Boulder Creek and St. Vrain Creek Annual Water Quality Analysis for 2014




Prepared for
Keep It Clean Partnership

Prepared by
Wright Water Engineers, Inc.

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1.0 Executive Summary

In 2014, the Keep It Clean Partnership (KICP) developed the *Boulder Creek and St. Vrain Creek Coordinated Watershed Monitoring Framework* ("Monitoring Plan"), providing improved coordination of multiple independent monitoring efforts being conducted in the watershed. This report is the first joint water quality analysis report resulting from the Monitoring Plan. The report provides a summary of flow and field conditions during 2014, water quality analysis, a limited summary of biological monitoring results, and conclusions and recommendations for future monitoring and reporting efforts. The primary water quality parameters discussed in this report include nutrients and *E. coli*, with limited discussion of arsenic and several general water quality indicators (e.g., total suspended solids, dissolved oxygen, pH). Key findings from analysis of the 2014 data include:

- *E. coli*: All segments evaluated in this report exceed *E. coli* standards, with the exception of South Boulder Creek. The portion of Boulder Creek between 13th Street to the confluence with South Boulder Creek is included in an *E. coli* Total Maximum Daily Load (TMDL), which drives additional regulatory requirements under Municipal Separate Storm Sewer System (MS4) permits.
- Total Phosphorus: Below wastewater treatment plant (WWTP) discharges, no stream segments evaluated in this report would be expected to attain the "interim values" adopted in Regulation 31 in 2012.
- Total Nitrogen: Below WWTP discharges, no stream segments evaluated in this report would be expected to attain the "interim values" adopted in Regulation 31 in 2012.
- Nitrate: For Coal Creek, the Division adopted a more stringent nitrate standard of 10 mg/L in the June 2015 Regulation 38 rulemaking hearing. The 2014 data indicate that this standard may be exceeded at multiple locations under certain conditions.
- Total Recoverable Arsenic: Although temporary modifications have been adopted for segments with "fish + water" standards for total recoverable arsenic through December 31, 2021, available data collected for Boulder Creek and South Boulder Creek indicate that the stringent 0.02 µg/L standard is not attainable at any monitoring location. Less stringent stream standards apply to other segments in the watershed.
- Aquatic Life: Based on biological monitoring results for 2014, portions of Coal Creek, Rock Creek, St. Vrain Creek and Left Hand Creek would be identified as impaired for aquatic life. One location on Boulder Creek above Coal Creek (BC-aCC) would be considered impaired for aquatic life when evaluated as Biotype 1, but not when evaluated as Biotype 3. It may be worth further evaluating whether other monitoring locations, particularly those within the Biotype 3 elevation range, are more appropriately evaluated as Biotype 1 or Biotype 3, given new provisions in the 2016 303(d) Listing Methodology.
- Other known regulatory issues not evaluated in this report include temperature related to WWTP discharges and several 303(d) or Monitoring and Evaluation listings for metals.

As a result of this analysis, additional source identification of *E. coli* through targeted monitoring is recommended. Recommendations will be further developed in the 319 Watershed Plan being developed for the basin in the fall of 2015.

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2.0 Introduction

The overall St. Vrain Creek watershed (8-digit hydrologic unit code [HUC] = 10190005) covers approximately 980 square miles and includes many governmental jurisdictions and water-related organizations (e.g., conservancy districts). Streams in the watershed include Boulder Creek, South Boulder Creek, Coal Creek, Rock Creek, Left Hand Creek, St. Vrain Creek and many smaller tributaries. Multiple local governments and organizations conduct instream water quality, biological and flow monitoring in various parts of the watershed. In 2014, the Keep It Clean Partnership (KICP) developed the *Boulder Creek and St. Vrain Creek Coordinated Watershed Monitoring Framework* ("Monitoring Plan") for the following purposes:

- Provide better coordination of existing multi-jurisdictional monitoring efforts.
- Provide consolidated documentation of the monitoring that is occurring in the watershed.
- Provide guidance for standardized field procedures and analytical methods.
- Identify and recommend additional monitoring to fill data gaps to support progress toward attainment of stream standards.

Due to the size of the watershed, the remote nature of the upper basin locations, and varying levels of participation among governmental jurisdictions, the Monitoring Plan cannot practically address all stream reaches; however, it is designed to address key water quality parameters, flow, and biological conditions at selected locations in the watershed where supported by local jurisdictions. These locations generally span the western edge of the urbanized portion of the watershed eastward to I-25. The scope of the Monitoring Plan is limited to flowing streams, although both the City of Boulder and the City of Longmont also monitor lakes and reservoirs.

This report provides an overview of the Monitoring Plan and scope of the analysis, a summary of flow and field conditions during 2014, water quality analysis, a limited summary of biological monitoring results, and conclusions and recommendations for future monitoring and reporting efforts. Because of differences in the breadth of the monitoring programs conducted by various jurisdictions, this report focuses primarily on several general water chemistry parameters including nutrients, *E. coli,* and arsenic, based on the priorities identified by the KICP. Additionally, selected findings from biological monitoring conducted by Timberline Aquatics on Boulder Creek, South Boulder Creek, Coal Creek, Rock Creek, Left Hand Creek and St. Vrain Creek for KICP municipalities are provided. Appendix A provides maps identifying monitoring locations, and Appendices B through D provide tabular and graphical summary statistics supporting the analysis. Appendix E provides a summary of designated uses and stream standard adopted for streams in the basin in Regulation 38, and Appendix F provides stream segments identified as impaired on the currently applicable "303(d) List." Appendix G provides results of a special *E. coli* monitoring conducted by Louisville on Coal Creek.

3.0 Overview of Monitoring Program and Scope of Analysis

The *Boulder Creek and St. Vrain Creek Coordinated Watershed Monitoring Framework* (KICP and WWE 2014) is an on-going, voluntary, ambient-based program that is independently managed and implemented by each participating jurisdiction (Table 1). The Monitoring Plan is focused on developing a coordinated baseline for the overall watershed. In the future, monitoring objectives and activities may be added to assess measureable results from implementation of structural or non-structural best management practices (BMPs) in the watershed.

Table 2 summarizes the primary monitoring locations included in this annual report, and Table 3 summarizes the monitoring program analytes and frequencies.

The overall basin monitoring program includes these general components:

- **Water quality monitoring:** Water quality monitoring includes instream sample collection during ambient conditions. This includes voluntary programs as well as samples collected to meet Regulation 85 requirements.

- **Flow measurements**: Two types of flow measurements are conducted (or retrieved) as part of this monitoring program. The first includes continuous daily flow measurements conducted at fixed, long-term gauges shown on Figure A-1 in Appendix A. These gauges and associated data are maintained by the U.S. Geological Survey (USGS) (see http://waterdata.usgs.gov/usa/nwis/sw) or the Colorado Division of Water Resources (DWR) (see http://cdss.state.co.us/onlineTools/Pages/StreamflowStations.aspx). Additionally, One-Rain gauge sites used in early alert flood warning systems may be used to supplement flow data; however, data downloads are restricted to subscribers and have not been included in this report. The second type of flow monitoring includes instantaneous flow monitoring with hand-held monitoring equipment, which is used to supplement fixed gauge data in key areas. Manual flow monitoring is conducted only when it is safe for field staff to enter the stream. Chapter 4 provides a summary of streamflow conditions for the USGS, DWR, and the municipally-operated stream gauge at Coal Creek (which was formerly a USGS gauge).

- **Biological Monitoring**: Biological monitoring is conducted in the spring and fall for portions of Boulder Creek, South Boulder Creek, Coal Creek, Rock Creek, St. Vrain Creek, and Left Hand Creek. Detailed annual reports on these monitoring efforts are provided by Timberline Aquatics; however, a subset of the biological monitoring data set is also provided in this report. The information contained in this report is limited to data needed to assess attainment of Colorado Policy 10-1 for aquatic life (e.g., multi-metric index [MMI] and associated metrics).

Table 1. Summary of Routine Instream Monitoring Programs in the Basin

General Waterbody	Program Description	Primary Monitoring Plan
Boulder Creek and Tributaries (from headwaters to below Coal Creek); Reservoirs—upper source water sites, Barker Reservoir, Boulder Reservoir; Dry Creek/Little Dry Creek	Extensive program including nutrients, fecal indicator bacteria, metals, and other physical constituents; flow; and biological monitoring. Sampling frequencies vary by waterbody. Main stem monitored monthly.	City of Boulder, Boulder Creek Monitoring Program, Prepared by the City of Boulder Department of Public Works Utilities Division Water Quality and Environmental Services. May 2012. Updated June 2014.
Rock Creek/Coal Creek	Monthly monitoring for TP, TKN, NO3/NO2, TN, TP and flow. Also pH, temperature, hardness, fecal indicator bacteria. Biological monitoring.	Regulation 85 Nutrient Sampling and Analysis Plan (separate plans for Lafayette, Superior, Louisville, Erie), 2013.
St. Vrain Creek (vicinity of Longmont) Left Hand Creek (@ conf. w/ St. Vrain) Selected ditches: Dry Creek, Spring Gulch #1, Spring Gulch #2, Oligarchy	Extensive program including nutrients, fecal indicator bacteria, metals, and other physical constituents; flow; and biological monitoring. Sampling frequencies vary by waterbody. Monthly monitoring for TP, TKN, NO3/NO2, TN, TP and flow.	Regulation 85 Nutrient Sampling and Analysis Plan, City of Longmont, Public Works and Natural Resources Division of Environmental Services, CDPS Permit No. CO-0026671, February 2013.
Boulder Creek abv/blw Boulder Supply Canal; Left Hand Creek abv/blw Boulder Feeder Canal; St. Vrain Creek abv/blw St. Vrain Supply Canal(+other ditches/reservoirs)	Extensive program including nutrients, metals, and other physical constituents; flow, and biological monitoring. Sampling frequencies vary by waterbody.	Standard Operating Procedures for Northern Water's Water Quality Monitoring Programs. Northern Water, June 2014.

Note: Table 1 describes overall monitoring programs conducted by entities in the watershed. Data evaluated in this report focus on selected constituents addressed in these monitoring programs.

Table 2. 2014 KICP Water Quality Monitoring Locations[1]

Plot ID	Instream Monitoring Location Description	Stream Name	Data Provider
BC-Can	Pool area at Anderson Ditch headgate	Boulder Creek	City of Boulder
BC-CU	Under foot bridge connecting Folsom Field with dirt parking lot to the north	Boulder Creek	City of Boulder
BC-61	Just West of 61st St. bridge	Boulder Creek	City of Boulder
BC-aWWTP	Under bridge at 75th St. Western side	Boulder Creek	City of Boulder
BC-aDC	At diversion channel	Boulder Creek	City of Boulder
BC-95	Downstream of Lower Boulder Ditch headgate 0.87 miles below BC-aDC sample site	Boulder Creek	City of Boulder
BC-107	Bridge at 107th Street	Boulder Creek	City of Boulder
BC-bCC	Bridge where Boulder Creek goes under East County Line Road 2.13 miles below BC-Ken site.	Boulder Creek	City of Boulder
SBC-3.5	Open Space at McGuinn Ditch gate (*merged with SBC-4.0 in analysis*)	South Boulder Creek	City of Boulder
CC-Ken	Bridge where Coal Creek goes under Kenosha Rd. 0.89 miles upstream from Boulder Creek confluence.	Coal Creek	City of Boulder
9-BC	Boulder Creek above the North Erie WWTP discharge	Boulder Creek	Erie
10-BC	Boulder Creek below the North Erie WWTP discharge	Boulder Creek	Erie
11-BC	Boulder Creek Gauge 06730500	Boulder Creek	Erie
1-CC	Coal Creek above the Louisville WWTP discharge	Coal Creek	Louisville
2-CC	Coal Creek below the Louisville WWTP discharge	Coal Creek	Louisville
3-CC	Coal Creek above the confluence with Rock Creek	Coal Creek	Lafayette
6-CC	Coal Creek above the Lafayette WWTP discharge	Coal Creek	Lafayette
7-CC	Coal Creek below the Lafayette WWTP discharge	Coal Creek	Lafayette
4-RC	Rock Creek above the Superior WWTP discharge	Rock Creek	Superior
5-RC	Rock Creek above the confluence with Coal Creek	Rock Creek	Superior
M9.5-SV	M-9.5, St. Vrain @ N. 75th St	St. Vrain Creek	Longmont
M8.9-SV	St. Vrain @ Golden Ponds, M-9	St. Vrain Creek	Longmont
M8.4-SV[2]	St. Vrain @ Below Boston Ave, M-8.4	St. Vrain Creek	Longmont
M8.2-SV[2]	St. Vrain @ Pratt Parkway, M-8.2	St. Vrain Creek	Longmont
M8-SV	St. Vrain @ Above Effluent M-8	St. Vrain Creek	Longmont
T11-SV	Left Hand Creek@ St. Vrain,T-11	Left Hand Creek	Longmont
T-Eff	WWTP effluent channel where it enters the St. Vrain. This is combined with the roadside ditch flow.	St. Vrain Creek	Longmont
M7-SV	M-7, St. Vrain @ 119	St. Vrain Creek	Longmont
M6-SV	St. Vrain Above Confluence, M-6 @ County Line Road	St. Vrain Creek	Longmont

[1] Additional monitoring is also conducted in the watershed; these locations are the sites selected for analysis for purposes of this report.
[2] These sites are not part of Longmont's long-term monitoring program commitment, but are included in the analysis.

Table 3. 2014 KICP Monitoring Program Analytes

Parameter	Frequency	Method Detection Limit (MDL)
pH	monthly	1 SU
DO	monthly	0.1 mg/L
Temperature	monthly	-15 C
Conductivity	monthly	0.1 mmhos/cm
Hardness, Total as CaCO3	monthly	1 mg/L
Alkalinity, Total	monthly	1 mg/L
Flow	monthly (inst. meters); daily @ gauges	Stream dependent
E. coli	monthly	1 MPN/100 mL
TSS	monthly	2 mg/L
NH3, as N	monthly	50 µg/L
NO3+NO2, as N	monthly	20 µg/L
TKN, as N	monthly	100 µg/L
TN, as N	monthly	100 µg/L
TIN, as N	monthly	NA
TP, as P	monthly	10 µg/L
Benthic monitoring*	twice per year, spring and fall	
Metals: (1) As, (2) Se, (3) Metals w/stream stds.	TBD (min. quarterly)	varies

*Benthic monitoring discussed in this report is limited to parameters needed to assess attainment with Aquatic Life Policy 10-1.

Other data sets that could be integrated into this report in the future include RiverWatch, rotational basin monitoring conducted by the Water Quality Control Division (Division), Denver Water and others. During 2014, the Division did not monitor the St. Vrain Basin, but would be expected to monitor in 2017. RiverWatch volunteers conducted monitoring at only a few locations in 2014. The Riverwatch data set is summarized in Appendix B, but is not discussed in the report due to limited sampling locations and frequencies for the analytes of interest for this report.

Additionally, although this data report focuses on a specific subset of analytes collected as part of routine monitoring, other data and special studies that may be of interest to KICP include:

- City of Boulder's source water monitoring program that includes streams and reservoirs in the upper basin of Boulder Creek, as well as monitoring for Boulder Reservoir and tributaries.
- City of Longmont's monitoring for several reservoirs, ditches and creeks not listed in Table 2, but included in Appendices B through D of this report.
- Northern Colorado Water Conservancy District's routine monitoring program. Flowing stream and ditch data collected within the basin are provided in Appendix B, but are not

combined with other data and discussed in the report due to lower sampling frequencies limited to certain seasonal periods.

- The City of Louisville's quarterly *E. coli* monitoring at selected locations (Appendix G).
- The City of Boulder's special monitoring program for neonicticides.
- Boulder County Parks and Open Space's targeted monitoring program for agricultural sites and practices (under development).

4.0 Summary of Annual Flow Data and Pertinent Field Conditions

During 2014, stream flow was measured at the gauge locations in Table 4. Figures 1 through 9 provide the 2014 hydrographs at these locations, with the format differing slightly depending on whether the site is managed by the USGS, the DWR or others. Varying periods of record are available for each gauge, both historically and for 2014. A few observations from review of these hydrographs and precipitation data at the National Oceanic and Atmospheric Administration/National Weather Service (NOAA/NWS) Cooperative Site in Boulder include:

- Spring runoff peaked in early June for most stream segments in the basin.
- Streamflows during 2014 were higher than the historic median during spring runoff for Boulder Creek, St. Vrain Creek, and Coal Creek.
- Increased flows in response to a July 30-31 storm event totaling 3.05 inches are evident for most of the streams in the watershed. (Source: http://www.esrl.noaa.gov/psd/boulder/data.daily.html#Aug14)
- Several fall storm events occurred with precipitation depths greater than 0.5 inch on September 5, September 12, and October 9, based on precipitation recorded at the NOAA/NWS Cooperative Site in Boulder.
- On South Boulder Creek, higher flow measurements in February in Figure 2 are expected to be due to ice buildup on the gauge, rather than actual high flows (Personal Communication with Cindy Brady, Denver Water). The measured discharge (green x on Figure 2) is much lower than the gauge reading (shown by the red line in Figure 2) during this time period.

Flow is an important variable to record along with water quality data because it is a key influence on pollutant loading to the stream and instream concentrations. Higher than normal streamflows from snowmelt and precipitation can dilute contributions from WWTPs, but may also increase transport of pollutants from urban and agricultural land uses, as well as from unstable areas affected by wildfire. Other field conditions that may affect 2014 data relative to previous years include channel instability, denuded vegetation on banks and other impacts from the September 2013 flood.

Table 4. Streamflow Gauges with 2014 Data Retrieved

USGS ID	DWR or Other Name	Description
06727000	BOCOROCO	Boulder Creek Near Orodell
06730200	BOCNORCO	Boulder Creek at North 75th Street
06729500	BOCELSCO	South Boulder Creek Near Eldorado Springs
06730500	BOCLONCO	Boulder Creek at Mouth Near Longmont
06724970	LEFTHOCO	Left Hand Creek at Hover Road Near Longmont
N/A	SVCLOPCO	St. Vrain Creek Below Ken Pratt Blvd. at Longmont, CO
06725450	SVCBLOCO[1]	St. Vrain Creek Below Longmont [Damaged by Flood] (USGS calculates as Gauge 06730525 – Gauge 0673050)
06730525	SVCBBCCO	St. Vrain Creek Below Boulder Creek at HWY 119 Near Longmont
06730400	COALOUCO	COC-1 Louisville Gauge, no longer managed by USGS/DWR

[1]This site was severely damaged by flood waters on September 12, 2013. A replacement gauge has been set up downstream at Hwy 119, 06730525. A calculated Mean Daily Discharge (06730525 - 0673050) is made available after data at both sites has been verified. (Source: http://waterdata.usgs.gov/nwis/uv?site_no=06725450).

Figure 1. Boulder Creek near Orodell 2014 Hydrograph

Figure 2. South Boulder Creek near Eldorado Springs 2014 Hydrograph

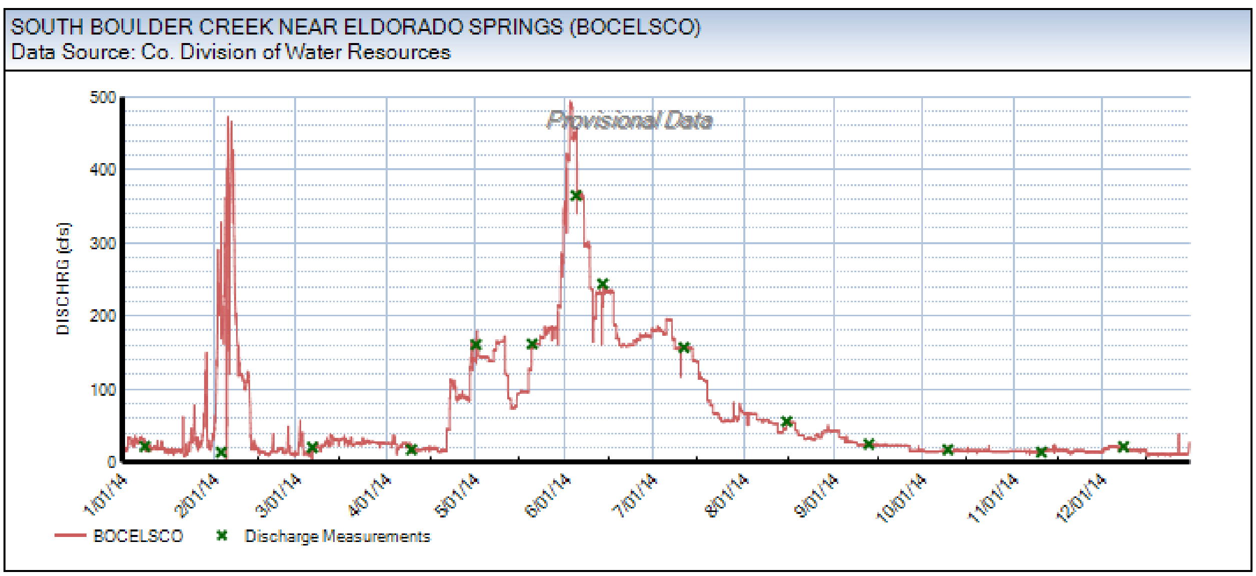


Figure 3. Boulder Creek at North 75th Street 2014 Hydrograph

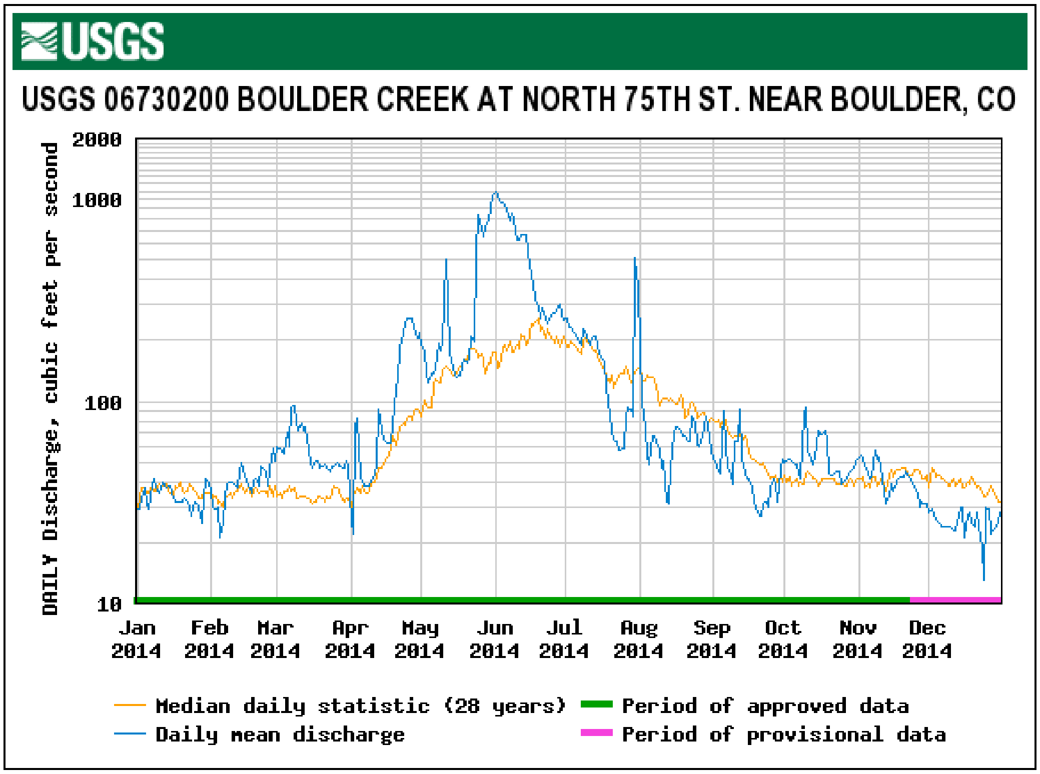


Figure 4. Boulder Creek at Mouth near Longmont 2014 Hydrograph

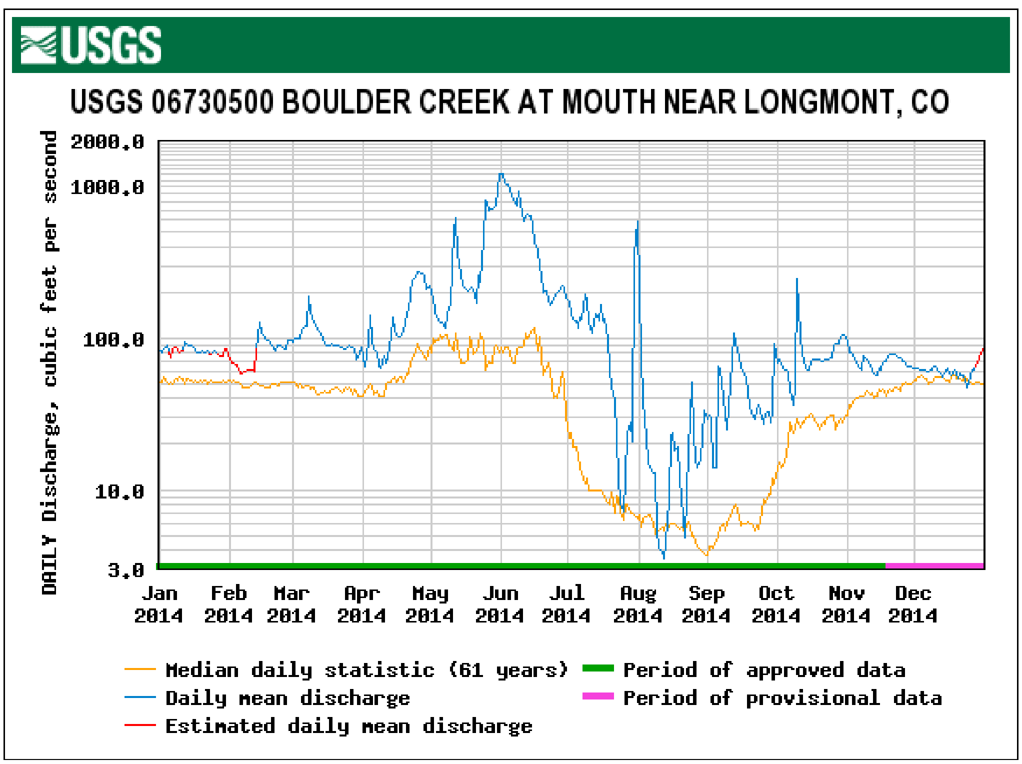


Figure 5. Left Hand Creek at Hover Road near Longmont 2014 Hydrograph

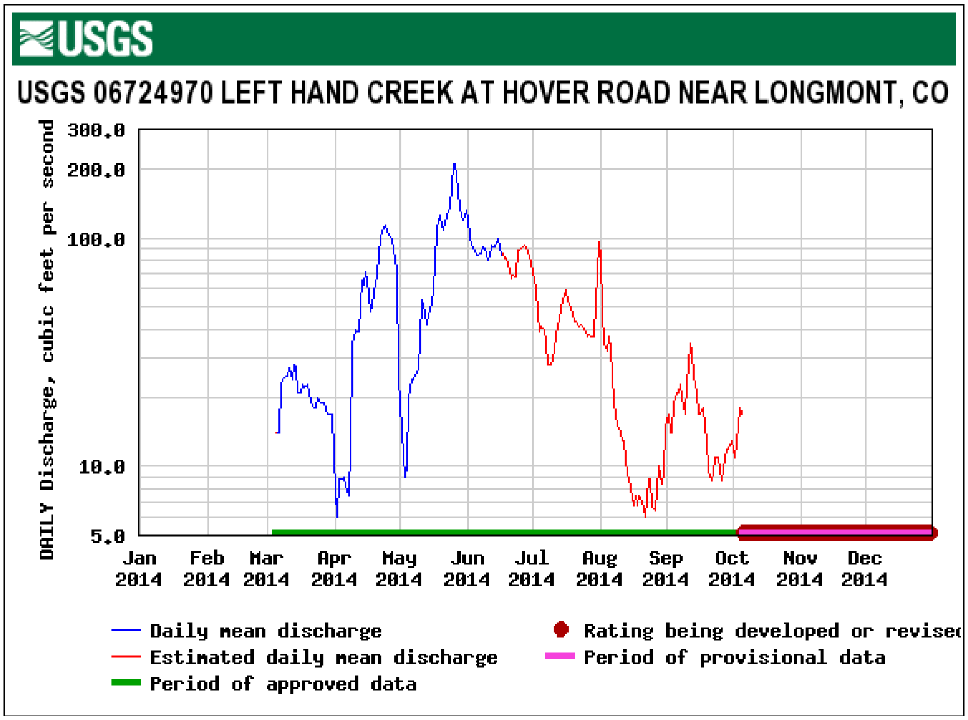


Figure 6. St. Vrain Creek below Longmont 2014 Hydrograph

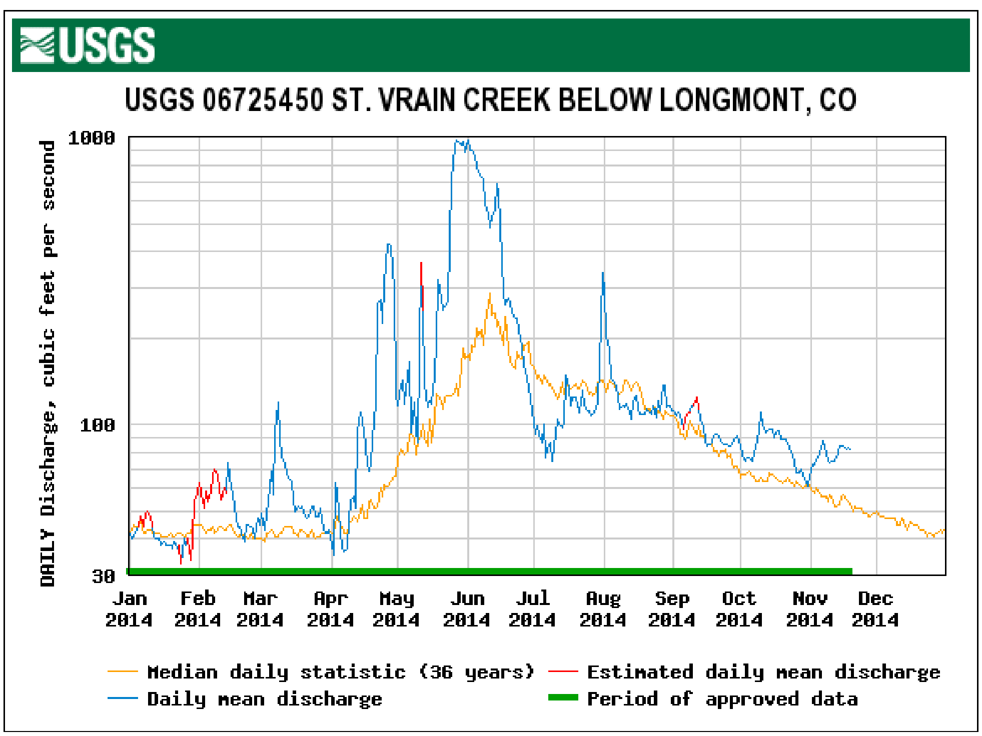


Figure 7. St. Vrain Creek below Boulder Creek at Hwy 119 Near Longmont 2014 Hydrograph

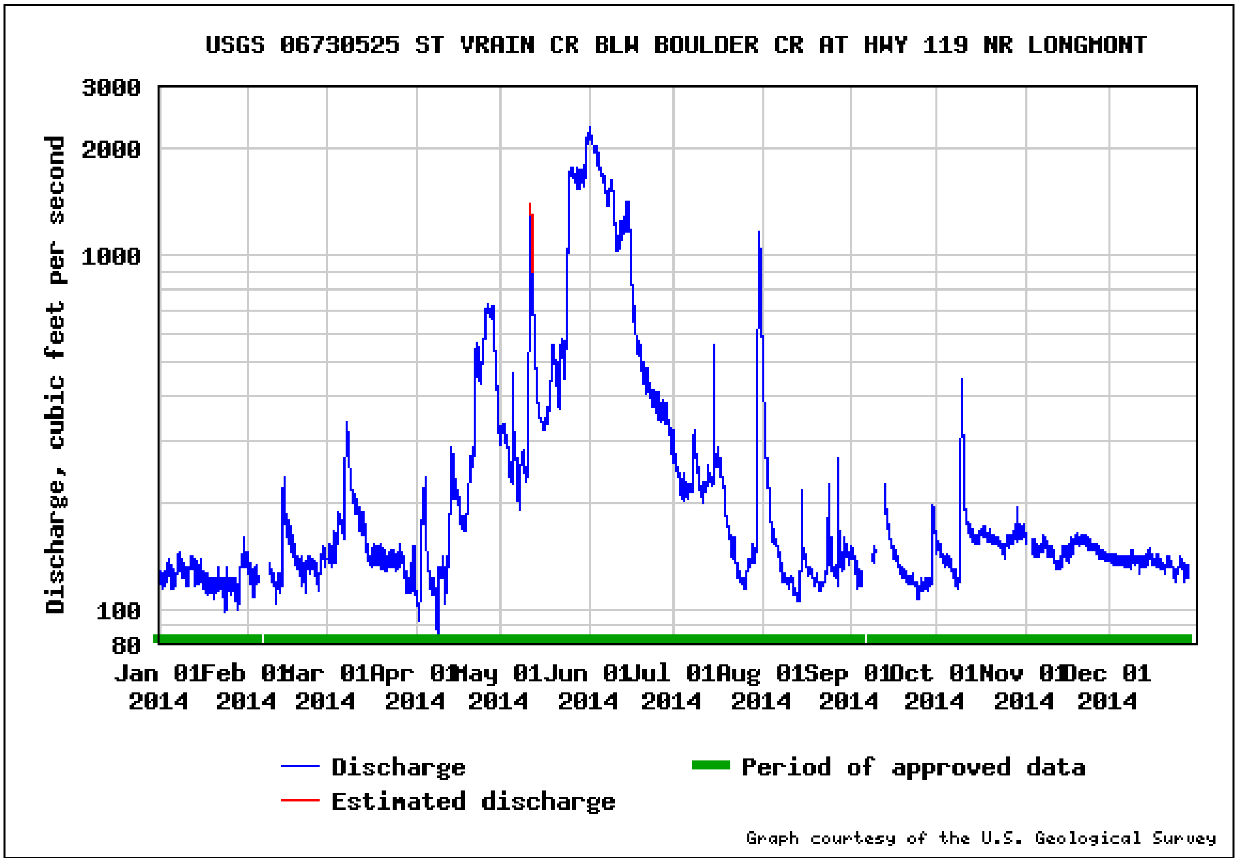


Figure 8. St. Vrain Creek below Ken Pratt Blvd at Longmont 2014 Hydrograph

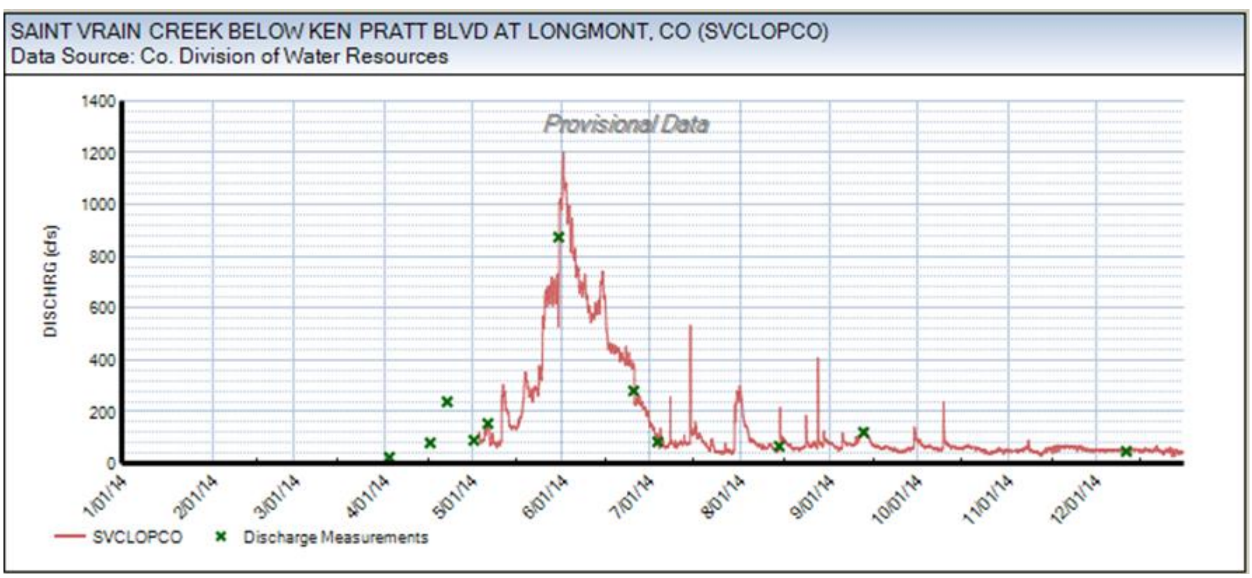
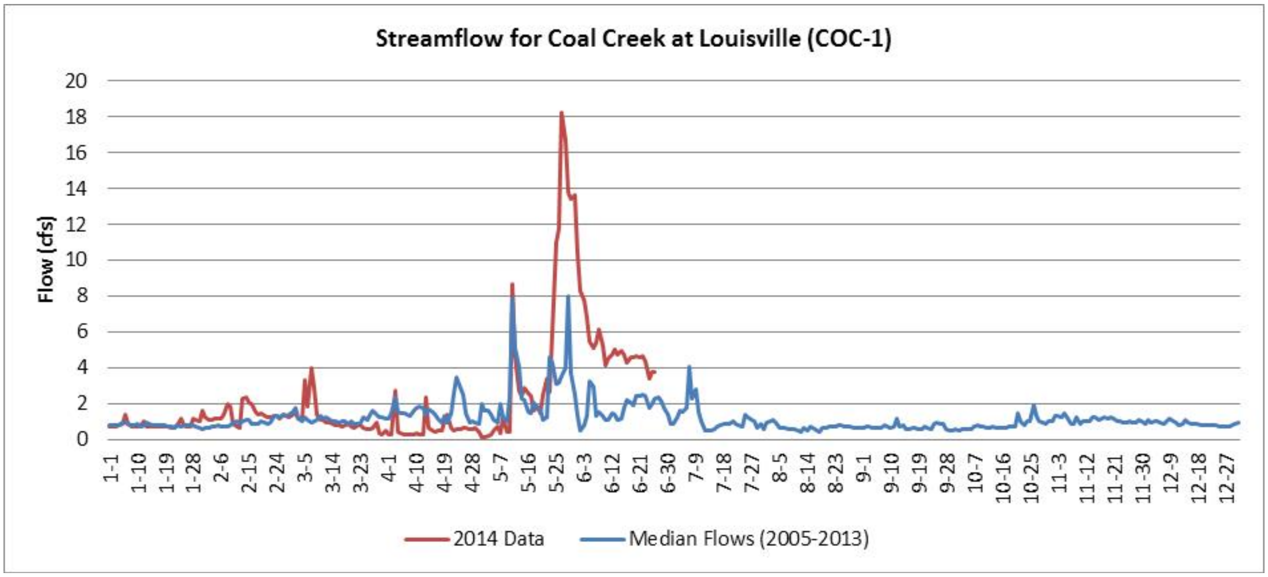


Figure 9. Coal Creek at Louisville (COC-1) 2014 Hydrograph



5.0 Water Quality Analysis

A brief overview of the statistical methods used in this analysis is provided, followed by a brief overview of selected stream standards assessment methodologies relevant to this report and a discussion of findings for general water chemistry, nutrients, *E. coli*, and total recoverable arsenic for certain streams by basin. Appendices B through D provide statistical summaries and data plots.

STATISTICAL CHARACTERIZATION METHODS

Tabulations of basic summary statistics are provided in Appendix B, including measures of central tendency and range of the data, along with several other statistical parameters, as described in Table 5. For purposes of descriptive statistics and plots, zero was substituted for non-detects to be consistent with standards assessment procedures used by the Division. In the event that more advanced trend analysis or hypothesis testing is conducted in future reports, an alternative substitution method may be considered (e.g., one-half of the detection limit, other advanced methods). This report is limited to statistical characterization and does not include formal hypothesis testing and trend analysis, given that one year of data is analyzed in this initial report.

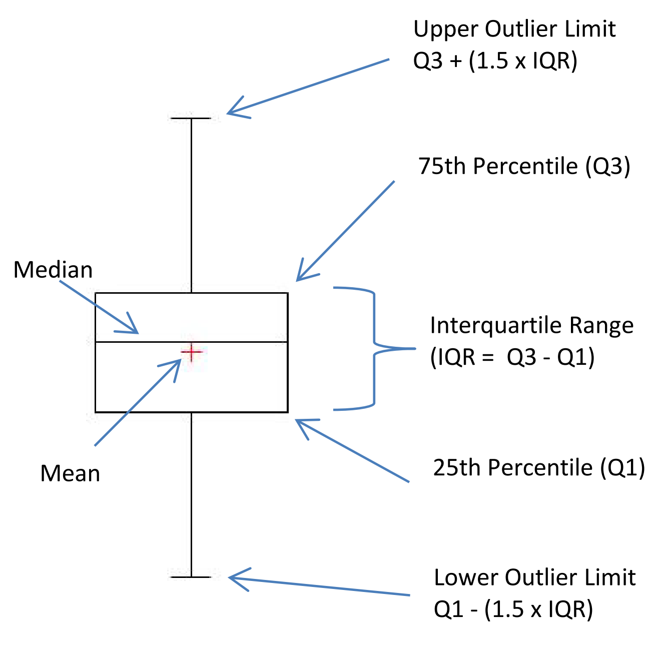
Table 5. Overview of Descriptive Statistics Provided in Appendices

Parameter	Brief Description
Number of observations	The number of values analyzed (n). Statistics based on few samples should be used with caution.
Minimum	The minimum of the series analyzed.
Maximum	The maximum of the series analyzed.
1st quartile	The first quartile (Q1) is defined as the value for which 25% of the values are less. Corresponds to the "floor" of a boxplot.
Median	The median (Q2) is the 50^{th} percentile value for the data set that corresponds to the mid-line of a boxplot. This is a non-parametric estimate of central tendency that does not require the assumption of normally distributed data.
3rd quartile	The third quartile (Q3) is defined as the value for which 75% of the values are less. Corresponds to the "roof" of a boxplot.
Mean	The mean of the sample is the arithmetic average. This is a parametric estimate of central tendency that requires the assumption of normally distributed data.
Standard deviation	A measure of how widely values are dispersed from the average (mean) value.
Geometric mean	A type of average, defined as the n^{th} root of the product of n values. (Used for assessment of *E. coli* standard compliance.)

Graphical representations of water quality data are often useful for identifying potential spatial and temporal water quality trends. Appendices C and D provide boxplots and time series plots of the data provided in 2014. Descriptions of the plots include:

- **Boxplots**: Boxplots provide a graphical representation of the 1st quartile (Q1 or 25th percentile), median (50th percentile), mean and 3rd quartile (Q3 or 75th percentile) displayed together with limits (i.e., the ends of the "whiskers") beyond which values are considered anomalous. The mean is displayed with a red "+", and a black line through the box corresponds to the median. The ends of the whiskers represent the following: a) lower limit: = Q1 – 1.5 (Q3 – Q1) and 2) upper limit: Q3 + 1.5 (Q3 – Q1). The legend below provides a key for interpreting boxplots, which are useful for depicting both the central tendencies (e.g., mean and median) of data sets, as well as the range of concentrations observed.

- **Time Series Plots**: Time series plots provide a graphical representation of data over time. The x-axis identifies sample dates and the y-axis provides quantitative values for those sample dates. Time series plots are particularly useful for identifying potential repeating seasonal patterns over time, or identifying whether multiple sample locations behave similarly or differently over time.



Boxplot Legend

OVERVIEW OF STREAM STANDARDS ASSESSMENT METHODOLOGY

Independent and proactive assessment of water quality data to determine whether streams attain Colorado water quality standards is an important aspect of the annual data review process. It provides an opportunity for local governments to identify potential water quality impairments and collect additional data prior to formal assessment by the Division for the 303(d) List of Impaired Waters. A complete assessment of water quality standards has not been completed for stream segments in this report because the analysis is limited to a subset of parameters on each stream segment. A full description of the Division's standards assessment methodology is beyond the scope of this report, but can be accessed in *Colorado Listing Methodology: 2016 303(d) List* (Division 2015). This methodology is typically reviewed and refined on a biannual basis, so it should be checked for changes prior to completing each annual report. A few key aspects of the assessment methodology for general reference for purposes of constituents discussed in this report for streams include:

- The most recent five years of data are typically used for purposes of standards assessment.
- For assessment of chronic standards, the 85^{th} percentile value for the data set is typically compared to the standard, with the exception of metals with standards in the total form. In those cases (e.g., iron, arsenic), the 50^{th} percentile value is used.
- For assessment of acute standards, more than one exceedance of an acute standard is considered an impairment.
- For *E. coli*, the bimonthly geometric mean is compared to the standard. Exceedance of one bimonthly assessment period is considered as an impairment. Evaluation of the *E. coli* standard is based on multiple fixed two-month intervals. The evaluation intervals are January/February, March/April, May/June, July/August, September/October, and November/December. A sample size of five or more is required for assessment of the two-month intervals. Data are assessed yearly if adequate data from each two-month interval are available. If adequate data are not available to make an attainment decision using yearly data, then the Division will assess *E. coli* data for that two-month interval over the entire period of record (i.e., combing several years of data for each bimonthly increment).
- If evaluation of a data set for an entire segment does not indicate impairment, but specific location(s) within the segment consistently exceed acute or chronic standards, the specific portion of the segment may be listed.
- Water supply standards (e.g., nitrate, arsenic) are assessed along the entire segment for those segments where a water supply use has been adopted, regardless of whether or not there is a point of intake identified on the stream.

- For dissolved oxygen (DO), the 15th percentile value should not be less than the stream standard.
- For pH, the 15th percentile value should not be less than the lower pH range for the standard and the 85th percentile value should not be greater than the upper pH range.
- Temperature and ammonia standards evaluation requires more complex assessment techniques, which are described in the 2016 303(d) Listing Methodology (Division 2015).
- For purposes of standards assessment, non-detects are replaced with zeros, per Division policy.
- If less than four samples are available, then the data set is not adequate to draw conclusions regarding impairment. In cases where less than four samples are available but impairment is indicated by available data, then the Division may list the segment on the Monitoring and Evaluation (M&E) List until additional data can be collected.
- In 2012, Colorado adopted "interim nutrient values," which currently may be adopted as standards for stream segments upstream of WWTPs for total phosphorus and chlorophyll-a, but will also apply to segments downstream in the future (after May 31, 2022). For total nitrogen, interim values may be adopted after May 31, 2017 upstream of WWTPs and for other segments after May 31, 2022. For streams, total nitrogen, total phosphorus, and chlorophyll-*a*, are evaluated based on comparison of annual median concentrations to the standard, which can be exceeded once every five years. (Additional assessment methods are in place for lakes and reservoirs.) In the June 2015 Rulemaking Hearing for Regulation 38, nutrient standards were adopted for several stream segments in the watershed, as described in Appendix E.

FINDINGS FOR GENERAL WATER QUALITY CONSTITUENTS BY BASIN

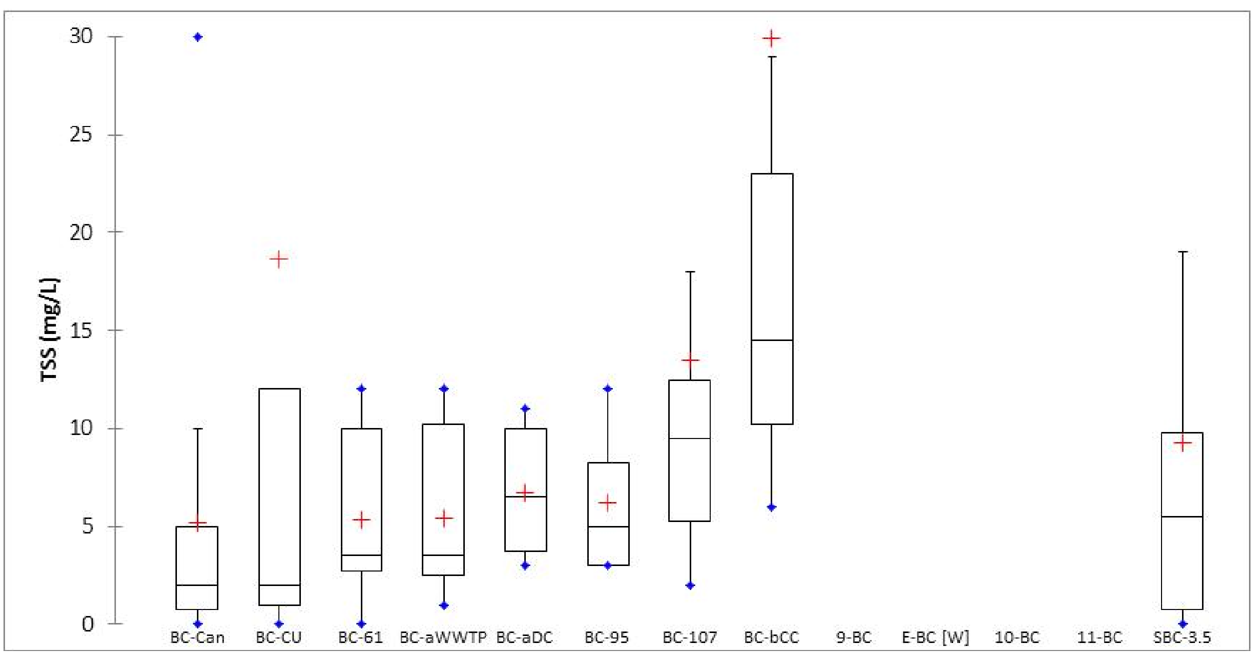
The Monitoring Plan includes several general water quality parameters that can be useful in trend analysis and/or that are also needed for calculating certain standards. These include pH, DO, temperature, conductivity, hardness, alkalinity and total suspended solids (TSS). For example, pH and temperature are needed for calculating ammonia standards and hardness is needed to calculated table value standards for various metals. Tabular statistics, boxplots and time series plots for these general water quality constituents are provided in Appendices B through D. General observations from the review of these water quality data are provided by basin below, although formal hypothesis testing for trend analysis has not been conducted for purposes of this initial report.

Boulder Creek and South Boulder Creek

Key observations regarding general water chemistry for Boulder Creek during 2014 include:

- For Boulder Creek, alkalinity, conductivity, hardness, pH and temperature generally increase from upstream to downstream, consistent with previous published analyses (e.g., Murphy 2006) and annual analysis by the City of Boulder (City of Boulder and WWE 2013; 2015). Concentrations of these parameters at the South Boulder Creek monitoring location (SBC3.5/4.0) are relatively similar to the upstream portion of Boulder Creek at site BC-Can. The range of DO concentrations present at monitoring locations on Boulder Creek and South Boulder Creek attain the stream standard of 6.0 and 5.0 mg/L, respectively. (Higher DO is better.)
- TSS concentrations on Boulder Creek were low (< 20 mg/L), although a few elevated values occurred. Higher concentrations typically occur during spring runoff and during storm events (City of Boulder and WWE 2015). Coal Creek has significantly higher TSS concentrations than upstream locations on Boulder Creek and influences TSS concentrations in Boulder Creek below the confluence with Coal Creek (BC-bcc), as summarized in Figure 10.
- The pH standard for Boulder Creek is based on a range of 6.5 to 9.0. Although none of the Boulder Creek stream segments monitored by the city are currently identified as impaired for pH on the 303(d) List, the pH at BC-95, BC-bCC, and BC-107 exceeded 9.0 on January 14, 2014. From a regulatory perspective, the 85th percentile for pH at these locations was below 9.0 at all locations. The pH levels are typically higher in the winter (Boulder and WWE 2015).

