly altered or removed. Artificial structures have greatly affected flow pattern.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
7. Frequency of re-oxygenation zones. Use frequency of riffle or bends for category. Rank by quality.	Occurrence of re-oxygenation zones relatively frequent; ratio of distance between areas divided by average stream width <7:1.	Occurrence of re-oxygenation zones infrequent; distance between areas divided by average stream width is 7 - 15.	Occasional re-oxygenation area. The distance between areas divided by average stream width is over 15 and up to 25.	Generally all flat water or flat bedrock; little opportunity for re-oxygenation. Distance between areas divided by average stream width >25.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
8. Bank Stability (score each bank) Determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. If approaching 30% score marginal if banks steep.	Moderately unstable; 30-60 % of bank in reach has areas of erosion; high erosion potential during floods, If approaching 60% score poor if banks steep.	Unstable; many eroded area; raw areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				
9. Vegetative Protective (score each bank) includes vegetation from top of bank to base of bank. Determine left or right side by facing downstream	More than 90% of the bank covered by undisturbed vegetation. All 4 classes (mature trees, understory trees, shrubs, groundcover) are represented and allowed to grow naturally. All plants are native.	70-90% of the bank covered by undisturbed vegetation. One class may not be well represented. Disruption evident but not effecting full plant growth. Non-natives are rare (< 30%)	50-70% of the bank covered by undisturbed vegetation. Two classes of vegetation may not be well represented. Non-native vegetation may be common (30-50%).	Less than 50% of the bank covered by undisturbed vegetation or more than 2 classes are not well represented or most vegetation has been cropped. Non-native vegetation may dominate (> 50%)
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				
10. Riparian Vegetative Zone Width (score each bank.) Zone begins at top of bank.	Average width of riparian zone > 18 meters. Unpaved footpaths may score 9 if run-off potential is negligible.	Average width of riparian zone 12-18 meters. Score high if areas < 18 meters are small or are minimally disturbed.	Average width of riparian zone 6-11 meters. Score high if areas less than 12 meters are small or are minimally disturbed.	Average width of riparian zone <6 meters. Score high if areas less than 6 meters are small or are minimally disturbed.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				

Total Score 128 **Comparison to Ecoregion Guidelines (circle):** **ABOVE** or **BELOW**

If score is below guidelines , result of (circle): Natural Conditions or Human Disturbance

Describe

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (FRONT)
(See Protocol E for detailed descriptions and rank information)

STATION ID: EF004	HABITAT ASSESSED BY: NTL CST
STREAM NAME: E Fork Stones River	DATE: 6/30/14 TIME: 1045
STATION LOCATION: EF004	ECOREGION: QC: Consensus Duplicate
WBID/HUC: GROUP:	ASSOCIATED LOG #:

	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Over 70% of stream reach has natural stable habitat suitable for colonization by fish and/or macroinvertebrates. Four or more productive habitats are present.	Natural stable habitat covers 40-70% of stream reach. Three or more productive habitats present. (If near 70% and more than 3 go to optimal.)	Natural stable habitat covers 20 -40% of stream reach or only 1-2 productive habitats present. (If near 40% and more than 2 go to suboptimal.)	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
2.Embeddedness of Riffles	Gravel, cobble, and boulders 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. If near 25% drop to suboptimal if riffle not layered cobble.	Gravel, cobble and boulders 25-50% surrounded by fine sediment. Niches in bottom layers of cobble compromised. If near 50% & riffles not layered cobble drop to marginal.	Gravel, cobble, and boulder s are 50-75% surrounded by fine sediment. Niche space in middle layers of cobble is starting to fill with fine sediment.	Gravel, cobble, and boulders are more than 75% surrounded by fine sediment. Niche space is reduced to a single layer or is absent.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
3. Velocity/ Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow).	Only 3 of the 4 regimes present (if fast-shallow is missing score lower). If slow-deep missing score 15.	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/depth regime. Others regimes too small or infrequent to support aquatic populations.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
4. Sediment Deposition	Sediment deposition affects less than 5% of stream bottom in quiet areas. New deposition on islands and point bars is absent or minimal.	Sediment deposition affects 5-30% of stream bottom. Slight deposition in pool or slow areas. Some new deposition on islands and point bars. Move to marginal if build-up approaches 30%.	Sediment deposition affects 30-50% of stream bottom. Sediment deposits at obstruction, constrictions and bends. Moderate pool deposition.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
5. Channel Flow Status.	Water reaches base of both lower banks and streambed is covered by water throughout reach. Minimal productive habitat is exposed.	Water covers > 75% of streambed or 25% of productive habitat is exposed.	Water covers 25-75% of streambed and/or productive habitat is mostly exposed.	Very little water in channel and mostly present as standing pools. Little or no productive habitat due to lack of water.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (BACK)

Station ID EF004 Date 6/30/14 Initials NJR

	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization, dredging rock removal or 4-wheel activity (past or present) absent or minimal; natural meander pattern. NO artificial structures in reach. Upstream or downstream structures do not affect reach.	Channelization, dredging or 4-wheel activity up to 40%. Channel has stabilized. If larger reach, channelization is historic and stable. Artificial structures in or out of reach do not affect natural flow patterns.	Channelization, dredging or 4-wheel activity 40-80% (or less that has not stabilized.) Artificial structures in or out of reach may have slight affect.	Over 80% of reach channelized, dredged or affected by 4-wheelers. Instream habitat greatly altered or removed. Artificial structures have greatly affected flow pattern.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
7. Frequency of re-oxygenation zones. Use frequency of riffle or bends for category. Rank by quality.	Occurrence of re-oxygenation zones relatively frequent; ratio of distance between areas divided by average stream width <7:1.	Occurrence of re-oxygenation zones infrequent; distance between areas divided by average stream width is 7 - 15.	Occasional re-oxygenation area. The distance between areas divided by average stream width is over 15 and up to 25.	Generally all flat water or flat bedrock; little opportunity for re-oxygenation. Distance between areas divided by average stream width >25.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
8. Bank Stability (score each bank) Determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. If approaching 30% score marginal if banks steep.	Moderately unstable; 30-60 % of bank in reach has areas of erosion; high erosion potential during floods, If approaching 60% score poor if banks steep.	Unstable; many eroded area; raw areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				
9. Vegetative Protective (score each bank) includes vegetation from top of bank to base of bank. Determine left or right side by facing downstream	More than 90% of the bank covered by undisturbed vegetation. All 4 classes (mature trees, understory trees, shrubs, groundcover) are represented and allowed to grow naturally. All plants are native.	70-90% of the bank covered by undisturbed vegetation. One class may not be well represented. Disruption evident but not effecting full plant growth. Non-natives are rare (< 30%)	50-70% of the bank covered by undisturbed vegetation. Two classes of vegetation may not be well represented. Non-native vegetation may be common (30-50%).	Less than 50% of the bank covered by undisturbed vegetation or more than 2 classes are not well represented or most vegetation has been cropped. Non-native vegetation may dominate (> 50%)
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				
10. Riparian Vegetative Zone Width (score each bank.) Zone begins at top of bank.	Average width of riparian zone > 18 meters. Unpaved footpaths may score 9 if run-off potential is negligible.	Average width of riparian zone 12-18 meters. Score high if areas < 18 meters are small or are minimally disturbed.	Average width of riparian zone 6-11 meters. Score high if areas less than 12 meters are small or are minimally disturbed.	Average width of riparian zone <6 meters. Score high if areas less than 6 meters are small or are minimally disturbed.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				

Total Score 143 **Comparison to Ecoregion Guidelines (circle): ABOVE or BELOW**

If score is below guidelines , result of (circle): Natural Conditions or Human Disturbance

Describe

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (FRONT)
(See Protocol E for detailed descriptions and rank information)

STATION ID: EF005	HABITAT ASSESSED BY: NTR CST
STREAM NAME: E Fork Stones River	DATE: 6/30/17 TIME: 1325
STATION LOCATION: EF	ECOREGION: QC: Consensus Duplicate
WBID/HUC: GROUP:	ASSOCIATED LOG #:

	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Over 70% of stream reach has natural stable habitat suitable for colonization by fish and/or macroinvertebrates. Four or more productive habitats are present.	Natural stable habitat covers 40-70% of stream reach. Three or more productive habitats present. (If near 70% and more than 3 go to optimal.)	Natural stable habitat covers 20 -40% of stream reach or only 1-2 productive habitats present. (If near 40% and more than 2 go to suboptimal.)	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
2.Embeddedness of Riffles	Gravel, cobble, and boulders 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. If near 25% drop to suboptimal if riffle not layered cobble.	Gravel, cobble and boulders 25-50% surrounded by fine sediment. Niches in bottom layers of cobble compromised. If near 50% & riffles not layered cobble drop to marginal.	Gravel, cobble, and boulder s are 50-75% surrounded by fine sediment. Niche space in middle layers of cobble is starting to fill with fine sediment.	Gravel, cobble, and boulders are more than 75% surrounded by fine sediment. Niche space is reduced to a single layer or is absent.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
3. Velocity/ Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow).	Only 3 of the 4 regimes present (if fast-shallow is missing score lower). If slow-deep missing score 15.	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/depth regime. Others regimes too small or infrequent to support aquatic populations.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
4. Sediment Deposition	Sediment deposition affects less than 5% of stream bottom in quiet areas. New deposition on islands and point bars is absent or minimal.	Sediment deposition affects 5-30% of stream bottom. Slight deposition in pool or slow areas. Some new deposition on islands and point bars. Move to marginal if build-up approaches 30%.	Sediment deposition affects 30-50% of stream bottom. Sediment deposits at obstruction, constrictions and bends. Moderate pool deposition.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
5. Channel Flow Status.	Water reaches base of both lower banks and streambed is covered by water throughout reach. Minimal productive habitat is exposed.	Water covers > 75% of streambed or 25% of productive habitat is exposed.	Water covers 25-75% of streambed and/or productive habitat is mostly exposed.	Very little water in channel and mostly present as standing pools. Little or no productive habitat due to lack of water.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (BACK)

Station ID EF005 Date 6/30/14 Initials NTC

	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization, dredging rock removal or 4-wheel activity (past or present) absent or minimal; natural meander pattern. NO artificial structures in reach. Upstream or downstream structures do not affect reach.	Channelization, dredging or 4-wheel activity up to 40%. Channel has stabilized. If larger reach, channelization is historic and stable. Artificial structures in or out of reach do not affect natural flow patterns.	Channelization, dredging or 4-wheel activity 40-80% (or less that has not stabilized.) Artificial structures in or out of reach may have slight affect.	Over 80% of reach channelized, dredged or affected by 4-wheelers. Instream habitat greatly altered or removed. Artificial structures have greatly affected flow pattern.
SCORE	20 19 (18) 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
7. Frequency of re-oxygenation zones. Use frequency of riffle or bends for category. Rank by quality.	Occurrence of re-oxygenation zones relatively frequent; ratio of distance between areas divided by average stream width <7:1.	Occurrence of re-oxygenation zones infrequent; distance between areas divided by average stream width is 7 - 15.	Occasional re-oxygenation area. The distance between areas divided by average stream width is over 15 and up to 25.	Generally all flat water or flat bedrock; little opportunity for re-oxygenation. Distance between areas divided by average stream width >25.
SCORE	20 19 18 17 16	15 14 13 12 11	(10) 9 8 7 6	5 4 3 2 1
Comments				
8. Bank Stability (score each bank) Determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. If approaching 30% score marginal if banks steep.	Moderately unstable; 30-60 % of bank in reach has areas of erosion; high erosion potential during floods, If approaching 60% score poor if banks steep.	Unstable; many eroded area; raw areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE (LB)	Left Bank (10) 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank (10) 9	8 7 6	5 4 3	2 1 0
Comments				
9. Vegetative Protective (score each bank) includes vegetation from top of bank to base of bank. Determine left or right side by facing downstream	More than 90% of the bank covered by undisturbed vegetation. All 4 classes (mature trees, understory trees, shrubs, groundcover) are represented and allowed to grow naturally. All plants are native.	70-90% of the bank covered by undisturbed vegetation. One class may not be well represented. Disruption evident but not effecting full plant growth. Non-natives are rare (< 30%)	50-70% of the bank covered by undisturbed vegetation. Two classes of vegetation may not be well represented. Non-native vegetation may be common (30-50%).	Less than 50% of the bank covered by undisturbed vegetation or more than 2 classes are not well represented or most vegetation has been cropped. Non-native vegetation may dominate (> 50%)
SCORE (LB)	Left Bank 10 9	(8) 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	(8) 7 6	5 4 3	2 1 0
Comments				
10. Riparian Vegetative Zone Width (score each bank.) Zone begins at top of bank.	Average width of riparian zone > 18 meters. Unpaved footpaths may score 9 if run-off potential is negligible.	Average width of riparian zone 12-18 meters. Score high if areas < 18 meters are small or are minimally disturbed.	Average width of riparian zone 6-11 meters. Score high if areas less than 12 meters are small or are minimally disturbed.	Average width of riparian zone <6 meters. Score high if areas less than 6 meters are small or are minimally disturbed.
SCORE (LB)	Left Bank (10) 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank (10) 9	8 7 6	5 4 3	2 1 0
Comments				

Total Score 170 **Comparison to Ecoregion Guidelines (circle):** **ABOVE** **or** **BELOW**

If score is below guidelines , result of (circle): Natural Conditions or Human Disturbance

Describe

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (FRONT)
(See Protocol E for detailed descriptions and rank information)

STATION ID: WF001	HABITAT ASSESSED BY: NTC ROM
STREAM NAME: W. Fork Stones River	DATE: 7/1/14 TIME: 1541
STATION LOCATION: WF	ECOREGION: QC: Consensus Duplicate
WBID/HUC: GROUP:	ASSOCIATED LOG #:

	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Over 70% of stream reach has natural stable habitat suitable for colonization by fish and/or macroinvertebrates. Four or more productive habitats are present.	Natural stable habitat covers 40-70% of stream reach. Three or more productive habitats present. (If near 70% and more than 3 go to optimal.)	Natural stable habitat covers 20 -40% of stream reach or only 1-2 productive habitats present. (If near 40% and more than 2 go to suboptimal.)	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
2.Embeddedness of Riffles	Gravel, cobble, and boulders 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. If near 25% drop to suboptimal if riffle not layered cobble.	Gravel, cobble and boulders 25-50% surrounded by fine sediment. Niches in bottom layers of cobble compromised. If near 50% & riffles not layered cobble drop to marginal.	Gravel, cobble, and boulder s are 50-75% surrounded by fine sediment. Niche space in middle layers of cobble is starting to fill with fine sediment.	Gravel, cobble, and boulders are more than 75% surrounded by fine sediment. Niche space is reduced to a single layer or is absent.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
3. Velocity/ Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow).	Only 3 of the 4 regimes present (if fast-shallow is missing score lower). If slow-deep missing score 15.	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/depth regime. Others regimes too small or infrequent to support aquatic populations.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
4. Sediment Deposition	Sediment deposition affects less than 5% of stream bottom in quiet areas. New deposition on islands and point bars is absent or minimal.	Sediment deposition affects 5-30% of stream bottom. Slight deposition in pool or slow areas. Some new deposition on islands and point bars. Move to marginal if build-up approaches 30%.	Sediment deposition affects 30-50% of stream bottom. Sediment deposits at obstruction, constrictions and bends. Moderate pool deposition.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
5. Channel Flow Status.	Water reaches base of both lower banks and streambed is covered by water throughout reach. Minimal productive habitat is exposed.	Water covers > 75% of streambed or 25% of productive habitat is exposed.	Water covers 25-75% of streambed and/or productive habitat is mostly exposed.	Very little water in channel and mostly present as standing pools. Little or no productive habitat due to lack of water.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (BACK)

Station ID WP002 Date 7/11/14 Initials NR

	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization, dredging rock removal or 4-wheel activity (past or present) absent or minimal; natural meander pattern. NO artificial structures in reach. Upstream or downstream structures do not affect reach.	Channelization, dredging or 4-wheel activity up to 40%. Channel has stabilized. If larger reach, channelization is historic and stable. Artificial structures in or out of reach do not affect natural flow patterns.	Channelization, dredging or 4-wheel activity 40-80% (or less that has not stabilized.) Artificial structures in or out of reach may have slight affect.	Over 80% of reach channelized, dredged or affected by 4-wheelers. Instream habitat greatly altered or removed. Artificial structures have greatly affected flow pattern.
SCORE	20 (19) 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
7. Frequency of re-oxygenation zones. Use frequency of riffle or bends for category. Rank by quality.	Occurrence of re-oxygenation zones relatively frequent; ratio of distance between areas divided by average stream width <7:1.	Occurrence of re-oxygenation zones infrequent; distance between areas divided by average stream width is 7 - 15.	Occasional re-oxygenation area. The distance between areas divided by average stream width is over 15 and up to 25.	Generally all flat water or flat bedrock; little opportunity for re-oxygenation. Distance between areas divided by average stream width >25.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 (1)
Comments				
8. Bank Stability (score each bank) Determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. If approaching 30% score marginal if banks steep.	Moderately unstable; 30-60 % of bank in reach has areas of erosion; high erosion potential during floods, If approaching 60% score poor if banks steep.	Unstable; many eroded area; raw areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE (LB)	Left Bank (10) 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank (10) 9	8 7 6	5 4 3	2 1 0
Comments				
9. Vegetative Protective (score each bank) includes vegetation from top of bank to base of bank. Determine left or right side by facing downstream	More than 90% of the bank covered by undisturbed vegetation. All 4 classes (mature trees, understory trees, shrubs, groundcover) are represented and allowed to grow naturally. All plants are native.	70-90% of the bank covered by undisturbed vegetation. One class may not be well represented. Disruption evident but not effecting full plant growth. Non-natives are rare (< 30%)	50-70% of the bank covered by undisturbed vegetation. Two classes of vegetation may not be well represented. Non-native vegetation may be common (30-50%).	Less than 50% of the bank covered by undisturbed vegetation or more than 2 classes are not well represented or most vegetation has been cropped. Non-native vegetation may dominate (> 50%)
SCORE (LB)	Left Bank 10 9	(8) 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 (9)	8 7 6	5 4 3	2 1 0
Comments				
10. Riparian Vegetative Zone Width (score each bank.) Zone begins at top of bank.	Average width of riparian zone > 18 meters. Unpaved footpaths may score 9 if run-off potential is negligible.	Average width of riparian zone 12-18 meters. Score high if areas < 18 meters are small or are minimally disturbed.	Average width of riparian zone 6-11 meters. Score high if areas less than 12 meters are small or are minimally disturbed.	Average width of riparian zone <6 meters. Score high if areas less than 6 meters are small or are minimally disturbed.
SCORE (LB)	Left Bank 10 9	8 7 6	5 (4) 3	2 1 0
SCORE (RB)	Right Bank 10 (9)	8 7 6	5 4 3	2 1 0
Comments				

Total Score 128 **Comparison to Ecoregion Guidelines (circle): ABOVE or BELOW**

If score is below guidelines , result of (circle): Natural Conditions or Human Disturbance

Describe Percy Priest Lake

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (FRONT)
(See Protocol E for detailed descriptions and rank information)

STATION ID: WF002	HABITAT ASSESSED BY: NJR RCM
STREAM NAME: W Fork Stones River	DATE: 7/1/14 TIME: 1145
STATION LOCATION: WF	ECOREGION: QC: Consensus Duplicate
WBID/HUC: GROUP:	ASSOCIATED LOG #:

	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Over 70% of stream reach has natural stable habitat suitable for colonization by fish and/or macroinvertebrates. Four or more productive habitats are present.	Natural stable habitat covers 40-70% of stream reach. Three or more productive habitats present. (If near 70% and more than 3 go to optimal.)	Natural stable habitat covers 20 -40% of stream reach or only 1-2 productive habitats present. (If near 40% and more than 2 go to suboptimal.)	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
2.Embeddedness of Riffles	Gravel, cobble, and boulders 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. If near 25% drop to suboptimal if riffle not layered cobble.	Gravel, cobble and boulders 25-50% surrounded by fine sediment. Niches in bottom layers of cobble compromised. If near 50% & riffles not layered cobble drop to marginal.	Gravel, cobble, and boulder s are 50-75% surrounded by fine sediment. Niche space in middle layers of cobble is starting to fill with fine sediment.	Gravel, cobble, and boulders are more than 75% surrounded by fine sediment. Niche space is reduced to a single layer or is absent.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
3. Velocity/ Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow).	Only 3 of the 4 regimes present (if fast-shallow is missing score lower). If slow-deep missing score 15.	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/depth regime. Others regimes too small or infrequent to support aquatic populations.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
4. Sediment Deposition	Sediment deposition affects less than 5% of stream bottom in quiet areas. New deposition on islands and point bars is absent or minimal.	Sediment deposition affects 5-30% of stream bottom. Slight deposition in pool or slow areas. Some new deposition on islands and point bars. Move to marginal if build-up approaches 30%.	Sediment deposition affects 30-50% of stream bottom. Sediment deposits at obstruction, constrictions and bends. Moderate pool deposition.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
5. Channel Flow Status.	Water reaches base of both lower banks and streambed is covered by water throughout reach. Minimal productive habitat is exposed.	Water covers > 75% of streambed or 25% of productive habitat is exposed.	Water covers 25-75% of streambed and/or productive habitat is mostly exposed.	Very little water in channel and mostly present as standing pools. Little or no productive habitat due to lack of water.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (BACK)

Station ID WR002 Date 7/1/14 Initials NR

	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization, dredging rock removal or 4-wheel activity (past or present) absent or minimal; natural meander pattern. NO artificial structures in reach. Upstream or downstream structures do not affect reach.	Channelization, dredging or 4-wheel activity up to 40%. Channel has stabilized. If larger reach, channelization is historic and stable. Artificial structures in or out of reach do not affect natural flow patterns.	Channelization, dredging or 4-wheel activity 40-80% (or less that has not stabilized.) Artificial structures in or out of reach may have slight affect.	Over 80% of reach channelized, dredged or affected by 4-wheelers. Instream habitat greatly altered or removed. Artificial structures have greatly affected flow pattern.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
7. Frequency of re-oxygenation zones. Use frequency of riffle or bends for category. Rank by quality.	Occurrence of re-oxygenation zones relatively frequent; ratio of distance between areas divided by average stream width <7:1.	Occurrence of re-oxygenation zones infrequent; distance between areas divided by average stream width is 7 - 15.	Occasional re-oxygenation area. The distance between areas divided by average stream width is over 15 and up to 25.	Generally all flat water or flat bedrock; little opportunity for re-oxygenation. Distance between areas divided by average stream width >25.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
8. Bank Stability (score each bank) Determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. If approaching 30% score marginal if banks steep.	Moderately unstable; 30-60 % of bank in reach has areas of erosion; high erosion potential during floods. If approaching 60% score poor if banks steep.	Unstable; many eroded area; raw areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				
9. Vegetative Protective (score each bank) includes vegetation from top of bank to base of bank. Determine left or right side by facing downstream	More than 90% of the bank covered by undisturbed vegetation. All 4 classes (mature trees, understory trees, shrubs, groundcover) are represented and allowed to grow naturally. All plants are native.	70-90% of the bank covered by undisturbed vegetation. One class may not be well represented. Disruption evident but not effecting full plant growth. Non-natives are rare (< 30%)	50-70% of the bank covered by undisturbed vegetation. Two classes of vegetation may not be well represented. Non-native vegetation may be common (30-50%).	Less than 50% of the bank covered by undisturbed vegetation or more than 2 classes are not well represented or most vegetation has been cropped. Non-native vegetation may dominate (> 50%)
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				
10. Riparian Vegetative Zone Width (score each bank.) Zone begins at top of bank.	Average width of riparian zone > 18 meters. Unpaved footpaths may score 9 if run-off potential is negligible.	Average width of riparian zone 12-18 meters. Score high if areas < 18 meters are small or are minimally disturbed.	Average width of riparian zone 6-11 meters. Score high if areas less than 12 meters are small or are minimally disturbed.	Average width of riparian zone <6 meters. Score high if areas less than 6 meters are small or are minimally disturbed.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				

Total Score 161 **Comparison to Ecoregion Guidelines (circle): ABOVE or BELOW**

If score is below guidelines , result of (circle): Natural Conditions or Human Disturbance

Describe

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (FRONT)
(See Protocol E for detailed descriptions and rank information)

STATION ID: WF003	HABITAT ASSESSED BY: NJE RGM
STREAM NAME: West Fork Stones River	DATE: 7/11/14 TIME: 1316
STATION LOCATION: WF	ECOREGION: QC: Consensus Duplicate
WBID/HUC: GROUP:	ASSOCIATED LOG #:

	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Over 70% of stream reach has natural stable habitat suitable for colonization by fish and/or macroinvertebrates. Four or more productive habitats are present.	Natural stable habitat covers 40-70% of stream reach. Three or more productive habitats present. (If near 70% and more than 3 go to optimal.)	Natural stable habitat covers 20 -40% of stream reach or only 1-2 productive habitats present. (If near 40% and more than 2 go to suboptimal.)	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
2.Embeddedness of Riffles	Gravel, cobble, and boulders 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. If near 25% drop to suboptimal if riffle not layered cobble.	Gravel, cobble and boulders 25-50% surrounded by fine sediment. Niches in bottom layers of cobble compromised. If near 50% & riffles not layered cobble drop to marginal.	Gravel, cobble, and boulder s are 50-75% surrounded by fine sediment. Niche space in middle layers of cobble is starting to fill with fine sediment.	Gravel, cobble, and boulders are more than 75% surrounded by fine sediment. Niche space is reduced to a single layer or is absent.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
3. Velocity/ Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow).	Only 3 of the 4 regimes present (if fast-shallow is missing score lower). If slow-deep missing score 15.	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/depth regime. Others regimes too small or infrequent to support aquatic populations.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
4. Sediment Deposition	Sediment deposition affects less than 5% of stream bottom in quiet areas. New deposition on islands and point bars is absent or minimal.	Sediment deposition affects 5-30% of stream bottom. Slight deposition in pool or slow areas. Some new deposition on islands and point bars. Move to marginal if build-up approaches 30%.	Sediment deposition affects 30-50% of stream bottom. Sediment deposits at obstruction, constrictions and bends. Moderate pool deposition.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
5. Channel Flow Status. .	Water reaches base of both lower banks and streambed is covered by water throughout reach. Minimal productive habitat is exposed.	Water covers > 75% of streambed or 25% of productive habitat is exposed.	Water covers 25-75% of streambed and/or productive habitat is mostly exposed.	Very little water in channel and mostly present as standing pools. Little or no productive habitat due to lack of water.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (BACK)

Station ID WF003 Date 7/1/19 Initials NJR

	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization, dredging rock removal or 4-wheel activity (past or present) absent or minimal; natural meander pattern. NO artificial structures in reach. Upstream or downstream structures do not affect reach.	Channelization, dredging or 4-wheel activity up to 40%. Channel has stabilized. If larger reach, channelization is historic and stable. Artificial structures in or out of reach do not affect natural flow patterns.	Channelization, dredging or 4-wheel activity 40-80% (or less that has not stabilized.) Artificial structures in or out of reach may have slight affect.	Over 80% of reach channelized, dredged or affected by 4-wheelers. Instream habitat greatly altered or removed. Artificial structures have greatly affected flow pattern.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
7. Frequency of re-oxygenation zones. Use frequency of riffle or bends for category. Rank by quality.	Occurrence of re-oxygenation zones relatively frequent; ratio of distance between areas divided by average stream width <7:1.	Occurrence of re-oxygenation zones infrequent; distance between areas divided by average stream width is 7 - 15.	Occasional re-oxygenation area. The distance between areas divided by average stream width is over 15 and up to 25.	Generally all flat water or flat bedrock; little opportunity for re-oxygenation. Distance between areas divided by average stream width >25.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
8. Bank Stability (score each bank) Determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. If approaching 30% score marginal if banks steep.	Moderately unstable; 30-60 % of bank in reach has areas of erosion; high erosion potential during floods, If approaching 60% score poor if banks steep.	Unstable; many eroded area; raw areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				
9. Vegetative Protective (score each bank) includes vegetation from top of bank to base of bank. Determine left or right side by facing downstream	More than 90% of the bank covered by undisturbed vegetation. All 4 classes (mature trees, understory trees, shrubs, groundcover) are represented and allowed to grow naturally. All plants are native.	70-90% of the bank covered by undisturbed vegetation. One class may not be well represented. Disruption evident but not effecting full plant growth. Non-natives are rare (< 30%)	50-70% of the bank covered by undisturbed vegetation. Two classes of vegetation may not be well represented. Non-native vegetation may be common (30-50%).	Less than 50% of the bank covered by undisturbed vegetation or more than 2 classes are not well represented or most vegetation has been cropped. Non-native vegetation may dominate (> 50%)
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				
10. Riparian Vegetative Zone Width (score each bank.) Zone begins at top of bank.	Average width of riparian zone > 18 meters. Unpaved footpaths may score 9 if run-off potential is negligible.	Average width of riparian zone 12-18 meters. Score high if areas < 18 meters are small or are minimally disturbed.	Average width of riparian zone 6-11 meters. Score high if areas less than 12 meters are small or are minimally disturbed.	Average width of riparian zone <6 meters. Score high if areas less than 6 meters are small or are minimally disturbed.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				

Total Score 158 **Comparison to Ecoregion Guidelines (circle):** **ABOVE** or **BELOW**

If score is below guidelines , result of (circle): Natural Conditions or Human Disturbance

Describe

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (FRONT)
(See Protocol E for detailed descriptions and rank information)

STATION ID: WF004	HABITAT ASSESSED BY: NJR RCM
STREAM NAME: W. Fork Stones River	DATE: 7/1/14 TIME: 1055
STATION LOCATION: W.F.	ECOREGION: QC: Consensus Duplicate
WBID/HUC: GROUP:	ASSOCIATED LOG #:

	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Over 70% of stream reach has natural stable habitat suitable for colonization by fish and/or macroinvertebrates. Four or more productive habitats are present.	Natural stable habitat covers 40-70% of stream reach. Three or more productive habitats present. (If near 70% and more than 3 go to optimal.)	Natural stable habitat covers 20 -40% of stream reach or only 1-2 productive habitats present. (If near 40% and more than 2 go to suboptimal.)	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 (18) 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
2.Embeddedness of Riffles	Gravel, cobble, and boulders 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. If near 25% drop to suboptimal if riffle not layered cobble.	Gravel, cobble and boulders 25-50% surrounded by fine sediment. Niches in bottom layers of cobble compromised. If near 50% & riffles not layered cobble drop to marginal.	Gravel, cobble, and boulder s are 50-75% surrounded by fine sediment. Niche space in middle layers of cobble is starting to fill with fine sediment.	Gravel, cobble, and boulders are more than 75% surrounded by fine sediment. Niche space is reduced to a single layer or is absent.
SCORE	20 19 18 (17) 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
3. Velocity/ Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow).	Only 3 of the 4 regimes present (if fast-shallow is missing score lower). If slow-deep missing score 15.	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/depth regime. Others regimes too small or infrequent to support aquatic populations.
SCORE	20 19 (18) 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
4. Sediment Deposition	Sediment deposition affects less than 5% of stream bottom in quiet areas. New deposition on islands and point bars is absent or minimal.	Sediment deposition affects 5-30% of stream bottom. Slight deposition in pool or slow areas. Some new deposition on islands and point bars. Move to marginal if build-up approaches 30%.	Sediment deposition affects 30-50% of stream bottom. Sediment deposits at obstruction, constrictions and bends. Moderate pool deposition.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 (17) 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
5. Channel Flow Status.	Water reaches base of both lower banks and streambed is covered by water throughout reach. Minimal productive habitat is exposed.	Water covers > 75% of streambed or 25% of productive habitat is exposed.	Water covers 25-75% of streambed and/or productive habitat is mostly exposed.	Very little water in channel and mostly present as standing pools. Little or no productive habitat due to lack of water.
SCORE	20 (19) 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (BACK)

Station ID VA F004 Date 7/11/14 Initials NR

	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization, dredging rock removal or 4-wheel activity (past or present) absent or minimal; natural meander pattern. NO artificial structures in reach. Upstream or downstream structures do not affect reach.	Channelization, dredging or 4-wheel activity up to 40%. Channel has stabilized. If larger reach, channelization is historic and stable. Artificial structures in or out of reach do not affect natural flow patterns.	Channelization, dredging or 4-wheel activity 40-80% (or less that has not stabilized.) Artificial structures in or out of reach may have slight affect.	Over 80% of reach channelized, dredged or affected by 4-wheelers. Instream habitat greatly altered or removed. Artificial structures have greatly affected flow pattern.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
7. Frequency of re-oxygenation zones. Use frequency of riffle or bends for category. Rank by quality.	Occurrence of re-oxygenation zones relatively frequent; ratio of distance between areas divided by average stream width <7:1.	Occurrence of re-oxygenation zones infrequent; distance between areas divided by average stream width is 7 - 15.	Occasional re-oxygenation area. The distance between areas divided by average stream width is over 15 and up to 25.	Generally all flat water or flat bedrock; little opportunity for re-oxygenation. Distance between areas divided by average stream width >25.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
8. Bank Stability (score each bank) Determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. If approaching 30% score marginal if banks steep.	Moderately unstable; 30-60 % of bank in reach has areas of erosion; high erosion potential during floods, If approaching 60% score poor if banks steep.	Unstable; many eroded area; raw areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				
9. Vegetative Protective (score each bank) includes vegetation from top of bank to base of bank. Determine left or right side by facing downstream	More than 90% of the bank covered by undisturbed vegetation. All 4 classes (mature trees, understory trees, shrubs, groundcover) are represented and allowed to grow naturally. All plants are native.	70-90% of the bank covered by undisturbed vegetation. One class may not be well represented. Disruption evident but not effecting full plant growth. Non-natives are rare (< 30%)	50-70% of the bank covered by undisturbed vegetation. Two classes of vegetation may not be well represented. Non-native vegetation may be common (30-50%).	Less than 50% of the bank covered by undisturbed vegetation or more than 2 classes are not well represented or most vegetation has been cropped. Non-native vegetation may dominate (> 50%)
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				
10. Riparian Vegetative Zone Width (score each bank.) Zone begins at top of bank.	Average width of riparian zone > 18 meters. Unpaved footpaths may score 9 if run-off potential is negligible.	Average width of riparian zone 12-18 meters. Score high if areas < 18 meters are small or are minimally disturbed.	Average width of riparian zone 6-11 meters. Score high if areas less than 12 meters are small or are minimally disturbed.	Average width of riparian zone <6 meters. Score high if areas less than 6 meters are small or are minimally disturbed.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				

Total Score 169 **Comparison to Ecoregion Guidelines (circle): ABOVE or BELOW**

If score is below guidelines , result of (circle): Natural Conditions or Human Disturbance

Describe

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (FRONT)
(See Protocol E for detailed descriptions and rank information)

STATION ID: WF005	HABITAT ASSESSED BY: NTC RCM
STREAM NAME: W. Fork Stones River	DATE: 7/1/14 TIME: 0955
STATION LOCATION: WF005	ECOREGION: QC: Consensus Duplicate
WBID/HUC: GROUP:	ASSOCIATED LOG #:

	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Over 70% of stream reach has natural stable habitat suitable for colonization by fish and/or macroinvertebrates. Four or more productive habitats are present.	Natural stable habitat covers 40-70% of stream reach. Three or more productive habitats present. (If near 70% and more than 3 go to optimal.)	Natural stable habitat covers 20 -40% of stream reach or only 1-2 productive habitats present. (If near 40% and more than 2 go to suboptimal.)	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
2.Embeddedness of Riffles	Gravel, cobble, and boulders 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. If near 25% drop to suboptimal if riffle not layered cobble.	Gravel, cobble and boulders 25-50% surrounded by fine sediment. Niches in bottom layers of cobble compromised. If near 50% & riffles not layered cobble drop to marginal.	Gravel, cobble, and boulder s are 50-75% surrounded by fine sediment. Niche space in middle layers of cobble is starting to fill with fine sediment.	Gravel, cobble, and boulders are more than 75% surrounded by fine sediment. Niche space is reduced to a single layer or is absent.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
3. Velocity/ Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow).	Only 3 of the 4 regimes present (if fast-shallow is missing score lower). If slow-deep missing score 15.	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/depth regime. Others regimes too small or infrequent to support aquatic populations.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
4. Sediment Deposition	Sediment deposition affects less than 5% of stream bottom in quiet areas. New deposition on islands and point bars is absent or minimal.	Sediment deposition affects 5-30% of stream bottom. Slight deposition in pool or slow areas. Some new deposition on islands and point bars. Move to marginal if build-up approaches 30%.	Sediment deposition affects 30-50% of stream bottom. Sediment deposits at obstruction, constrictions and bends. Moderate pool deposition.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
5. Channel Flow Status.	Water reaches base of both lower banks and streambed is covered by water throughout reach. Minimal productive habitat is exposed.	Water covers > 75% of streambed or 25% of productive habitat is exposed.	Water covers 25-75% of streambed and/or productive habitat is mostly exposed.	Very little water in channel and mostly present as standing pools. Little or no productive habitat due to lack of water.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (BACK)

Station ID WF005 Date 7/11/14 Initials NR

	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization, dredging rock removal or 4-wheel activity (past or present) absent or minimal; natural meander pattern. NO artificial structures in reach. Upstream or downstream structures do not affect reach.	Channelization, dredging or 4-wheel activity up to 40%. Channel has stabilized. If larger reach, channelization is historic and stable. Artificial structures in or out of reach do not affect natural flow patterns.	Channelization, dredging or 4-wheel activity 40-80% (or less that has not stabilized.) Artificial structures in or out of reach may have slight affect.	Over 80% of reach channelized, dredged or affected by 4-wheelers. Instream habitat greatly altered or removed. Artificial structures have greatly affected flow pattern.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
7. Frequency of re-oxygenation zones. Use frequency of riffle or bends for category. Rank by quality.	Occurrence of re-oxygenation zones relatively frequent; ratio of distance between areas divided by average stream width <7:1.	Occurrence of re-oxygenation zones infrequent; distance between areas divided by average stream width is 7 - 15.	Occasional re-oxygenation area. The distance between areas divided by average stream width is over 15 and up to 25.	Generally all flat water or flat bedrock; little opportunity for re-oxygenation. Distance between areas divided by average stream width >25.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
8. Bank Stability (score each bank) Determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. If approaching 30% score marginal if banks steep.	Moderately unstable; 30-60 % of bank in reach has areas of erosion; high erosion potential during floods, If approaching 60% score poor if banks steep.	Unstable; many eroded area; raw areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				
9. Vegetative Protective (score each bank) includes vegetation from top of bank to base of bank. Determine left or right side by facing downstream	More than 90% of the bank covered by undisturbed vegetation. All 4 classes (mature trees, understory trees, shrubs, groundcover) are represented and allowed to grow naturally. All plants are native.	70-90% of the bank covered by undisturbed vegetation. One class may not be well represented. Disruption evident but not effecting full plant growth. Non-natives are rare (< 30%)	50-70% of the bank covered by undisturbed vegetation. Two classes of vegetation may not be well represented. Non-native vegetation may be common (30-50%).	Less than 50% of the bank covered by undisturbed vegetation or more than 2 classes are not well represented or most vegetation has been cropped. Non-native vegetation may dominate (> 50%)
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				
10. Riparian Vegetative Zone Width (score each bank.) Zone begins at top of bank.	Average width of riparian zone > 18 meters. Unpaved footpaths may score 9 if run-off potential is negligible.	Average width of riparian zone 12-18 meters. Score high if areas < 18 meters are small or are minimally disturbed.	Average width of riparian zone 6-11 meters. Score high if areas less than 12 meters are small or are minimally disturbed.	Average width of riparian zone <6 meters. Score high if areas less than 6 meters are small or are minimally disturbed.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				