Figure 10. 2014 Boulder Creek Total Suspended Solids



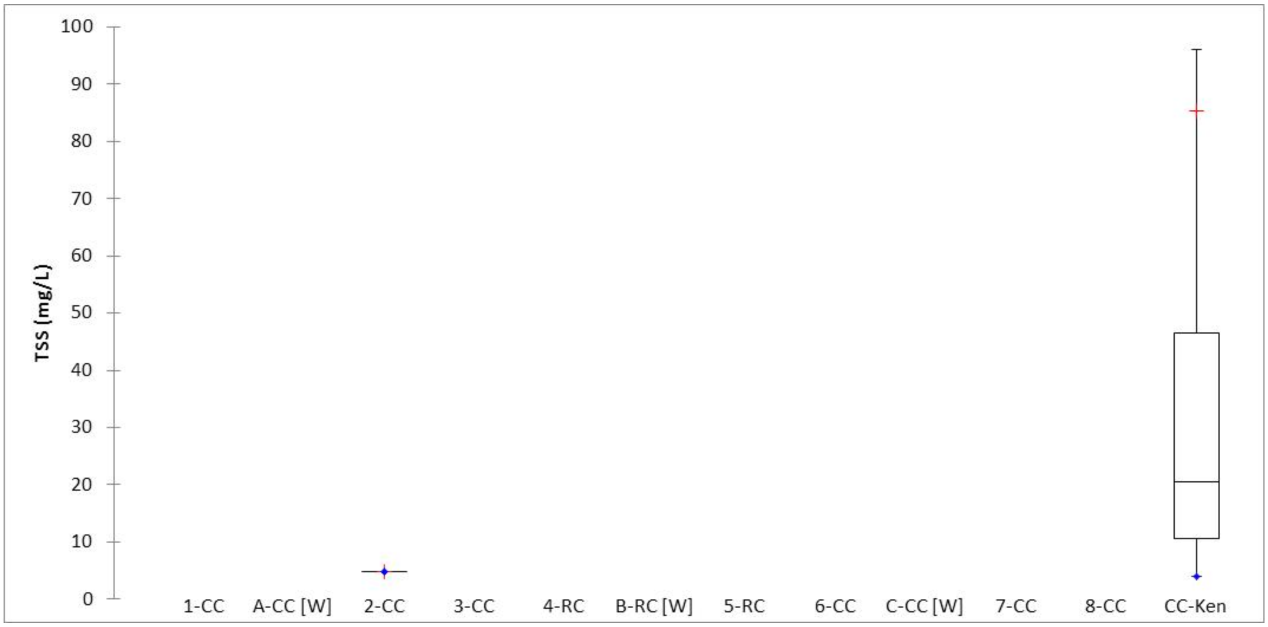
Note: Individual sample concentrations exceeding 30 mg/L occurred at BC-CU, BC-107 and BC-bCC that are not shown on this plot. If no boxplot is shown for a site, then TSS data were not provided for the sampling location.

Coal Creek and Rock Creek

Key observations regarding general water chemistry for Coal Creek and Rock Creek during 2014 include:

- During 2014, a complete general water chemistry data set was not available for Coal Creek and Rock Creek. Spatial representation of data was particularly limited for DO, temperature and TSS.
- The pH of Coal Creek and Rock Creek ranged from 7.8 to 8.3 for most sites, with the exception of CC-Ken, which was more highly variable, ranging from 7.4 to 8.7. All measured values were within the acceptable pH range of 6.5 to 9.0.
- Mean alkalinity ranged from approximately 240 to 290 mg/L at various monitoring locations, without noteworthy spatial trends.
- The conductivity of Coal Creek generally increases in an upstream to downstream direction and appears to be particularly influenced by high conductivity from Rock Creek (1537 umhos/cm).
- TSS data were only available at CC-Ken on Coal Creek, upstream from the confluence with Boulder Creek. TSS concentrations prior to the confluence with Boulder Creek were typically under 50 mg/L (median = 20 mg/L), but ranging from 4 to 707 mg/L. The average TSS concentration of 85 mg/L is significantly affected by the 707 mg/L result in the sample collected on July 8, 2014. Figure 9 shows the range of TSS concentrations in Coal Creek above the confluence with Rock Creek. In future annual reports, trend analysis could be conducted if TSS data were collected at more monitoring locations.
- Coal Creek and Rock Creek have relatively high hardness, with Coal Creek above Rock Creek averaging 240 mg/L, Rock Creek averaging 323 mg/L, and Coal Creek below the confluence averaging approximately 300 mg/L. These relatively high hardness values result in less stringent hardness-based metals standards.
- Although only one monitoring location for DO is available at Coal Creek (CC-Ken, above the confluence with Boulder Creek), it shows good DO levels that average 9 mg/L, with no values below the standard of 5 mg/L.

Figure 11. 2014 Coal Creek Total Suspended Solids



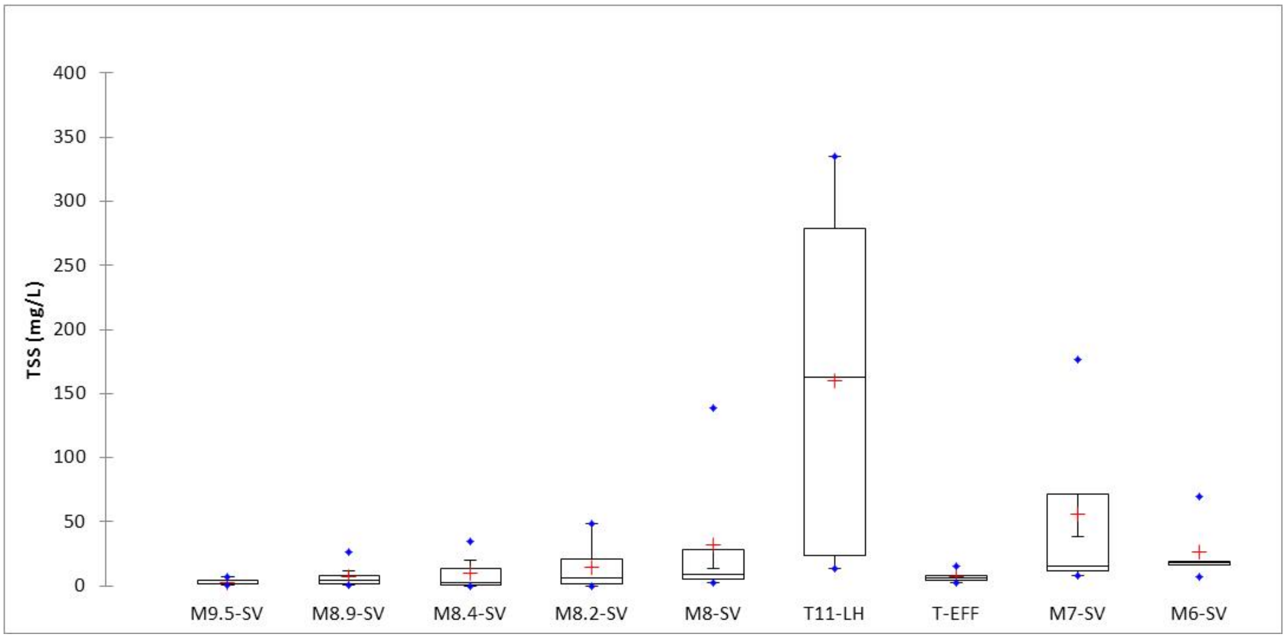
St. Vrain Creek and Left Hand Creek

Key observations regarding general water chemistry for St. Vrain Creek and Left Hand Creek (above the confluence with St. Vrain Creek) during 2014 include:

- Alkalinity, conductivity, hardness and pH generally increase in an upstream to downstream direction; however, the Longmont WWTP discharge appears to "reset" the alkalinity and pH concentrations, by temporarily decreasing the instream alkalinity and pH, after which the increasing trend for downstream sites begins again.
- All pH and DO values for St. Vrain Creek and Left Hand Creek monitoring locations attain stream standards.
- Although temperature monitoring for purposes of this report is limited to monthly samples, as opposed to finer time increments necessary to evaluate attainment of temperature standards, the first location downstream of the WWTP discharge (M7-SV) is generally within ranges of temperatures observed at upstream locations, even though the temperature at T-Eff (the roadside ditch combined with the Longmont WWTP discharge) is higher than instream concentrations. (Note: Longmont has additional temperature monitoring data collected to support its WWTP discharge permit that are more appropriate for evaluation of temperature standards, but were beyond the scope of this report.)
- TSS concentrations in St. Vrain Creek are relatively low (averaging < 30 mg/L) for most sites, with Left Hand Creek having significantly higher TSS concentrations relative to St. Vrain Creek (averaging 160 mg/L) (Figure 12). Below the confluence of St. Vrain Creek

and Left Hand Creek, TSS concentrations in St. Vrain Creek at M7-SV (averaging 55 mg/L) also show increased TSS, presumably in response to loading from Left Hand Creek, but these concentrations appear to decrease downstream at M6-SV. TSS on Left Hand Creek is also much more variable than concentrations on St. Vrain Creek. This TSS loading from Left Hand Creek may be temporary due to unstable banks resulting from the 2013 flood.

Figure 12. 2014 St. Vrain Creek and Left Hand Creek Total Suspended Solids



FINDINGS FOR SELECTED NUTRIENTS BY BASIN

Nutrients are of interest for each basin due to current and future water quality regulations and the communities' desire to maintain healthy aquatic life and aesthetically pleasing conditions in streams. Excessive nutrient concentrations can lead to undesirable algae and other vegetative growth, adversely affecting aquatic life and aesthetics.

Currently, stream standards for ammonia, nitrate and nitrite have been adopted for each stream segment in Regulation 38, but additional nutrient "interim values" for total nitrogen and total phosphorus, as well as chlorophyll-*a*, will be added in the future in accordance with Regulation 31, along with technology-based WWTP effluent limits for total inorganic nitrogen (TIN) and total phosphorus for WWTP discharges under Regulation 85. The following nutrients are discussed in this section and will be of increasing interest to the municipalities:

- Phosphorus (total phosphorus)
- Nitrogen (total Kjeldahl nitrogen [TKN], nitrate, nitrite, ammonia, total nitrogen)

The “interim values” adopted in Regulation 31 for total nitrogen, total phosphorus and chlorophyll-*a* that may be adopted as stream standards in future Regulation 38 rulemaking hearings are summarized in Table 6. Chlorophyll-*a* is not part of the current Monitoring Plan, so is not discussed further in this 2014 report. Appendix E provides a summary of stream standards adopted for various stream segments in the basin, including various nutrient standards adopted in the June 2015 Regulation 38 Rulemaking Hearing.

Table 6. “Interim Values” for Total Nitrogen, Total Phosphorus and Chlorophyll-*a*

Analyte	Cold Water “Interim Value”	Warm Water “Interim Value”
Total Phosphorus	0.11 mg/L	0.17 mg/L
Total Nitrogen	1.25 mg/L	2.01 mg/L
Chlorophyll-*a*	150 mg/m^2	150 mg/m^2
Streams: Interim values for phosphorus and nitrogen are assessed based on comparison of annual median to standard. Allowable exceedance frequency is once every five years. Chlorophyll-*a* is measured as maximum attached algae and is assessed during July 1-September 30 as a “not to exceed” value.		

As additional background on water quality standards for nutrients:

- There is not a standard for TKN, but it is an important component of total nitrogen. TKN represents organic nitrogen plus ammonia. To calculate total nitrogen, TKN is added to nitrate/nitrite.

- A nitrate standard of 10 mg/L is in place on streams with water supply use designations (Boulder Creek, South Boulder Creek, Left Hand Creek). The Division also adopted a water supply standard for Coal Creek in the June 2015 Regulation 38 hearing. For stream segments with agricultural use but no water supply designation, a nitrate standard of 100 mg/L applies.

- A nitrite standard of 0.05 mg/L is also in place for streams with a water supply classification and is evaluated similarly to acute standards. For streams without a water supply classification, the nitrite standard is ten times higher at 0.5 mg/L.

- Ammonia standards are adopted for protection of aquatic life and are calculated based on temperature and pH, in accordance with the aquatic life classification adopted for the segment in Regulation 38.

- New total phosphorus “interim values” (as summarized in Table 6) were adopted in Regulation 31 in 2012 and were adopted as stream standards upstream of WWTP discharges in each basin in the June 2015 Regulation 38 Rulemaking Hearing, with standards potentially applied downstream of WWTP discharges after May 31, 2022. Total phosphorus interim values vary for cold water and warm water streams, with more stringent values for cold water streams. All of the monitoring locations in this report are located on warm water segments except for the upper portion of Boulder Creek at sites BC-Can, BC-CU and BC-61 (Boulder Creek Segment 2b). In the June 2015 Regulation 38 Hearing, the Division adopted total phosphorus standards for Boulder Creek (Boulder Creek Segment 2b), Left Hand Creek (St. Vrain Segment 5), and Rock Creek (Boulder Creek Segment 8).

- As summarized in Table 6, new total nitrogen “interim values” were adopted under Regulation 31. These values can be applied no sooner than May 31, 2017 and may be applied after May 31, 2022. Total nitrogen standards were not proposed for any of the stream segments in the June 2015 Regulation 38 hearing. Total nitrogen is the sum of nitrate/nitrite and TKN.

Tables 7 and 8 summarize the total nitrogen and total phosphorus data provided in support of this 2014 water quality analysis.

Table 7. 2014 Total Phosphorus Data

	Total Phosphorus (mg/L)							
Boulder Creek	No.	Min	Max	25th%	**Median**	75th%	Mean	St. Dev.
BC-Can	11	ND	0.06	0.01	**0.01**	0.02	0.02	0.02
BC-CU	11	ND	0.10	0.01	**0.01**	0.03	0.03	0.03
BC-61	11	ND	0.03	0.02	**0.02**	0.03	0.02	0.01
BC-aWWTP	12	0.01	0.06	0.02	**0.03**	0.03	0.03	0.01
BC-aDC	11	0.12	1.48	0.64	**0.94**	1.07	0.85	0.37
BC-107	11	0.14	0.98	0.48	**0.54**	0.67	0.57	0.21
BC-bCC	11	0.15	1.01	0.38	**0.59**	0.80	0.59	0.26
9-BC	12	0.14	1.03	0.46	**0.56**	0.86	0.62	0.28
E-BC **[W]**	12	0.09	0.25	0.12	**0.14**	0.16	0.15	0.05
10-BC	12	0.16	1.00	0.44	**0.58**	0.83	0.60	0.26
11-BC	12	0.13	1.03	0.29	**0.57**	0.77	0.56	0.27
South Boulder Creek	No.	Min	Max	25th%	**Median**	75th%	Mean	St. Dev.
SBC-3.5/4.0	11	ND	0.06	ND	0.01	0.02	0.02	0.02
Coal Creek/Rock Creek	No.	Min	Max	25th%	**Median**	75th%	Mean	St. Dev.
1-CC	12	ND	0.06	0.01	**0.02**	0.03	0.02	0.02
A-CC **[W]**	12	ND	1.90	0.10	**0.16**	0.51	0.41	0.51
2-CC	9	0.03	0.48	0.04	**0.06**	0.18	0.14	0.15
3-CC	12	0.03	0.52	0.06	**0.10**	0.21	0.17	0.16
4-RC	12	ND	0.80	ND	**0.05**	0.09	0.11	0.21
B-RC **[W]**	12	ND	3.36	1.67	**1.85**	1.96	1.83	0.72
5-RC	12	0.11	1.00	0.14	**0.27**	0.50	0.36	0.26
6-CC	12	0.09	0.51	0.14	**0.19**	0.27	0.21	0.11
7-CC	12	0.01	0.70	0.43	**0.52**	0.58	0.47	0.18
8-CC	12	0.40	1.06	0.58	**0.81**	0.95	0.75	0.22
Left Hand-St. Vrain	No.	Min	Max	25th%	**Median**	75th%	Mean	St. Dev.
M9.5-SV	6	0.01	0.02	0.01	**0.01**	0.02	0.01	0.01
M8.9-SV	7	0.01	0.04	0.01	**0.02**	0.03	0.02	0.01
M8.4-SV	7	ND	0.08	ND	**ND**	0.06	0.03	0.03
M8.2-SV	7	ND	0.34	ND	**ND**	0.06	0.07	0.11
M8-SV	12	0.01	0.52	0.02	**0.04**	0.13	0.10	0.14
T11-LH	12	0.02	0.46	0.04	**0.13**	0.37	0.20	0.17
T-EFF	8	0.82	3.85	1.06	**2.30**	3.39	2.30	1.39
M7-SV	12	0.11	0.83	0.25	**0.33**	0.53	0.40	0.21
M6-SV	5	ND	0.50	0.23	**0.28**	0.43	0.29	0.18

Notes: Wastewater discharge sample locations are designated by [W]. T-EFF is the Longmont WWTP effluent channel combined with roadside ditch flow where it enters the St. Vrain.
ND = non-detect.

Table 8. 2014 Total Nitrogen Data

	Total Nitrogen (mg/L)							
Boulder Creek	No.	Min	Max	25th%	**Median**	75th%	Mean	St. Dev.
BC-Can	12	0.14	0.59	0.23	**0.27**	0.35	0.31	0.13
BC-61	12	0.26	0.86	0.34	**0.38**	0.81	0.53	0.24
BC-aWWTP	12	0.27	0.88	0.47	**0.61**	0.71	0.59	0.17
BC-aDC	12	1.20	7.24	3.75	**5.27**	6.49	4.73	2.03
BC-95	12	1.20	6.21	2.84	**3.89**	4.85	3.82	1.61
BC-107	12	1.06	5.02	2.86	**3.42**	4.10	3.30	1.16
BC-bCC	12	1.49	6.51	2.73	**4.39**	5.76	4.15	1.74
9-BC	12	0.70	7.80	3.13	**4.80**	6.30	4.62	2.11
E-BC **[W]**	12	9.90	14.70	12.60	**13.65**	13.90	13.21	1.25
10-BC	12	0.40	7.80	3.05	**4.80**	6.33	4.53	2.20
11-BC	12	0.50	7.30	2.70	**4.15**	5.88	4.21	2.06
Coal Creek/ Rock Creek	No.	Min	Max	25th%	**Median**	75th%	Mean	St. Dev.
1-CC	12	0.59	1.90	0.69	**0.88**	1.50	1.08	0.47
A-CC **[W]**	12	5.40	15.20	8.23	**8.55**	8.95	9.14	2.77
2-CC	9	0.70	13.30	3.80	**4.27**	6.90	5.26	3.43
3-CC	12	1.42	5.40	3.32	**4.67**	5.07	4.21	1.13
4-RC	12	0.80	4.40	1.78	**2.30**	3.00	2.35	0.94
B-RC **[W]**	12	11.50	20.00	13.30	**14.15**	15.45	14.77	2.18
5-RC	12	1.28	11.81	1.97	**4.34**	6.16	4.54	2.96
6-CC	12	1.74	5.45	2.60	**3.27**	5.06	3.58	1.32
7-CC	12	3.73	10.53	5.43	**6.83**	8.17	6.85	1.91
8-CC	12	4.00	11.30	7.65	**9.15**	10.20	8.63	2.06
CC-Ken	12	3.42	11.54	6.96	**8.18**	9.77	8.05	2.17
Left Hand Creek/St. Vrain Creek	No.	Min	Max	25th%	**Median**	75th%	Mean	St. Dev.
M8-SV	12	0.44	4.01	0.79	**0.89**	1.18	1.25	0.95
T11-LH	12	0.52	1.89	1.25	**1.33**	1.57	1.34	0.38
M7-SV	12	0.68	5.97	2.06	**3.65**	4.33	3.41	1.56

Note: wastewater discharge sample locations are designated by [W]. ND = non-detect.

Boulder Creek and South Boulder Creek

Boulder Creek monitoring data for nutrients included in this report extends from Canyon Road (BC-Can) to the USGS gauging station near the confluence with St. Vrain Creek (11-BC). This long stream reach includes Boulder's 75th Street WWTP discharge, Coal Creek flows (which are influenced by Louisville, Lafayette and Superior WWTP discharges), and Erie's North WWTP discharge shown as E-BC [W]. Although discharge data for Boulder's 75th Street WWTP are not shown in Figure 13 and Figure 14a-c, the discharge location is shown for general reference and these data could easily be included in future evaluations. The first location below the confluence with Coal Creek is identified as BC-bCC. South Boulder Creek enters Boulder Creek above BC-61, but is shown at the downstream end of the graphs on the x-axis. Key findings related to nutrients for Boulder Creek and South Boulder Creek include:

- As would be expected, nutrient concentrations for South Boulder Creek are very low and would attain existing and future proposed nutrient standards.
- Upstream of Boulder's 75th Street WWTP, Boulder Creek also has low nutrient concentrations and would be expected to attain existing and potential future nutrient standards for total phosphorus, total nitrogen and nitrate.
- Downstream of Boulder's 75th Street WWTP, a significant increase in total phosphorus is present as shown on Figure 13 that would exceed interim values for total phosphorus. From BC-107 to the confluence, total phosphorus concentrations remain relatively constant to the confluence with the St. Vrain River. Erie's WWTP discharge is comparable to the interim value for total phosphorus and an instream response from Erie's discharge is not apparent, based on review of Figure 13.
- Downstream of Boulder's 75th Street WWTP, a significant increase in total nitrogen and nitrate are present as shown on Figure 14a-b that would exceed interim values for total nitrogen, but attain the existing water supply standard for nitrate of 10 mg/L. Total nitrogen and nitrate concentrations gradually decline below Boulder's 75th Street discharge, but rise below the confluence with Coal Creek. Erie's WWTP discharge does not appear to significantly influence the instream total nitrogen and nitrate concentrations, even though total nitrogen and nitrate concentrations are much higher than the instream concentrations above the discharge.
- Assessment of attainment of ammonia standards is not evaluated in this report due to the varying standards resulting from calculations based on a pH and temperature based equation, but Table 8 and Figure 14c generally indicate an instream response to ammonia discharges from the Boulder WWTP, but not the Erie WWTP. An additional interesting observation is the slight increase in ammonia at BC-61, which does not have a corresponding increase in other forms of nitrogen, but is also elevated for *E. coli*.

Figure 13. 2014 Boulder Creek and South Boulder Creek Total Phosphorus

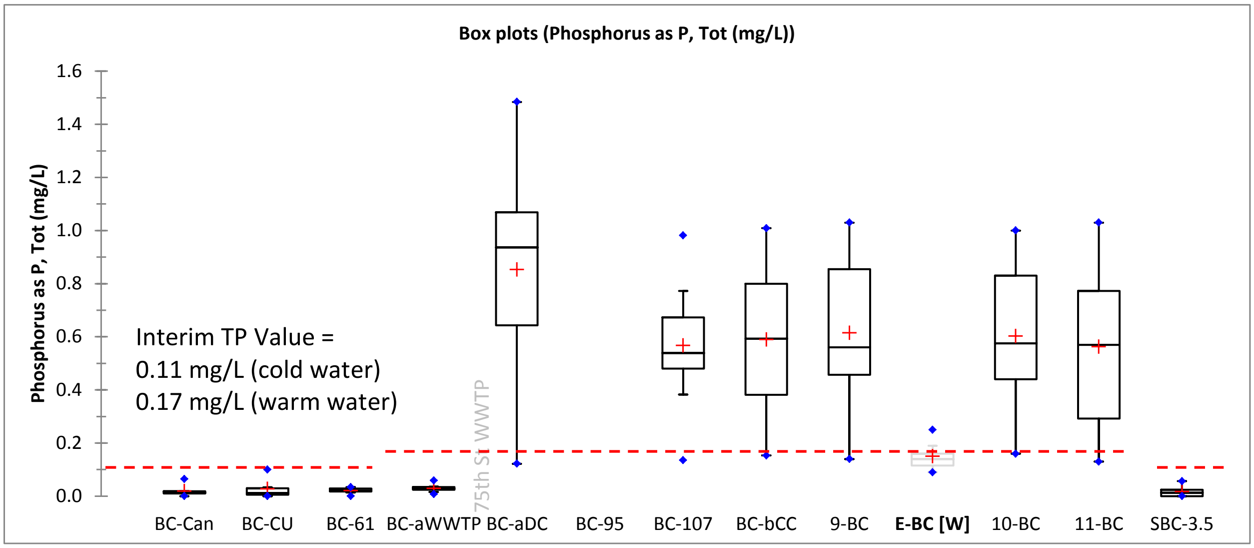
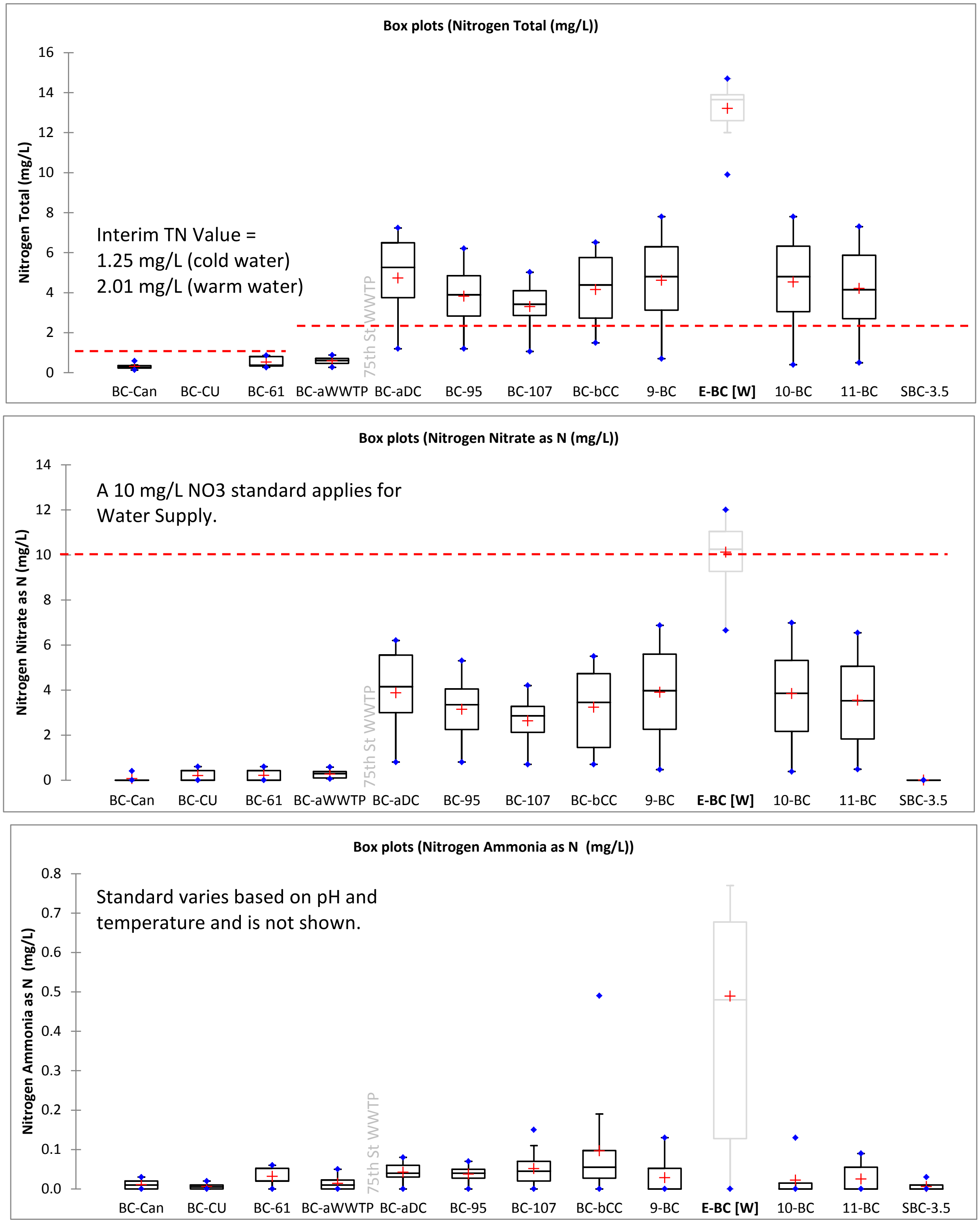


Figure 14a-c. 2014 Boulder Creek and South Boulder Creek Nitrogen



Coal Creek and Rock Creek

Nutrient data are available for both Coal Creek and Rock Creek at various monitoring locations. Louisville (A-CC[W]) and Superior (B-RC[W]) also provided effluent sample results for nutrients which are shown in light grey on Figures 15 and 16. A placeholder on the figures is shown as C-CC [W] to identify where Lafayette's discharge would enter the stream, although data were not provided during 2014. Key findings related to nutrients for Rock Creek and Coal Creek include:

- Concentrations for total nitrogen, nitrate, and total phosphorus increase in an upstream to downstream direction on both Coal Creek and Rock Creek. As would be expected, instream concentrations increase below each WWTP discharge, identified by [W]. Coal Creek nutrient concentrations also increase below the confluence with Rock Creek.

- Although total phosphorus standards do not currently apply to Coal Creek below Highway 36, the 2014 data indicate that Coal Creek could meet the interim value for total phosphorus upstream of the confluence with Rock Creek and that Rock Creek could meet the interim total phosphorus value above the Superior WWTP discharge. On Rock Creek below the Superior WWTP discharge and downstream for the remainder of Coal Creek monitoring locations, the interim total phosphorus value would not be met under conditions existing during 2014.

- For total nitrogen and nitrate, an instream response to WWTP discharges is evident. The only location on Coal Creek and Rock Creek that would be expected to attain a potential future total nitrogen standard of 2.01 mg/L is upstream of the Louisville discharge at 1-CC. Some assimilation of nitrogen on Coal Creek occurs between the Louisville discharge and Rock Creek. An increase in nitrate between sites 7-CC and 8-CC is also suggested, but may be due to sources other than WWTP discharges. Four monitoring locations had one or more values that exceed the 10 mg/L nitrate standard adopted in the June 2015 Regulation 38 Rulemaking Hearing (the nitrate standard decreased from 100 mg/L to 10 mg/L).

- Assessment of attainment of ammonia standards is not evaluated in this report due to the varying standards resulting from calculations based on a pH and temperature based equation, but Table 8 and Figure 16c generally indicate an instream response to ammonia discharges from the WWTPs. Several temporarily elevated ammonia concentrations also occurred during 2014. For example, in November, some temporary operational issues occurred during a clarifier upgrade project at Superior that affected ammonia concentrations in the Superior discharge shown as B-RC [W] in November (Personal Communication with Randy Martinez).

Figure 15. 2014 Coal Creek and Rock Creek Total Phosphorus

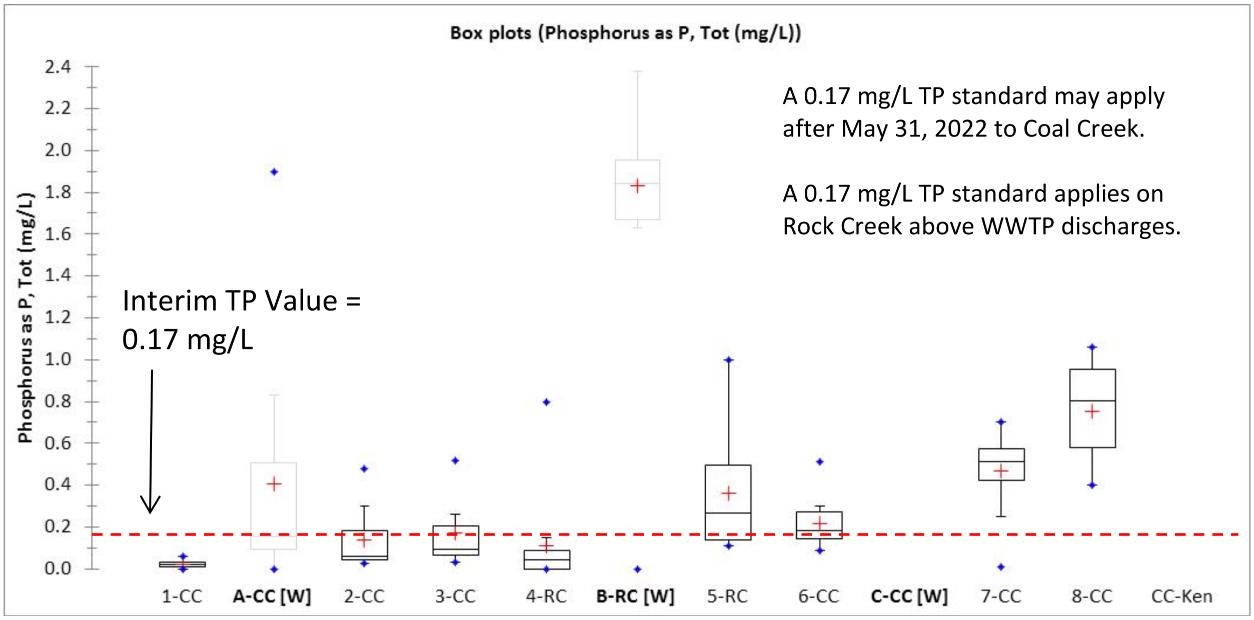
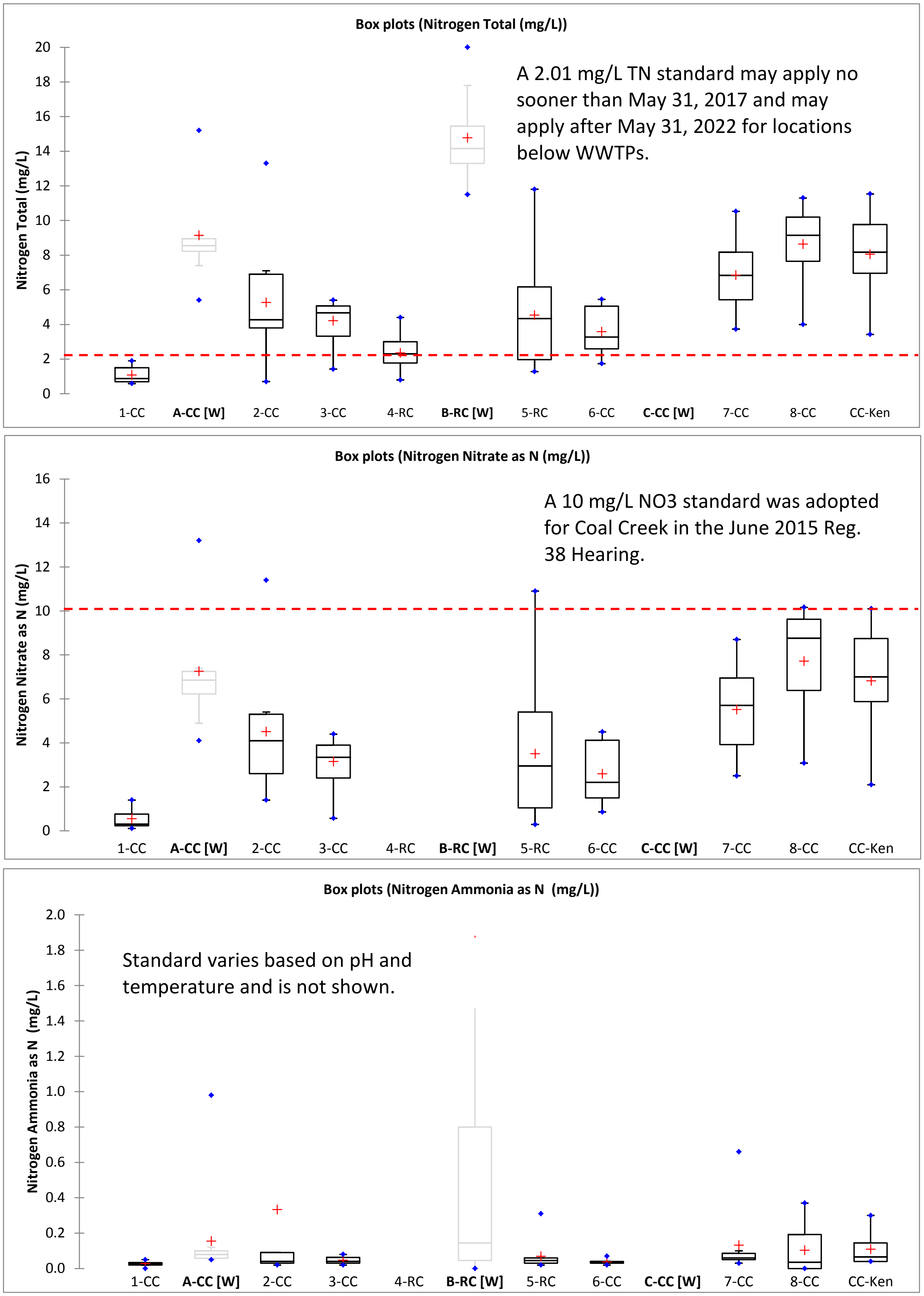


Figure 16a-c. 2014 Coal Creek and Rock Creek Nitrogen



St. Vrain Creek and Left Hand Creek

St. Vrain Creek and Left Hand Creek monitoring data for nutrients extend from the western boundary of Longmont's urbanized area to the confluence with Boulder Creek. Data are also provided for Left Hand Creek near its confluence with St. Vrain Creek and for Longmont's WWTP discharge to St. Vrain Creek comingled with roadside ditch water (T-Eff). Key findings related to nutrients for St. Vrain Creek and the portion of Left Hand Creek near the confluence include:

- Total phosphorus, total nitrogen, nitrate/nitrite and ammonia concentrations generally increase in an upstream to downstream direction for St. Vrain Creek. Left Hand Creek has higher nutrient concentrations than St. Vrain Creek above the Longmont WWTP discharge. Thus, instream nutrient concentrations downstream of the WWTP discharge are influence by both the Longmont WWTP and loading from Left Hand Creek.

- Upstream of Longmont's WWTP, St. Vrain Creek has low nutrient concentrations and would be expected to attain existing and future proposed standards for total phosphorus, total nitrogen and nitrate.

- Downstream of Longmont's WWTP, a significant increase in total phosphorus is present as shown on Figure 17 that would exceed interim warm water values for total phosphorus of 0.17 mg/L. Left Hand Creek (T11-LH) has a median total phosphorus concentration of 0.13 mg/L, which would meet the warm water standard for total phosphorus of 0.17 mg/L adopted in June 2015.

- Downstream of Longmont's WWTP, a significant increase in total nitrogen and nitrate is present as shown on Figures 18a-b that would exceed the interim warm water value for total nitrogen (2.01 mg/L), but would attain the existing agricultural use standard for nitrate of 100 mg/L. Left Hand Creek has a median total nitrogen concentration of 1.33 mg/L, which would meet the warm water interim value of 2.01 mg/L for total nitrogen, which may be applied in the future.

- Assessment of attainment of ammonia standards is not evaluated in this report due to the varying standards resulting from calculations based on a pH and temperature based equation, but Table 8 and Figure 18c generally indicate that instream concentrations of ammonia at M8-SV (above the Longmont WWTP discharge and the confluence with Left Hand Creek) are similar to concentrations below the WWTP discharge at M7-SV.

Figure 17. 2014 St. Vrain Creek and Left Hand Creek Total Phosphorus

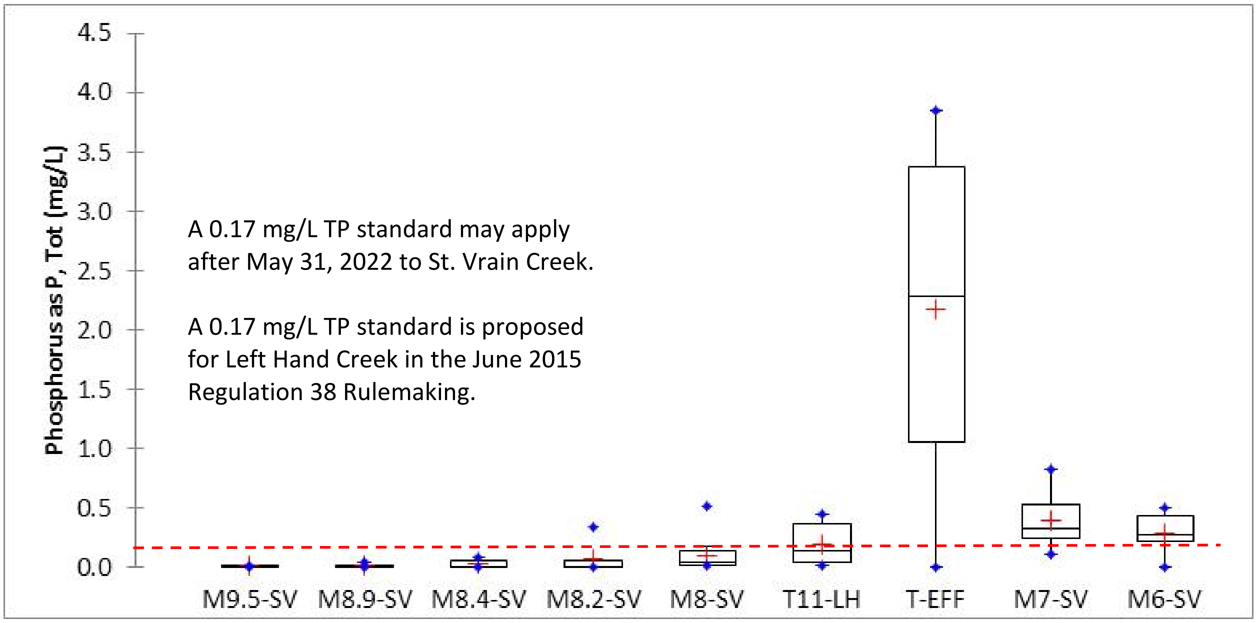
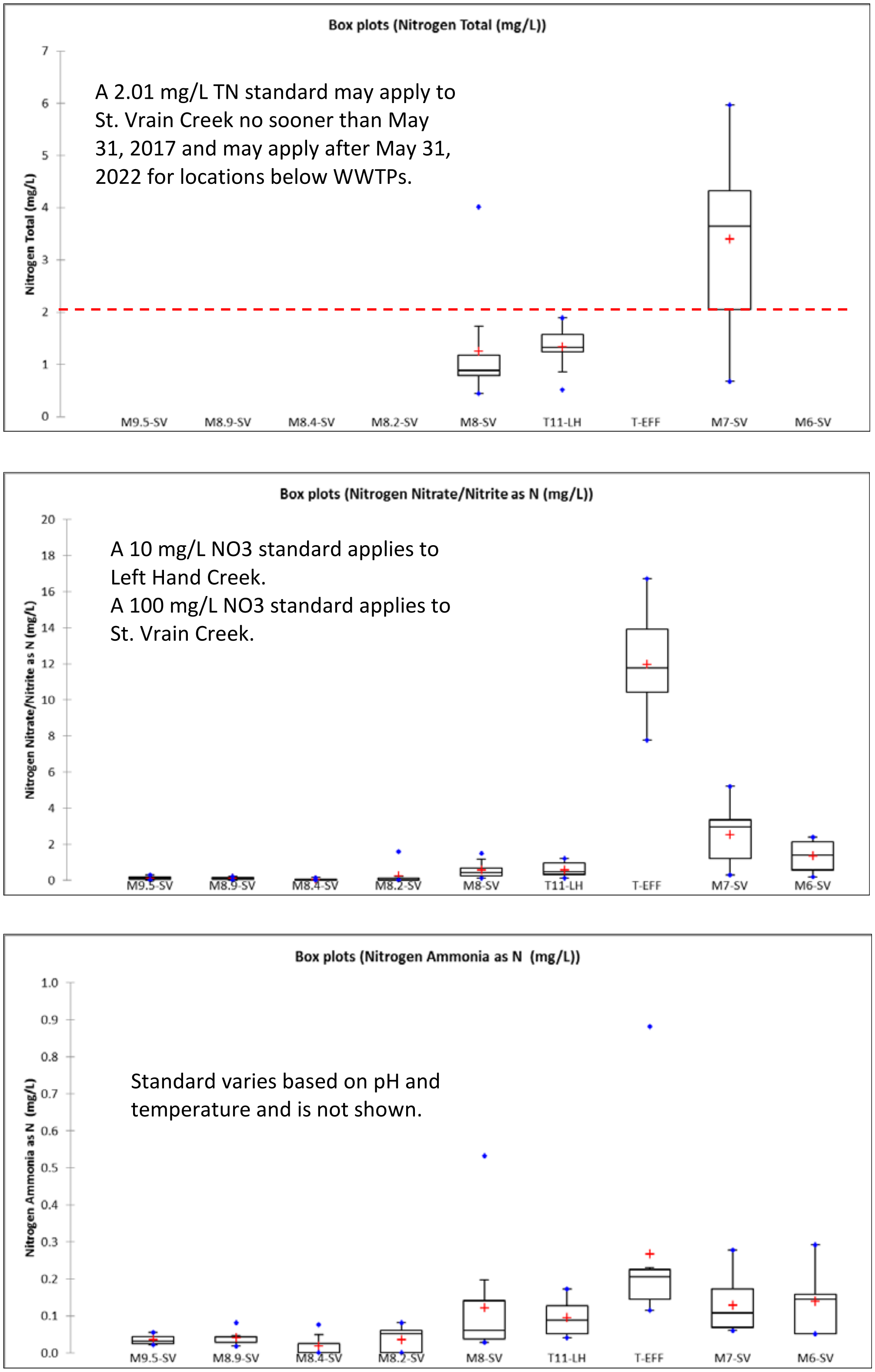


Figure 18a-c. 2014 St. Vrain Creek and Left Hand Creek Nitrogen



FINDINGS FOR *E. COLI* BY BASIN

Many urban streams in Colorado exceed primary contact recreational water quality criteria for *E. coli* in portions of the stream during various times of the year, particularly during warm summer and fall months. Most modern WWTPs provide effective disinfection through UV or chlorination, so treated municipal effluent is not typically the cause of exceedances in urban areas (although leaking sanitary infrastructure may be a contributor in some areas).

Attainment of *E. coli* standards is sensitive to assessment methodology because of the highly variable nature of *E. coli*, which can span an order of magnitude or more between adjacent locations on the same sampling date, as well as between closely spaced sampling dates at the same location. For this reason, it is important to understand the current assessment procedure applied by the Division (Division 2015) in assessing recreational use attainment (see call-out box).

Consistent with other voluntary instream monitoring programs along the Front Range, each municipality's *E. coli* data set includes one sample per month or quarter, which does not result in a sample size of five or more samples per bimonthly evaluation period. As a result, the period of record (presumed to be the most recent five years) would be evaluated for each bimonthly period to assess whether *E. coli* standards are attained by stream segment, and potentially by individual monitoring locations with a segment. Because of the sample size limitations in the annual data set, two broad analysis subgroupings have been used for trend analysis for purposes of this report. These groupings are identified as recreation season (May-October) and non-recreation season (November-April). Evaluation of a longer term data set is needed to draw statistically significant conclusions. This analysis approach is less stringent that the bimonthly assessment procedure used for standards assessment, so the findings in this section should not be interpreted as a regulatory evaluation.

E. coli Standards Assessment Method

Evaluation of the Colorado *E. coli* stream standard is based on multiple fixed two-month intervals. The evaluation intervals are January/February, March/April, May/June, July/August, September/October, and November/December. A sample size of five or more is required for assessment of the two-month intervals. The primary contact recreation standard is 126 cfu/100 mL. Data are assessed yearly if adequate data from each two-month interval are available. If adequate data are not available to make an attainment decision using yearly data, then the Division will assess *E. coli* data for that two month interval over the entire period of record (i.e., combing several years of data for each bimonthly increment).

If evaluation of a data set for an entire segment does not indicate impairment, but specific location(s) within the segment consistently exceed acute or chronic standards, the specific portion of the segment may be listed.

Boulder Creek and South Boulder Creek

Table 9 provides seasonal geometric mean *E. coli* concentrations according to recreational (R) and non-recreational seasons (N-Rec). Figures 19a and 19b provide upstream to downstream *E. coli* plots according to non-recreational and recreational seasons during 2014.

During 2014, the recreation season geometric mean concentrations exceeded 126/100 mL at BC-61, BC-aDC, and BC-bCC. Additionally, BC-CU, which is included in the TMDL reach, had elevated *E. coli*, even though the seasonal geometric mean is below 126/100 mL. The five sampling locations from BC-61 downstream through BC-bcc (below Coal Creek) had values exceeding the upper quantitation limit of 2419.6 MPN/100 mL. South Boulder Creek did not exceed stream standards in any samples during 2014.

An *E. coli* Total Maximum Daily Load (TMDL) was completed in 2011 for the portion of Boulder Creek Segment 2b from 13th Street to the confluence with South Boulder Creek, focusing on urban sources typically associated with the storm sewer system (Tetra Tech 2011a). (Note: this reach of stream includes monitoring location BC-CU.) Continued instream monitoring of *E. coli* is important to assess progress towards TMDL goals and to assess the effectiveness of measures identified in the TMDL Implementation Plan (Tetra Tech 2011b). Although the TMDL focuses on a portion of Segment 2b, other portions of the stream are also affected by elevated *E. coli* concentrations, as discussed above.

Table 9. 2014 Boulder Creek and South Boulder Creek Seasonal *E. coli* Data

Boulder Creek/South Boulder Creek	Season	No.	Geometric mean	Minimum	Maximum
BC-Can	N-Rec	6	2	1	16
BC-Can	Rec	6	36	10	387
BC-CU	N-Rec	6	89	11	866
BC-CU	Rec	6	103	16	387
BC-61	N-Rec	6	74	3	1553
BC-61	Rec	6	145	34	2420
BC-aWWTP	N-Rec	5	38	5	308
BC-aWWTP	Rec	6	95	20	2420
BC-aDC	N-Rec	6	71	16	194
BC-aDC	Rec	6	135	46	2420
BC-107	N-Rec	6	67	25	214
BC-107	Rec	6	66	10	2420
BC-bCC	N-Rec	6	43	28	105
BC-bCC	Rec	6	206	86	2420
SBC-3.5/4.0	N-Rec	6	6	1	25
SBC-3.5	Rec	6	20	11	40

Notes: N-Rec = November to April; Rec = May to October. Bimonthly assessment periods used by the Division for regulatory purposes are Jan-Feb, Mar-Apr, May-Jun, Jul-Aug, Sept-Oct, and Nov-Dec.