Total Score 170 **Comparison to Ecoregion Guidelines (circle):** ABOVE **or** BELOW

If score is below guidelines , result of (circle): Natural Conditions or Human Disturbance

Describe

TABLE 13. IN-SITU WATER QUALITY MEASUREMENTS

DATE (mm.dd.yy)	TIME (military)	LOCATION	LOCATION IN CHANNEL (REW, MID, LEW)	DEPTH (ft)	DO (mg/L)	TEMP (ºC)	CONDUCTIVITY (umhos/cm)	pH (S.U.)	INSTRUMENT
8/5/2015	0750	EF004	REW	0.85	5.88	26.98	0.350	6.89	SmarTROLL
8/5/2015	0854	EF005	LEW	1.42	5.41	27.08	0.347	7.44	SmarTROLL
8/5/2015	1031	EF006	MID	0.25	5.00	27.28	0.347	7.74	SmarTROLL
8/5/2015	1139	WF003	LEW	0.51	8.48	25.67	0.549	7.39	SmarTROLL
8/5/2015	1250	WF006	LEW	0.48	9.66	29.04	0.502	7.90	SmarTROLL
8/5/2015	14008	WF002	MID	1.78	9.10	26.78	0.544	7.60	SmarTROLL
8/5/2015	1542	WF007	MID	0.59	7.87	27.93	0.618	7.81	SmarTROLL
8/7/2015	0835	WF005	MID	0.86	4.99	24.32	0.362	7.16	SmarTROLL
8/7/2015	1005	WF004	MID	0.82	4.85	24.4	0.365	7.50	SmarTROLL
8/13/2015	0920	WF005	MID	0.56	6.89	24.84	0.450	7.55	SmarTROLL
8/13/2015	1055	WF004	MID	0.35	6.23	25.14	0.441	7.82	SmarTROLL
8/13/2015	1120	WF007	MID	0.90	7.96	25.45	0.556	7.90	SmarTROLL
8/13/2015	1150	WF006	MID	0.30	9.40	26.37	0.572	8.06	SmarTROLL
8/13/2015	1300	Wf003	MID	1.50	8.67	25.09	0.551	7.68	SmarTROLL
8/13/2015	1345	WF002	MID	0.91	9.76	24.86	0.557	7.80	SmarTROLL
8/13/2015	1508	EF005	MID	1.82	11.92	28.67	0.368	8.32	SmarTROLL
8/13/2015	1528	EF006	MID	0.22	10.86	27.05	0.381	8.28	SmarTROLL
8/13/2015	1600	EF004	REW	1.52	10.17	26.75	0.382	8.11	SmarTROLL

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (FRONT)
(See Protocol E for detailed descriptions and rank information)

STATION ID: WF002	HABITAT ASSESSED BY: WR RCS
STREAM NAME: W. Fork Stones	DATE: 8/05/15 TIME: 1412
STATION LOCATION:	ECOREGION: 71; QC: Consensus Duplicate
WBID/HUC: GROUP:	ASSOCIATED LOG #:

	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Over 70% of stream reach has natural stable habitat suitable for colonization by fish and/or macroinvertebrates. Four or more productive habitats are present.	Natural stable habitat covers 40-70% of stream reach. Three or more productive habitats present. (If near 70% and more than 3 go to optimal.)	Natural stable habitat covers 20 -40% of stream reach or only 1-2 productive habitats present. (If near 40% and more than 2 go to suboptimal.)	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
2.Embeddedness of Riffles	Gravel, cobble, and boulders 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. If near 25% drop to suboptimal if riffle not layered cobble.	Gravel, cobble and boulders 25-50% surrounded by fine sediment. Niches in bottom layers of cobble compromised. If near 50% & riffles not layered cobble drop to marginal.	Gravel, cobble, and boulder s are 50-75% surrounded by fine sediment. Niche space in middle layers of cobble is starting to fill with fine sediment.	Gravel, cobble, and boulders are more than 75% surrounded by fine sediment. Niche space is reduced to a single layer or is absent.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
3. Velocity/ Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow).	Only 3 of the 4 regimes present (if fast-shallow is missing score lower). If slow-deep missing score 15.	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/depth regime. Others regimes too small or infrequent to support aquatic populations.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
4. Sediment Deposition	Sediment deposition affects less than 5% of stream bottom in quiet areas. New deposition on islands and point bars is absent or minimal.	Sediment deposition affects 5-30% of stream bottom. Slight deposition in pool or slow areas. Some new deposition on islands and point bars. Move to marginal if build-up approaches 30%.	Sediment deposition affects 30-50% of stream bottom. Sediment deposits at obstruction, constrictions and bends. Moderate pool deposition.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
5. Channel Flow Status. .	Water reaches base of both lower banks and streambed is covered by water throughout reach. Minimal productive habitat is exposed.	Water covers > 75% of streambed or 25% of productive habitat is exposed.	Water covers 25-75% of streambed and/or productive habitat is mostly exposed.	Very little water in channel and mostly present as standing pools. Little or no productive habitat due to lack of water.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (BACK)

Station ID_____ Date_____ Initials_____

	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization, dredging rock removal or 4-wheel activity (past or present) absent or minimal; natural meander pattern. NO artificial structures in reach. Upstream or downstream structures do not affect reach.	Channelization, dredging or 4-wheel activity up to 40%. Channel has stabilized. If larger reach, channelization is historic and stable. Artificial structures in or out of reach do not affect natural flow patterns.	Channelization, dredging or 4-wheel activity 40-80% (or less that has not stabilized.) Artificial structures in or out of reach may have slight affect.	Over 80% of reach channelized, dredged or affected by 4-wheelers. Instream habitat greatly altered or removed. Artificial structures have greatly affected flow pattern.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
7. Frequency of re-oxygenation zones. Use frequency of riffle or bends for category. Rank by quality.	Occurrence of re-oxygenation zones relatively frequent; ratio of distance between areas divided by average stream width <7:1.	Occurrence of re-oxygenation zones infrequent; distance between areas divided by average stream width is 7 - 15.	Occasional re-oxygenation area. The distance between areas divided by average stream width is over 15 and up to 25.	Generally all flat water or flat bedrock; little opportunity for re-oxygenation. Distance between areas divided by average stream width >25.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
8. Bank Stability (score each bank) Determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. If approaching 30% score marginal if banks steep.	Moderately unstable; 30-60 % of bank in reach has areas of erosion; high erosion potential during floods, If approaching 60% score poor if banks steep.	Unstable; many eroded area; raw areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				
9. Vegetative Protective (score each bank) includes vegetation from top of bank to base of bank. Determine left or right side by facing downstream	More than 90% of the bank covered by undisturbed vegetation. All 4 classes (mature trees, understory trees, shrubs, groundcover) are represented and allowed to grow naturally. All plants are native.	70-90% of the bank covered by undisturbed vegetation. One class may not be well represented. Disruption evident but not effecting full plant growth. Non-natives are rare (< 30%)	50-70% of the bank covered by undisturbed vegetation. Two classes of vegetation may not be well represented. Non-native vegetation may be common (30-50%).	Less than 50% of the bank covered by undisturbed vegetation or more than 2 classes are not well represented or most vegetation has been cropped. Non-native vegetation may dominate (> 50%)
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				
10. Riparian Vegetative Zone Width (score each bank.) Zone begins at top of bank.	Average width of riparian zone > 18 meters. Unpaved footpaths may score 9 if run-off potential is negligible.	Average width of riparian zone 12-18 meters. Score high if areas < 18 meters are small or are minimally disturbed.	Average width of riparian zone 6-11 meters. Score high if areas less than 12 meters are small or are minimally disturbed.	Average width of riparian zone <6 meters. Score high if areas less than 6 meters are small or are minimally disturbed.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				

Total Score 154 **Comparison to Ecoregion Guidelines (circle):** **ABOVE** **or** **BELOW**

If score is below guidelines , result of (circle): Natural Conditions or Human Disturbance

Describe

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (FRONT)
(See Protocol E for detailed descriptions and rank information)

STATION ID: WF003	HABITAT ASSESSED BY: NTC RDS
STREAM NAME: W. Fork Stones	DATE: 8/5/15 TIME: 1241
STATION LOCATION:	ECOREGION: 71 QC: Consensus Duplicate
WBID/HUC: GROUP:	ASSOCIATED LOG #:

	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Over 70% of stream reach has natural stable habitat suitable for colonization by fish and/or macroinvertebrates. Four or more productive habitats are present.	Natural stable habitat covers 40-70% of stream reach. Three or more productive habitats present. (If near 70% and more than 3 go to optimal.)	Natural stable habitat covers 20 -40% of stream reach or only 1-2 productive habitats present. (If near 40% and more than 2 go to suboptimal.)	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
2.Embeddedness of Riffles	Gravel, cobble, and boulders 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. If near 25% drop to suboptimal if riffle not layered cobble.	Gravel, cobble and boulders 25-50% surrounded by fine sediment. Niches in bottom layers of cobble compromised. If near 50% & riffles not layered cobble drop to marginal.	Gravel, cobble, and boulder s are 50-75% surrounded by fine sediment. Niche space in middle layers of cobble is starting to fill with fine sediment.	Gravel, cobble, and boulders are more than 75% surrounded by fine sediment. Niche space is reduced to a single layer or is absent.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
3. Velocity/ Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow).	Only 3 of the 4 regimes present (if fast-shallow is missing score lower). If slow-deep missing score 15.	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/depth regime. Others regimes too small or infrequent to support aquatic populations.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
4. Sediment Deposition	Sediment deposition affects less than 5% of stream bottom in quiet areas. New deposition on islands and point bars is absent or minimal.	Sediment deposition affects 5-30% of stream bottom. Slight deposition in pool or slow areas. Some new deposition on islands and point bars. Move to marginal if build-up approaches 30%.	Sediment deposition affects 30-50% of stream bottom. Sediment deposits at obstruction, constrictions and bends. Moderate pool deposition.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
5. Channel Flow Status. .	Water reaches base of both lower banks and streambed is covered by water throughout reach. Minimal productive habitat is exposed.	Water covers > 75% of streambed or 25% of productive habitat is exposed.	Water covers 25-75% of streambed and/or productive habitat is mostly exposed.	Very little water in channel and mostly present as standing pools. Little or no productive habitat due to lack of water.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (BACK)

Station ID_____ Date_____ Initials_____

	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization, dredging rock removal or 4-wheel activity (past or present) absent or minimal; natural meander pattern. NO artificial structures in reach. Upstream or downstream structures do not affect reach.	Channelization, dredging or 4-wheel activity up to 40%. Channel has stabilized. If larger reach, channelization is historic and stable. Artificial structures in or out of reach do not affect natural flow patterns.	Channelization, dredging or 4-wheel activity 40-80% (or less that has not stabilized.) Artificial structures in or out of reach may have slight affect.	Over 80% of reach channelized, dredged or affected by 4-wheelers. Instream habitat greatly altered or removed. Artificial structures have greatly affected flow pattern.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
7. Frequency of re-oxygenation zones. Use frequency of riffle or bends for category. Rank by quality.	Occurrence of re-oxygenation zones relatively frequent; ratio of distance between areas divided by average stream width <7:1.	Occurrence of re-oxygenation zones infrequent; distance between areas divided by average stream width is 7 - 15.	Occasional re-oxygenation area. The distance between areas divided by average stream width is over 15 and up to 25.	Generally all flat water or flat bedrock; little opportunity for re-oxygenation. Distance between areas divided by average stream width >25.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
8. Bank Stability (score each bank) Determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. If approaching 30% score marginal if banks steep.	Moderately unstable; 30-60 % of bank in reach has areas of erosion; high erosion potential during floods, If approaching 60% score poor if banks steep.	Unstable; many eroded area; raw areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				
9. Vegetative Protective (score each bank) includes vegetation from top of bank to base of bank. Determine left or right side by facing downstream	More than 90% of the bank covered by undisturbed vegetation. All 4 classes (mature trees, understory trees, shrubs, groundcover) are represented and allowed to grow naturally. All plants are native.	70-90% of the bank covered by undisturbed vegetation. One class may not be well represented. Disruption evident but not effecting full plant growth. Non-natives are rare (< 30%)	50-70% of the bank covered by undisturbed vegetation. Two classes of vegetation may not be well represented. Non-native vegetation may be common (30-50%).	Less than 50% of the bank covered by undisturbed vegetation or more than 2 classes are not well represented or most vegetation has been cropped. Non-native vegetation may dominate (> 50%)
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				
10. Riparian Vegetative Zone Width (score each bank.) Zone begins at top of bank.	Average width of riparian zone > 18 meters. Unpaved footpaths may score 9 if run-off potential is negligible.	Average width of riparian zone 12-18 meters. Score high if areas < 18 meters are small or are minimally disturbed.	Average width of riparian zone 6-11 meters. Score high if areas less than 12 meters are small or are minimally disturbed.	Average width of riparian zone <6 meters. Score high if areas less than 6 meters are small or are minimally disturbed.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				

Total Score 161 **Comparison to Ecoregion Guidelines (circle): ABOVE or BELOW**

If score is below guidelines , result of (circle): Natural Conditions or Human Disturbance

Describe

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (FRONT)
(See Protocol E for detailed descriptions and rank information)

STATION ID: WF004	HABITAT ASSESSED BY: NR RDS
STREAM NAME: W. Fork	DATE: 8/7/15 TIME: 1005
STATION LOCATION:	ECOREGION: 71. QC: Consensus Duplicate
WBID/HUC: GROUP:	ASSOCIATED LOG #:

	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Over 70% of stream reach has natural stable habitat suitable for colonization by fish and/or macroinvertebrates. Four or more productive habitats are present.	Natural stable habitat covers 40-70% of stream reach. Three or more productive habitats present. (If near 70% and more than 3 go to optimal.)	Natural stable habitat covers 20 -40% of stream reach or only 1-2 productive habitats present. (If near 40% and more than 2 go to suboptimal.)	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 (17) 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
2.Embeddedness of Riffles	Gravel, cobble, and boulders 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. If near 25% drop to suboptimal if riffle not layered cobble.	Gravel, cobble and boulders 25-50% surrounded by fine sediment. Niches in bottom layers of cobble compromised. If near 50% & riffles not layered cobble drop to marginal.	Gravel, cobble, and boulder s are 50-75% surrounded by fine sediment. Niche space in middle layers of cobble is starting to fill with fine sediment.	Gravel, cobble, and boulders are more than 75% surrounded by fine sediment. Niche space is reduced to a single layer or is absent.
SCORE	20 19 (18) 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
3. Velocity/ Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow).	Only 3 of the 4 regimes present (if fast-shallow is missing score lower). If slow-deep missing score 15.	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/depth regime. Others regimes too small or infrequent to support aquatic populations.
SCORE	20 19 18 17 16	(15) 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
4. Sediment Deposition	Sediment deposition affects less than 5% of stream bottom in quiet areas. New deposition on islands and point bars is absent or minimal.	Sediment deposition affects 5-30% of stream bottom. Slight deposition in pool or slow areas. Some new deposition on islands and point bars. Move to marginal if build-up approaches 30%.	Sediment deposition affects 30-50% of stream bottom. Sediment deposits at obstruction, constrictions and bends. Moderate pool deposition.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 (17) 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
5. Channel Flow Status. .	Water reaches base of both lower banks and streambed is covered by water throughout reach. Minimal productive habitat is exposed.	Water covers > 75% of streambed or 25% of productive habitat is exposed.	Water covers 25-75% of streambed and/or productive habitat is mostly exposed.	Very little water in channel and mostly present as standing pools. Little or no productive habitat due to lack of water.
SCORE	20 19 (18) 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (BACK)

Station ID_____ Date_____ Initials_____

	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization, dredging rock removal or 4-wheel activity (past or present) absent or minimal; natural meander pattern. NO artificial structures in reach. Upstream or downstream structures do not affect reach.	Channelization, dredging or 4-wheel activity up to 40%. Channel has stabilized. If larger reach, channelization is historic and stable. Artificial structures in or out of reach do not affect natural flow patterns.	Channelization, dredging or 4-wheel activity 40-80% (or less that has not stabilized.) Artificial structures in or out of reach may have slight affect.	Over 80% of reach channelized, dredged or affected by 4-wheelers. Instream habitat greatly altered or removed. Artificial structures have greatly affected flow pattern.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
7. Frequency of re-oxygenation zones. Use frequency of riffle or bends for category. Rank by quality.	Occurrence of re-oxygenation zones relatively frequent; ratio of distance between areas divided by average stream width <7:1.	Occurrence of re-oxygenation zones infrequent; distance between areas divided by average stream width is 7 - 15.	Occasional re-oxygenation area. The distance between areas divided by average stream width is over 15 and up to 25.	Generally all flat water or flat bedrock; little opportunity for re-oxygenation. Distance between areas divided by average stream width >25.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
8. Bank Stability (score each bank) Determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. If approaching 30% score marginal if banks steep.	Moderately unstable; 30-60 % of bank in reach has areas of erosion; high erosion potential during floods, If approaching 60% score poor if banks steep.	Unstable; many eroded area; raw areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				
9. Vegetative Protective (score each bank) includes vegetation from top of bank to base of bank. Determine left or right side by facing downstream	More than 90% of the bank covered by undisturbed vegetation. All 4 classes (mature trees, understory trees, shrubs, groundcover) are represented and allowed to grow naturally. All plants are native.	70-90% of the bank covered by undisturbed vegetation. One class may not be well represented. Disruption evident but not effecting full plant growth. Non-natives are rare (< 30%)	50-70% of the bank covered by undisturbed vegetation. Two classes of vegetation may not be well represented. Non-native vegetation may be common (30-50%).	Less than 50% of the bank covered by undisturbed vegetation or more than 2 classes are not well represented or most vegetation has been cropped. Non-native vegetation may dominate (> 50%)
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				
10. Riparian Vegetative Zone Width (score each bank.) Zone begins at top of bank.	Average width of riparian zone > 18 meters. Unpaved footpaths may score 9 if run-off potential is negligible.	Average width of riparian zone 12-18 meters. Score high if areas < 18 meters are small or are minimally disturbed.	Average width of riparian zone 6-11 meters. Score high if areas less than 12 meters are small or are minimally disturbed.	Average width of riparian zone <6 meters. Score high if areas less than 6 meters are small or are minimally disturbed.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				

Total Score 147 **Comparison to Ecoregion Guidelines (circle):** **ABOVE** or **BELOW**

If score is below guidelines , result of (circle): Natural Conditions or Human Disturbance

Describe

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (FRONT)
(See Protocol E for detailed descriptions and rank information)

STATION ID: WF005	HABITAT ASSESSED BY: NR RUS
STREAM NAME: West Fork Stones River	DATE: 8/7/15 TIME: 0835
STATION LOCATION:	ECOREGION: QC: Consensus Duplicate
WBID/HUC: GROUP:	ASSOCIATED LOG #:

	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Over 70% of stream reach has natural stable habitat suitable for colonization by fish and/or macroinvertebrates. Four or more productive habitats are present.	Natural stable habitat covers 40-70% of stream reach. Three or more productive habitats present. (If near 70% and more than 3 go to optimal.)	Natural stable habitat covers 20 -40% of stream reach or only 1-2 productive habitats present. (If near 40% and more than 2 go to suboptimal.)	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
2.Embeddedness of Riffles	Gravel, cobble, and boulders 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. If near 25% drop to suboptimal if riffle not layered cobble.	Gravel, cobble and boulders 25-50% surrounded by fine sediment. Niches in bottom layers of cobble compromised. If near 50% & riffles not layered cobble drop to marginal.	Gravel, cobble, and boulder s are 50-75% surrounded by fine sediment. Niche space in middle layers of cobble is starting to fill with fine sediment.	Gravel, cobble, and boulders are more than 75% surrounded by fine sediment. Niche space is reduced to a single layer or is absent.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
3. Velocity/ Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow).	Only 3 of the 4 regimes present (if fast-shallow is missing score lower). If slow-deep missing score 15.	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/depth regime. Others regimes too small or infrequent to support aquatic populations.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
4. Sediment Deposition	Sediment deposition affects less than 5% of stream bottom in quiet areas. New deposition on islands and point bars is absent or minimal.	Sediment deposition affects 5-30% of stream bottom. Slight deposition in pool or slow areas. Some new deposition on islands and point bars. Move to marginal if build-up approaches 30%.	Sediment deposition affects 30-50% of stream bottom. Sediment deposits at obstruction, constrictions and bends. Moderate pool deposition.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
5. Channel Flow Status. .	Water reaches base of both lower banks and streambed is covered by water throughout reach. Minimal productive habitat is exposed.	Water covers > 75% of streambed or 25% of productive habitat is exposed.	Water covers 25-75% of streambed and/or productive habitat is mostly exposed.	Very little water in channel and mostly present as standing pools. Little or no productive habitat due to lack of water.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (BACK)

Station ID _____ Date _____ Initials _____

	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization, dredging rock removal or 4-wheel activity (past or present) absent or minimal; natural meander pattern. NO artificial structures in reach. Upstream or downstream structures do not affect reach.	Channelization, dredging or 4-wheel activity up to 40%. Channel has stabilized. If larger reach, channelization is historic and stable. Artificial structures in or out of reach do not affect natural flow patterns.	Channelization, dredging or 4-wheel activity 40-80% (or less that has not stabilized.) Artificial structures in or out of reach may have slight affect.	Over 80% of reach channelized, dredged or affected by 4-wheelers. Instream habitat greatly altered or removed. Artificial structures have greatly affected flow pattern.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
7. Frequency of re-oxygenation zones. Use frequency of riffle or bends for category. Rank by quality.	Occurrence of re-oxygenation zones relatively frequent; ratio of distance between areas divided by average stream width <7:1.	Occurrence of re-oxygenation zones infrequent; distance between areas divided by average stream width is 7 - 15.	Occasional re-oxygenation area. The distance between areas divided by average stream width is over 15 and up to 25.	Generally all flat water or flat bedrock; little opportunity for re-oxygenation. Distance between areas divided by average stream width >25.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
8. Bank Stability (score each bank) Determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. If approaching 30% score marginal if banks steep.	Moderately unstable; 30-60 % of bank in reach has areas of erosion; high erosion potential during floods, If approaching 60% score poor if banks steep.	Unstable; many eroded area; raw areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				
9. Vegetative Protective (score each bank) includes vegetation from top of bank to base of bank. Determine left or right side by facing downstream	More than 90% of the bank covered by undisturbed vegetation. All 4 classes (mature trees, understory trees, shrubs, groundcover) are represented and allowed to grow naturally. All plants are native.	70-90% of the bank covered by undisturbed vegetation. One class may not be well represented. Disruption evident but not effecting full plant growth. Non-natives are rare (< 30%)	50-70% of the bank covered by undisturbed vegetation. Two classes of vegetation may not be well represented. Non-native vegetation may be common (30-50%).	Less than 50% of the bank covered by undisturbed vegetation or more than 2 classes are not well represented or most vegetation has been cropped. Non-native vegetation may dominate (> 50%)
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				
10. Riparian Vegetative Zone Width (score each bank.) Zone begins at top of bank.	Average width of riparian zone > 18 meters. Unpaved footpaths may score 9 if run-off potential is negligible.	Average width of riparian zone 12-18 meters. Score high if areas < 18 meters are small or are minimally disturbed.	Average width of riparian zone 6-11 meters. Score high if areas less than 12 meters are small or are minimally disturbed.	Average width of riparian zone <6 meters. Score high if areas less than 6 meters are small or are minimally disturbed.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				

Total Score 150 **Comparison to Ecoregion Guidelines (circle):** **ABOVE** or **BELOW**

If score is below guidelines , result of (circle): Natural Conditions or Human Disturbance

Describe

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (FRONT)
(See Protocol E for detailed descriptions and rank information)

STATION ID: WF006	HABITAT ASSESSED BY: NTR RCB
STREAM NAME: W. Fork Stones	DATE: 8/5/15 TIME: 1254
STATION LOCATION:	ECOREGION: 71i QC: Consensus Duplicate
WBID/HUC: GROUP:	ASSOCIATED LOG #:

	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Over 70% of stream reach has natural stable habitat suitable for colonization by fish and/or macroinvertebrates. Four or more productive habitats are present.	Natural stable habitat covers 40-70% of stream reach. Three or more productive habitats present. (If near 70% and more than 3 go to optimal.)	Natural stable habitat covers 20 -40% of stream reach or only 1-2 productive habitats present. (If near 40% and more than 2 go to suboptimal.)	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
2.Embeddedness of Riffles	Gravel, cobble, and boulders 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. If near 25% drop to suboptimal if riffle not layered cobble.	Gravel, cobble and boulders 25-50% surrounded by fine sediment. Niches in bottom layers of cobble compromised. If near 50% & riffles not layered cobble drop to marginal.	Gravel, cobble, and boulder s are 50-75% surrounded by fine sediment. Niche space in middle layers of cobble is starting to fill with fine sediment.	Gravel, cobble, and boulders are more than 75% surrounded by fine sediment. Niche space is reduced to a single layer or is absent.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
3. Velocity/ Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow).	Only 3 of the 4 regimes present (if fast-shallow is missing score lower). If slow-deep missing score 15.	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/depth regime. Others regimes too small or infrequent to support aquatic populations.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
4. Sediment Deposition	Sediment deposition affects less than 5% of stream bottom in quiet areas. New deposition on islands and point bars is absent or minimal.	Sediment deposition affects 5-30% of stream bottom. Slight deposition in pool or slow areas. Some new deposition on islands and point bars. Move to marginal if build-up approaches 30%.	Sediment deposition affects 30-50% of stream bottom. Sediment deposits at obstruction, constrictions and bends. Moderate pool deposition.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
5. Channel Flow Status. .	Water reaches base of both lower banks and streambed is covered by water throughout reach. Minimal productive habitat is exposed.	Water covers > 75% of streambed or 25% of productive habitat is exposed.	Water covers 25-75% of streambed and/or productive habitat is mostly exposed.	Very little water in channel and mostly present as standing pools. Little or no productive habitat due to lack of water.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (BACK)

Station ID_____ Date_____ Initials_____

	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization, dredging rock removal or 4-wheel activity (past or present) absent or minimal; natural meander pattern. NO artificial structures in reach. Upstream or downstream structures do not affect reach.	Channelization, dredging or 4-wheel activity up to 40%. Channel has stabilized. If larger reach, channelization is historic and stable. Artificial structures in or out of reach do not affect natural flow patterns.	Channelization, dredging or 4-wheel activity 40-80% (or less that has not stabilized.) Artificial structures in or out of reach may have slight affect.	Over 80% of reach channelized, dredged or affected by 4-wheelers. Instream habitat greatly altered or removed. Artificial structures have greatly affected flow pattern.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
7. Frequency of re-oxygenation zones. Use frequency of riffle or bends for category. Rank by quality.	Occurrence of re-oxygenation zones relatively frequent; ratio of distance between areas divided by average stream width <7:1.	Occurrence of re-oxygenation zones infrequent; distance between areas divided by average stream width is 7 - 15.	Occasional re-oxygenation area. The distance between areas divided by average stream width is over 15 and up to 25.	Generally all flat water or flat bedrock; little opportunity for re-oxygenation. Distance between areas divided by average stream width >25.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
8. Bank Stability (score each bank) Determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. If approaching 30% score marginal if banks steep.	Moderately unstable; 30-60 % of bank in reach has areas of erosion; high erosion potential during floods, If approaching 60% score poor if banks steep.	Unstable; many eroded area; raw areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				
9. Vegetative Protective (score each bank) includes vegetation from top of bank to base of bank. Determine left or right side by facing downstream	More than 90% of the bank covered by undisturbed vegetation. All 4 classes (mature trees, understory trees, shrubs, groundcover) are represented and allowed to grow naturally. All plants are native.	70-90% of the bank covered by undisturbed vegetation. One class may not be well represented. Disruption evident but not effecting full plant growth. Non-natives are rare (< 30%)	50-70% of the bank covered by undisturbed vegetation. Two classes of vegetation may not be well represented. Non-native vegetation may be common (30-50%).	Less than 50% of the bank covered by undisturbed vegetation or more than 2 classes are not well represented or most vegetation has been cropped. Non-native vegetation may dominate (> 50%)
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				
10. Riparian Vegetative Zone Width (score each bank.) Zone begins at top of bank.	Average width of riparian zone > 18 meters. Unpaved footpaths may score 9 if run-off potential is negligible.	Average width of riparian zone 12-18 meters. Score high if areas < 18 meters are small or are minimally disturbed.	Average width of riparian zone 6-11 meters. Score high if areas less than 12 meters are small or are minimally disturbed.	Average width of riparian zone <6 meters. Score high if areas less than 6 meters are small or are minimally disturbed.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				

Total Score 155 **Comparison to Ecoregion Guidelines (circle):** **ABOVE** **or** **BELOW**

If score is below guidelines , result of (circle): Natural Conditions or Human Disturbance

Describe

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (FRONT)
(See Protocol E for detailed descriptions and rank information)

STATION ID: WF007	HABITAT ASSESSED BY: NRC ROS
STREAM NAME: W. Fork Stones River	DATE: 8/15/15 TIME: 1542
STATION LOCATION:	ECOREGION: 71 QC: Consensus Duplicate
WBID/HUC: GROUP:	ASSOCIATED LOG #:

	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Over 70% of stream reach has natural stable habitat suitable for colonization by fish and/or macroinvertebrates. Four or more productive habitats are present.	Natural stable habitat covers 40-70% of stream reach. Three or more productive habitats present. (If near 70% and more than 3 go to optimal.)	Natural stable habitat covers 20 -40% of stream reach or only 1-2 productive habitats present. (If near 40% and more than 2 go to suboptimal.)	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
2.Embeddedness of Riffles	Gravel, cobble, and boulders 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. If near 25% drop to suboptimal if riffle not layered cobble.	Gravel, cobble and boulders 25-50% surrounded by fine sediment. Niches in bottom layers of cobble compromised. If near 50% & riffles not layered cobble drop to marginal.	Gravel, cobble, and boulder s are 50-75% surrounded by fine sediment. Niche space in middle layers of cobble is starting to fill with fine sediment.	Gravel, cobble, and boulders are more than 75% surrounded by fine sediment. Niche space is reduced to a single layer or is absent.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
3. Velocity/ Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow).	Only 3 of the 4 regimes present (if fast-shallow is missing score lower). If slow-deep missing score 15.	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/depth regime. Others regimes too small or infrequent to support aquatic populations.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
4. Sediment Deposition	Sediment deposition affects less than 5% of stream bottom in quiet areas. New deposition on islands and point bars is absent or minimal.	Sediment deposition affects 5-30% of stream bottom. Slight deposition in pool or slow areas. Some new deposition on islands and point bars. Move to marginal if build-up approaches 30%.	Sediment deposition affects 30-50% of stream bottom. Sediment deposits at obstruction, constrictions and bends. Moderate pool deposition.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
5. Channel Flow Status. .	Water reaches base of both lower banks and streambed is covered by water throughout reach. Minimal productive habitat is exposed.	Water covers > 75% of streambed or 25% of productive habitat is exposed.	Water covers 25-75% of streambed and/or productive habitat is mostly exposed.	Very little water in channel and mostly present as standing pools. Little or no productive habitat due to lack of water.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (BACK)

Station ID_____ Date_____ Initials_____

	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization, dredging rock removal or 4-wheel activity (past or present) absent or minimal; natural meander pattern. NO artificial structures in reach. Upstream or downstream structures do not affect reach.	Channelization, dredging or 4-wheel activity up to 40%. Channel has stabilized. If larger reach, channelization is historic and stable. Artificial structures in or out of reach do not affect natural flow patterns.	Channelization, dredging or 4-wheel activity 40-80% (or less that has not stabilized.) Artificial structures in or out of reach may have slight affect.	Over 80% of reach channelized, dredged or affected by 4-wheelers. Instream habitat greatly altered or removed. Artificial structures have greatly affected flow pattern.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments			Upstream low water dam	
7. Frequency of re-oxygenation zones. Use frequency of riffle or bends for category. Rank by quality.	Occurrence of re-oxygenation zones relatively frequent; ratio of distance between areas divided by average stream width <7:1.	Occurrence of re-oxygenation zones infrequent; distance between areas divided by average stream width is 7 - 15.	Occasional re-oxygenation area. The distance between areas divided by average stream width is over 15 and up to 25.	Generally all flat water or flat bedrock; little opportunity for re-oxygenation. Distance between areas divided by average stream width >25.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
8. Bank Stability (score each bank) Determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. If approaching 30% score marginal if banks steep.	Moderately unstable; 30-60 % of bank in reach has areas of erosion; high erosion potential during floods, If approaching 60% score poor if banks steep.	Unstable; many eroded area; raw areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				
9. Vegetative Protective (score each bank) includes vegetation from top of bank to base of bank. Determine left or right side by facing downstream	More than 90% of the bank covered by undisturbed vegetation. All 4 classes (mature trees, understory trees, shrubs, groundcover) are represented and allowed to grow naturally. All plants are native.	70-90% of the bank covered by undisturbed vegetation. One class may not be well represented. Disruption evident but not effecting full plant growth. Non-natives are rare (< 30%)	50-70% of the bank covered by undisturbed vegetation. Two classes of vegetation may not be well represented. Non-native vegetation may be common (30-50%).	Less than 50% of the bank covered by undisturbed vegetation or more than 2 classes are not well represented or most vegetation has been cropped. Non-native vegetation may dominate (> 50%)
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				
10. Riparian Vegetative Zone Width (score each bank.) Zone begins at top of bank.	Average width of riparian zone > 18 meters. Unpaved footpaths may score 9 if run-off potential is negligible.	Average width of riparian zone 12-18 meters. Score high if areas < 18 meters are small or are minimally disturbed.	Average width of riparian zone 6-11 meters. Score high if areas less than 12 meters are small or are minimally disturbed.	Average width of riparian zone <6 meters. Score high if areas less than 6 meters are small or are minimally disturbed.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				

Total Score 47 **Comparison to Ecoregion Guidelines (circle):** **ABOVE** or **BELOW**

If score is below guidelines , result of (circle): Natural Conditions or Human Disturbance

Describe

NJC
JWM

8/14/15

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (FRONT)
(See Protocol E for detailed descriptions and rank information)

STATION ID: EF004	HABITAT ASSESSED BY: NJC RDS
STREAM NAME: E. Fork Stones	DATE: 8/5/15 TIME: 0754
STATION LOCATION:	ECOREGION: 71J QC: Consensus Duplicate
WBID/HUC: GROUP:	ASSOCIATED LOG #:

	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Over 70% of stream reach has natural stable habitat suitable for colonization by fish and/or macroinvertebrates. Four or more productive habitats are present.	Natural stable habitat covers 40-70% of stream reach. Three or more productive habitats present. (If near 70% and more than 3 go to optimal.)	Natural stable habitat covers 20 -40% of stream reach or only 1-2 productive habitats present. (If near 40% and more than 2 go to suboptimal.)	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
2.Embeddedness of Riffles	Gravel, cobble, and boulders 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. If near 25% drop to suboptimal if riffle not layered cobble.	Gravel, cobble and boulders 25-50% surrounded by fine sediment. Niches in bottom layers of cobble compromised. If near 50% & riffles not layered cobble drop to marginal.	Gravel, cobble, and boulder s are 50-75% surrounded by fine sediment. Niche space in middle layers of cobble is starting to fill with fine sediment.	Gravel, cobble, and boulders are more than 75% surrounded by fine sediment. Niche space is reduced to a single layer or is absent.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
3. Velocity/ Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow).	Only 3 of the 4 regimes present (if fast-shallow is missing score lower). If slow-deep missing score 15.	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/depth regime. Others regimes too small or infrequent to support aquatic populations.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
4. Sediment Deposition	Sediment deposition affects less than 5% of stream bottom in quiet areas. New deposition on islands and point bars is absent or minimal.	Sediment deposition affects 5-30% of stream bottom. Slight deposition in pool or slow areas. Some new deposition on islands and point bars. Move to marginal if build-up approaches 30%.	Sediment deposition affects 30-50% of stream bottom. Sediment deposits at obstruction, constrictions and bends. Moderate pool deposition.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
5. Channel Flow Status. .	Water reaches base of both lower banks and streambed is covered by water throughout reach. Minimal productive habitat is exposed.	Water covers > 75% of streambed or 25% of productive habitat is exposed.	Water covers 25-75% of streambed and/or productive habitat is mostly exposed.	Very little water in channel and mostly present as standing pools. Little or no productive habitat due to lack of water.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (BACK)

Station ID _____ Date _____ Initials _____

	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization, dredging rock removal or 4-wheel activity (past or present) absent or minimal; natural meander pattern. NO artificial structures in reach. Upstream or downstream structures do not affect reach.	Channelization, dredging or 4-wheel activity up to 40%. Channel has stabilized. If larger reach, channelization is historic and stable. Artificial structures in or out of reach do not affect natural flow patterns.	Channelization, dredging or 4-wheel activity 40-80% (or less that has not stabilized.) Artificial structures in or out of reach may have slight affect.	Over 80% of reach channelized, dredged or affected by 4-wheelers. Instream habitat greatly altered or removed. Artificial structures have greatly affected flow pattern.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
7. Frequency of re-oxygenation zones. Use frequency of riffle or bends for category. Rank by quality.	Occurrence of re-oxygenation zones relatively frequent; ratio of distance between areas divided by average stream width <7:1.	Occurrence of re-oxygenation zones infrequent; distance between areas divided by average stream width is 7 - 15.	Occasional re-oxygenation area. The distance between areas divided by average stream width is over 15 and up to 25.	Generally all flat water or flat bedrock; little opportunity for re-oxygenation. Distance between areas divided by average stream width >25.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
8. Bank Stability (score each bank) Determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. If approaching 30% score marginal if banks steep.	Moderately unstable; 30-60 % of bank in reach has areas of erosion; high erosion potential during floods. If approaching 60% score poor if banks steep.	Unstable; many eroded area; raw areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				
9. Vegetative Protective (score each bank) includes vegetation from top of bank to base of bank. Determine left or right side by facing downstream	More than 90% of the bank covered by undisturbed vegetation. All 4 classes (mature trees, understory trees, shrubs, groundcover) are represented and allowed to grow naturally. All plants are native.	70-90% of the bank covered by undisturbed vegetation. One class may not be well represented. Disruption evident but not effecting full plant growth. Non-natives are rare (< 30%)	50-70% of the bank covered by undisturbed vegetation. Two classes of vegetation may not be well represented. Non-native vegetation may be common (30-50%).	Less than 50% of the bank covered by undisturbed vegetation or more than 2 classes are not well represented or most vegetation has been cropped. Non-native vegetation may dominate (> 50%)
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				
10. Riparian Vegetative Zone Width (score each bank.) Zone begins at top of bank.	Average width of riparian zone > 18 meters. Unpaved footpaths may score 9 if run-off potential is negligible.	Average width of riparian zone 12-18 meters. Score high if areas < 18 meters are small or are minimally disturbed.	Average width of riparian zone 6-11 meters. Score high if areas less than 12 meters are small or are minimally disturbed.	Average width of riparian zone <6 meters. Score high if areas less than 6 meters are small or are minimally disturbed.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				

Total Score 111 **Comparison to Ecoregion Guidelines (circle): ABOVE or BELOW**

If score is below guidelines , result of (circle): Natural Conditions or Human Disturbance

Describe Impacted by Percy Priest Little flow in reach.