Figure 19a. 2014 Boulder Creek and South Boulder Creek Non-Recreation Season *E. coli*

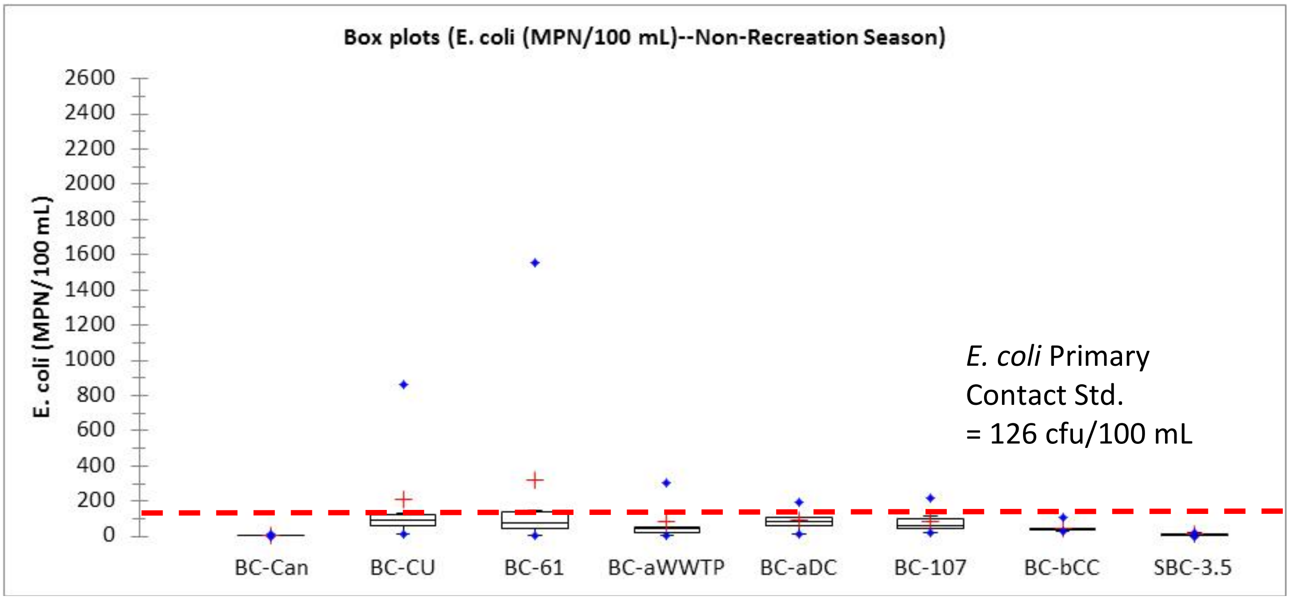
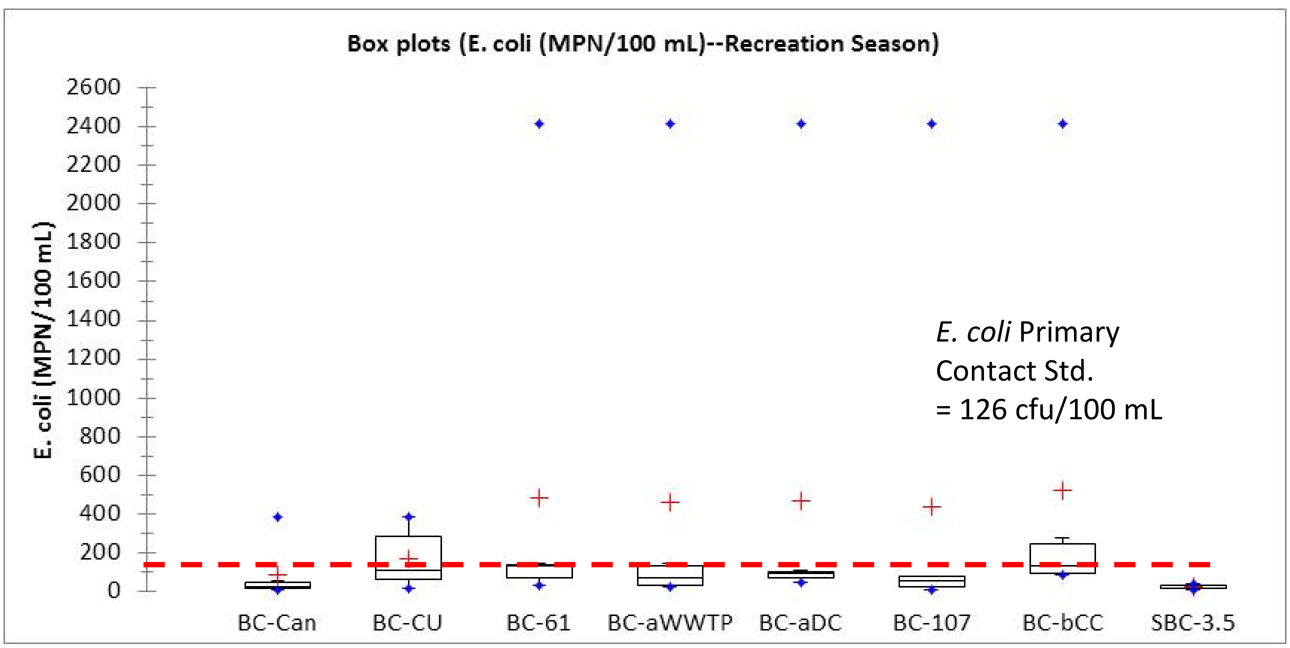


Figure 19b. 2014 Boulder Creek and South Boulder Creek Recreation Season *E. coli*



Coal Creek and Rock Creek

Table 10 summarizes *E. coli* data available for Rock Creek and Coal Creek, including locations in the Monitoring Plan and additional special monitoring (Appendix G) for Coal Creek and drainage to Coal Creek conducted by Louisville. Figures 20a and 20b provide upstream to downstream *E. coli* plots according to non-recreational and recreational seasons during 2014. (Note: for sites with only one sample, the result displays as a horizontal line on the graphs and is simply the sample result, not a mean value.) Table 10 and Figures 20a and 20b include additional special quarterly monitoring locations on Coal Creek and Rock Creek that are not part of the routine instream monitoring program. These extra locations are identified by a “CC” prefix (with the exception of CC-Ken, which is a routine site monitored by the City of Boulder.) Sites with a “B” suffix indicate sampling locations for drainage to Coal Creek, whereas sites with an “A” suffix indicate sample locations in Coal Creek. Quarterly monitoring at these special sampling locations results in small sample sizes for seasonal assessment, which limits the conclusions that can be drawn when comparing data collected during one year. Observations based on the available data set include:

- No upstream to downstream trend is evident.
- Recreational season samples tend to have higher concentrations than non-recreational season samples.
- Monitoring location CC-12A stand out as the instream site with the most elevated *E. coli* for 2014. Recreational season geometric means in the lower portion of Coal Creek at 6-CC, 7-CC and CC-Ken and at 5-RC on Rock Creek are consistently above the stream standard. Other locations are also elevated above the stream standard, as well.

Additional analysis of the longer term data set for Coal Creek and Rock Creek is needed to draw more rigorous conclusions, given the small sample sizes per location in Table 10. It may be beneficial to reduce the number of sample locations and increase the number of samples at potential “hot spots” to develop a better understanding of *E. coli* trends for Coal Creek and Rock Creek.

Appendix G contains supplemental analysis of the long-term Coal Creek “special monitoring” for *E. coli*. Although this analysis is beyond the scope of this annual report, summary statistics and boxplots for *E. coli* data for the 2007-2014 time period were tabulated on a bimonthly basis. These results also show elevated *E. coli* at multiple monitoring locations. The highest priority locations for additional source investigation based on the longer-term special monitoring program include sites CC-1A (Highway 36 north of bridge), CC-3B (Andrews St. Drainage), CC-5B (Augusta Lane), and CC-9B (Aspen Way).

Table 10. 2014 Coal Creek and Rock Creek Seasonal *E. coli* Data

Coal Creek/Rock Creek	Season	No.	Geometric mean	Minimum	Maximum
CC-Superior	N-Rec	1	15	15	15
CC-Superior	Rec	2	205	104	408
CC-1A	Rec	2	231	168	318
CC-2A	N-Rec	1	10	10	10
CC-2A	Rec	3	100	36	199
CC-2B	N-Rec	1	23	23	23
CC-2B	Rec	3	627	166	2420
CC-3A	N-Rec	1	167	167	167
CC-3A	Rec	3	210	120	299
CC-3B	N-Rec	1	1180	1180	1180
CC-3B	Rec	3	244	207	269
CC-4A	N-Rec	1	8	8	8
CC-4A	Rec	3	250	184	326
CC-4B	N-Rec	1	3	3	3
CC-4B	Rec	3	34	4	199
CC-5A	N-Rec	1	17	17	17
CC-5A	Rec	3	105	58	214
CC-5B	Rec	3	90	14	384
CC-6A	N-Rec	1	53	53	53
CC-6A	Rec	1	210	210	210
CC-7B	N-Rec	1	2	2	2
CC-7B	Rec	3	1	1	3
CC-8B	N-Rec	1	1	1	1
CC-8B	Rec	3	1	1	1
CC-9B	N-Rec	1	450	450	450
CC-9B	Rec	3	168	30	520
2-CC	N-Rec	1	70	70	70
CC-10A	N-Rec	1	72	72	72
CC-10A	Rec	3	83	34	253
CC-10B	N-Rec	1	2407	2407	2407
CC-10B	Rec	2	113	67	192
CC-11A	N-Rec	1	84	84	84
CC-11A	Rec	3	114	77	215
3-CC	N-Rec	6	153	16	435
3-CC	Rec	5	191	23	1553
CC-12A	N-Rec	1	66	66	66
CC-12A	Rec	3	1027	133	9764
CC-12B	N-Rec	1	2240	2240	2240
CC-12B	Rec	3	7	2	43
6-CC	N-Rec	6	29	5	66
6-CC	Rec	5	371	115	2420
7-CC	N-Rec	6	42	20	74
7-CC	Rec	5	321	107	1300
CC-Ken	N-Rec	6	69	23	172
CC-Ken	Rec	6	289	108	2420
5-RC	N-Rec	6	42	4	131
5-RC	Rec	5	276	84	1733

Figure 20a. 2014 Coal Creek and Rock Creek Non-Recreation Season *E. coli*

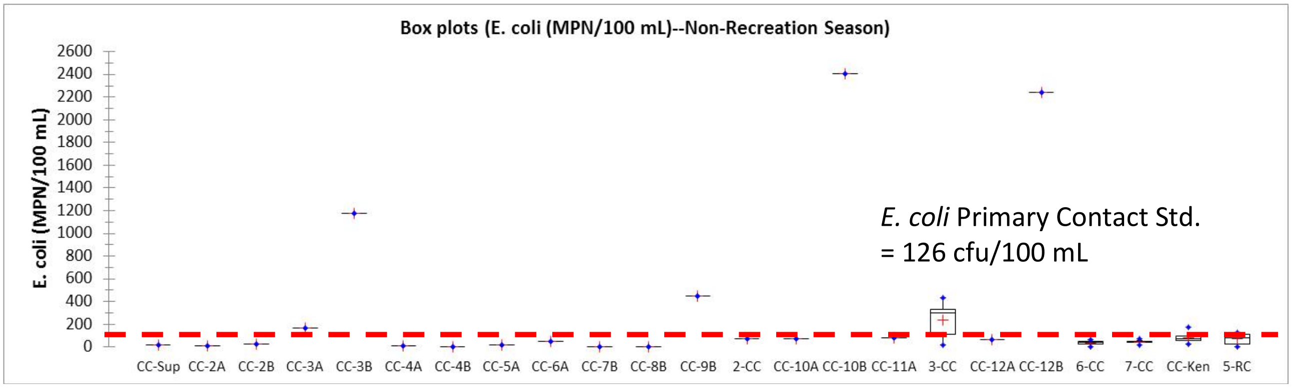
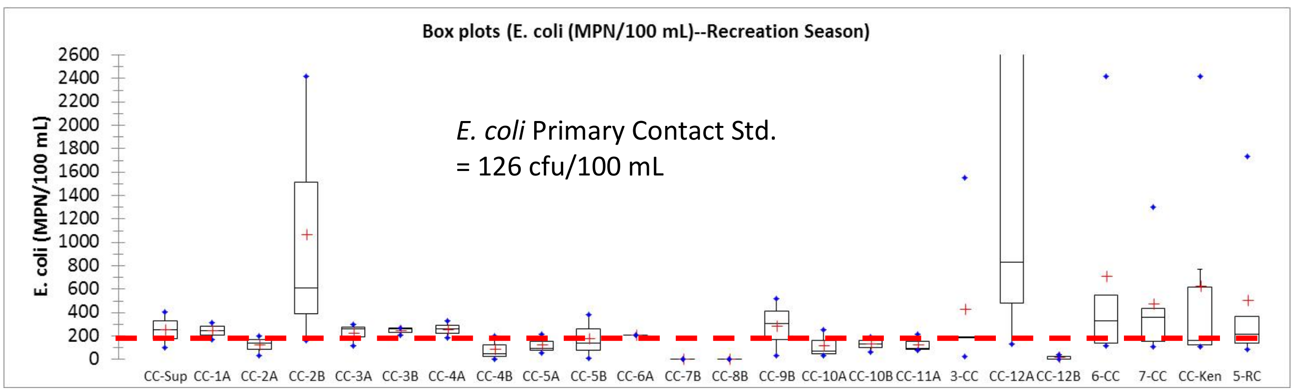


Figure 20b. 2014 Coal Creek and Rock Creek Recreation Season *E. coli*



St. Vrain Creek and Left Hand Creek

Table 11 and Figures 21a and 21b summarize seasonal *E. coli* data available for Left Hand Creek and St. Vrain Creek during 2014. Key observations include:

- During November-April (non-recreational season), geometric mean *E. coli* concentrations were below the stream standard of 126/100 mL, with the exception of M7-SV and M8-SV. During May through October (recreational season), the geometric mean *E. coli* concentration exceeded the stream standard at all monitoring locations except M8-SV.
- An upstream to downstream trend is not apparent.
- Discharges from the Longmont WWTP, as represented by location T-Eff that contains combined roadside ditch drainage and WWTP effluent, are consistently low and well below the stream standard.
- The highest geometric mean concentration and most variable concentrations were measured at Left Hand Creek.

In summary, the pattern of exceedances of the *E. coli* standard for St. Vrain Creek and Left Hand Creek do not indicate a specific hot spot or upstream to downstream trend; therefore, identification of the causes of elevated *E. coli* would require additional monitoring at a finer spatial resolution and for a longer period of record to draw conclusions or form and evaluate hypotheses about sources.

Table 11. 2014 Left Hand Creek and St. Vrain Creek Seasonal *E. coli* Data

Left Hand-St. Vrain	Season	No.	Geometric mean	Minimum	Maximum
M9.5-SV	Rec	4	170	42	980
M9.5-SV	N-Rec	2	33	21	52
M8.9-SV	Rec	5	281	61	1414
M8.9-SV	N-Rec	2	52	50	55
M8.4-SV	Rec	5	141	52	866
M8.4-SV	N-Rec	2	30	30	30
M8.2-SV	Rec	5	198	130	488
M8.2-SV	N-Rec	2	44	41	46
M8-SV	Rec	6	100	40	260
M8-SV	N-Rec	2	132	77	225
T11-LH	Rec	6	326	79	1203
T11-LH	N-Rec	2	104	83	129
T-EFF	Rec	6	33	19	59
T-EFF	N-Rec	2	66	54	81
M7-SV	Rec	6	150	83	206
M7-SV	N-Rec	2	166	84	326
M6-SV	Rec	5	216	142	579
M6-SV	N-Rec	0	N/A	N/A	N/A

Figure 21a. 2014 Left Hand Creek and St. Vrain Creek Non-Recreation Season *E. coli*

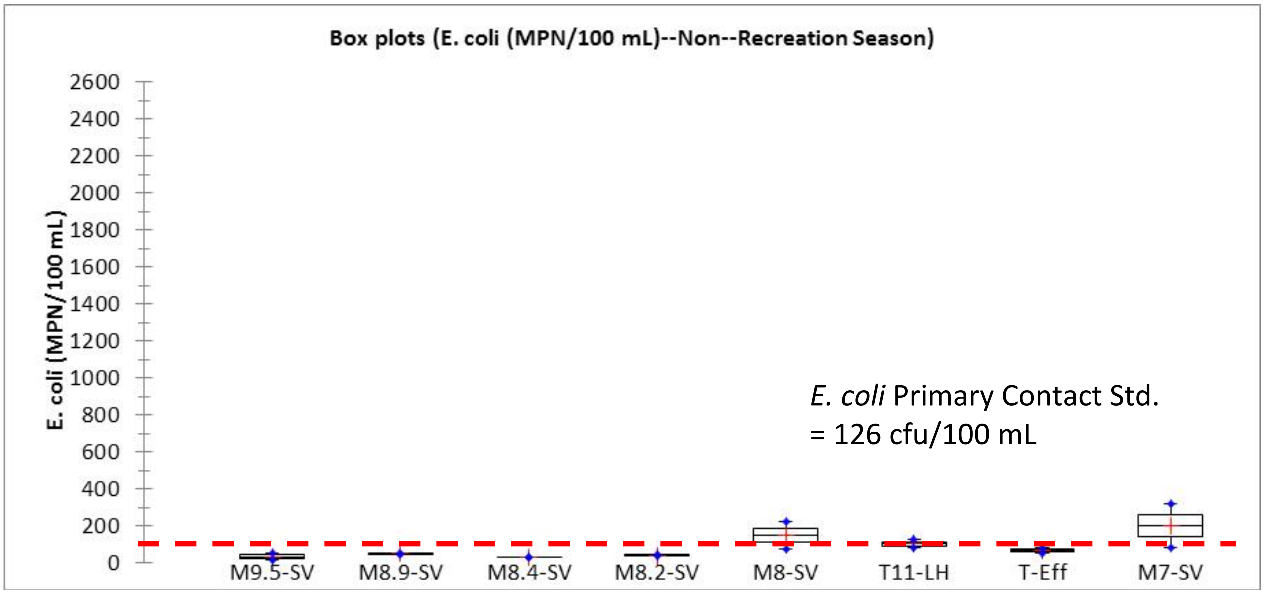
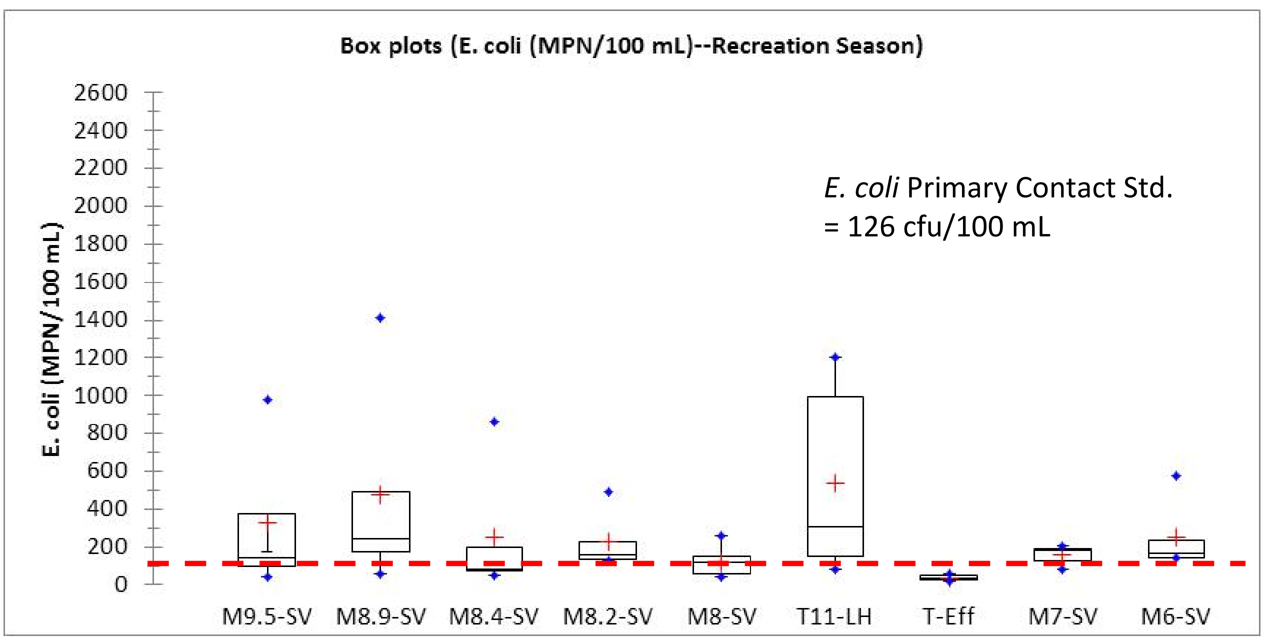


Figure 21b. 2014 Left Hand Creek and St. Vrain Creek Recreation Season *E. coli*



FINDINGS FOR TOTAL RECOVERABLE ARSENIC

For the most part, metals were beyond the scope of the coordinated Monitoring Plan and this report during 2014; however, both the City of Boulder and City of Longmont monitor metals routinely. Total recoverable arsenic is discussed briefly below since monitoring data were available for several segments. Figures 22 and 23 provide results for total recoverable arsenic on Boulder Creek and St. Vrain Creek.

Several different arsenic standards are in place in the basin, depending on the designated use of the stream. For example, the chronic total recoverable arsenic standards for each segment evaluated are:

- Boulder Creek and South Boulder Creek: 0.02 µg/L, with temporary modification at ambient condition through 12/31/2021.[2]
- Coal Creek: currently assigned standard is 100 µg/L; however, a lower standard of 0.02-10 µg/L, which is a hyphenated standard that allows permitted dischargers to meet a 10 µg/L limit, was adopted by the Division in the June 2015 Regulation 38 rulemaking hearing.
- St. Vrain Creek: 7.6 µg/L.
- Left Hand Creek: 0.02-10 µg/L, which is a hyphenated standard that allows permitted dischargers to meet a 10 µg/L limit.

In the context of these stream standards, key findings regarding total recoverable arsenic concentrations in the basin include:

- Median arsenic concentrations on Boulder Creek ranged from 0.59 to 1.57 µg/L (Figure 22). The median South Boulder Creek concentration was 0.25 µg/L. Because of the temporary modification to the 0.02 µg/L standard, these results would not currently cause the stream to be identified as impaired. However, these results reiterate the importance of actively participating in the Regulation 31 Basic Standards work group process where this standard is being reevaluated.
- Arsenic data for Coal Creek and Rock Creek were limited to two monitoring locations: 2-CC and 7-CC, with a median concentrations of 0.33 µg/L (n = 3) and 1.10 µg/L (n = 1), respectively. These results would not result in identification of an impairment since they are below the 10 µg/L threshold for designation as impairment for the hyphenated standard (even though the results exceed the 0.02 µg/L).
- Arsenic concentrations on St. Vrain Creek generally increase in an upstream to downstream direction (Figure 23), and Left Hand Creek has notably higher and more

[2] In Colorado, stream segments designated for water supply or "water + fish" have extremely low total arsenic standards of 0.02 µg/L. Because these standards are so low that they are not attainable in many parts of Colorado, the Commission has adopted temporary modifications to instream arsenic standards where "water + fish" criteria apply and when there is a discharge to the stream segment that cannot comply with subsequent effluent limits.

variable total arsenic than St. Vrain Creek. Arsenic in the Longmont WWTP discharges was typically lower than detection limits. Median arsenic concentrations at all locations are well below 7.6 µg/L on St. Vrain Creek.

- Left Hand Creek arsenic concentrations range from 1.0 to 7.3 µg/L, with a median concentration of 3.8 µg/L, which exceeds the assigned standard of 0.02 µg/L, but is below the 10 µg/L threshold for designation as impairment.

Figure 22. 2014 Total Recoverable Arsenic for Boulder Creek and South Boulder Creek

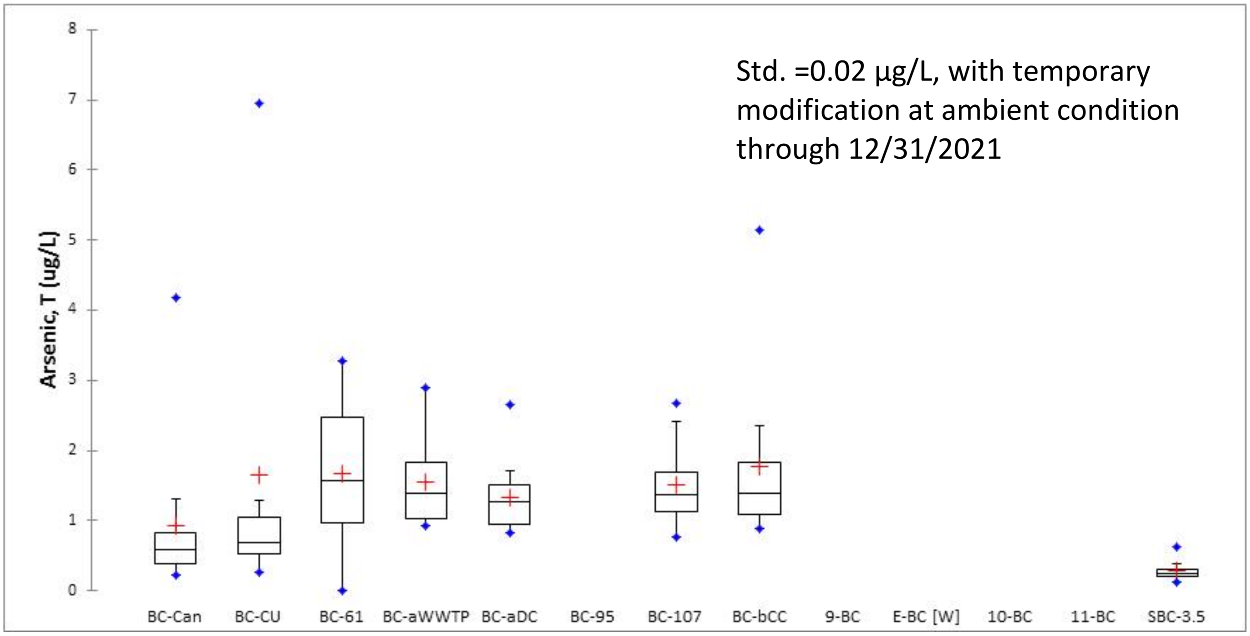
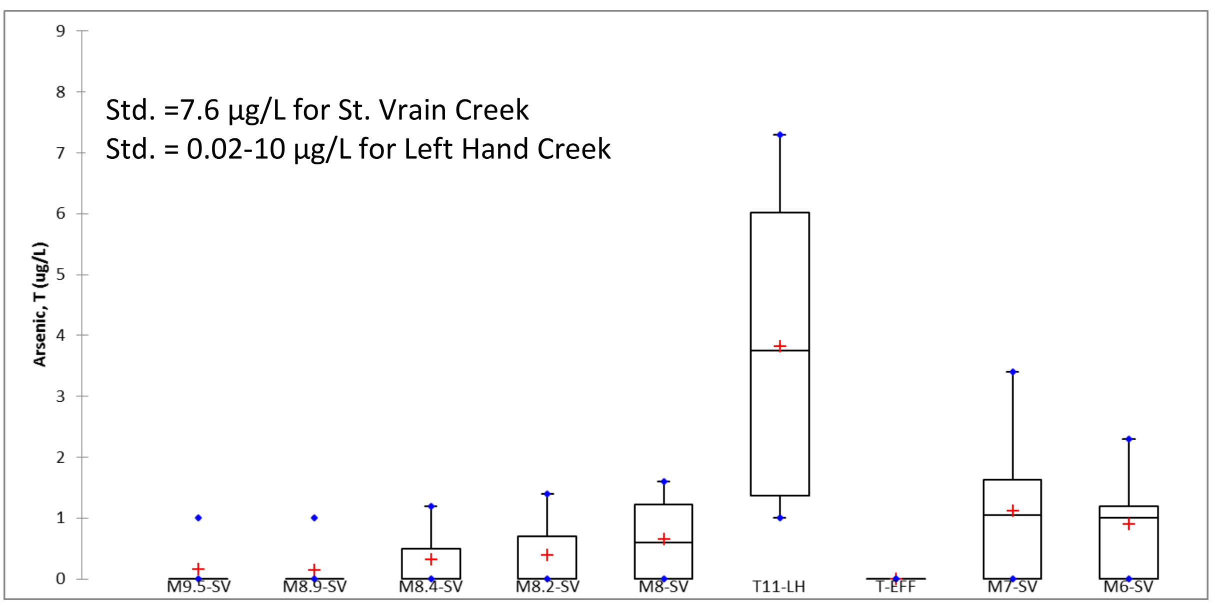


Figure 23. 2014 Total Recoverable Arsenic for St. Vrain Creek and Left Hand Creek



6.0 Biological Monitoring

On behalf of local governments in the watershed, Timberline Aquatics conducts biological monitoring of Boulder Creek and South Boulder Creek, Coal Creek and Rock Creek and St. Vrain Creek and Left Hand Creek. The monitoring is conducted using comparable methods for all of the streams, which are described in the individual biological monitoring reports for each basin. Monitoring locations are shown in Appendix A. The summary below highlights key findings from the latest report for each stream, focusing primarily on comparison of the multi-metric index (MMI) scores to thresholds for various biotypes defined in *Policy 10-1, Aquatic Life Use Attainment, Methodology to Determine Use Attainment for Rivers and Streams* (WQCD 2010). Policy 10-1 should be referenced for more detailed guidance on the interpretation of MMI scores.

As a brief overview, the location of macroinvertebrate sample sites results in assignment of one of three biotypes for the MMI assessments, as summarized in Table 12. Biotype site class is a function of three environmental variables: EPA Level IV ecoregion, site elevation, and stream slope (Policy 10-1, Appendix A). The thresholds that determine attainment or impairment are different for each biotype. Higher MMI scores are better than low scores. When an MMI score falls between the attainment and impairment thresholds identified in Table 12, additional evaluation using supplemental thresholds using the Hilsenhoff Biotic Index (HBI) and the Shannon Diversity Index (SDI) (Table 13) are required for "Class 1" aquatic life, as described in Regulation 38 (see Appendix E). For the HBI, lower values are better. For the SDI, higher values are better. If a Class 1 site fails to meet the criteria shown in Table 13 for either auxiliary metric, the site will be considered impaired. Auxiliary metrics are not applicable to Class 2 waters (CDPHE 2010). The only Class 1 streams evaluated in this report are Boulder Creek, South Boulder Creek and St. Vrain Creek. (Auxiliary metrics do not apply to Coal Creek and Rock Creek.)

Table 12. Policy 10-1 MMI Thresholds

Biotype	Description	Attainment Threshold	Impairment Threshold
1	Transition	>52	42
2	Mountains	>50	42
3	Plains & Xeric	>37	22

Table 13. Policy 10-1 Supplemental Evaluation Thresholds

Biotype	Description	Hilsenhoff Biotic Index	Shannon Diversity Index
1	Transition	<5.4	>2.4
2	Mountains	<5.1	>3.0
3	Plains & Xeric	<7.7	>2.5

All locations discussed in this report are located in either Biotype 1 or Biotype 3. Biotype 1 (Transition Zone) includes lower mountain areas of the Colorado Front Range downstream to the lower boundary of the "Front Range Fans". Biotype 3 (Plains) ranges from the eastern border of the "Front Range Fans" to the eastern border of Colorado. Both ecoregion and stream elevation are used to determine which biotype is appropriate, with the elevation of 5085 feet serving as the dividing threshold between Biotype 1 and Biotype 3. The Division has acknowledged that where uncertainty exists regarding the transitional boundaries between biotypes, the MMI for the adjacent biotype may be used to help determine the status of the aquatic life use. This additional analysis may be conducted under two circumstances:

1. At sites in Level IV Ecoregion 21c where the biotype assignment along a waterbody varies between Biotypes 1 and 2 because the stream slope fluctuates above and below 0.04. This situation typically occurs when stream slopes are slightly greater than or less than 0.04 along the gradient of a waterbody resulting in varying site classifications or biotypes.
2. At sites that encompass the physical border between two different Level IV Ecoregions or elevation zone boundaries used in the biotype classification. This results in a predicted site classification in one biotype, but is narrowly adjacent to another biotype. In such cases, sites may be represented by characteristics shared by more than one biotype.

For these circumstances, the Division states that "MMIs for each of the adjacent biotypes shall be investigated and used in the assessment." This new procedure has not yet been applied to 303(d) listings to date, but is expected to be taken into consideration in development of the 2016 303(d) List.

For in-depth discussion of biological findings for each stream segment, the Timberline Aquatics annual reports for each basin should be reviewed. The remainder of this chapter provides MMI, HBI and SDI summaries, as well as EPT[3]scores, which are provided for general reference, but not discussed in this report.

BOULDER CREEK AND SOUTH BOULDER CREEK

For Boulder Creek and South Boulder Creek, sites were strategically established at specific locations to assist in the evaluation of aquatic conditions. These sites include:

- BC-CAN: the furthest upstream site on Boulder Creek upstream of most urban development, serving as a reference site with relatively low anthropogenic influences.

[3] The EPT index an index of water quality based on the abundance of three pollution-sensitive orders of macroinvertebrates relative to the abundance of a hardy species of macroinvertebrate. It is calculated as the sum of the number of *Ephemeroptera*, *Plecoptera*, and *Trichoptera* divided by the total number of midges (*Diptera: Chironomid*).

- SBC-OS: located on South Boulder Creek upstream of most urban development, serving as a reference site with relatively low anthropogenic influences. Within the City of Boulder, site BC-28 was used to monitor possible impacts from urban runoff.
- BC-55: located further downstream on Boulder Creek and used to assess recovery that may occur downstream from the City of Boulder, but upstream of the 75th Street WWTP.
- BC-aWWTP: located immediately upstream of Boulder's 75th Street WWTP to evaluate changes in habitat that have been observed at that location. Four sites downstream of the WWTP provide information on the influence of WWTP effluent and potential recovery.
- BC-aDC: located on Boulder Creek 2.4 river miles (RM) (3.9 km) downstream of the WWTP.
- BC-95: located on Boulder Creek 3.2 RM (5.1 km) below the WWTP.
- BC-107 located on Boulder Creek approximately 4.7 RM (7.5 km) downstream of the WWTP.
- BC-aCC: established on Boulder Creek in 2012, farther downstream in a stream reach with possible impacts from nutrients.

Based on review of the 2014 MMI scores (Table 14 and Figure 24), all monitoring locations attain Biotype 1 aquatic life thresholds, with the exception of site BC-aCC. BC-aCC's MMI scores are in the "grey zone" and require assessment of auxiliary metrics in Table 15, which indicate that the HBI metric is not attained for 2014 at this location. Sites BC-aDC, BC-95, BC-107, and BC-aCC are located within the Biotype 3 elevation range, but in the Biotype 1 ecoregion. These lower elevation locations coincide with the portion of the stream below Boulder's 75th Street WWTP, which is a confounding factor in data analysis, given that these sites were selected to provide information on the influence of WWTP effluent and potential recovery. At the time of this report, Timberline Aquatics has suggested that for BC-aCC, a Biotype 3 classification is expected to be more appropriate than Biotype 1. Timberline Aquatics recalculated the MMI score for this location as Biotype 3, with a resulting MMI score of 46.2 which attains the Biotype 3 threshold (Personal Communication with Dave Rees, June 2015). Using these assumptions, the 2014 MMI scores show attainment of aquatic life use for all monitoring locations. Significant recovery of aquatic life following the 2013 flood impacts is evident at most of the sites.

Table 14. Boulder Creek and South Boulder Creek MMI Scores

Date	BC-CAN	BC-28	BC-55	BC-aWWTP	BC-aDC	BC-95	BC-107	BC-aCC[2]	SBC-OS
23-Sep-10	76.2	78.0	50.7	67.3	57.7	52.2	NA	NA	76.0
29-Sep-11	73.6	84.8	79.5	74.7	52.8	61.8	53.8	NA	72.6
28-Sep-12	73.5	63.5	70.4	62.8	42.4	43.3	37.0	40.2	78.8
25-Oct-13	68.3	75.5	0[1]	45.5	40.2	40.0	35.2	35.4	71.0
26-Oct-14	73.2	67.6	84.4	79.4	53.3	62.5	58.4	44 (Biotype 1) or 46.2 (Biotype 3)	80.6

Pink-shaded cells indicate impairments. Grey-shaded cells are MMI scores between attainment and impairment thresholds.

[1]The substrate at BC-55 was completely covered with sand in October 2013, providing no colonizable substrate after the flood. No invertebrates were present at this site during 2013 sampling.

[2]BC-aCC may be more appropriately classified as Biotype 3.

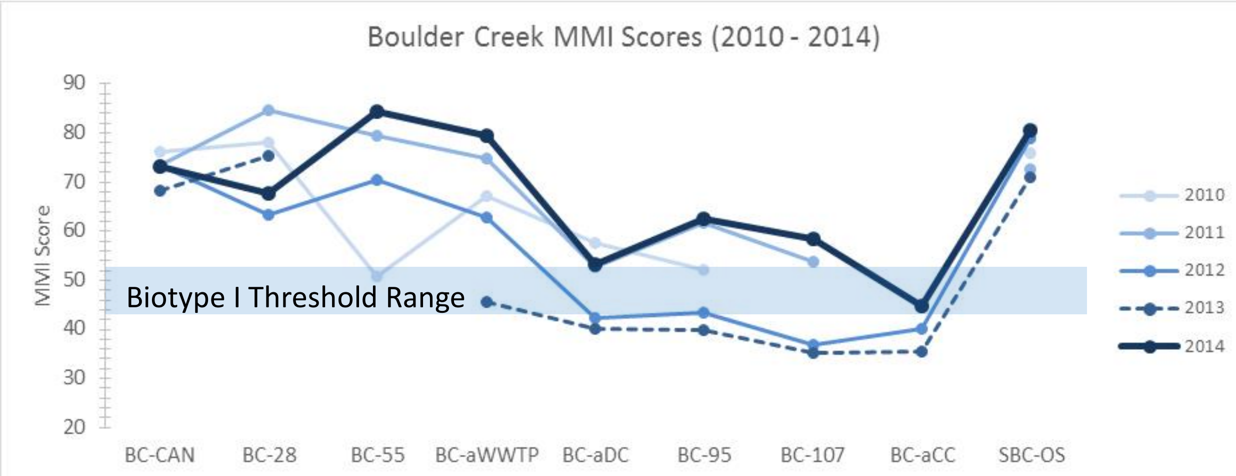
Table 15. Boulder Creek and South Boulder Creek EPT, Diversity Index and HBI Scores

Date	BC-CAN*	BC-28	BC-55	BC-aWWTP*	BC-aDC*	BC-95*	BC-107*	BC-aCC	SBC-OS
EPT Scores									
23-Sep-10	23	14	12	14	10	10	NA	NA	22
29-Sep-11	17	19	14	13	8	8	6	NA	21
28-Sep-12	18	10	14	13	6	9	6	4	20
25-Oct-13	12	14	NA	8	6	5	7	7	18
26-Oct-14	18		18	19	17	8	10	8	8
Shannon Diversity Index Scores									
23-Sep-10	3.40	3.07	2.70	2.72	2.86	2.67	NA	NA	3.99
29-Sep-11	3.19	3.23	2.39	2.90	2.83	2.78	2.80	NA	3.01
28-Sep-12	2.80	3.15	3.46	2.50	3.12	2.82	2.35	2.52	3.77
25-Oct-13	2.61	2.96	NA	2.48	2.54	2.82	2.66	2.47	2.47
26-Oct-14	3.17	4.29	2.62	3.16	3.16	3.19	2.72	2.57	3.56
HBI Scores									
23-Sep-10	3.22	3.80	5.96	5.97	4.64	4.74	NA	NA	3.43
29-Sep-11	2.09	3.66	3.91	4.61	4.81	5.06	5.02	NA	4.60
28-Sep-12	3.60	4.22	5.22	6.01	4.93	5.64	7.41	6.51	2.69
25-Oct-13	3.56	3.64	NA	4.79	4.11	5.86	4.23	5.53	3.38
26-Oct-14	2.01	4.22	4.23	4.70	4.70	5.33	5.83	5.70	3.33

*Also an active water quality monitoring location.

Pink-shaded cells do not attain target thresholds for Biotype 1.

Figure 24. Boulder Creek and South Boulder Creek MMI Scores (2010-2014)



*Does not show the “0” MMI score for BC-55 following the September 2013 flood.

Coal Creek and Rock Creek

Five biological monitoring locations are included for Coal Creek and Rock Creek. These sites are located in Aquatic Life Class 2 segments and include these monitoring locations:

- CC-EMP, which is the “reference site” upstream of the effluent discharge from the WWTP for the City of Louisville.
- CC-OSB, which is 0.4 km downstream of site CC-EMP, intended to evaluate the potential influence of the Louisville WWTP.
- RC-120, which is on Rock Creek, approximately 1 km upstream of its confluence with Coal Creek, downstream of Superior WWTP.
- CC-AP, located on Coal Creek: downstream of the confluence with Rock Creek, influenced by effluent from Lafayette WWTP and Rock Creek.
- CC-CLR, located on Coal Creek, downstream of Erie WWTP, influenced by effluent from all four municipalities (although Erie has been discharging from the North Erie WWTP to Boulder Creek instead of Coal Creek).

Each of these locations is classified as Biotype 1. Sites CC-OSB on Coal Creek and RC-120 on Rock Creek would be considered impaired based on comparison of the 2014 MMI scores to the MMI thresholds. Most of the sites showed decreases in MMI scores following the September 2013 flood; however, 2014 MMI scores showed significant recovery of the aquatic life at most of these sites, with the exception of CC-OSB. Interestingly, the downstream-most site has the highest (best) MMI score for the stream.

Timberline Aquatics (2013) noted that the low MMI scores are likely influenced by the spring-fed nature of Coal Creek and Rock Creek that may have inadvertently influenced components of the MMI that are intended to represent responses to changes in water quality. The unique physical parameters (temperature, dissolved oxygen, etc.) that are typically found near the origin of spring-fed streams may contribute to the structure and function of macroinvertebrate communities in a way that negatively influences the MMI. These types of physical environmental changes may partially explain the relatively low MMI scores at the upstream sites (e.g., CC-EMP) on Coal Creek and gradual improvement in a downstream direction (Timberline Aquatics 2013).

The intermittent, spring-fed nature of these two effluent-dominated streams requires consideration when evaluating the status of aquatic life in Coal Creek and Rock Creek. The macroinvertebrate communities present in these streams depend on effluent discharge to provide stable aquatic habitat. The reference site in this study (CC-EMP) was selected because it was upstream of most potential perturbations and maintained enough groundwater to achieve permanent flow. At other locations, these streams rely on effluent discharge to maintain permanent flows through stream reaches that coincide with areas of urban development. Because of the intermittent nature of these streams, there is little opportunity for colonization from upstream macroinvertebrate populations in Coal Creek or Rock Creek. Aquatic life communities in these unique streams are substantially limited by the natural, intermittent, pre-existing conditions (Timberline Aquatics 2013).

Table 16. Coal Creek and Rock Creek MMI Scores

Date	CC-EMP	CC-OSB	RC-120	CC-AP	CC-CLR
22-Sep-10	38.1	42.2	38.6	44.1	50.1
28-Sep-11	39.8	37.4	36.0	51.4	49.7
27-Sep-12	43.7	33.6	22.5	42.2	53.6
26-Oct-13	24.5	32.3	24.1	38.1	36.6
28-Sep-14	47.8	31.5	36.0	51.3	53.4

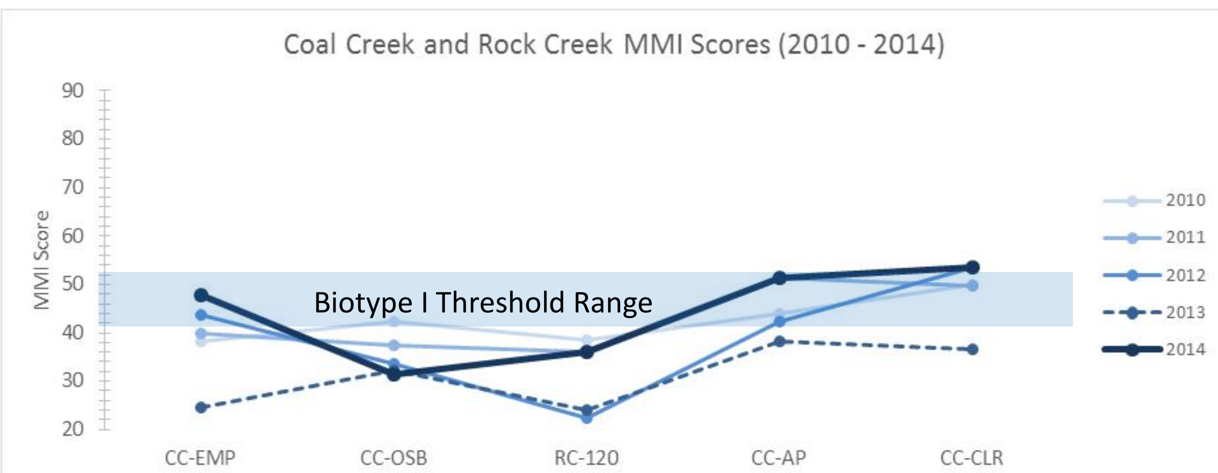
Grey-shaded cells are scores between the attainment and impairment threshold. Scores in pink are considered impaired.

Table 17. Coal Creek and Rock Creek EPT, Diversity Index and HBI Scores

Date	CC-EMP	CC-OSB	RC-120	CC-AP	CC-CLR
EPT Scores					
22-Sep-10	6	7	8	9	8
28-Sep-11	6	4	8	9	8
27-Sep-12	6	2	6	6	10
26-Oct-13	4	6	4	7	10
28-Sep-14	9	5	7	10	9
Shannon Diversity Index Scores					
22-Sep-10	2.23	2.02	3.42	3.11	2.56
28-Sep-11	1.97	1.76	3.35	3.35	2.79
27-Sep-12	2.32	1.30	2.59	2.68	2.58
26-Oct-13	2.76	2.91	1.99	2.70	2.46
28-Sep-14	2.70	2.71	2.48	2.82	2.61
HBI Scores					
22-Sep-10	6.29	6.48	5.92	5.12	4.64
28-Sep-11	6.27	6.86	5.77	5.66	4.77
27-Sep-12	6.65	6.69	6.79	5.97	5.24
26-Oct-13	6.73	6.51	6.37	6.47	5.95
28-Sep-14	6.08	5.97	5.73	5.53	4.86

Note: Diversity and HBI scores are not required to be evaluated to assess aquatic life use attainment for Class 2 streams.

Figure 25. Coal Creek and Rock Creek MMI Scores (2010-2014)



St. Vrain Creek and Left Hand Creek

Biological monitoring is conducted at six monitoring locations on St. Vrain Creek, and Left Hand Creek.[4] These sites, which are all classified as Aquatic Life Class 1 segments, include:

- SVC-75: farthest upstream site was added in 2013 to serve as a new reference site on St. Vrain Creek upstream of urban influences.
- SVC-M9: upstream site on St. Vrain Creek is used to provide reference information upstream of urban influences.
- SVC-M8: site within the city of Longmont is used to assess potential impacts from urban runoff.
- LHC-1: site on Left Hand Creek is located approximately 300 m upstream of its confluence with St. Vrain Creek and is used to evaluate the contributions and influence of Left Hand Creek on St. Vrain Creek.
- SVC-M6: site is located on St. Vrain Creek downstream of the Longmont WWTP and is used to measure the influence of treated effluent in combination with urban runoff
- SVC-M4: site is the farthest downstream site on St. Vrain Creek and was established to evaluate potential recovery downstream of the city.

During 2014, no MMI scores for St. Vrain Creek or Left Hand Creek were poorer than the impairment threshold (Table 18); however, four sites fell within the “grey” zone, requiring additional evaluation of supplementary metrics (Table 19). Sites SVC-M8 on St. Vrain Creek and LHC-1 on Left Hand Creek were identified as impaired after review of the supplementary metrics. The downstream-most sites showed significant improvements in MMI scores relative to several previous years that showed impairment based on MMI scores. Although the St. Vrain Creek and Left Hand Creek sites are evaluated as Biotype 1, it is noteworthy that all of these sites are located in Biotype 3 elevation range (below 5085 feet) with the exception of SVC-75.

[4] A special study location on Spring Gulch (SG-2) is also monitored, but it is not included in this report since it is not part of the long-term monitoring program.

Table 18. St. Vrain and Left Hand Creek MMI Scores

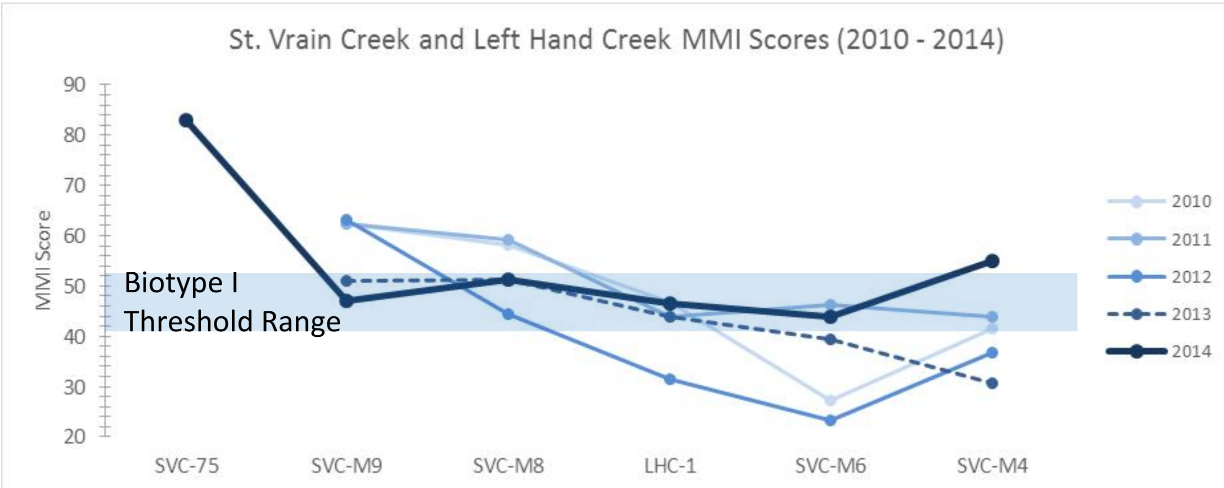
Date	SVC-75	SVC-M9	SVC-M8	LHC-1	SVC-M6	SVC-M4
WQ Cross-Ref	M9.5-SV	M8.9-SV	M8-SV	T11-SV	M6-SV	M4-SV
22-Sep-10	NA	62.5	58.2	46.9	27.2	41.5
28-Sep-11	NA	62.3	59.1	43.8	46.2	44.0
27-Sep-12	NA	63.2	44.5	31.6	23.3	36.9
28-Oct-13	NA	51.0	51.4	43.8	39.4	30.6
2-Oct-14	82.9	47.1	51.4	46.6	43.9	54.9

Note: all sites on St. Vrain and Left Hand Creek are below elevation 5085 ft, with the exception of SVC-75. Grey-shaded cells are scores between the attainment and impairment threshold. Scores in pink are considered impaired.

Table 19. St. Vrain and Left Hand Creek EPT, Diversity Index and HBI Scores

Date	SVC-75	SVC-M9	SVC-M8	LHC-1	SVC-M6	SVC-M4
EPT Scores						
22-Sep-10	NA	14	14	8	10	7
28-Sep-11	NA	11	8	8	7	7
27-Sep-12	NA	10	8	3	9	7
28-Oct-13	NA	9	13	6	8	6
2-Oct-14	20	9	10	7	10	8
Shannon Diversity Index Scores						
22-Sep-10	NA	2.65	2.81	3.50	2.43	3.05
28-Sep-11	NA	2.19	2.25	2.59	2.95	2.16
27-Sep-12	NA	1.99	1.70	2.65	2.63	2.84
28-Oct-13	NA	2.23	3.08	3.11	2.69	2.00
2-Oct-14	2.74	2.81	2.58	1.31	2.71	3.30
HBI Scores						
22-Sep-10	NA	3.90	5.15	6.49	5.49	5.12
28-Sep-11	NA	4.90	4.73	6.83	4.37	4.95
27-Sep-12	NA	5.36	6.56	7.41	5.93	5.68
28-Oct-13	NA	4.58	5.42	5.11	4.96	4.13
2-Oct-14	3.67	4.41	5.72	3.54	4.19	4.88

Figure 26. St. Vrain and Left Hand Creek MMI Scores (2010-2014)



7.0 QA/QC Analysis

Field duplicates and field blanks were recommended in the 2014 Monitoring Plan at the frequencies recommended in Table 20. For this initial annual report, most data providers did not provide field blanks and replicates, but these should be submitted in the future. A brief summary of QC samples that were provided includes:

- Data provided by Longmont included 291 analytical results for field blanks. Results for these field blanks showed values below detection limits (n=236), low J-qualified (estimated) values (n=37), or very low results (n=18). These results indicate that bias due to sample contamination is unlikely for the Longmont sampling program.