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (FRONT)
(See Protocol E for detailed descriptions and rank information)

STATION ID: EF005	HABITAT ASSESSED BY: NSC ROS
STREAM NAME: East Fork Stones River	DATE: 8/5/15 TIME: 0912
STATION LOCATION:	ECOREGION: MI QC: Consensus Duplicate
WBID/HUC: GROUP:	ASSOCIATED LOG #:

	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Over 70% of stream reach has natural stable habitat suitable for colonization by fish and/or macroinvertebrates. Four or more productive habitats are present.	Natural stable habitat covers 40-70% of stream reach. Three or more productive habitats present. (If near 70% and more than 3 go to optimal.)	Natural stable habitat covers 20 -40% of stream reach or only 1-2 productive habitats present. (If near 40% and more than 2 go to suboptimal.)	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
2.Embeddedness of Riffles	Gravel, cobble, and boulders 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. If near 25% drop to suboptimal if riffle not layered cobble.	Gravel, cobble and boulders 25-50% surrounded by fine sediment. Niches in bottom layers of cobble compromised. If near 50% & riffles not layered cobble drop to marginal.	Gravel, cobble, and boulder s are 50-75% surrounded by fine sediment. Niche space in middle layers of cobble is starting to fill with fine sediment.	Gravel, cobble, and boulders are more than 75% surrounded by fine sediment. Niche space is reduced to a single layer or is absent.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
3. Velocity/ Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow).	Only 3 of the 4 regimes present (if fast-shallow is missing score lower). If slow-deep missing score 15.	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/depth regime. Others regimes too small or infrequent to support aquatic populations.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
4. Sediment Deposition	Sediment deposition affects less than 5% of stream bottom in quiet areas. New deposition on islands and point bars is absent or minimal.	Sediment deposition affects 5-30% of stream bottom. Slight deposition in pool or slow areas. Some new deposition on islands and point bars. Move to marginal if build-up approaches 30%.	Sediment deposition affects 30-50% of stream bottom. Sediment deposits at obstruction, constrictions and bends. Moderate pool deposition.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
5. Channel Flow Status. .	Water reaches base of both lower banks and streambed is covered by water throughout reach. Minimal productive habitat is exposed.	Water covers > 75% of streambed or 25% of productive habitat is exposed.	Water covers 25-75% of streambed and/or productive habitat is mostly exposed.	Very little water in channel and mostly present as standing pools. Little or no productive habitat due to lack of water.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (BACK)

Station ID_____ Date_____ Initials_____

	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization, dredging rock removal or 4-wheel activity (past or present) absent or minimal; natural meander pattern. NO artificial structures in reach. Upstream or downstream structures do not affect reach.	Channelization, dredging or 4-wheel activity up to 40%. Channel has stabilized. If larger reach, channelization is historic and stable. Artificial structures in or out of reach do not affect natural flow patterns.	Channelization, dredging or 4-wheel activity 40-80% (or less that has not stabilized.) Artificial structures in or out of reach may have slight affect.	Over 80% of reach channelized, dredged or affected by 4-wheelers. Instream habitat greatly altered or removed. Artificial structures have greatly affected flow pattern.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
7. Frequency of re-oxygenation zones. Use frequency of riffle or bends for category. Rank by quality.	Occurrence of re-oxygenation zones relatively frequent; ratio of distance between areas divided by average stream width <7:1.	Occurrence of re-oxygenation zones infrequent; distance between areas divided by average stream width is 7 - 15.	Occasional re-oxygenation area. The distance between areas divided by average stream width is over 15 and up to 25.	Generally all flat water or flat bedrock; little opportunity for re-oxygenation. Distance between areas divided by average stream width >25.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
8. Bank Stability (score each bank) Determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. If approaching 30% score marginal if banks steep.	Moderately unstable; 30-60 % of bank in reach has areas of erosion; high erosion potential during floods, If approaching 60% score poor if banks steep.	Unstable; many eroded area; raw areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				
9. Vegetative Protective (score each bank) includes vegetation from top of bank to base of bank. Determine left or right side by facing downstream	More than 90% of the bank covered by undisturbed vegetation. All 4 classes (mature trees, understory trees, shrubs, groundcover) are represented and allowed to grow naturally. All plants are native.	70-90% of the bank covered by undisturbed vegetation. One class may not be well represented. Disruption evident but not effecting full plant growth. Non-natives are rare (< 30%)	50-70% of the bank covered by undisturbed vegetation. Two classes of vegetation may not be well represented. Non-native vegetation may be common (30-50%).	Less than 50% of the bank covered by undisturbed vegetation or more than 2 classes are not well represented or most vegetation has been cropped. Non-native vegetation may dominate (> 50%)
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				
10. Riparian Vegetative Zone Width (score each bank.) Zone begins at top of bank.	Average width of riparian zone > 18 meters. Unpaved footpaths may score 9 if run-off potential is negligible.	Average width of riparian zone 12-18 meters. Score high if areas < 18 meters are small or are minimally disturbed.	Average width of riparian zone 6-11 meters. Score high if areas less than 12 meters are small or are minimally disturbed.	Average width of riparian zone <6 meters. Score high if areas less than 6 meters are small or are minimally disturbed.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				

Total Score 137 **Comparison to Ecoregion Guidelines (circle):** **ABOVE** **or** **BELOW**

If score is below guidelines , result of (circle): Natural Conditions or Human Disturbance

Describe

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (FRONT)
(See Protocol E for detailed descriptions and rank information)

STATION ID: EF006	HABITAT ASSESSED BY: NTL RDS
STREAM NAME: E. Fork Stones	DATE: 8/15 TIME: 1034
STATION LOCATION:	ECOREGION: QC: Consensus Duplicate
WBID/HUC: GROUP:	ASSOCIATED LOG #:

	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Over 70% of stream reach has natural stable habitat suitable for colonization by fish and/or macroinvertebrates. Four or more productive habitats are present.	Natural stable habitat covers 40-70% of stream reach. Three or more productive habitats present. (If near 70% and more than 3 go to optimal.)	Natural stable habitat covers 20 -40% of stream reach or only 1-2 productive habitats present. (If near 40% and more than 2 go to suboptimal.)	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
2.Embeddedness of Riffles	Gravel, cobble, and boulders 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space. If near 25% drop to suboptimal if riffle not layered cobble.	Gravel, cobble and boulders 25-50% surrounded by fine sediment. Niches in bottom layers of cobble compromised. If near 50% & riffles not layered cobble drop to marginal.	Gravel, cobble, and boulder s are 50-75% surrounded by fine sediment. Niche space in middle layers of cobble is starting to fill with fine sediment.	Gravel, cobble, and boulders are more than 75% surrounded by fine sediment. Niche space is reduced to a single layer or is absent.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
3. Velocity/ Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow).	Only 3 of the 4 regimes present (if fast-shallow is missing score lower). If slow-deep missing score 15.	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/depth regime. Others regimes too small or infrequent to support aquatic populations.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
4. Sediment Deposition	Sediment deposition affects less than 5% of stream bottom in quiet areas. New deposition on islands and point bars is absent or minimal.	Sediment deposition affects 5-30% of stream bottom. Slight deposition in pool or slow areas. Some new deposition on islands and point bars. Move to marginal if build-up approaches 30%.	Sediment deposition affects 30-50% of stream bottom. Sediment deposits at obstruction, constrictions and bends. Moderate pool deposition.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
5. Channel Flow Status. .	Water reaches base of both lower banks and streambed is covered by water throughout reach. Minimal productive habitat is exposed.	Water covers > 75% of streambed or 25% of productive habitat is exposed.	Water covers 25-75% of streambed and/or productive habitat is mostly exposed.	Very little water in channel and mostly present as standing pools. Little or no productive habitat due to lack of water.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				

HABITAT ASSESSMENT FIELD SHEET- MODERATE TO HIGH GRADIENT STREAMS (BACK)

Station ID_____ Date_____ Initials_____

	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization, dredging rock removal or 4-wheel activity (past or present) absent or minimal; natural meander pattern. NO artificial structures in reach. Upstream or downstream structures do not affect reach.	Channelization, dredging or 4-wheel activity up to 40%. Channel has stabilized. If larger reach, channelization is historic and stable. Artificial structures in or out of reach do not affect natural flow patterns.	Channelization, dredging or 4-wheel activity 40-80% (or less that has not stabilized.) Artificial structures in or out of reach may have slight affect.	Over 80% of reach channelized, dredged or affected by 4-wheelers. Instream habitat greatly altered or removed. Artificial structures have greatly affected flow pattern.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
7. Frequency of re-oxygenation zones. Use frequency of riffle or bends for category. Rank by quality.	Occurrence of re-oxygenation zones relatively frequent; ratio of distance between areas divided by average stream width <7:1.	Occurrence of re-oxygenation zones infrequent; distance between areas divided by average stream width is 7 - 15.	Occasional re-oxygenation area. The distance between areas divided by average stream width is over 15 and up to 25.	Generally all flat water or flat bedrock; little opportunity for re-oxygenation. Distance between areas divided by average stream width >25.
SCORE	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1
Comments				
8. Bank Stability (score each bank) Determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion. If approaching 30% score marginal if banks steep.	Moderately unstable; 30-60 % of bank in reach has areas of erosion; high erosion potential during floods, If approaching 60% score poor if banks steep.	Unstable; many eroded area; raw areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				
9. Vegetative Protective (score each bank) includes vegetation from top of bank to base of bank. Determine left or right side by facing downstream	More than 90% of the bank covered by undisturbed vegetation. All 4 classes (mature trees, understory trees, shrubs, groundcover) are represented and allowed to grow naturally. All plants are native.	70-90% of the bank covered by undisturbed vegetation. One class may not be well represented. Disruption evident but not effecting full plant growth. Non-natives are rare (< 30%)	50-70% of the bank covered by undisturbed vegetation. Two classes of vegetation may not be well represented. Non-native vegetation may be common (30-50%).	Less than 50% of the bank covered by undisturbed vegetation or more than 2 classes are not well represented or most vegetation has been cropped. Non-native vegetation may dominate (> 50%)
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				
10. Riparian Vegetative Zone Width (score each bank.) Zone begins at top of bank.	Average width of riparian zone > 18 meters. Unpaved footpaths may score 9 if run-off potential is negligible.	Average width of riparian zone 12-18 meters. Score high if areas < 18 meters are small or are minimally disturbed.	Average width of riparian zone 6-11 meters. Score high if areas less than 12 meters are small or are minimally disturbed.	Average width of riparian zone <6 meters. Score high if areas less than 6 meters are small or are minimally disturbed.
SCORE (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
Comments				

Total Score 163 **Comparison to Ecoregion Guidelines (circle):** **ABOVE** **or** **BELOW**

If score is below guidelines , result of (circle): Natural Conditions or Human Disturbance

Describe

APPENDIX 5

MACROBENTHIC DATA COLLECTED AND CALCULATIONS

MACROBENTHOS TAXA COLLECTED AT EF001 -2014

Class	Order	Family	Genus	Count
CLITELLATA	TUBIFICIDA	NAIDIDAE	NAIS	3
CLITELLATA	TUBIFICIDA	NAIDIDAE	STYLARIA	2
INSECTA	CLADOCERA	DAPHNIIDAE	UNID. DAPHNIID SP	11
INSECTA	COLEOPTERA	SCIRTIDAE	CYPHON	11
INSECTA	DIPTERA	CHIRONOMIDAE	UNID. CHIRONOMID SP	12
INSECTA	DIPTERA	CHIRONOMIDAE	ABLABESMYIA	1
INSECTA	DIPTERA	CHIRONOMIDAE	DIRCROTENDIPES	1
INSECTA	DIPTERA	CHIRONOMIDAE	GLYPOTENDIPES	13
INSECTA	DIPTERA	CHIRONOMIDAE	NANOCLADIUS	3
INSECTA	DIPTERA	CHIRONOMIDAE	POLYPEDILUM	5
INSECTA	EPHEMEROPTERA	BAETIDAE	UNID. BAETID SP	1
INSECTA	HEMIPTERA	MESOVELIIDAE	MESOVELIA	3
INSECTA	HEMIPTERA	VELIIDAE	MICROVELIA	4
INSECTA	ODONATA	COENAGRIONIDAE	ENALLAGMA	5
INSECTA	TRICHOPTERA	HYDROPSYCHIDAE	CHEUMATOPSYCHE	1

MACROBENTHOS TAXA COLLECTED AT EF002 -2014

Class	Order	Family	Genus	Count
CLITELLATA	TUBIFICIDA	NAIDIDAE	UNID. NAIDID SP	1
CLITELLATA	TUBIFICIDA	NAIDIDAE	ILYODRILUS	1
INSECTA	COLEOPTERA	HALIPLIDAE	PELTODYTES	1
INSECTA	COLEOPTERA	SCIRTIDAE	CYPHON	4
INSECTA	COPEPODA		UNID. COPEPOD SP	1
INSECTA	DIPTERA	CERATOPOGONIDAE	ATRICHOPOGON	2
INSECTA	DIPTERA	CHIRONOMIDAE	UNID. CHIRONOMID SP	1
INSECTA	DIPTERA	CHIRONOMIDAE	DIRCROTENDIPES	3
INSECTA	DIPTERA	CHIRONOMIDAE	GLYPOTENDIPES	3
INSECTA	EPHEMEROPTERA		UNID. EPHEMEROPTERA SP	1
INSECTA	HEMIPTERA	VELIIDAE	UNID. VELIID SP	3
INSECTA	ODONATA	COENAGRIONIDAE	UNID. COENAGRIONID SP	1

MACROBENTHOS TAXA COLLECTED AT EF003 -2014

Class	Order	Family	Genus	Count
CLITELLATA	TUBIFICIDA	NAIDIDAE	NAIS	13
CLITELLATA	TUBIFICIDA	NAIDIDAE	SLAVINA	1
INSECTA	BASOMMATOPHORA	HYDROBIIDAE	UNID. HYDROBIID SP	1
INSECTA	BASOMMATOPHORA	LYMNAEIDAE	LYMNAEA	5
INSECTA	BASOMMATOPHORA	PLANORBIDAE	UNID. PLANORBID SP	1
INSECTA	CLADOCERA	DAPHNIIDAE	UNID. DAPHNIID SP	3
INSECTA	COLEOPTERA	ELMIDAE	ANCYRONYX	1
INSECTA	COLEOPTERA	ELMIDAE	STENELMIS	1
INSECTA	COLEOPTERA	HYDROPHILIDAE	TROPISTERNUS	1
INSECTA	COLEOPTERA	SCIRTIDAE	CYPHON	23
INSECTA	COLEOPTERA	STAPHYLINIDAE	UNID. STAPHYLINID SP	1
INSECTA	DIPTERA	CERATOPOGONIDAE	BEZZIA	1
INSECTA	DIPTERA	CHIRONOMIDAE	UNID. CHIRONOMID SP	22
INSECTA	DIPTERA	CHIRONOMIDAE	ABLABESMYIA	3
INSECTA	DIPTERA	CHIRONOMIDAE	DIRCROTENDIPES	5
INSECTA	DIPTERA	CHIRONOMIDAE	ENDOCHIRONOMUS	1
INSECTA	DIPTERA	CHIRONOMIDAE	GLYPOTENDIPES	2
INSECTA	DIPTERA	CHIRONOMIDAE	NANOCLADIUS	4
INSECTA	DIPTERA	CHIRONOMIDAE	PARACHIRONOMUS	3
INSECTA	DIPTERA	CHIRONOMIDAE	PARATANYTARSUS	11
INSECTA	DIPTERA	CHIRONOMIDAE	POLYPEDILUM	35
INSECTA	DIPTERA	CHIRONOMIDAE	TANYTARSUS	2
INSECTA	EPHEMEROPTERA	BAETIDAE	ACERPENNA	2
INSECTA	EPHEMEROPTERA	CAENIDAE	CAENIS	1
INSECTA	EPHEMEROPTERA	HEPTAGENIIDAE	MACCAFFERTIUM	1
INSECTA	EPHEMEROPTERA	ISONYCHIIDAE	ISONYCHIA	1
INSECTA	EPHEMEROPTERA	LEPTOHYPHIDAE	TRICORYTHODES	6
INSECTA	HEMIPTERA	MESOVELIIDAE	MESOVELIA	4

Class	Order	Family	Genus	Count
INSECTA	HEMIPTERA	VELIIDAE	MICROVELIA	9
INSECTA	ODONATA	COENAGRIONIDAE	ENALLAGMA	5
INSECTA	TRICHOPTERA	HYDROPTILIDAE	HYDROPTILA	2

MACROBENTHOS TAXA COLLECTED AT EF004 -2014

Class	Order	Family	Genus	Count
CLITELLATA	TUBIFICIDA	NAIDIDAE	BRANCHIURA	1
CLITELLATA	TUBIFICIDA	NAIDIDAE	CHAETOGASTER	1
CLITELLATA	TUBIFICIDA	NAIDIDAE	NAIS	1
INSECTA	AMPHIPODA		UNID. AMPHIPOD SP	3
INSECTA	BASOMMATOPHORA	PHYSIDAE	PHYSA	7
INSECTA	BASOMMATOPHORA	PLANORBIDAE	UNID. PLANORBID SP	1
INSECTA	CLADOCERA	DAPHNIIDAE	UNID. DAPHNIID SP	2
INSECTA	COLEOPTERA	ELMIDAE	MACRONYCHUS	1
INSECTA	COLEOPTERA	ELMIDAE	STENELMIS	3
INSECTA	COLEOPTERA	HYDROPHILIDAE	BEROSUS	2
INSECTA	DIPTERA		UNID. DIPTERA SP	1
INSECTA	DIPTERA	CHIRONOMIDAE	UNID. CHIRONOMID SP	6
INSECTA	DIPTERA	CHIRONOMIDAE	ABLABESMYIA	2
INSECTA	DIPTERA	CHIRONOMIDAE	CRICOTOPUS/ORTHOCLADIUS	2
INSECTA	DIPTERA	CHIRONOMIDAE	DIRCROTENDIPES	1
INSECTA	DIPTERA	CHIRONOMIDAE	LABRUNDINIA	1
INSECTA	DIPTERA	CHIRONOMIDAE	NANOCLADIUS	4
INSECTA	DIPTERA	CHIRONOMIDAE	PARATANYTARSUS	1
INSECTA	DIPTERA	CHIRONOMIDAE	POLYPEDILUM	3
INSECTA	DIPTERA	CHIRONOMIDAE	STEMPELLINELLA	3
INSECTA	DIPTERA	CHIRONOMIDAE	TANYTARSUS	4
INSECTA	DIPTERA	CHIRONOMIDAE	TRIBELOS	2
INSECTA	EPHEMEROPTERA	BAETIDAE	CENTROPTILUM	2
INSECTA	EPHEMEROPTERA	CAENIDAE	CAENIS	9
INSECTA	EPHEMEROPTERA	EPHEMERIDAE	HEXGENIA	1
INSECTA	EPHEMEROPTERA	LEPTOHYPHIDAE	TRICORYTHODES	14
INSECTA	HEMIPTERA	MESOVELIIDAE	MESOVELIA	5
INSECTA	HEMIPTERA	VELIIDAE	MICROVELIA	2

INSECTA	NEOTAENIOGLOSSA	HYDROBIIDAE	UNID. HYDROBIID SP	7
INSECTA	NEOTAENIOGLOSSA	PLEUROCERIDAE	PLEUROCERA	20
INSECTA	ODONATA	COENAGRIONIDAE	UNID. COENAGRIONID SP	42
INSECTA	ODONATA	COENAGRIONIDAE	ENALLAGMA	13
INSECTA	TRICHOPTERA	HYDROPSYCHIDAE	UNID HYDROPSYCHID SP	1

MACROBENTHOS TAXA COLLECTED AT EF005 -2014

Class	Order	Family	Genus	Count
CLITELLATA	TUBIFICIDA	NAIDIDAE	BRANCHIURA	2
CLITELLATA	TUBIFICIDA	NAIDIDAE	NAIS	2
INSECTA	COLEOPTERA	ELMIDAE	STENELMIS	4
INSECTA	DIPTERA	CHIRONOMIDAE	UNID. CHIRONOMID SP	12
INSECTA	DIPTERA	CHIRONOMIDAE	ABLABESMYIA	1
INSECTA	DIPTERA	CHIRONOMIDAE	CLADOTANYTARSUS	8
INSECTA	DIPTERA	CHIRONOMIDAE	CRYPTOCHIRONOMUS	2
INSECTA	DIPTERA	CHIRONOMIDAE	DIRCROTENDIPES	1
INSECTA	DIPTERA	CHIRONOMIDAE	POLYPEDILUM	9
INSECTA	DIPTERA	CHIRONOMIDAE	STEMPELLINELLA	2
INSECTA	EPHEMEROPTERA	BAETIDAE	ACERPENNA	1
INSECTA	EPHEMEROPTERA	BAETIDAE	CENTROPTILUM	1
INSECTA	EPHEMEROPTERA	CAENIDAE	CAENIS	23
INSECTA	EPHEMEROPTERA	HEPTAGENIIDAE	UNID. HEPTAGENIID SP	1
INSECTA	EPHEMEROPTERA	LEPTOHYPHIDAE	TRICORYTHODES	103
INSECTA	TRICHOPTERA	HYDROPSYCHIDAE	UNID. HYDROPSYCHID SP	4
INSECTA	TRICHOPTERA	HYDROPSYCHIDAE	CHEUMATOPSYCHE	2
INSECTA	TRICHOPTERA	POLYCENTROPODIDA	POLYCENTROPUS	1

MACROBENTHOS TAXA COLLECTED AT WF001 -2014

Class	Order	Family	Genus	Count
INSECTA	AMPHIPODA	HYALELLIDAE	HYALELLA	5
INSECTA	AMPHIPODA	TALITRIDAE	UNID. TALITRID SP	4
INSECTA	COLEOPTERA	SCIRTIDAE	CYPHON	11
INSECTA	DIPTERA	CHIRONOMIDAE	GLYPOTENDIPES	3
INSECTA	DIPTERA	CHIRONOMIDAE	PROCLADIUS	1
INSECTA	EPHEMEROPTERA	LEPTOHYPHIDAE	TRICORYTHODES	1
INSECTA	HEMIPTERA	MESOVELIIDAE	MESOVELIA	1
INSECTA	ODONATA	AESHNIDAE	BOYERIA	1

MACROBENTHOS TAXA COLLECTED AT WF002 -2014

Class	Order	Family	Genus	Count
CLITELLATA	LUMBRICINA	SPARGANOPHILIDAE	UNID. SPARGANOPHILID SP	2
INSECTA	COLEOPTERA	ELMIDAE	STENELMIS	10
INSECTA	COLEOPTERA	PSEPHENIDAE	PSEPHENUS	5
INSECTA	DIPTERA	CHIRONOMIDAE	CARDIOCLADIUS	1
INSECTA	DIPTERA	CHIRONOMIDAE	CONCHAPELOPIA	1
INSECTA	DIPTERA	CHIRONOMIDAE	CRICOTOPUS/ORTHOCLADIUS	3
INSECTA	DIPTERA	CHIRONOMIDAE	POLYPEDILUM	1
INSECTA	DIPTERA	CHIRONOMIDAE	STEMPELLINELLA	1
INSECTA	EPHEMEROPTERA	BAETIDAE	BAETIS	13
INSECTA	EPHEMEROPTERA	EPHEMERELLIDAE	SERRATELLA	13
INSECTA	EPHEMEROPTERA	EPHEMERIDAE	EPHEMERA	3
INSECTA	EPHEMEROPTERA	HEPTAGENIIDAE	UNID. HEPTAGENIID SP	36
INSECTA	EPHEMEROPTERA	HEPTAGENIIDAE	MACCAFFERTIUM	46
INSECTA	EPHEMEROPTERA	HEPTAGENIIDAE	STENACRON	10
INSECTA	EPHEMEROPTERA	ISONYCHIIDAE	ISONYCHIA	10
INSECTA	EPHEMEROPTERA	LEPTOHYPHIDAE	TRICORYTHODES	6
INSECTA	ISOPODA	ASELLOTA	CAECIDOTEA	28
INSECTA	NEOTAENIOGLOSSA	PLEUROCERIDAE	PLEUROCERA	1
INSECTA	ODONATA	COENAGRIONIDAE	ARGIA	2
INSECTA	TRICHOPTERA	HYDROPSYCHIDAE	CHEUMATOPSYCHE	15
INSECTA	VENEROIDA	CORBICULIDAE	CORBICULA	2

MACROBENTHOS TAXA COLLECTED AT WF003 -2014

Class	Order	Family	Genus	Count
CLITELLATA	TUBIFICIDA	NAIDIDAE	UNID. NAIDID SP	6
CLITELLATA	TUBIFICIDA	NAIDIDAE	RHYACODRILUS	1
INSECTA	COLEOPTERA	ELMIDAE	STENELMIS	11
INSECTA	COLEOPTERA	ELMIDAE	STENELMIS	41
INSECTA	COLEOPTERA	PSEPHENIDAE	PSEPHENUS	9
INSECTA	DECAPODA	CAMBARIDAE	UNID. CAMBARID SP	1
INSECTA	DIPTERA	CHIRONOMIDAE	UNID. CHIRONOMID SP	1
INSECTA	DIPTERA	CHIRONOMIDAE	CONCHAPELOPIA	6
INSECTA	DIPTERA	CHIRONOMIDAE	POLYPEDILUM	2
INSECTA	DIPTERA	CHIRONOMIDAE	STEMPELLINELLA	1
INSECTA	EPHEMEROPTERA	BAETIDAE	BAETIS	11
INSECTA	EPHEMEROPTERA	EPHEMERELLIDAE	SERRATELLA	8
INSECTA	EPHEMEROPTERA	EPHEMERIDAE	EPHEMERA	1
INSECTA	EPHEMEROPTERA	HEPTAGENIIDAE	UNID. HEPTAGENIID SP	9
INSECTA	EPHEMEROPTERA	HEPTAGENIIDAE	MACCAFFERTIUM	26
INSECTA	EPHEMEROPTERA	HEPTAGENIIDAE	STENACRON	4
INSECTA	EPHEMEROPTERA	ISONYCHIIDAE	ISONYCHIA	18
INSECTA	EPHEMEROPTERA	LEPTOHYPHIDAE	TRICORYTHODES	1
INSECTA	ISOPODA	ASELLOTA	CAECIDOTEA	35
INSECTA	NEOTAENIOGLOSSA	PLEUROCERIDAE	PLEUROCERA	9
INSECTA	ODONATA	COENAGRIONIDAE	ARGIA	6
INSECTA	TRICHOPTERA		UNID. TRICHOPTERA SP	1
INSECTA	TRICHOPTERA	HYDROPSYCHIDAE	CHEUMATOPSYCHE	24
INSECTA	TRICHOPTERA	HYDROPSYCHIDAE	HYDROPSYCHE	1
INSECTA	VENEROIDA	CORBICULIDAE	CORBICULA	4

MACROBENTHOS TAXA COLLECTED AT WF004 -2014

Class	Order	Family	Genus	Count
CLITELLATA	TUBIFICIDA	NAIDIDAE	UNID. NAIDID SP	1
INSECTA	AMPHIPODA	HYALELLIDAE	HYALELLA	1
INSECTA	COLEOPTERA	ELMIDAE	STENELMIS	45
INSECTA	COLEOPTERA	PSEPHENIDAE	PSEPHENUS	7
INSECTA	DIPTERA	CHIRONOMIDAE	UNID. CHIRONOMID SP	3
INSECTA	DIPTERA	CHIRONOMIDAE	CONCHAPELOPIA	2
INSECTA	DIPTERA	CHIRONOMIDAE	CRYPTOCHIRONOMUS	1
INSECTA	DIPTERA	CHIRONOMIDAE	POLYPEDILUM	4
INSECTA	DIPTERA	CHIRONOMIDAE	STEMPELLINELLA	4
INSECTA	EPHEMEROPTERA	BAETIDAE	BAETIS	33
INSECTA	EPHEMEROPTERA	EPHEMERIDAE	EPHEMERA	2
INSECTA	EPHEMEROPTERA	HEPTAGENIIDAE	UNID. HEPTAGENIID SP	7
INSECTA	EPHEMEROPTERA	HEPTAGENIIDAE	MACCAFFERTIUM	9
INSECTA	EPHEMEROPTERA	HEPTAGENIIDAE	STENACRON	27
INSECTA	EPHEMEROPTERA	LEPTOHYPHIDAE	TRICORYTHODES	13
INSECTA	ISOPODA	ASELLOTA	CAECIDOTEA	1
INSECTA	NEOTAENIOGLOSSA	PLEUROCERIDAE	PLEUROCERA	1
INSECTA	ODONATA	COENAGRIONIDAE	ARGIA	3
INSECTA	TRICHOPTERA	HYDROPSYCHIDAE	CHEUMATOPSYCHE	4

MACROBENTHOS TAXA COLLECTED AT WF005 -2014

Class	Order	Family	Genus	Count
CLITELLATA	LUMBRICINA	SPARGANOPHILIDAE	UNID. SPARGANOPHILID SP	1
CLITELLATA	TUBIFICIDA	NAIDIDAE	UNID. NAIDID SP	1
INSECTA	AMPHIPODA	TALITRIDAE	UNID. TALITRID SP	1
INSECTA	BASOMMATOPHORA	HYDROBIIDAE	UNID. HYDROBIID SP	2
INSECTA	COLEOPTERA	ELMIDAE	STENELMIS	68
INSECTA	COLEOPTERA	PSEPHENIDAE	PSEPHENUS	1
INSECTA	DIPTERA	CHIRONOMIDAE	UNID. CHIRONOMID SP	1
INSECTA	DIPTERA	CHIRONOMIDAE	CONCHAPELOPIA	1
INSECTA	DIPTERA	CHIRONOMIDAE	CORYNONEURA	1
INSECTA	DIPTERA	CHIRONOMIDAE	DIRCROTENDIPES	1
INSECTA	DIPTERA	CHIRONOMIDAE	POLYPEDILUM	33
INSECTA	DIPTERA	CHIRONOMIDAE	STEMPELLINELLA	1
INSECTA	DIPTERA	EMPIDIDAE	HEMERODROMIA	1
INSECTA	DIPTERA	SIMULIIDAE	SIMULIUM	1
INSECTA	EPHEMEROPTERA	BAETIDAE	BAETIS	33
INSECTA	EPHEMEROPTERA	EPHEMERELLIDAE	SERRATELLA	16
INSECTA	EPHEMEROPTERA	HEPTAGENIIDAE	MACCAFFERTIUM	21
INSECTA	EPHEMEROPTERA	ISONYCHIIDAE	ISONYCHIA	2
INSECTA	EPHEMEROPTERA	LEPTOHYPHIDAE	TRICORYTHODES	1
INSECTA	NEOTAENIOGLOSSA	PLEUROCERIDAE	PLEUROCERA	5
INSECTA	TRICHOPTERA	HYDROPSYCHIDAE	CHEUMATOPSYCHE	34
INSECTA	TRICHOPTERA	PHILOPOTAMIDAE	CHIMARRA	9

TMI - EF001

STATION ID: EF001	
STREAM NAME: East Fork Stones River	DATE: 6/30/2014 TIME:
STATION LOCATION:	ECOREGION: 71i QC:
WBID/HUC: LC-051302020306 GROUP:	ASSOCIATED LOG #:

Total # in subsample =	76	**SCORE**
Taxa Richness (TR) =	**15**	2
EPT Richness =	**2**	2
Total # of E,P,T =	2	
# Cheumatopsyche =	1	
% EPT-Cheum =	**1.3158**	0
Total # Oligochaeta =	5	
Total # Chironomids =	35	
%OC =	**52.632**	4
NCBI =	**7.49**	2
Total # Clingers =	1	
% Clingers =	**1.3158**	0
# Cheumatopsyche	1	
# Stenelmis		
# Polypedilum	5	
# Cricotopus		
# Cricotopus/Orthocladius		
# Lirceus		
# Caenis		
# Elimia		
# Nais	3	
# Dero		
# UnID Tubificidae		
% TNUTOL =	**11.842**	6

TOTAL TBI SCORE
16

TMI - EF002

STATION ID: EF002	
STREAM NAME: East Fork Stones River	DATE: 6/30/2014 TIME:
STATION LOCATION:	ECOREGION: 71i QC:
WBID/HUC: LC-051302020306 GROUP:	ASSOCIATED LOG #:

Total # in subsample =	21	**SCORE**
Taxa Richness (TR) =	**9**	2
EPT Richness =	**1**	0
Total # of E,P,T =	1	
# Cheumatopsyche =	0	
% EPT-Cheum =	**4.7619**	0
Total # Oligochaeta =	2	
Total # Chironomids =	7	
%OC =	**42.8571**	4
NCBI =	**7.2**	2
Total # Clingers =	0	
% Clingers =	**0**	0
# Cheumatopsyche		
# Stenelmis		
# Polypedilum		
# Cricotopus		
# Cricotopus/Orthocladius		
# Lirceus		
# Caenis		
# Elimia		
# Nais		
# Dero		
# UnID Tubificidae	1	
% TNUTOL =	**4.7619**	6

TOTAL TBI SCORE

14

TMI - EF003

STATION ID: EF003	
STREAM NAME: East Fork Stones River	DATE: 6/30/2014 TIME:
STATION LOCATION:	ECOREGION: 71i QC:
WBID/HUC: LC-051302020306 GROUP:	ASSOCIATED LOG #:

Total # in subsample =	171	**SCORE**
Taxa Richness (TR) =	**31**	6
EPT Richness =	**6**	4
Total # of E,P,T =	13	
# Cheumatopsyche =	0	
% EPT-Cheum =	**7.602339**	0
Total # Oligochaeta =	14	
Total # Chironomids =	88	
%OC =	**59.64912**	2
NCBI =	**6.75**	4
Total # Clingers =	4	
% Clingers =	**2.339181**	0
# Cheumatopsyche	0	
# Stenelmis	1	
# Polypedilum	35	
# Cricotopus		
# Cricotopus/Orthocladius		
# Lirceus		
# Caenis	1	
# Elimia		
# Nais	13	
# Dero		
# UnID Tubificidae		
% TNUTOL =	**29.23977**	6

TOTAL TBI SCORE

22

TMI - EF004

STATION ID: EF004	
STREAM NAME: East Fork Stones River	DATE: 6/30/2014 TIME:
STATION LOCATION:	ECOREGION: 71i QC:
WBID/HUC: LC-051302020306 GROUP:	ASSOCIATED LOG #:

Total # in subsample =	168	**SCORE**
Taxa Richness (TR) =	**29**	6
EPT Richness =	**5**	4
Total # of E,P,T =	27	
# Cheumatopsyche =	0	
% EPT-Cheum =	**16.07143**	2
Total # Oligochaeta =	3	
Total # Chironomids =	29	
%OC =	**19.04762**	6
NCBI =	**6.48**	4
Total # Clingers =	7	
% Clingers =	**4.166667**	0
# Cheumatopsyche	0	
# Stenelmis	3	
# Polypedilum	3	
# Cricotopus		
# Cricotopus/Orthocladius	2	
# Lirceus		
# Caenis	9	
# Elimia	20	
# Nais	1	
# Dero		
# UnID Tubificidae		
% TNUTOL =	**22.61905**	6

TOTAL TBI SCORE

28

TMI - EF005

STATION ID: EF005	
STREAM NAME: East Fork Stones River	DATE: 6/30/2014 TIME:
STATION LOCATION:	ECOREGION: 71i QC:
WBID/HUC: LC-051302020306 GROUP:	ASSOCIATED LOG #:

Total # in subsample =	179	**SCORE**
Taxa Richness (TR) =	**16**	4
EPT Richness =	**7**	4
Total # of E,P,T =	136	
# Cheumatopsyche =	2	
% EPT-Cheum =	**74.86034**	6
Total # Oligochaeta =	4	
Total # Chironomids =	35	
%OC =	**21.78771**	6
NCBI =	**5.52**	6
Total # Clingers =	11	
% Clingers =	**6.145251**	0
# Cheumatopsyche	2	
# Stenelmis	4	
# Polypedilum	9	
# Cricotopus		
# Cricotopus/Orthocladius		
# Lirceus		
# Caenis	23	
# Elimia		
# Nais	2	
# Dero		
# UnID Tubificidae		
% TNUTOL =	**22.34637**	6

TOTAL TBI SCORE

32

TMI - WF001

STATION ID: WF001	
STREAM NAME: West Fork Stones River	DATE: 7/1/2014 TIME:
STATION LOCATION:	ECOREGION: 71i QC:
WBID/HUC: LC-051302020306 GROUP:	ASSOCIATED LOG #:

Total # in subsample =	24	**SCORE**
Taxa Richness (TR) =	**8**	2
EPT Richness =	**1**	0
Total # of E,P,T =	1	
# Cheumatopsyche =	0	
% EPT-Cheum =	**4.166667**	0
Total # Oligochaeta =	0	
Total # Chironomids =	4	
%OC =	**16.66667**	6
NCBI =	**8.68**	0
Total # Clingers =	0	
% Clingers =	**0**	0
# Cheumatopsyche	0	
# Stenelmis		
# Polypedilum		
# Cricotopus		
# Cricotopus/Orthocladius		
# Lirceus		
# Caenis		
# Elimia		
# Nais		
# Dero		
# UnID Tubificidae		
% TNUTOL =	**0**	6

TOTAL TBI SCORE

14

TMI - WF002

STATION ID: WF002	
STREAM NAME: West Fork Stones River	DATE: 7/1/2014 TIME:
STATION LOCATION:	ECOREGION: 71i QC:
WBID/HUC: LC-051302020306 GROUP:	ASSOCIATED LOG #:

		SCORE
Total # in subsample =	209	
Taxa Richness (TR) =	**20**	4
EPT Richness =	**8**	6
Total # of E,P,T =	152	
# Cheumatopsyche =	15	
% EPT-Cheum =	**65.55024**	6
Total # Oligochaeta =	2	
Total # Chironomids =	7	
%OC =	**4.30622**	6
NCBI =	**4.52**	6
Total # Clingers =	138	
% Clingers =	**66.02871**	6
# Cheumatopsyche	15	
# Stenelmis	10	
# Polypedilum	1	
# Cricotopus		
# Cricotopus/Orthocladius	3	
# Lirceus		
# Caenis		
# Elimia	1	
# Nais		
# Dero		
# UnID Tubificidae		
% TNUTOL =	**14.35407**	6

TOTAL TBI SCORE

40

TMI - WF003

STATION ID: WF003	
STREAM NAME: West Fork Stones River	DATE: 7/1/2014 TIME:
STATION LOCATION:	ECOREGION: 71i QC:
WBID/HUC: LC-051302020306 GROUP:	ASSOCIATED LOG #:

		SCORE
Total # in subsample =	237	
Taxa Richness (TR) =	**21**	4
EPT Richness =	**9**	6
Total # of E,P,T =	104	
# Cheumatopsyche =	24	
% EPT-Cheum =	**33.75527**	4
Total # Oligochaeta =	7	
Total # Chironomids =	10	
%OC =	**7.172996**	6
NCBI =	**5.1**	6
Total # Clingers =	133	
% Clingers =	**56.11814**	6
# Cheumatopsyche	24	
# Stenelmis	52	
# Polypedilum	2	
# Cricotopus		
# Cricotopus/Orthocladius		
# Lirceus		
# Caenis		
# Elimia	9	
# Nais		
# Dero		
# UnID Tubificidae		
% TNUTOL =	**36.70886**	6

TOTAL TBI SCORE

38

TMI - WF004

STATION ID: WF004	
STREAM NAME: West Fork Stones River	DATE: 7/1/2014 TIME:
STATION LOCATION:	ECOREGION: 71i QC:
WBID/HUC: LC-051302020306 GROUP:	ASSOCIATED LOG #:

Total # in subsample =	168	**SCORE**
Taxa Richness (TR) =	**17**	4
EPT Richness =	**7**	4
Total # of E,P,T =	95	
# Cheumatopsyche =	4	
% EPT-Cheum =	**54.16667**	6
Total # Oligochaeta =	1	
Total # Chironomids =	14	
%OC =	**8.928571**	6
NCBI =	**4.63**	6
Total # Clingers =	99	
% Clingers =	**58.92857**	6
# Cheumatopsyche	4	
# Stenelmis	45	
# Polypedilum	4	
# Cricotopus		
# Cricotopus/Orthocladius		
# Lirceus		
# Caenis		
# Elimia	1	
# Nais		
# Dero		
# UnID Tubificidae		
% TNUTOL =	**32.14286**	6

TOTAL TBI SCORE

38

TMI - WF005

STATION ID: WF005	
STREAM NAME: West Fork Stones River	DATE: 7/1/2014 TIME:
STATION LOCATION:	ECOREGION: 71i QC:
WBID/HUC: LC-051302020306 GROUP:	ASSOCIATED LOG #:

		SCORE
Total # in subsample =	235	
Taxa Richness (TR) =	**20**	4
EPT Richness =	**7**	4
Total # of E,P,T =	116	
# Cheumatopsyche =	34	
% EPT-Cheum =	**34.89362**	4
Total # Oligochaeta =	2	
Total # Chironomids =	6	
%OC =	**3.404255**	6
NCBI =	**4.81**	6
Total # Clingers =	149	
% Clingers =	**63.40426**	6
# Cheumatopsyche	34	
# Stenelmis	68	
# Polypedilum	33	
# Cricotopus		
# Cricotopus/Orthocladius		
# Lirceus		
# Caenis		
# Elimia	5	
# Nais		
# Dero		
# UnID Tubificidae		
% TNUTOL =	**59.57447**	2

TOTAL TBI SCORE

32

2015 Macroinvertebrate Collection

								EF004	EF005	EF006	WF002
Phylum	Class	Order	Family	Taxon				5-Aug-15	5-Aug-15	5-Aug-15	5-Aug-15
Nematoda				Nematoda							
Platyhelminthes	Turbellaria	Tricladida	Dugesiidae	*Cura*				1			
Annelida	Hirundinea	Arhynchobdellida	Erpobdellidae	*Erpobdella*							
Annelida	Oligochaeta	Branchiobdellida	Branchiobdellidae	Branchiobdellidae		6					
Annelida	Oligochaeta	Tubificida	Naididae	*Branchiura*		*8.28*		1			
Annelida	Oligochaeta	Tubificida	Naididae	*Nais*		*8.88*		4			
Annelida	Oligochaeta	Tubificida	Naididae	*Slavina*		*7.06*					
Annelida	Oligochaeta	Tubificida	Naididae	Tubificinae: hair+pectinate chaetae		7.11			1		
Arthropoda	Arachnida	Acariformes	Arrenuridae	Acariformes				2			
Arthropoda	Crustacea	Amphipoda	Crangonyctidae	*Crangonyx*		*7.87*					
Arthropoda	Crustacea	Amphipoda	Hyalellidae	*Hyalella*		*7.75*		5			
Arthropoda	Crustacea	Decapoda	Cambaridae	*Orconectes*		*2.6*	*I*				
Arthropoda	Crustacea	Isopoda	Asellidae	*Caecidotea*		*9.11*					1
Arthropoda	Crustacea	Isopoda	Asellidae	*Lirceus*		*7.85*					
Arthropoda	Insecta	Ephemeroptera	Baetidae	*Acerpenna*		*3.7*			6	5	
Arthropoda	Insecta	Ephemeroptera	Baetidae	Baetidae		6.1		1	3	3	13
Arthropoda	Insecta	Ephemeroptera	Baetidae	*Baetis*		*4.51*					
Arthropoda	Insecta	Ephemeroptera	Baetidae	*Plauditus*		*4.51*					
Arthropoda	Insecta	Ephemeroptera	Caenidae	*Caenis*		*7.41*		1	16	2	
Arthropoda	Insecta	Ephemeroptera	Ephemerellidae	Ephemerellidae	x	1.8				1	
Arthropoda	Insecta	Ephemeroptera	Ephemerellidae	*Telagonopsis*	x	*1.8*		1		1	20
Arthropoda	Insecta	Ephemeroptera	Ephemeridae	*Ephemera*		*1.12*	*I*		1		
Arthropoda	Insecta	Ephemeroptera	Heptageniidae	Heptageniidae	x	2.57	I		8		
Arthropoda	Insecta	Ephemeroptera	Heptageniidae	*Leucrocuta*	x	*2.4*	*I*		3	1	1
Arthropoda	Insecta	Ephemeroptera	Heptageniidae	*Maccaffertium*	x	*3.15*			5	4	19
Arthropoda	Insecta	Ephemeroptera	Heptageniidae	*Stenacron*	x	*3.58*			4		
Arthropoda	Insecta	Ephemeroptera	Isonychidae	*Isonychia*		*3.45*				1	16
Arthropoda	Insecta	Ephemeroptera	Leptophlebiidae	Leptophlebiidae		1.8			1		
Arthropoda	Insecta	Ephemeroptera	Tricorythidae	*Tricorythodes*		*5.06*		12	6		
Arthropoda	Insecta	Odonata	Aeshnidae	*Basiaeschna*		*7.35*		1			
Arthropoda	Insecta	Odonata	Coenagrionidae	*Argia*		*8.17*		1	2		
Arthropoda	Insecta	Odonata	Coenagrionidae	Coenagrionidae		6.1		27			
Arthropoda	Insecta	Odonata	Coenagrionidae	*Enallagma*		*8.91*		9			
Arthropoda	Insecta	Odonata	Corduliidae	Corduliidae		6.6		1			
Arthropoda	Insecta	Odonata	Gomphidae	*Gomphus*		*5.8*		1			
Arthropoda	Insecta	Plecoptera	Perlidae	Perlidae	x	1.5	I		2		5
Arthropoda	Insecta	Hemiptera	Belostomatidae	Belostomatidae		6.9		1			
Arthropoda	Insecta	Trichoptera	Hydropsychidae	*Cheumatopsyche*	x	*6.22*			44	82	57
Arthropoda	Insecta	Trichoptera	Hydropsychidae	*Hydropsyche*	x	*4.3*			2	3	13
Arthropoda	Insecta	Trichoptera	Hydropsychidae	Hydropsychidae	x	4		1	3	4	3
Arthropoda	Insecta	Trichoptera	Hydropsychidae	*Macrostemum*	x	*3.52*				1	
Arthropoda	Insecta	Trichoptera	Hydroptildae	*Hydroptila*	x	*6.22*			2		
Arthropoda	Insecta	Trichoptera	Philopotamidae	*Chimarra*	x	*2.76*	*I*				
Arthropoda	Insecta	Lepidoptera	Crambidae	Crambidae		4.2					

2015 Macroinvertebrate Collection

								EF004	EF005	EF006	WF002
Phylum	Class	Order	Family	Taxon				5-Aug-15	5-Aug-15	5-Aug-15	5-Aug-15
Arthropoda	Insecta	Lepidoptera		Lepidoptera		4.3			2		
Arthropoda	Insecta	Coleoptera	Dytiscidae	*Paracymus*		*4*		1			
Arthropoda	Insecta	Coleoptera	Elmidae	*Ancyronyx*	x	*6.49*				1	
Arthropoda	Insecta	Coleoptera	Elmidae	*Dubiraphia*	x	*5.93*		3			1
Arthropoda	Insecta	Coleoptera	Elmidae	*Microcylloepus*	x	*2.11*	*I*				
Arthropoda	Insecta	Coleoptera	Elmidae	*Stenelmis*	x	*5.1*		1	21	6	24
Arthropoda	Insecta	Coleoptera	Haliplidae	*Peltodytes*		*8.73*		1			
Arthropoda	Insecta	Coleoptera	Hydrophilidae	*Berosus*		*8.43*		4			
Arthropoda	Insecta	Coleoptera	Psephenidae	*Psephenus*	x	*2.35*	*I*		1		3
Arthropoda	Insecta	Coleoptera	Scirtidae	*Scirtes*		*6.8*		1			
Arthropoda	Insecta	Diptera	Ceratopogonidae	*Bezzia/Palpomyia*		*6*		2			
Arthropoda	Insecta	Diptera	Ceratopogonidae	Ceratopogonidae		5.9		1			
Nematoda				Nematoda							
Arthropoda	Insecta	Diptera	Chironomidae	*Ablabesmyia*		*7.2*		1			
Arthropoda	Insecta	Diptera	Chironomidae	*Cardiocladius*		*5.87*		2			2
Arthropoda	Insecta	Diptera	Chironomidae	Chironomidae		6.2					1
Arthropoda	Insecta	Diptera	Chironomidae	*Cladotanytarsus*		*4.09*					
Arthropoda	Insecta	Diptera	Chironomidae	*Corynoneura*		*6.01*			1		
Arthropoda	Insecta	Diptera	Chironomidae	*Cricotopus*	x	*5.78*					
Arthropoda	Insecta	Diptera	Chironomidae	*Cricotopus/Orthocladius*	x	*4.86*		4		1	
Arthropoda	Insecta	Diptera	Chironomidae	*Dicrotendipes*		*8.1*					
Arthropoda	Insecta	Diptera	Chironomidae	*Endochironomus*	x	*7.79*		5			
Arthropoda	Insecta	Diptera	Chironomidae	*Eukiefferiella*		*3.43*					
Arthropoda	Insecta	Diptera	Chironomidae	*Labrundinia*		*5.9*		5			
Arthropoda	Insecta	Diptera	Chironomidae	*Nanocladius*		*7.07*					
Arthropoda	Insecta	Diptera	Chironomidae	*Nilotanypus*		*3.9*					
Arthropoda	Insecta	Diptera	Chironomidae	*Parachironomus*		*9.42*		3			
Arthropoda	Insecta	Diptera	Chironomidae	*Paratanytarsus*		*8.45*		6			
Arthropoda	Insecta	Diptera	Chironomidae	*Polypedilum*		*5.69*		27	22	48	23
Arthropoda	Insecta	Diptera	Chironomidae	*Procladius*		*9.1*		1			
Arthropoda	Insecta	Diptera	Chironomidae	*Rheotanytarsus*	x	*5.89*			2	10	
Arthropoda	Insecta	Diptera	Chironomidae	*Stempellinella*		*4.62*			2	1	
Arthropoda	Insecta	Diptera	Chironomidae	*Tanytarsus*		*6.76*		8			
Arthropoda	Insecta	Diptera	Chironomidae	*Thienemanniella*		*5.86*		1			
Arthropoda	Insecta	Diptera	Chironomidae	*Thienemannimyia grp.*		*6.2*					1
Arthropoda	Insecta	Diptera	Empididae	Empididae		7.6					
Arthropoda	Insecta	Diptera	Empididae	*Hemerodromia*		*7.57*			2		
Arthropoda	Insecta	Diptera	Simuliidae	*Simulium*	x	*4*					
Arthropoda	Insecta	Diptera	Tipulidae	*Hexatoma*		*4.31*			1		
Mollusca	Bivalvia	Veneroida	Corbiculidae	*Corbicula*		*6.12*			3		
Mollusca	Bivalvia	Veneroida	Sphaeriidae	*Pisidium*		*6.48*		5			
Mollusca	Bivalvia	Veneroida	Sphaeriidae	*Sphaerium*		*7.58*					
Mollusca	Bivalvia	Veneroida	Sphaeriidae	Sphaeriidae		6.6		1	2		
Mollusca	Bivalvia	Veneroida		Veneroida		6.48					

2015 Macroinvertebrate Collection

								EF004	EF005	EF006	WF002
Phylum	Class	Order	Family	Taxon				5-Aug-15	5-Aug-15	5-Aug-15	5-Aug-15
Mollusca	Gastropoda	Neotaenioglossa	Hydrobiidae	Hydrobiidae		5.78		4	11		
Mollusca	Gastropoda	Basommatophora	Physidae	*Physa*				5			
Mollusca	Gastropoda	Basommatophora	Planorbidae	*Menetus*		*8.23*		2			
Mollusca	Gastropoda	Neotaenioglossa	Pleuroceridae	*Leptoxis*		*1.79*	*I*		25	3	15
Mollusca	Gastropoda	Neotaenioglossa	Pleuroceridae	*Lithasia*		*3.4*		1	2		
Mollusca	Gastropoda	Neotaenioglossa	Pleuroceridae	*Pleurocera (Elimia)*		*2.46*	*I*	22	14		4
Mollusca	Gastropoda	Neotaenioglossa	Pleuroceridae	*Pleurocera (Pleurocera)*		*6*					
Mollusca	Gastropoda	Neotaenioglossa	Pleuroceridae	Pleuroceridae		3.4					1
				Total number of individuals				187	220	178	223
				Total number of taxa per sample				40	30	16	18

2015 Macroinvertebrate Collection

								WF003	WF004	WF005	WF006	WF007
Phylum	Class	Order	Family	Taxon				5-Aug-15	7-Aug-15	7-Aug-15	5-Aug-15	5-Aug-15
Nematoda				Nematoda								1
Platyhelminthes	Turbellaria	Tricladida	Dugesiidae	*Cura*						2		3
Annelida	Hirundinea	Arhynchobdellida	Erpobdellidae	*Erpobdella*				1				
Annelida	Oligochaeta	Branchiobdellida	Branchiobdellidae	Branchiobdellidae		6				1		
Annelida	Oligochaeta	Tubificida	Naididae	*Branchiura*		*8.28*						
Annelida	Oligochaeta	Tubificida	Naididae	*Nais*		*8.88*						
Annelida	Oligochaeta	Tubificida	Naididae	*Slavina*		*7.06*						1
Annelida	Oligochaeta	Tubificida	Naididae	Tubificinae: hair+pectinate chaetae		7.11						1
Arthropoda	Arachnida	Acariformes	Arrenuridae	Acariformes								
Arthropoda	Crustacea	Amphipoda	Crangonyctidae	*Crangonyx*		*7.87*						1
Arthropoda	Crustacea	Amphipoda	Hyalellidae	*Hyalella*		*7.75*						
Arthropoda	Crustacea	Decapoda	Cambaridae	*Orconectes*		*2.6*	*I*					1
Arthropoda	Crustacea	Isopoda	Asellidae	*Caecidotea*		*9.11*					9	
Arthropoda	Crustacea	Isopoda	Asellidae	*Lirceus*		*7.85*		4	18		1	3
Arthropoda	Insecta	Ephemeroptera	Baetidae	*Acerpenna*		*3.7*		1		6	2	
Arthropoda	Insecta	Ephemeroptera	Baetidae	Baetidae		6.1		6		5	7	14
Arthropoda	Insecta	Ephemeroptera	Baetidae	*Baetis*		*4.51*		26	4	6	30	19
Arthropoda	Insecta	Ephemeroptera	Baetidae	*Plauditus*		*4.51*		2			1	
Arthropoda	Insecta	Ephemeroptera	Caenidae	*Caenis*		*7.41*						
Arthropoda	Insecta	Ephemeroptera	Ephemerellidae	Ephemerellidae	x	1.8						
Arthropoda	Insecta	Ephemeroptera	Ephemerellidae	*Telagonopsis*	x	*1.8*		8			2	
Arthropoda	Insecta	Ephemeroptera	Ephemeridae	*Ephemera*		*1.12*	*I*				2	
Arthropoda	Insecta	Ephemeroptera	Heptageniidae	Heptageniidae	x	2.57	I			6		3
Arthropoda	Insecta	Ephemeroptera	Heptageniidae	*Leucrocuta*	x	*2.4*	*I*					
Arthropoda	Insecta	Ephemeroptera	Heptageniidae	*Maccaffertium*	x	*3.15*		13	7	8	10	3
Arthropoda	Insecta	Ephemeroptera	Heptageniidae	*Stenacron*	x	*3.58*			1	2		1
Arthropoda	Insecta	Ephemeroptera	Isonychidae	*Isonychia*		*3.45*		6	7	3	5	6
Arthropoda	Insecta	Ephemeroptera	Leptophlebiidae	Leptophlebiidae		1.8						
Arthropoda	Insecta	Ephemeroptera	Tricorythidae	*Tricorythodes*		*5.06*				3	12	22
Arthropoda	Insecta	Odonata	Aeshnidae	*Basiaeschna*		*7.35*						
Arthropoda	Insecta	Odonata	Coenagrionidae	*Argia*		*8.17*		1	1			3
Arthropoda	Insecta	Odonata	Coenagrionidae	Coenagrionidae		6.1						
Arthropoda	Insecta	Odonata	Coenagrionidae	*Enallagma*		*8.91*						
Arthropoda	Insecta	Odonata	Corduliidae	Corduliidae		6.6						
Arthropoda	Insecta	Odonata	Gomphidae	*Gomphus*		*5.8*						
Arthropoda	Insecta	Plecoptera	Perlidae	Perlidae	x	1.5	I		2		5	1
Arthropoda	Insecta	Hemiptera	Belostomatidae	Belostomatidae		6.9						
Arthropoda	Insecta	Trichoptera	Hydropsychidae	*Cheumatopsyche*	x	*6.22*		38	48	19	28	22
Arthropoda	Insecta	Trichoptera	Hydropsychidae	*Hydropsyche*	x	*4.3*		8	5	2	1	8
Arthropoda	Insecta	Trichoptera	Hydropsychidae	Hydropsychidae	x	4		10	5	4		10
Arthropoda	Insecta	Trichoptera	Hydropsychidae	*Macrostemum*		*3.52*			3	2		
Arthropoda	Insecta	Trichoptera	Hydroptildae	*Hydroptila*	x	*6.22*			1		1	
Arthropoda	Insecta	Trichoptera	Philopotamidae	*Chimarra*	x	*2.76*	*I*		3	8		1
Arthropoda	Insecta	Lepidoptera	Crambidae	Crambidae		4.2						1

2015 Macroinvertebrate Collection

								WF003	WF004	WF005	WF006	WF007
Phylum	Class	Order	Family	Taxon				5-Aug-15	7-Aug-15	7-Aug-15	5-Aug-15	5-Aug-15
Arthropoda	Insecta	Lepidoptera		Lepidoptera		4.3						
Arthropoda	Insecta	Coleoptera	Dytiscidae	*Paracymus*		*4*						
Arthropoda	Insecta	Coleoptera	Elmidae	*Ancyronyx*	x	*6.49*						
Arthropoda	Insecta	Coleoptera	Elmidae	*Dubiraphia*	x	*5.93*						
Arthropoda	Insecta	Coleoptera	Elmidae	*Microcylloepus*	x	*2.11*	*I*					1
Arthropoda	Insecta	Coleoptera	Elmidae	*Stenelmis*	x	*5.1*		24	18	27	77	43
Arthropoda	Insecta	Coleoptera	Haliplidae	*Peltodytes*		*8.73*						
Arthropoda	Insecta	Coleoptera	Hydrophilidae	*Berosus*		*8.43*						
Arthropoda	Insecta	Coleoptera	Psephenidae	*Psephenus*	x	*2.35*	*I*	3			7	
Arthropoda	Insecta	Coleoptera	Scirtidae	*Scirtes*		*6.8*						
Arthropoda	Insecta	Diptera	Ceratopogonidae	*Bezzia/Palpomyia*		*6*						
Arthropoda	Insecta	Diptera	Ceratopogonidae	Ceratopogonidae		5.9						
Nematoda				Nematoda								1
Arthropoda	Insecta	Diptera	Chironomidae	*Ablabesmyia*		*7.2*						
Arthropoda	Insecta	Diptera	Chironomidae	*Cardiocladius*		*5.87*		4	2			
Arthropoda	Insecta	Diptera	Chironomidae	Chironomidae		6.2						
Arthropoda	Insecta	Diptera	Chironomidae	*Cladotanytarsus*		*4.09*					1	
Arthropoda	Insecta	Diptera	Chironomidae	*Corynoneura*		*6.09*					1	2
Arthropoda	Insecta	Diptera	Chironomidae	*Cricotopus*	x	*5.78*						1
Arthropoda	Insecta	Diptera	Chironomidae	*Cricotopus/Orthocladius*	x	*4.86*		1	1			
Arthropoda	Insecta	Diptera	Chironomidae	*Dicrotendipes*		*8.1*						1
Arthropoda	Insecta	Diptera	Chironomidae	*Endochironomus*	x	*7.79*						
Arthropoda	Insecta	Diptera	Chironomidae	*Eukiefferiella*		*3.43*				1		
Arthropoda	Insecta	Diptera	Chironomidae	*Labrundinia*		*5.9*						
Arthropoda	Insecta	Diptera	Chironomidae	*Nanocladius*		*7.07*		1				
Arthropoda	Insecta	Diptera	Chironomidae	*Nilotanypus*		*3.9*						1
Arthropoda	Insecta	Diptera	Chironomidae	*Parachironomus*		*9.42*						
Arthropoda	Insecta	Diptera	Chironomidae	*Paratanytarsus*		*8.45*						
Arthropoda	Insecta	Diptera	Chironomidae	*Polypedilum*		*5.69*		12	44	69	7	21
Arthropoda	Insecta	Diptera	Chironomidae	*Procladius*		*9.1*						
Arthropoda	Insecta	Diptera	Chironomidae	*Rheotanytarsus*	x	*5.89*		3	1		1	
Arthropoda	Insecta	Diptera	Chironomidae	*Stempellinella*		*4.62*		1	1	1	4	2
Arthropoda	Insecta	Diptera	Chironomidae	*Tanytarsus*		*6.76*						1
Arthropoda	Insecta	Diptera	Chironomidae	*Thienemanniella*		*5.86*		1			1	4
Arthropoda	Insecta	Diptera	Chironomidae	*Thienemannimyia grp.*		*6.2*				4	8	2
Arthropoda	Insecta	Diptera	Empididae	Empididae		7.6			2			
Arthropoda	Insecta	Diptera	Empididae	*Hemerodromia*		*7.57*						
Arthropoda	Insecta	Diptera	Simuliidae	*Simulium*	x	*4*						1
Arthropoda	Insecta	Diptera	Tipulidae	*Hexatoma*		*4.31*						
Mollusca	Bivalvia	Veneroida	Corbiculidae	*Corbicula*		*6.12*		1		2	1	
Mollusca	Bivalvia	Veneroida	Sphaeriidae	*Pisidium*		*6.48*						
Mollusca	Bivalvia	Veneroida	Sphaeriidae	*Sphaerium*		*7.58*				1		
Mollusca	Bivalvia	Veneroida	Sphaeriidae	Sphaeriidae		6.6				3		
Mollusca	Bivalvia	Veneroida		Veneroida		6.48		2	1		3	6
Mollusca	Gastropoda	Neotaenioglossa	Hydrobiidae	Hydrobiidae		5.78						
Mollusca	Gastropoda	Basommatophora	Physidae	*Physa*								
Mollusca	Gastropoda	Basommatophora	Planorbidae	*Menetus*		*8.23*						

2015 Macroinvertebrate Collection

								WF003	WF004	WF005	WF006	WF007
Phylum	Class	Order	Family	Taxon				5-Aug-15	7-Aug-15	7-Aug-15	5-Aug-15	5-Aug-15
Mollusca	Gastropoda	Neotaenioglossa	Pleuroceridae	*Leptoxis*		*1.79*	*I*	3	2	15	1	2
Mollusca	Gastropoda	Neotaenioglossa	Pleuroceridae	*Lithasia*		*3.4*			1	1		
Mollusca	Gastropoda	Neotaenioglossa	Pleuroceridae	*Pleurocera (Elimia)*		*2.46*	*I*	2	2	21	5	2
Mollusca	Gastropoda	Neotaenioglossa	Pleuroceridae	*Pleurocera (Pleurocera)*		*6*		1				
Mollusca	Gastropoda	Neotaenioglossa	Pleuroceridae	Pleuroceridae		3.4						
				Total number of individuals				183	180	222	233	215
				Total number of taxa per sample				24	23	22	26	33

TMI - EF004

STATION ID: EF004			
STREAM NAME: East Fork Stones River		DATE:	TIME:
STATION LOCATION:		ECOREGION: 71i	QC:
WBID/HUC: LC-051302020306	GROUP:	ASSOCIATED LOG #:	

Total # in subsample =	187	**SCORE**
Taxa Richness (TR) =	**40**	6
EPT Richness =	**5**	4
Total # of E,P,T =	16	
# Cheumatopsyche =	0	
% EPT-Cheum =	**8.55615**	0
Total # Oligochaeta =	5	
Total # Chironomids =	63	
%OC =	**36.3636**	4
NCBI =	**5.34**	6
Total # Clingers =	15	
% Clingers =	**8.02139**	0
# Cheumatopsyche	0	
# Stenelmis	1	
# Polypedilum	27	
# Cricotopus	0	
# Cricotopus/Orthocladius	4	
# Lirceus	0	
# Caenis	1	
# Elimia	22	
# Nais	4	
# Dero		
# UnID Tubificidae		
% TNUTOL =	**31.5508**	6

TOTAL TMI SCORE

26

TMI - EF005

STATION ID: EF005	
STREAM NAME: East Fork Stones River	DATE: 8/5/2015 TIME:
STATION LOCATION:	ECOREGION: 71i QC:
WBID/HUC: LC-051302020306 GROUP:	ASSOCIATED LOG #:

Total # in subsample =	220	**SCORE**
Taxa Richness (TR) =	**29**	6
EPT Richness =	**12**	6
Total # of E,P,T =	106	
# Cheumatopsyche =	44	
% EPT-Cheum =	**28.18182**	4
Total # Oligochaeta =	1	
Total # Chironomids =	27	
%OC =	**12.72727**	6
NCBI =	**4.76**	6
Total # Clingers =	97	
% Clingers =	**44.09091**	4
# Cheumatopsyche	44	
# Stenelmis	21	
# Polypedilum	22	
# Cricotopus	0	
# Cricotopus/Orthocladius	0	
# Lirceus	0	
# Caenis	16	
# Elimia	14	
# Nais	0	
# Dero		
# UnID Tubificidae	0	
% TNUTOL =	**53.18182**	4

TOTAL TMI SCORE

36

TMI - EF006

STATION ID: EF006	
STREAM NAME: East Fork Stones River	DATE: 8/5/2015 TIME:
STATION LOCATION:	ECOREGION: 71i QC:
WBID/HUC: LC-051302020306 GROUP:	ASSOCIATED LOG #:

Total # in subsample =	178	**SCORE**
Taxa Richness (TR) =	**16**	4
EPT Richness =	**9**	6
Total # of E,P,T =	108	
# Cheumatopsyche =	82	
% EPT-Cheum =	**14.60674**	2
Total # Oligochaeta =	0	
Total # Chironomids =	60	
%OC =	**33.70787**	6
NCBI =	**5.62**	4
Total # Clingers =	115	
% Clingers =	**64.60674**	6
# Cheumatopsyche	82	
# Stenelmis	6	
# Polypedilum	48	
# Cricotopus	0	
# Cricotopus/Orthocladius	1	
# Lirceus	0	
# Caenis	2	
# Elimia	0	
# Nais	0	
# Dero		
# UnID Tubificidae	0	
% TNUTOL =	**78.08989**	2

TOTAL TMI SCORE

30

TMI - WF002

STATION ID: WF002	
STREAM NAME: West Fork Stones River	DATE: 8/5/2015 TIME:
STATION LOCATION:	ECOREGION: 71i QC:
WBID/HUC: LC-051302020306 GROUP:	ASSOCIATED LOG #:

Total # in subsample =	223	**SCORE**
Taxa Richness (TR) =	**17**	4
EPT Richness =	**8**	6
Total # of E,P,T =	147	
# Cheumatopsyche =	57	
% EPT-Cheum =	**40.35874**	6
Total # Oligochaeta =	0	
Total # Chironomids =	27	
%OC =	**12.10762**	6
NCBI =	**4.49**	6
Total # Clingers =	146	
% Clingers =	**65.47085**	6
# Cheumatopsyche	57	
# Stenelmis	24	
# Polypedilum	23	
# Cricotopus	0	
# Cricotopus/Orthocladius	0	
# Lirceus	0	
# Caenis	0	
# Elimia	4	
# Nais	0	
# Dero		
# UnID Tubificidae	0	
% TNUTOL =	**48.43049**	4

TOTAL TMI SCORE

38

TMI - WF003

STATION ID: WF003	
STREAM NAME: West Fork Stones River	DATE: 8/5/15 TIME:
STATION LOCATION:	ECOREGION: 71i QC:
WBID/HUC: LC-051302020306 GROUP:	ASSOCIATED LOG #:

Total # in subsample =	183	**SCORE**
Taxa Richness (TR) =	**24**	6
EPT Richness =	**8**	6
Total # of E,P,T =	118	
# Cheumatopsyche =	38	
% EPT-Cheum =	**43.71585**	6
Total # Oligochaeta =	0	
Total # Chironomids =	23	
%OC =	**12.56831**	6
NCBI =	**4.83**	6
Total # Clingers =	108	
% Clingers =	**59.01639**	6
# Cheumatopsyche	38	
# Stenelmis	24	
# Polypedilum	12	
# Cricotopus	0	
# Cricotopus/Orthocladius	1	
# Lirceus	4	
# Caenis		
# Elimia	2	
# Nais		
# Dero		
# UnID Tubificidae	0	
% TNUTOL =	**44.2623**	4

TOTAL TMI SCORE

40

TMI - WF004

STATION ID: WF004	
STREAM NAME: West Fork Stones River	DATE: 8/7/15 TIME:
STATION LOCATION:	ECOREGION: 71i QC:
WBID/HUC: LC-051302020306 GROUP:	ASSOCIATED LOG #:

Total # in subsample =	180	**SCORE**
Taxa Richness (TR) =	**23**	4
EPT Richness =	**10**	6
Total # of E,P,T =	86	
# Cheumatopsyche =	48	
% EPT-Cheum =	**21.11111**	2
Total # Oligochaeta =	0	
Total # Chironomids =	49	
%OC =	**27.22222**	6
NCBI =	**5.49**	6
Total # Clingers =	92	
% Clingers =	**51.11111**	6
# Cheumatopsyche	48	
# Stenelmis	18	
# Polypedilum	44	
# Cricotopus	0	
# Cricotopus/Orthocladius	1	
# Lirceus	18	
# Caenis		
# Elimia	2	
# Nais		
# Dero		
# UnID Tubificidae	0	
% TNUTOL =	**72.77778**	2

TOTAL TMI SCORE

32

TMI - WF005

STATION ID: WF005	
STREAM NAME: West Fork Stones River	DATE: 8/7/2015 TIME:
STATION LOCATION:	ECOREGION: 71i QC:
WBID/HUC: LC-051302020306 GROUP:	ASSOCIATED LOG #:

Total # in subsample =	222	**SCORE**
Taxa Richness (TR) =	**22**	4
EPT Richness =	**10**	6
Total # of E,P,T =	74	
# Cheumatopsyche =	19	
% EPT-Cheum =	**24.77477**	4
Total # Oligochaeta =	0	
Total # Chironomids =	75	
%OC =	**33.78378**	6
NCBI =	**4.55**	6
Total # Clingers =	76	
% Clingers =	**34.23423**	4
# Cheumatopsyche	19	
# Stenelmis	27	
# Polypedilum	69	
# Cricotopus	0	
# Cricotopus/Orthocladius	0	
# Lirceus	0	
# Caenis		
# Elimia	21	
# Nais		
# Dero		
# UnID Tubificidae	0	
% TNUTOL =	**61.26126**	2

TOTAL TMI SCORE

32

TMI - WF006

STATION ID: WF006	
STREAM NAME: West Fork Stones River	DATE: 8/5/2015 TIME:
STATION LOCATION:	ECOREGION: 71i QC:
WBID/HUC: LC-051302020306 GROUP:	ASSOCIATED LOG #:

Total # in subsample =	233	**SCORE**
Taxa Richness (TR) =	**26**	6
EPT Richness =	**12**	6
Total # of E,P,T =	106	
# Cheumatopsyche =	28	
% EPT-Cheum =	**33.47639**	4
Total # Oligochaeta =	0	
Total # Chironomids =	23	
%OC =	**9.871245**	6
NCBI =	**5**	6
Total # Clingers =	132	
% Clingers =	**56.65236**	6
# Cheumatopsyche	28	
# Stenelmis	77	
# Polypedilum	7	
# Cricotopus	0	
# Cricotopus/Orthocladius	0	
# Lirceus	1	
# Caenis		
# Elimia	5	
# Nais		
# Dero		
# UnID Tubificidae	0	
% TNUTOL =	**50.64378**	4

TOTAL TMI SCORE

38

TMI - WF007

STATION ID: WF007	
STREAM NAME: West Fork Stones River	DATE: 8/5/2015 TIME:
STATION LOCATION:	ECOREGION: 71i QC:
WBID/HUC: LC-051302020306 GROUP:	ASSOCIATED LOG #:

Total # in subsample =	215	**SCORE**
Taxa Richness (TR) =	**33**	6
EPT Richness =	**9**	6
Total # of E,P,T =	110	
# Cheumatopsyche =	22	
% EPT-Cheum =	**40.93023**	6
Total # Oligochaeta =	2	
Total # Chironomids =	35	
%OC =	**17.2093**	6
NCBI =	**5.07**	6
Total # Clingers =	95	
% Clingers =	**44.18605**	4
# Cheumatopsyche	22	
# Stenelmis	43	
# Polypedilum	21	
# Cricotopus	1	
# Cricotopus/Orthocladius	0	
# Lirceus	3	
# Caenis		
# Elimia	2	
# Nais		
# Dero		
# UnID Tubificidae	1	
% TNUTOL =	**43.25581**	4

TOTAL TMI SCORE

38

APPENDIX 5

FISH DATA COLLECTED AND CALCULATIONS

FISH TAXA COLLECTED AT EF001 - 2014

COMMON NAME	SCIENTIFIC NAME	COLLECTED
Common carp	*Cyprinus carpio*	1
Gizzard shad	*Dorosoma cepedianum*	56
Threadfin shad	*Dorosoma petenense*	2
Bluegill	*Lepomis macrochirus*	6
Longear sunfish	*Lepomis megalotis*	1
Spotted bass	*Micropterus punctulatus*	1
Largemouth bass	*Micropterus salmoides*	1
Golden redhorse	*Moxostoma erythrurum*	1
White crappie	*Pomoxis annularis*	1

FISH TAXA COLLECTED AT EF002 - 2014

COMMON NAME	SCIENTIFIC NAME	COLLECTED
Common carp	*Cyprinus carpio*	1
Gizzard shad	*Dorosoma cepedianum*	12
Threadfin shad	*Dorosoma petenense*	40
Channel catfish	*Ictalurus punctatus*	1
Green sunfish	*Lepomis cyanellus*	1
Bluegill	*Lepomis macrochirus*	23
Longear sunfish	*Lepomis megalotis*	8
Striped shiner	*Luxilus chrysocephalus*	1
Spotted bass	*Micropterus punctulatus*	2
Largemouth bass	*Micropterus salmoides*	3
Spotted sucker	*Minytrema melanops*	2
Golden redhorse	*Moxostoma erythrurum*	3
Logperch	*Percina caprodes*	3
White crappie	*Pomoxis annularis*	1

FISH TAXA COLLECTED AT EF003 - 2014

COMMON NAME	SCIENTIFIC NAME	COLLECTED
Freshwater drum	*Aplodinotus grunniens*	1
Central stoneroller	*Campostoma anomalum*	1
Common carp	*Cyprinus carpio*	6
Gizzard shad	*Dorosoma cepedianum*	25
Northern hogsucker	*Hypentelium nigricans*	2
Green sunfish	*Lepomis cyanellus*	4
Bluegill	*Lepomis macrochirus*	27
Longear sunfish	*Lepomis megalotis*	10
Redear sunfish	*Lepomis microlophus*	2
Striped shiner	*Luxilus chrysocephalus*	5
Largemouth bass	*Micropterus salmoides*	3
Spotted sucker	*Minytrema melanops*	3
Golden redhorse	*Moxostoma erythrurum*	11
Logperch	*Percina caprodes*	4
Bluntnose minnow	*Pimephales notatus*	3

FISH TAXA COLLECTED AT EF004 - 2014

COMMON NAME	SCIENTIFIC NAME	COLLECTED
Rock bass	*Ambloplites rupestris*	3
Central stoneroller	*Campostoma anomalum*	3
Gizzard shad	*Dorosoma cepedianum*	18
Northern hogsucker	*Hypentelium nigricans*	8
Channel catfish	*Ictalurus punctatus*	1
Green sunfish	*Lepomis cyanellus*	3
Bluegill	*Lepomis macrochirus*	25
Longear sunfish	*Lepomis megalotis*	25
Redear sunfish	*Lepomis microlophus*	13
Striped shiner	*Luxilus chrysocephalus*	2
Smallmouth bass	*Micropterus dolomieu*	1
Spotted bass	*Micropterus punctulatus*	1
Largemouth bass	*Micropterus salmoides*	4
Spotted sucker	*Minytrema melanops*	8
Black redhorse	*Moxostoma duquesnei*	4
Golden redhorse	*Moxostoma erythrurum*	18
Mimic shiner	*Notropis volucellus*	1
Logperch	*Percina caprodes*	3
Bluntnose minnow	*Pimephales notatus*	2

FISH TAXA COLLECTED AT EF005 - 2014

COMMON NAME	SCIENTIFIC NAME	COLLECTED
Rock bass	*Ambloplites rupestris*	6
Yellow bullhead	*Ameiurus natalis*	1
Central stoneroller	*Campostoma anomalum*	4
Steelecolor shiner	*Cyprinella whippilei*	3
Greenside darter	*Etheostoma blennoides*	4
Tennessee snubnose dater	*Etheostoma simoterum*	1
Bigeye chub	*Hybopsis amblops*	6
Northern hogsucker	*Hypentelium nigricans*	3
Green sunfish	*Lepomis cyanellus*	6
Bluegill	*Lepomis macrochirus*	31
Longear sunfish	*Lepomis megalotis*	23
Striped shiner	*Luxilus chrysocephalus*	1
Spotted bass	*Micropterus punctulatus*	1
Brindled madtom	*Noturus miurus*	1

FISH TAXA COLLECTED AT WF001 - 2014

COMMON NAME	SCIENTIFIC NAME	COLLECTED
Gizzard shad	*Dorosoma cepedianum*	14
Threadfin shad	*Dorosoma petenense*	37
Bluegill	*Lepomis macrochirus*	31
Longear sunfish	*Lepomis megalotis*	7
Largemouth bass	*Micropterus salmoides*	3
Spotted sucker	*Minytrema melanops*	2
Golden redhorse	*Moxostoma erythrurum*	4

FISH TAXA COLLECTED AT WF002 - 2014

COMMON NAME	SCIENTIFIC NAME	COLLECTED
Rock bass	*Ambloplites rupestris*	12
Central stoneroller	*Campostoma anomalum*	10
Banded sculpin	*Cottus carolinae*	2
Greenside darter	*Etheostoma blennoides*	9
Rainbow darter	*Etheostoma caerleum*	13
Fringed darter	*Etheostoma crosspterum*	2
Fantail darter	*Etheostoma flabellare*	1
Redline darter	*Etheostoma rufilineatum*	12
Tennessee snubnose dater	*Etheostoma simoterum*	10
Northern hogsucker	*Hypentelium nigricans*	3
Green sunfish	*Lepomis cyanellus*	1
Bluegill	*Lepomis macrochirus*	23
Longear sunfish	*Lepomis megalotis*	43
Striped shiner	*Luxilus chrysocephalus*	1
Spotted sucker	*Minytrema melanops*	2
Golden redhorse	*Moxostoma erythrurum*	2
Bigeye shiner	*Notropis boops*	2
Logperch	*Percina caprodes*	1

FISH TAXA COLLECTED AT WF003 - 2014

COMMON NAME	SCIENTIFIC NAME	COLLECTED
Rock bass	*Ambloplites rupestris*	3
Central stoneroller	*Campostoma anomalum*	19
Banded sculpin	*Cottus carolinae*	9
Whitetail shiner	*Cyprinella galactura*	1
Steelecolor shiner	*Cyprinella whippilei*	5
Greenside darter	*Etheostoma blennoides*	46
Rainbow darter	*Etheostoma caerleum*	4
Fringed darter	*Etheostoma crosspterum*	2
Redline darter	*Etheostoma rufilineatum*	14
Tennessee snubnose dater	*Etheostoma simoterum*	11
Striped darter	*Etheostoma virgatum*	6
Longear sunfish	*Lepomis megalotis*	4
Striped shiner	*Luxilus chrysocephalus*	4
Golden redhorse	*Moxostoma erythrurum*	2
Bigeye shiner	*Notropis boops*	1

FISH TAXA COLLECTED AT WF004 - 2014

COMMON NAME	SCIENTIFIC NAME	COLLECTED
Rock bass	*Ambloplites rupestris*	12
Central stoneroller	*Campostoma anomalum*	5
Whitetail shiner	*Cyprinella galactura*	3
Greenside darter	*Etheostoma blennoides*	32
Rainbow darter	*Etheostoma caerleum*	3
Fringed darter	*Etheostoma crosspterum*	1
Redline darter	*Etheostoma rufilineatum*	15
Tennessee snubnose dater	*Etheostoma simoterum*	7
Striped darter	*Etheostoma virgatum*	4
Northern hogsucker	*Hypentelium nigricans*	1
Green sunfish	*Lepomis cyanellus*	1
Bluegill	*Lepomis macrochirus*	5
Longear sunfish	*Lepomis megalotis*	19
Striped shiner	*Luxilus chrysocephalus*	4
Spotted bass	*Micropterus punctulatus*	1
Largemouth bass	*Micropterus salmoides*	1
Golden redhorse	*Moxostoma erythrurum*	2
Bigeye shiner	*Notropis boops*	6
Bluntnose minnow	*Pimephales notatus*	3

FISH TAXA COLLECTED AT WF005 - 2014

COMMON NAME	SCIENTIFIC NAME	COLLECTED
Rock bass	*Ambloplites rupestris*	4
Central stoneroller	*Campostoma anomalum*	56
Steelecolor shiner	*Cyprinella whippilei*	1
Greenside darter	*Etheostoma blennoides*	32
Fantail darter	*Etheostoma flabellare*	2
Redline darter	*Etheostoma rufilineatum*	4
Tennessee snubnose dater	*Etheostoma simoterum*	7
Striped darter	*Etheostoma virgatum*	1
Bigeye chub	*Hybopsis amblops*	1
Northern hogsucker	*Hypentelium nigricans*	17
Bluegill	*Lepomis macrochirus*	3
Longear sunfish	*Lepomis megalotis*	70
Striped shiner	*Luxilus chrysocephalus*	5
Smallmouth bass	*Micropterus dolomieu*	1
Golden redhorse	*Moxostoma erythrurum*	1
Bluntnose minnow	*Pimephales notatus*	1

FISH SAMPLING FIELD DATA SHEET (FRONT)

STREAM NAME: E. Fork Stones	LOCATION: EF001
STATION #: EF001	STREAM CLASS:
RIVER MILE:	RIVER BASIN: ~~OUACHITA~~ NR
LATITUDE: 35.97672	AGENCY: AQUAETER, INC
LONGITUDE: -86.43709	INVESTIGATORS: MDH, MBS, JMC, CDS, RWR, JGL, NTC, ROS
STORET #	DATE / TIME: 8/25 1408
GEAR: Boat - 1920	REASON FOR SURVEY: ~~UAA OF COFFEE CREEK/MOSSY LAKE~~ NR City of M
FORM COMPLETED BY: ~~MDH~~ NR	PAGE 1 OF 2

SAMPLE COLLECTION:

HOW WERE THE FISH CAPTURED? _____ BACKPACK X BOAT ELECTROFISH

_____ SEINE _____ FYKE NET _____ EXPERIMENTAL GILL NET

BLOCK NETS USED? _____ YES X NO

SAMPLING DURATION: START TIME 1408 END TIME 1600 DURATION 1920 sec

STREAM WIDTH (METERS): MAX 56 MEAN 48

HABITAT TYPES:

INDICATE THE PERCENTAGE OF EACH HABITAT TYPE PRESENT

0 % RIFFLES ~~100~~ 90 % POOLS 0 % RUNS 10 % SNAGS

0 % SUBMERGED MACROPHYTES 0 % OTHER: _____

GENERAL COMMENTS: 1000m total distance

SPECIES	LENGTH (mm)	WEIGHT (g)	ANOMALIES D	E	F	L	M	S	T	Z	ID #
Common Carp	543										
White Crappie	251										
Golden Redhorse	379		X								
Largemouth bass	207										
Spotted Bass	273										
Bluegill	155										
Bluegill	115										
Bluegill	120										
Gizzard Shad	168										
G Shad	163										
G Shad	156										
G Shad	208										
"	209										
"	164										
"	170										
"	248										

Anomaly codes: D = deformities; E = eroded fins; F = fungus; L = legions; M = multiple DELT anomalies; S = emaciated; Z = other

EF001

FISH SAMPLING FIELD DATA SHEET (BACK)

SPECIES	LENGTH (mm)	WEIGHT (g)	ANOMALIES								ID #
			D	E	F	L	M	S	T	Z	
"	212										
"	64										
"	64										
"	145										
"	184										
"	65										
"	66										
"	61										
"	64										
"	64										
"	61										
"	69										
"	56										
"	73										
"	64										
"	70										
"	55										
"	70										
Bluegill	95										
Longear sunfish	88										
Gizz	182										
Threadfin shad	123										
Gizz	155										
Gizz	156										
Threadfin	63										
Gizz	164										
Gizz Count = 26											
Bluegill	89										
Bluegill	94										

Anomaly codes: D = deformities; E = eroded fins; F = fungus; L = legions; M = multiple DELT anomalies; S = emaciated; Z = other

1881 total time

FISH SAMPLING FIELD DATA SHEET (FRONT)

STREAM NAME: E. Fork Stones	LOCATION: EF002
STATION #: EF002	STREAM CLASS:
RIVER MILE:	RIVER BASIN: ~~OUACHITA~~ Cumberland
LATITUDE: 35.97186	AGENCY: AQUAETER, INC
LONGITUDE: -86.41965	INVESTIGATORS: ~~MDH, MBS, JMC, CDS, RWR, JGL~~ MBS NTR ROS
STORET #	DATE / TIME: 8/27 0750
GEAR: Boat	REASON FOR SURVEY: ~~UAA OF COFFEE CREEK/MOSSY LAKE~~ City of FM
FORM COMPLETED BY: ~~MDH~~ NTR	PAGE 1 OF 3

SAMPLE COLLECTION:

HOW WERE THE FISH CAPTURED? _____ BACKPACK X BOAT ELECTROFISH

_____ SEINE _____ FYKE NET _____ EXPERIMENTAL GILL NET

BLOCK NETS USED? _____ YES X NO

SAMPLING DURATION: START TIME 0750 END TIME 0915 DURATION 1881 total sec

STREAM WIDTH (METERS): MAX 57 MEAN 52

HABITAT TYPES:

INDICATE THE PERCENTAGE OF EACH HABITAT TYPE PRESENT

0 % RIFFLES 85 % POOLS 0 % RUNS 15 % SNAGS

0 % SUBMERGED MACROPHYTES 0 % OTHER: _____

GENERAL COMMENTS: 1000m total distance

SPECIES	LENGTH (mm)	WEIGHT (g)	ANOMALIES D	E	F	L	M	S	T	Z	ID #
GZSD	145										
GZSD	147										
GZSD	145										
Thread fin	127										
Thread fin	127										
Thread fin	125										
River Red Horse	329										
Spotted Bass (large)	~~400~~ 395										
Thread fin	137										
Thread fin	125										
GZSD	186										
GZSD	207										
BGSF	99										
BGSF	166										
Large Spotted Bass	238										
River Red Horse	366										

Anomaly codes: D = deformities; E = eroded fins; F = fungus; L = legions; M = multiple DELT anomalies; S = emaciated; Z = other

EF002

FISH SAMPLING FIELD DATA SHEET (BACK)

SPECIES	LENGTH (mm)	WEIGHT (g)	ANOMALIES D	E	F	L	M	S	T	Z	ID #
Channel Catfish	276										
Large mouth ~~spotted~~ bass	323										
River Red Horse	305										
Thread fin	133										
Thread fin	66										
Thread fin	54										
Thread fin	55										
Thread fin	133										
Thread fin	58										
Thread fin	54										
Thread fin	55										
Thread fin	54										
Thread fin	65										
Thread fin	61										
Thread fin	51										
Thread fin	74										
Thread fin	55										
Thread fin	72										
Thread fin	60										
	55										
	50										
	52										
	60										
	65										
GTSD	209										
BGSF	115										
BGSF	138										
BGSF	145										
BGSF	137										
BGSF	97										
BGSF	87										
Large mouth ~~spotted~~ bass	116										
BGSF	89										
LGSF	80										
LGSF	89										
LGSF	96										
LGSF	75										
LGSF	82										
GNSF	90										
BGSF	94										
Thread fin	61										

Anomaly codes: D = deformities; E = eroded fins; F = fungus; L = legions; M = multiple DELT anomalies; S = emaciated; Z = other

2

EF002

FISH SAMPLING FIELD DATA SHEET (BACK)

SPECIES	LENGTH (mm)	WEIGHT (g)	ANOMALIES D	E	F	L	M	S	T	Z	ID #
LESF	73										
Un Id Shiner Striped Shiner	72										
Un Id Redhorse (Spotted sucker)	73										
Log Perch	82										
Log Perch	82										
Log Perch	96										
Common Carp	700 gm										
GZSD	239										
GZSD	211										
GZSD	248										
White Crappie	272										
GZSD	215										
Threadfin	59										
Threadfin	65										
Threadfin	56										
~~THRF~~ BGSF	88										
Threadfin	74										
Threadfin	68										
GZSD	76										
Lmp	80										
GZSD	215										
BGSF	139										
Spotted Sucker	261										
BGSF	177										
BGSF	138										
LESF	78										
BGSF	115										
BGSF	112										
LESF	87										
BGSF	117										
	122										
	101										
	110										
	~~122~~ 129										
	104										
	83										
Threadfin x 8											

3

Anomaly codes: D = deformities; E = eroded fins; F = fungus; L = legions; M = multiple DELT anomalies; S = emaciated; Z = other

1995 total time

FISH SAMPLING FIELD DATA SHEET (FRONT)

STREAM NAME: E. FORK	LOCATION: EF003
STATION #: EF003	STREAM CLASS:
RIVER MILE:	RIVER BASIN: ~~OUACHITA~~ Cumberland
LATITUDE: 35.96157	AGENCY: AQUAETER, INC
LONGITUDE: -86.39996	INVESTIGATORS: ~~MDH, MBS, JMC, CDS, RWR, JGL~~ RWR NTR ROS
STORET #	DATE / TIME: 8/8/06 1130
GEAR: Boat	REASON FOR SURVEY: ~~UAA OF COFFEE CREEK/MOSSY LAKE~~ City of M
FORM COMPLETED BY: ~~MDH~~ NTR	PAGE 1 OF 4

SAMPLE COLLECTION:

HOW WERE THE FISH CAPTURED? ____ BACKPACK X BOAT ELECTROFISH

____ SEINE ____ FYKE NET ____ EXPERIMENTAL GILL NET

BLOCK NETS USED? ____ YES X NO

SAMPLING DURATION: START TIME 1130 END TIME 1345 DURATION 1995 & 5CCS

STREAM WIDTH (METERS): MAX 58 MEAN 46

HABITAT TYPES:

INDICATE THE PERCENTAGE OF EACH HABITAT TYPE PRESENT

0 % RIFFLES 90 % POOLS 0 % RUNS 10 % SNAGS

0 % SUBMERGED MACROPHYTES 0 % OTHER: ____

GENERAL COMMENTS: 1000m total distance

SPECIES	LENGTH (mm)	WEIGHT (g)	ANOMALIES D	E	F	L	M	S	T	Z	ID #
Common Carp	485										
Common Carp	502										
Common Carp	620										
CC	480										
CC	520										
CC	510										
~~River~~ Red Horse	350										
~~River~~ Red Horse	395										
~~River~~ Red Horse	328										
~~River~~ Red Horse	425										
~~River~~ Red Horse	412										
~~River~~ Red Horse	451										
~~River~~ Red Horse	415										
Spotted Sucker	269										
Spotted Sucker	319										
Fillet with Jerum	454										

Golden

Anomaly codes: D = deformities; E = eroded fins; F = fungus; L = legions; M = multiple DELT anomalies; S = emaciated; Z = other

EF003

FISH SAMPLING FIELD DATA SHEET (BACK)

SPECIES	LENGTH (mm)	WEIGHT (g)	ANOMALIES D	E	F	L	M	S	T	Z	ID #
Golden ~~River~~ Red Horse	366										
- Northern Hog Sucker	384										
- Gizzard Shad	210										
- Gizzard Shad	210										
- Gizzard Shad	202										
- Gizzard Shad	192										
- Gizzard Shad	140										
- Spotted Sucker	290										
- ~~River~~ Red Horse	292										
Golden - ~~River~~ Red Horse	275										
- ~~River~~ Red Horse	288										
- ~~River~~ Gizzard	210										
Gizzard Shad	189										
- Gizzard Shad	195										
- Gizzard Shad	204										
- Gizzard Shad	205										
- Gizzard Shad	152										
- Gizzard Shad	140										
- Gizzard Shad	199										
- G.S.	145										
- G.S.	276										
- G.S.	215										
- G.S.	201										
- G.S.	188										
- Blunt Nose minnow	50										
- G.S.	139										
- G.S.	155										
- G.S.	146										
- G.S.	157										
- G.S.	154										
- G.S.	216										
- G.S.	211										
- B.G.S.F.	149										
- B.G.S.F.	172										
- B.G.S.F.	161										
- B.G.S.F.	139										
- B.G.S.F.	136										
- R.E.S.F.	226										
- R.E.S.F.	106										
- L.E.S.F.	126										
- B.G.S.F.	165										

2

Anomaly codes: D = deformities; E = eroded fins; F = fungus; L = legions; M = multiple DELT anomalies; S = emaciated; Z = other

EF003

FISH SAMPLING FIELD DATA SHEET (BACK)

SPECIES	LENGTH (mm)	WEIGHT (g)	ANOMALIES D	E	F	L	M	S	T	Z	ID #
~~Unid. Shiner~~ Striped Shiner	59										
Striped Shiner	122										
St. Shiner	111										
St. Shiner	81										
L.M.B.S	106										
L.M.B.S	81										
B.G.S.F.	127										
B.G.S.F	124										
BGSF	164										
BGSF	131										
BGSF	95										
BGSF	114										
BGSF	96										
BGSF	116										
BGSF	79										
BGSF	100										
~~L.E.S.F~~ BGSF	81										
LESF	126										
LESF	101										
LESF	86										
LESF	110										
GNSF	57										
GNSF	75										
Log Perch	107										
~~Shiner~~ BNMW	56										
~~Unid. Shiner~~ Striped Shiner	50										
LGBS	94										
Log Perch	77										
Log Perch	82										
BGSF	132										
BGSF	101										
BGSF	121										
BGSF	112										
BGSF	115										
BGSF	70										
BGSF	118										
BGSF	105										
BGSF	90										
BGSF	40										
LESF	71										
LESF	76										

3

Anomaly codes: D = deformities; E = eroded fins; F = fungus; L = legions; M = multiple DELT anomalies; S = emaciated; Z = other

EF003

FISH SAMPLING FIELD DATA SHEET (BACK)

SPECIES	LENGTH (mm)	WEIGHT (g)	ANOMALIES								ID #
			D	E	F	L	M	S	T	Z	
LSSF	109										
LSSF	118										
LSSF	92										
GNSF	85										
GNSF	89										
Log Perch	79										
Hog Sucker	98										
BNMW	41										
Stone Roller	60										

4

Anomaly codes: D = deformities; E = eroded fins; F = fungus; L = legions; M = multiple DELT anomalies; S = emaciated; Z = other

~~2101~~ 1201 ~~1201~~ end time 2182 sec.

FISH SAMPLING FIELD DATA SHEET (FRONT)

STREAM NAME: E Fork	LOCATION: EF00~~3~~4
STATION #: EF00~~3~~4	STREAM CLASS:
RIVER MILE:	RIVER BASIN: ~~OUACHITA~~ Cumberland
LATITUDE: 35.959617	AGENCY: AQUAETER, INC
LONGITUDE: -86.389169	INVESTIGATORS: ~~MDH, MBS, JMC, CDS, RWR, JGL~~ MBS NTC RDS
STORET #	DATE / TIME: 0852 8/25/6
GEAR: Boat	REASON FOR SURVEY: ~~UAA OF COFFEE CREEK/MOSSY LAKE~~ City of M
FORM COMPLETED BY: ~~MDH~~ NTC	PAGE 1 OF 5

SAMPLE COLLECTION:

HOW WERE THE FISH CAPTURED? _____ BACKPACK X BOAT ELECTROFISH

_____ SEINE _____ FYKE NET _____ EXPERIMENTAL GILL NET

BLOCK NETS USED? _____ YES X NO

SAMPLING DURATION: START TIME 0852 END TIME ~~1100~~ 1201 DURATION ~~2101~~ 2182 sec

STREAM WIDTH (METERS): MAX 32 MEAN 28

HABITAT TYPES:

INDICATE THE PERCENTAGE OF EACH HABITAT TYPE PRESENT

0 % RIFFLES 60 % POOLS 20 % RUNS 15 % SNAGS

5 % SUBMERGED MACROPHYTES 0 % OTHER: _____

GENERAL COMMENTS: 1000m total distance

SPECIES	LENGTH (mm)	WEIGHT (g)	ANOMALIES D	E	F	L	M	S	T	Z	ID #
Golden Red Horse	374				✓						
Golden ~~River~~ Red Horse	346										
Spotted Sucker	111										
Golden Red Horse	382										
Golden Red Horse	270										
Golden Red Horse	RS ~~213~~ 320										
Golden ~~River~~ Red Horse	275										
Northern Hog Sucker	252										
Channel Cat Fish	278										
Blue Gill	107										
Blue Gill	110										
Large mouth bass	246										
Spotted bass	278		✓								
Large Mouth Bass	352										
Blue Gill	137										
Large mouth	68										

Blue Gill - 14

Long Ear Sun - 19

Anomaly codes: D = deformities; E = eroded fins; F = fungus; L = legions; M = multiple DELT anomalies; S = emaciated; Z = other

EF004

FISH SAMPLING FIELD DATA SHEET (BACK)

SPECIES	LENGTH (mm)	WEIGHT (g)	ANOMALIES D	E	F	L	M	S	T	Z	ID #
Gizzard Shad	195										
Gizzard Shad	295										
Gizzard Shad	291										
Long Ear Sunfish	128										
Log Perch	119										
Gizzard Shad	262										
Log Perch	118										
Northern Hog Sucker	155										
Central Stone Roller	114										
Smallmouth	145		✓								
Red Ear Sunfish	147										
Red Ear Sunfish	183										
Red Ear Sunfish	180										
Blue Gill	160										
Blue Gill	178										
Blue Gill	156										
Blue Gill	155										
Blue Gill	142										
Red Ear Sunfish	154										
Red Ear Sunfish	160										
Red Ear Sunfish	114										
Blue Gill	96										
Gizzard Shad	145										
Blue Gill	132										
Long Ear Sunfish	104										
Long Ear Sunfish	92										
Long Ear Sunfish	107										
Long Ear Sunfish	105										
Long Ear Sunfish	115										
Long Ear Sunfish	87										
Rock Bass	160										
Spotted Sucker	255										
Hog Sucker	77										
Long Ear Sunfish	105										
Green Sunfish	106										
Long Ear Sunfish	130										
Long Ear Sunfish	100										
Long Ear Sunfish	118										
Long Ear Sunfish	122										
Long Ear Sunfish	121										
Long Ear Sunfish	109										

Anomaly codes: D = deformities; E = eroded fins; F = fungus; L = legions; M = multiple DELT anomalies; S = emaciated; Z = other

2

EF004

FISH SAMPLING FIELD DATA SHEET (BACK)

SPECIES	LENGTH (mm)	WEIGHT (g)	ANOMALIES D	E	F	L	M	S	T	Z	ID #
Blue Gill	131										
Blue Gill	116										
~~Blue~~ Red ear Sunfish	112										
Long ear Sunfish	120										
Long ear Sunfish	91										
Long ear Sunfish	79										
Long ear Sunfish	80										
Log Perch	82										
Blue Gill	165										
Green Sunfish	102										
Blue Gill	89										
~~Gold Minnow~~ Mimic Shiner	47										
Golden Red Horse	573										
Golden ~~River~~ Red Horse	527										
Black Red Horse	400										
Golden Red Horse	386										
~~Golden Red Horse~~	~~393~~										
Black Red Horse	393										
Black Red Horse	381										
Black Red Horse	401										
Spotted Sucker	280										
Spotted Sucker	272										
Spotted Sucker	265										
Golden Red Horse	392										
Golden ~~Blue~~ ~~River~~ Red Horse	410										
Golden ~~River~~ Red Horse	369										
Golden ~~River~~ Red Horse	382										
Golden ~~River~~ Red Horse	276										
Golden ~~River~~ Red Horse	280										
Golden ~~River~~ Red Horse	361										
Red ear Sunfish	249										
Spotted Sucker	274										
Gizzard Shad	190										
Gizzard Shad	149										
Gizzard Shad	192										
Gizzard Shad	131										
Northern Hog Sucker	210										
Northern Hog Sucker	229										
Large Mouth Bass	211										
Golden ~~River~~ Red Horse	182										
~~Golden~~ Striped Shiner	132										

3

Anomaly codes: D = deformities; E = eroded fins; F = fungus; L = legions; M = multiple DELT anomalies; S = emaciated; Z = other

E Foo

FISH SAMPLING FIELD DATA SHEET (BACK)

SPECIES	LENGTH (mm)	WEIGHT (g)	ANOMALIES								ID #
			D	E	F	L	M	S	T	Z	
Striped ~~Golden~~ Shiner	146										
Red Ear Sunfish	234										
Northern Hog Sucker	179										
Gizzard Shad	200										
Gizzard Shad	212										
Gizzard Shad	181										
Gizzard Shad	187										
Gizzard Shad	218										
Gizzard Shad	195										
Gizzard Shad	283										
Gizzard Shad	187										
Gizzard Shad	275										
~~Gizzard Shad~~											
Central Stone Roller	170										
Central Stone Roller	134										
Golden ~~River~~ Red Horse	108										
Rock Bass	192										
Red Ear Sunfish	252										
Red Ear Sunfish	223										
Red Ear Sunfish	154										
Rock Bass	202										
Blue Gill	164										
Blue Gill	162										
Red Ear Sunfish	149										
Long Ear Sunfish	111										
Blue Gill	116										
Blue Gill	148										
Blue Gill	137										
Blue Gill	134										
Blue Gill	98										
Blue Gill	157										
Long Ear Sunfish	119										
Green Sunfish	105										
Northern Hog Sucker	176										
Northern Hog Sucker	210										
Blue Gill	102										
Long Ear Sunfish	162										
Long Ear Sunfish	~~88~~ 89										
Long Ear Sunfish	99										
Long Ear Sunfish	82										
Long Ear Sunfish	96										

4

Anomaly codes: D = deformities; E = eroded fins; F = fungus; L = legions; M = multiple DELT anomalies; S = emaciated; Z = other

EPOD 9

FISH SAMPLING FIELD DATA SHEET (BACK)

SPECIES	LENGTH (mm)	WEIGHT (g)	ANOMALIES D	E	F	L	M	S	T	Z	ID #
Blue Gill	92										
Blue Gill	73										
~~Spotted Sucker~~ ~~Spotted Sucker~~ Red Horse	86										
Spotted ~~Orbit~~ Sucker	75										
Blunt Nose Minnows	44										
Blunt Nose Minnows	45										

5

Anomaly codes: D = deformities; E = eroded fins; F = fungus; L = legions; M = multiple DELT anomalies; S = emaciated; Z = other

EF005 Total Time 1712

FISH SAMPLING FIELD DATA SHEET (FRONT)

STREAM NAME: E. Fork Stones	LOCATION: EF005
STATION #: EF005	STREAM CLASS:
RIVER MILE:	RIVER BASIN: ~~OUACHITA~~ Cumberland
LATITUDE: 35.9468	AGENCY: AQUAETER, INC
LONGITUDE: -86.390533	INVESTIGATORS: ~~MDH, MBS, JMC, CDS, RWR, JGL~~ CDS NTR ROS
STORET #	DATE / TIME: 08/28 1322
GEAR: Boat	REASON FOR SURVEY: ~~UAA OF COFFEE CREEK/MOSSY LAKE~~ City of FM
FORM COMPLETED BY: ~~MDH~~ NTR	PAGE 1 OF 3

SAMPLE COLLECTION:

HOW WERE THE FISH CAPTURED? ____ BACKPACK X BOAT ELECTROFISH
____ SEINE ____ FYKE NET ____ EXPERIMENTAL GILL NET

BLOCK NETS USED? ____ YES X NO

SAMPLING DURATION: START TIME 1322 END TIME 1450 DURATION 1712 sec

STREAM WIDTH (METERS): MAX 42 MEAN 38

HABITAT TYPES:

INDICATE THE PERCENTAGE OF EACH HABITAT TYPE PRESENT

20 % RIFFLES 30 % POOLS 40 % RUNS 5 % SNAGS

5 % SUBMERGED MACROPHYTES ____ % OTHER: ____

GENERAL COMMENTS: 250 m total distance

SPECIES	LENGTH (mm)	WEIGHT (g)	ANOMALIES D	E	F	L	M	S	T	Z	ID #
GNSF	142										
Rock Bass	202										
Rock Bass	208										
Rock Bass	136										
BGSF	105										
BGSF	176										
BGSF	104										
BGSF	163										
BGSF	169										
BGSF	150										
BGSF	160										
BGSF	110										
BGSF	100										
BGSF	77										
BGSF	85										
BGSF	176										

1

Anomaly codes: D = deformities; E = eroded fins; F = fungus; L = legions; M = multiple DELT anomalies; S = emaciated; Z = other

EF005

FISH SAMPLING FIELD DATA SHEET (BACK)

SPECIES	LENGTH (mm)	WEIGHT (g)	ANOMALIES D	E	F	L	M	S	T	Z	ID #
BGSF	130										
BGSF	157										
BGSF	86										
BGSF	91										
BGSF	81										
BGSF	87										
BGSF	148										
BGSF	134										
BGSF	105										
BGSF	93										
BGSF	75										
BGSF	120										
BGSF	140										
BGSF	126										
BGSF	91										
BGSF	86										
BGSF	80										
BGSF	124										
BGSF	112										
BGSF	85										
LESF	129										
LESF	115										
LESF	124										
LESF	127										
LESF	106										
LESF	132		✓								
LESF	104										
LESF	120										
LESF	101										
LESF	86										
LESF	112										
LESF	104										
LESF	121										
LESF	109										
LESF	86										
LESF	78										
LESF	88										
LESF	121										
LESF	126										
LESF	107										

2

Anomaly codes: D = deformities; E = eroded fins; F = fungus; L = legions; M = multiple DELT anomalies; S = emaciated; Z = other

E5005

FISH SAMPLING FIELD DATA SHEET (BACK)

SPECIES	LENGTH (mm)	WEIGHT (g)	ANOMALIES D	E	F	L	M	S	T	Z	ID #
N. Hog Sucker	299										
N. Hog Sucker	209										
N. Hog Sucker	162										
GNSF	111										
GNSF	85										
GNSF	111										
GNSF	93										
GNSF	121										
Rock bass	103										
Rock bass	151										
Rock bass	107										
* Brindled madtom *	68										
LESF	101										
Spotted bass	121										
Central Stone Roller	50										
Central Stone Roller	137										
Central Stone Roller	52										
Central Stone Roller	52										
Yellow bullhead	81										
Green side darter	95										
Green side darter	108										
Green side darter	88										
Green side darter	82										
LESF	71										
Snubnose darter	40										
Striped Shiner	59										
Steelcolor shiner	85										
Steelcolor shiner	79										
Steelcolor shiner	89										
Bigeye chub	71										
	76										
	68										
	75										
	71										
	70										

13

Anomaly codes: D = deformities; E = eroded fins; F = fungus; L = legions; M = multiple DELT anomalies; S = emaciated; Z = other

1928 total time

FISH SAMPLING FIELD DATA SHEET (FRONT)

STREAM NAME: W. fork Stones	LOCATION: WF001
STATION #: WF001	STREAM CLASS:
RIVER MILE:	RIVER BASIN: ~~OUACHITA~~ Cumberland
LATITUDE: 35.97161 3	AGENCY: AQUAETER, INC
LONGITUDE: -86.46667	INVESTIGATORS: ~~MDH, MBS, JMC, CDS, RWR, JGL~~ NTR MBS ROS
STORET #	DATE / TIME: 1045 8/27
GEAR: Boat	REASON FOR SURVEY: ~~UAA OF COFFEE CREEK/MOSSY LAKE~~ City of Murf
FORM COMPLETED BY: ~~MDH~~ NTR	PAGE 1 OF 3

SAMPLE COLLECTION:

HOW WERE THE FISH CAPTURED? _____ BACKPACK X BOAT ELECTROFISH

_____ SEINE _____ FYKE NET _____ EXPERIMENTAL GILL NET

BLOCK NETS USED? _____ YES X NO

SAMPLING DURATION: START TIME 1045 END TIME 1300 DURATION 1928 sec

STREAM WIDTH (METERS): MAX 62 MEAN 59

HABITAT TYPES:

INDICATE THE PERCENTAGE OF EACH HABITAT TYPE PRESENT

0 % RIFFLES 93 ~~100~~ % POOLS 0 % RUNS 5 % SNAGS

2 % SUBMERGED MACROPHYTES 0 % OTHER: _____

GENERAL COMMENTS: Total distance 1000 Km

SPECIES	LENGTH (mm)	WEIGHT (g)	ANOMALIES D	E	F	L	M	S	T	Z	ID #
Golden Red Horse	353										
Golden ~~River~~ Red Horse	375										
GZSD	230										
GZSD	137										
Spotted Sucker	92										
Golden ~~River~~ Red Horse	325										
Golden Red Horse	305										
UMBS	39le										
GZSD	150										
Thread fin	105										
Spotted Sucker	100										
GZSD	153										
GZSD	154										
GZSD	205										
GZSD	232										
GZSD	225										

1

Anomaly codes: D = deformities; E = eroded fins; F = fungus; L = legions; M = multiple DELT anomalies; S = emaciated; Z = other

WF001

FISH SAMPLING FIELD DATA SHEET (BACK)

SPECIES	LENGTH (mm)	WEIGHT (g)	ANOMALIES D	E	F	L	M	S	T	Z	ID #
LMBS	160										
BGSF	84										
BGSF	92										
TFSD	49										
TFSD	59										
TFSD	60										
TFSD	63										
TFSD	55										
TFSD	57										
TFSD	60										
TFSD	66										
~~TFSD~~ BGSF	136										
TFSD	47										
GZSD	196										
GZSD	143										
GZSD	149										
GZSD	149										
GZSD	148										
BGSF	154										
BGSF	136										
BGSF	124										
BGSF	103										
BGSF	120										
BGSF	84										
LGSF	99										
BGSF	140										
BGSF	156										
	115										
	94										
	137										
	90										
	117										
	101										
	84										
	125										
	101										
	137										
LGSF	132										
LGSF	85										
LGSF	91										
LGSF	91										

2

Anomaly codes: D = deformities; E = eroded fins; F = fungus; L = legions; M = multiple DELT anomalies; S = emaciated; Z = other

WF001

FISH SAMPLING FIELD DATA SHEET (BACK)

SPECIES	LENGTH (mm)	WEIGHT (g)	ANOMALIES D	E	F	L	M	S	T	Z	ID #
Largemouth	126										
BGSF	126										
GZSD	155										
BGSF	121										
BGSF	79										
IFSD	60										
	52										
	56										
	55										
	56										
	55										
	58										
	54										
	54										
	54										
	54										
	53										
	55										
	59										
	52										
	59										
	53										
	55										
	56										
	57										
	51										
	50										
	58										
	54										
	49										
	52										
	59										
LGSF	54										
LGSF	86										
BGSF	127										
	118										
	120										
	122										
	93										
	90										
	85										

Anomaly codes: D = deformities; E = eroded fins; F = fungus; L = legions; M = multiple DELT anomalies; S = emaciated; Z = other

WF002 Total Time: 1708

FISH SAMPLING FIELD DATA SHEET (FRONT)

STREAM NAME: ~~WF 002~~ W. Fork Stw	LOCATION: WF002
STATION #: WF002	STREAM CLASS:
RIVER MILE:	RIVER BASIN: ~~OUACHITA~~ Cumberland
LATITUDE: 35.741392	AGENCY: AQUAETER, INC
LONGITUDE: -86.463594	INVESTIGATORS: ~~MDH, MBS, JMC, CDS, RWR, JGL~~ CDS NTR RDS
STORET #	DATE / TIME: 8/28 1045
GEAR: ~~Boat~~ Backpack	REASON FOR SURVEY: ~~UAA OF COFFEE CREEK/MOSSY LAKE~~ City of Murf
FORM COMPLETED BY: ~~MDH~~ NTR	PAGE 1 OF 5

SAMPLE COLLECTION:

HOW WERE THE FISH CAPTURED? X BACKPACK ___ BOAT ELECTROFISH

___ SEINE ___ FYKE NET ___ EXPERIMENTAL GILL NET

BLOCK NETS USED? ___ YES X NO

SAMPLING DURATION: START TIME 1045 END TIME 1200 DURATION 1708 sec

STREAM WIDTH (METERS): MAX 51 MEAN 43

HABITAT TYPES:

INDICATE THE PERCENTAGE OF EACH HABITAT TYPE PRESENT

30 % RIFFLES 30 % POOLS 25 % RUNS 0 % SNAGS

15 % SUBMERGED MACROPHYTES 0 % OTHER: ___

GENERAL COMMENTS: Total distance 250 m

SPECIES	LENGTH (mm)	WEIGHT (g)	ANOMALIES D	E	F	L	M	S	T	Z	ID #
BGSF (V)	81										
BGSF (V)	72										
LESF (V)	86										
LESF (V)	74										
Central Stone Roller (V)	50										
CSR (V)	45										
SPSK (V)	59										
SPSK											
Central	152										
Stripped Shiner (V)	134										
BGSF	133										
BGSF	80										
LESF	115										
BGSF	138										
Rock Bass	149										
Rock Bass (V)	84										

1

Anomaly codes: D = deformities; E = eroded fins; F = fungus; L = legions; M = multiple DELT anomalies; S = emaciated; Z = other

WF002

FISH SAMPLING FIELD DATA SHEET (BACK)

SPECIES	LENGTH (mm)	WEIGHT (g)	ANOMALIES D	E	F	L	M	S	T	Z	ID #
Rock Bass (V)	120										
Central Stone Roller	145										
" " "	129										
Rock bass	101										
BGSF	192										
BGSF	122										
LGSF	104										
LGSF	111										
LGSF	80										
LGSF	81										
LGSF	92										
LGSF	79										
Central Stone Roller	138										
Golden ~~DATE~~ Redhorse (V)	166										
Rock bass	234										
N. Hog Sucker (PV)	236										
LGSF	89										
LGSF	92										
LGSF	117										
LGSF	90										
Green Side Darter (V)	58										
Central Stone Roller	53										
N. Hog Sucker	204										
Rock Bass	115										
BGSF	121										
LGSF	120										
Lon LNGR (PV)	316										
BGSF	72										
BGSF	75										
LGSF	89										
RGSF (PV)	143										
Rock Bass	145										
Rock Bass	156										
Rock Bass	163										
Rock Bass	141										
Green Side darter (V)	89										
Green Side darter	71										
~~BGSS~~ BGSF	94										
BGSF	83										
BGSF	87										
BGSF	70										

(2)

Anomaly codes: D = deformities; E = eroded fins; F = fungus; L = legions; M = multiple DELT anomalies; S = emaciated; Z = other

WF002

FISH SAMPLING FIELD DATA SHEET (BACK)

SPECIES	LENGTH (mm)	WEIGHT (g)	ANOMALIES D	E	F	L	M	S	T	Z	ID #
Green Side darter	64										
BGSF	112										
BGSF	84										
BGSF	67										
~~BGS~~ LPSF	111										
LPSF	109										
LPSF	120										
LPSF	107										
~~LPSF~~ Central Stone Roller	145										
Central Stone Roller	61										
ROCK BASS	96										
ROCK BASS	91										
BGSF	87										
BGSF	74										
LPSF	98										
LPSF	81										
LPSF	112										
LPSF	75										
LPSF	107										
LPSF	82										
BGSF	74										
Central Stone Roller	55										
LPSF	70										
LPSF	109										
LPSF	79										
LPSF	71										
BGSF	82										
LPSF	75										
GNSF (IV)	124			✓							
N. Hog Sucker (V)	79										
LPSF	94										
LPSF	81										
LPSF	78										
LPSF	71										
Fantail darter (V)	54										
Banded Sculpin (V)	74										
BGSF	46										
LPSF	75										
LPSF	72										
LPSF	76										
LPSF	74										

(3)

Anomaly codes: D = deformities; E = eroded fins; F = fungus; L = legions; M = multiple DELT anomalies; S = emaciated; Z = other

WF002

FISH SAMPLING FIELD DATA SHEET (BACK)

SPECIES	LENGTH (mm)	WEIGHT (g)	ANOMALIES D	E	F	L	M	S	T	Z	ID #
LESF	74										
LESF	80										
LESF	109										
BGSF	94										
Log Perch (V)	65										
Green Side darter	109										
Green Side darter	60										
Green Side darter	104										
Green Side darter	96										
Green side darter	116										
Banded Sculpin (V)	52										
Golden RH (V)	57										
Snub nose darter (V)	42										
Snubnose darter (V)	54										
	72										
	70										
	61										
	56										
	57										
	54										
	58										
Snubnose	56										
Redline DT (V)	69										
Redline DT (V)	66										
	59										
	52										
	53										
	54										
	48										
	55										
	57										
	45										
	49										
	50										
Fringed DT (V)	66										
Fringed DT (V)	35										
Rainbow DT (V)	61										
Rainbow DT (V)	63										
	53										
	70										
	72										

(4)

Anomaly codes: D = deformities; E = eroded fins; F = fungus; L = legions; M = multiple DELT anomalies; S = emaciated; Z = other

WF-002

FISH SAMPLING FIELD DATA SHEET (BACK)

SPECIES	LENGTH (mm)	WEIGHT (g)	ANOMALIES								ID #
			D	E	F	L	M	S	T	Z	
Rainbow DT	56										
	55										
	66										
	40										
	65										
	39										
	56										
	68										
Tennessee Shiner (V)	69										
Tennessee Shiner (V)	61										

(5)

Anomaly codes: D = deformities; E = eroded fins; F = fungus; L = legions; M = multiple DELT anomalies; S = emaciated; Z = other

Total Time: 1644

FISH SAMPLING FIELD DATA SHEET (FRONT)