- Data downloaded from Northern's website identified replicate samples; however, these have not been independently evaluated for purposes of this report, given the program that Northern already has in place to QC data.

In future annual reports, if QC data are provided as part of the annual report effort, then a more detailed evaluation of QC samples will be completed. For example, relative percent difference calculations for field replicates could be provided as a data appendix and interpreted as part of the report. This exercise should be feasible for nutrients, given that Regulation 85 requires QC samples be collected.

Table 20. Recommended Field Quality Control Samples

QC Sample	Data Quality Indicator	Collection Frequency (recommended)[1]	Acceptance Criteria	Corrective Action
Field Blank Sample	Bias Due to Sample Contamination	5% of samples (1 per 20 samples)	< Reporting Limit	Investigate and eliminate sources of contamination; flag suspect data (e.g., "B" qualifier)
Field Replicate Sample	Precision	5% of samples (1 per 20 samples)	For concentrations > Reporting Limit, <25% Relative Percent Difference[2]	Investigate and eliminate cause (e.g., inconsistent field techniques and sample processing, lab error); request re-analysis of sample; flag suspect data

[1]If the recommended frequency is infeasible, it is highly recommend that, at a minimum, one set of field duplicates and one set of field blanks should be collected by each sampling program per year.

[2]*E. coli* may be an exception to this acceptance criterion. In such cases, the RPD should be discussed as part of the data analysis report.

8.0 Conclusions Regarding Current and Future Regulatory Issues

Based on the analysis completed in this report and analyses conducted by others, current regulatory issues for the Boulder Creek and St. Vrain basin include:

- *E. coli*: All segments evaluated in this report exceed *E. coli* standards, with the exception of South Boulder Creek. The portion of Boulder Creek between 13th Street to the confluence with South Boulder Creek is included in an *E. coli* TMDL, which drives additional regulatory requirements under MS4 permits.
- Aquatic Life: Based on biological monitoring results for 2014, portions of Coal Creek, Rock Creek, St. Vrain Creek and Left Hand Creek would be identified as impaired for aquatic life. One location on Boulder Creek above Coal Creek (BC-aCC) would be considered impaired for aquatic life when evaluated as Biotype 1, but not when evaluated as Biotype 3. It may be worth further evaluating whether other monitoring locations, particularly those within the Biotype 3 elevation range, are more appropriately evaluated as Biotype 1 or Biotype 3, given new provisions in the 2016 303(d) Listing Methodology.

Future regulatory issues include:

- Total Phosphorus: Below WWTP discharges, no stream segments evaluated in this report would be expected to attain the "interim values" adopted in Regulation 31 in 2012.
- Total Nitrogen: Below WWTP discharges, no stream segments evaluated in this report would be expected to attain the "interim values" adopted in Regulation 31 in 2012.
- Total Recoverable Arsenic: Although temporary modifications have been adopted for segments with "fish + water" standards for total recoverable arsenic through December 31, 2021, available data collected for Boulder Creek and South Boulder Creek indicate that the stringent 0.02 µg/L standard is not attainable at any monitoring location. Less stringent stream standards apply to other segments in the watershed.
- Nitrate: For Coal Creek, the Division adopted a more stringent nitrate standard of 10 mg/L in the June 2015 Regulation 38 rulemaking hearing. The 2014 data indicate that this standard may be exceeded at multiple locations under certain conditions.

Other known regulatory issues not evaluated in this report:

- Rock Creek is identified as impaired for selenium on the 2012 303 (d) List. Several stream segments are listed on the Monitoring and Evaluation or 303(d) list for other metals, as described in Appendix F. Some of these listings are anticipated to be resolved in 2016 due to more representative monitoring data.
- Based on a proposal from the City of Boulder, the Commission adopted a temporary modification for temperature during December to February on Segment 9 of Boulder Creek due to difficulty meeting the winter "shoulder season" standard for temperature. This temporary modification expires December 31, 2020.

9.0 Recommendations

This inaugural annual water quality report is a first step in coordinating monitoring and interpretation of water quality conditions in the overall St. Vrain Basin and identifying general water quality trends (at least spatially). This section provides recommendations for improvements to the Monitoring Plan, annual data compilation process, and general recommendations for water quality improvements and enhancements.

Recommended modifications to the Monitoring Plan include:

- Clearly specify that WWTP data should be provided as part of the data submission (at least for Regulation 85 nutrients) to improve consistency in graphic representations of the data and provide better insight into pollutant sources that may be influencing instream water quality.

- In order to address controllable *E. coli* sources to the streams, a more refined monitoring program (both temporally and spatially) is needed for *E. coli*. Recommendations for monitoring to further refine understanding of sources of *E. coli* will be provided in the 319 Watershed Plan that is currently being developed by KICP.

- Two additional monitoring locations should be considered to reflect instream conditions upstream of urbanized conditions. These include: 1) Coal Creek near (or upstream of) Highway 36 and 2) Left Hand Creek near the USGS gauge at Hover (LEFTHOCO). Because Coal Creek is segmented between 7a and 7b at Highway 36, the Coal Creek station should be located near Highway 36, but upstream of urbanization.

Recommendations to increase efficiency in the data analysis and compilation process based on lessons learned in 2014 include several simple suggestions:

- Continue to clearly communicate with data providers regarding data format and desired data submission timeline. When working with database outputs and "batch" statistical analysis, it is most efficient to have a complete data set submitted in one standardized file, as opposed to several submissions.

- Consistent sample location names and clearly identified sample location names should be used to avoid misinterpretation of the sample location. For example "upstream" and "downstream" identifiers should be replaced with the standardized KICP monitoring location name.

- Clearly identify whether the data being provided is also being provided by another entity. For example, the Coal Creek cities share monitoring location 11-BC and it only needs to be provided once.

Recommendations for water quality enhancements and improvements:

- At this time, the recommendations of basin master plans in response to the September 2013 flood are considered highest priority, combined with gradual upgrades to WWTP treatment processes to reduce nutrients to meet Regulation 85 requirements.
- Continued implementation of construction and post-construction stormwater quality BMPs following the recommendations of Volume 3 of the Urban Drainage and Flood Control District's *Urban Storm Drainage Criteria Manual* is generally recommended, particularly in MS4 permit covered areas. Because of the general nature of this initial water quality analysis, more detailed recommendations are not appropriate at this time. As a general recommendation for bacteria, practices that provide runoff volume reduction through infiltration and/or filtration (e.g., sand filter, bioretention) are expected to be most beneficial for bacteria reduction. Although wet ponds with permanent pools may also help to reduce bacteria concentrations, water rights and space constraints often preclude their use for new developments and redevelopments in Colorado.
- Work with Boulder County Parks and Open Space to identify opportunities for implementation of agricultural BMPs. For agricultural areas, pollutant loading is affected by practices already in place on specific parcels. Some parcels may have significant opportunity for improvements, whereas others may already be implementing agricultural BMPs. An inventory of practices in place for various agricultural parcels has not been completed for purposes of this annual water quality report, but will be further explored in the 319 Plan under development by the KICP. KICP is also coordinating with Boulder County Parks and Open Space with regard to a water quality monitoring program that is being developed to assess the effectiveness of various practices implemented on County lands.
- Encourage participation of agricultural producers (particularly on County land) in the Rocky Mountain National Park Early Warning System project to reduce ammonia emissions during certain weather conditions (see http://www.rmwarningsystem.com/ReducingAmmoniaEmissions.aspx).

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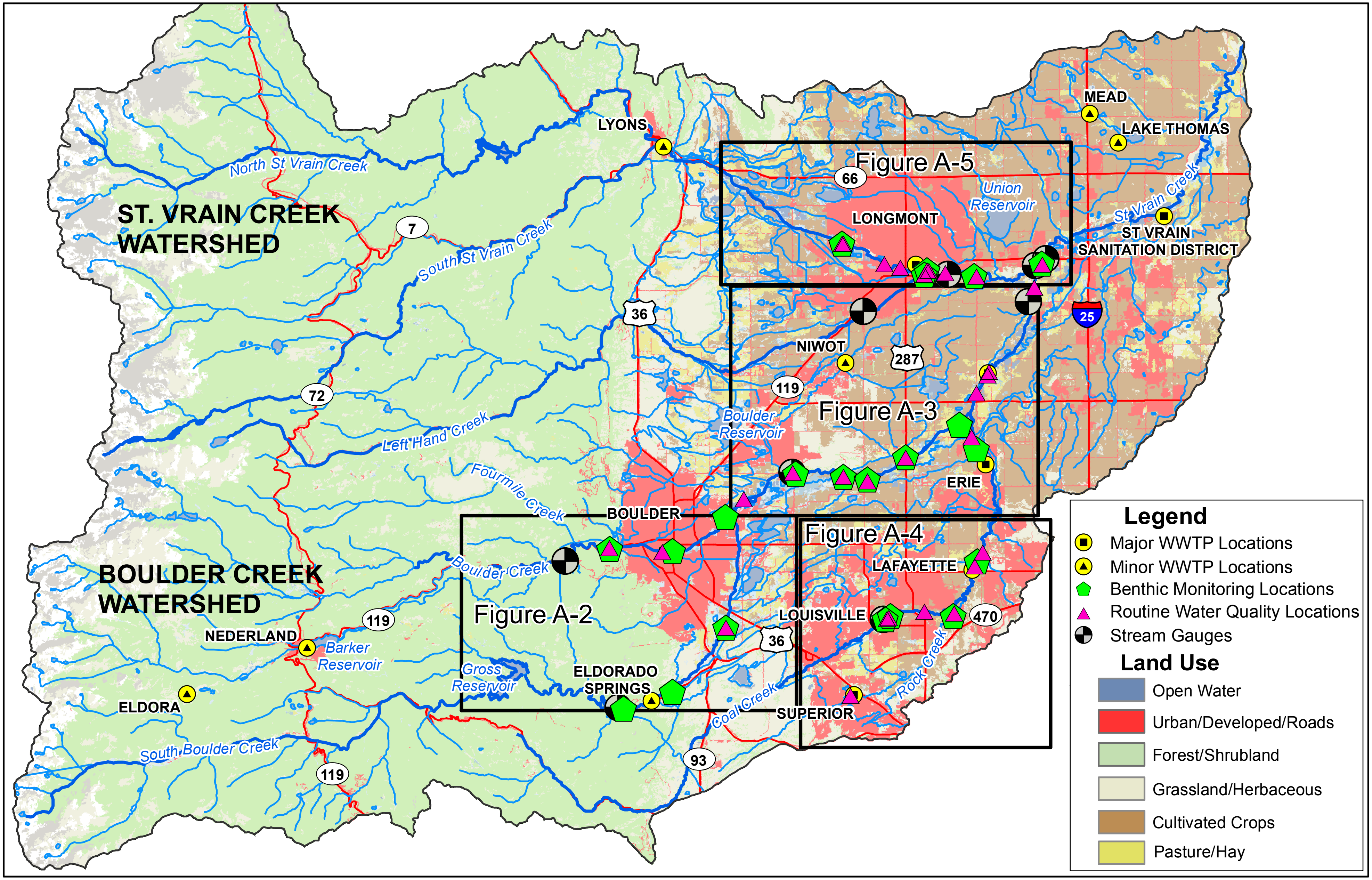
Appendix A. Monitoring Location Maps



Path: Z:\Project Files\12\121-002\121-002.010\CAD-GIS\GIS\Monitoring Plan Series\Figure 1_Boulder St Vrain Monitoring Locations.mxd

Base Map: National Land Cover Dataset

WRIGHT WATER ENGINEERS, INC.
2490 W 26TH AVE 100A
DENVER, CO. 80211
(303) 480-1700

ST. VRAIN-BOULDER WATERSHED

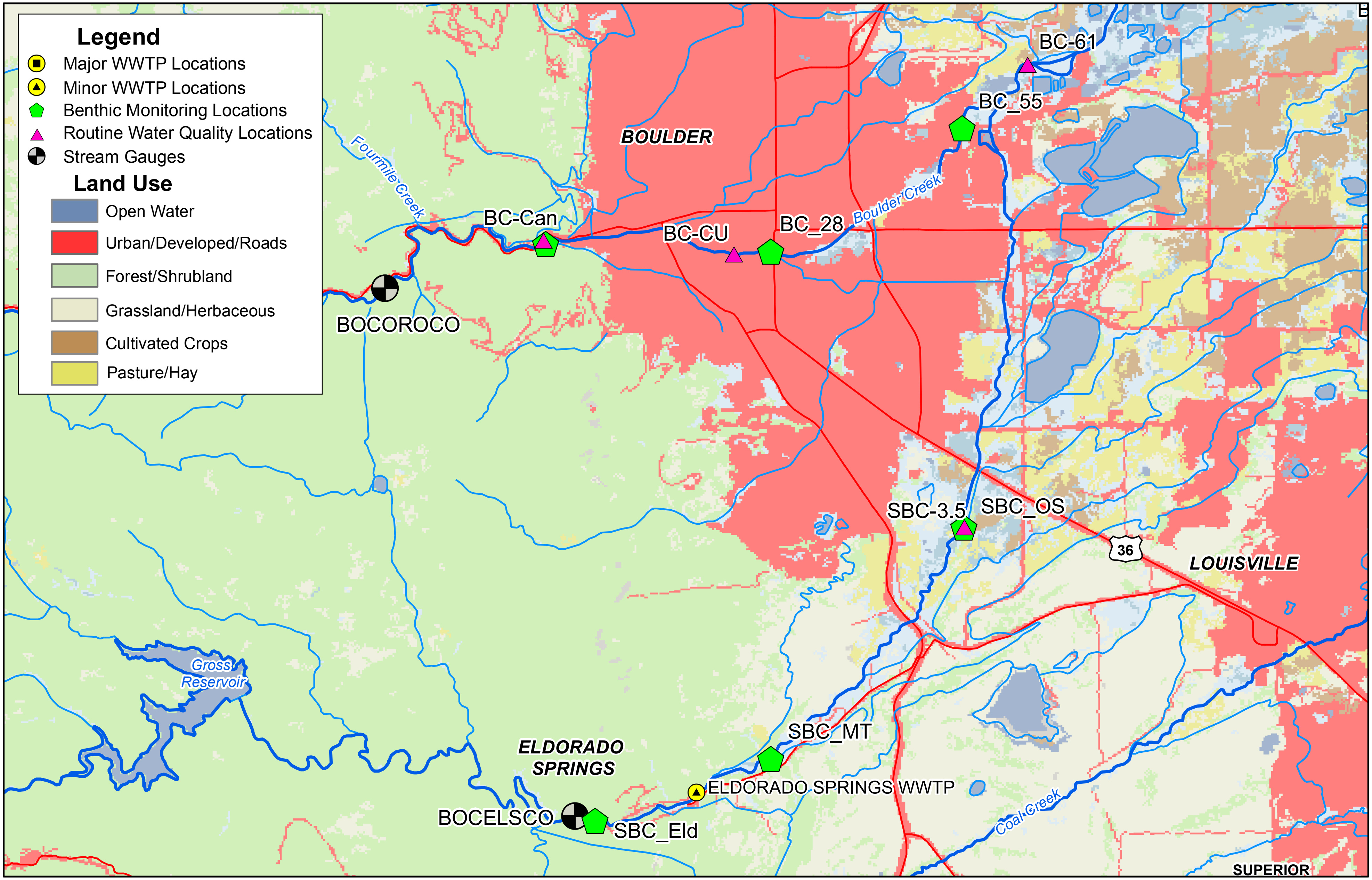
JOINT MONITORING PLAN LOCATIONS

N W E S

0 1.5 3 6
Miles

PROJECT NO.
121-002.010

FIGURE
A-1



Path: Z:\Project Files\12\121-002\121-002.010\CAD-GIS\GIS\Monitoring Plan Series\Figure 2A_Boulder Monitoring Locations 62915.mxd

Base Map: National Land Cover Dataset

WWE
WRIGHT WATER ENGINEERS, INC.
2490 W 26TH AVE 100A
DENVER, CO. 80211
(303) 480-1700

BOULDER CREEK WATERSHED

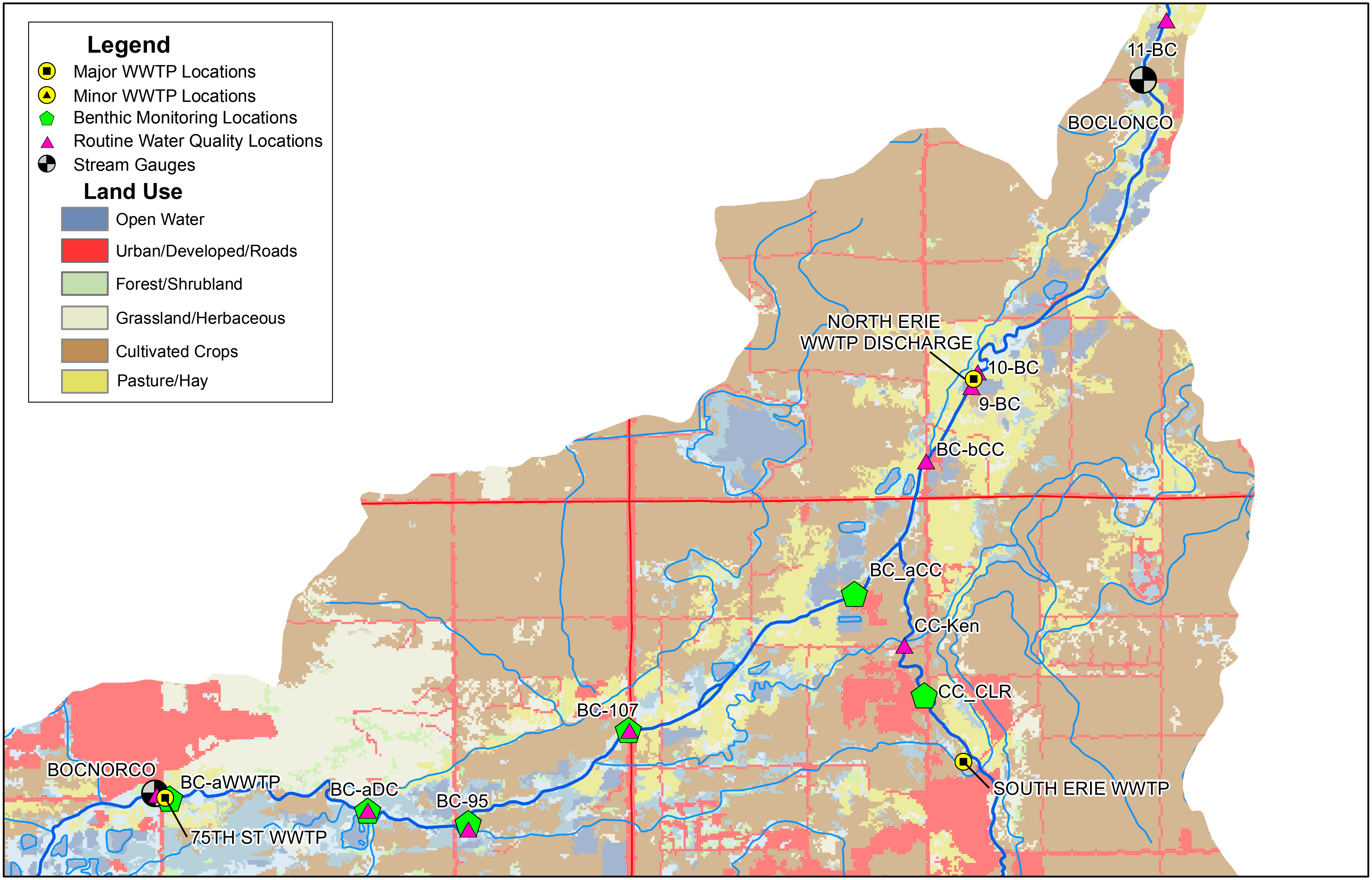
JOINT MONITORING PLAN LOCATIONS

N S E W

0 0.375 0.75 1.5
Miles

PROJECT NO.
121-002.010

FIGURE
A-2



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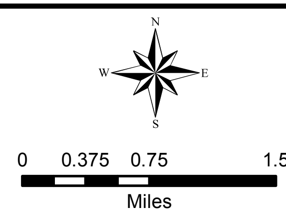
Base Map: National Land Cover Dataset

WWE
WRIGHT WATER ENGINEERS, INC.
2490 W 26TH AVE 100A
DENVER, CO. 80211
(303) 480-1700

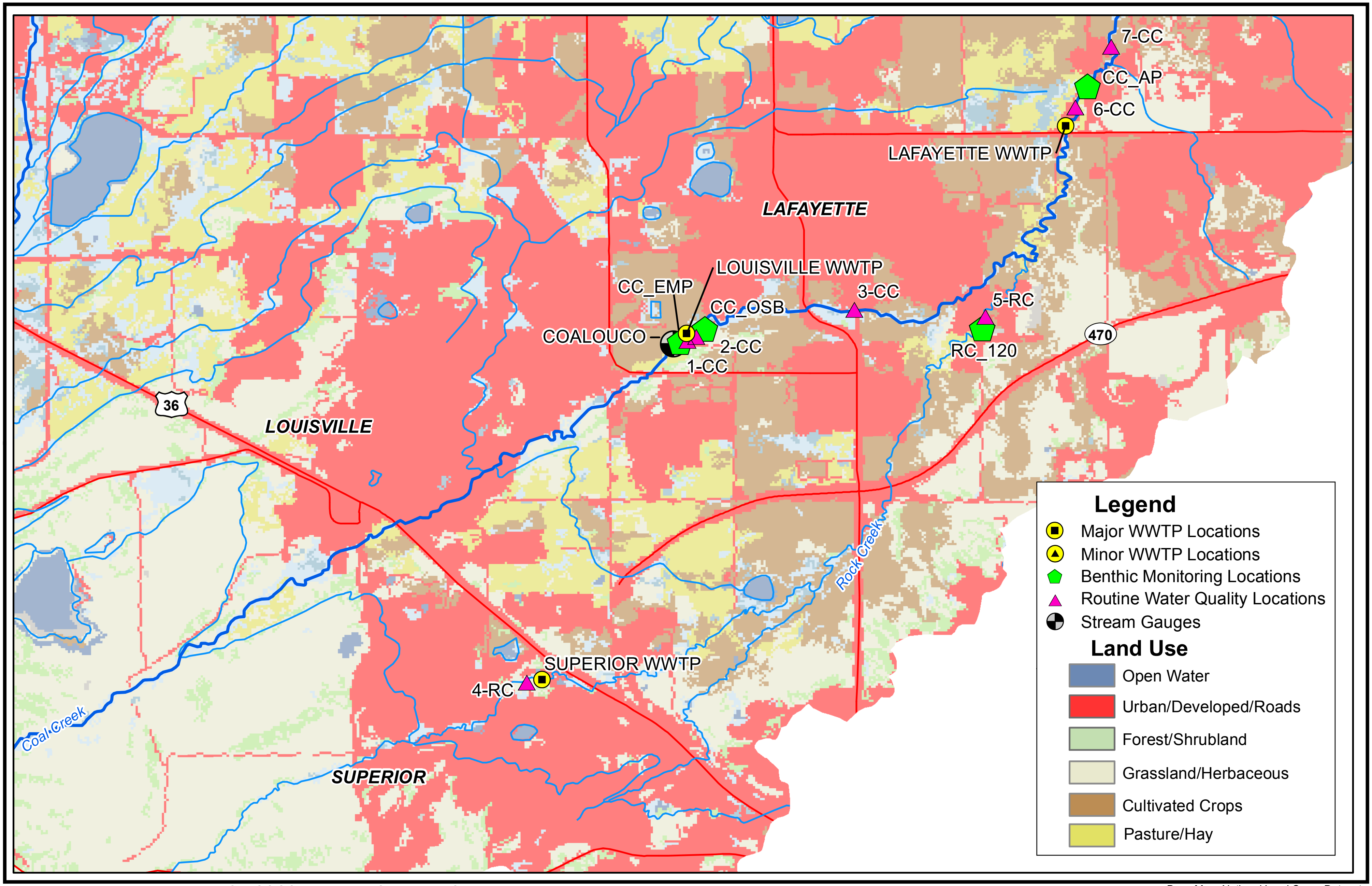
BOULDER CREEK WATERSHED

JOINT MONITORING PLAN LOCATIONS



PROJECT NO.
121-002.010

FIGURE
A-3



Path: Z:\Project Files\12\121-002\121-002.010\CAD-GIS\GIS\Monitoring Plan Series\Figure 2C_Boulder Monitoring Locations 62915.mxd

Base Map: National Land Cover Dataset

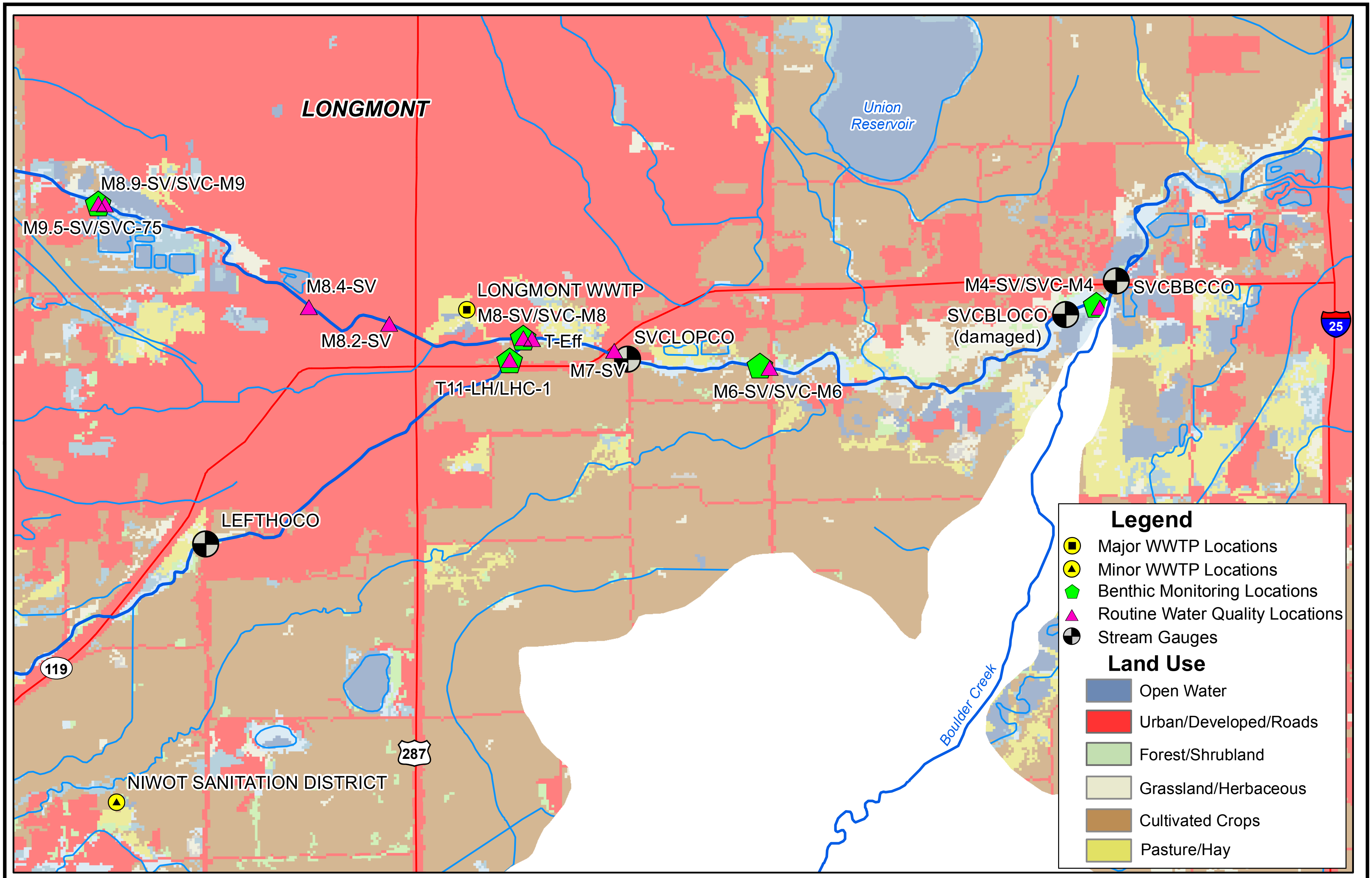
WWE
WRIGHT WATER ENGINEERS, INC.
2490 W 26TH AVE 100A
DENVER, CO. 80211
(303) 480-1700

BOULDER CREEK WATERSHED

JOINT MONITORING PLAN LOCATIONS

PROJECT NO.
121-002.010

FIGURE
A-4



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Base Map: National Land Cover Dataset

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2490 W 26TH AVE 100A
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ST. VRAIN CREEK WATERSHED

JOINT MONITORING PLAN LOCATIONS

N W E S

0 0.25 0.5 1
Miles

PROJECT NO.
121-002.010

FIGURE
A-5

Table A-1. Map Coordinates for Monitoring Locations

Station_Name	Data_Type	Latitude	Longitude	Monitored By
SBC_Eld	Benthic	39.93046	-105.292	City of Boulder
SBC_MT	Benthic	39.93924	-105.26	City of Boulder
SBC_OS	Benthic	39.97211	-105.224	City of Boulder
BC_28	Benthic	40.01152	-105.259	City of Boulder
BC_CAN	Benthic	40.01267	-105.301	City of Boulder
BC_55	Benthic	40.02899	-105.224	City of Boulder
BC_95	Benthic	40.04793	-105.129	City of Boulder
BC_aWTP	Benthic	40.05108	-105.177	City of Boulder
BC_aDC	Benthic	40.04948	-105.145	City of Boulder
BC_107	Benthic	40.05925	-105.103	City of Boulder
BC_aCC	Benthic	40.07584	-105.067	City of Boulder
SBC-3.5	WQ	39.97215	-105.224	City of Boulder
BC-CU	WQ	40.01113	-105.266	City of Boulder
BC-Can	WQ	40.01318	-105.301	City of Boulder
BC-61	WQ	40.03809	-105.212	City of Boulder
BC-95	WQ	40.04716	-105.129	City of Boulder
BC-aWWTP	WQ	40.05152	-105.179	City of Boulder
BC-aDC	WQ	40.04948	-105.145	City of Boulder
BC-107	WQ	40.05922	-105.103	City of Boulder
CC-Ken	WQ	40.06949	-105.059	City of Boulder
BC-bCC	WQ	40.09211	-105.055	City of Boulder
CC_EMP	Benthic	39.97609	-105.117	Coal Creek Cities
RC_120	Benthic	39.97762	-105.072	Coal Creek Cities
CC_OSB	Benthic	39.9777	-105.113	Coal Creek Cities
CC_AP	Benthic	40.00564	-105.055	Coal Creek Cities
CC_CLR	Benthic	40.06336	-105.056	Coal Creek Cities
1-CC	WQ	39.97611	-105.116	Coal Creek Cities
2-CC	WQ	39.9765	-105.116	Coal Creek Cities
3-CC	WQ	39.97985	-105.091	Coal Creek Cities
4-RC	WQ	39.93685	-105.138	Coal Creek Cities
5-RC	WQ	39.97897	-105.071	Coal Creek Cities
6-CC	WQ	40.00321	-105.057	Coal Creek Cities
7-CC	WQ	40.01025	-105.052	Coal Creek Cities
9-BC	WQ	40.1012	-105.048	Coal Creek Cities
10-BC	WQ	40.103	-105.047	Coal Creek Cities
11-BC	WQ	40.15222	-105.014	Coal Creek Cities
LHC_1	Benthic	40.15306	-105.09	Longmont
SVC_M9	Benthic	40.16937	-105.145	Longmont
SVC_M8	Benthic	40.15538	-105.088	Longmont
SVC_M6	Benthic	40.1524	-105.056	Longmont
SVC_M4	Benthic	40.15846	-105.011	Longmont
SG_2	Benthic	40.17175	-105.05	Longmont
M9.5-SV	WQ	40.16937	-105.145	Longmont
M8.9-SV	WQ	40.16928	-105.144	Longmont
M8.4-SV	WQ	40.15861	-105.117	Longmont
M8.2-SV	WQ	40.15687	-105.106	Longmont
M8-SV	WQ	40.1553	-105.088	Longmont
T11-LH	WQ	40.15513	-105.087	Longmont
T-Eff	WQ	40.15569	105.0862	Longmont
M7-SV	WQ	40.15296	105.0741	Longmont
M6-SV	WQ	40.15215	-105.055	Longmont
M4-SV	WQ	40.15817	105.0874	Longmont

Appendix B. Tabular Summary Statistics

Sample	No. of Samples	Minimum	Maximum	1st Quartile	Median	3rd Quartile	Mean	Standard Deviation (n)	Geometric Mean
Alkalinity (mg/L) | BC-Can	12	17.0	56.0	27.8	32.5	47.3	35.9	12.5	33.7
Alkalinity (mg/L) | BC-CU	12	19.0	62.0	33.5	36.5	50.8	40.3	13.1	37.9
Alkalinity (mg/L) | BC-61	12	26.0	82.0	53.0	59.0	68.0	57.3	16.9	54.2
Alkalinity (mg/L) | BC-aWWTP	12	29.0	85.0	59.0	71.5	83.0	66.2	19.2	62.4
Alkalinity (mg/L) | BC-aDC	12	36.0	100.0	76.3	81.5	93.0	79.3	19.5	76.2
Alkalinity (mg/L) | BC-95	0								
Alkalinity (mg/L) | BC-107	12	40.0	123.0	86.5	94.5	106.8	91.3	22.9	87.5
Alkalinity (mg/L) | BC-bCC	12	49.0	177.0	118.5	142.0	151.0	130.7	36.8	123.6
Alkalinity (mg/L) | 9-BC	0								
Alkalinity (mg/L) | E-BC [W]	0								
Alkalinity (mg/L) | 10-BC	0								
Alkalinity (mg/L) | 11-BC	0								
Alkalinity (mg/L) | SBC-3.5	12	22.0	70.0	27.3	32.5	33.8	34.9	13.8	32.8
Conductivity (umhos/cm) | BC-Can	12	40.6	179.3	76.6	101.4	146.8	107.9	44.1	98.2
Conductivity (umhos/cm) | BC-CU	11	43.5	229.3	100.6	127.1	151.6	129.7	53.2	117.5
Conductivity (umhos/cm) | BC-61	12	82.7	505.0	183.5	256.9	292.5	247.5	109.4	220.7
Conductivity (umhos/cm) | BC-aWWTP	12	72.6	532.0	204.9	306.5	360.3	287.3	123.7	251.5
Conductivity (umhos/cm) | BC-aDC	11	150.6	543.0	356.5	438.0	511.0	409.9	128.1	382.3
Conductivity (umhos/cm) | BC-95	12	156.6	569.0	361.0	446.0	486.8	409.7	117.9	386.6
Conductivity (umhos/cm) | BC-107	12	160.0	573.0	367.3	441.5	494.8	418.6	119.3	396.1
Conductivity (umhos/cm) | BC-bCC	12	216.5	761.0	504.3	578.0	647.5	566.4	145.1	542.0
Conductivity (umhos/cm) | 9-BC	0								
Conductivity (umhos/cm) | E-BC [W]	0								
Conductivity (umhos/cm) | 10-BC	0								
Conductivity (umhos/cm) | 11-BC	0								
Conductivity (umhos/cm) | SBC-3.5	12	69.7	284.9	73.9	86.9	111.1	110.3	60.2	99.7
Hardness, Total as CaCO3 (mg/L) | BC-Can	12	22.0	84.0	32.5	43.4	75.5	50.7	22.5	45.8
Hardness, Total as CaCO3 (mg/L) | BC-CU	12	34.0	145.0	45.0	56.5	90.5	68.8	32.6	61.9
Hardness, Total as CaCO3 (mg/L) | BC-61	12	38.0	150.0	76.4	88.4	114.3	92.9	31.9	86.7
Hardness, Total as CaCO3 (mg/L) | BC-aWWTP	12	38.0	160.0	88.7	123.0	141.7	111.5	37.3	103.1
Hardness, Total as CaCO3 (mg/L) | BC-aDC	12	60.0	200.0	132.2	158.9	185.2	149.8	42.5	141.9
Hardness, Total as CaCO3 (mg/L) | BC-95	0								
Hardness, Total as CaCO3 (mg/L) | BC-107	12	60.0	216.5	148.3	166.6	205.5	164.6	47.2	155.5
Hardness, Total as CaCO3 (mg/L) | BC-bCC	12	58.0	314.8	142.5	211.9	226.8	191.9	70.4	174.7
Hardness, Total as CaCO3 (mg/L) | 9-BC	0								
Hardness, Total as CaCO3 (mg/L) | E-BC [W]	0								
Hardness, Total as CaCO3 (mg/L) | 10-BC	0								
Hardness, Total as CaCO3 (mg/L) | 11-BC	0								
Hardness, Total as CaCO3 (mg/L) | SBC-3.5	12	24.4	123.1	36.0	52.0	59.0	54.8	26.3	49.6
DO (mg/L) | BC-Can	12	8.2	12.5	9.1	9.8	10.7	10.0	1.2	9.9
DO (mg/L) | BC-CU	12	8.0	12.9	9.2	9.9	11.4	10.3	1.5	10.2
DO (mg/L) | BC-61	12	6.6	12.6	7.9	9.2	10.5	9.3	1.8	9.1
DO (mg/L) | BC-aWWTP	12	7.3	12.9	8.6	9.6	11.0	9.9	1.7	9.7
DO (mg/L) | BC-aDC	12	7.4	12.0	8.4	9.3	10.1	9.4	1.4	9.3
DO (mg/L) | BC-95	11	7.9	12.2	8.2	9.4	9.8	9.4	1.4	9.3
DO (mg/L) | BC-107	11	7.6	13.3	8.5	9.2	10.2	9.5	1.5	9.3
DO (mg/L) | BC-bCC	11	6.9	13.4	8.4	9.3	10.7	9.6	2.0	9.4
DO (mg/L) | 9-BC	0								
DO (mg/L) | E-BC [W]	0								
DO (mg/L) | 10-BC	0								
DO (mg/L) | 11-BC	0								
DO (mg/L) | SBC-3.5	12	7.4	13.4	9.3	9.6	10.7	10.0	1.5	9.9
pH (SU) | BC-Can	11	6.2	7.4	6.6	6.7	7.1	6.8	0.4	6.8
pH (SU) | BC-CU	11	6.6	8.0	6.8	7.3	7.5	7.2	0.4	7.2
pH (SU) | BC-61	11	6.6	8.6	6.9	7.5	8.3	7.6	0.7	7.5
pH (SU) | BC-aWWTP	11	5.9	8.9	7.1	7.5	8.1	7.5	0.8	7.5
pH (SU) | BC-aDC	11	6.9	8.5	7.0	7.5	8.0	7.6	0.5	7.6
pH (SU) | BC-95	11	6.6	9.0	7.1	7.6	8.3	7.7	0.8	7.7
pH (SU) | BC-107	11	6.5	9.4	7.2	7.8	8.5	7.8	0.9	7.8
pH (SU) | BC-bCC	11	7.1	9.5	7.6	8.1	8.8	8.2	0.8	8.1
pH (SU) | 9-BC	0								
pH (SU) | E-BC [W]	0								
pH (SU) | 10-BC	0								
pH (SU) | 11-BC	0								
pH (SU) | SBC-3.5	11	6.8	8.5	6.9	7.1	7.6	7.3	0.5	7.3
Temperature (deg C) | BC-Can	12	0.0	14.8	1.3	7.0	10.7	6.7	5.6	
Temperature (deg C) | BC-CU	12	0.3	15.1	1.1	7.3	10.9	7.0	5.6	3.5
Temperature (deg C) | BC-61	12	0.6	19.6	2.3	10.5	13.1	9.0	6.4	5.7
Temperature (deg C) | BC-aWWTP	12	0.0	21.1	1.8	10.9	14.3	9.5	7.1	
Temperature (deg C) | BC-aDC	12	4.4	22.8	6.7	12.8	15.1	11.8	5.7	10.4
Temperature (deg C) | BC-95	12	3.8	23.7	5.8	13.8	16.5	12.2	6.4	10.3

Sample	No. of Samples	Minimum	Maximum	1st Quartile	Median	3rd Quartile	Mean	Standard Deviation (n)	Geometric Mean
Temperature (deg C) | BC-107	12	3.3	24.0	4.9	13.7	17.3	12.0	6.9	9.7
Temperature (deg C) | BC-bCC	12	2.7	22.7	4.5	14.5	17.8	12.1	7.1	9.4
Temperature (deg C) | 9-BC	0								
Temperature (deg C) | E-BC [W]	0								
Temperature (deg C) | 10-BC	0								
Temperature (deg C) | 11-BC	0								
Temperature (deg C) | SBC-3.5	11	0.0	17.9	0.6	5.1	10.6	6.6	6.0	
E_ coli (MPN/100 mL) | BC-Can	12	1.0	387.3	2.6	12.9	21.9	45.4	104.2	9.3
E_ coli (MPN/100 mL) | BC-CU	12	10.8	866.4	50.0	101.5	181.8	187.7	234.3	95.9
E_ coli (MPN/100 mL) | BC-61	12	3.1	2419.6	47.8	107.9	145.0	399.9	732.6	103.5
E_ coli (MPN/100 mL) | BC-aWWTP	11	5.2	2419.6	21.4	52.9	111.1	288.6	678.9	62.4
E_ coli (MPN/100 mL) | BC-aDC	12	16.0	2419.6	55.2	93.3	105.9	280.2	646.5	97.8
E_ coli (MPN/100 mL) | BC-95	0								
E_ coli (MPN/100 mL) | BC-107	12	9.7	2419.6	32.8	62.2	86.8	262.6	652.5	66.4
E_ coli (MPN/100 mL) | BC-bCC	12	27.5	2419.6	37.7	86.1	116.1	284.2	647.3	94.5
E_ coli (MPN/100 mL) | 9-BC	0								
E_ coli (MPN/100 mL) | E-BC [W]	0								
E_ coli (MPN/100 mL) | 10-BC	0								
E_ coli (MPN/100 mL) | 11-BC	0								
E_ coli (MPN/100 mL) | SBC-3.5	12	1.0	40.2	6.0	16.1	21.1	16.4	12.0	10.7
TSS (mg/L) | BC-Can	12	0.0	30.0	0.8	2.0	5.0	5.2	8.1	
TSS (mg/L) | BC-CU	12	0.0	112.0	1.0	2.0	12.0	18.7	34.0	
TSS (mg/L) | BC-61	12	0.0	12.0	2.8	3.5	10.0	5.3	3.9	
TSS (mg/L) | BC-aWWTP	12	1.0	12.0	2.5	3.5	10.3	5.4	4.3	3.7
TSS (mg/L) | BC-aDC	12	3.0	11.0	3.8	6.5	10.0	6.8	2.9	6.0
TSS (mg/L) | BC-95	4	3.0	12.0	3.0	5.0	8.3	6.3	3.7	5.2
TSS (mg/L) | BC-107	12	2.0	66.0	5.3	9.5	12.5	13.5	16.5	8.4
TSS (mg/L) | BC-bCC	12	6.0	192.0	10.3	14.5	23.0	29.9	49.4	16.6
TSS (mg/L) | 9-BC	0								
TSS (mg/L) | E-BC [W]	0								
TSS (mg/L) | 10-BC	0								
TSS (mg/L) | 11-BC	0								
TSS (mg/L) | SBC-3.5	12	0.00	49.00	0.75	5.50	9.75	9.25	13.21	
Nitrogen Ammonia as N (mg/L) | BC-Can	12	0.00	0.03	0.00	0.01	0.02	0.01	0.01	
Nitrogen Ammonia as N (mg/L) | BC-CU	12	0.00	0.02	0.00	0.01	0.01	0.01	0.01	
Nitrogen Ammonia as N (mg/L) | BC-61	12	0.00	0.06	0.02	0.02	0.05	0.03	0.02	
Nitrogen Ammonia as N (mg/L) | BC-aWWTP	12	0.00	0.05	0.00	0.01	0.02	0.01	0.02	
Nitrogen Ammonia as N (mg/L) | BC-aDC	12	0.00	0.08	0.03	0.04	0.06	0.04	0.02	
Nitrogen Ammonia as N (mg/L) | BC-95	12	0.00	0.07	0.03	0.04	0.05	0.04	0.02	
Nitrogen Ammonia as N (mg/L) | BC-107	12	0.00	0.15	0.02	0.05	0.07	0.05	0.04	
Nitrogen Ammonia as N (mg/L) | BC-bCC	12	0.00	0.49	0.03	0.06	0.10	0.10	0.13	
Nitrogen Ammonia as N (mg/L) | 9-BC	12	0.00	0.13	0.00	0.00	0.05	0.03	0.04	
Nitrogen Ammonia as N (mg/L) | E-BC [W]	12	0.00	1.69	0.13	0.48	0.68	0.49	0.45	
Nitrogen Ammonia as N (mg/L) | 10-BC	12	0.00	0.13	0.00	0.00	0.02	0.02	0.04	
Nitrogen Ammonia as N (mg/L) | 11-BC	12	0.00	0.09	0.00	0.00	0.06	0.03	0.04	
Nitrogen Ammonia as N (mg/L) | SBC-3.5	12	0.00	0.03	0.00	0.00	0.01	0.01	0.01	
Nitrogen Nitrate/Nitrite as N (mg/L) | BC-Can	12	0.00	0.40	0.00	0.00	0.00	0.07	0.15	
Nitrogen Nitrate/Nitrite as N (mg/L) | BC-CU	12	0.00	0.60	0.00	0.00	0.43	0.20	0.24	
Nitrogen Nitrate/Nitrite as N (mg/L) | BC-61	12	0.00	0.60	0.00	0.00	0.43	0.21	0.25	
Nitrogen Nitrate/Nitrite as N (mg/L) | BC-aWWTP	12	0.06	0.58	0.09	0.29	0.38	0.27	0.16	0.21
Nitrogen Nitrate/Nitrite as N (mg/L) | BC-aDC	12	0.80	6.22	3.00	4.17	5.55	3.88	1.84	3.23
Nitrogen Nitrate/Nitrite as N (mg/L) | BC-95	12	0.80	5.32	2.25	3.35	4.07	3.15	1.48	2.70
Nitrogen Nitrate/Nitrite as N (mg/L) | BC-107	12	0.70	4.23	2.14	2.85	3.32	2.65	1.06	2.35
Nitrogen Nitrate/Nitrite as N (mg/L) | BC-bCC	12	0.71	5.64	1.47	3.48	4.82	3.27	1.76	2.65
Nitrogen Nitrate/Nitrite as N (mg/L) | 9-BC	12	0.47	6.87	2.26	3.97	5.60	3.90	2.03	3.14
Nitrogen Nitrate/Nitrite as N (mg/L) | E-BC [W]	12	7.29	12.01	10.16	10.65	11.50	10.53	1.25	10.44
Nitrogen Nitrate/Nitrite as N (mg/L) | 10-BC	12	0.38	6.98	2.17	3.85	5.41	3.86	2.02	3.09
Nitrogen Nitrate/Nitrite as N (mg/L) | 11-BC	12	0.48	6.54	1.83	3.53	5.06	3.56	1.98	2.86
Nitrogen Nitrate/Nitrite as N (mg/L) | SBC-3.5	12	0.00	0.01	0.00	0.00	0.00	0.00	0.00	
Nitrogen TKN (mg/L) | BC-Can	12	0.14	0.38	0.20	0.23	0.29	0.25	0.07	0.24
Nitrogen TKN (mg/L) | BC-CU	0								
Nitrogen TKN (mg/L) | BC-61	12	0.20	0.42	0.27	0.33	0.36	0.32	0.06	0.31
Nitrogen TKN (mg/L) | BC-aWWTP	12	0.20	0.43	0.28	0.34	0.38	0.32	0.08	0.31
Nitrogen TKN (mg/L) | BC-aDC	12	0.40	1.33	0.75	0.82	1.03	0.85	0.26	0.81
Nitrogen TKN (mg/L) | BC-95	12	0.40	0.94	0.58	0.62	0.76	0.67	0.17	0.65
Nitrogen TKN (mg/L) | BC-107	12	0.36	0.86	0.57	0.64	0.79	0.65	0.14	0.64
Nitrogen TKN (mg/L) | BC-bCC	12	0.49	1.37	0.71	0.88	0.96	0.88	0.24	0.85
Nitrogen TKN (mg/L) | 9-BC	12	0.30	1.00	0.58	0.80	0.90	0.73	0.22	0.69
Nitrogen TKN (mg/L) | E-BC [W]	12	1.80	4.30	2.20	2.60	2.98	2.68	0.67	2.61
Nitrogen TKN (mg/L) | 10-BC	12	0.00	1.40	0.48	0.70	1.03	0.68	0.41	
Nitrogen TKN (mg/L) | 11-BC	12	0.00	1.20	0.50	0.70	0.80	0.63	0.32	