STREAM NAME: W. FORK	LOCATION: WF003
STATION #: WF-003	STREAM CLASS:
RIVER MILE:	RIVER BASIN: ~~OUACHITA~~ Cumberland
LATITUDE: 35.924069	AGENCY: AQUAETER, INC
LONGITUDE: -86.455417	INVESTIGATORS: ~~MDH, MBS, JMC, CDS, RWR, JGL~~ CDS NTZ DCS
STORET #	DATE / TIME: 8/28 0825
GEAR: Backpack	REASON FOR SURVEY: ~~UAA OF COFFEE CREEK/MOSSY LAKE~~ City of M.
FORM COMPLETED BY: ~~MDH~~ NJC	PAGE 1 OF 4

SAMPLE COLLECTION:

HOW WERE THE FISH CAPTURED? X BACKPACK ____ BOAT ELECTROFISH

____ SEINE ____ FYKE NET ____ EXPERIMENTAL GILL NET

BLOCK NETS USED? ____ YES X NO

SAMPLING DURATION: START TIME 0825 END TIME 0950 DURATION 1644 sec

STREAM WIDTH (METERS): MAX 22 MEAN 20

HABITAT TYPES:

INDICATE THE PERCENTAGE OF EACH HABITAT TYPE PRESENT

35 % RIFFLES 15 % POOLS 30 % RUNS 10 % SNAGS

10 % SUBMERGED MACROPHYTES ____ % OTHER: ____

GENERAL COMMENTS:

Total distance 250 m

SPECIES	LENGTH (mm)	WEIGHT (g)	ANOMALIES D	E	F	L	M	S	T	Z	ID #
Rock Bass	235										
Rock Bass	150										
Rock Bass	171										
LESF	89										
Green Side darter	128										
GNDT	99										
GNDT	63										
	118										
	134										
	125										
	104										
	78										
	124										
	125										
	120										
	108										

1

Anomaly codes: D = deformities; E = eroded fins; F = fungus; L = legions; M = multiple DELT anomalies; S = emaciated; Z = other

W.F 003

FISH SAMPLING FIELD DATA SHEET (BACK)

SPECIES	LENGTH (mm)	WEIGHT (g)	ANOMALIES D	E	F	L	M	S	T	Z	ID #
GNDT	124										
	110										
	70										
	70										
	75										
	69										
	112										
	72										
	67										
	77										
	105										
	74										
	106										
	74										
	102										
	63										
	65										
	60										
LESF	52										
~~Mottled sculpin~~ Banded sculpin	78										
~~Mottled sculpin~~ Banded sculpin	63										
banded sculpin	55										
~~mottled sculpin~~ Banded sculpin	68										
banded sculpin	74										
central stone roller	58										
central stone roller	63										
central stone roller	44										
central stone roller	49										
central stone roller	50										
central stone roller	84										
Banded ~~mottled~~ sculpin	53										
~~mottled~~ sculpin	56										
mottled sculpin	81										
mottled sculpin	47										
central stone roller	55										
central stone roller	85										
central stone roller	55										
central stone roller	56										
central stone roller	55										
central stone roller	54										
LESF	59										

2

Anomaly codes: D = deformities; E = eroded fins; F = fungus; L = legions; M = multiple DELT anomalies; S = emaciated; Z = other

WF 003

FISH SAMPLING FIELD DATA SHEET (BACK)

SPECIES	LENGTH (mm)	WEIGHT (g)	ANOMALIES D	E	F	L	M	S	T	Z	ID #
LESF	91										
central stone roller	66										
central stone roller	85										
central stone roller	55										
central stone roller	50										
central stone roller	48										
central stone roller	44										
central stone roller	66										
GNDT											
Striped darter	38										
	41										
	47										
	34										
	40										
Striped darter	40										
Fringed ~~Fantail~~ darter	54										
Fringed ~~Fantail~~ darter	49										
Snubnose darter	51										
	42										
	45										
	38										
	53										
	47										
	42										
	45										
	46										
	40										

14

3

Anomaly codes: D = deformities; E = eroded fins; F = fungus; L = legions; M = multiple DELT anomalies; S = emaciated; Z = other

WF-003

FISH SAMPLING FIELD DATA SHEET (BACK)

SPECIES	LENGTH (mm)	WEIGHT (g)	ANOMALIES D	E	F	L	M	S	T	Z	ID #
Snubnose darter	49										
Redline darter	65										
	53										
	54										
	49										
	65										
	59										
	56										
	54										
	44										
	50										
	49										
	48										
	46										
GNDT	65										
Rainbow DT	72										
	45										
	51										
	53										
Redline DT	55										
Whitetail shiner	90										
Striped shiner	66										
	56										
	61										
	69										
Golden Rlt	61										
Golden Rlt	58										
Steeldolor	61										
	67										
	56										
	55										
	49										
Tennessee Shiner	58										

(4)

Anomaly codes: D = deformities; E = eroded fins; F = fungus; L = legions; M = multiple DELT anomalies; S = emaciated; Z = other

1752

FISH SAMPLING FIELD DATA SHEET (FRONT)

STREAM NAME: West FORK	LOCATION: WF004
STATION #: WF004	STREAM CLASS:
RIVER MILE:	RIVER BASIN: ~~OUACHI~~TA Cumberland
LATITUDE: 35.898892	AGENCY: AQUAETER, INC
LONGITUDE: -86.405161	INVESTIGATORS: ~~MDH, MBS, JMC, CDS, RWR, JGL~~ MBS NR RDS
STORET #	DATE / TIME: 8/27 1421
GEAR: Backpack	REASON FOR SURVEY: ~~UAA OF COFFEE CREEK/MOSSY LAKE~~ City FM
FORM COMPLETED BY: ~~MDH~~ NR	PAGE 1 OF 4

SAMPLE COLLECTION:

HOW WERE THE FISH CAPTURED? X BACKPACK ____ BOAT ELECTROFISH ____ SEINE ____ FYKE NET ____ EXPERIMENTAL GILL NET

BLOCK NETS USED? ____ YES X NO

SAMPLING DURATION: START TIME 1421 END TIME 1630 DURATION 1752 sec

STREAM WIDTH (METERS): MAX 12 MEAN 10

HABITAT TYPES:

INDICATE THE PERCENTAGE OF EACH HABITAT TYPE PRESENT

25 % RIFFLES 20 % POOLS 30 % RUNS 10 % SNAGS

15 % SUBMERGED MACROPHYTES 0 % OTHER: ____

GENERAL COMMENTS: 250m total

SPECIES	LENGTH (mm)	WEIGHT (g)	ANOMALIES D	E	F	L	M	S	T	Z	ID #
Blunt nose minnow	56										
LESF	98										
LESF	87										
LESF	77										
Rock Bass	89										
Green side darter	98										
LESF	37										
Spotted bass	63										
Blunt nose minnow	62										
BGSF	32										
LMBS	372										
Golden ~~River~~ Red Nose	356										
LESF	105										
N. Hog Sucker	147										
Rock Bass	224										
Rock Bass	176										

1

Anomaly codes: D = deformities; E = eroded fins; F = fungus; L = legions; M = multiple DELT anomalies; S = emaciated; Z = other

WF004

FISH SAMPLING FIELD DATA SHEET (BACK)

SPECIES	LENGTH (mm)	WEIGHT (g)	ANOMALIES D	E	F	L	M	S	T	Z	ID #
ROCK BASS	208										
ROCK BASS	198										
ROCK BASS	167										
ROCK BASS	143										
RCBS	211										
RCBS	195										
RCBS	188										
RCBS	205										
LPSF	95										
LPSF	97										
LPSF	125										
	105										
	77										
	137										
	80										
	105										
	106										
BGSF	121										
GNDT	121										
GREEN SF	140										
BGSF	104										
BGSF	113										
BGSF	145										
ROCK BASS	118										
LPSF	179										
LPSF	84										
LPSF	78										
LPSF	69										
LPSF	74										
Green Side darter	54										
	105										
	92										
	53										
	87										
	45										
	118										
	114										
	57										
	99										
	90										
	97										

2

Anomaly codes: D = deformities; E = eroded fins; F = fungus; L = legions; M = multiple DELT anomalies; S = emaciated; Z = other

WF004

FISH SAMPLING FIELD DATA SHEET (BACK)

SPECIES	LENGTH (mm)	WEIGHT (g)	ANOMALIES D	E	F	L	M	S	T	Z	ID #
Green Side darter	46										
	106										
	55										
	96										
	54										
	96										
	113										
	34										
	92										
	85										
	59										
	40										
	59										
	56										
Central Stone Roller	76										
	51										
	53										
	56										
	40										
Blunt Nose minnow	65										
Snubnose DT	67										
	36										
	66										
	41										
	38										
	49										
	43										
Redline DT	52										
	43										
	41										
	42										
	36										
	46										
	44										
	46										
	54										
	58										
	52										
	39										
	41										
	35										

3

Anomaly codes: D = deformities; E = eroded fins; F = fungus; L = legions; M = multiple DELT anomalies; S = emaciated; Z = other

WF004

FISH SAMPLING FIELD DATA SHEET (BACK)

SPECIES	LENGTH (mm)	WEIGHT (g)	ANOMALIES D	E	F	L	M	S	T	Z	ID #
Redline DT	36										
Rainbow DT	42										
	41										
	35										
striped darter	33										
	28										
	44										
	30										
Fringed dt	34										
Golden RH	87										
GNDT	62										
	50										
	41										
	46										
Whitetail shiner	83										
	71										
	74										
Bigeye Shiner	60										
	51										
	74										
	50										
Striped Shiner	49										
	57										
	55										
	54										
Tennessee Shiner	50										
	51										

(4)

Anomaly codes: D = deformities; E = eroded fins; F = fungus; L = legions; M = multiple DELT anomalies; S = emaciated; Z = other

Total Time: 1787

FISH SAMPLING FIELD DATA SHEET (FRONT)

STREAM NAME: W Fork Stones	LOCATION: W F005
STATION #: WF005	STREAM CLASS:
RIVER MILE:	RIVER BASIN: ~~OUACHITA~~ Cumberland
LATITUDE: 35.887904	AGENCY: AQUAETER, INC
LONGITUDE: 86.402458	INVESTIGATORS: ~~MDH, MBS, JMC, CDS, RWR, JGL~~ CDS NTR RCS
STORET #	DATE / TIME: 08/29 0820
GEAR: Backpack	REASON FOR SURVEY: ~~UAA OF COFFEE CREEK/MOSSY LAKE~~ City of M
FORM COMPLETED BY: ~~MDH~~ NTR	PAGE 1 OF 5

SAMPLE COLLECTION:

HOW WERE THE FISH CAPTURED? X BACKPACK ___ BOAT ELECTROFISH ___ SEINE ___ FYKE NET ___ EXPERIMENTAL GILL NET

BLOCK NETS USED? ___ YES X NO

SAMPLING DURATION: START TIME 0820 END TIME 1000 DURATION 1787 sec

STREAM WIDTH (METERS): MAX 37 MEAN 32

HABITAT TYPES:

INDICATE THE PERCENTAGE OF EACH HABITAT TYPE PRESENT

20 % RIFFLES 15 % POOLS 40 % RUNS 10 % SNAGS

15 % SUBMERGED MACROPHYTES ___ % OTHER: ___

GENERAL COMMENTS: 250m total distance

SPECIES	LENGTH (mm)	WEIGHT (g)	ANOMALIES D	E	F	L	M	S	T	Z	ID #
~~Smallmouth Redhorse~~	~~[illegible]~~										
SMBS (PV)	199										
N. Hog Sucker	255										
	254										
	174										
	177										
	240										
	241										
	222										
	229										
	210										
	130										
	107										
	216										
	197										
Central Stone Roller	97										

(1)

Anomaly codes: D = deformities; E = eroded fins; F = fungus; L = legions; M = multiple DELT anomalies; S = emaciated; Z = other

WFD05

FISH SAMPLING FIELD DATA SHEET (BACK)

SPECIES	LENGTH (mm)	WEIGHT (g)	ANOMALIES D	E	F	L	M	S	T	Z	ID #
Central Stone Roller	96										
	90										
	98										
	91										
	91										
	99										
	105										
	116										
	118										
	110										
	127										
	127										
	108										
	131										
	115										
	110										
	109										
	58										
	137										
	56										
	107										
	96										
	114										
	113										
	91										
	94										
	109										
	90										
	46										
	103										
	94										
N. Hog Sucker	272										
LESF	120										
	151										
	131										
	96										
	110										
	137										
	136										
	114										
	140										

(2)

Anomaly codes: D = deformities; E = eroded fins; F = fungus; L = legions; M = multiple DELT anomalies; S = emaciated; Z = other

WFD05

FISH SAMPLING FIELD DATA SHEET (BACK)

SPECIES	LENGTH (mm)	WEIGHT (g)	ANOMALIES D	E	F	L	M	S	T	Z	ID #
LGSF	93										
	111										
	98										
	137										
	91										
	139										
	88										
	119										
	145										
	101										
	110										
	113										
	103										
	99										
	79										
	103										
	98										
	89										
	128										
	101										
	116										
	102										
LESF X 7+32											
ROCK bass	149										
ROCK bass	167										
ROCK bass	170										
N. Hog sucker	191										
N. Hog Sucker	201										
ROCK bass	96										
BGSF	122										
BGSF	112										
BGSF	102										
GREEN side darter	121										
	117										
	98										
	111										
	99										
	97										
	101										
	101										
	104										

3

Anomaly codes: D = deformities; E = eroded fins; F = fungus; L = legions; M = multiple DELT anomalies; S = emaciated; Z = other

WF 005

FISH SAMPLING FIELD DATA SHEET (BACK)

SPECIES	LENGTH (mm)	WEIGHT (g)	ANOMALIES D	E	F	L	M	S	T	Z	ID #
Green side darter	122										
	100										
	107										
	101										
	117										
	60										
	61										
	105										
	111										
	111										
	64										
	61										
	101										
	102										
	104										
Green side darter	73										
Green side darter	112										
N. Hog Sucker	90										
Green side darter	63										
Green side darter	58										
Green side darter	59										
Striped darter	42										
Fantail darter	70										
Fantail darter	68										
GSDT	54										
GSDT	61										
GSDT	64										
~~GSDT~~ NZ Snubnose darter	37										
~~GSDT Count = 6~~ NZ											
CS Roller Count = 24											
Redline darter	56										
Redline darter	48										
Redline darte	50										
Redline darter	42										
Snubnose dt	32										
Snubnose dt	45										
Snubnose dt	57										
Snubnose dt	41										
Snubnose dt	38										
Snubnose dt	40										
Golden Redhorse	70										

4

Anomaly codes: D = deformities; E = eroded fins; F = fungus; L = legions; M = multiple DELT anomalies; S = emaciated; Z = other

WF005

FISH SAMPLING FIELD DATA SHEET (BACK)

SPECIES	LENGTH (mm)	WEIGHT (g)	ANOMALIES								ID #
			D	E	F	L	M	S	T	Z	
Steelcolor ~~Spotfin~~ UT Shiner	79										
Striped shiner	76										
Striped Shiner	51										
Striped Shiner	50										
Striped Shiner	52										
Striped shiner	60										
Bigeye Chub	87										
BNMW	65										

Anomaly codes: D = deformities; E = eroded fins; F = fungus; L = legions; M = multiple DELT anomalies; S = emaciated; Z = other

APPENDIX 6

TIME-SERIES BOD TEST DATA

MEMORANDUM

TO:	**Darren Gore, P.E., Murfreesboro Water and Sewer Department**
CC:	Steve Tate, MWSD
	John Strickland, MWSD
	Mike Bernard, P.E., Smith Seckman Reid, Inc.
	Kenny Diehl, P.E., SSR
FROM:	John Michael Corn, P.E. and Mike Corn, P.E., BCEE
DATE:	June 24, 2016
JOB NO.:	152384
RE:	**Total Biochemical Oxygen Demand Test Results**

The following memo details the results of the time-series biochemical oxygen demand (BOD) tests that were completed for MWSD and previously reported in the overall study report.

INTRODUCTION

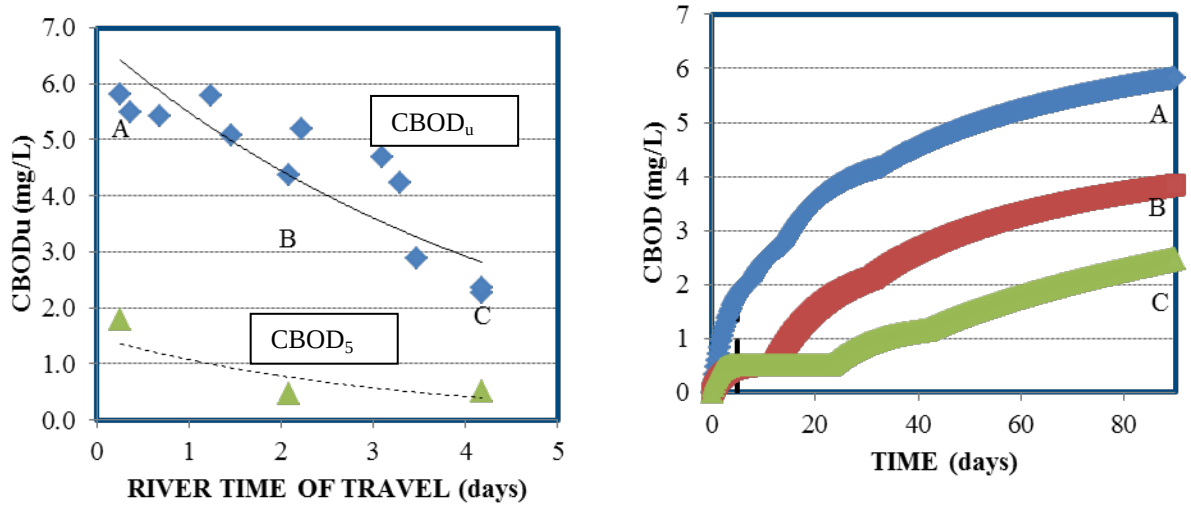
The ultimate carbonaceous- and nitrogenous-biochemical oxygen demand is measured by conducting time-series biochemical oxygen demand (BOD) tests. The total BOD (TBOD) measured during the test can be speciated into ultimate carbonaceous BOD ($CBOD_u$) and nitrogenous BOD (NBOD), as well as, immediate oxygen demand (IOD) that is caused by either algal respiration or chemical oxygen demand that either can be asserted within the first 12 hrs of the time-series BOD test. The ratio of $CBOD_u$ to the 5-day BOD (BOD_5), called the f-ratio, can also be determined. This f-ratio is then used to convert a $CBOD_u$ to a regulatory-used BOD_5 concentration for setting permit discharge limits. In reality, BOD_5 as measured in the bottle does not exist in the real environment and it is the $CBOD_u$ that results in the oxygen demand in the natural setting. In Biological Waste Treatment (Eckenfelder & O'Connor, 1961) distinguished between the bottle rate and the river rate as seen in Figure 1.

As shown graphically in Figure 1, collecting samples at point A (close to the source) and at points B and C downstream will show the loss of BOD in the system with time of travel downstream. The CBOD loss as a function of river distance (time of travel) is then given by the curve described by the points A through C, which is a first-order exponential curve. This curve represents losses both from decay and potentially from settling. The settling rate can only affect the particulate present in the system.

The different fractions that can be found in the laboratory test decay at different rates in the stream. It is possible that the fraction of the $CBOD_u$ that exists as $CBOD_5$ and the fraction of the CBOD that was measured in the period between 5 and 30 days in the bottle will both be

reduced at the same time at nearly the same rate in the natural environment (Corn, Sielbeck, Rogers V, Carmean, & Corn, November 2015). A river decay rate can be determined by collecting samples within the same mass of water as it moves downstream. The MWSD previously sponsored a study to determine the stream BOD deoxygenation rate for waste assimilative capacity determination of the West Fork Stones River for assisting TDEC in establishing the wasteload allocation for the West Fork Stones River. This will be discussed in detail below.

Figure 1. Comparison of the River Rate of CBODu and CBOD5 Compared to the Bottle Rates



In the long-term BOD test, the bottle may show several independent, discernible BOD rates as different components are degraded, including both nitrogenous and carbonaceous oxygen demanding substances. However, when following the same slug of water downstream, the identification of these different rates within the overall change in the total mass is arbitrary. Considering the points, A, B, and C, presented previously in Figure 2 - 2, these samples represented a sample collected at a point close to an outfall that was well mixed in the River (A), and the subsequent samples collected at approximately days 2 and 4. For each sample, one can break down the carbonaceous BOD into the following three groups: 1) 0 to 5 day; 2) greater than 5 to 30 days; and, 3) greater than 30 to 90 days. The results from samples A, B, and C are presented in Table 1.

The rate developed for each category is based on the Lagrangian method of collecting data with time of travel. This system was a controlled system that was not at steady state conditions. If samples had been collected at specific locations on pre-determined intervals, the slug of water would have been missed. The main takeaway from this is that there comes a point downstream from a loading where the BOD_5 does not change. The system comes back to a balance between the loadings from upstream and the internal loadings from the natural processes within the water.

Table 1. Example of CBOD Decay with Time of Travel and Decay Rate for Each

SAMPLE NAME (TIME OF TRAVEL, days)	CBOD 0 to 5 days (mg/L)	CBOD >5 to 30 days (mg/L)	CBOD >30 to 90 days (mg/L)	$CBOD_u$ (mg/L)
A (0.25)	1.8	2.3	1.7	5.8
B (2.1)	0.5	1.6	1.8	3.8
C (4.2)	0.5	0.4	1.6	2.5
Rate at 32.2°C (day^{-1})	0.317	0.456	0.025	0.218
Rate at 20°C (day^{-1})	0.181	0.260	0.014	0.124
r^2	0.67	0.92	0.688	0.999

METHODOLOGY

A water sample is collected in a 5-gallon Nalgene® carboy. Samples collected by the field crew were set up immediately in the field or at the AquAeTer laboratory. All samples were stored at the AquAeTer laboratory for the 90-day test. All bottle storage areas were kept at 20°C.

The 5-gallon carboy was shaken vigorously to aerate the samples to near saturation. The lid was then opened without removing it to allow the sample to equilibrate for five minutes. The sample was carefully siphoned into the bottom of two 2 liter (L) glass BOD bottles. After the BOD bottle was full, the DO was measured. If the DO concentration in the two bottles was greater than +/- 0.2 mg/L (the accuracy of the DO measurement), the process was restarted. Samples for nutrient analysis were then collected from the 5-gallon carboy. The nutrients analyzed at time zero were total Kjeldahl nitrogen (TKN), ammonia-nitrogen (NH_3), nitrite+nitrate-nitrogen (NO_2+NO_3), total phosphorus (TP), and ortho-phosphate (PO_4). The remaining sample was then siphoned to a glass 5-gallon carboy. The sample in the glass carboy was used as make-up water and to collect periodic nutrient samples.

The make-up water is intended to replace water lost during periodic DO readings and due to evaporation. Make-up water was transferred to the BOD bottles using a disposable plastic pipette.

After time-zero readings were taken from the two duplicate samples and the lost volume was carefully replaced in the sample (minimizing oxygen addition), both samples were sealed with air-tight caps to prevent DO exchange. All samples, once back in the laboratory in Brentwood, were kept in incubators set at a temperature of 20°C.

No inhibitors for nitrogen inhibition were used since both organic and inorganic nitrogen decay was also measured during the tests and the fact that both Nitrosomonas and Nitrobacter bacteria also may uptake carbonaceous BOD. No sample dilutions were made since effluent BODs were expected to be extremely low.

All samples were run for at least 90 days. Periodic dissolved oxygen measurements were made using a YSI 5100 DO meter. Each meter was calibrated before and after each reading day. If samples approached 3.0 mg/L DO, the remaining sample from Bottle A, B and the matching make-up water bottle was transferred to a 5-gallon carboy where it was reaerated using the same process as mentioned previously. At a DO of less than 2 mg/L, the bacterial population in the bottles may begin to become anoxic and this will affect the total oxygen uptake for the test. The anoxic condition slows the metabolic rates compared to the aerobic condition. The bacterial population may take a while to recover, which introduces an error into the test.

SAMPLE LOCATIONS

Sample locations included the stations on the West Fork Stones River labeled WF003, WF004 and a sample from the Sinking Creek Wastewater Treatment Plan (SCWWTP) effluent. One sample, WF003, is located downstream from the SCWWTP outfall. The other sample, WF004, is located upstream from the SCWWTP.

Each sample collected from the WFSR was collected from the riverine portion of the River.

RESULTS - TBOD

A summary of the results for all Time-Series BOD tests is provided in Table 2. The ratio of the ultimate carbonaceous biochemical oxygen demand ($CBOD_u$) and the 5-day BOD (BOD_5) are also provided. Various curves can be derived from the Time-Series BOD tests, which represent the various rates that the

food is consumed by the bacterial populations. This is an artifact of the laboratory test. In the natural environment, the bacterial populations will consume the food that is available, so that in the River the materials consumed in the first 5 days in the bottle may be consumed at the same time as the materials consumed over the first 30 days. In keeping with this, a rate developed from a bottle is not valid for use in the river setting. Murfreesboro has previously measured the $CBOD_u$ in the West Fork Stones River, but these measurements were before increased treatment efficiencies were implemented. All sample results are provided in Attachment 1.

Table 2. Summary of Results

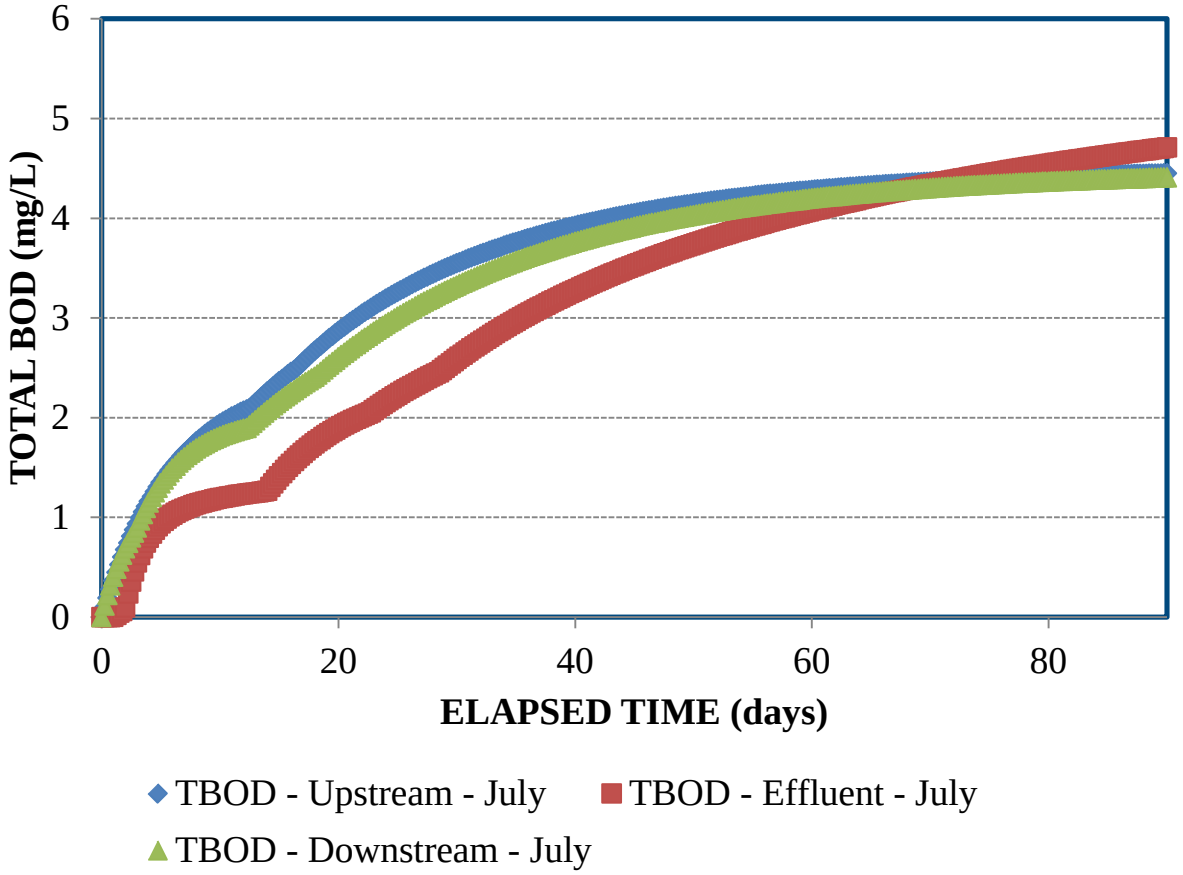
COLLECTION DATE	SAMPLE	LOCATION	TBOD (mg/L)	$CBOD_u$ (mg/L)	F-RATIO	NBOD (mg/L)
July 29, 2015	WFSRDown	WF003	4.4	3.5	2.6	0.9
	WFSREff	WWTP	4.7	3.2	3.4	1.5
	WFSRUP	WF004	4.4	3.9	2.9	0.5
August 27, 2015	WFSRDown	WF003	3.3	2.4	3.0	0.9
	WFSREff	WWTP	7.1	5.3	5.7	1.8
	WFSRUP	WF004	4.0	3.3	2.9	0.7
September 28, 2015	WFSRDown	WF003	5.0	4.3	4.8	0.7
	WFSREff	WWTP	4.4	4.0	6.0	0.5
	WFSRUP	WF004	4.0	3.4	4.2	0.6
	WFSRUP-D	WF004	4.0	3.3	4.1	0.7

Note: (D) Represents a duplicate sample

<u>July 2015 Samples</u>

The total BOD for the samples collected in July is presented in Figure 2. This graph shows that the SCWWTP effluent was not having an effect on the TBOD in the stream. The upstream and downstream samples were almost identical. The breakdown of the curves for each sample is presented in Figures 3 through 5. The breakdown identifies the various components of the individual BOD curves that could be discerned in the bottle. It is noted that these are not going to be discernible in a time of travel study that measures the overall River rates. It is also noted that the NBOD measured in the bottle is not likely to occur in the River due to competing sources for the nutrients.

Figure 2. Total BOD Measured for Samples in July



The above paragraph demonstrates the total biochemical oxygen demand. The largest takeaway from this graph is that the SCWWTP discharge is at the same concentration of potential oxygen demand as the background water.

The following graphs show the component breakdown for each sample individually. The blue rhombi represent the BOD derived from the measurements of dissolved oxygen. The squares represent the nitrogenous BOD based on the increase in nitrate in the bottle over time. Each dashed or broken line represents the individual component that could be determined based on the different measurements, with the solid red line representing the sum of all individual components.

Figure 3. BOD Measured for SCWWTP in July

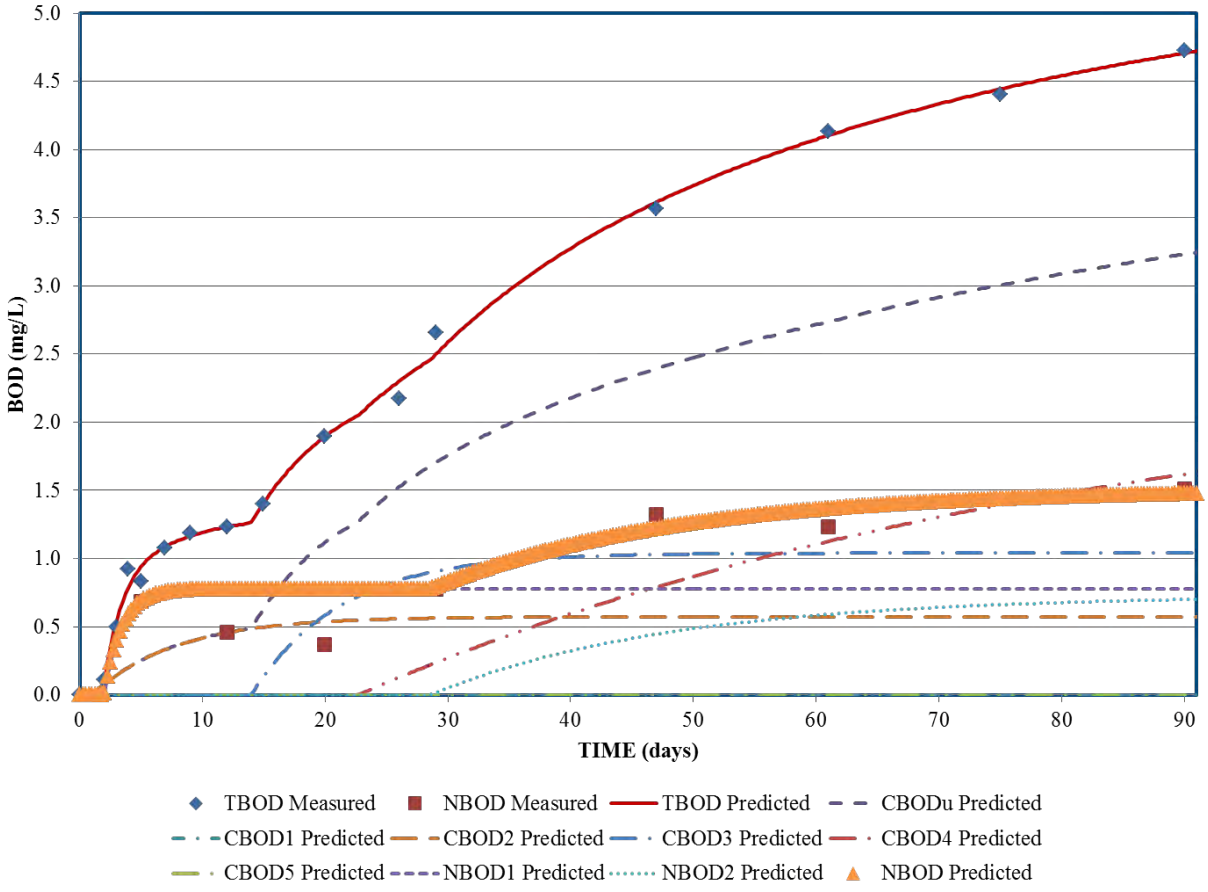


Figure 4. BOD Measured in the WFSR Downstream from SCWWTP in July

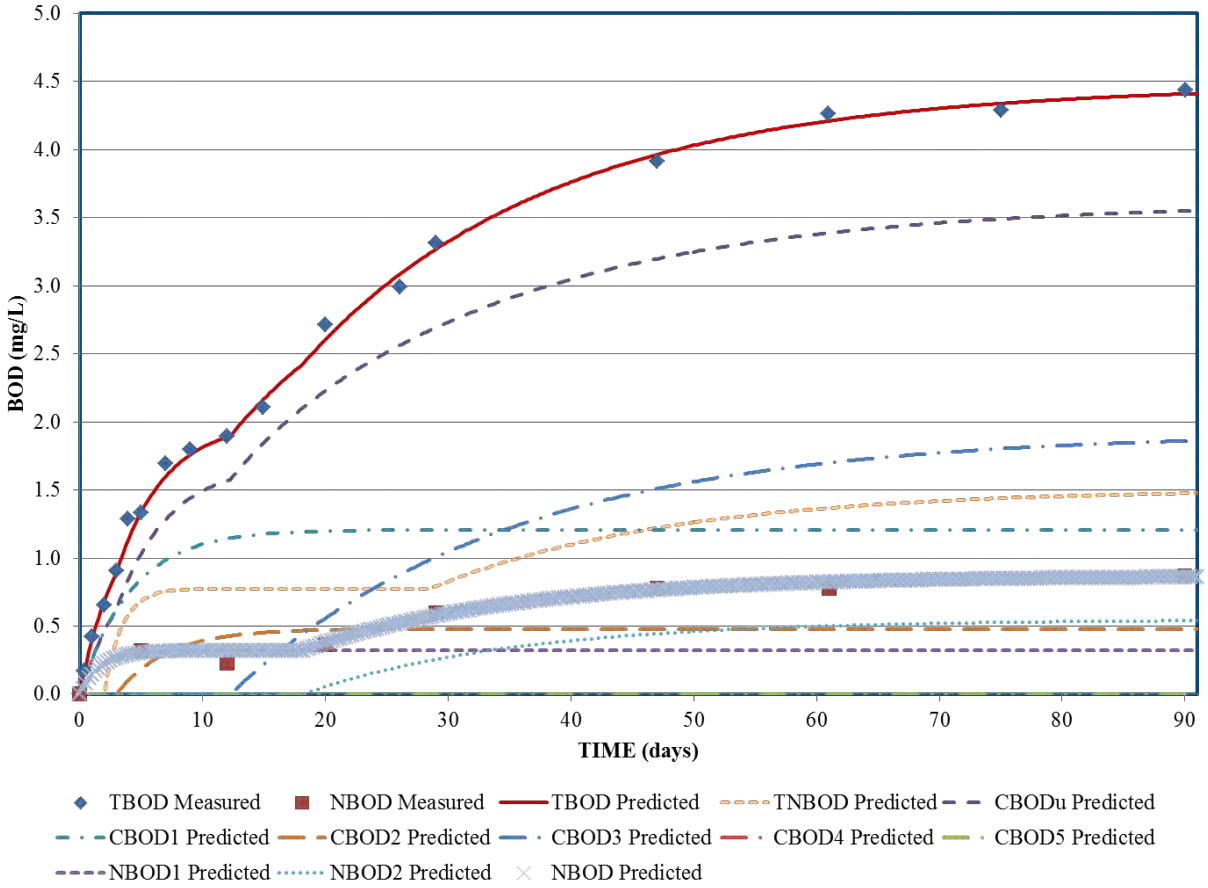
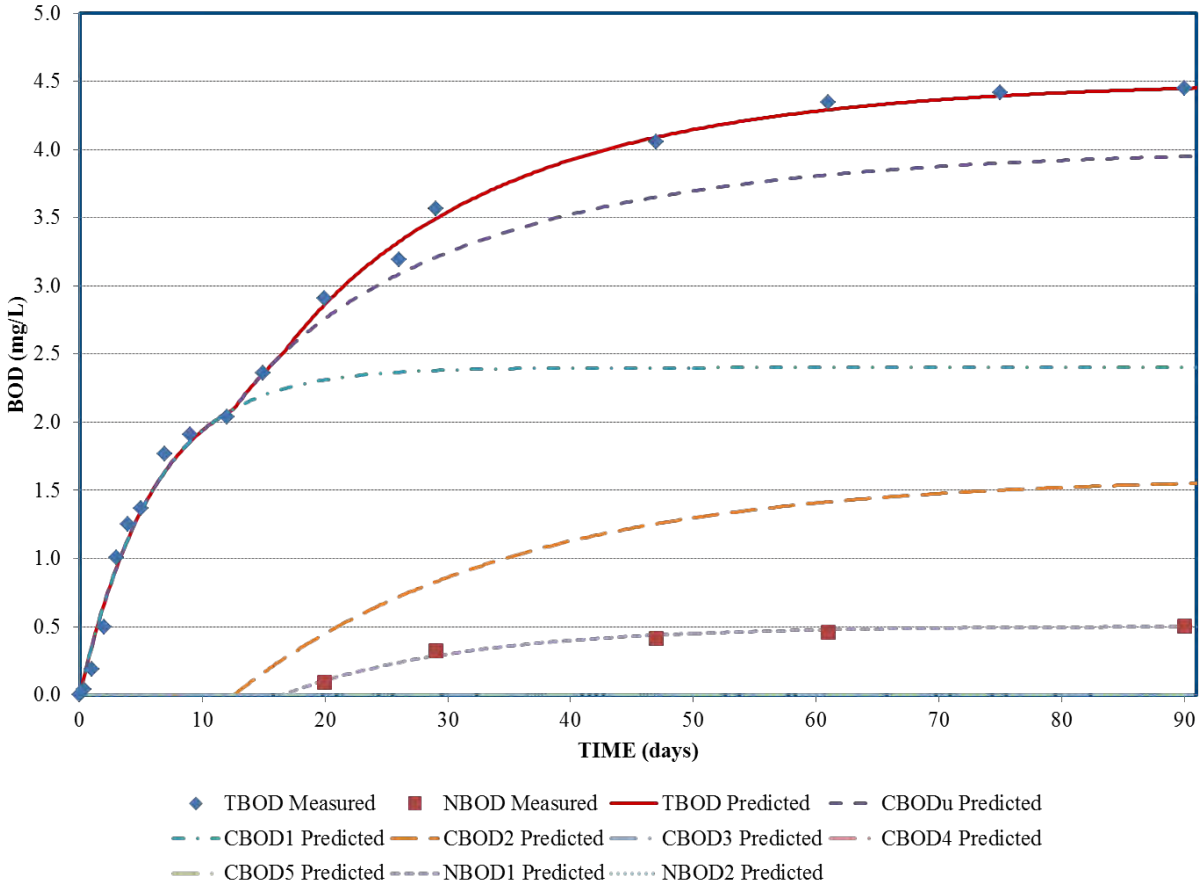


Figure 5. BOD Measured in the WFSR Upstream from SCWWTP in July



August 2015 Samples

The total BOD for the samples collected in August is presented in Figure 6. This graph shows that the SCWWTP effluent was not having an effect on the TBOD in the stream. The upstream and downstream samples were similar, with the downstream TBOD being slightly less than the upstream TBOD. The breakdown of the curves for each sample is presented in Figures 7 through 9. The breakdown identifies the various components of the individual BOD curves that could be discerned in the bottle. It is noted that these are not going to be discernible in a time of travel study that measures the overall River rates. It is also noted that the NBOD measured in the bottle is not likely to occur in the River due to competing sources for the nutrients.