Sample	No. of Samples	Minimum	Maximum	1st Quartile	Median	3rd Quartile	Mean	Standard Deviation (n)	Geometric Mean
Nitrogen TKN (mg/L) | SBC-3.5	0								
Nitrogen Nitrate as N (mg/L) | BC-Can	12	0.00	0.40	0.00	0.00	0.00	0.07	0.15	
Nitrogen Nitrate as N (mg/L) | BC-CU	12	0.00	0.60	0.00	0.00	0.43	0.20	0.24	
Nitrogen Nitrate as N (mg/L) | BC-61	12	0.00	0.60	0.00	0.00	0.43	0.21	0.25	
Nitrogen Nitrate as N (mg/L) | BC-aWWTP	12	0.06	0.58	0.09	0.29	0.38	0.27	0.16	0.21
Nitrogen Nitrate as N (mg/L) | BC-aDC	12	0.80	6.20	3.00	4.15	5.55	3.88	1.84	3.22
Nitrogen Nitrate as N (mg/L) | BC-95	12	0.80	5.30	2.25	3.35	4.05	3.14	1.47	2.69
Nitrogen Nitrate as N (mg/L) | BC-107	12	0.70	4.20	2.13	2.85	3.28	2.63	1.06	2.35
Nitrogen Nitrate as N (mg/L) | BC-bCC	12	0.70	5.50	1.45	3.45	4.73	3.23	1.73	2.62
Nitrogen Nitrate as N (mg/L) | 9-BC	12	0.47	6.87	2.26	3.97	5.60	3.90	2.03	3.15
Nitrogen Nitrate as N (mg/L) | E-BC [W]	12	6.65	12.00	9.27	10.25	11.04	10.12	1.42	10.01
Nitrogen Nitrate as N (mg/L) | 10-BC	12	0.38	6.98	2.17	3.85	5.32	3.84	2.01	3.08
Nitrogen Nitrate as N (mg/L) | 11-BC	12	0.48	6.54	1.83	3.53	5.06	3.55	1.97	2.85
Nitrogen Nitrate as N (mg/L) | SBC-3.5	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Nitrogen Nitrite as N (mg/L) | BC-Can	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Nitrogen Nitrite as N (mg/L) | BC-CU	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Nitrogen Nitrite as N (mg/L) | BC-61	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Nitrogen Nitrite as N (mg/L) | BC-aWWTP	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Nitrogen Nitrite as N (mg/L) | BC-aDC	12	0.00	0.04	0.00	0.00	0.01	0.01	0.01	
Nitrogen Nitrite as N (mg/L) | BC-95	12	0.00	0.03	0.00	0.01	0.01	0.01	0.01	
Nitrogen Nitrite as N (mg/L) | BC-107	12	0.00	0.06	0.00	0.01	0.01	0.01	0.02	
Nitrogen Nitrite as N (mg/L) | BC-bCC	12	0.00	0.14	0.01	0.02	0.02	0.03	0.05	
Nitrogen Nitrite as N (mg/L) | 9-BC	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Nitrogen Nitrite as N (mg/L) | E-BC [W]	12	0.00	1.23	0.19	0.44	0.67	0.51	0.40	
Nitrogen Nitrite as N (mg/L) | 10-BC	12	0.00	0.12	0.00	0.00	0.00	0.02	0.04	
Nitrogen Nitrite as N (mg/L) | 11-BC	12	0.00	0.17	0.00	0.00	0.00	0.01	0.05	
Nitrogen Nitrite as N (mg/L) | SBC-3.5	12	0.00	0.01	0.00	0.00	0.00	0.00	0.00	
Nitrogen Total (mg/L) | BC-Can	12	0.14	0.59	0.23	0.27	0.35	0.31	0.13	0.29
Nitrogen Total (mg/L) | BC-CU	0								
Nitrogen Total (mg/L) | BC-61	12	0.26	0.86	0.34	0.38	0.81	0.53	0.24	0.47
Nitrogen Total (mg/L) | BC-aWWTP	12	0.27	0.88	0.47	0.61	0.71	0.59	0.17	0.56
Nitrogen Total (mg/L) | BC-aDC	12	1.20	7.24	3.75	5.27	6.49	4.73	2.03	4.10
Nitrogen Total (mg/L) | BC-95	12	1.20	6.21	2.84	3.89	4.85	3.82	1.61	3.41
Nitrogen Total (mg/L) | BC-107	12	1.06	5.02	2.86	3.42	4.10	3.30	1.16	3.03
Nitrogen Total (mg/L) | BC-bCC	12	1.49	6.51	2.73	4.39	5.76	4.15	1.74	3.71
Nitrogen Total (mg/L) | 9-BC	12	0.70	7.80	3.13	4.80	6.30	4.62	2.11	3.91
Nitrogen Total (mg/L) | E-BC [W]	12	9.90	14.70	12.60	13.65	13.90	13.21	1.25	13.14
Nitrogen Total (mg/L) | 10-BC	12	0.40	7.80	3.05	4.80	6.33	4.53	2.20	3.68
Nitrogen Total (mg/L) | 11-BC	12	0.50	7.30	2.70	4.15	5.88	4.21	2.06	3.49
Nitrogen Total (mg/L) | SBC-3.5	0								
Nitrogen Total Inorganic (mg/L) | BC-Can	12	0.00	0.81	0.00	0.01	0.02	0.11	0.24	
Nitrogen Total Inorganic (mg/L) | BC-CU	12	0.00	0.62	0.00	0.02	0.43	0.21	0.24	
Nitrogen Total Inorganic (mg/L) | BC-61	12	0.00	0.62	0.02	0.06	0.47	0.24	0.25	
Nitrogen Total Inorganic (mg/L) | BC-aWWTP	12	0.06	0.60	0.11	0.32	0.41	0.28	0.17	0.22
Nitrogen Total Inorganic (mg/L) | BC-aDC	12	0.83	6.28	3.04	4.22	5.59	3.93	1.84	3.28
Nitrogen Total Inorganic (mg/L) | BC-95	12	0.85	5.36	2.29	3.37	4.13	3.19	1.48	2.75
Nitrogen Total Inorganic (mg/L) | BC-107	12	0.76	4.38	2.16	2.87	3.38	2.70	1.07	2.41
Nitrogen Total Inorganic (mg/L) | BC-bCC	12	0.74	5.83	1.84	3.49	4.92	3.36	1.75	2.76
Nitrogen Total Inorganic (mg/L) | 9-BC	12	0.47	6.94	2.27	3.97	5.69	3.93	2.04	3.17
Nitrogen Total Inorganic (mg/L) | E-BC [W]	12	7.86	12.38	10.77	11.21	11.84	11.02	1.23	10.94
Nitrogen Total Inorganic (mg/L) | 10-BC	12	0.38	6.98	2.17	3.85	5.43	3.88	2.04	3.10
Nitrogen Total Inorganic (mg/L) | 11-BC	12	0.48	6.61	1.83	3.56	5.13	3.59	2.00	2.88
Nitrogen Total Inorganic (mg/L) | SBC-3.5	12	0.00	0.03	0.00	0.00	0.01	0.01	0.01	
Phosphorus as P, Tot (mg/L) | BC-Can	11	0.00	0.06	0.01	0.01	0.02	0.02	0.02	
Phosphorus as P, Tot (mg/L) | BC-CU	11	0.00	0.10	0.01	0.01	0.03	0.03	0.03	
Phosphorus as P, Tot (mg/L) | BC-61	11	0.00	0.03	0.02	0.02	0.03	0.02	0.01	
Phosphorus as P, Tot (mg/L) | BC-aWWTP	12	0.01	0.06	0.02	0.03	0.03	0.03	0.01	0.03
Phosphorus as P, Tot (mg/L) | BC-aDC	11	0.12	1.48	0.64	0.94	1.07	0.85	0.37	0.73
Phosphorus as P, Tot (mg/L) | BC-95	0								
Phosphorus as P, Tot (mg/L) | BC-107	11	0.14	0.98	0.48	0.54	0.67	0.57	0.21	0.52
Phosphorus as P, Tot (mg/L) | BC-bCC	11	0.15	1.01	0.38	0.59	0.80	0.59	0.26	0.52
Phosphorus as P, Tot (mg/L) | 9-BC	12	0.14	1.03	0.46	0.56	0.86	0.62	0.28	0.54
Phosphorus as P, Tot (mg/L) | E-BC [W]	12	0.09	0.25	0.12	0.14	0.16	0.15	0.05	0.14
Phosphorus as P, Tot (mg/L) | 10-BC	12	0.16	1.00	0.44	0.58	0.83	0.60	0.26	0.53
Phosphorus as P, Tot (mg/L) | 11-BC	12	0.13	1.03	0.29	0.57	0.77	0.56	0.27	0.48
Phosphorus as P, Tot (mg/L) | SBC-3.5	11	0.00	0.06	0.00	0.01	0.02	0.02	0.02	
Arsenic, T (ug/L) | BC-Can	11	0.22	4.18	0.38	0.59	0.82	0.92	1.07	0.63
Arsenic, T (ug/L) | BC-CU	11	0.27	6.95	0.53	0.68	1.04	1.64	2.14	0.91
Arsenic, T (ug/L) | BC-61	11	0.00	3.28	0.98	1.57	2.47	1.67	0.99	
Arsenic, T (ug/L) | BC-aWWTP	11	0.92	2.89	1.03	1.39	1.83	1.55	0.62	1.44
Arsenic, T (ug/L) | BC-aDC	11	0.82	2.65	0.94	1.27	1.52	1.34	0.50	1.26

Sample	No. of Samples	Minimum	Maximum	1st Quartile	Median	3rd Quartile	Mean	Standard Deviation (n)	Geometric Mean
Arsenic, T (ug/L) | BC-95	0								
Arsenic, T (ug/L) | BC-107	11	0.76	2.68	1.13	1.36	1.69	1.52	0.56	1.42
Arsenic, T (ug/L) | BC-bCC	11	0.88	5.15	1.09	1.40	1.83	1.76	1.16	1.53
Arsenic, T (ug/L) | 9-BC	0								
Arsenic, T (ug/L) | E-BC [W]	0								
Arsenic, T (ug/L) | 10-BC	0								
Arsenic, T (ug/L) | 11-BC	0								
Arsenic, T (ug/L) | SBC-3.5	11	0.13	0.62	0.19	0.25	0.30	0.28	0.13	0.25
Selenium, D (ug/L) | BC-Can	11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Selenium, D (ug/L) | BC-CU	11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Selenium, D (ug/L) | BC-61	11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Selenium, D (ug/L) | BC-aWWTP	11	0.00	0.56	0.00	0.00	0.00	0.10	0.21	
Selenium, D (ug/L) | BC-aDC	11	0.00	0.82	0.42	0.63	0.67	0.53	0.21	
Selenium, D (ug/L) | BC-95	0								
Selenium, D (ug/L) | BC-107	11	0.00	0.67	0.39	0.45	0.56	0.41	0.21	
Selenium, D (ug/L) | BC-bCC	11	0.00	1.56	0.85	1.12	1.18	0.99	0.39	
Selenium, D (ug/L) | 9-BC	0								
Selenium, D (ug/L) | E-BC [W]	0								
Selenium, D (ug/L) | 10-BC	0								
Selenium, D (ug/L) | 11-BC	0								
Selenium, D (ug/L) | SBC-3.5	11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Stream Flow (cfs) | BC-Can	0								
Stream Flow (cfs) | BC-CU	0								
Stream Flow (cfs) | BC-61	0								
Stream Flow (cfs) | BC-aWWTP	12	21.0	632.0	38.8	41.0	96.5	115.4	166.4	64.1
Stream Flow (cfs) | BC-aDC	7	40.3	77.0	54.3	64.2	72.6	62.2	12.9	60.7
Stream Flow (cfs) | BC-95	0								
Stream Flow (cfs) | BC-107	0								
Stream Flow (cfs) | BC-bCC	0								
Stream Flow (cfs) | 9-BC	0								
Stream Flow (cfs) | E-BC [W]	0								
Stream Flow (cfs) | 10-BC	0								
Stream Flow (cfs) | 11-BC	12	56.0	1920.0	127.8	148.5	170.0	293.2	493.2	168.0
Stream Flow (cfs) | SBC-3.5	0								
Discharge (MGD) | BC-Can	0								
Discharge (MGD) | BC-CU	0								
Discharge (MGD) | BC-61	0								
Discharge (MGD) | BC-aWWTP	0								
Discharge (MGD) | BC-aDC	0								
Discharge (MGD) | BC-95	0								
Discharge (MGD) | BC-107	0								
Discharge (MGD) | BC-bCC	0								
Discharge (MGD) | 9-BC	0								
Discharge (MGD) | E-BC [W]	12	1.1	1.5	1.3	1.3	1.4	1.3	0.1	1.3
Discharge (MGD) | 10-BC	0								
Discharge (MGD) | 11-BC	0								
Discharge (MGD) | SBC-3.5	0								

Sample	No. of Samples	Minimum	Maximum	1st Quartile	Median	3rd Quartile	Mean	Standard Deviation (n)	Geometric Mean
Alkalinity (mg/L) | 1-CC	0								
Alkalinity (mg/L) | A-CC [W]	0								
Alkalinity (mg/L) | 2-CC	0								
Alkalinity (mg/L) | 3-CC	4	240.0	291.0	240.0	248.5	265.5	257.0	20.8	256.2
Alkalinity (mg/L) | 6-CC	4	240.0	342.0	265.5	282.5	303.8	286.8	36.8	284.4
Alkalinity (mg/L) | 7-CC	4	223.0	274.0	261.3	274.0	274.0	261.3	22.1	260.2
Alkalinity (mg/L) | 8-CC	0								
Alkalinity (mg/L) | CC-Ken	12	161.0	281.0	239.8	248.5	258.8	242.8	33.1	240.1
Alkalinity (mg/L) | 4-RC	0								
Alkalinity (mg/L) | B-RC [W]	0								
Alkalinity (mg/L) | 5-RC	4	223.0	342.0	248.5	274.0	303.8	278.3	44.0	274.8
Conductivity (umhos/cm) | 1-CC	0								
Conductivity (umhos/cm) | A-CC [W]	0								
Conductivity (umhos/cm) | 2-CC	1	758.0	758.0	758.0	758.0	758.0	758.0	44.0	758.0
Conductivity (umhos/cm) | 3-CC	2	849.0	854.0	850.3	851.5	852.8	851.5	2.5	851.5
Conductivity (umhos/cm) | 6-CC	2	1162.0	1180.0	1166.5	1171.0	1175.5	1171.0	9.0	1171.0
Conductivity (umhos/cm) | 7-CC	2	1134.0	1149.0	1137.8	1141.5	1145.3	1141.5	7.5	1141.5
Conductivity (umhos/cm) | 8-CC	0								
Conductivity (umhos/cm) | CC-Ken	12	950.0	1407.0	999.3	1093.5	1254.0	1123.3	142.7	1114.5
Conductivity (umhos/cm) | 4-RC	0								
Conductivity (umhos/cm) | B-RC [W]	0								
Conductivity (umhos/cm) | 5-RC	2	1400.0	1673.0	1468.3	1536.5	1604.8	1536.5	136.5	1530.4
Hardness, Total as CaCO3 (mg/L) | 1-CC	0								
Hardness, Total as CaCO3 (mg/L) | A-CC [W]	0								
Hardness, Total as CaCO3 (mg/L) | 2-CC	1	211.0	211.0	211.0	211.0	211.0	211.0	136.5	211.0
Hardness, Total as CaCO3 (mg/L) | 3-CC	11	154.0	300.0	218.5	240.0	253.0	238.4	39.5	234.9
Hardness, Total as CaCO3 (mg/L) | 6-CC	11	171.0	377.0	287.0	325.0	342.0	303.5	55.0	297.4
Hardness, Total as CaCO3 (mg/L) | 7-CC	11	197.0	369.0	270.0	291.0	334.0	294.4	48.7	290.0
Hardness, Total as CaCO3 (mg/L) | 8-CC	0								
Hardness, Total as CaCO3 (mg/L) | CC-Ken	0								
Hardness, Total as CaCO3 (mg/L) | 4-RC	0								
Hardness, Total as CaCO3 (mg/L) | B-RC [W]	0								
Hardness, Total as CaCO3 (mg/L) | 5-RC	11	240.0	471.0	270.0	317.0	368.5	323.2	68.0	316.3
DO (mg/L) | 1-CC	0								
DO (mg/L) | A-CC [W]	0								
DO (mg/L) | 2-CC	0								
DO (mg/L) | 3-CC	0								
DO (mg/L) | 6-CC	0								
DO (mg/L) | 7-CC	0								
DO (mg/L) | 8-CC	0								
DO (mg/L) | CC-Ken	11	5.9	14.0	7.2	8.3	10.3	9.1	2.6	8.8
DO (mg/L) | 4-RC	0								
DO (mg/L) | B-RC [W]	0								
DO (mg/L) | 5-RC	0								
pH (SU) | 1-CC	0								
pH (SU) | A-CC [W]	0								
pH (SU) | 2-CC	1	7.9	7.9	7.9	7.9	7.9	7.9	2.6	7.9
pH (SU) | 3-CC	11	8.0	8.3	8.1	8.1	8.2	8.1	0.1	8.1
pH (SU) | 6-CC	11	7.8	8.3	8.1	8.2	8.2	8.1	0.1	8.1
pH (SU) | 7-CC	11	7.9	8.2	8.1	8.1	8.2	8.1	0.1	8.1
pH (SU) | 8-CC	0								
pH (SU) | CC-Ken	11	7.4	8.7	7.7	7.9	8.2	8.0	0.4	8.0
pH (SU) | 4-RC	0								
pH (SU) | B-RC [W]	0								
pH (SU) | 5-RC	11	7.9	8.1	8.0	8.0	8.1	8.0	0.1	8.0
Temperature (deg C) | 1-CC	0								
Temperature (deg C) | A-CC [W]	0								
Temperature (deg C) | 2-CC	1	10.0	10.0	10.0	10.0	10.0	10.0	0.1	10.0
Temperature (deg C) | 3-CC	0								
Temperature (deg C) | 6-CC	0								
Temperature (deg C) | 7-CC	0								
Temperature (deg C) | 8-CC	0								
Temperature (deg C) | CC-Ken	12	2.6	21.5	4.2	14.0	18.4	12.3	7.1	9.7
Temperature (deg C) | 4-RC	0								
Temperature (deg C) | B-RC [W]	0								
Temperature (deg C) | 5-RC	0								
TSS (mg/L) | 1-CC	0								
TSS (mg/L) | A-CC [W]	0								
TSS (mg/L) | 2-CC	1	4.8	4.8	4.8	4.8	4.8	4.8	7.1	4.8
TSS (mg/L) | 3-CC	0								
TSS (mg/L) | 6-CC	0								

Sample	No. of Samples	Minimum	Maximum	1st Quartile	Median	3rd Quartile	Mean	Standard Deviation (n)	Geometric Mean
TSS (mg/L) | 7-CC	0								
TSS (mg/L) | 8-CC	0								
TSS (mg/L) | CC-Ken	12	4.0	707.0	10.5	20.5	46.5	85.3	189.2	26.1
TSS (mg/L) | 4-RC	0								
TSS (mg/L) | B-RC [W]	0								
TSS (mg/L) | 5-RC	0								
Nitrogen Ammonia as N (mg/L) | 1-CC	12	0.00	0.05	0.02	0.03	0.03	0.03	0.01	
Nitrogen Ammonia as N (mg/L) | A-CC [W]	12	0.05	0.98	0.06	0.08	0.10	0.15	0.25	0.09
Nitrogen Ammonia as N (mg/L) | 2-CC	9	0.02	2.60	0.03	0.04	0.09	0.33	0.80	0.07
Nitrogen Ammonia as N (mg/L) | 3-CC	12	0.02	0.08	0.03	0.04	0.06	0.05	0.02	0.04
Nitrogen Ammonia as N (mg/L) | 6-CC	12	0.02	0.07	0.03	0.04	0.04	0.04	0.01	0.04
Nitrogen Ammonia as N (mg/L) | 7-CC	12	0.03	0.66	0.05	0.06	0.09	0.13	0.18	0.08
Nitrogen Ammonia as N (mg/L) | 8-CC	12	0.00	0.37	0.00	0.04	0.19	0.10	0.13	
Nitrogen Ammonia as N (mg/L) | CC-Ken	12	0.04	0.30	0.04	0.07	0.15	0.11	0.09	0.08
Nitrogen Ammonia as N (mg/L) | 4-RC	0								
Nitrogen Ammonia as N (mg/L) | B-RC [W]	12	0.00	18.12	0.05	0.15	0.80	1.85	4.93	
Nitrogen Ammonia as N (mg/L) | 5-RC	12	0.02	0.31	0.03	0.05	0.06	0.07	0.08	0.05
Nitrogen Nitrate/Nitrite as N (mg/L) | 1-CC	12	0.11	1.50	0.27	0.33	0.84	0.58	0.46	0.42
Nitrogen Nitrate/Nitrite as N (mg/L) | A-CC [W]	12	4.10	13.30	6.23	6.90	7.25	7.28	2.43	6.94
Nitrogen Nitrate/Nitrite as N (mg/L) | 2-CC	9	0.00	11.50	2.60	4.10	5.40	4.26	3.10	
Nitrogen Nitrate/Nitrite as N (mg/L) | 3-CC	12	0.57	4.40	2.40	3.45	3.90	3.16	1.05	2.86
Nitrogen Nitrate/Nitrite as N (mg/L) | 6-CC	12	0.86	4.50	1.50	2.25	4.13	2.60	1.35	2.22
Nitrogen Nitrate/Nitrite as N (mg/L) | 7-CC	12	2.50	8.80	3.95	5.75	7.05	5.57	1.96	5.18
Nitrogen Nitrate/Nitrite as N (mg/L) | 8-CC	12	3.08	10.26	6.38	8.77	9.62	7.72	2.31	7.28
Nitrogen Nitrate/Nitrite as N (mg/L) | CC-Ken	12	2.13	10.20	5.90	7.08	8.78	6.86	2.44	6.24
Nitrogen Nitrate/Nitrite as N (mg/L) | 4-RC	12	0.39	3.71	0.89	1.18	2.13	1.51	0.95	1.25
Nitrogen Nitrate/Nitrite as N (mg/L) | B-RC [W]	12	1.47	15.50	11.45	12.42	13.50	11.71	3.41	10.49
Nitrogen Nitrate/Nitrite as N (mg/L) | 5-RC	12	0.29	11.00	1.05	3.00	5.40	3.53	3.05	2.18
Nitrogen TKN (mg/L) | 1-CC	12	0.36	0.69	0.44	0.47	0.58	0.50	0.10	0.49
Nitrogen TKN (mg/L) | A-CC [W]	12	1.30	3.40	1.68	1.70	1.90	1.86	0.50	1.81
Nitrogen TKN (mg/L) | 2-CC	8	0.00	1.80	0.90	1.20	1.53	1.12	0.53	
Nitrogen TKN (mg/L) | 3-CC	12	0.82	1.60	0.91	0.97	1.05	1.04	0.22	1.02
Nitrogen TKN (mg/L) | 6-CC	12	0.81	1.20	0.88	0.94	1.03	0.97	0.13	0.96
Nitrogen TKN (mg/L) | 7-CC	12	0.90	2.00	1.00	1.20	1.43	1.29	0.32	1.25
Nitrogen TKN (mg/L) | 8-CC	12	0.00	1.80	0.40	1.00	1.25	0.91	0.53	
Nitrogen TKN (mg/L) | CC-Ken	12	0.77	3.00	0.96	1.03	1.11	1.19	0.56	1.12
Nitrogen TKN (mg/L) | 4-RC	12	0.40	1.70	0.48	0.70	0.98	0.83	0.41	0.74
Nitrogen TKN (mg/L) | B-RC [W]	12	0.60	18.50	1.50	1.70	2.08	3.05	4.69	1.89
Nitrogen TKN (mg/L) | 5-RC	12	0.72	1.70	0.86	0.99	1.03	1.02	0.25	0.99
Nitrogen Nitrate as N (mg/L) | 1-CC	12	0.11	1.40	0.23	0.31	0.76	0.55	0.43	0.40
Nitrogen Nitrate as N (mg/L) | A-CC [W]	12	4.10	13.20	6.23	6.85	7.25	7.26	2.40	6.92
Nitrogen Nitrate as N (mg/L) | 2-CC	9	1.40	11.40	2.60	4.10	5.30	4.51	2.76	3.84
Nitrogen Nitrate as N (mg/L) | 3-CC	12	0.57	4.40	2.40	3.35	3.90	3.15	1.05	2.85
Nitrogen Nitrate as N (mg/L) | 6-CC	12	0.86	4.50	1.50	2.20	4.13	2.59	1.35	2.21
Nitrogen Nitrate as N (mg/L) | 7-CC	12	2.50	8.70	3.93	5.70	6.95	5.52	1.94	5.14
Nitrogen Nitrate as N (mg/L) | 8-CC	12	3.08	10.16	6.38	8.77	9.62	7.72	2.30	7.28
Nitrogen Nitrate as N (mg/L) | CC-Ken	12	2.10	10.10	5.88	7.00	8.75	6.82	2.42	6.20
Nitrogen Nitrate as N (mg/L) | 4-RC	0								
Nitrogen Nitrate as N (mg/L) | B-RC [W]	0								
Nitrogen Nitrate as N (mg/L) | 5-RC	12	0.29	10.90	1.05	2.95	5.40	3.50	3.03	2.17
Nitrogen Nitrite as N (mg/L) | 1-CC	12	0.00	0.14	0.00	0.00	0.06	0.04	0.05	
Nitrogen Nitrite as N (mg/L) | A-CC [W]	12	0.01	0.12	0.02	0.03	0.05	0.04	0.03	0.03
Nitrogen Nitrite as N (mg/L) | 2-CC	9	0.00	3.30	0.00	0.05	0.06	0.39	1.03	
Nitrogen Nitrite as N (mg/L) | 3-CC	12	0.00	0.08	0.00	0.02	0.05	0.03	0.02	
Nitrogen Nitrite as N (mg/L) | 6-CC	12	0.00	0.12	0.00	0.01	0.02	0.02	0.03	
Nitrogen Nitrite as N (mg/L) | 7-CC	12	0.00	0.13	0.02	0.04	0.06	0.04	0.03	
Nitrogen Nitrite as N (mg/L) | 8-CC	12	0.00	0.10	0.00	0.00	0.00	0.01	0.03	
Nitrogen Nitrite as N (mg/L) | CC-Ken	12	0.00	0.10	0.02	0.04	0.07	0.05	0.03	0.03
Nitrogen Nitrite as N (mg/L) | 4-RC	0								
Nitrogen Nitrite as N (mg/L) | B-RC [W]	0								
Nitrogen Nitrite as N (mg/L) | 5-RC	12	0.00	0.08	0.00	0.00	0.04	0.02	0.03	
Nitrogen Total (mg/L) | 1-CC	12	0.59	1.90	0.69	0.88	1.50	1.08	0.47	0.99
Nitrogen Total (mg/L) | A-CC [W]	12	5.40	15.20	8.23	8.55	8.95	9.14	2.77	8.78
Nitrogen Total (mg/L) | 2-CC	9	0.70	13.30	3.80	4.27	6.90	5.26	3.43	4.10
Nitrogen Total (mg/L) | 3-CC	12	1.42	5.40	3.32	4.67	5.07	4.21	1.13	3.99
Nitrogen Total (mg/L) | 6-CC	12	1.74	5.45	2.60	3.27	5.06	3.58	1.32	3.33
Nitrogen Total (mg/L) | 7-CC	12	3.73	10.53	5.43	6.83	8.17	6.85	1.91	6.57
Nitrogen Total (mg/L) | 8-CC	12	4.00	11.30	7.65	9.15	10.20	8.63	2.06	8.33
Nitrogen Total (mg/L) | CC-Ken	12	3.42	11.54	6.96	8.18	9.77	8.05	2.17	7.70
Nitrogen Total (mg/L) | 4-RC	12	0.80	4.40	1.78	2.30	3.00	2.35	0.94	2.15
Nitrogen Total (mg/L) | B-RC [W]	12	11.50	20.00	13.30	14.15	15.45	14.77	2.18	14.62

Sample	No. of Samples	Minimum	Maximum	1st Quartile	Median	3rd Quartile	Mean	Standard Deviation (n)	Geometric Mean
Nitrogen Total (mg/L) | 5-RC	12	1.28	11.81	1.97	4.34	6.16	4.54	2.96	3.66
Nitrogen Total Inorganic (mg/L) | 1-CC	12	0.13	1.60	0.30	0.38	0.85	0.62	0.47	0.46
Nitrogen Total Inorganic (mg/L) | A-CC [W]	12	4.20	13.30	6.33	7.00	7.35	7.45	2.54	7.09
Nitrogen Total Inorganic (mg/L) | 2-CC	9	1.40	11.50	2.70	4.10	5.40	4.59	2.78	3.91
Nitrogen Total Inorganic (mg/L) | 3-CC	12	0.60	4.44	2.46	3.50	3.97	3.21	1.05	2.91
Nitrogen Total Inorganic (mg/L) | 6-CC	12	0.88	4.57	1.54	2.29	4.17	2.64	1.35	2.26
Nitrogen Total Inorganic (mg/L) | 7-CC	12	2.56	9.46	4.03	5.81	7.27	5.70	2.07	5.29
Nitrogen Total Inorganic (mg/L) | 8-CC	12	3.12	10.59	6.38	8.95	9.69	7.83	2.38	7.37
Nitrogen Total Inorganic (mg/L) | CC-Ken	12	2.17	10.50	6.06	7.16	8.93	6.97	2.48	6.35
Nitrogen Total Inorganic (mg/L) | 4-RC	1	2.20	2.20	2.20	2.20	2.20	2.20	2.48	2.20
Nitrogen Total Inorganic (mg/L) | B-RC [W]	12	10.00	19.60	12.10	13.05	13.93	13.58	2.47	13.37
Nitrogen Total Inorganic (mg/L) | 5-RC	12	0.32	11.06	1.09	3.08	5.46	3.60	3.06	2.27
Phosphorus as P, Tot (mg/L) | 1-CC	12	0.00	0.06	0.01	0.02	0.03	0.02	0.02	
Phosphorus as P, Tot (mg/L) | A-CC [W]	12	0.00	1.90	0.10	0.16	0.51	0.41	0.51	
Phosphorus as P, Tot (mg/L) | 2-CC	9	0.03	0.48	0.04	0.06	0.18	0.14	0.15	0.08
Phosphorus as P, Tot (mg/L) | 3-CC	12	0.03	0.52	0.06	0.10	0.21	0.17	0.16	0.12
Phosphorus as P, Tot (mg/L) | 6-CC	12	0.09	0.51	0.14	0.19	0.27	0.21	0.11	0.19
Phosphorus as P, Tot (mg/L) | 7-CC	12	0.01	0.70	0.43	0.52	0.58	0.47	0.18	0.35
Phosphorus as P, Tot (mg/L) | 8-CC	12	0.40	1.06	0.58	0.81	0.95	0.75	0.22	0.72
Phosphorus as P, Tot (mg/L) | CC-Ken	0								
Phosphorus as P, Tot (mg/L) | 4-RC	12	0.00	0.80	0.00	0.05	0.09	0.11	0.21	
Phosphorus as P, Tot (mg/L) | B-RC [W]	12	0.00	3.36	1.67	1.85	1.96	1.83	0.72	
Phosphorus as P, Tot (mg/L) | 5-RC	12	0.11	1.00	0.14	0.27	0.50	0.36	0.26	0.28
Arsenic, T (ug/L) | 1-CC	0								
Arsenic, T (ug/L) | A-CC [W]	0								
Arsenic, T (ug/L) | 2-CC	3	0.23	0.65	0.28	0.33	0.49	0.40	0.18	0.37
Arsenic, T (ug/L) | 3-CC	0								
Arsenic, T (ug/L) | 6-CC	0								
Arsenic, T (ug/L) | 7-CC	1	1.10	1.10	1.10	1.10	1.10	1.10	0.18	1.10
Arsenic, T (ug/L) | 8-CC	0								
Arsenic, T (ug/L) | CC-Ken	0								
Arsenic, T (ug/L) | 4-RC	0								
Arsenic, T (ug/L) | B-RC [W]	0								
Arsenic, T (ug/L) | 5-RC	0								
Discharge (MGD) | 1-CC	0								
Discharge (MGD) | A-CC [W]	12	1.4	1.8	1.6	1.6	1.7	1.6	0.1	1.6
Discharge (MGD) | 2-CC	0								
Discharge (MGD) | 3-CC	0								
Discharge (MGD) | 6-CC	0								
Discharge (MGD) | 7-CC	0								
Discharge (MGD) | 8-CC	0								
Discharge (MGD) | CC-Ken	0								
Discharge (MGD) | 4-RC	0								
Discharge (MGD) | B-RC [W]	12	0.0	1.4	0.2	0.6	0.8	0.6	0.4	0.4
Discharge (MGD) | 5-RC	0								

Sample	No. of Samples	Minimum	Maximum	1st Quartile	Median	3rd Quartile	Mean	Standard Deviation (n)	Geometric Mean
Alkalinity (mg/L) | T11-LH	8	47.8	311.1	117.8	177.9	217.4	175.1	92.6	145.0
Alkalinity (mg/L) | M9.5-SV	6	51.3	111.1	54.4	65.6	81.6	71.9	21.2	69.0
Alkalinity (mg/L) | M8.9-SV	7	29.6	101.4	57.9	58.9	91.1	69.7	23.7	65.0
Alkalinity (mg/L) | M8.4-SV	7	33.8	128.0	70.4	78.1	125.0	90.1	33.8	82.6
Alkalinity (mg/L) | M8.2-SV	7	38.3	162.0	100.1	108.0	142.0	113.2	38.0	104.4
Alkalinity (mg/L) | M8-SV	8	24.3	152.7	91.6	127.4	140.0	108.7	46.0	93.1
Alkalinity (mg/L) | T-EFF	8	71.3	133.0	98.2	108.0	118.0	105.9	19.0	104.0
Alkalinity (mg/L) | M7-SV	8	29.8	153.6	111.9	138.4	141.5	115.7	44.8	101.6
Alkalinity (mg/L) | M6-SV	5	50.5	173.0	79.4	149.0	160.0	122.4	48.4	110.6
Conductivity (umhos/cm) | T11-LH	8	189.0	1154.4	431.8	655.4	839.7	657.9	341.5	553.0
Conductivity (umhos/cm) | M9.5-SV	6	186.9	364.0	190.0	236.2	302.7	253.8	68.2	245.0
Conductivity (umhos/cm) | M8.9-SV	7	104.0	316.7	203.8	212.1	304.3	235.6	71.7	222.3
Conductivity (umhos/cm) | M8.4-SV	7	125.0	499.0	277.0	316.0	492.5	354.1	133.9	322.9
Conductivity (umhos/cm) | M8.2-SV	7	177.0	805.0	511.5	545.0	738.5	575.3	199.0	525.3
Conductivity (umhos/cm) | M8-SV	8	83.5	794.5	464.5	645.5	723.6	550.5	249.9	449.0
Conductivity (umhos/cm) | T-EFF	8	750.0	933.0	834.8	883.0	913.8	866.1	58.4	864.1
Conductivity (umhos/cm) | M7-SV	8	116.0	779.4	561.9	721.8	763.1	596.7	246.5	506.9
Conductivity (umhos/cm) | M6-SV	5	249.0	828.0	548.0	791.0	800.0	643.2	221.4	590.0
Hardness, Total as CaCO3 (mg/L) | T11-LH	16	86.0	548.0	175.1	304.6	369.5	298.1	160.5	249.0
Hardness, Total as CaCO3 (mg/L) | M9.5-SV	12	77.9	153.3	79.0	100.7	125.8	106.2	29.2	102.3
Hardness, Total as CaCO3 (mg/L) | M8.9-SV	14	40.7	130.2	86.2	88.8	129.5	98.6	30.6	92.6
Hardness, Total as CaCO3 (mg/L) | M8.4-SV	7	49.0	207.0	111.0	126.0	201.0	143.7	56.2	130.2
Hardness, Total as CaCO3 (mg/L) | M8.2-SV	7	64.0	349.0	191.5	215.0	296.0	229.0	87.8	205.3
Hardness, Total as CaCO3 (mg/L) | M8-SV	16	41.9	344.0	179.2	263.0	289.3	224.6	102.1	186.3
Hardness, Total as CaCO3 (mg/L) | T-EFF	8	191.0	262.0	198.0	235.5	255.0	228.3	27.9	226.5
Hardness, Total as CaCO3 (mg/L) | M7-SV	16	53.0	319.0	202.0	271.6	287.5	228.2	91.7	198.2
Hardness, Total as CaCO3 (mg/L) | M6-SV	5	95.0	335.0	146.0	302.0	307.0	237.0	97.1	212.3
DO (mg/L) | T11-LH	8	6.7	14.0	8.4	8.6	9.9	9.5	2.3	9.3
DO (mg/L) | M9.5-SV	6	7.9	13.8	8.4	9.2	11.6	10.1	2.2	9.9
DO (mg/L) | M8.9-SV	7	7.8	13.7	8.3	9.5	11.0	10.0	2.1	9.8
DO (mg/L) | M8.4-SV	7	8.1	14.1	8.7	9.7	11.2	10.3	2.1	10.1
DO (mg/L) | M8.2-SV	7	8.0	13.9	9.2	9.7	11.5	10.4	1.9	10.2
DO (mg/L) | M8-SV	8	8.3	14.0	9.1	9.3	12.0	10.4	2.0	10.3
DO (mg/L) | T-EFF	8	4.8	7.6	5.7	5.8	6.3	6.0	0.8	6.0
DO (mg/L) | M7-SV	8	7.2	12.6	8.1	9.3	10.3	9.5	1.8	9.3
DO (mg/L) | M6-SV	5	7.9	10.5	8.2	8.2	9.2	8.8	1.0	8.7
pH (SU) | T11-LH	8	7.1	8.1	7.4	7.5	7.6	7.5	0.3	7.5
pH (SU) | M9.5-SV	6	6.8	7.8	6.9	7.0	7.4	7.2	0.4	7.2
pH (SU) | M8.9-SV	7	6.8	7.7	7.2	7.3	7.4	7.3	0.3	7.3
pH (SU) | M8.4-SV	7	7.1	8.1	7.5	7.9	8.0	7.7	0.4	7.7
pH (SU) | M8.2-SV	7	7.2	8.3	7.5	7.9	8.1	7.8	0.4	7.8
pH (SU) | M8-SV	8	7.2	8.4	7.5	7.7	8.0	7.7	0.4	7.7
pH (SU) | T-EFF	8	6.6	7.4	6.8	6.9	7.0	6.9	0.2	6.9
pH (SU) | M7-SV	8	6.7	7.6	7.0	7.2	7.3	7.2	0.3	7.2
pH (SU) | M6-SV	5	6.9	8.1	7.4	7.5	7.7	7.5	0.4	7.5
Temperature (deg C) | T11-LH	8	0.0	24.4	9.9	14.6	16.4	12.5	7.9	
Temperature (deg C) | M9.5-SV	6	0.9	18.9	3.5	12.8	16.8	10.6	7.3	6.1
Temperature (deg C) | M8.9-SV	7	0.5	19.9	6.3	12.5	17.3	11.5	7.3	6.1
Temperature (deg C) | M8.4-SV	7	1.0	22.2	6.4	13.8	18.9	12.5	7.8	8.0
Temperature (deg C) | M8.2-SV	7	1.6	22.4	6.6	13.7	18.3	12.5	7.6	8.6
Temperature (deg C) | M8-SV	8	0.8	25.4	10.2	14.0	18.1	13.4	8.0	8.6
Temperature (deg C) | T-EFF	8	13.8	21.4	17.3	18.7	20.4	18.4	2.5	18.2
Temperature (deg C) | M7-SV	8	3.7	22.9	9.4	12.7	17.7	12.9	6.5	10.8
Temperature (deg C) | M6-SV	5	11.3	22.9	12.8	15.9	19.4	16.5	4.3	15.9
E_ coli (MPN/100 mL) | T11-LH	8	79.4	1203.3	107.8	188.6	574.9	428.5	456.3	245.0
E_ coli (MPN/100 mL) | M9.5-SV	6	21.1	980.4	44.5	85.0	158.8	231.0	339.0	98.6
E_ coli (MPN/100 mL) | M8.9-SV	7	49.5	1413.6	57.7	172.6	364.2	354.2	455.9	173.4
E_ coli (MPN/100 mL) | M8.4-SV	7	29.5	866.0	40.8	77.1	137.7	189.9	280.8	90.0
E_ coli (MPN/100 mL) | M8.2-SV	7	40.8	488.0	88.2	133.0	193.0	174.9	141.1	128.4
E_ coli (MPN/100 mL) | M8-SV	8	40.4	260.3	69.1	116.3	177.4	130.2	75.5	107.4
E_ coli (MPN/100 mL) | T-EFF	8	18.9	81.3	27.8	42.4	55.2	43.8	20.0	39.2
E_ coli (MPN/100 mL) | M7-SV	8	83.3	325.5	102.8	177.9	196.7	169.7	74.9	153.9
E_ coli (MPN/100 mL) | M6-SV	5	142.0	579.0	144.0	167.0	238.0	254.0	166.2	216.0
TSS (mg/L) | T11-LH	8	13.4	335.0	23.8	162.9	279.0	160.0	126.4	88.2
TSS (mg/L) | M9.5-SV	6	1.0	6.8	1.3	1.8	4.6	3.0	2.3	2.3
TSS (mg/L) | M8.9-SV	7	0.8	26.7	1.8	4.2	8.0	7.3	8.6	3.9
TSS (mg/L) | M8.4-SV	7	0.0	35.0	1.0	2.8	13.8	9.6	12.2	
TSS (mg/L) | M8.2-SV	7	0.0	48.6	1.2	6.4	21.1	14.2	17.4	
TSS (mg/L) | M8-SV	8	2.8	139.0	5.5	8.9	27.9	31.8	45.8	12.6
TSS (mg/L) | T-EFF	8	2.6	15.2	4.7	5.8	7.7	7.2	4.1	6.2
TSS (mg/L) | M7-SV	8	8.0	177.0	11.3	15.6	71.3	55.6	68.4	26.3
TSS (mg/L) | M6-SV	5	7.6	70.0	16.6	18.2	19.2	26.3	22.2	19.9

Sample	No. of Samples	Minimum	Maximum	1st Quartile	Median	3rd Quartile	Mean	Standard Deviation (n)	Geometric Mean
Nitrogen Ammonia as N (mg/L) | T11-LH	12	0.04	0.17	0.05	0.09	0.13	0.09	0.05	0.08
Nitrogen Ammonia as N (mg/L) | M9.5-SV	6	0.02	0.05	0.02	0.03	0.04	0.04	0.01	0.03
Nitrogen Ammonia as N (mg/L) | M8.9-SV	7	0.02	0.08	0.03	0.04	0.05	0.04	0.02	0.04
Nitrogen Ammonia as N (mg/L) | M8.4-SV	7	0.00	0.08	0.00	0.00	0.03	0.02	0.03	
Nitrogen Ammonia as N (mg/L) | M8.2-SV	7	0.00	0.08	0.00	0.05	0.06	0.04	0.03	
Nitrogen Ammonia as N (mg/L) | M8-SV	12	0.03	0.53	0.04	0.06	0.14	0.12	0.14	0.08
Nitrogen Ammonia as N (mg/L) | T-EFF	8	0.11	0.88	0.14	0.21	0.22	0.27	0.24	0.21
Nitrogen Ammonia as N (mg/L) | M7-SV	12	0.06	0.28	0.07	0.11	0.17	0.13	0.06	0.11
Nitrogen Ammonia as N (mg/L) | M6-SV	5	0.05	0.29	0.05	0.15	0.16	0.14	0.09	0.11
Nitrogen Nitrate/Nitrite as N (mg/L) | T11-LH	12	0.12	1.19	0.33	0.47	0.95	0.58	0.37	0.45
Nitrogen Nitrate/Nitrite as N (mg/L) | M9.5-SV	6	0.02	0.29	0.04	0.11	0.19	0.13	0.10	0.08
Nitrogen Nitrate/Nitrite as N (mg/L) | M8.9-SV	7	0.01	0.24	0.05	0.08	0.15	0.10	0.07	0.07
Nitrogen Nitrate/Nitrite as N (mg/L) | M8.4-SV	7	0.00	0.14	0.00	0.00	0.06	0.04	0.06	
Nitrogen Nitrate/Nitrite as N (mg/L) | M8.2-SV	7	0.00	1.59	0.00	0.00	0.12	0.26	0.55	
Nitrogen Nitrate/Nitrite as N (mg/L) | M8-SV	12	0.11	1.47	0.25	0.45	0.68	0.59	0.46	0.43
Nitrogen Nitrate/Nitrite as N (mg/L) | T-EFF	8	7.76	16.70	10.45	11.75	13.90	11.97	2.87	11.61
Nitrogen Nitrate/Nitrite as N (mg/L) | M7-SV	12	0.30	5.21	1.20	2.96	3.36	2.54	1.49	1.91
Nitrogen Nitrate/Nitrite as N (mg/L) | M6-SV	5	0.18	2.40	0.58	1.39	2.12	1.33	0.85	0.94
Nitrogen TKN (mg/L) | T11-LH	12	0.12	1.40	0.38	0.84	1.04	0.76	0.40	0.63
Nitrogen TKN (mg/L) | M9.5-SV	0								
Nitrogen TKN (mg/L) | M8.9-SV	0								
Nitrogen TKN (mg/L) | M8.4-SV	0								
Nitrogen TKN (mg/L) | M8.2-SV	0								
Nitrogen TKN (mg/L) | M8-SV	12	0.30	2.85	0.34	0.49	0.60	0.67	0.67	0.53
Nitrogen TKN (mg/L) | T-EFF	0								
Nitrogen TKN (mg/L) | M7-SV	12	0.37	1.21	0.73	0.87	1.06	0.87	0.25	0.83
Nitrogen TKN (mg/L) | M6-SV	0								
Nitrogen Total (mg/L) | T11-LH	12	0.52	1.89	1.25	1.33	1.57	1.34	0.38	1.27
Nitrogen Total (mg/L) | M9.5-SV	0								
Nitrogen Total (mg/L) | M8.9-SV	0								
Nitrogen Total (mg/L) | M8.4-SV	0								
Nitrogen Total (mg/L) | M8.2-SV	0								
Nitrogen Total (mg/L) | M8-SV	12	0.44	4.01	0.79	0.89	1.18	1.25	0.95	1.03
Nitrogen Total (mg/L) | T-EFF	0								
Nitrogen Total (mg/L) | M7-SV	12	0.68	5.97	2.06	3.65	4.33	3.41	1.56	2.94
Nitrogen Total (mg/L) | M6-SV	0								
Nitrogen Total Inorganic (mg/L) | T11-LH	12	0.18	1.31	0.41	0.59	1.05	0.67	0.38	0.56
Nitrogen Total Inorganic (mg/L) | M9.5-SV	6	0.04	0.32	0.07	0.16	0.24	0.16	0.10	0.12
Nitrogen Total Inorganic (mg/L) | M8.9-SV	7	0.03	0.28	0.08	0.16	0.19	0.15	0.08	0.12
Nitrogen Total Inorganic (mg/L) | M8.4-SV	7	0.00	0.17	0.00	0.00	0.11	0.06	0.07	
Nitrogen Total Inorganic (mg/L) | M8.2-SV	7	0.00	1.67	0.03	0.06	0.15	0.30	0.57	
Nitrogen Total Inorganic (mg/L) | M8-SV	12	0.23	1.69	0.38	0.49	0.80	0.71	0.53	0.55
Nitrogen Total Inorganic (mg/L) | T-EFF	8	8.41	16.93	10.73	11.92	14.02	12.24	2.74	11.93
Nitrogen Total Inorganic (mg/L) | M7-SV	12	0.49	5.40	1.45	3.05	3.43	2.66	1.48	2.12
Nitrogen Total Inorganic (mg/L) | M6-SV	5	0.24	2.45	0.74	1.68	2.27	1.47	0.86	1.10
Phosphorus as P, Tot (mg/L) | T11-LH	12	0.02	0.46	0.04	0.13	0.37	0.20	0.17	0.12
Phosphorus as P, Tot (mg/L) | M9.5-SV	6	0.01	0.02	0.01	0.01	0.02	0.01	0.01	0.01
Phosphorus as P, Tot (mg/L) | M8.9-SV	7	0.01	0.04	0.01	0.02	0.03	0.02	0.01	0.02
Phosphorus as P, Tot (mg/L) | M8.4-SV	7	0.00	0.08	0.00	0.00	0.06	0.03	0.03	
Phosphorus as P, Tot (mg/L) | M8.2-SV	7	0.00	0.34	0.00	0.00	0.06	0.07	0.11	
Phosphorus as P, Tot (mg/L) | M8-SV	12	0.01	0.52	0.02	0.04	0.13	0.10	0.14	0.05
Phosphorus as P, Tot (mg/L) | T-EFF	8	0.00	3.85	1.06	2.29	3.39	2.18	1.39	
Phosphorus as P, Tot (mg/L) | M7-SV	12	0.11	0.83	0.25	0.33	0.53	0.40	0.21	0.35
Phosphorus as P, Tot (mg/L) | M6-SV	5	0.00	0.50	0.23	0.28	0.43	0.29	0.18	
Arsenic, T (ug/L) | T11-LH	8	1.00	7.30	1.38	3.75	6.03	3.83	2.36	2.95
Arsenic, T (ug/L) | M9.5-SV	6	0.00	1.00	0.00	0.00	0.00	0.17	0.37	
Arsenic, T (ug/L) | M8.9-SV	7	0.00	1.00	0.00	0.00	0.00	0.14	0.35	
Arsenic, T (ug/L) | M8.4-SV	7	0.00	1.20	0.00	0.00	0.50	0.31	0.50	
Arsenic, T (ug/L) | M8.2-SV	7	0.00	1.40	0.00	0.00	0.70	0.40	0.63	
Arsenic, T (ug/L) | M8-SV	8	0.00	1.60	0.00	0.60	1.23	0.66	0.67	
Arsenic, T (ug/L) | T-EFF	8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Arsenic, T (ug/L) | M7-SV	8	0.00	3.40	0.00	1.05	1.63	1.13	1.11	
Arsenic, T (ug/L) | M6-SV	5	0.00	2.30	0.00	1.00	1.20	0.90	0.86	
Stream Flow (cfs) | T11-LH	7	3.4	114.0	11.5	14.2	59.1	39.0	43.7	19.9
Stream Flow (cfs) | M9.5-SV	6	3.5	60.9	9.2	17.1	32.0	23.7	19.6	16.0
Stream Flow (cfs) | M8.9-SV	5	7.8	57.6	9.3	10.5	26.0	22.2	18.9	16.3
Stream Flow (cfs) | M8.4-SV	5	11.5	34.7	11.6	16.8	20.0	18.9	8.5	17.3
Stream Flow (cfs) | M8.2-SV	5	21.2	43.8	23.2	32.2	33.0	30.7	8.1	29.6
Stream Flow (cfs) | M8-SV	6	20.2	47.0	31.4	36.5	37.8	34.7	8.2	33.6
Stream Flow (cfs) | T-EFF	8	10.5	16.4	10.8	12.4	13.6	12.6	1.9	12.4
Stream Flow (cfs) | M7-SV	8	49.4	917.0	52.0	58.4	132.0	197.3	286.0	98.5
Stream Flow (cfs) | M6-SV	3	37.8	71.1	46.8	55.8	63.5	54.9	13.6	53.1

Sample	No. of Samples	Minimum	Maximum	1st Quartile	Median	3rd Quartile	Mean	Standard Deviation (n)	Geometric Mean
Alkalinity (mg/L) | Dry Creek	7	153.000	254.000	168.500	204.000	208.000	194.857	32.006	192.293
Alkalinity (mg/L) | SG-1	7	188.000	270.000	206.000	212.000	243.500	224.143	28.802	222.367
Alkalinity (mg/L) | SG-2	6	210.000	281.000	239.250	241.000	245.750	243.167	20.716	242.293
Alkalinity (mg/L) | Olig Dtch	6	58.000	114.000	72.200	95.800	111.000	90.667	22.331	87.723
Alkalinity (mg/L) | Union-B	1	163.000	163.000	163.000	163.000	163.000	163.000	22.331	163.000
Alkalinity (mg/L) | Union-M	1	150.000	150.000	150.000	150.000	150.000	150.000	22.331	150.000
Alkalinity (mg/L) | Union-T	0								
Conductivity (umhos/cm) | Dry Creek	9	1020.000	2540.000	1110.000	1355.000	1760.000	1605.000	545.252	1520.880
Conductivity (umhos/cm) | SG-1	10	945.000	1820.000	1106.250	1190.000	1272.500	1279.000	286.398	1250.673
Conductivity (umhos/cm) | SG-2	8	1220.000	1550.000	1337.500	1430.000	1511.250	1411.875	120.440	1406.612
Conductivity (umhos/cm) | Olig Dtch	9	333.000	586.000	362.000	410.000	511.000	439.500	84.162	431.764
Conductivity (umhos/cm) | Union-B	1	1585.000	1585.000	1585.000	1585.000	1585.000	1585.000	84.162	1585.000
Conductivity (umhos/cm) | Union-M	1	1600.000	1600.000	1600.000	1600.000	1600.000	1600.000	84.162	1600.000
Conductivity (umhos/cm) | Union-T	0								
Hardness, Total as CaCO3 (mg/L) | Dry Creek	7	447.000	1150.000	472.500	573.000	672.000	637.000	231.300	603.668
Hardness, Total as CaCO3 (mg/L) | SG-1	7	400.000	823.000	455.500	506.000	564.000	538.286	130.985	524.542
Hardness, Total as CaCO3 (mg/L) | SG-2	6	553.000	692.000	562.750	601.500	655.250	611.833	53.146	609.558
Hardness, Total as CaCO3 (mg/L) | Olig Dtch	6	136.000	231.000	156.500	185.500	217.500	185.500	35.818	181.962
Hardness, Total as CaCO3 (mg/L) | Union-B	1	620.000	620.000	620.000	620.000	620.000	620.000	35.818	620.000
Hardness, Total as CaCO3 (mg/L) | Union-M	1	633.000	633.000	633.000	633.000	633.000	633.000	35.818	633.000
Hardness, Total as CaCO3 (mg/L) | Union-T	0								
DO (mg/L) | Dry Creek	7	9.570	14.500	10.100	11.000	12.100	11.353	1.605	11.245
DO (mg/L) | SG-1	7	8.540	13.300	9.750	9.950	11.200	10.527	1.557	10.418
DO (mg/L) | SG-2	6	7.550	10.800	8.670	9.855	10.140	9.428	1.129	9.357
DO (mg/L) | Olig Dtch	6	8.260	9.660	8.733	9.170	9.488	9.073	0.503	9.059
DO (mg/L) | Union-B	1	0.090	0.090	0.090	0.090	0.090	0.090	0.503	0.090
DO (mg/L) | Union-M	1	8.760	8.760	8.760	8.760	8.760	8.760	0.503	8.760
DO (mg/L) | Union-T	0								
pH (SU) | Dry Creek	7	7.960	8.560	8.130	8.230	8.335	8.240	0.180	8.238
pH (SU) | SG-1	7	7.690	8.410	7.885	7.950	8.005	7.976	0.204	7.973
pH (SU) | SG-2	6	7.730	8.200	7.815	7.960	7.970	7.932	0.154	7.930
pH (SU) | Olig Dtch	6	8.090	8.370	8.145	8.180	8.320	8.220	0.108	8.219
pH (SU) | Union-B	1	7.110	7.110	7.110	7.110	7.110	7.110	0.108	7.110
pH (SU) | Union-M	1	8.410	8.410	8.410	8.410	8.410	8.410	0.108	8.410
pH (SU) | Union-T	0								
Temperature (deg C) | Dry Creek	7	13.500	22.800	16.900	19.500	21.350	18.900	3.352	18.574
Temperature (deg C) | SG-1	7	14.500	25.700	17.600	19.800	21.650	19.786	3.541	19.462
Temperature (deg C) | SG-2	6	13.800	24.300	14.825	17.050	19.650	17.800	3.636	17.449
Temperature (deg C) | Olig Dtch	6	12.300	21.600	16.550	17.650	19.500	17.583	2.953	17.315
Temperature (deg C) | Union-B	1	21.000	21.000	21.000	21.000	21.000	21.000	2.953	21.000
Temperature (deg C) | Union-M	1	23.700	23.700	23.700	23.700	23.700	23.700	2.953	23.700
Temperature (deg C) | Union-T	0								
E_ coli (MPN/100 mL) | Dry Creek	7	109.000	980.000	200.000	219.000	507.000	388.857	284.432	303.183
E_ coli (MPN/100 mL) | SG-1	7	86.200	1990.000	143.700	249.000	748.500	587.086	642.639	326.097
E_ coli (MPN/100 mL) | SG-2	6	40.400	1200.000	117.075	276.000	297.000	360.083	389.583	205.845
E_ coli (MPN/100 mL) | Olig Dtch	6	261.000	1200.000	382.500	491.500	571.250	564.667	303.597	500.815
E_ coli (MPN/100 mL) | Union-B	0								
E_ coli (MPN/100 mL) | Union-M	0								
E_ coli (MPN/100 mL) | Union-T	1	4.100	4.100	4.100	4.100	4.100	4.100	303.597	4.100
TSS (mg/L) | Dry Creek	7	6.400	37.200	8.100	12.200	20.700	16.200	10.277	13.465
TSS (mg/L) | SG-1	7	4.800	18.200	6.500	9.000	12.800	10.086	4.482	9.093
TSS (mg/L) | SG-2	6	8.400	65.600	18.550	35.300	52.950	36.067	21.271	28.612
TSS (mg/L) | Olig Dtch	6	17.600	78.400	29.300	38.900	51.800	42.667	19.847	38.151
TSS (mg/L) | Union-B	1	5.600	5.600	5.600	5.600	5.600	5.600	19.847	5.600
TSS (mg/L) | Union-M	1	7.800	7.800	7.800	7.800	7.800	7.800	19.847	7.800
TSS (mg/L) | Union-T	0								
Nitrogen Ammonia as N (mg/L) | Dry Creek	7	0.000	0.072	0.051	0.052	0.062	0.050	0.022	
Nitrogen Ammonia as N (mg/L) | SG-1	7	0.055	0.119	0.072	0.086	0.091	0.084	0.019	0.081
Nitrogen Ammonia as N (mg/L) | SG-2	6	0.000	0.092	0.059	0.066	0.077	0.060	0.029	
Nitrogen Ammonia as N (mg/L) | Olig Dtch	6	0.000	0.103	0.015	0.068	0.088	0.055	0.041	
Nitrogen Ammonia as N (mg/L) | Union-B	1	0.348	0.348	0.348	0.348	0.348	0.348	0.041	0.348
Nitrogen Ammonia as N (mg/L) | Union-M	1	0.000	0.000	0.000	0.000	0.000	0.000	0.041	
Nitrogen Ammonia as N (mg/L) | Union-T	0								
Nitrogen Nitrate/Nitrite as N (mg/L) | Dry Creek	7	0.440	1.530	0.549	0.736	1.006	0.831	0.357	0.762
Nitrogen Nitrate/Nitrite as N (mg/L) | SG-1	7	1.510	3.090	1.625	1.700	2.115	1.969	0.523	1.910
Nitrogen Nitrate/Nitrite as N (mg/L) | SG-2	6	0.796	2.200	1.173	1.310	1.620	1.411	0.444	1.342
Nitrogen Nitrate/Nitrite as N (mg/L) | Olig Dtch	6	0.000	0.265	0.161	0.212	0.248	0.182	0.090	
Nitrogen Nitrate/Nitrite as N (mg/L) | Union-B	1	0.000	0.000	0.000	0.000	0.000	0.000	0.090	
Nitrogen Nitrate/Nitrite as N (mg/L) | Union-M	1	0.000	0.000	0.000	0.000	0.000	0.000	0.090	
Nitrogen Nitrate/Nitrite as N (mg/L) | Union-T	0								
Nitrogen Total Inorganic (mg/L) | Dry Creek	7	0.440	1.593	0.610	0.797	1.057	0.880	0.366	0.810
Nitrogen Total Inorganic (mg/L) | SG-1	7	1.565	3.169	1.717	1.794	2.202	2.052	0.523	1.995

Sample	No. of Samples	Minimum	Maximum	1st Quartile	Median	3rd Quartile	Mean	Standard Deviation (n)	Geometric Mean
Nitrogen Total Inorganic (mg/L) | SG-2	6	0.861	2.292	1.193	1.383	1.680	1.471	0.457	1.403
Nitrogen Total Inorganic (mg/L) | Olig Dtch	6	0.000	0.335	0.237	0.274	0.305	0.237	0.111	
Nitrogen Total Inorganic (mg/L) | Union-B	1	0.348	0.348	0.348	0.348	0.348	0.348	0.111	0.348
Nitrogen Total Inorganic (mg/L) | Union-M	1	0.000	0.000	0.000	0.000	0.000	0.000	0.111	
Nitrogen Total Inorganic (mg/L) | Union-T	0								
Phosphorus as P, Tot (mg/L) | Dry Creek	7	0.000	0.102	0.000	0.019	0.042	0.029	0.035	
Phosphorus as P, Tot (mg/L) | SG-1	7	0.000	0.093	0.000	0.000	0.064	0.031	0.038	
Phosphorus as P, Tot (mg/L) | SG-2	6	0.000	0.115	0.000	0.000	0.082	0.037	0.053	
Phosphorus as P, Tot (mg/L) | Olig Dtch	6	0.000	0.154	0.021	0.092	0.117	0.077	0.058	
Phosphorus as P, Tot (mg/L) | Union-B	1	0.185	0.185	0.185	0.185	0.185	0.185	0.058	0.185
Phosphorus as P, Tot (mg/L) | Union-M	1	0.020	0.020	0.020	0.020	0.020	0.020	0.058	0.020
Phosphorus as P, Tot (mg/L) | Union-T	0								
Arsenic, T (ug/L) | Dry Creek	7	0.000	1.600	0.500	1.000	1.300	0.886	0.601	
Arsenic, T (ug/L) | SG-1	7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
Arsenic, T (ug/L) | SG-2	6	1.000	2.200	1.325	1.850	2.075	1.700	0.455	1.631
Arsenic, T (ug/L) | Olig Dtch	6	0.000	1.500	1.000	1.150	1.300	1.017	0.488	
Arsenic, T (ug/L) | Union-B	1	4.700	4.700	4.700	4.700	4.700	4.700	0.488	4.700
Arsenic, T (ug/L) | Union-M	1	2.700	2.700	2.700	2.700	2.700	2.700	0.488	2.700
Arsenic, T (ug/L) | Union-T	0								
Stream Flow (cfs) | Dry Creek	7	2.020	17.600	4.105	5.150	10.440	7.694	5.381	6.028
Stream Flow (cfs) | SG-1	7	2.900	6.770	3.265	3.860	5.085	4.319	1.292	4.140
Stream Flow (cfs) | SG-2	5	1.250	12.800	2.200	2.500	9.070	5.564	4.560	3.806
Stream Flow (cfs) | Olig Dtch	6	6.360	60.600	10.045	12.400	16.975	19.920	18.550	14.735
Stream Flow (cfs) | Union-B	0								
Stream Flow (cfs) | Union-M	0								
Stream Flow (cfs) | Union-T	0								

Sample	No. of Samples	Minimum	Maximum	1st Quartile	Median	3rd Quartile	Mean	Standard Deviation (n)	Geometric Mean
Alkalinity (mg/L) | BSC-BCU	1	71.0	71.0	71.0	71.0	71.0	71.0	0.0	71.0
Alkalinity (mg/L) | BSC-BC	1	99.0	99.0	99.0	99.0	99.0	99.0	0.0	99.0
Alkalinity (mg/L) | BSC-BCD	2	28.0	73.0	39.3	50.5	61.8	50.5	22.5	45.2
Alkalinity (mg/L) | BFC	3	25.0	47.0	28.5	32.0	39.5	34.7	9.2	33.5
Alkalinity (mg/L) | BFC-BR	3	30.0	85.0	40.5	51.0	68.0	55.3	22.7	50.7
Alkalinity (mg/L) | BSC-BR	1	101.0	101.0	101.0	101.0	101.0	101.0	22.7	101.0
Alkalinity (mg/L) | BFC-LHU	2	41.0	84.0	51.8	62.5	73.3	62.5	21.5	58.7
Alkalinity (mg/L) | BFC-LH	3	27.0	44.0	28.0	29.0	36.5	33.3	7.6	32.5
Alkalinity (mg/L) | BFC-LHD	3	20.0	64.0	23.5	27.0	45.5	37.0	19.3	32.6
Alkalinity (mg/L) | SVSC-SVU	2	23.0	37.0	26.5	30.0	33.5	30.0	7.0	29.2
Alkalinity (mg/L) | SVSC-SVD	4	13.0	23.0	19.0	21.5	22.3	19.8	4.0	19.3
Conductivity (umhos/cm) | BSC-BCU	1	270.0	270.0	270.0	270.0	270.0	270.0	4.0	270.0
Conductivity (umhos/cm) | BSC-BC	3	444.0	497.0	452.5	461.0	479.0	467.3	22.1	466.8
Conductivity (umhos/cm) | BSC-BCD	4	92.0	299.0	176.0	227.0	262.3	211.3	76.6	193.5
Conductivity (umhos/cm) | BFC	6	62.0	97.0	63.8	73.5	90.0	77.0	14.2	75.7
Conductivity (umhos/cm) | BFC-BR	6	70.0	273.0	80.3	93.0	138.8	126.5	70.6	111.8
Conductivity (umhos/cm) | BSC-BR	3	400.0	497.0	433.5	467.0	482.0	454.7	40.5	452.8
Conductivity (umhos/cm) | BFC-LHU	2	108.0	236.0	140.0	172.0	204.0	172.0	64.0	159.6
Conductivity (umhos/cm) | BFC-LH	6	68.0	172.0	72.5	88.0	117.0	101.7	36.8	95.9
Conductivity (umhos/cm) | BFC-LHD	6	66.0	304.0	106.3	120.0	176.5	151.2	78.1	134.0
Conductivity (umhos/cm) | SVSC-SVU	2	59.0	59.0	59.0	59.0	59.0	59.0	0.0	59.0
Conductivity (umhos/cm) | SVSC-SVD	7	34.0	79.0	42.5	59.0	61.0	54.1	14.7	52.1
DO (mg/L) | BSC-BCU	1	7.8	7.8	7.8	7.8	7.8	7.8	14.7	7.8
DO (mg/L) | BSC-BC	4	7.0	8.8	7.3	7.6	8.0	7.7	0.7	7.7
DO (mg/L) | BSC-BCD	5	7.8	10.2	7.8	8.1	8.4	8.5	0.9	8.4
DO (mg/L) | BFC	6	8.5	10.4	9.1	10.2	10.3	9.7	0.8	9.7
DO (mg/L) | BFC-BR	6	9.1	10.4	9.1	9.1	9.3	9.4	0.5	9.4
DO (mg/L) | BSC-BR	4	6.4	8.7	6.6	6.8	7.3	7.2	0.9	7.1
DO (mg/L) | BFC-LHU	2	8.4	9.4	8.7	8.9	9.2	8.9	0.5	8.9
DO (mg/L) | BFC-LH	6	7.6	9.6	9.1	9.2	9.4	9.0	0.7	9.0
DO (mg/L) | BFC-LHD	6	8.3	9.2	8.6	8.7	9.1	8.8	0.3	8.8
DO (mg/L) | SVSC-SVU	2	8.6	9.0	8.7	8.8	8.9	8.8	0.2	8.8
DO (mg/L) | SVSC-SVD	7	8.3	10.3	8.7	9.1	9.5	9.1	0.7	9.1
pH (SU) | BSC-BCU	1	7.8	7.8	7.8	7.8	7.8	7.8	0.7	7.8
pH (SU) | BSC-BC	4	8.1	8.3	8.2	8.2	8.2	8.2	0.1	8.2
pH (SU) | BSC-BCD	5	7.7	8.1	7.9	7.9	8.0	7.9	0.1	7.9
pH (SU) | BFC	6	7.1	8.0	7.5	7.7	8.0	7.7	0.3	7.7
pH (SU) | BFC-BR	6	7.6	9.3	8.0	8.5	8.7	8.4	0.6	8.4
pH (SU) | BSC-BR	4	8.0	8.2	8.1	8.2	8.2	8.1	0.1	8.1
pH (SU) | BFC-LHU	2	7.6	8.0	7.7	7.8	7.9	7.8	0.2	7.8
pH (SU) | BFC-LH	6	7.4	9.2	7.6	7.9	8.5	8.1	0.7	8.1
pH (SU) | BFC-LHD	6	7.4	7.9	7.7	7.9	7.9	7.8	0.2	7.8
pH (SU) | SVSC-SVU	2	7.5	7.5	7.5	7.5	7.5	7.5	0.0	7.5
pH (SU) | SVSC-SVD	7	7.3	7.7	7.5	7.6	7.6	7.5	0.1	7.5
Hardness (mg/L) | BSC-BCU	1	94.6	94.6	94.6	94.6	94.6	94.6	0.1	94.6
Hardness (mg/L) | BSC-BC	1	192.5	192.5	192.5	192.5	192.5	192.5	0.1	192.5
Hardness (mg/L) | BSC-BCD	2	33.5	101.6	50.6	67.6	84.6	67.6	34.0	58.4
Hardness (mg/L) | BFC	3	24.6	40.4	29.0	33.3	36.9	32.8	6.5	32.1
Hardness (mg/L) | BFC-BR	3	31.7	118.3	48.4	65.0	91.7	71.7	35.7	62.5
Hardness (mg/L) | BSC-BR	1	193.4	193.4	193.4	193.4	193.4	193.4	35.7	193.4
Hardness (mg/L) | BFC-LHU	2	42.0	104.6	57.6	73.3	88.9	73.3	31.3	66.3
Hardness (mg/L) | BFC-LH	3	28.9	61.4	40.1	51.3	56.3	47.2	13.6	45.0
Hardness (mg/L) | BFC-LHD	3	24.1	80.3	33.6	43.1	61.7	49.2	23.4	43.7
Hardness (mg/L) | SVSC-SVU	2	21.6	21.6	21.6	21.6	21.6	21.6	0.0	21.6
Hardness (mg/L) | SVSC-SVD	4	12.7	24.5	19.8	22.5	23.2	20.5	4.6	19.9
Temperature (deg C) | BSC-BCU	1	16.5	16.5	16.5	16.5	16.5	16.5	4.6	16.5
Temperature (deg C) | BSC-BC	4	7.7	23.8	14.7	19.2	21.9	17.5	6.1	16.0
Temperature (deg C) | BSC-BCD	5	8.6	20.3	14.4	16.8	19.9	16.0	4.3	15.3
Temperature (deg C) | BFC	6	7.6	15.4	8.9	9.9	14.1	11.2	3.1	10.8
Temperature (deg C) | BFC-BR	6	8.8	24.4	15.1	15.7	22.1	17.3	5.5	16.4
Temperature (deg C) | BSC-BR	4	11.1	23.7	16.3	19.9	22.1	18.6	4.8	17.9
Temperature (deg C) | BFC-LHU	2	9.6	17.2	11.5	13.4	15.3	13.4	3.8	12.9
Temperature (deg C) | BFC-LH	6	7.9	20.9	12.9	13.1	18.4	14.6	4.5	13.9
Temperature (deg C) | BFC-LHD	6	10.4	16.0	11.3	13.8	15.3	13.4	2.2	13.2
Temperature (deg C) | SVSC-SVU	2	11.7	15.2	12.5	13.4	14.3	13.4	1.8	13.3
Temperature (deg C) | SVSC-SVD	7	6.3	16.0	11.0	11.8	14.4	12.1	3.1	11.7
Nitrogen Ammonia as N (mg/L) | BSC-BCU	1	0.01	0.01	0.01	0.01	0.01	0.01	3.10	0.01
Nitrogen Ammonia as N (mg/L) | BSC-BC	4	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00
Nitrogen Ammonia as N (mg/L) | BSC-BCD	5	0.00	0.01	0.00	0.01	0.01	0.01	0.00	0.00
Nitrogen Ammonia as N (mg/L) | BFC	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrogen Ammonia as N (mg/L) | BFC-BR	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrogen Ammonia as N (mg/L) | BSC-BR	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrogen Ammonia as N (mg/L) | BFC-LHU	2	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00
Nitrogen Ammonia as N (mg/L) | BFC-LH	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrogen Ammonia as N (mg/L) | BFC-LHD	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrogen Ammonia as N (mg/L) | SVSC-SVU	2	0.00	0.01	0.00	0.01	0.01	0.01	0.00	0.00
Nitrogen Ammonia as N (mg/L) | SVSC-SVD	7	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00

Sample	No. of Samples	Minimum	Maximum	1st Quartile	Median	3rd Quartile	Mean	Standard Deviation (n)	Geometric Mean
Nitrogen Nitrate/Nitrite as N (mg/L) | BSC-BCU	1	0.16	0.16	0.16	0.16	0.16	0.16	0.00	0.16
Nitrogen Nitrate/Nitrite as N (mg/L) | BSC-BC	4	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.01
Nitrogen Nitrate/Nitrite as N (mg/L) | BSC-BCD	5	0.08	0.15	0.10	0.10	0.11	0.11	0.02	0.11
Nitrogen Nitrate/Nitrite as N (mg/L) | BFC	6	0.02	0.11	0.06	0.08	0.09	0.07	0.03	0.07
Nitrogen Nitrate/Nitrite as N (mg/L) | BFC-BR	6	0.02	0.40	0.03	0.04	0.04	0.10	0.14	0.05
Nitrogen Nitrate/Nitrite as N (mg/L) | BSC-BR	4	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Nitrogen Nitrate/Nitrite as N (mg/L) | BFC-LHU	2	0.07	0.08	0.08	0.08	0.08	0.08	0.01	0.08
Nitrogen Nitrate/Nitrite as N (mg/L) | BFC-LH	6	0.00	0.05	0.01	0.03	0.04	0.03	0.02	0.02
Nitrogen Nitrate/Nitrite as N (mg/L) | BFC-LHD	6	0.02	0.08	0.03	0.04	0.07	0.05	0.02	0.04
Nitrogen Nitrate/Nitrite as N (mg/L) | SVSC-SVU	2	0.07	0.11	0.08	0.09	0.10	0.09	0.02	0.09
Nitrogen Nitrate/Nitrite as N (mg/L) | SVSC-SVD	7	0.06	0.11	0.07	0.08	0.09	0.08	0.02	0.08
Nitrogen TKN (mg/L) | BSC-BCU	1	0.21	0.21	0.21	0.21	0.21	0.21	0.02	0.21
Nitrogen TKN (mg/L) | BSC-BC	4	0.28	0.48	0.36	0.42	0.46	0.40	0.08	0.39
Nitrogen TKN (mg/L) | BSC-BCD	5	0.22	0.41	0.25	0.25	0.26	0.28	0.06	0.27
Nitrogen TKN (mg/L) | BFC	6	0.21	0.29	0.23	0.27	0.28	0.26	0.03	0.25
Nitrogen TKN (mg/L) | BFC-BR	6	0.19	0.30	0.21	0.22	0.25	0.23	0.04	0.23
Nitrogen TKN (mg/L) | BSC-BR	4	0.25	0.46	0.39	0.44	0.45	0.40	0.08	0.39
Nitrogen TKN (mg/L) | BFC-LHU	2	0.23	0.41	0.28	0.32	0.37	0.32	0.09	0.31
Nitrogen TKN (mg/L) | BFC-LH	6	0.21	0.30	0.21	0.22	0.24	0.23	0.03	0.23
Nitrogen TKN (mg/L) | BFC-LHD	6	0.23	0.59	0.26	0.26	0.35	0.33	0.12	0.31
Nitrogen TKN (mg/L) | SVSC-SVU	2	0.15	0.60	0.26	0.37	0.49	0.37	0.22	0.30
Nitrogen TKN (mg/L) | SVSC-SVD	7	0.18	0.76	0.20	0.23	0.49	0.37	0.23	0.31
Phosphorus as P, Tot (mg/L) | BSC-BCU	1	0.02	0.02	0.02	0.02	0.02	0.02	0.23	0.02
Phosphorus as P, Tot (mg/L) | BSC-BC	4	0.02	0.03	0.02	0.03	0.03	0.03	0.01	0.03
Phosphorus as P, Tot (mg/L) | BSC-BCD	5	0.02	0.03	0.02	0.02	0.02	0.02	0.00	0.02
Phosphorus as P, Tot (mg/L) | BFC	6	0.01	0.02	0.01	0.01	0.01	0.01	0.00	0.01
Phosphorus as P, Tot (mg/L) | BFC-BR	6	0.01	0.02	0.01	0.01	0.01	0.01	0.00	0.01
Phosphorus as P, Tot (mg/L) | BSC-BR	4	0.02	0.04	0.02	0.03	0.04	0.03	0.01	0.03
Phosphorus as P, Tot (mg/L) | BFC-LHU	2	0.03	0.14	0.06	0.09	0.11	0.09	0.06	0.06
Phosphorus as P, Tot (mg/L) | BFC-LH	6	0.01	0.02	0.01	0.01	0.01	0.01	0.00	0.01
Phosphorus as P, Tot (mg/L) | BFC-LHD	6	0.01	0.12	0.02	0.02	0.09	0.05	0.05	0.03
Phosphorus as P, Tot (mg/L) | SVSC-SVU	2	0.03	0.17	0.06	0.10	0.13	0.10	0.07	0.07
Phosphorus as P, Tot (mg/L) | SVSC-SVD	7	0.02	0.17	0.02	0.02	0.10	0.06	0.06	0.04
TSS (mg/L) | BSC-BCU	1	2.50	2.50	2.50	2.50	2.50	2.50	0.06	2.50
TSS (mg/L) | BSC-BC	4	6.50	9.30	7.25	8.15	8.93	8.03	1.10	7.95
TSS (mg/L) | BSC-BCD	5	2.50	9.15	5.50	5.75	6.70	5.92	2.14	5.46
TSS (mg/L) | BFC	6	1.80	8.00	2.08	2.40	3.33	3.37	2.15	2.90
TSS (mg/L) | BFC-BR	6	3.00	7.90	3.48	4.55	5.55	4.83	1.67	4.57
TSS (mg/L) | BSC-BR	4	5.35	11.00	6.44	8.65	10.63	8.41	2.40	8.05
TSS (mg/L) | BFC-LHU	2	7.75	84.50	26.94	46.13	65.31	46.13	38.38	25.59
TSS (mg/L) | BFC-LH	6	2.50	6.80	2.70	3.50	3.93	3.80	1.45	3.57
TSS (mg/L) | BFC-LHD	6	4.30	93.00	4.40	5.35	60.00	31.72	38.28	12.48
TSS (mg/L) | SVSC-SVU	2	2.50	84.00	22.88	43.25	63.63	43.25	40.75	14.49
TSS (mg/L) | SVSC-SVD	7	1.30	118.00	3.50	10.00	64.00	37.76	49.67	11.26
Arsenic, T (ug/L) | BSC-BCU	1	3.00	3.00	3.00	3.00	3.00	3.00	49.67	3.00
Arsenic, T (ug/L) | BSC-BC	1	0.80	0.80	0.80	0.80	0.80	0.80	49.67	0.80
Arsenic, T (ug/L) | BSC-BCD	2	1.20	2.20	1.45	1.70	1.95	1.70	0.50	1.62
Arsenic, T (ug/L) | BFC	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Arsenic, T (ug/L) | BFC-BR	2	0.00	0.60	0.15	0.30	0.45	0.30	0.30	
Arsenic, T (ug/L) | BSC-BR	1	0.90	0.90	0.90	0.90	0.90	0.90	0.30	0.90
Arsenic, T (ug/L) | BFC-LHU	1	1.90	1.90	1.90	1.90	1.90	1.90	0.30	1.90
Arsenic, T (ug/L) | BFC-LH	2	0.00	0.40	0.10	0.20	0.30	0.20	0.20	
Arsenic, T (ug/L) | BFC-LHD	2	1.10	2.70	1.50	1.90	2.30	1.90	0.80	1.72
Arsenic, T (ug/L) | SVSC-SVU	1	0.00	0.00	0.00	0.00	0.00	0.00	0.80	
Arsenic, T (ug/L) | SVSC-SVD	2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Selenium, D (ug/L) | BSC-BCU	1	0.14	0.14	0.14	0.14	0.14	0.14	0.00	0.14
Selenium, D (ug/L) | BSC-BC	1	0.53	0.53	0.53	0.53	0.53	0.53	0.00	0.53
Selenium, D (ug/L) | BSC-BCD	2	0.06	0.20	0.10	0.13	0.17	0.13	0.07	0.11
Selenium, D (ug/L) | BFC	2	0.07	0.07	0.07	0.07	0.07	0.07	0.00	0.07
Selenium, D (ug/L) | BFC-BR	2	0.10	0.28	0.15	0.19	0.24	0.19	0.09	0.17
Selenium, D (ug/L) | BSC-BR	1	0.52	0.52	0.52	0.52	0.52	0.52	0.09	0.52
Selenium, D (ug/L) | BFC-LHU	1	0.18	0.18	0.18	0.18	0.18	0.18	0.09	0.18
Selenium, D (ug/L) | BFC-LH	2	0.09	0.13	0.10	0.11	0.12	0.11	0.02	0.11
Selenium, D (ug/L) | BFC-LHD	2	0.04	0.15	0.07	0.10	0.12	0.10	0.06	0.08
Selenium, D (ug/L) | SVSC-SVU	1	0.07	0.07	0.07	0.07	0.07	0.07	0.06	0.07
Selenium, D (ug/L) | SVSC-SVD	2	0.05	0.07	0.05	0.06	0.06	0.06	0.01	0.06
Stream Flow (cfs) | BSC-BCU	1	29.1	29.1	29.1	29.1	29.1	29.1	0.0	29.1
Stream Flow (cfs) | BSC-BC	4	1.9	45.2	2.2	9.2	23.3	16.4	17.6	7.5
Stream Flow (cfs) | BSC-BCD	5	31.0	267.0	46.0	64.0	98.0	101.2	85.9	75.1
Stream Flow (cfs) | BFC	6	7.0	82.0	19.0	43.0	55.0	40.8	26.0	29.7
Stream Flow (cfs) | BFC-BR	6	2.6	51.0	5.5	14.5	21.0	18.0	16.4	10.9
Stream Flow (cfs) | BSC-BR	4	1.9	57.7	3.3	20.4	42.3	25.1	23.5	11.1
Stream Flow (cfs) | BFC-LHU	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Stream Flow (cfs) | BFC-LH	6	4.4	48.4	8.0	22.1	36.6	23.6	16.9	16.5
Stream Flow (cfs) | BFC-LHD	6	0.0	10.0	1.1	4.5	7.9	4.7	3.9	
Stream Flow (cfs) | SVSC-SVU	2	64.0	888.0	270.0	476.0	682.0	476.0	412.0	238.4
Stream Flow (cfs) | SVSC-SVD	7	92.9	880.0	151.5	280.0	441.8	348.5	267.0	261.3

RiverWatch Monitoring Locations Active in 2013-2014 Timeframe

StationNum	StationName	River	WaterBodyID	StationQUAD	NearCity
105	Bohn Pk Br	S St Vrain	COSPSV02B	Lyons	Lyons
121	Boulder HS	Boulder Cr	COSPBO02B	Boulder	Boulder
123	Gamble G	Gamble G	COSPBO04A	Nederland	Rollinsville
124	Hwy 72 Br	S Boulder Cr	COSPBO04A	Tungsten	Rollinsville
158	Alicia Mine Drainage	James Cr	COSPSV04B	Boulder	Jamestown
166	Below Conf	St Vrain	COSPSV02A	Lyons	Longmont
274	Above Lefthand Creek	James Cr	COSPSV04B	Boulder	Jamestown
289	9th St Br	Boulder Cr	COSPBO09	Boulder	Boulder
420	Scott Carpenter Pk	Boulder Cr	COSPBO02B	Boulder	Boulder
422	Hwy 287	St Vrain	COSPSV03	Longmont	Longmont
423	75th St Br	St Vrain	COSPSV03	Hygiene	Longmont
428	Rec Center	S Boulder Cr	COSPBO05	Louisville	Boulder
484	Golden Prop. BLW Airport Rd	St Vrain	COSPSV03	Longmont	Longmont
485	Longmont	St Vrain	COSPSV03	Longmont	Longmont
494	Oxbow	Boulder Cr	COSPBO09	Erie	Erie
500	Eldorado Canyon	S Boulder Cr	COSPBO04B	Virginia Dale	Boulder
564	Lefthand Cr at Peak to Peak	Left Hand Cr	COSPSV04A	Ward	Ward
565	Lefthand Cr at California G	Left Hand Cr	COSPSV04A	Ward	Ward
570	Hover	St Vrain	COSPSV03	Hygiene	Longmont
577	Below Yellow Girl	Little James Cr	COSPSV04B	Gold Hill	Jamestown
578	Above Yellow Girl	Little James Cr	COSPSV04B	Gold Hill	Jamestown
582	Post Office	James Cr	COSPSV04B	Gold Hill	Jamestown
583	Town Intake	James Cr	COSPSV04B	Gold Hill	Jamestown
584	Cushman Bark	James Cr	COSPSV04B	Gold Hill	Jamestown
585	John Jay	James Cr	COSPSV04B	Gold Hill	Jamestown
586	Peak to Peak Hwy	James Cr	COSPSV04B	Gold Hill	Jamestown
587	Buckingham Pk	Left Hand Cr	COSPSV04C	Boulder	Niwot
588	Nimbus Rd	Left Hand Cr	COSPSV05	Niwot	Niwot
594	OS Baseline	S Boulder Cr	COSPBO05	Louisville	Louisville
629	Above James Cr	Left Hand Cr	COSPSV04A	Boulder	Jamestown
630	Haldi Intake	Left Hand Cr	COSPSV05	Boulder	Boulder
648	75th St	Boulder Cr	COSPBO09	Niwot	Boulder
670	Above Porphyry	Little James Cr	COSPSV04B	Gold Hill	Jamestown
671	Upstream Burlington	Little James Cr	COSPSV04B	Raymond	Jamestown
672	Homeland	Left Hand Cr	COSPSV04A	Boulder	Boulder
675	East Br	Coal Cr	COSPBO06	Lafayette	Lafayette
678	Above Left Hand	James Cr	COSPSV04B	Boulder	Jamestown
752	Chipeta Pk	M Boulder Cr	COSPBO03	Nederland	Nederland
790	Ward Rd	Little James Cr	COSPSV04B	Gold Hill	Jamestown
832	Sunset St Br	St Vrain	COSPSV03	Longmont	Longmont
839	Pike Rd	Left Hand Cr	COSPSV05	Longmont	Longmont
933	JPII Trail Head	Cabin Cr	COSPSV02A	Allens Park	Allenspark
934	East Hwy 7	Cabin Cr	COSPSV02A	Allens Park	Allenspark
2600	Blw Conf Rock Cr	Coal Cr	COSPBO07B	Lafayette	Lafayette
2601	Bobolink Trailhead	S Boulder Cr	COSPBO05	Louisville	Boulder
2602	CR 20.5	Boulder Cr	COSPBO10	Longmont	Longmont
2820	Upper Como Cr	Como Cr	COSPBO03	Gold Hill	Sugarloaf
2821	Lower Como Cr	Como Cr	COSPBO03	Gold Hill	Sugarloaf
3700	At Twin Spruce Rd	Coal Cr	COSPBO06	Eldorado Springs	Plainview
3701	Blw Plainview	Coal Cr	COSPBO06	Eldorado Springs	Arvada
3918	Blw Hwy 287	Left Hand Cr	COSPSV05	Abarr	Longmont
4137	Above Coal Creek	Boulder Cr	COSPBO09	Erie	Erie
4138	Below S. Boulder Creek	Boulder Cr	COSPBO09	Niwot	Niwot
5102	Golden Ponds (site 107)	St Vrain	COSPSV03	Hygiene	Longmont
5103	Above Dam @ Golden Ponds	St Vrain	COSPSV03	Hygiene	Longmont
5104	Open Space	St Vrain	COSPSV03	Hygiene	Longmont
5105	St Vrain #86	St Vrain	COSPSV03	Hygiene	
5106	Main St Br	Left Hand Cr	COSPSV05	Longmont	Longmont
5133	Sandstone Ranch	St Vrain	COSPSV03	Longmont	Longmont
5145	Blw Button Rock Res	N St Vrain	COSPSV02A	Lyons	Lyons
5146	Button Rock Preserve Upper	St Vrain	COSPSV02A	Lyons	Lyons
5175	At Grover	S Boulder Cr	COSPBO05	Boulder	Boulder
5179	Blw Hwy 287 Br	St Vrain	COSPSV03	Longmont	Longmont
5188	Abv Diversion	St Vrain	COSPSV03	Hygiene	Longmont
5192	E of Hover St	St Vrain	COSPSV03	Longmont	Longmont

Stn#	Org Name	Date	Flow (cfs)	pH (SU)	Temp C	Phen Alk (mg/L)	Tot Alk (mg/L)	Tot Hard (mg/L)	DO (mg/L)	DO Sat (%)
124	Teens, Inc.	12/12/2014		6.98	0	0	30	34	10.4	72
124	Teens, Inc.	11/20/2014		7.84	0	0		34	10.2	70
124	Teens, Inc.	10/30/2014		7.61	5	0	30	20.5	9.3	74
124	Teens, Inc.	10/1/2014		7.58	8	0	20	24	9.5	80
124	Teens, Inc.	5/5/2014		7.48	6	0	18	26	8.9	72
124	Teens, Inc.	2/27/2014		7.47	0	0	28	46	11.7	82
124	Teens, Inc.	1/28/2014			0	0	40	42	10.1	68
274	LWOG	11/4/2014		5.7	3	0	16	32	10.3	77
274	LWOG	7/12/2014		6.4	15	0	8	12	7.7	77
274	LWOG	5/26/2014		6.1	13	0	12	28	8.3	79
274	LWOG	4/26/2014		5.6	10	0	20	34	8.5	76
289	Watershed School	10/29/2014		7.55	5	0	28	32		
289	Watershed School	8/24/2014		7.41	14	0	24	30	7.2	70
289	Watershed School	7/31/2014			13	0	16	32		
289	Watershed School	6/28/2014			12	0	14	42	6.8	64
289	Watershed School	5/22/2014		7.56	9	0	30	64	7.6	66
420	Colorado Ocean Coalition	5/24/2014		7.64	9	0	2	36	9	80
420	Colorado Ocean Coalition	3/29/2014		7.82	7.5	0	26	70	9.1	78
420	Colorado Ocean Coalition	2/15/2014			3	28	4	74	11.8	81
428	Frost Family	5/24/2014	-999	7.59	11	0	34	56	9.1	84
428	Frost Family	3/24/2014	-999	8.02	4	0	84	154	10.9	85
428	Frost Family	2/16/2014	-999	7.38	8	0	38	56	9.5	80
494	Alexander Dawson Sch	12/4/2014		7.95	4		58	178	11.1	86
494	Alexander Dawson Sch	11/18/2014		8.05	4	0	88	162	11.1	85
494	Alexander Dawson Sch	5/13/2014			6	0	72	114	9.7	80
494	Alexander Dawson Sch	4/2/2014		7.77	8	0	116	242	9.2	78
494	Alexander Dawson Sch	1/24/2014			1.5	0	98	198	10.4	75
500	Frost Family	5/24/2014	170	7.72	8	0	26	34	9.6	82
500	Frost Family	3/24/2014	28.9	7.41	3	0	28	82	10.4	78
500	Frost Family	2/16/2014	16.4	7.45	4	0	28	36	10.1	78
564	LWOG	8/12/2014		5.9	13	0	12	16	7.3	70
564	LWOG	7/13/2014		6.5	14	0	8	12	7.3	72
564	LWOG	4/26/2014		6.1	4	0	16	20	8.8	67
565	LWOG	8/12/2014		5.7	15	0	12	22	7.2	72
565	LWOG	7/13/2014		6.4	15	0	10	16	7.3	73
565	LWOG	5/26/2014		5.6	8	0	8	30	8.6	73
565	LWOG	4/26/2014		5.9	6	0	12	38	8.6	70
570	Olde Columbine HS	10/8/2014		7.92	13	0	114	158	8	76
570	Olde Columbine HS	5/15/2014			8	0	48	68	8.8	74
570	Olde Columbine HS	4/24/2014			8	0	48	72	8.2	70
570	Olde Columbine HS	3/27/2014		8.22	9		194	408	9.4	82
577	LWOG	8/12/2014		5.7	22	0	68	1000	5.8	58
578	LWOG	11/4/2014		5	7	0	12	2	7.6	72
578	LWOG	8/12/2014		6	22	0	10	2	6.4	73
578	LWOG	7/13/2014		5.7	18	0	10	2	6.4	68
578	LWOG	5/26/2014		5.8	14	0	10	44	7.2	70
578	LWOG	4/26/2014		6	11	0	12	42	7.7	70
582	James Creek Watershed In	10/26/2014	9	7.48	8	0	12	18	7.8	68
583	James Creek Watershed In	10/26/2014	9	7.51	8	0	12	16	7.7	68
584	James Creek Watershed In	10/26/2014	9	7.43	6	0	10	16		
585	James Creek Watershed In	10/26/2014	9	7.44	6	0	10	14		
586	James Creek Watershed In	10/26/2014	9	7.39	6	0	10	12	7.7	62
629	LWOG	11/4/2014		5.9	4	0	40	78	10.4	80
629	LWOG	5/26/2014		6.2	11	0	20	38	8.5	78
629	LWOG	4/26/2014		6.1	8	0	20	44	8.8	75
630	LWOG	11/4/2014		5.9	6	0	22	46	9.8	80
630	LWOG	8/12/2014	42	6.4	20	0	10	32	7	79
630	LWOG	7/13/2014	100	6.3	18	0	10	16	7.7	82
630	LWOG	5/27/2014		6.3	15	0	18	32	8	79
630	LWOG	4/26/2014		6.3	11	0	26	44	8.4	77

Stn#	Org Name	Date	Flow (cfs)	pH (SU)	Temp C	Phen Alk (mg/L)	Tot Alk (mg/L)	Tot Hard (mg/L)	DO (mg/L)	DO Sat (%)
671	LWOG	7/13/2014		6	17	0	16	36	7.1	74
671	LWOG	4/26/2014		6.4	8	0	16	30	8.6	74
672	LWOG	11/4/2014		6.1	8	0	32	74	10	86
672	LWOG	7/13/2014		6.2	16	0	20	28	7.7	79
672	LWOG	5/26/2014		5.5	10	0	18	32	8.6	77
752	Teens, Inc.	12/12/2014			0	0	30	24	10	70
752	Teens, Inc.	11/18/2014		7.84	0	0	16	10	10.3	70
752	Teens, Inc.	10/23/2014		7.62	5	0	16	22	9.1	74
752	Teens, Inc.	9/24/2014		7.65	12	0	16	25	7.7	74
752	Teens, Inc.	5/5/2014		7.92	5	0	16	21	9.3	74
752	Teens, Inc.	2/25/2014		8.04	0	0	29	43	10	70
752	Teens, Inc.	1/23/2014			0	0	22	30	10.5	72
2600	Boulder Creek Watershed	9/12/2014		8.34	11	6	188	214	8.3	78
2600	Boulder Creek Watershed	8/17/2014		8.46	18	0	200	274	6.5	64
2600	Boulder Creek Watershed	7/6/2014		8.07	18		222	220	7.5	80
2600	Boulder Creek Watershed	5/31/2014		7.95	20		118	126	7.2	82
2600	Boulder Creek Watershed	1/18/2014		8.1	3		272	324	9.5	71
2601	Boulder Creek Watershed	8/8/2014		8.06	19	0	28	32	6.8	77
2601	Boulder Creek Watershed	6/6/2014		8	12	0	24	30	8.9	84
2601	Boulder Creek Watershed	5/2/2014		7.82	11		28	34	8.3	77
2601	Boulder Creek Watershed	4/5/2014		8.25	4		16	62	10.1	77
2601	Boulder Creek Watershed	3/1/2014		8.71	0		50	46	10.8	76
2601	Boulder Creek Watershed	1/11/2014		8.26	0	0	32	36	11	77
3701	Coal Creek Canyon K-8	11/19/2014		7.2	-0.3	0	86	128	9	67
3701	Coal Creek Canyon K-8	10/29/2014		7.72	9.4	0	112	108		
3701	Coal Creek Canyon K-8	9/24/2014		8.07	9.2	0	90	120		

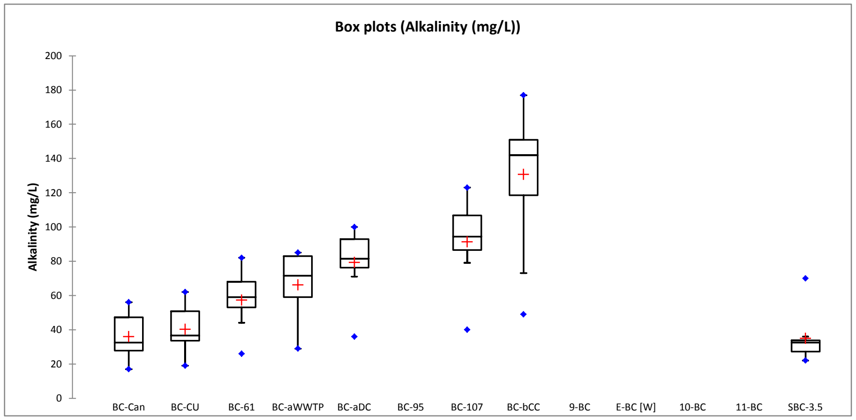
Stn#	Org Name	Date	Time	AL Dis	AL Tot	AS Dis	AS Tot	CA Dis	CA Tot	CD Dis	CD Tot	CU Dis	CU Tot
				ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
289	Watershed School	4/17/2014	15:50:00	36	766	0	0	20399	20821	0	0	0	4.8
289	Watershed School	3/17/2014	16:00:00	0	68	0	0	25778	26749	0	0	0	2.3
289	Watershed School	2/19/2014	16:10:00	0	73	0	0	29512	36014	0	0	0	0
420	Colorado Ocean Coalition	5/24/2014	10:00:00	35	3294	0	0	9131	10180	0	0.23	0	5.6
420	Colorado Ocean Coalition	3/29/2014	12:30:00	0	808	0	0	19389	19224	0	0	0	0
420	Colorado Ocean Coalition	2/15/2014	10:00:00	0	167	0	0	29764	29800	0	0	0	0
428	Frost Family	5/24/2014	11:20:00	37	216	0	0	13708	14013	0	0	0	0
428	Frost Family	3/24/2014	12:00:00	21	476	0	0	37984	38757	0	0	0	2.8
428	Frost Family	2/16/2014	15:00:00	40	702	0	0	15192	15573	0	0	0	0
494	Alexander Dawson Sch	5/13/2014	8:00:00	0	19	0	0	24694	57291	0	0.27	0	3.4
494	Alexander Dawson Sch	4/2/2014	10:00:00	16	89	0	0	47964	50169	0.27	0	7	9.3
494	Alexander Dawson Sch	1/24/2014	10:00:00	0	275	0	0	48949	49072	0	0.28	5	5.1
500	Frost Family	5/24/2014	10:40:00	45	190	0	0	9247	10081	0	0	0	2
500	Frost Family	3/24/2014	12:30:00	33	847	0	0	9638	9729	0	0	0	0
500	Frost Family	2/16/2014	14:30:00	85	3495	0	0	9577	10897	0	0.21	0	8.3
564	LWOG	8/12/2014	13:30:00	24	75	0	0	3929	3922	0	0	0	0
564	LWOG	7/13/2014	13:40:00	31	102	0	0	3203	3188	0	0	0	0
565	LWOG	8/12/2014	14:00:00	135	210	0	0	5703	5661	0.21	0.26	34	40.5
565	LWOG	7/13/2014	13:15:00	66	185	0	0	3649	3980	0	0	16.6	20.7
565	LWOG	5/26/2014	14:45:00	292	704	0	0	7831	7846	0.54	0.53	104.8	139
570	Olde Columbine HS	5/15/2014	15:10:00	32	847	0	0	20012	19911	0	0	0	0
570	Olde Columbine HS	4/24/2014	15:10:00	34	2141	0	0	20557	20810	0	0	0	3.7
570	Olde Columbine HS	3/27/2014	15:12:00	0	256	0	0	89316	90188	0	0	0	0
578	LWOG	11/4/2014	11:00:00	6313	8004	0	0	59735	60555	3.05	2.94	17.3	34.5
578	LWOG	8/12/2014	12:10:00	4239	4362	0	0	36455	36955	1.59	1.58	14.7	20.5
578	LWOG	7/13/2014	10:50:00	4612	5706	0	0	39554	39540	1.9	1.95	19	28
578	LWOG	5/26/2014	12:15:00	851	8424	0	0	14661	16480	0.54	0.93	19.2	78.6
629	LWOG	11/4/2014	12:45:00	0	26	0	0	23101	23006	0	0	0	0
629	LWOG	5/26/2014	13:30:00	70	1332	0	0	10939	11253	0	0	9.6	21.6
630	LWOG	11/4/2014	12:15:00	0	145	0	0	16946	16969	0	0	0	0
630	LWOG	8/12/2014	15:15:00	34	161	0	0	9242	9314	0	0	0	2.3
630	LWOG	7/13/2014	12:00:00	37	412	0	0	5222	5364	0	0	2	4.3
630	LWOG	5/27/2014	14:30:00	131	3492	0	0	9684	10481	0	0	5.9	16.6
671	LWOG	7/13/2014	10:25:00	106	342	0	0	11986	12287	0.31	26	8.8	9.9
672	LWOG	11/4/2014	13:15:00	0	5586	0	0	19699	21406	0	1.01	2.8	77
672	LWOG	7/13/2014	12:35:00	27	137	0	0	7639	7870	0	0	10.5	12.6
672	LWOG	5/26/2014	14:00:00	75	934	0	0	9274	9551	0	0.2	11.9	25.2
2600	Boulder Creek Watershed Initiative	8/17/2014	8:15:00	0	526	0	0	49986	54373	0.33	0.36	4.9	6.7
2600	Boulder Creek Watershed Initiative	7/6/2014	9:15:00	15	545	0	0	41745	42021	0.25	0.24	4.9	5
2600	Boulder Creek Watershed Initiative	5/31/2014	9:30:00	22	1963	0	0	30448	31721	0	0	2.2	4.4
2600	Boulder Creek Watershed Initiative	1/18/2014	16:20:00	31	808	0	0	72603	73814	0.3	0.37	4	3.8
2601	Boulder Creek Watershed Initiative	8/8/2014	15:45:00	29	96	0	0	8778	8710	0	0	0	0
2601	Boulder Creek Watershed Initiative	6/6/2014	15:45:00	49	929	0	0	9163	9390	0	0	0	0
2601	Boulder Creek Watershed Initiative	5/2/2014	15:45:00	58	1330	0	0	10170	12242	0	0	0	2.6
2601	Boulder Creek Watershed Initiative	4/5/2014	9:15:00	0	212	0	0	18922	22426	0	0	0	0
2601	Boulder Creek Watershed Initiative	3/1/2014	9:15:00	29	398	0	0	14828	14762	0	0	0	0