Figure 6. Total BOD Measured for Samples in August

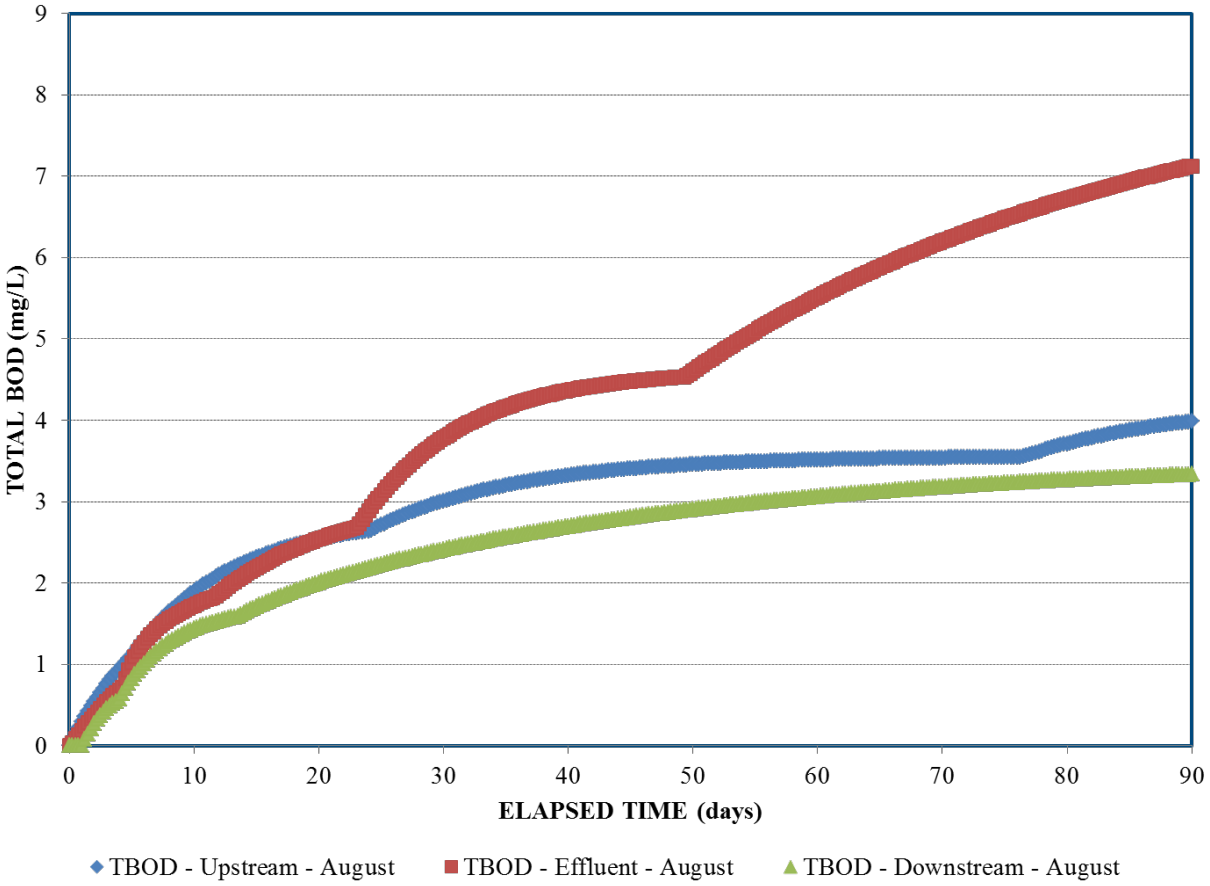


Figure 7. BOD Measured for SCWWTP in August

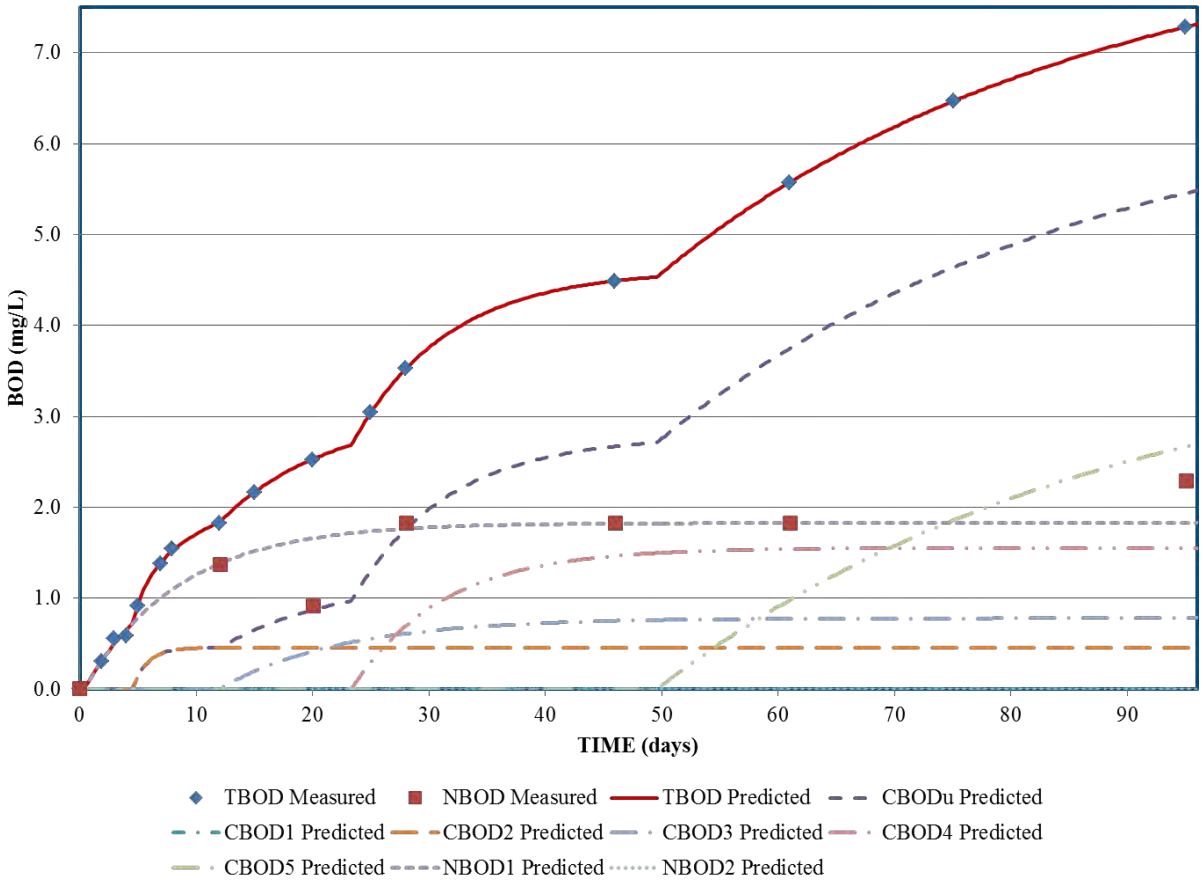


Figure 8. BOD Measured in the WFSR Downstream from SCWWTP in August

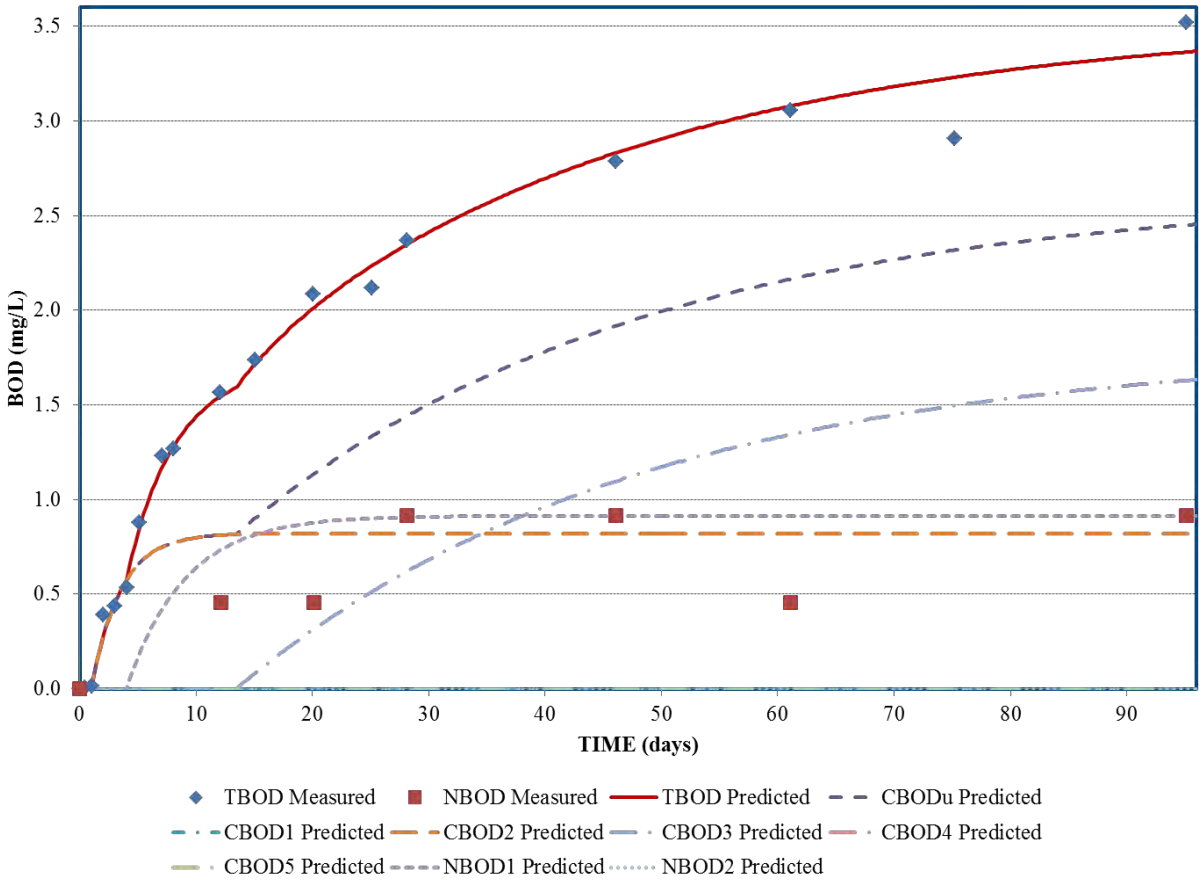
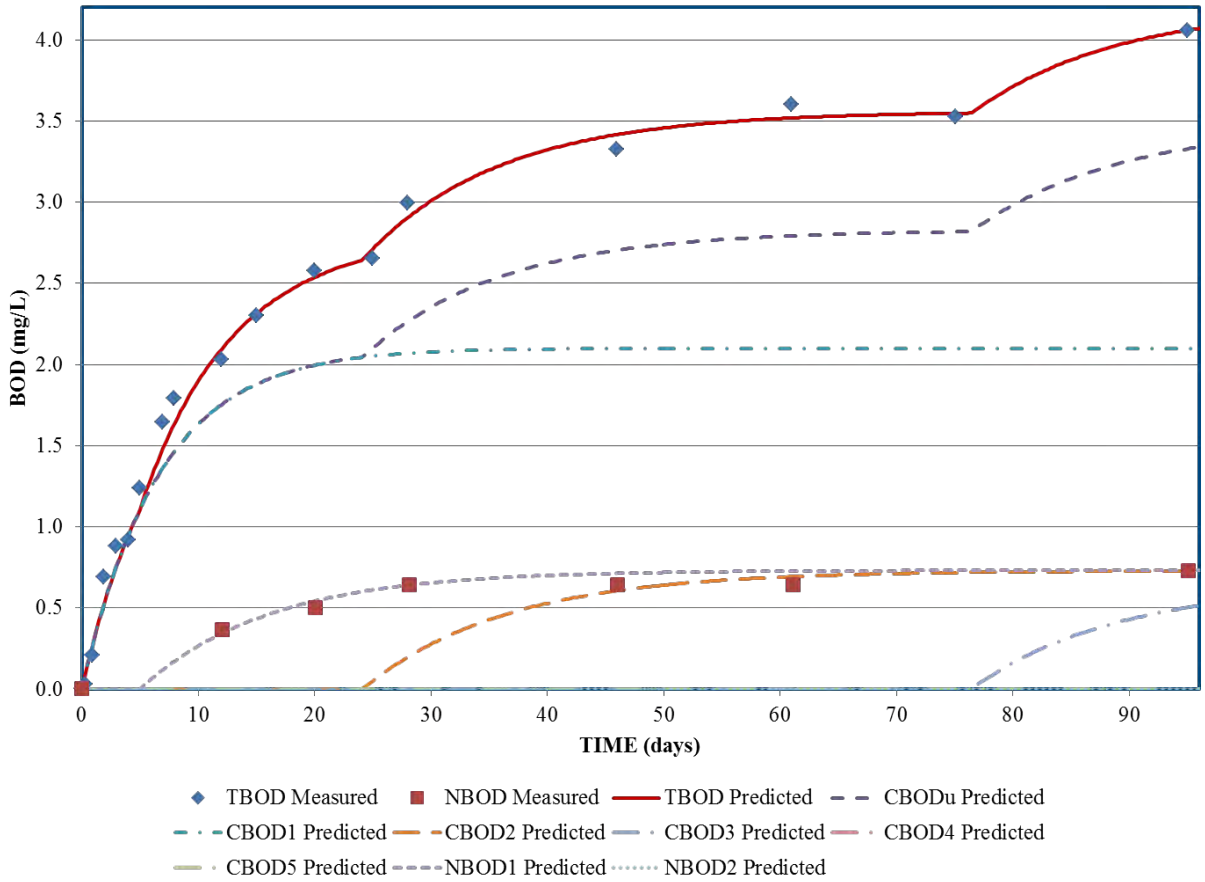


Figure 9. BOD Measured in the WFSR Upstream from SCWWTP in August



September 2015 Samples

The total BOD for the samples collected in September is presented in Figure 10. This graph shows that the SCWWTP effluent was potentially affecting the TBOD in the downstream sample, although the TBOD in the downstream sample was higher than the SCWWTP TBOD. The duplicate sample collected from the upstream location showed good agreement. The breakdown of the curves for each sample is presented in Figures 11 through 14. The breakdown identifies the various components of the individual BOD curves that could be discerned in the bottle. It is noted that these are not going to be discernible in a time of travel study that measures the overall River rates. It is also noted that the NBOD measured in the bottle is not likely to occur in the River due to competing sources for the nutrients.

Figure 10. Total BOD Measured for Samples in September

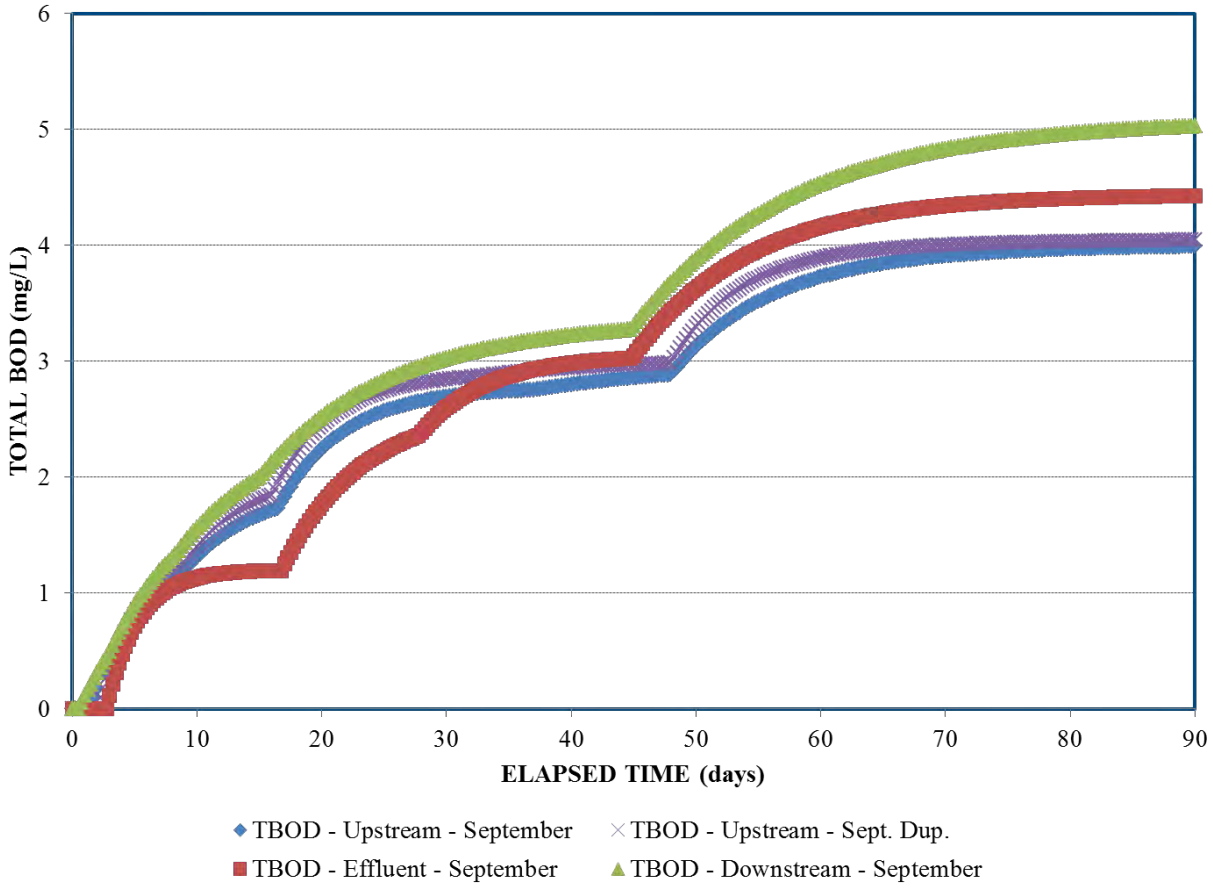


Figure 11. BOD Measured for SCWWTP in September

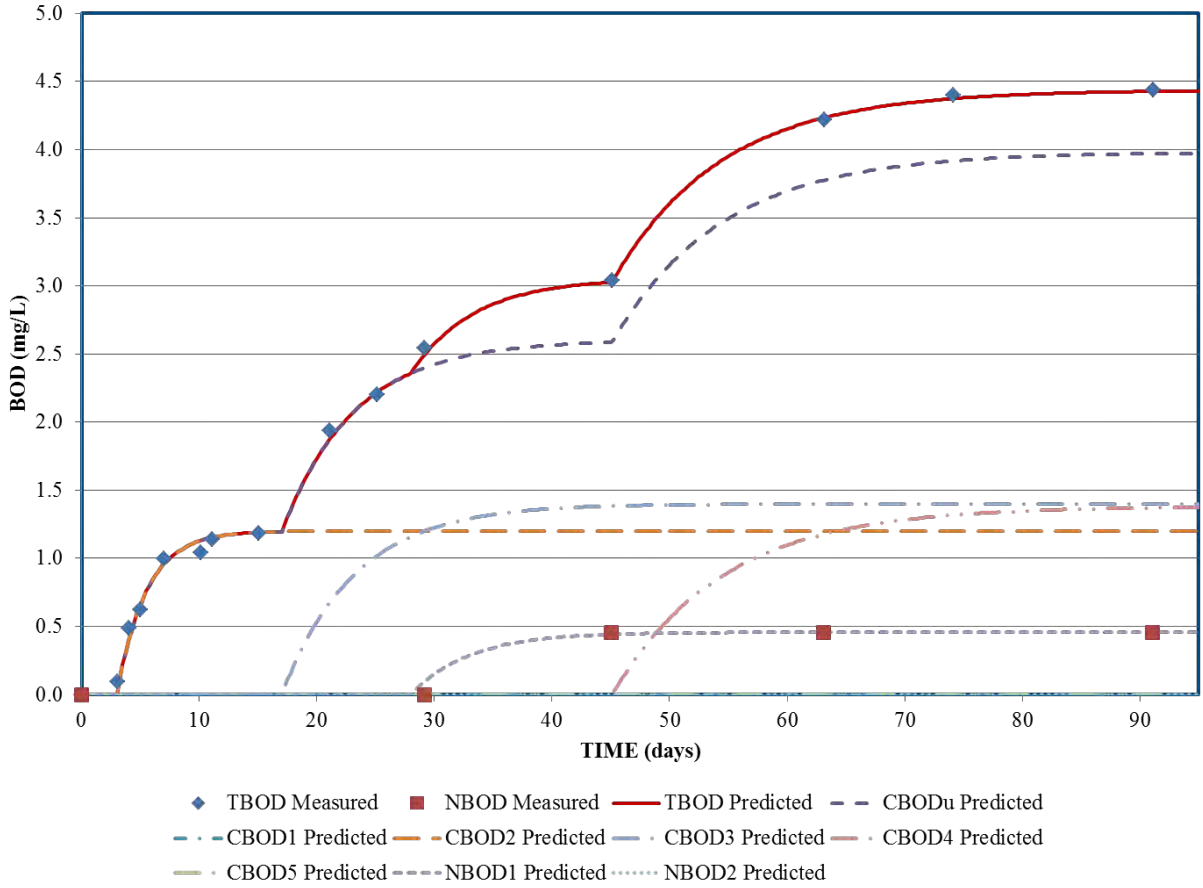


Figure 12. BOD Measured in the WFSR Downstream from SCWWTP in September

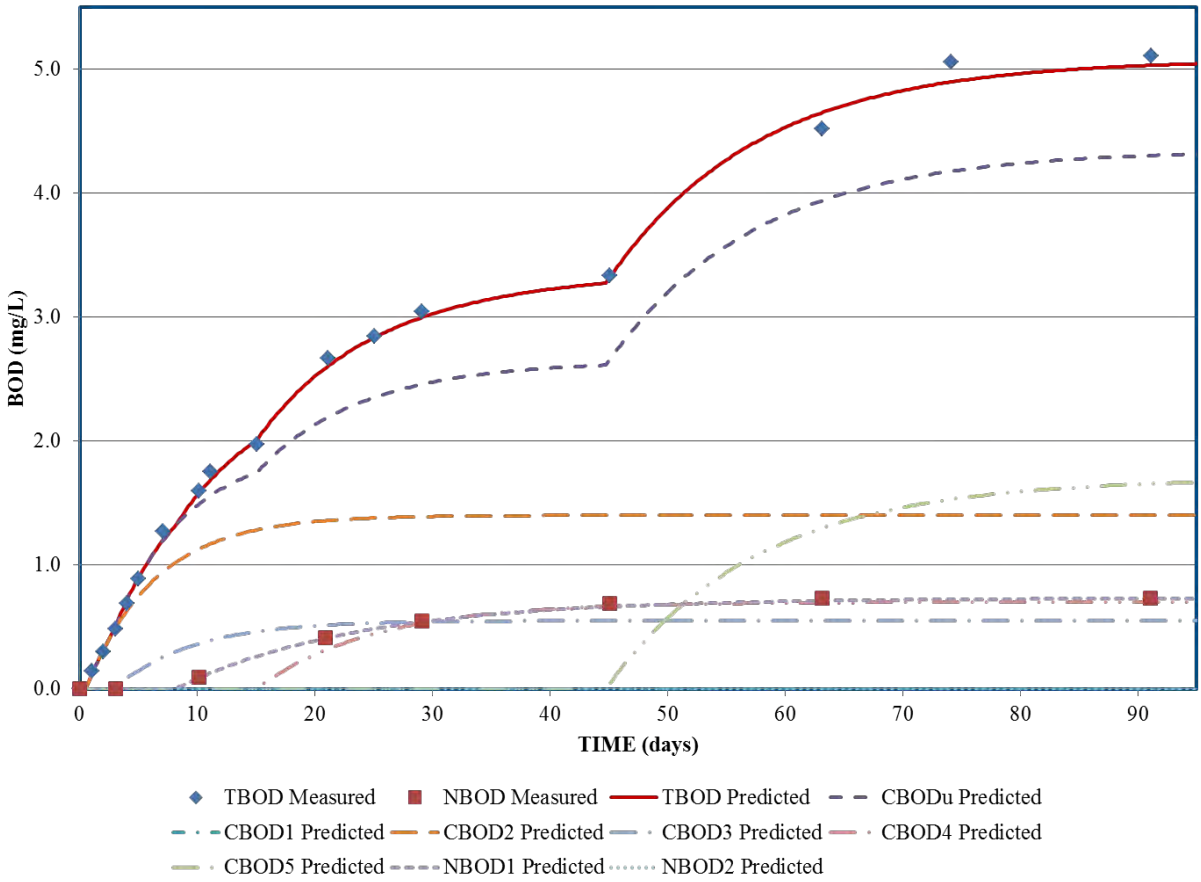


Figure 13. BOD Measured in the WFSR Upstream from SCWWTP in September

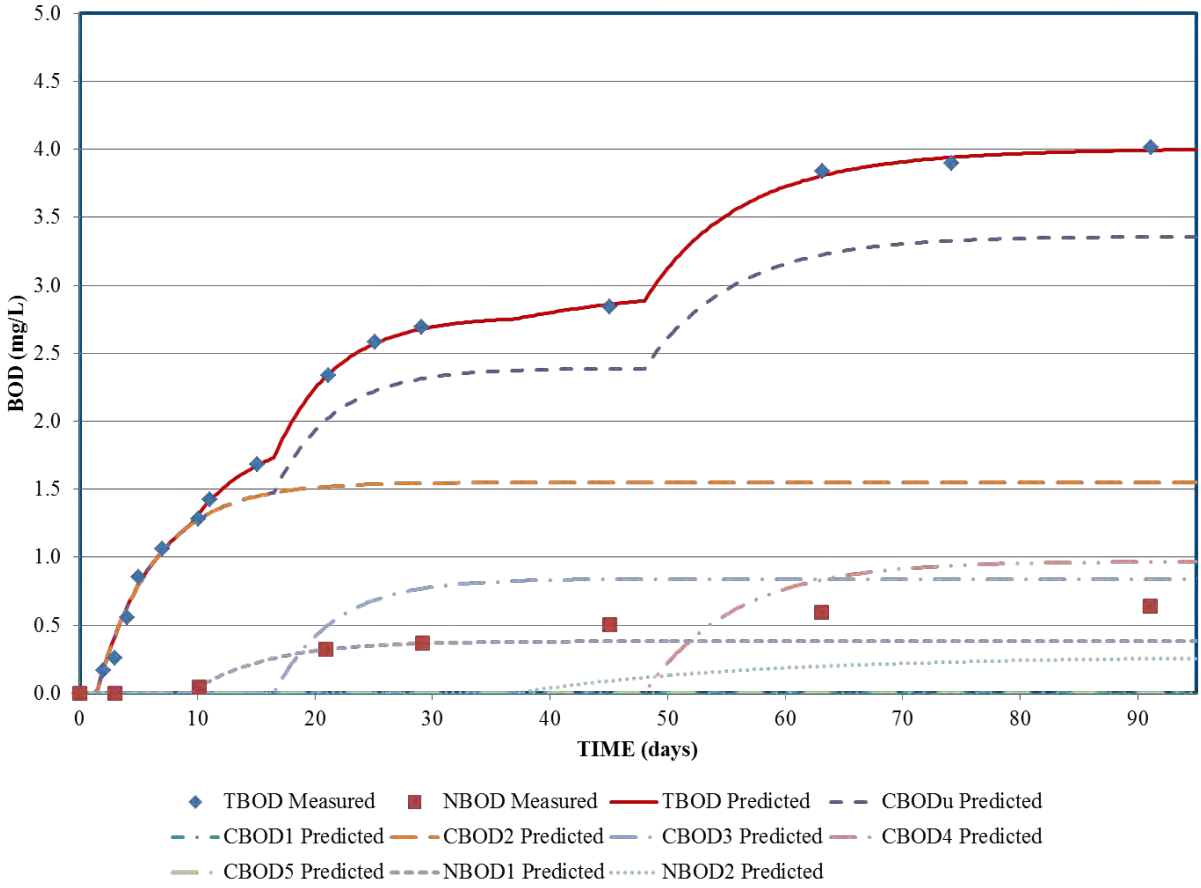
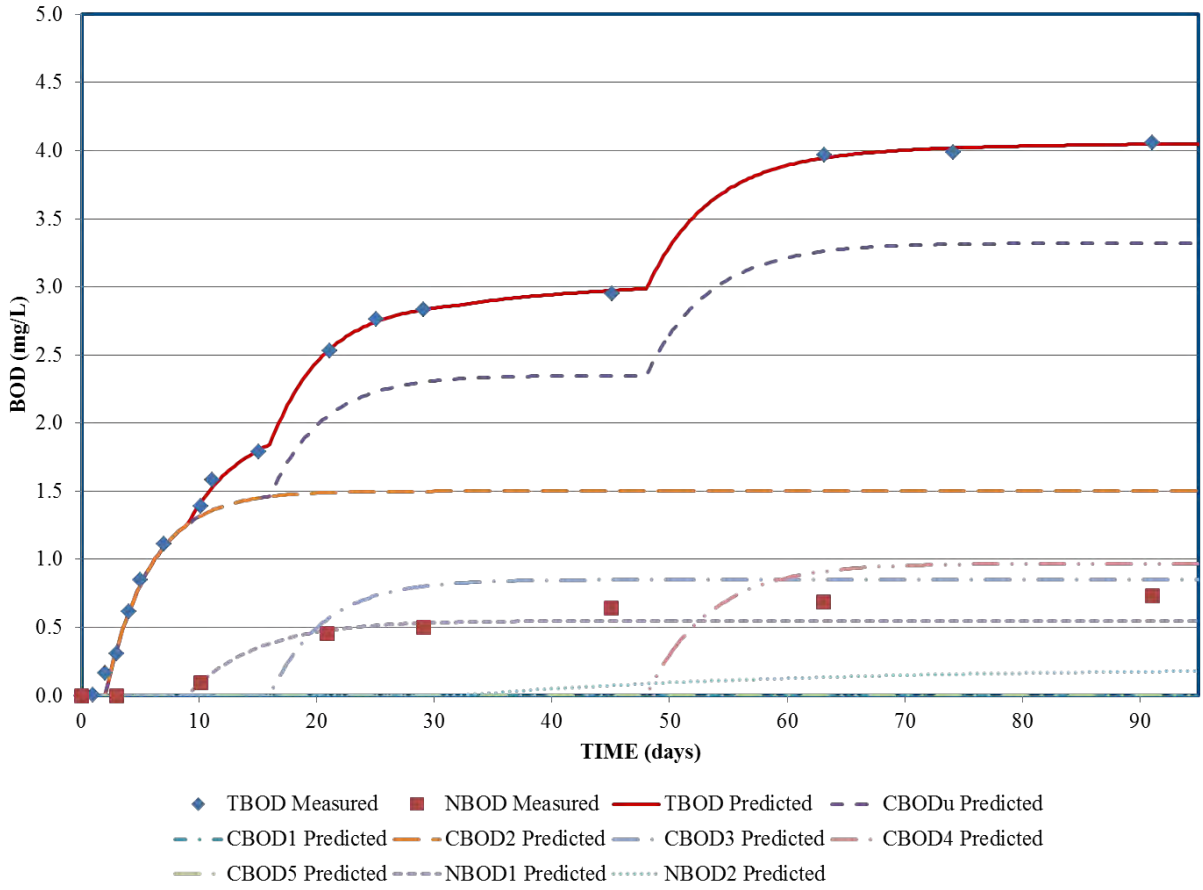


Figure 14. BOD Measured in the WFSR Upstream from SCWWTP in September (Duplicate)



RESULTS – NUTRIENT ANALYSIS

An additional benefit to this test is the ability to determine the amount of both labile and recalcitrant nitrogen and phosphorus that is present in the sample. By tracking the conversion of ammonia and organic nitrogen to nitrate over time, one can determine the amount of nitrogen that could be expected to potentially impact a system. Organic nitrogen that remains after 90 days is considered recalcitrant and is not expected to impact the system. For this system, the phosphorus concentrations were not large enough to allow for this analysis to take place. The results of this analysis are presented in Table 3.

Table 3. Labile and Recalcitrant Nitrogen

COLLECTION DATE	SAMPLE	LOCATION	INITIAL ORG. N (mg/L)	FINAL ORG. N (mg/L)	RECALC. ORG. N (%)	LABILE ORG. N (%)
July 29, 2015	WFSRDown	WF003	0.326	0.17	52%	48%
	WFSREff	WWTP	0.972	0.67	69%	31%
	WFSRUP	WF004	*0.093*	0	0%	100%
August 27, 2015	WFSRDown	WF003	0.231	0.05	22%	78%
	WFSREff	WWTP	1.072	0.6	56%	44%
	WFSRUP	WF004	0.222	0.09	41%	59%
September 28, 2015	WFSRDown	WF003	0.218	0.09	41%	59%
	WFSREff	WWTP	1.35	1.3	96%	4%
	WFSRUP	WF004	0.211	0.11	52%	48%
	WFSRUP-D	WF004	0.22	0.09	41%	59%

Note: (D) Represents a duplicate sample
Italicized text represents an estimated concentration.

The amount of labile nitrogen in the system increases slightly downstream from the WWTP, although the percent of nitrogen that is labile, or available for biological uptake, appears to decrease.

DISCUSSION

The results of these tests show that the Sinking Creek WWTP is having little impact on the dissolved oxygen resources on the West Fork due to the level of treatment achieved. These tests were completed over a 90-day period. The station directly downstream at WF003 would not see the full impact of the 90-days exertion. They also demonstrate through the high f-ratio that the effluent $CBOD_u$ is highly recalcitrant and that the river deoxygenation rate should be much lower than what Murfreesboro reported in 1991 (Crane, Vlachos, Leeds, Verner, Corn, & Lane, 1991). The United States Army Corps of Engineers (USACE) (1998) has estimated that the J. Percy Priest Reservoir retains water for 176 days. This means that the results of these Time-Series BOD tests would be fully realized within the reservoir. The tests show that it would not be possible to distinguish an area in Percy Priest Lake that is impacted by the WWTP versus the impacts from the existing background conditions.

It is noted that the NBOD exerted in the bottle may not be exerted in the same manner in the River. The Time-Series BOD test is conducted without light, so that algal impacts are removed. In the River, the algae will out-compete the nitrifying bacteria for nutrients. With the

nutrient-starved conditions in the system, the small addition of nutrients allows the algae to grow and provide a solid foundation for the food chain. While excessive algae are not desirable from an aesthetic condition and from potentially causing DOs to fall below 1 to 2 mg/L during the early morning hours, the absence of nutrients also impacts the stream in a negative manner. Without the nutrients, the food chain suffers, which can be seen in the lower fisheries population on the East Fork compared to the West Fork. Because both the West Fork and the East Fork have good DO concentrations, the system appears to be in balance to support a healthy aquatic ecosystem.

BIBLIOGRAPHY

Crane, Vlachos, Leeds, Verner, Corn, & Lane. 1991. *Assimilative Capacity of the West Fork Stones River*. Brentwood and Nashville. The Advent Group, Inc. and Smith Seckman Reid, Inc.

Eckenfelder & O'Connor. *1961. Biological Waste Treatment*. New York. Pergamon Press

USACE. 1998. *National Inventory of Dams*. Washington, D.C.USACE, Office of the Chief

Corn, Sielbeck, Rogers V, Carmean, & Corn. November 2015. *Wasteload Allocation Analysis, North Newport River near Riceboro, Georgia*. Brentwood. AquAeTer, Inc.

If you should have questions or comments concerning our assessment, please call us at (615) 373-8532 or by FAX at (615) 373-8512 or by e-mail at jmcorn@aquaeter.com.