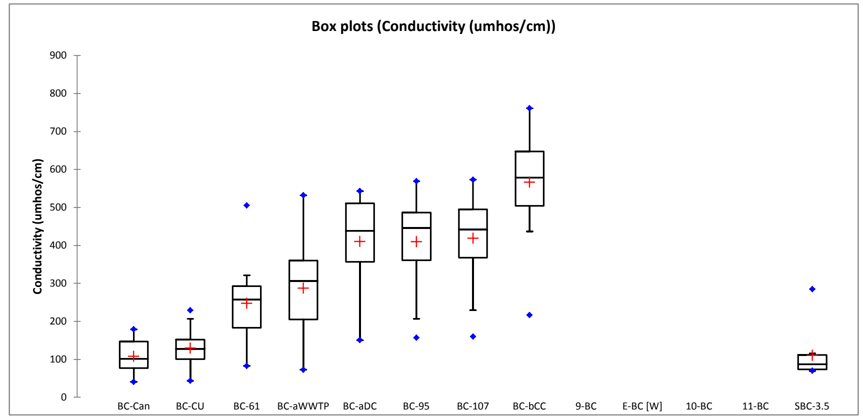
Stn#	Org Name	Date	FE Dis	FE Tot	PB Dis	PB Tot	MG Dis	MG Tot	MN Dis	MN Tot	SE Dis	SE Tot	ZN Dis
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
289	Watershed School	4/17/2014	68	900	6.7	10.7	6551	6675	10.3	43.8	0	0	0
289	Watershed School	3/17/2014	34	124	4.2	5.4	8075	8385	13.4	16.9	0	0	0
289	Watershed School	2/19/2014	38	163	4.7	6.1	9305	11412	22.3	28.7	0	0	4.1
420	Colorado Ocean Coalition	5/24/2014	85	3422	4.7	24.6	3014	4205	10.8	189.3	0	0	0
420	Colorado Ocean Coalition	3/29/2014	44	795	4	8.8	6836	6823	16.6	39.4	0	0	0
420	Colorado Ocean Coalition	2/15/2014	21	195	4.7	5.5	10603	10747	22	25.8	0	0	4.6
428	Frost Family	5/24/2014	109	318	4.8	5.4	4172	4300	20.9	30.3	0	0	0
428	Frost Family	3/24/2014	88	710	4.5	6.3	10451	10743	59.7	75.6	0	0	0
428	Frost Family	2/16/2014	82	795	5.2	7.5	4100	4333	19.4	52.6	0	0	0
494	Alexander Dawson Sch	5/13/2014	0	0	4.2	10.8	9571	23051	0	0	0	0	8.1
494	Alexander Dawson Sch	4/2/2014	90	230	3.5	0	21084	23555	52.6	63.2	0	0	19.8
494	Alexander Dawson Sch	1/24/2014	66	366	5.2	6.1	21357	21357	50.4	65.8	0	0	12.1
500	Frost Family	5/24/2014	69	214	4.1	6.1	2484	2795	0	20.2	0	0	0
500	Frost Family	3/24/2014	52	497	4.1	6.2	2635	2822	0	23.1	0	0	0
500	Frost Family	2/16/2014	107	3424	4.4	12.9	2620	4089	12.5	155.5	0	0	4.7
564	LWOG	8/12/2014	216	441	0	0	1480	1466	21.2	37.8	0	0	0
564	LWOG	7/13/2014	159	346	0	0	1183	1196	20.1	30.6	0	0	0
565	LWOG	8/12/2014	159	329	0	0	2342	2330	76.4	86.5	0	0	60.6
565	LWOG	7/13/2014	131	343	0	0	1402	1629	38.3	50.6	0	0	27.5
565	LWOG	5/26/2014	281	631	0	0	3845	3877	147.2	157.3	0	0	131.5
570	Olde Columbine HS	5/15/2014	124	851	5.1	6.9	5407	5399	21.6	37.6	0	0	0
570	Olde Columbine HS	4/24/2014	111	1863	5.8	11.6	5075	5380	32.6	63.3	0	0	0
570	Olde Columbine HS	3/27/2014	25	373	0	0	38819	39512	63	110.6	0	0	5.2
578	LWOG	11/4/2014	477	1552	4.4	39.2	14629	14895	3648	3675.3	0	0	430.6
578	LWOG	8/12/2014	130	336	7.7	12.4	8797	8821	1627.2	1647.2	0	0	246.8
578	LWOG	7/13/2014	163	513	9.9	19	9624	9726	1740.1	1735.4	0	0	311
578	LWOG	5/26/2014	106	5556	0	157.9	3927	5069	219.6	463	0	0	77.4
629	LWOG	11/4/2014	124	241	0	0	9856	10075	107.3	107.1	0	0	7.5
629	LWOG	5/26/2014	74	1224	0	7.5	4686	5032	25.7	73.9	0	0	39.1
630	LWOG	11/4/2014	164	422	0	0	5129	5155	142	156	0	0	8.1
630	LWOG	8/12/2014	196	276	0	0	2653	2725	79.7	79	0	0	12.9
630	LWOG	7/13/2014	82	411	0	0	1456	1559	38.6	52	0	0	13.1
630	LWOG	5/27/2014	119	2569	0	26.5	3250	4109	45.2	141.9	0	0	18.5
671	LWOG	7/13/2014	0	115	0	0	3640	3598	5	6.8	0	0	30.5
672	LWOG	11/4/2014	38	12096	0	104.9	9334	12128	97.7	657	0	0	4.5
672	LWOG	7/13/2014	93	265	0	0	3286	3406	35.6	47	0	0	18.9
672	LWOG	5/26/2014	80	750	0	6.5	4085	4297	31.6	79.3	0	0	20.4
2600	Boulder Creek Watershed Initiative	8/17/2014	19	568	5.2	5.9	23941	25438	43.3	60.7	0	0	16.3
2600	Boulder Creek Watershed Initiative	7/6/2014	35	516	5.1	6.6	19012	19047	32.6	47.3	0	0	19.3
2600	Boulder Creek Watershed Initiative	5/31/2014	54	1746	5.5	12.4	11888	12244	36.4	97.4	0	0	7.7
2600	Boulder Creek Watershed Initiative	1/18/2014	29	509	5.8	8.1	34216	38425	26	41.1	0	0	22.6
2601	Boulder Creek Watershed Initiative	8/8/2014	187	341	3.5	3.7	2746	2711	20.8	33.3	0	0	0
2601	Boulder Creek Watershed Initiative	6/6/2014	79	772	4.3	6.5	2774	2998	10.1	40.3	0	0	0
2601	Boulder Creek Watershed Initiative	5/2/2014	83	1075	4.1	9.2	2871	3912	8.7	54.2	0	0	0
2601	Boulder Creek Watershed Initiative	4/5/2014	64	282	4.1	4.8	6445	7500	29.8	41.9	0	0	0
2601	Boulder Creek Watershed Initiative	3/1/2014	62	320	4.7	5.8	4404	4437	21.7	29.8	0	0	0

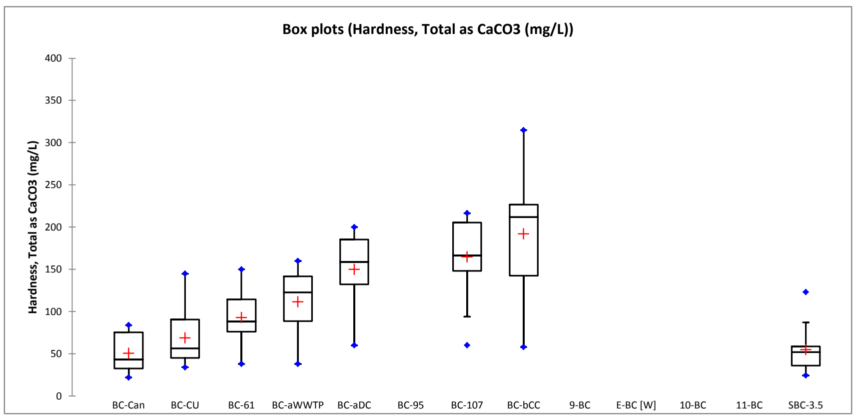
Stn#	Org Name	Date	ZN Tot	NA Dis	NA Tot	Calc Hard D	Calc Hard T	K Dis	K Tot
			ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
289	Watershed School	4/17/2014	20.6	4246	4169	78	79	1741	2017
289	Watershed School	3/17/2014	7.7	5237	5460	98	101	1891	1879
289	Watershed School	2/19/2014	7.8	6511	7998	112	137	2147	2536
420	Colorado Ocean Coalition	5/24/2014	31.4	2277	2375	35	43	267	447
420	Colorado Ocean Coalition	3/29/2014	8.8	4383	4220	77	76	330	360
420	Colorado Ocean Coalition	2/15/2014	6.3	9644	9706	118	119	450	461
428	Frost Family	5/24/2014	4.1	4046	4166	51	53	1256	1396
428	Frost Family	3/24/2014	8.1	9727	9890	138	141	2173	2343
428	Frost Family	2/16/2014	0	3074	3133	55	57	760	821
494	Alexander Dawson Sch	5/13/2014	3.3	9853	23651	101	238	2412	6133
494	Alexander Dawson Sch	4/2/2014	22	20489	21598	207	222	6178	6369
494	Alexander Dawson Sch	1/24/2014	14.6	17983	18433	210	210	5266	5159
500	Frost Family	5/24/2014	6.8	1673	1525	33	37	708	596
500	Frost Family	3/24/2014	0	1508	1579	35	36	708	801
500	Frost Family	2/16/2014	35.6	1558	1589	35	44	1148	1144
564	LWOG	8/12/2014	0	748	675	16	16	262	218
564	LWOG	7/13/2014	0	618	619	13	13	0	0
565	LWOG	8/12/2014	69.6	828	846	24	24	251	290
565	LWOG	7/13/2014	31.3	646	674	15	17	211	220
565	LWOG	5/26/2014	135	1312	1291	35	36	410	428
570	Olde Columbine HS	5/15/2014	3.4	4094	4006	72	72	1255	1342
570	Olde Columbine HS	4/24/2014	8.6	3378	3390	72	74	1328	1664
570	Olde Columbine HS	3/27/2014	0	28096	28703	383	388	2831	2765
578	LWOG	11/4/2014	427.4	25135	25431	209	213	3508	3561
578	LWOG	8/12/2014	249.3	13580	13627	127	129	2331	2341
578	LWOG	7/13/2014	308	15167	15220	138	139	2496	2514
578	LWOG	5/26/2014	123.2	3816	3832	53	62	808	1406
629	LWOG	11/4/2014	8.8	2520	2410	98	99	909	892
629	LWOG	5/26/2014	36.4	1909	1964	47	49	570	722
630	LWOG	11/4/2014	14.8	1832	1869	63	64	561	561
630	LWOG	8/12/2014	13.7	1058	1066	34	34	464	476
630	LWOG	7/13/2014	26.8	618	646	19	20	256	338
630	LWOG	5/27/2014	38.7	1461	1675	38	43	548	992
671	LWOG	7/13/2014	38.3	3593	3544	45	45	622	609
672	LWOG	11/4/2014	122.8	2025	2057	88	103	777	1831
672	LWOG	7/13/2014	21	1045	1052	33	34	388	382
672	LWOG	5/26/2014	41.5	1735	1918	40	42	483	676
2600	Boulder Creek Watershed Initiative	8/17/2014	29.3	49776	77738	223	241	1169	1202
2600	Boulder Creek Watershed Initiative	7/6/2014	22.9	37363	37717	183	183	851	995
2600	Boulder Creek Watershed Initiative	5/31/2014	31.2	18935	20077	125	130	406	437
2600	Boulder Creek Watershed Initiative	1/18/2014	25.9	87784	91000	322	343	1306	1110
2601	Boulder Creek Watershed Initiative	8/8/2014	0	2040	2004	33	33	0	0
2601	Boulder Creek Watershed Initiative	6/6/2014	3.8	1738	1794	34	36	0	0
2601	Boulder Creek Watershed Initiative	5/2/2014	22.6	1796	2314	37	47	0	220
2601	Boulder Creek Watershed Initiative	4/5/2014	0	5828	6332	74	87	0	0
2601	Boulder Creek Watershed Initiative	3/1/2014	8.6	2853	2881	55	55	0	0

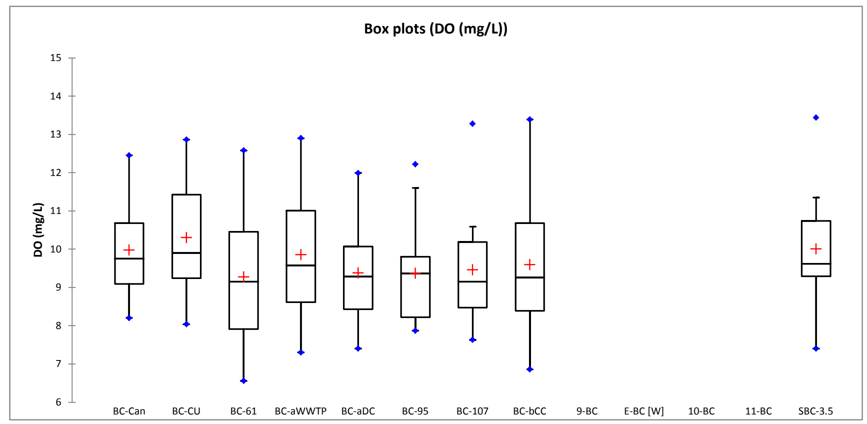
Stn#	Org Name	Date	Time	Ammonia	Chloride	Nitrate Nitrite	Sulfate	Tot P	TSS
				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
289	Watershed School	11/17/2014	16:30:00	0.08	7.06	0.1095	6.34	0	0
420	Colorado Ocean Coalition	5/24/2014	10:00:00	0.04	7.92	0.144	7.18	0.122	152.7
494	Alexander Dawson Sch	10/21/2014	7:30:00	0.02	42.2	3.24	66.1	0.894	4.1
494	Alexander Dawson Sch	5/13/2014	8:00:00	0.04	40.4	0.971	35.8	0.519	37.6
570	Olde Columbine HS	10/8/2014	8:57:00	0.02	5.97	0	64.1	0.0057	0
570	Olde Columbine HS [dup]	10/8/2014	8:57:00	0.02	5.97	0	64.1	0.0057	0
570	Olde Columbine HS	5/15/2014	15:10:00	1.39	4.7	0.076	15	0	30.3
578	Lefthand Watershed Oversight Group	11/4/2014	11:00:00	0.06	13.6	0.062	237	0	24.1
630	Lefthand Watershed Oversight Group	11/4/2014	12:15:00	0.09	3.4	0.045	18.8	0	5.2
2600	Boulder Creek Watershed Initiative	9/12/2014	10:15:00	0.06	99.1	0.748	116	0.0068	125.6

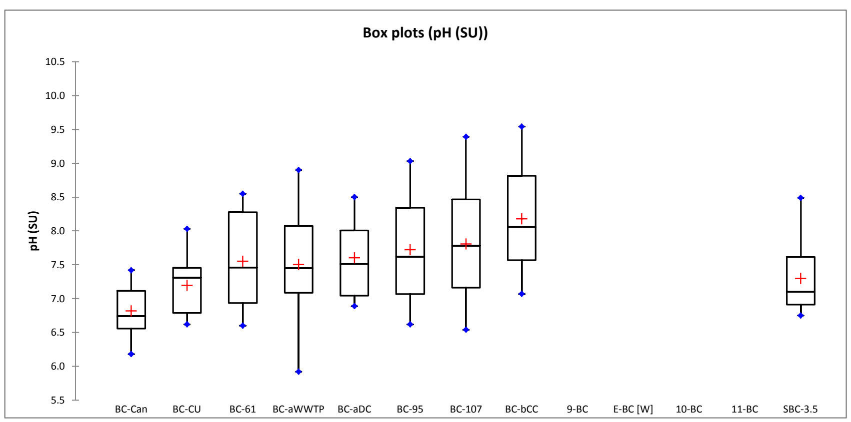
Appendix C. Boxplots

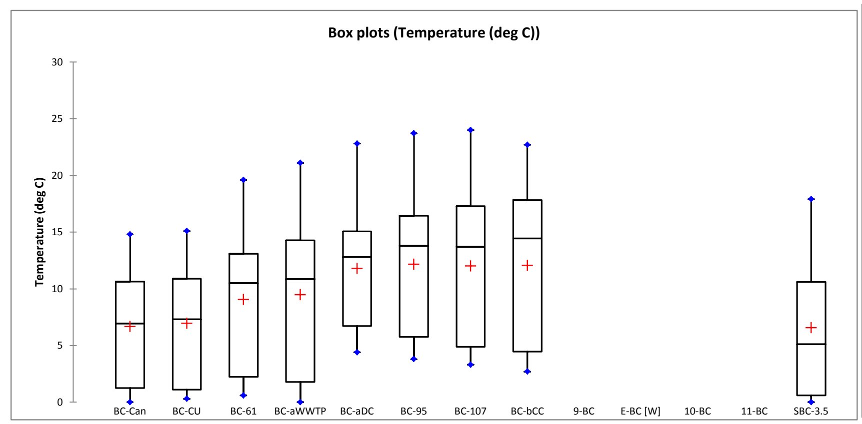

Box plots (Alkalinity (mg/L))
Alkalinity (mg/L)
0
20
40
60
80
100
120
140
160
180
200
BC-Can
BC-CU
BC-61
BC-aWWTP
BC-aDC
BC-95
BC-107
BC-bCC
9-BC
E-BC [W]
10-BC
11-BC
SBC-3.5

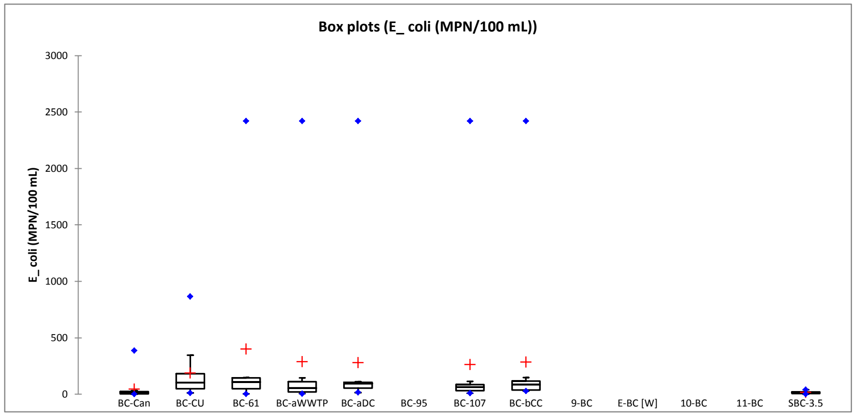

Box plots (Conductivity (umhos/cm))
Conductivity (umhos/cm)
0
100
200
300
400
500
600
700
800
900
BC-Can
BC-CU
BC-61
BC-aWWTP
BC-aDC
BC-95
BC-107
BC-bCC
9-BC
E-BC [W]
10-BC
11-BC
SBC-3.5

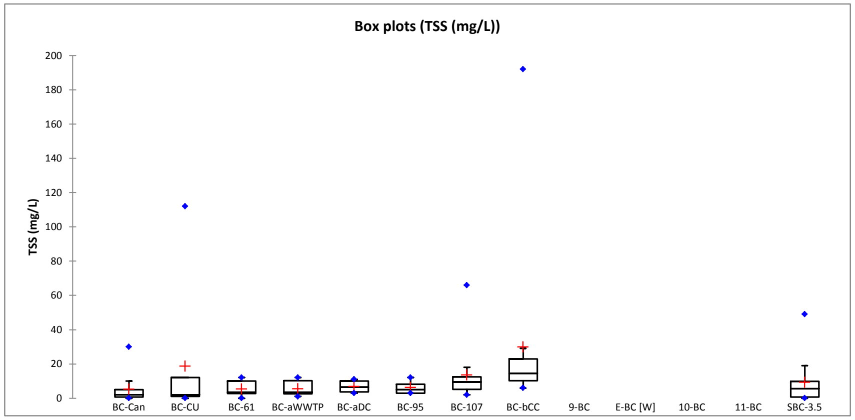

Box plots (Hardness, Total as CaCO3 (mg/L))
Hardness, Total as CaCO3 (mg/L)
0
50
100
150
200
250
300
350
400
BC-Can
BC-CU
BC-61
BC-aWWTP
BC-aDC
BC-95
BC-107
BC-bCC
9-BC
E-BC [W]
10-BC
11-BC
SBC-3.5

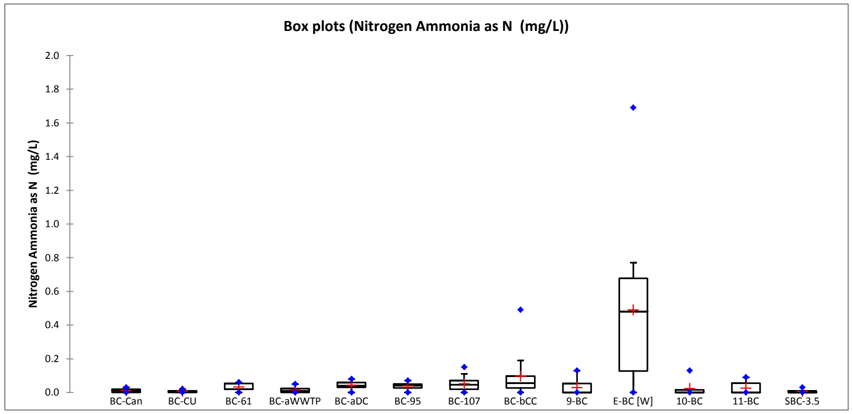

Box plots (DO (mg/L))
DO (mg/L)
6
7
8
9
10
11
12
13
14
15
BC-Can
BC-CU
BC-61
BC-aWWTP
BC-aDC
BC-95
BC-107
BC-bCC
9-BC
E-BC [W]
10-BC
11-BC
SBC-3.5

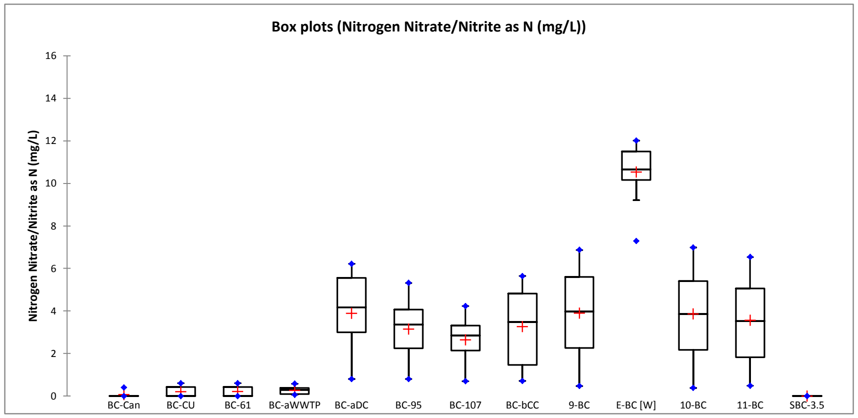

Box plots (pH (SU))
pH (SU)
5.5
6.0
6.5
7.0
7.5
8.0
8.5
9.0
9.5
10.0
10.5
BC-Can
BC-CU
BC-61
BC-aWWTP
BC-aDC
BC-95
BC-107
BC-bCC
9-BC
E-BC [W]
10-BC
11-BC
SBC-3.5

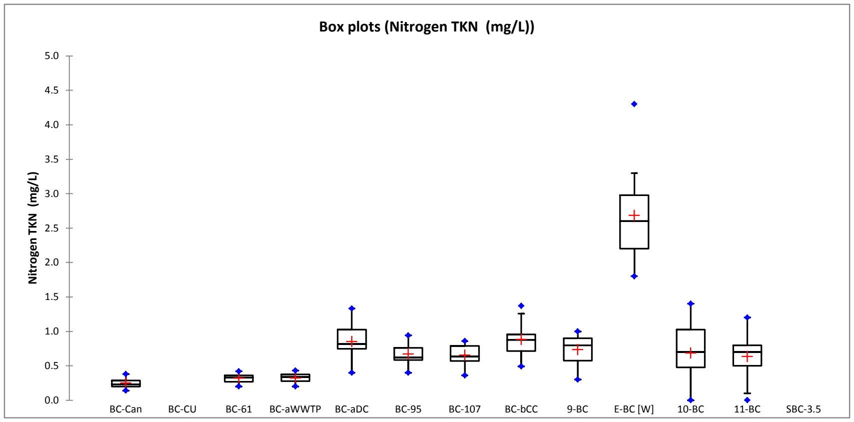

Box plots (Temperature (deg C))
Temperature (deg C)
0
5
10
15
20
25
30
BC-Can
BC-CU
BC-61
BC-aWWTP
BC-aDC
BC-95
BC-107
BC-bCC
9-BC
E-BC [W]
10-BC
11-BC
SBC-3.5

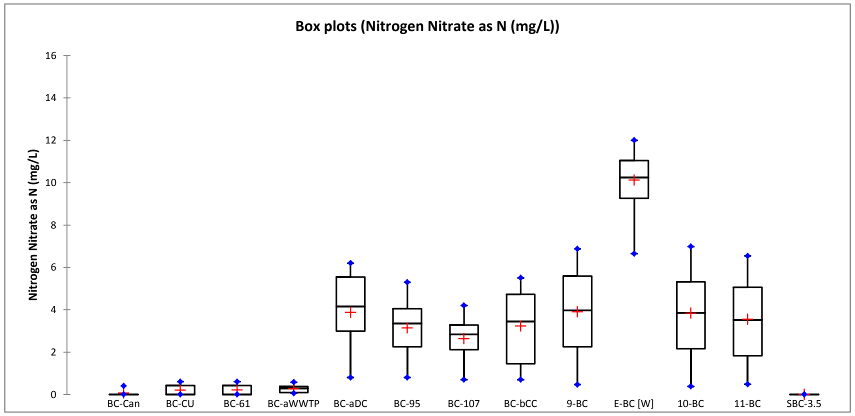

Box plots (E_ coli (MPN/100 mL))
E_ coli (MPN/100 mL)
3000
2500
2000
1500
1000
500
0
BC-Can
BC-CU
BC-61
BC-aWWTP
BC-aDC
BC-95
BC-107
BC-bCC
9-BC
E-BC [W]
10-BC
11-BC
SBC-3.5

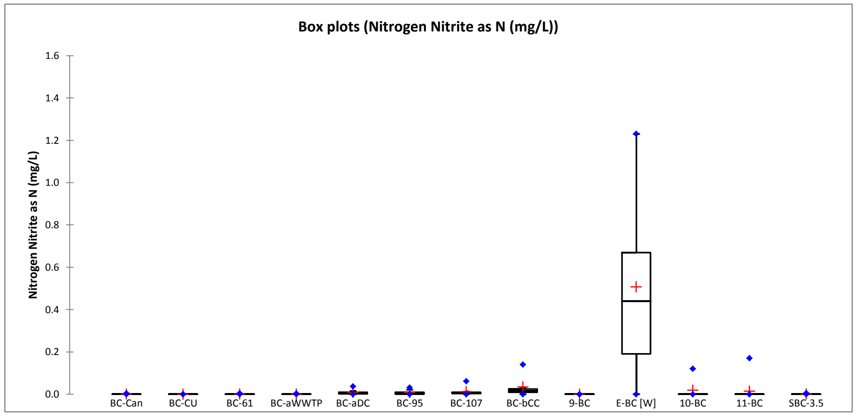

Box plots (TSS (mg/L))
TSS (mg/L)
200
180
160
140
120
100
80
60
40
20
0
BC-Can
BC-CU
BC-61
BC-aWWTP
BC-aDC
BC-95
BC-107
BC-bCC
9-BC
E-BC [W]
10-BC
11-BC
SBC-3.5

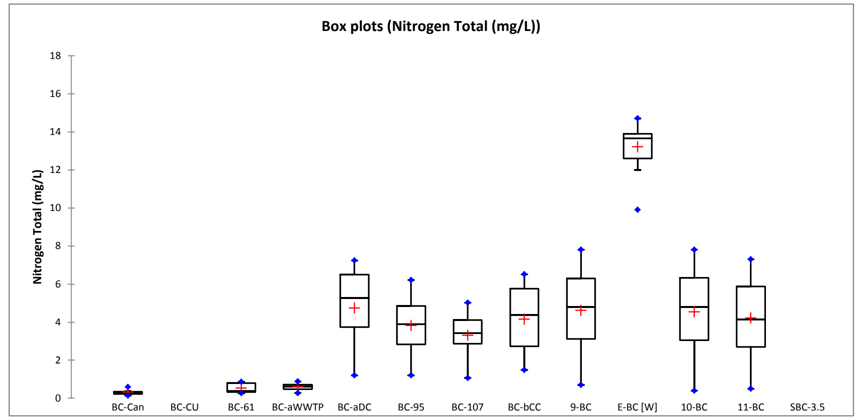

Box plots (Nitrogen Ammonia as N (mg/L))
Nitrogen Ammonia as N (mg/L)
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
BC-Can
BC-CU
BC-61
BC-aWWTP
BC-aDC
BC-95
BC-107
BC-bCC
9-BC
E-BC [W]
10-BC
11-BC
SBC-3.5

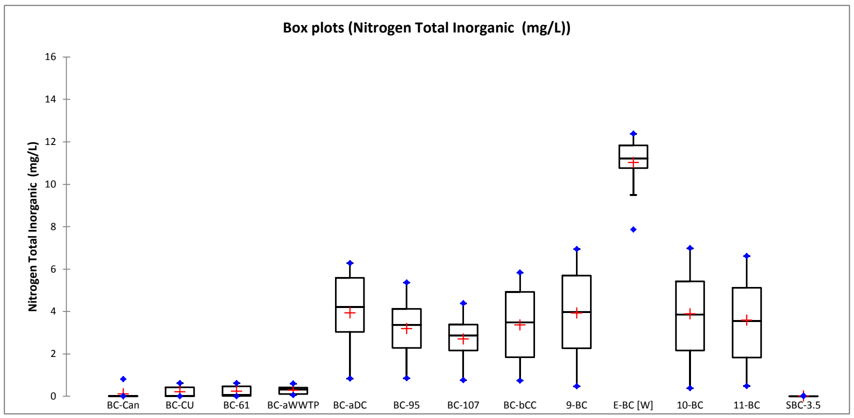

Box plots (Nitrogen Nitrate/Nitrite as N (mg/L))
Nitrogen Nitrate/Nitrite as N (mg/L)
16
14
12
10
8
6
4
2
0
BC-Can
BC-CU
BC-61
BC-aWWTP
BC-aDC
BC-95
BC-107
BC-bCC
9-BC
E-BC [W]
10-BC
11-BC
SBC-3.5

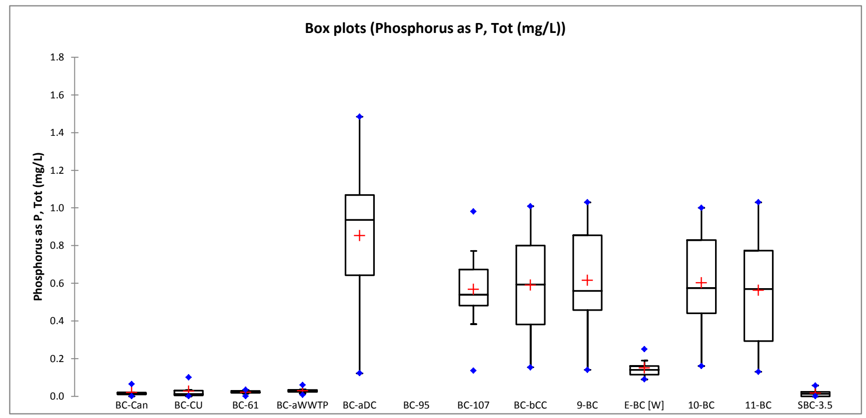

Box plots (Nitrogen TKN (mg/L))
Nitrogen TKN (mg/L)
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
BC-Can
BC-CU
BC-61
BC-aWWTP
BC-aDC
BC-95
BC-107
BC-bCC
9-BC
E-BC [W]
10-BC
11-BC
SBC-3.5

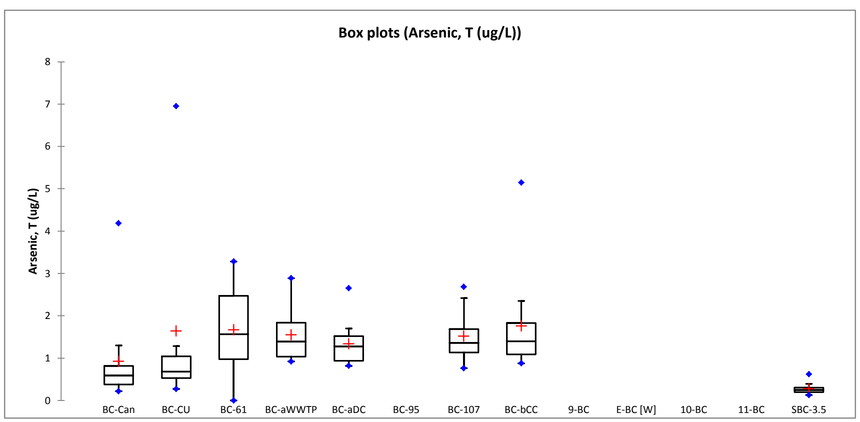

Box plots (Nitrogen Nitrate as N (mg/L))
Nitrogen Nitrate as N (mg/L)
16
14
12
10
8
6
4
2
0
BC-Can
BC-CU
BC-61
BC-aWWTP
BC-aDC
BC-95
BC-107
BC-bCC
9-BC
E-BC [W]
10-BC
11-BC
SBC-3.5

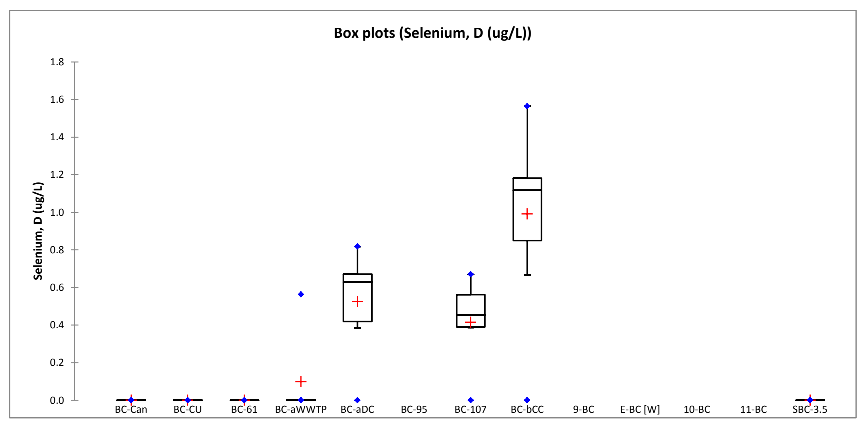

Box plots (Nitrogen Nitrite as N (mg/L))
Nitrogen Nitrite as N (mg/L)
0.0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6
BC-Can BC-CU BC-61 BC-aWWTP BC-aDC BC-95 BC-107 BC-bCC 9-BC E-BC [W] 10-BC 11-BC SBC-3.5

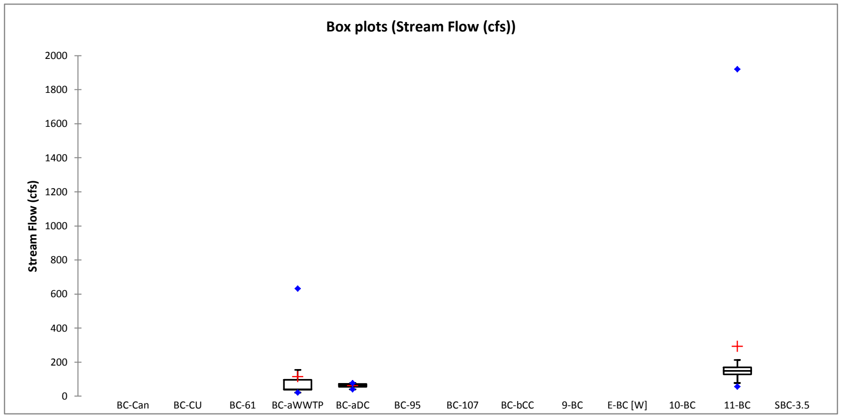

Box plots (Nitrogen Total (mg/L))
Nitrogen Total (mg/L)
0 2 4 6 8 10 12 14 16 18
BC-Can BC-CU BC-61 BC-aWWTP BC-aDC BC-95 BC-107 BC-bCC 9-BC E-BC [W] 10-BC 11-BC SBC-3.5

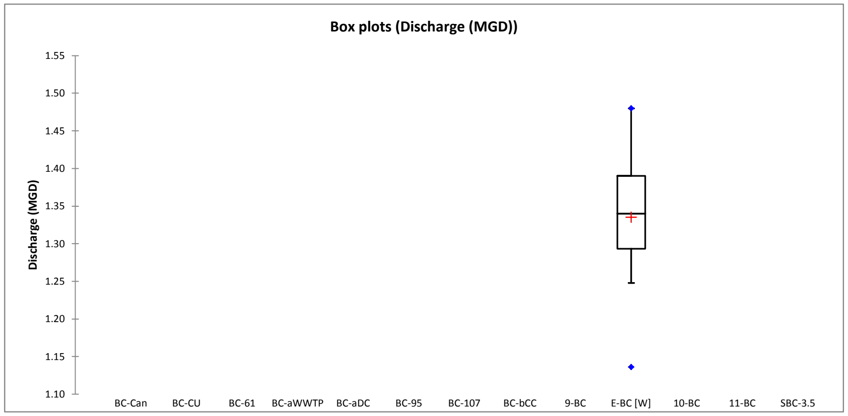

Box plots (Nitrogen Total Inorganic (mg/L))
Nitrogen Total Inorganic (mg/L)
0 2 4 6 8 10 12 14 16
BC-Can BC-CU BC-61 BC-aWWTP BC-aDC BC-95 BC-107 BC-bCC 9-BC E-BC [W] 10-BC 11-BC SBC-3.5

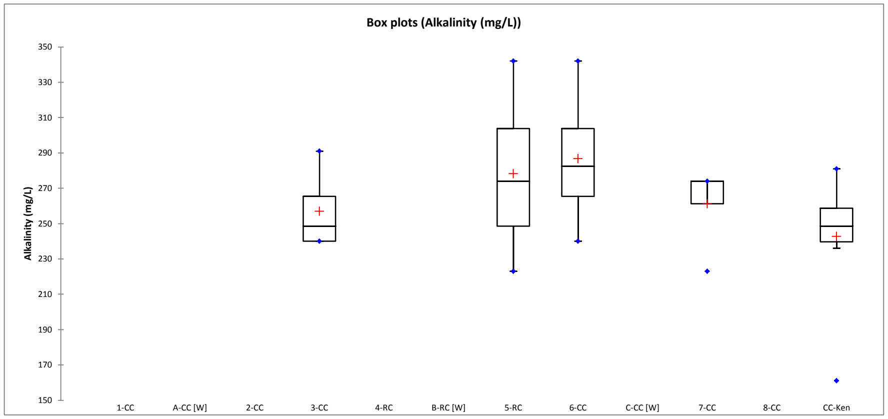

Box plots (Phosphorus as P, Tot (mg/L))
Phosphorus as P, Tot (mg/L)
0.0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8
BC-Can BC-CU BC-61 BC-aWWTP BC-aDC BC-95 BC-107 BC-bCC 9-BC E-BC [W] 10-BC 11-BC SBC-3.5

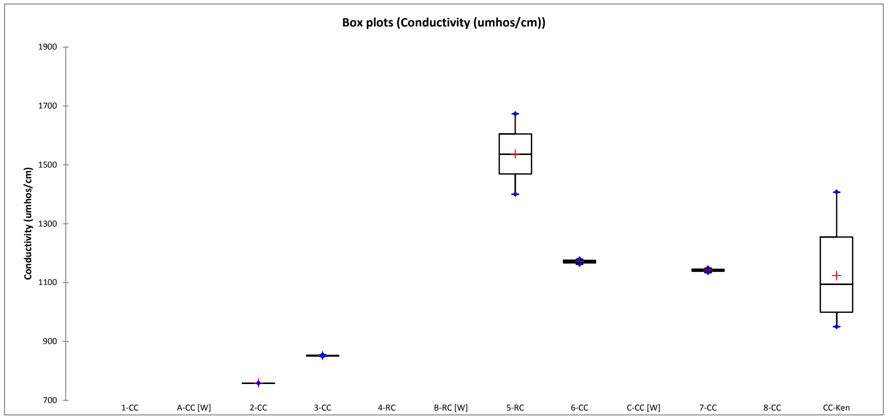

Box plots (Arsenic, T (ug/L))
Arsenic, T (ug/L)
0 1 2 3 4 5 6 7 8
BC-Can BC-CU BC-61 BC-aWWTP BC-aDC BC-95 BC-107 BC-bCC 9-BC E-BC [W] 10-BC 11-BC SBC-3.5

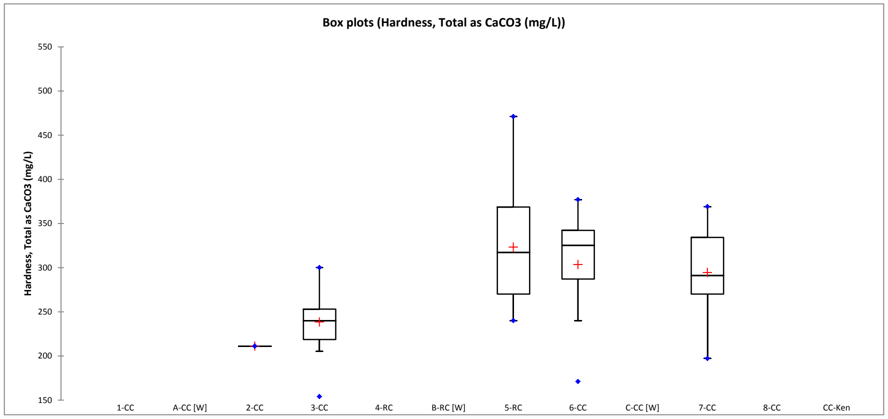

Box plots (Selenium, D (ug/L))
Selenium, D (ug/L)
0.0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8
BC-Can BC-CU BC-61 BC-aWWTP BC-aDC BC-95 BC-107 BC-bCC 9-BC E-BC [W] 10-BC 11-BC SBC-3.5

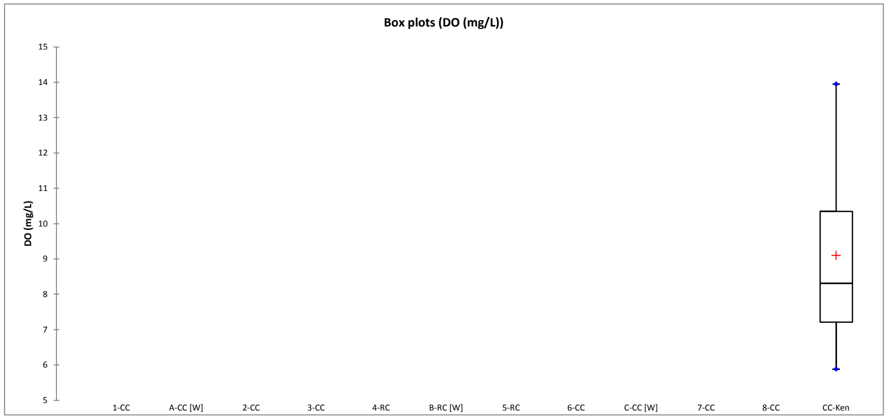

Box plots (Stream Flow (cfs))
Stream Flow (cfs)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
BC-Can
BC-CU
BC-61
BC-aWWTP
BC-aDC
BC-95
BC-107
BC-bCC
9-BC
E-BC [W]
10-BC
11-BC
SBC-3.5

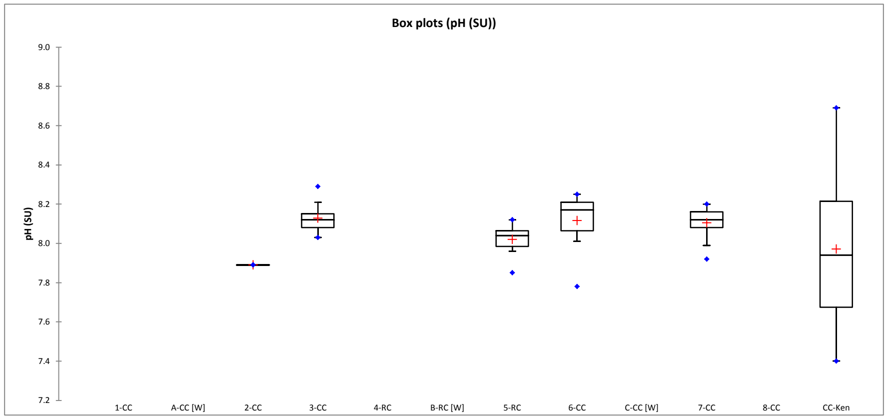

Box plots (Discharge (MGD))
Discharge (MGD)
1.55
1.50
1.45
1.40
1.35
1.30
1.25
1.20
1.15
1.10
BC-Can
BC-CU
BC-61
BC-aWWTP
BC-aDC
BC-95
BC-107
BC-bCC
9-BC
E-BC [W]
10-BC
11-BC
SBC-3.5

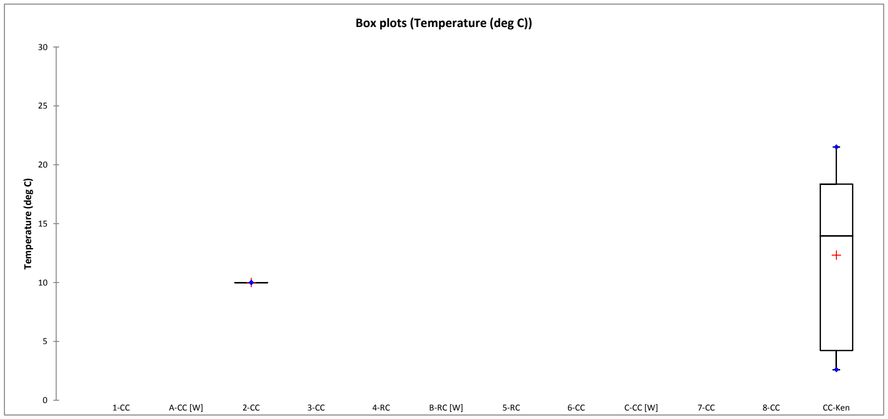

Box plots (Alkalinity (mg/L))
Alkalinity (mg/L)
350
330
310
290
270
250
230
210
190
170
150
1-CC
A-CC [W]
2-CC
3-CC
4-RC
B-RC [W]
5-RC
6-CC
C-CC [W]
7-CC
8-CC
CC-Ken

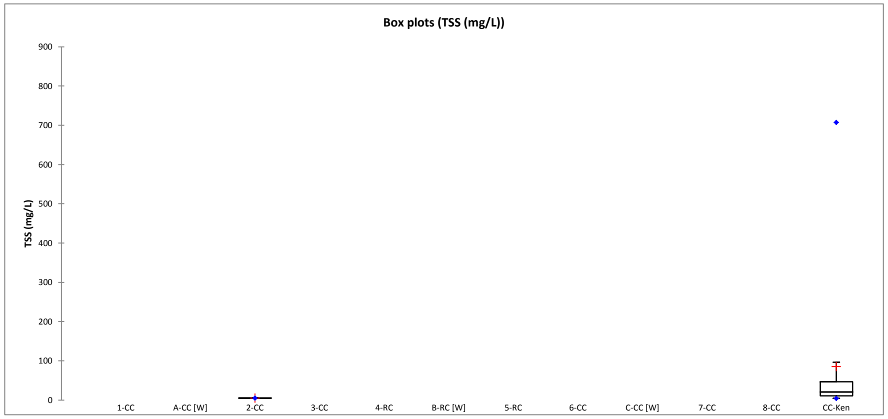

Box plots (Conductivity (umhos/cm))
Conductivity (umhos/cm)
1900
1700
1500
1300
1100
900
700
1-CC
A-CC [W]
2-CC
3-CC
4-RC
B-RC [W]
5-RC
6-CC
C-CC [W]
7-CC
8-CC
CC-Ken

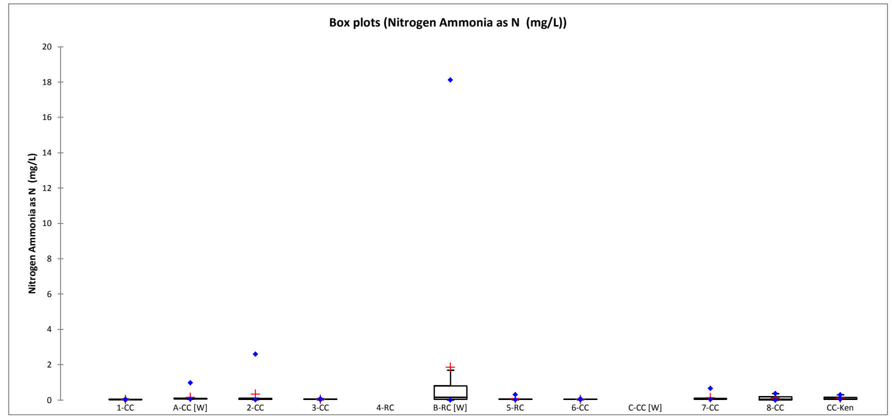

Box plots (Hardness, Total as CaCO3 (mg/L))
Hardness, Total as CaCO3 (mg/L)
550
500
450
400
350
300
250
200
150
1-CC
A-CC [W]
2-CC
3-CC
4-RC
B-RC [W]
5-RC
6-CC
C-CC [W]
7-CC
8-CC
CC-Ken

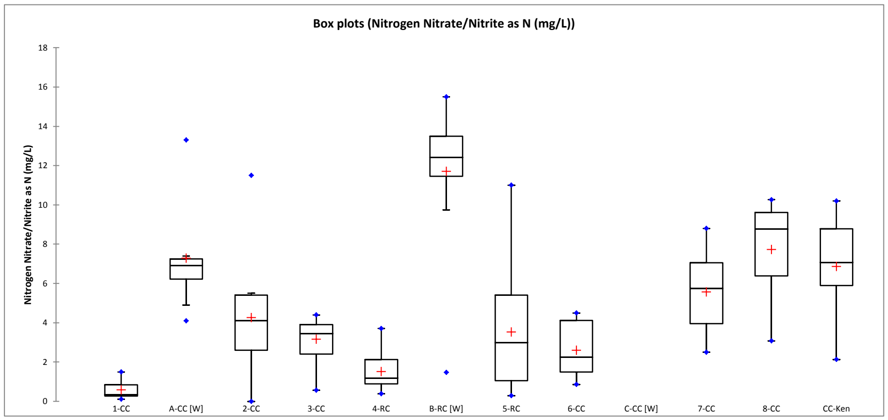

Box plots (DO (mg/L))
DO (mg/L)
15
14
13
12
11
10
9
8
7
6
5
1-CC
A-CC [W]
2-CC
3-CC
4-RC
B-RC [W]
5-RC
6-CC
C-CC [W]
7-CC
8-CC
CC-Ken

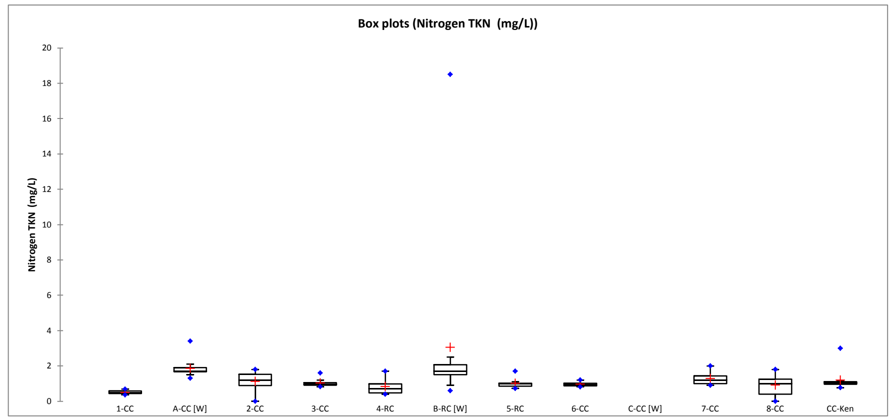

Box plots (pH (SU))
pH (SU)
9.0
8.8
8.6
8.4
8.2
8.0
7.8
7.6
7.4
7.2
1-CC
A-CC [W]
2-CC
3-CC
4-RC
B-RC [W]
5-RC
6-CC
C-CC [W]
7-CC
8-CC
CC-Ken

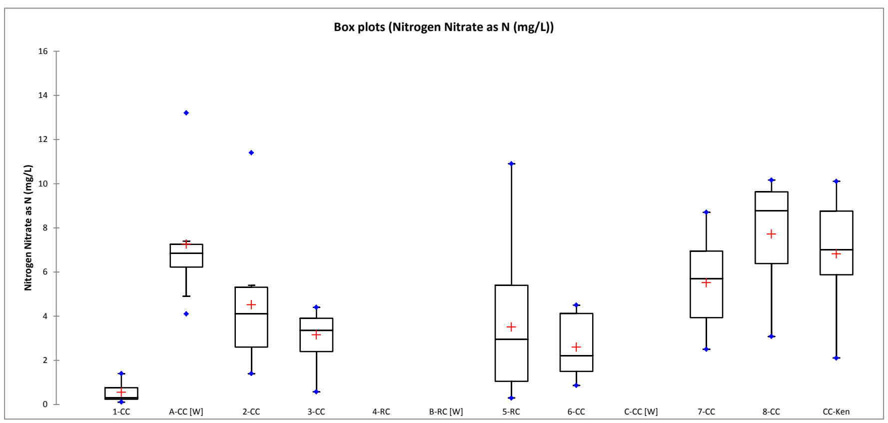

Box plots (Temperature (deg C))
Temperature (deg C)
30
25
20
15
10
5
0
1-CC
A-CC [W]
2-CC
3-CC
4-RC
B-RC [W]
5-RC
6-CC
C-CC [W]
7-CC
8-CC
CC-Ken