ATTACHMENT 1

LABORATORY DATA

Lab Instrument Calibration Log

Page 3

DATE (mm.dd.yy)	TIME (military)	INSTRUMENT TYPE	INSTRUMENT MODEL	INTIAL READING	INTIAL TEMP	FINAL READING	FINAL TEMP
09.24.15	1351	YSI	II	115.3 / 8.24		99.8	8.33
09.24.15	1437	YSI	★ ~~II~~ II (backup) w/ probe II	140	23.38	100.0 / 8.50	23.51
09.24.15	1450	YSI	II (backup)	112.4 / 9.58	23.09	100.0 / 8.63	22.71
9/28/15	1223	YSI	III	100.9 / 8.59	22.82	N/A	
9/28/15	2055	YSI	IV	97.3/8.30	23.33	100.0/8.49	23.55
9/28/15	2107	YSI	IV	102.0/8.96	21.66	100.0/8.75	21.99
9/29/15	1102	YSI	III	99.3/8.55	22.95	100.0/8.52	23.31
9/30/15	1059	YSI	III	97.1/8.25	23.46	100.0/8.46	23.76
9/30/15	1119	YSI	III	101.2/8.93	21.66	unsteady...	
9/30/15	1121	YSI	II	93.4/8.06	22.71	100.0/8.60	22.86
10/1/15	1101	YSI	II	98.7/8.56	22.43	100.0/8.67	22.51
10/2/15	1007	YSI	I *changed probe head	100.3 / ~~99.~~	22.65	~~100.3~~ / 99.9	
10/02/15	1111	YSI	II	93.1 / 8.02	22.72	100.0 / 8.62	22.72
10/03/15	1021	YSI	II	99.6 / 8.82	21.43	100.0 / 8.81	21.62

★ w/ probe III

TABLE __. CALIBRATION LOG

DATE	TIME	INSTRUMENT	pH				CONDUCTIVITY				DO								AUTO LOG OFF	BATT (v)	INITIALS	COMMENTS
			pH_i	TEMP	pH_f	TEMP	$COND_i$	TEMP	$COND_f$	TEMP	$DO_{i\%sat}$	TEMP	$DO_{i100\%sat}$	TEMP	$DO_{img/L}$	TEMP	$DO_{fmg/L}$	TEMP				
9/28/15	0730	III									89.8	24.22	100.0	24.22	8.21	24.22	8.39	24.22				III for field
9/28/15	0731	II									92.8	23.38	100.0	23.45	7.90	23.38	8.51	23.45				II field backup
10/05/15	1046	II									99.5	22.26	100.0	22.05	8.46		8.74					
~~10/07/15~~	~~1401~~	~~II~~									~~99.1~~	~~22.19~~			~~8.00~~							
10/08/15	1403	II									97.8	22.31	100.0	22.47	8.51		8.67					
10/09/15	1350	II									99.3	22.31	100.0	22.31	8.40		8.67					
10/12/15	1221	II									99.0	20.97			8.84							
"		II									96.3	22.75	100.0	22.95	8.29		8.59					
"	1339	II									108.4	19.74	100.0	20.55	9.88		9.05					
10/13/15	1251	II									92.9	20.35	100.0	20.64	8.35		8.99					
10/19/15	1349	II									103.2	20.40	100.0	20.33	9.32		9.04					
10/23/15	1250	II									110.4	21.23	100.0	21.38	9.57	21.24	8.87					
10/27/15	1250	II									91.3	20.82	100.0	20.93	8.16		9.94					
11/10/15	1317	II									103.2	20.00	100.0	19.97	5.74		9.10					
11/10/15	1331	II	Re: changed probe								101.9	20.59		19.83								
11/16/15	1405	II									96.1	22.73	100.0	22.88	7.41		8.60					
11/12/15	1207	II									97.3	21.59	100.0	21.70	8.57		8.79					
11/30/15		II									91.2	20.97	100.0	20.92	7.58		8.93					
12/11/15		II									94.9	21.94	100.0	22.00	8.31		8.75					
~~12/20/15~~	~~1209~~	~~II~~									~~95.8~~	~~21.97~~	~~100.0~~	~~21.9~~	~~1.38~~			changed membrane				
12/28/15	1217	II									110.4	21.76	100.0	22.03	9.65		8.74					

TABLE __. CALIBRATION LOG

DATE	TIME	INSTRUMENT	pH				CONDUCTIVITY				DO								AUTO LOG OFF	BATT (v)	INITIALS	COMMENTS
			pH_i	TEMP	pH_f	TEMP	$COND_i$	TEMP	$COND_f$	TEMP	$DO_{i\%sat}$	TEMP	$DO_{100\%sat}$	TEMP	$DO_{i mg/L}$	TEMP	$DO_{f mg/L}$	TEMP				
8/5	1150										99.5	20.15			9.03							
											100.0	20.37			9.03							
8/5	1159										106.1	19.77			9.68							
											100.0	19.98			9.10							
8/7	1256										97.4	21.16			8.64							
											100.0	21.23			8.80							
8/10	1231										97.8	20.02			8.87							
											100.0	20.26			9.03							
8/13/15	1100	II									~~100.7~~	~~20.79~~			~~8.97~~	~~20.79~~	MBS					
											99.5%	20.89			8.87	20.89						
											100.0%	21.07			8.91	21.07						
8/18/15	1206	II									103.5%	20.66			9.27							
											100.0%	21.05			8.90							
8/24/15	1357	II									97.7%	~~8.59~~	21.82		8.59							
											100.0%		21.86		~~8.77~~							
8/27/15	1122	II									71.7	20.96			6.41							
											100.0	21.11			8.90							
											100.9	20.25			9.09							
											100.0	20.87			8.93							
8/27/15	2019	III									~~94.5~~	~~23.74~~			~~8.06~~							
											96.7	22.78			8.38							
											100	22.96			8.56							
		~~II~~									~~77.9~~	~~22.89~~ ~~6.89~~			~~6.68~~	CJT						
8/28/15	1106	III									101.3	22.58			8.73							
											100.0	22.90			8.58							
8/29/15	1106	III									101.1	23.19			8.63	MBS						
											100.0	23.28			8.53							
8/30/15	1104	III									97.9	23.25			8.36							
											100.0	23.32			8.52							
8/31/15	1231	III									98.5	22.48			8.52							
											100.0	22.77			8.62							

TABLE __. CALIBRATION LOG Stones BOD Sampling

DATE	TIME	INSTRUMENT	pH				CONDUCTIVITY				DO								AUTO LOG OFF	BATT (v)	INITIALS	COMMENTS
			pH_i	TEMP	pH_f	TEMP	$COND_i$	TEMP	$COND_f$	TEMP	$DO_{\%sat}$	TEMP	$DO_{100\%sat}$	TEMP	$DO_{mg/L}$	TEMP	$DO_{mg/L}$	TEMP				
7/29/15	0714	II									100.5	23.10			8.62							
											100.0	23.38			8.52							
7/29/15	0716	I									99.9	24.25			8.37							
											100.0	24.32			8.37							
7/29/15	2104	II									101.9	23.06			8.73							
											100.0	23.36			8.52							
7/29/15	2118	II									101.9	21.97			8.92							Re-Cal-Re-
											100.0	22.08			8.74							off Readings
7/30/15	1207	II									100.3	23.01			8.61							
											100.0	23.12			8.55							
7/30/15	1408	II									99.9	22.97			8.57							Practice for
											100.0	23.07			8.57							C. Brown
7/31/15	1257	II									99.7	22.46			8.64							
											100.0	22.64			8.63							
8/1/15	1226	II									100.3	22.81			8.61							
											100.0	22.11			8.57							
8/2/15	1108	II									~~95.5~~	~~20.59~~			8.49							Probe acting
											98.6	22.71										odd - redo
8/2/15	1115	II									100.2	23.20			8.55							
											100.0	23.27			8.54							
8/2/15	1132	II									120.9	22.83			10.40							Changed probe
											100.0	22.88			8.59							
8/3/15	1237	II									88.9	22.90			7.55							
											100.0	23.08			8.56							

Long Term BOD Data Sheet
Series Number:
Series Description: __ % Eff. __ % River
Sample Location:

Project Name: Stones River
WFSR Down - 07

Project No: 142299
Setup Date:
Setup Time:

	Day 0	DAY 0.5	DAY 1	DAY 2	DAY 3	DAY 4 *	DAY 5	DAY 7
		II	II	II	II	II	Mon	Wed 8/5 II
Read Date	7/29	7/29/15	7/30/15	7/31/15	8/1/15	8/2/15	8/3/15	8/5/15
Read Time	1237	~~2111~~ 2120	1209	1259	1232	1117	1248	~~1153~~
Btl. A - Temp.	28.61	20.40	19.41	19.15	19.17	~~19.58~~ 19.58	19.25	19.42
Btl. A - DO	8.34	8.16	7.87	7.72	7.37	~~7.16~~ 7.03	6.97	7.01
Btl. B - Temp.	28.77	20.50	19.17	19.37	19.37	~~19.56~~ 19.54	19.13	19.24
Btl. B - DO	8.31	8.15	7.95	7.73	7.49	~~7.2~~ 7.17	7.19	7.24

	DAY 10	DAY 12	DAY 15	DAY 20	DAY 25	DAY 30	DAY 45	DAY 60
	Fri 8/7	Mon 8/10 II	8/13	8/18 II	8/24 II	8/28 (or 27?) II	9/14	9/28
Read Date	8/7	8/10	8/13/15	8/18/15	8/24/15	8/27/15	9/14/15	9/29/15
Read Time	1257	1233	1105	1210	1401	1242 1290	1219	1225
Btl. A - Temp.	20.04	19.82	20.07	20.24	20.13	19.59 21.14	20.71	20.54
Btl. A - DO	6.50	10.47	6.22	5.61	5.34	5.86 5.02	4.41	4.09
Btl. B - Temp.	19.86	19.95	19.85	20.07	20.24	19.86 21.01	20.62	20.75
Btl. B - DO	6.77	6.69	~~5.48~~ 6.46	5.98	5.63	6.16 5.32	4.74	4.39

	DAY 75	DAY 90
	10/12 Rerun	10/27 II
Read Date	10/12/15	10/27/15
Read Time	1334	1253
Btl. A - Temp.	19.86 19.85	18.70
Btl. A - DO	4.07 4.05	3.89
Btl. B - Temp.	19.59 18.67	18.89
Btl. B - DO	4.39 4.35	4.22

1201
19.33
6.66
19.25
6.85

DO is to be monitored on the following days: 0, 0.5, 1, 2, 3, 4, 5, 7, 10, 12, 15, 20, 25, 35, 45, 60, 75 and 90. On days where samples are aerated, DO will be measured both before and after aerations. Samples will be collected on days 0, 5, 10, 20, 30, 45, 60, and 90.

*recalibrated DO probe so new readings were taken
** recalibrated due to ↑ readings

Long Term BOD Data Sheet
Series Number:
Series Description: __ % Eff. __ % River
Sample Location:

Project Name: Stones River

WFSR-EFF-07

Project No: 142299
Setup Date:
Setup Time:

	Day 0	II DAY 0.5	II DAY 1	II DAY 2	II DAY 3	DAY 4	DAY 5 II	II DAY 7
Read Date	7/29	7/29	7/30/15	7/31/15	8/1/15	8/2/15	8/3/15	8/5/15
Read Time	1258	2132	1214	1307	1238	1155	1256	1209
Btl. A - Temp.	20.03	20.30	18.84	18.75	19.11	19.29	18.35	19.26
Btl. A - DO	8.26	6.40*	8.32	8.13	7.70	7.35	7.46	7.14
Btl. B - Temp.	27.72	20.90	18.77	19.01	19.06	19.10	19.12	19.10
Btl. B - DO	8.37	8.30	8.32	8.17	7.89	7.49	7.53	7.30

	8/7 DAY 10 II	II DAY 12	DAY 15 II	II DAY 20	II DAY 25	II DAY 30	II DAY 45	II DAY 60
Read Date	8/7	8/10	8/13	8/18/15	8/24/15	8/27/15	9/14/15	9/28/15
Read Time	1306	1239	1114	1222	1408	1304	1229	1240
Btl. A - Temp.	19.74	19.73	19.84	19.95	20.07	20.55	20.66	20.70
Btl. A - DO	7.07	7.02	6.85	6.38	6.12	5.61	4.63	4.13
Btl. B - Temp.	19.83	19.81	19.76	20.07	19.91	20.64	20.56	20.88
Btl. B - DO	7.24	7.21	7.06	6.56	6.23	5.70	4.94	4.33

	II DAY 75	II DAY 90						
Read Date	10/12/15	10/27/15						
Read Time	1357	1302						
Btl. A - Temp.	18.64	18.91						
Btl. A - DO	3.89	3.55						
Btl. B - Temp.	18.57	18.66						
Btl. B - DO	4.02	3.64						

DO is to be monitored on the following days: 0, 0.5, 1, 2, 3, 4, 5, 7, 10, 12, 15, 20, 25, 35, 45, 60, 75 and 90. On days where samples are aerated, DO will be measured both before and after aerations. Samples will be collected on days 0, 5, 10, 20, 30, 45, 60, and 90.

*tried recalibrating due to high reading; same result

Long Term BOD Data Sheet
Series Number:
Series Description: __ % Eff. __ % River
Sample Location: WFSRUp - 67

Project Name: Stones River

Project No: 142299
Setup Date:
Setup Time:

	Day 0	II DAY 0.5	II DAY 1	II DAY 2	II DAY 3	II DAY 4	DAY 5 II	DAY 7 II
Read Date	7/29/15	7/29/15	7/30/15	7/31/15	8/1/15	8/2/15	8/3/15	8/5/15
Read Time	1317	2202	1224	1314	1245	1142	1304	1211
Btl. A - Temp.	28.96	19.55	18.72	18.85	19.45	19.19	19.31	19.43
Btl. A - DO	8.38	8.30	8.21	7.85	7.37	7.08	7.00	6.60
Btl. B - Temp.	28.80	19.76	18.74	18.85	19.39	19.32	19.12	19.36
Btl. B - DO	8.44	8.38	8.19	7.90	7.43	7.24	7.18	6.81

	8/7 DAY 10 II	DAY 12 II	DAY 15 II	DAY 20 II	DAY 25 II	DAY 30 II	DAY 45 II	DAY 60 II
Read Date	8/7	8/10	8/13	8/18/15	8/24/15	8/27/15	9/14/15	9/29/15
Read Time	1314 ←	1246	1122	1231	1416	1312	1239	1251
Btl. A - Temp.	20.02	19.99	20.10	20.01	20.10	20.04	20.57	20.71
Btl. A - DO	6.47	6.32	6.02	5.46	5.19	4.60	4.33	4.00
Btl. B - Temp.	20.11	20.02	20.00	20.14	19.97	20.72	20.52	20.67
Btl. B - DO	6.66	6.57	6.27	5.73	5.46	5.09	4.60	4.34

	DAY 75 II	DAY 90 II						
Read Date	10/12/15	10/27/15						
Read Time	1355	1309						
Btl. A - Temp.	19.75	18.79						
Btl. A - DO	3.96	3.93						
Btl. B - Temp.	18.65	18.87						
Btl. B - DO	4.30	4.27						

DO is to be monitored on the following days: 0, 0.5, 1, 2, 3, 4, 5, 7, 10, 12, 15, 20, 25, 35, 45, 60, 75 and 90. On days where samples are aerated, DO will be measured both before and after aerations. Samples will be collected on days 0, 5, 10, 20, 30, 45, 60, and 90.

Long Term BOD Data Sheet
Series Number:
Series Description: __ % Eff. __ % River
Sample Location: WFSR Down

Project Name: Stones River
WFSR-Down-08
Collected @ 0914

Project No: 142299
Setup Date: 8/27/15
Setup Time: 1025

	I Day 0	III DAY 0.5	II DAY 1	II DAY 2	III DAY 3	II DAY 4	II DAY 5	II DAY 7
Read Date	8/27/15	8/27/15	8/28/15	8/29/15	8/30/15	8/31/15	9/1/15	9/3/15
Read Time	1025	2021	1108	1110	1131	1235	1231	1227
Btl. A - Temp.	23.05	20.78	20.48	~~20.50~~ 20.41	20.08	20.04	20.06	20.13
Btl. A - DO	7.68	7.78 *	7.00	~~7.32~~ 7.35	7.24	7.07	6.03	6.41
Btl. B - Temp.	22.84	20.74	20.46	20.38	20.15	20.09	20.15	20.14
Btl. B - DO	7.78	7.67	7.62	7.25	7.15	7.13	6.03	6.49

	II DAY 10	II DAY 12	II DAY 15	II DAY 20	II DAY 25	II DAY 30	II DAY 45	II DAY 60
Read Date	~~8~~ 9/4/15	9/8/15	9/11/15	9/16/15	9/21/15	9/24/15	10/12/15	10/27/15
Read Time	1151	1252	1249	1245	1327	1310 1355	1230	1316
Btl. A - Temp.	20.08	20.30	~~20.15~~ 20.13	20.25	20.25	6.39 5.32	~~5.01~~ → 4.98	18.64
Btl. A - DO	6.36	6.17	5.96	5.63	5.54	20.27 20.45	20.21	4.64
Btl. B - Temp.	20.21	20.22	20.10	20.37	20.31	6.40 5.38	4.92	18.65
Btl. B - DO	6.54	6.24	6.01	5.62	5.57	21.0 20.27	18.40	4.05

	II DAY 75	II DAY 90
Read Date	11/10/15	11/30/15
Read Time	~~1325~~ 1415	1242
Btl. A - Temp.	20.99	17.08
Btl. A - DO	~~20~~ 4.79	4.15
Btl. B - Temp.	20.87	16.93
Btl. B - DO	4.77	4.25

DO is to be monitored on the following days: 0, 0.5, 1, 2, 3, 4, 5, 7, 10, 12, 15, 20, 25, 35, 45, 60, 75 and 90. On days where samples are aerated, DO will be measured both before and after aerations. Samples will be collected on days 0, 5, 10, 20, 30, 45, 60, and 90.

* started w/ III, went back to II, III - inaccurate

Long Term BOD Data Sheet **Project Name:** **Stones River** **Project No:** **142299** 15035 NSR

Series Number: **Setup Date:** 8/27/15

Series Description: __ % Eff. __ % River **Setup Time:** 1133

Sample Location: WFSR-up WFSRUP-08 Collected @ 0938

	Day 0	III DAY 0.5	III DAY 1	III 8/29 DAY 2	III 8/30 DAY 3	III 8/31 DAY 4	III 9/1 DAY 5	III 9/3 DAY 7
Read Date	8/27/15	8/27/15	8/28/15	8/29/15	8/30/15	8/31/15	9/1/15	9/3/15
Read Time	1133 | 1325	2100	1112	1116	1136	1243	1244	1240
Btl. A - Temp.	21.48 | 21.09	20.75	20.55	20.48	20.18	20.19	20.16	20.22
Btl. A - DO	8.49 | 8.25	8.23	8.02	7.54	7.38	7.29	6.96	6.59
Btl. B - Temp.	21.43 | 21.48	~~21.42~~ 20.68	20.51	20.48	20.22	20.20	20.20	20.16
Btl. B - DO	8.43 | 8.28	~~8.28~~ 8.24	8.07	7.63	7.45	7.44	7.19	6.83

	III 9/7 DAY 10	III 9/8 DAY 12	III 9/11 DAY 15	III 9/16 DAY 20	III 9/21 DAY 25	III 9/24 DAY 30	I 10/12 DAY 45	I 10/26 DAY 60
Read Date	9/14/15	9/8/15	9/11/13	9/16/15	9/21/15	9/24/15	10/12/15	10/27/15
Read Time	1204	1305	1258	1256	1321	1359	1241	1321
Btl. A - Temp.	20.11	20.36	20.15	20.25	20.31	20.30	18.50	19.67
Btl. A - DO	6.47	6.21	5.94	5.05	5.57	5.29	4.89	4.64
Btl. B - Temp.	20.13	20.30	20.16	20.23	20.23	20.28	18.36	19.65
Btl. B - DO	6.69	6.45	6.20	5.95	5.92	5.51	5.24	5.01

	III 11/10 DAY 75	11/25 DAY 90 I
Read Date	11/10/15	11/30/15
Read Time	1420	1248
Btl. A - Temp.	20.85	17.00
Btl. A - DO	4.74	4.14
Btl. B - Temp.	20.44	17.05
Btl. B - DO	5.06	4.58

DO is to be monitored on the following days: 0, 0.5, 1, 2, 3, 4, 5, 7, 10, 12, 15, 20, 25, 35, 45, 60, 75 and 90. On days where samples are aerated, DO will be measured both before and after aerations. Samples will be collected on days 0, 5, 10, 20, 30, 45, 60, and 90.

Long Term BOD Data Sheet **Project Name:** **Stones River** **Project No:** ~~142299~~ 152001 NR

Series Number: **Setup Date:** 8/27/15

Series Description: __ % Eff. __ % River **Setup Time:** 1157

Sample Location: WFSR-EFF WFSREFF-08 Collected @ 1000

	Day 0	III DAY 0.5	DAY 1	III DAY 2	III DAY 3	III DAY 4	III DAY 5	III DAY 7
Read Date	8/27/15	8/27/15	8/28/15	8/29/15	8/30/15	8/31/15	9/1/15	9/3/15
Read Time	1157 | 1328	2110	1116	1121	1141	1240	1234	1230
Btl. A - Temp.	24.00 | 22.92	20.80	20.68	20.73	20.45	20.42	20.34	20.44
Btl. A - DO	8.93 | 7.78	8.14	7.97	7.41	7.21	7.13	6.85	6.36
Btl. B - Temp.	24.0 | 23.07	20.88	20.68	20.70	20.45	20.42	20.44	20.45
Btl. B - DO	8.95 | 7.85	8.17	7.97	7.49	7.25	7.24	6.93	6.46

	III DAY 10	III DAY 12	III DAY 15	III DAY 20	III DAY 25	III DAY 30	I DAY 45	I DAY 60
Read Date	9/4/15	9/6/15	9/11/15	9/16/15	9/21	9/24/15	10/12/15	~~10/27~~ 10/27/15
Read Time	1209	1257	1254	1248	1333	1403	1257 | 1315	1328
Btl. A - Temp.	20.37	20.46	20.43	20.42	20.44	20.46	18.74 | 20.35	18.86
Btl. A - DO	6.20	5.91	5.04	5.17	4.69	4.25	3.25 | 8.60	7.35
Btl. B - Temp.	20.38	20.48	20.45	20.43	20.47	20.49	18.70 | 20.37	18.81
Btl. B - DO	6.31	6.05	5.07	5.31	4.87	4.38	3.40 | 8.62	7.72

	III DAY 75	II DAY 90						
Read Date	11/10/15	11/30/15						
Read Time	1415	1255						
Btl. A - Temp.	20.98	17.34						
Btl. A - DO	6.61	5.74						
Btl. B - Temp.	20.98	17.36						
Btl. B - DO	7.02	6.30						

DO is to be monitored on the following days: 0, 0.5, 1, 2, 3, 4, 5, 7, 10, 12, 15, 20, 25, 35, 45, 60, 75 and 90. On days where samples are aerated, DO will be measured both before and after aerations. Samples will be collected on days 0, 5, 10, 20, 30, 45, 60, and 90.

Long Term BOD Data Sheet **Project Name:** **Stones River** **Project No:** ~~142299~~ 152384

Series Number: **Setup Date:** 9/29/15

Series Description: __ % Eff. __ % River WFSRDown-09 **Setup Time:** 1032

Sample Location:

	III Day 0	III DAY 0.5	III DAY 1	I DAY 2	II DAY 3	II DAY 4	II DAY 5	II DAY 7
Read Date	9/29/15	9/29/15 *	9/29/15	9/30/15	10/1/15	10/02/15	10/03/15	10/05/15
Read Time	1032	2058 / 2110	1105	1127	1102	1115	1045	1153
Btl. A - Temp.	23.42	20.52 / 20.79	20.79	19.62	19.35	19.87	19.30	19.49
Btl. A - DO	7.91	7.95 / 7.92	7.75	7.59	7.49	7.11	7.07	6.58
Btl. B - Temp.	23.46	20.53 / 20.58	20.49	19.62	19.86	19.37	19.58	19.10
Btl. B - DO	7.94	8.00 / 7.91	7.78	7.67	7.45	7.29	7.15	6.78

	DAY 10	II DAY 12	II DAY 15	II DAY 20	II DAY 25	II DAY 30	II DAY 45	II DAY 60
Read Date	10/08/15	10/09/15	10/13/15	10/19/15	10/23/15	10/27/15	11/12/15	11/30/15
Read Time	1405	1302	1254	1355	1258	1347	1211	1300 / 1322
Btl. A - Temp.	19.02	19.35	18.38	19.39	19.17	19.14	20.97	17.54 / 19.63
Btl. A - DO	6.34	6.13	5.99	5.23	5.02	4.87	4.52	3.37 / 7.87
Btl. B - Temp.	19.21	18.91	18.90	19.02	19.33	18.99	21.21	13.72 / 19.63
Btl. B - DO	6.49	6.34	6.09	5.35	5.23	5.07	4.83	17.14 / 7.89

	II DAY 75	II DAY 90						
Read Date	12/11/15	12/28/15						
Read Time	1313	1222						
Btl. A - Temp.	17.28	17.76						
Btl. A - DO	7.58	7.33						
Btl. B - Temp.	16.97	~~17.4~~ 17.25	KSL					
Btl. B - DO	7.14	~~6.56~~ 6.84	KSL					

DO is to be monitored on the following days: 0, 0.5, 1, 2, 3, 4, 5, 7, 10, 12, 15, 20, 25, 35, 45, 60, 75 and 90. On days where samples are aerated, DO will be measured both before and after aerations. Samples will be collected on days 0, 5, 10, 20, 30, 45, 60, and 90.

*recalibrated

Long Term BOD Data Sheet **Project Name:** **Stones River** **Project No:** ~~142299~~ 152-4

Series Number: **Setup Date:** 9/28/15

Series Description: __ % Eff. __ % River **Setup Time:** 1047

Sample Location: WFSREFF-09 use this data

	III Day 0	III DAY 0.5	III DAY 1	III DAY 2 IV	II DAY 3	II DAY 4	DAY 5	DAY 7
Read Date	9/28/15	9/28/15	9/29/15	9/30/15	10/1/15	10/02/15	10/03/15	10/05/15
Read Time	1047	2105 / 2114	1109	1108 / 1132	1110	1124	1051	1159
Btl. A - Temp.	25.62	20.87 / 20.49	20.72	20.69 / 19.69	19.62	19.70	19.49	19.44
Btl. A - DO	8.06	8.96 / 8.37	8.17	8.15 / 8.00	7.88	7.58	7.34	7.16
Btl. B - Temp.	25.68	/ 20.86	20.61	20.76 / 19.83	19.50	19.56	19.48	19.24
Btl. B - DO	8.07	8.34	8.27	8.34 / 8.23	8.22	7.90	7.86	7.49

	DAY 10	DAY 12 II	II DAY 15	II DAY 20	II DAY 25	II DAY 30	II DAY 45	II DAY 60
Read Date	10/08/15	10/10/15	10/13/15	10/19/15	10/23/15	10/27/15	11/12/15	11/30/15
Read Time	1412	1307	1301	1404	1305	1353	1218	1312
Btl. A - Temp.	19.18	19.27	18.90	19.40	19.50	19.08	21.16	17.90
Btl. A - DO	7.00	6.92	6.05	6.15	5.80	5.48	5.04	3.82
Btl. B - Temp.	19.38	19.15	18.88	19.43	19.45	19.15	21.23	17.85
Btl. B - DO	7.57	7.30	7.28	6.53	6.30	6.05	5.57	4.39

	II DAY 75	II DAY 90						
Read Date	12/11/15	12/28/15						
Read Time	1325	1238						
Btl. A - Temp.	16.96	17.07						
Btl. A - DO	3.62	3.62						
Btl. B - Temp.	17.07	16.96						
Btl. B - DO	4.27	4.28						

DO is to be monitored on the following days: 0, 0.5, 1, 2, 3, 4, 5, 7, 10, 12, 15, 20, 25, 35, 45, 60, 75 and 90. On days where samples are aerated, DO will be measured both before and after aerations. Samples will be collected on days 0, 5, 10, 20, 30, 45, 60, and 90.

*recalibrated

Long Term BOD Data Sheet **Project Name:** **Stones River** **Project No:** ~~142299~~ 152384

Series Number: **Setup Date:** 9/28/15

Series Description: __ % Eff. __ % River WFSRUP-09 **Setup Time:** 1117

Sample Location:

	II Day 0	III DAY 0.5	IV DAY 1	I DAY 2	II DAY 3	II DAY 4	DAY 5	I DAY 7
Read Date	9/28/15	9/28/15	9/29/15	9/30/15	10/1/15	10/02/15	10/03/15	10/05/15
Read Time	1117	2121	1113	1122	1118	1129	1058	1105
Btl. A - Temp.	23.59	20.95	20.54	20.69	19.54	~~19.57~~ 19.34	19.45	19.18
Btl. A - DO	7.99	8.11	8.03	7.93	7.69	~~7.50~~ 7.44	7.12	6.92
Btl. B - Temp.	23.55	20.74	20.59	19.76	19.46	19.51	19.41	19.28
Btl. B - DO	8.03	8.13	8.04	7.82	7.76	7.50	7.21	7.03

	DAY 10	II DAY 12	II DAY 15	II DAY 20	II DAY 25	I DAY 30	III DAY 45	II DAY 60
Read Date	10/08/15	10/09/15	10/13/15	10/19/15	10/23/15	10/27/15	11/12/15	11/30/15
Read Time	1418	1313	1304	1411	1315	1402	1124	1330
Btl. A - Temp.	19.15	19.22	18.76	19.39	19.31	18.96	21.15	18.02
Btl. A - DO	6.72	6.55	6.32	5.60	5.39	5.32	5.11	4.19
Btl. B - Temp.	19.30	19.05	18.82	19.24	19.34	19.15	21.07	18.09
Btl. B - DO	6.81	6.67	6.41	5.79	5.62	5.50	5.37	4.37

	II DAY 75	II DAY 90						
Read Date	12/11/15	12/28/15						
Read Time	1332	1241						
Btl. A - Temp.	17.02	17.10						
Btl. A - DO	4.12	4.01						
Btl. B - Temp.	17.15	17.16						
Btl. B - DO	4.25	4.07						

DO is to be monitored on the following days: 0, 0.5, 1, 2, 3, 4, 5, 7, 10, 12, 15, 20, 25, 35, 45, 60, 75 and 90. On days where samples are aerated, DO will be measured both before and after aerations. Samples will be collected on days 0, 5, 10, 20, 30, 45, 60, and 90.

Long Term BOD Data Sheet **Project Name: Stones River** **Project No: ~~142299~~ 1523**

Series Number: **Setup Date:** 9/23/15

Series Description: __ % Eff. __ % River WFSR-UP-09 Dup **Setup Time:** 1126

Sample Location:

	III Day 0	III DAY 0.5	III DAY 1	II DAY 2	II DAY 3	II DAY 4	DAY 5	I DAY 7
Read Date	9/28/15	9/29/15	9/29/15	9/30/15	10/1/15	10/02/15	10/03/15	10/05/15
Read Time	1126	1241 KSL	1117	1137	1126	1135	1104	1110
Btl. A - Temp.	23.56	20.03	20.43	19.95	19.68	19.74	19.52	19.70
Btl. A - DO	8.06	8.19	8.07	7.89	7.77	7.47	7.17	6.96
Btl. B - Temp.	23.55	20.87	20.90	19.83	19.86	19.58	19.71	19.42
Btl. B - DO	8.06	8.21	8.06	7.89	7.74	7.39	7.17	6.96

	DAY 10	DAY 12 II	II DAY 15	II DAY 20	II DAY 25	I DAY 30	III DAY 45	II DAY 60
Read Date	10/08/15	10/09/15	10/13/15	10/19/15	10/23/15	10/27/15	11/12/15	11/30/15
Read Time	1423	1318	1306	1418	1324	1406	1232	1335
Btl. A - Temp.	19.34	19.32	18.97	19.59	19.56	19.07	21.39	18.10
Btl. A - DO	6.65	6.48	6.29	5.52	5.29	5.28	5.06	4.06
Btl. B - Temp.	19.42	19.30	18.99	19.45	19.61	19.24	21.27	18.18
Btl. B - DO	6.71	6.54	6.31	5.56	5.34	5.23	~~5.12~~ 5.11	4.18

	II DAY 75	I DAY 90						
Read Date	12/11/15	12/28/15						
Read Time	1340	1244						
Btl. A - Temp.	17.48	17.53						
Btl. A - DO	4.09	4.01						
Btl. B - Temp.	17.48	17.46						
Btl. B - DO	4.18	4.08						

DO is to be monitored on the following days: 0, 0.5, 1, 2, 3, 4, 5, 7, 10, 12, 15, 20, 25, 35, 45, 60, 75 and 90. On days where samples are aerated, DO will be measured both before and after aerations. Samples will be collected on days 0, 5, 10, 20, 30, 45, 60, and 90.

APPENDIX 7

RESUMES OF KEY PERSONNEL

MICHAEL R. CORN, P.E., BCEE

EDUCATION:

M.S., Environmental & Water Resources Engineering, Vanderbilt University, Nashville, Tennessee, 1979
B.S., Nuclear Engineering, University of Tennessee, Knoxville, Tennessee, 1972

PROFESSIONAL LICENSES:

Professional Engineer: Alabama, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Minnesota, Mississippi, Missouri, Nevada, New Jersey, North Carolina, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Virginia, West Virginia, Wisconsin

PROFESSIONAL MEMBERSHIPS AND AFFILIATIONS:

American Nuclear Society, Member
American Academy of Environmental Engineers
Defense Research Institute, Member
Harpeth River Watershed Association, Advisory Board Member and Technical Advisor
National Council for Air and Stream Improvement (NCASI), Member
Treated Wood Council, Member
Water Environment Federation, Member

OTHER PROFESSIONAL ACHIEVEMENTS AND AWARDS:

Board Certified Environmental Engineer (BCEE) - American Academy of Environmental Engineers
Roy F. Weston Environmental Technical Award, Engineering Division at TAPPI
Co-holder U.S. Patent for Hazardous Waste Land Treatment of Petroleum Sludges
Co-inventor U.S. Patent for In-Situ Biostimulation of Groundwater and Vadose Zone Double-Bonded Carbon Atoms
Honor Award for Diffuser Design from Consulting Engineers Council of Illinois

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CURRENT PROFESSIONAL INVOLVEMENT: 1992 - present, **AquAeTer**, President

Mr. Corn provides technical direction and management of projects involving groundwater, surface water resources, water quality/environmental management (including modeling), contaminant transport, fate and effects analyses, toxicity identification/reduction evaluations, bioassays, bioconcentration/bioaccumulation studies and modeling, geomorphologic analysis, environmental permitting, air, CERCLA, SPCC, SWPP, and evaluations, NPDES, RCRA, TSCA, and hazardous waste management. Mr. Corn is a Board Certified Environmental Engineer (BCEE) working in the areas of solid, hazardous and nuclear waste management, permitting, disposal and remediation. He has over 40 years of experience in environmental engineering, including the design and construction oversight of the remediation of contaminated soils and other complex earth projects. He is a co-holder of a U.S. Patent for a hazardous waste land treatment unit for petroleum sludges and co-inventor of a U.S. Patent for in-situ biostimulation of double-bonded carbon atoms in vadose zone soils and groundwater. Mr. Corn is also an Adjunct Professor of environmental engineering at Vanderbilt University where he teaches classes on environmental sampling, modeling, permitting and regulatory affairs for air, water quality, wastewater, and solid hazardous and nuclear waste.

PRIOR PROFESSIONAL INVOLVEMENT:

1985-1992 The ADVENT Group, Inc., Brentwood, Tennessee, Principal/Vice-President
1980-1985 AWARE, Inc., SE, Nashville, Tennessee, Senior Project Engineer/Project Manager
1975-1980 Law Engineering Testing Co., Marietta, Georgia, Water Resources Engineer/Project Manager
1973-1975 Vanderbilt University, Nashville, Tennessee, Research Assistant

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AREAS OF EXPERTISE:

Water Quality Monitoring/Modeling
Contaminant Transport Fate & Effects
Bathymetric Surveys
Ecological Risk Assessments
Expert Report/Expert Testimony
C02 Emissions' Estimates
Air Monitoring & Modeling
Bench-scale Treatability Studies
Sediment Mapping
Environmental Permitting
Environmental Remediation
Total Maximum Daily Loads
Human Health Risk Assessments
Hazardous Waste Management
Environmental Chemistry

KEY CLIENTS AND INDUSTRIES:

Industrial
Iron and Steel
Organic/Inorganic Chemicals
Pulp and Paper
Refinery/Petrochemicals
Wood Treatment

Law Firms
Chisenhall, Nestrud & Julian
Lewis, King, Krieg & Waldrop
Lightfoot, Franklin & White
Maynard Cooper & Gale
Neal & Harwell
Roberts & Stevenson
Scott, Dukes & Geisler
Wildman, Harrold, Allen & Dixon

Government/Municipal
USEPA, DOE, DOD, ORNL, USACE

JOHN MICHAEL CORN, P.E.

EDUCATION:

B.S. Chemical Engineering, University of Tennessee, Knoxville, Tennessee, 2001
M.E. Environmental Engineering, Vanderbilt University, Nashville, Tennessee, December 2013

PROFESSIONAL LICENSES AND CERTIFICATIONS:

Professional Engineer, Tennessee
Certified AHERA Inspector for Asbestos

PROFESSIONAL TRAINING:

40-Hour Training for Hazardous Waste Operations and Emergency Response (HAZWOPER)

CURRENT PROFESSIONAL INVOLVEMENT: 2003 - present, **AquAeTer**, Project Engineer

Mr. Corn has 12 years of experience in environmental engineering. His current projects include water quality studies and modeling, air emissions calculations and modeling, environmental litigation support, dispersion studies, groundwater investigations, geomorphologic analysis, wastewater treatment selection, bioaccumulation, and environmental site assessments. He has been involved in environmental sampling, bench and pilot-scale studies, groundwater tracer tests, site assessments for spill prevention control & countermeasures plans, total maximum load analyses studies, design of single-port and multi-port diffusers, statistical distribution analyses, emissions estimations for facility permitting, toxicity testing, surface water remediation, and project planning and budgeting.

PRIOR PROFESSIONAL INVOLVEMENT:

2002-2003 Environmental Systems Corp., Senior Technologist. Mr. Corn's work included management and development of over 90 SPCC Plans, asbestos surveys, and air quality assessments.

2000-2001 **AquAeTer, Inc.**, Summer and Winter Intern. Mr. Corn's work included tidal dispersion study, creosote emissions analyses, SVE system design, groundwater and soil monitoring, and ambient air monitoring.

AREAS OF EXPERTISE:

Environmental Investigations and Remediation
Ambient Air Testing and Monitoring
Air Modeling
Water Quality Monitoring and Modeling
Total Maximum Daily Load Determination
Dispersion Analysis
Site Remediation
Soil/Groundwater Investigations
Bioremediation
Bench & Pilot Scale Studies
Asbestos Sampling Evaluation
Sediment Investigation and Surveys
Bathymetric Surveys
Hydrologic Analyses

Industrial
Wood Treatment
Chemical Hazard Analysis
Air Emission Inventories
Emission Data Analysis
Emission Control Evaluation
State Voluntary Cleanup Programs

Permitting and Best Management Plans (BMPs)
Title V & Minor Source Operating Permits
NPDES
SPCC Plans
BMPs for Sediment Control
BMPs for Discharge Control
BMPs for Sediment Mitigation

Water Quality Modeling
HEC
WASP
EPD-RIV1
CORMIX
Visual PLUMES
WATER9

Air Emissions Modeling
AERMOD
WATER9

Geomorphologic Analysis
Flood Sampling and Flow Analysis
Creek Surveys and Profile Assessment

NICHOLAS J. CARMEAN

EDUCATION:

M.S. Fisheries Biology, Arkansas Tech University, Russellville, AR
B.S. Environmental Studies and Biology, Ohio Northern University, Ada, Ohio

PROFESSIONAL TRAINING:

38-Hour Army Corps of Engineers Wetland Delineation Classroom and Field Training
16-Hour USACE 404 Permitting Training
40-Hour Training for Hazardous Waste Operations and Emergency Response (HAZWOPER)
8-hour (HAZWOPER) supervisory training
TN Hydrologic Determination Training

PROFESSIONAL MEMBERSHIPS AND AFFILIATIONS:

American Fisheries Society, Member

CURRENT PROFESSIONAL INVOLVEMENT: 2013-present, **AquAeTer**, Scientist

Mr. Carmean has over 5 years of experience in biological and environmental projects throughout the United States. The experience includes Phase I and II Environmental Site Assessments, Informal Biological Assessments, wetland delineations and associated State and Federal permitting, soil and groundwater sampling, and water quality assessments. In addition, Mr. Carmean has conducted biological assessments that incorporated riparian and instream habitat evaluation, habitat mapping, instream discharge measurements, electrofishing, seine netting, and identification of fish collected through those methods, as well as, the collection and identification of macroinvertebrates.

PRIOR PROFESSIONAL INVOLVEMENT:

2009-2013	Brazos River Authority, Waco, Texas, Aquatic Scientist
2008-2009	US EPA National Rivers and Streams Assessment Team, Russellville, Arkansas, Field Crew Leader
2007-2010	Arkansas Tech University, Russellville, Arkansas, Teaching and Research Assistant

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AREAS OF EXPERTISE:

Biological Assessments
- Instream Biological Assessments
- Instream Habitat Quality Assessments
- Habitat Mapping
- Fish Collection (Electrofishing and Seine)
- Fish Identification
- Habitat Mapping
- Macroinvertebrate Collection
- Macroinvertebrate Identification

Environmental Assessments
- Wetland Delineation and Permitting
- Phase I and II Environmental Assessments
- Soil and Groundwater Sampling
- Water Quality Sampling & Monitoring