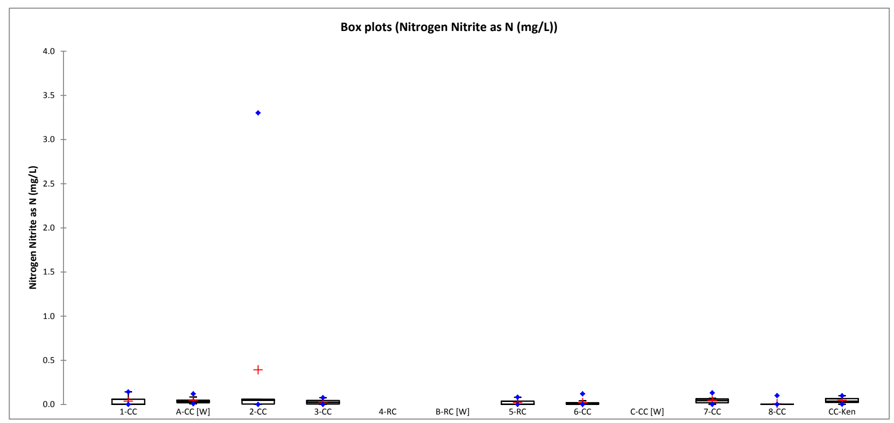

Box plots (TSS (mg/L))
TSS (mg/L)
0
100
200
300
400
500
600
700
800
900
1-CC
A-CC [W]
2-CC
3-CC
4-RC
B-RC [W]
5-RC
6-CC
C-CC [W]
7-CC
8-CC
CC-Ken

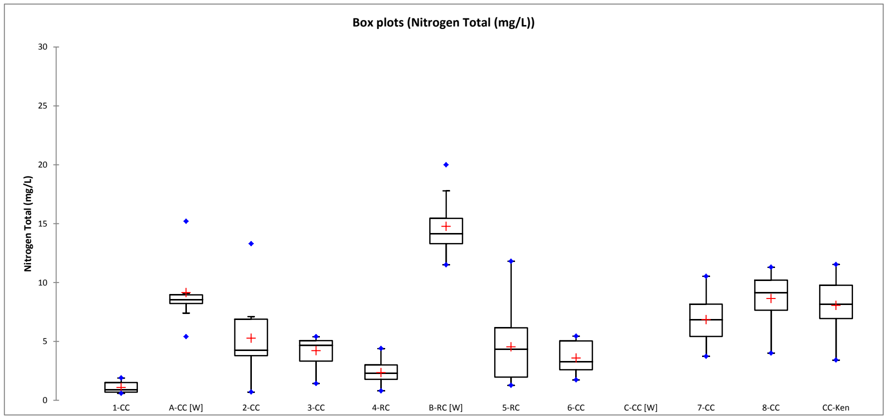

Box plots (Nitrogen Ammonia as N (mg/L))
Nitrogen Ammonia as N (mg/L)
0
2
4
6
8
10
12
14
16
18
20
1-CC
A-CC [W]
2-CC
3-CC
4-RC
B-RC [W]
5-RC
6-CC
C-CC [W]
7-CC
8-CC
CC-Ken

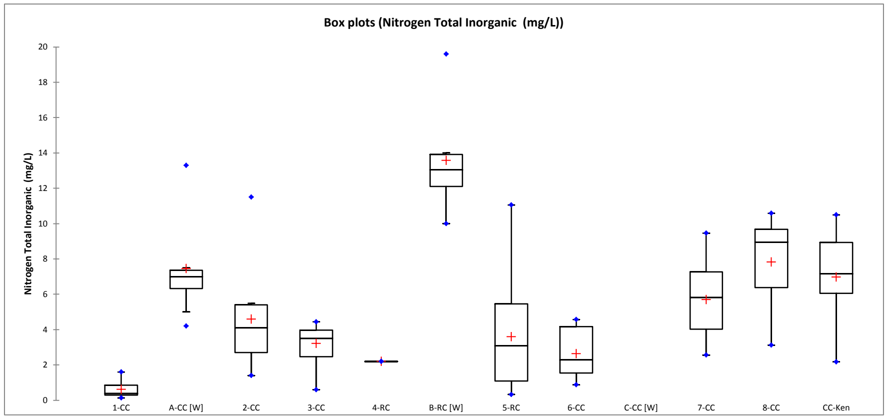

Box plots (Nitrogen Nitrate/Nitrite as N (mg/L))
Nitrogen Nitrate/Nitrite as N (mg/L)
0
2
4
6
8
10
12
14
16
18
1-CC
A-CC [W]
2-CC
3-CC
4-RC
B-RC [W]
5-RC
6-CC
C-CC [W]
7-CC
8-CC
CC-Ken

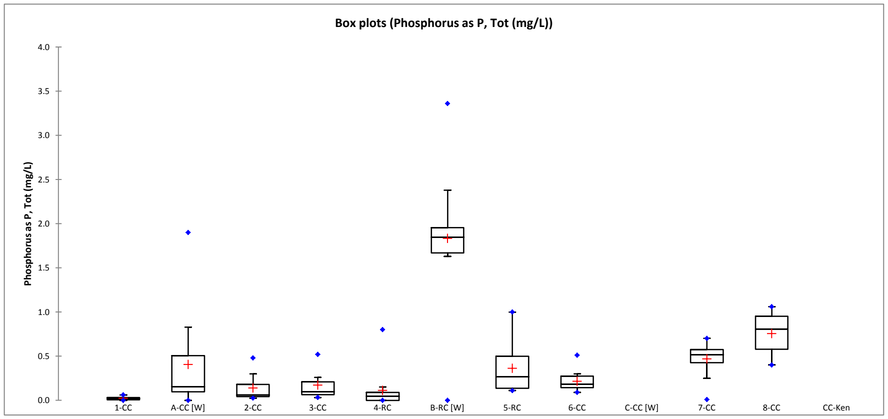

Box plots (Nitrogen TKN (mg/L))
Nitrogen TKN (mg/L)
0
2
4
6
8
10
12
14
16
18
20
1-CC
A-CC [W]
2-CC
3-CC
4-RC
B-RC [W]
5-RC
6-CC
C-CC [W]
7-CC
8-CC
CC-Ken

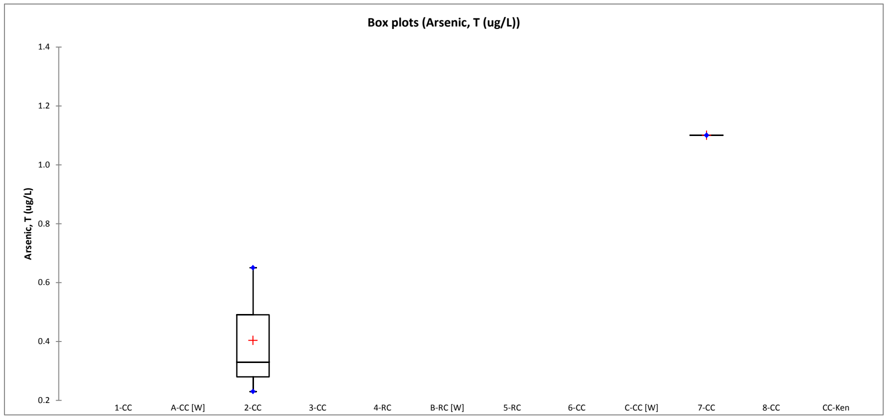

Box plots (Nitrogen Nitrate as N (mg/L))
Nitrogen Nitrate as N (mg/L)
0
2
4
6
8
10
12
14
16
1-CC
A-CC [W]
2-CC
3-CC
4-RC
B-RC [W]
5-RC
6-CC
C-CC [W]
7-CC
8-CC
CC-Ken

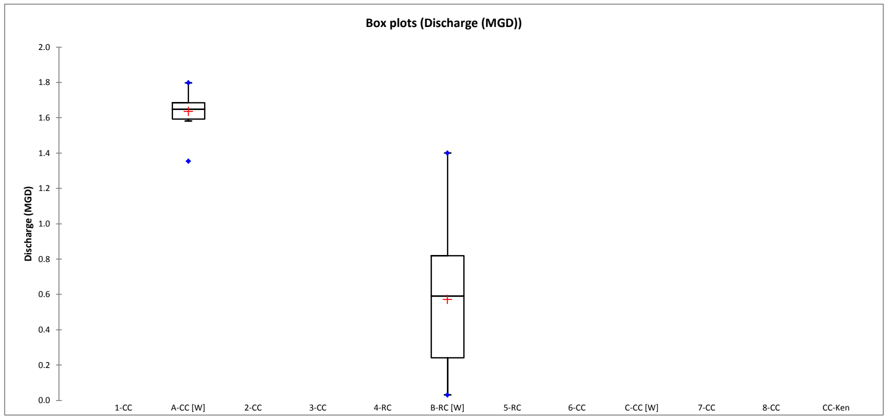

Box plots (Nitrogen Nitrite as N (mg/L))
Nitrogen Nitrite as N (mg/L)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
1-CC
A-CC [W]
2-CC
3-CC
4-RC
B-RC [W]
5-RC
6-CC
C-CC [W]
7-CC
8-CC
CC-Ken

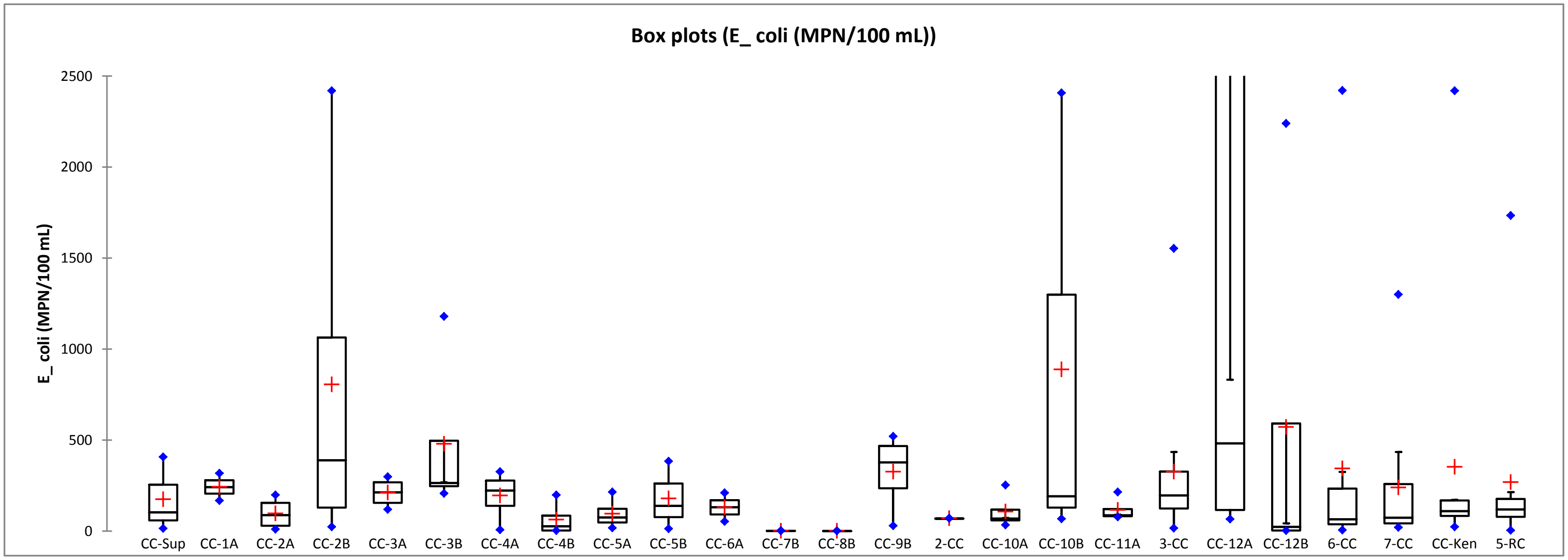

Box plots (Nitrogen Total (mg/L))
Nitrogen Total (mg/L)
0
5
10
15
20
25
30
1-CC
A-CC [W]
2-CC
3-CC
4-RC
B-RC [W]
5-RC
6-CC
C-CC [W]
7-CC
8-CC
CC-Ken

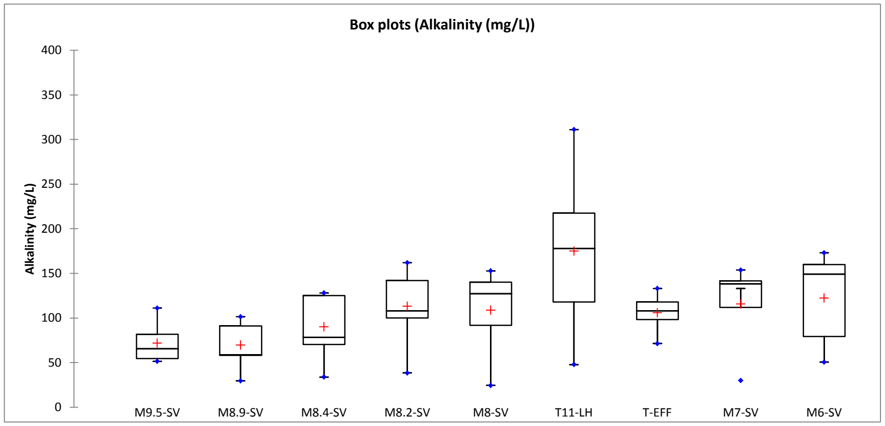

Box plots (Nitrogen Total Inorganic (mg/L))
Nitrogen Total Inorganic (mg/L)
0
2
4
6
8
10
12
14
16
18
20
1-CC
A-CC [W]
2-CC
3-CC
4-RC
B-RC [W]
5-RC
6-CC
C-CC [W]
7-CC
8-CC
CC-Ken

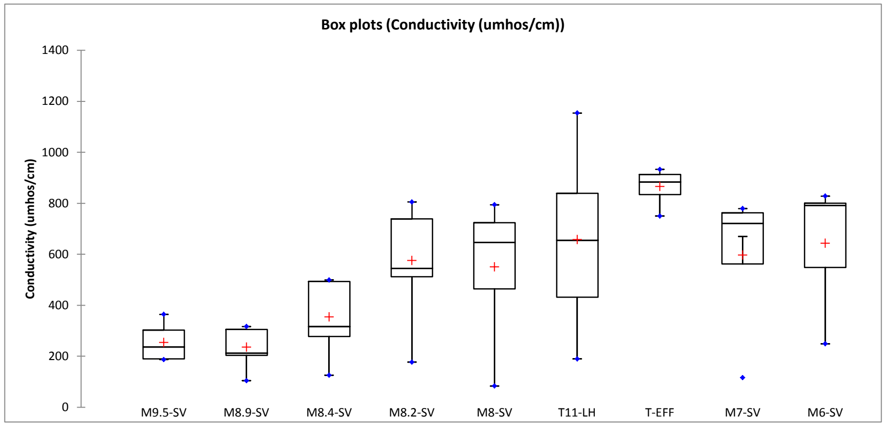

Box plots (Phosphorus as P, Tot (mg/L))
Phosphorus as P, Tot (mg/L)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
1-CC
A-CC [W]
2-CC
3-CC
4-RC
B-RC [W]
5-RC
6-CC
C-CC [W]
7-CC
8-CC
CC-Ken

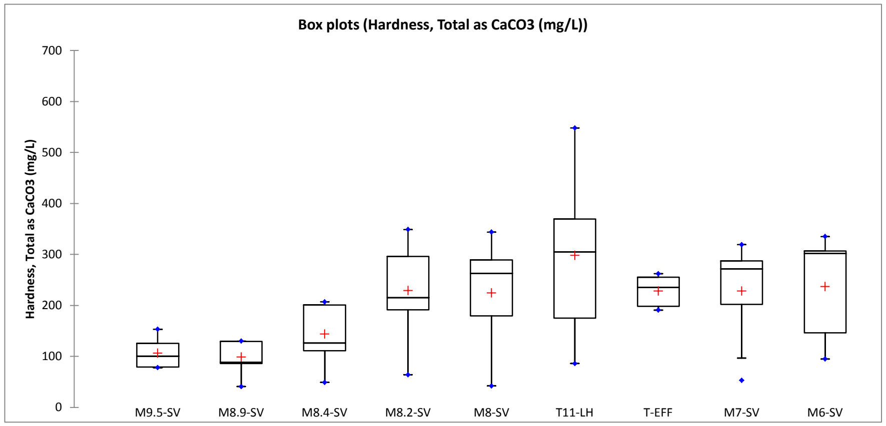

Box plots (Arsenic, T (ug/L))
Arsenic, T (ug/L)
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1-CC
A-CC [W]
2-CC
3-CC
4-RC
B-RC [W]
5-RC
6-CC
C-CC [W]
7-CC
8-CC
CC-Ken

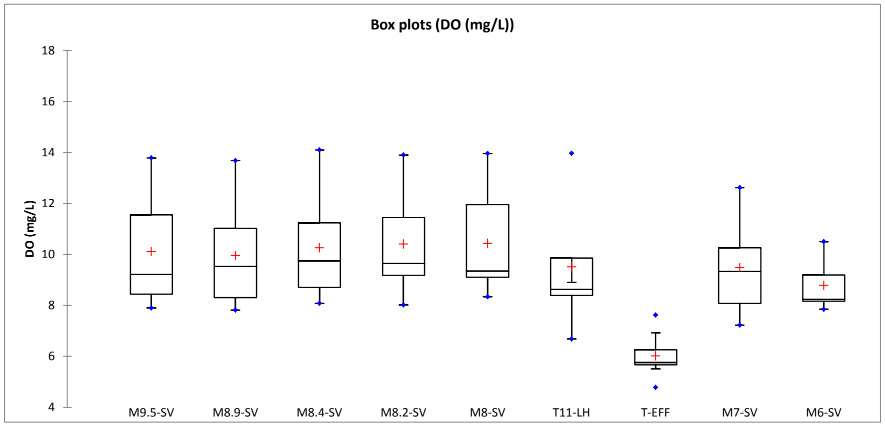

Box plots (Discharge (MGD))
Discharge (MGD)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1-CC
A-CC [W]
2-CC
3-CC
4-RC
B-RC [W]
5-RC
6-CC
C-CC [W]
7-CC
8-CC
CC-Ken

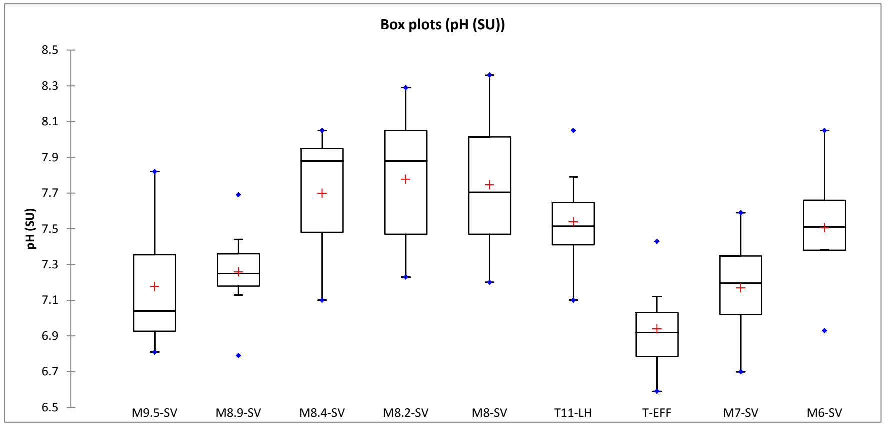

Box plots (E_ coli (MPN/100 mL))
E_ coli (MPN/100 mL)
2500
2000
1500
1000
500
0
CC-Sup
CC-1A
CC-2A
CC-2B
CC-3A
CC-3B
CC-4A
CC-4B
CC-5A
CC-5B
CC-6A
CC-7B
CC-8B
CC-9B
2-CC
CC-10A
CC-10B
CC-11A
3-CC
CC-12A
CC-12B
6-CC
7-CC
CC-Ken
5-RC

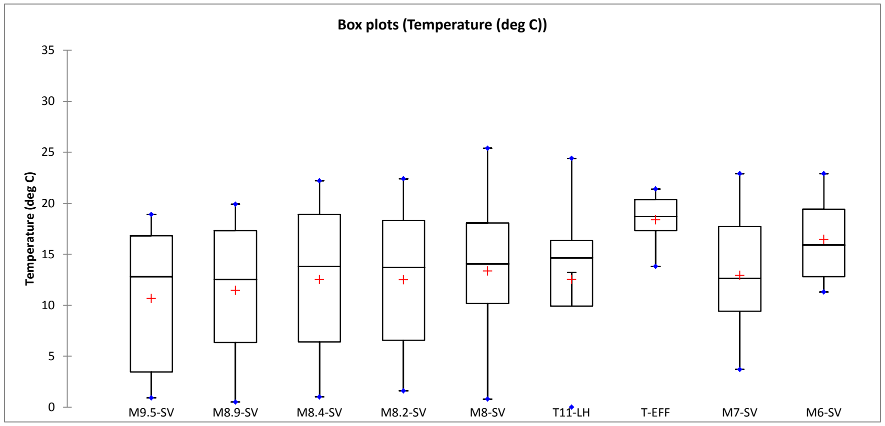

Box plots (Alkalinity (mg/L))
Alkalinity (mg/L)
400
350
300
250
200
150
100
50
0
M9.5-SV
M8.9-SV
M8.4-SV
M8.2-SV
M8-SV
T11-LH
T-EFF
M7-SV
M6-SV

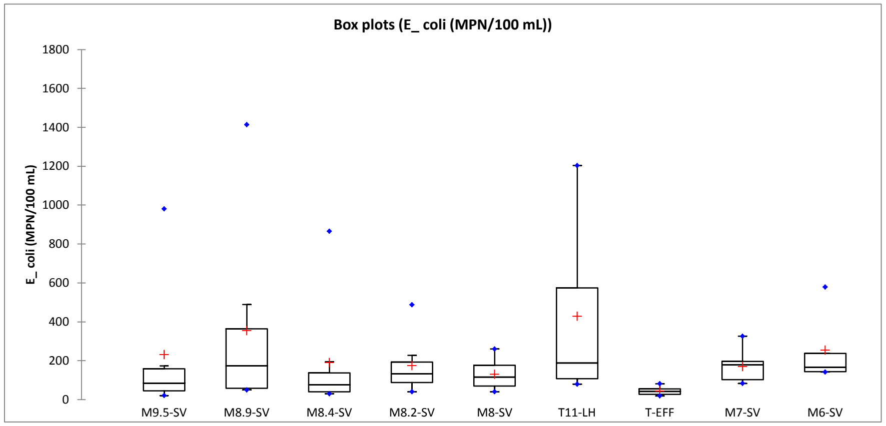

Box plots (Conductivity (umhos/cm))
Conductivity (umhos/cm)
1400
1200
1000
800
600
400
200
0
M9.5-SV
M8.9-SV
M8.4-SV
M8.2-SV
M8-SV
T11-LH
T-EFF
M7-SV
M6-SV

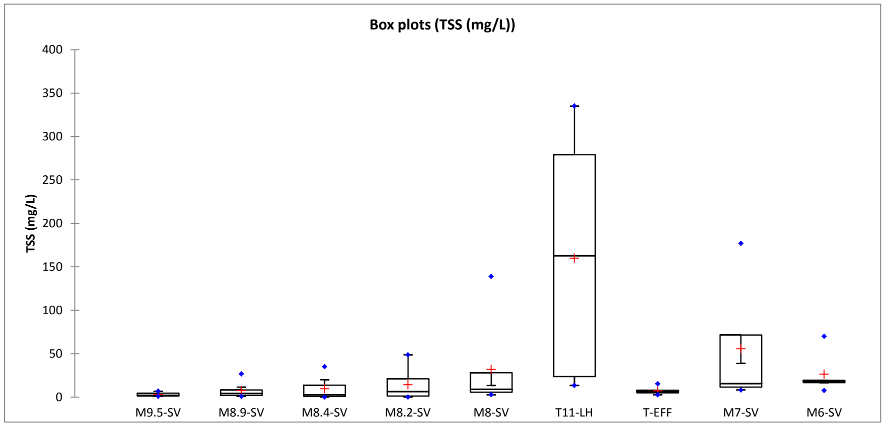

Box plots (Hardness, Total as CaCO3 (mg/L))
Hardness, Total as CaCO3 (mg/L)
700
600
500
400
300
200
100
0
M9.5-SV
M8.9-SV
M8.4-SV
M8.2-SV
M8-SV
T11-LH
T-EFF
M7-SV
M6-SV

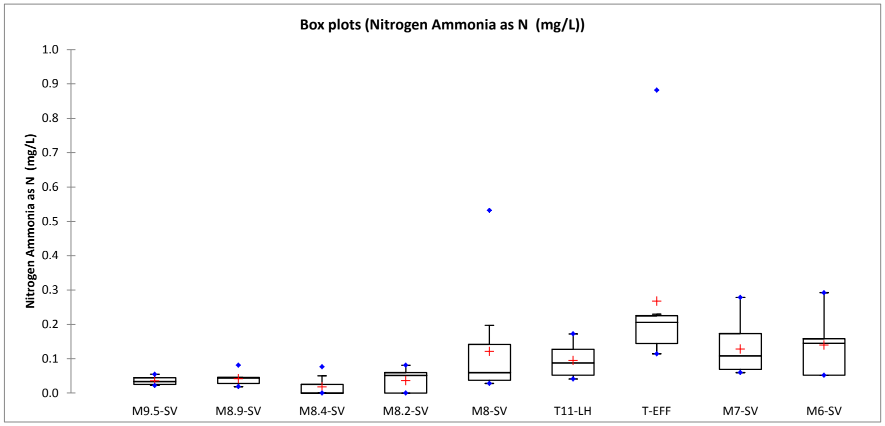

Box plots (DO (mg/L))
DO (mg/L)
18
16
14
12
10
8
6
4
M9.5-SV
M8.9-SV
M8.4-SV
M8.2-SV
M8-SV
T11-LH
T-EFF
M7-SV
M6-SV

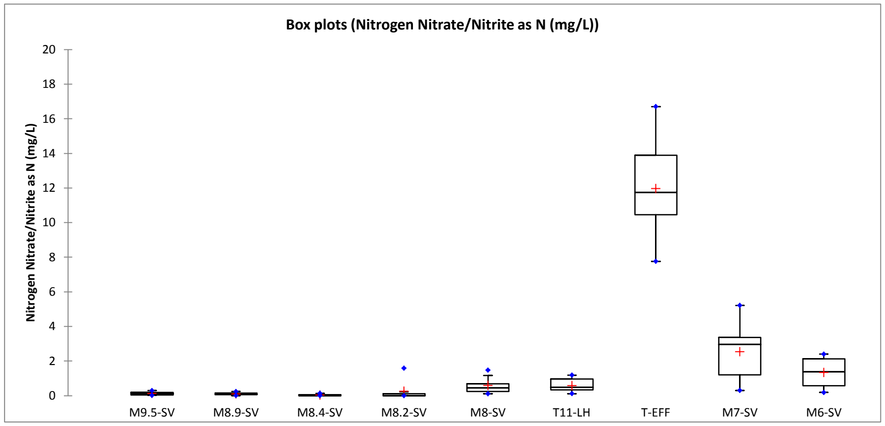

Box plots (pH (SU))
pH (SU)
8.5
8.3
8.1
7.9
7.7
7.5
7.3
7.1
6.9
6.7
6.5
M9.5-SV
M8.9-SV
M8.4-SV
M8.2-SV
M8-SV
T11-LH
T-EFF
M7-SV
M6-SV

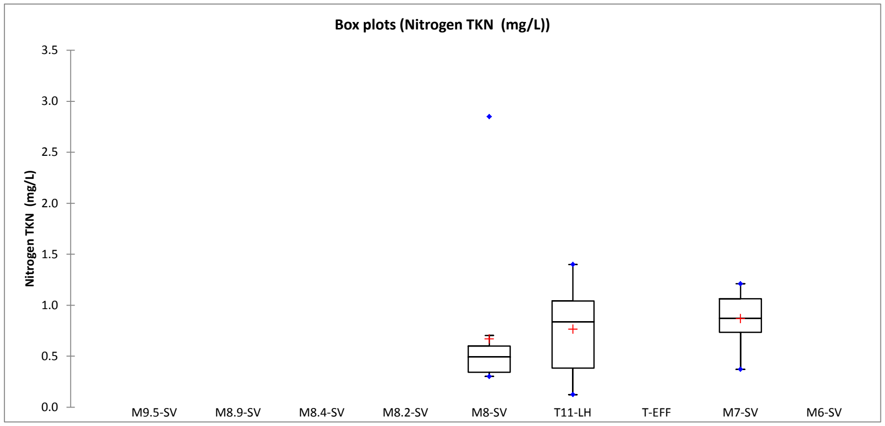

Box plots (Temperature (deg C))
Temperature (deg C)
35
30
25
20
15
10
5
0
M9.5-SV
M8.9-SV
M8.4-SV
M8.2-SV
M8-SV
T11-LH
T-EFF
M7-SV
M6-SV

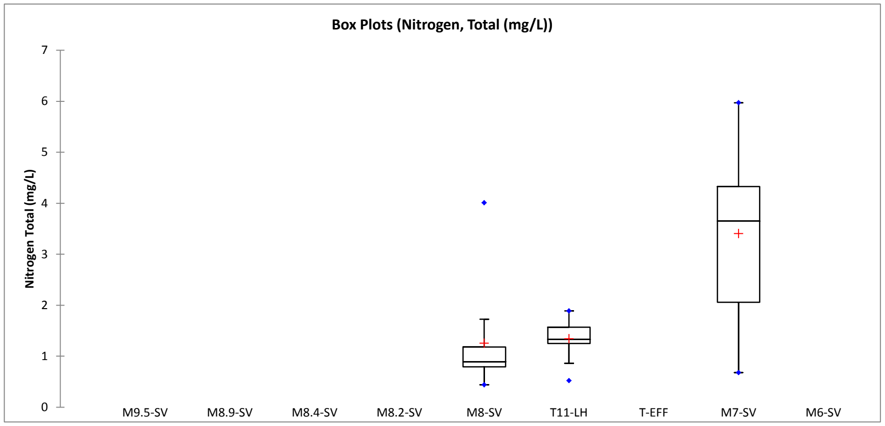

Box plots (E_ coli (MPN/100 mL))
E_ coli (MPN/100 mL)
0
200
400
600
800
1000
1200
1400
1600
1800
M9.5-SV
M8.9-SV
M8.4-SV
M8.2-SV
M8-SV
T11-LH
T-EFF
M7-SV
M6-SV

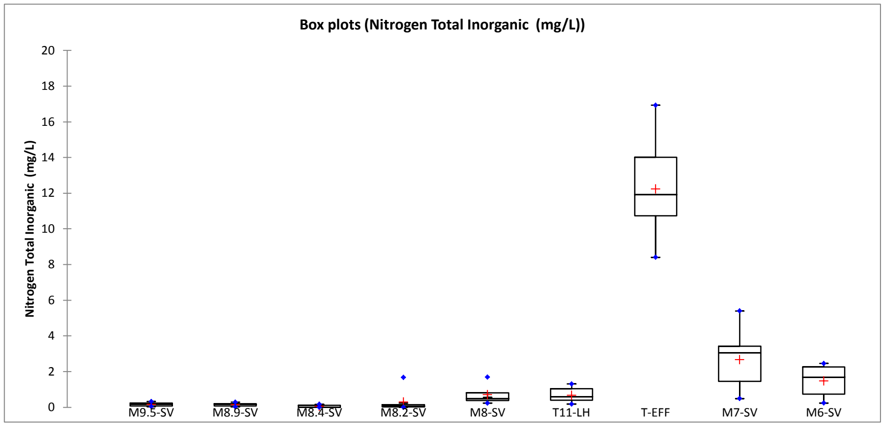

Box plots (TSS (mg/L))
TSS (mg/L)
0
50
100
150
200
250
300
350
400
M9.5-SV
M8.9-SV
M8.4-SV
M8.2-SV
M8-SV
T11-LH
T-EFF
M7-SV
M6-SV

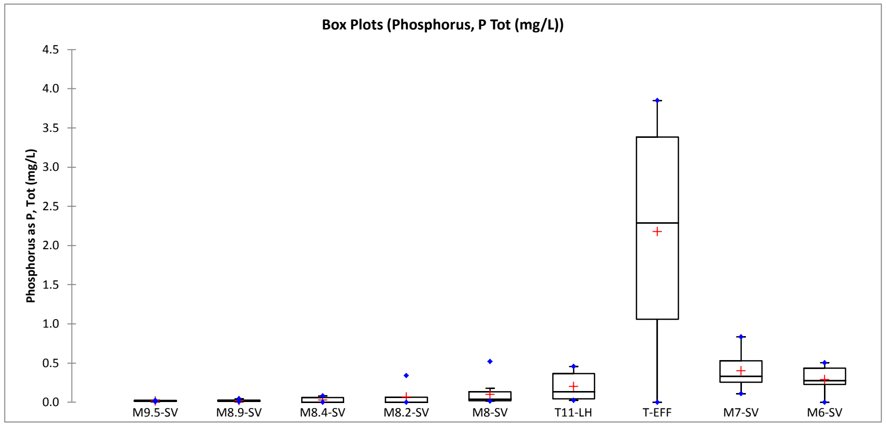

Box plots (Nitrogen Ammonia as N (mg/L))
Nitrogen Ammonia as N (mg/L)
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
M9.5-SV
M8.9-SV
M8.4-SV
M8.2-SV
M8-SV
T11-LH
T-EFF
M7-SV
M6-SV

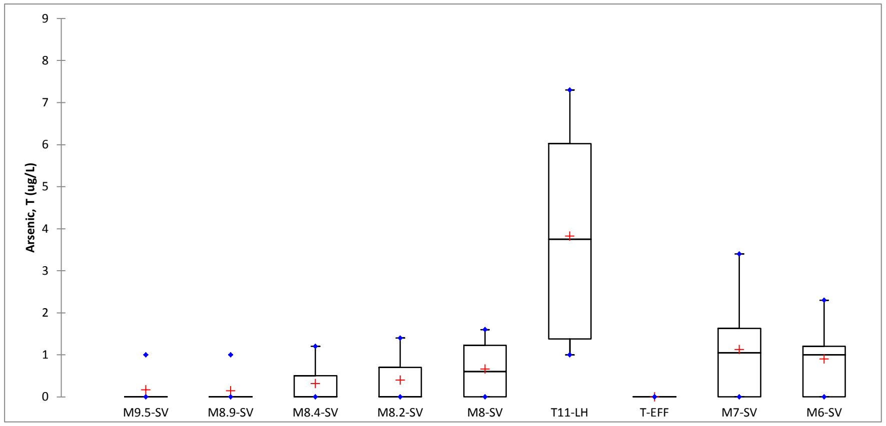

Box plots (Nitrogen Nitrate/Nitrite as N (mg/L))
Nitrogen Nitrate/Nitrite as N (mg/L)
0
2
4
6
8
10
12
14
16
18
20
M9.5-SV
M8.9-SV
M8.4-SV
M8.2-SV
M8-SV
T11-LH
T-EFF
M7-SV
M6-SV

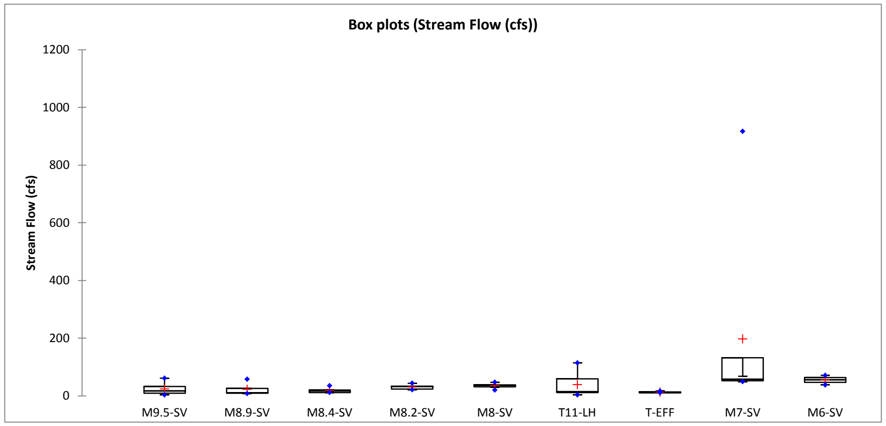

Box plots (Nitrogen TKN (mg/L))
Nitrogen TKN (mg/L)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
M9.5-SV
M8.9-SV
M8.4-SV
M8.2-SV
M8-SV
T11-LH
T-EFF
M7-SV
M6-SV

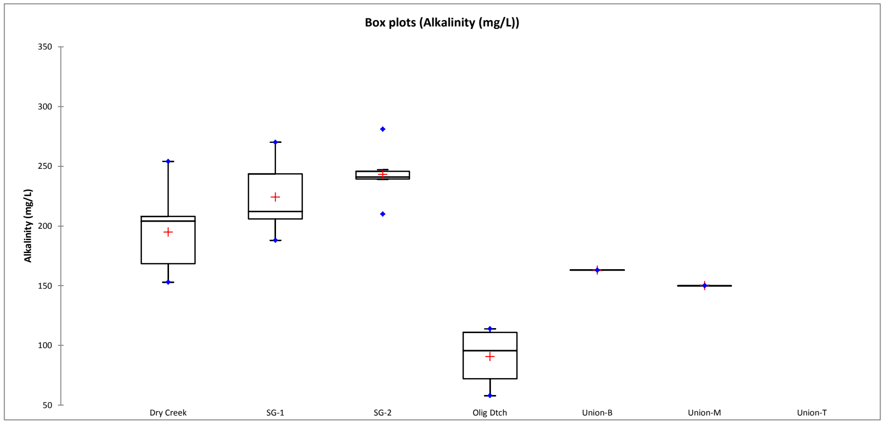

Box Plots (Nitrogen, Total (mg/L))
Nitrogen Total (mg/L)
0
1
2
3
4
5
6
7
M9.5-SV
M8.9-SV
M8.4-SV
M8.2-SV
M8-SV
T11-LH
T-EFF
M7-SV
M6-SV

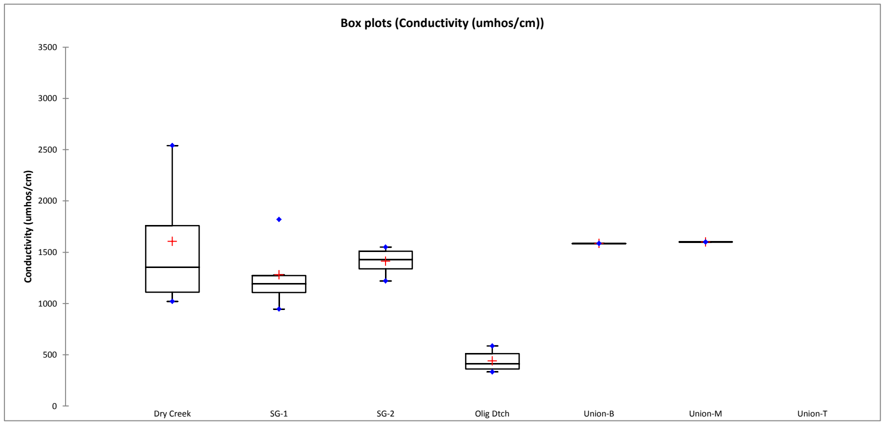

Box plots (Nitrogen Total Inorganic (mg/L))
Nitrogen Total Inorganic (mg/L)
20
18
16
14
12
10
8
6
4
2
0
M9.5-SV
M8.9-SV
M8.4-SV
M8.2-SV
M8-SV
T11-LH
T-EFF
M7-SV
M6-SV

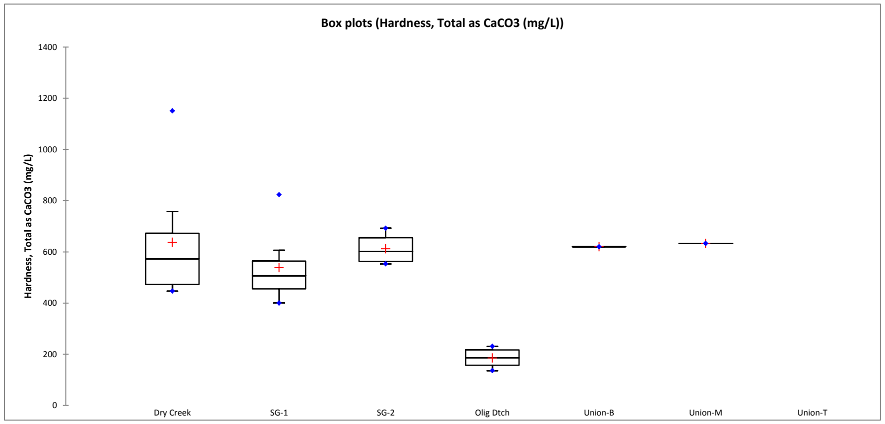

Box Plots (Phosphorus, P Tot (mg/L))
Phosphorus as P, Tot (mg/L)
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
M9.5-SV
M8.9-SV
M8.4-SV
M8.2-SV
M8-SV
T11-LH
T-EFF
M7-SV
M6-SV

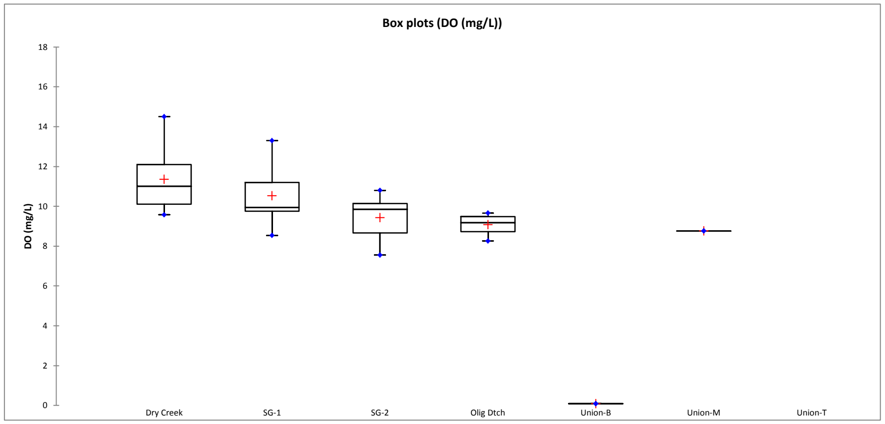

Arsenic, T (ug/L)
9
8
7
6
5
4
3
2
1
0
M9.5-SV
M8.9-SV
M8.4-SV
M8.2-SV
M8-SV
T11-LH
T-EFF
M7-SV
M6-SV

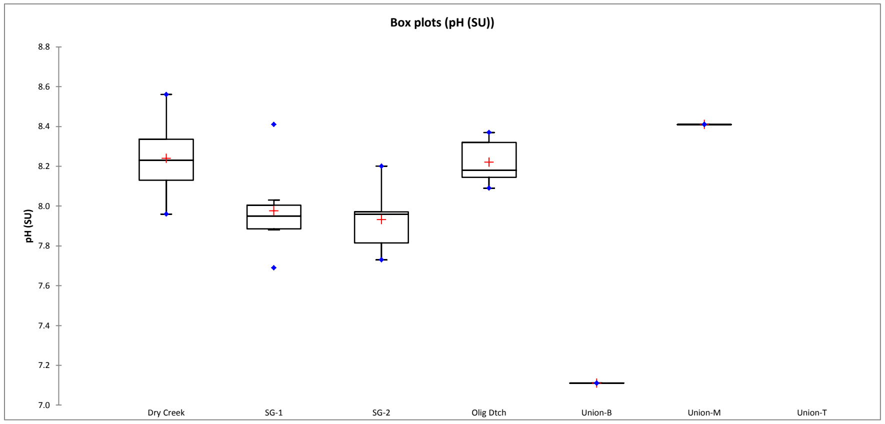

Box plots (Stream Flow (cfs))
Stream Flow (cfs)
1200
1000
800
600
400
200
0
M9.5-SV
M8.9-SV
M8.4-SV
M8.2-SV
M8-SV
T11-LH
T-EFF
M7-SV
M6-SV

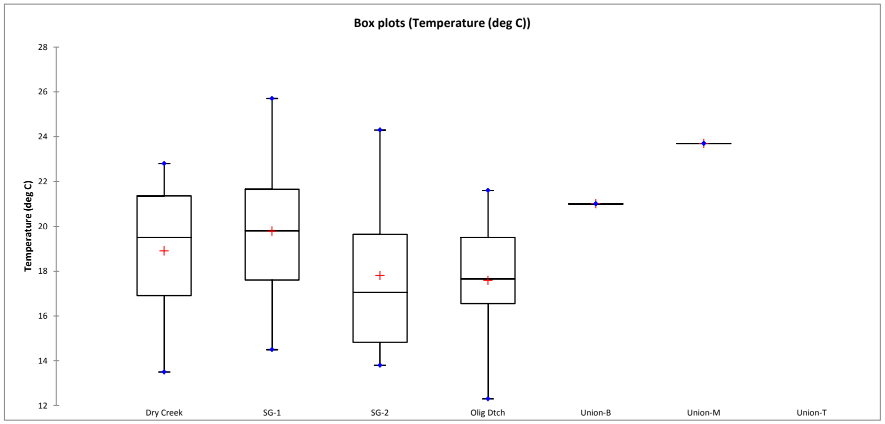

Box plots (Alkalinity (mg/L))
Alkalinity (mg/L)
350
300
250
200
150
100
50
Dry Creek
SG-1
SG-2
Olig Dtch
Union-B
Union-M
Union-T

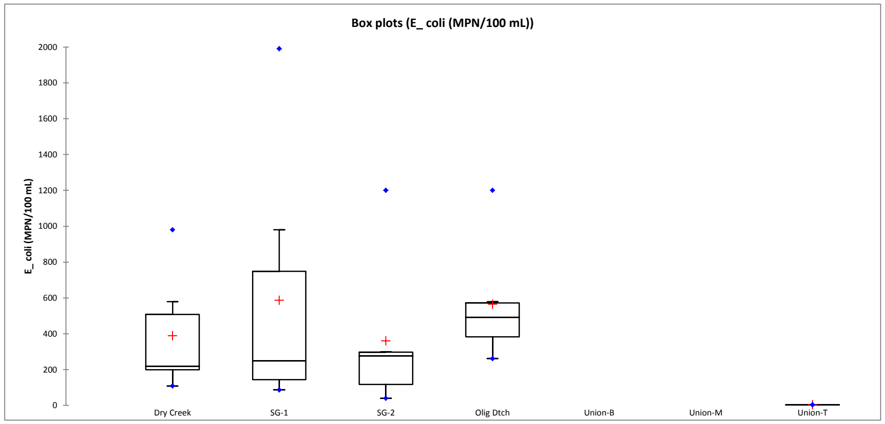

Box plots (Conductivity (umhos/cm))
Conductivity (umhos/cm)
3500
3000
2500
2000
1500
1000
500
0
Dry Creek
SG-1
SG-2
Olig Dtch
Union-B
Union-M
Union-T

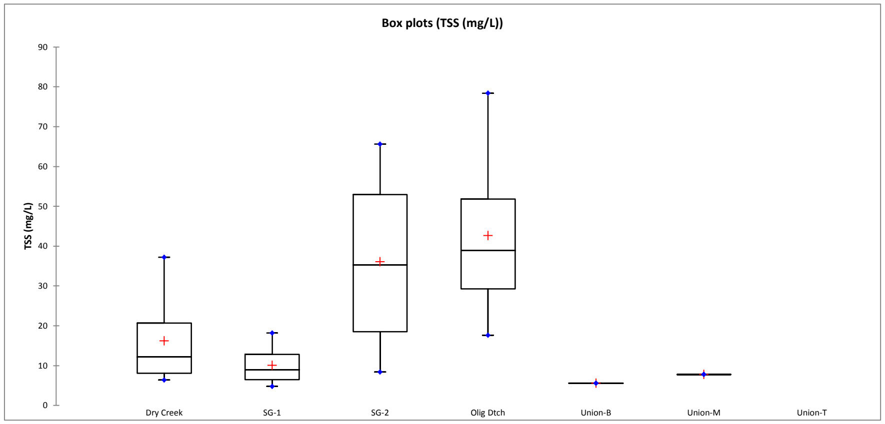

Box plots (Hardness, Total as CaCO3 (mg/L))
Hardness, Total as CaCO3 (mg/L)
1400
1200
1000
800
600
400
200
0
Dry Creek
SG-1
SG-2
Olig Dtch
Union-B
Union-M
Union-T

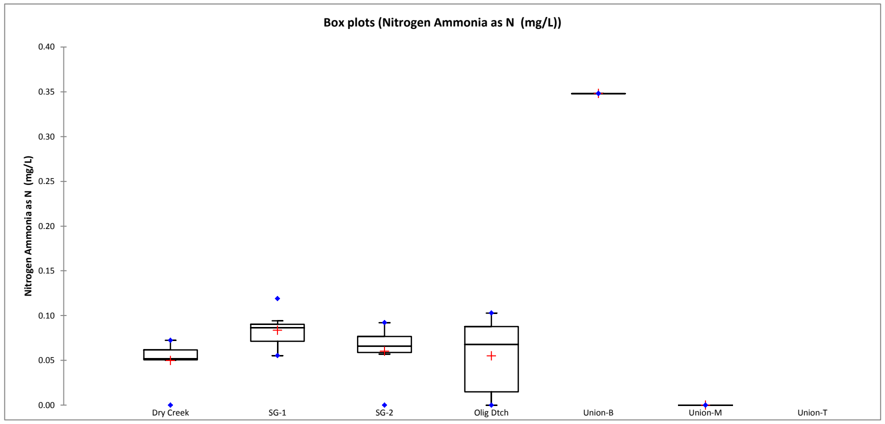

Box plots (DO (mg/L))
DO (mg/L)
18
16
14
12
10
8
6
4
2
0
Dry Creek
SG-1
SG-2
Olig Dtch
Union-B
Union-M
Union-T

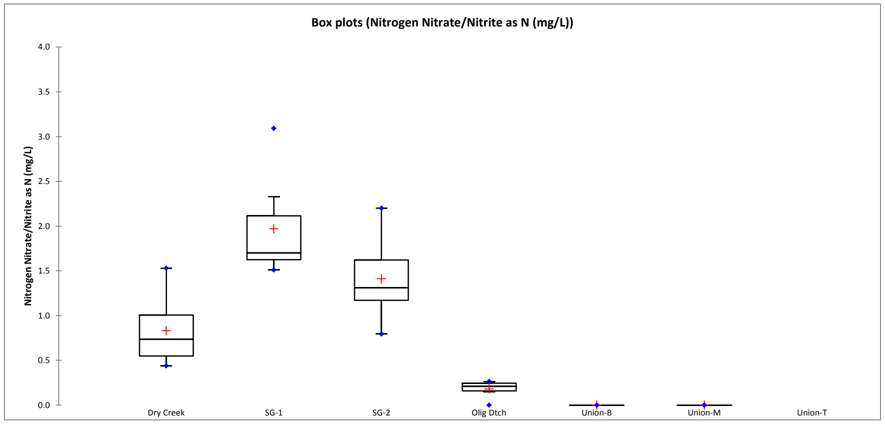

Box plots (pH (SU))
pH (SU)
8.8
8.6
8.4
8.2
8.0
7.8
7.6
7.4
7.2
7.0
Dry Creek
SG-1
SG-2
Olig Dtch
Union-B
Union-M
Union-T

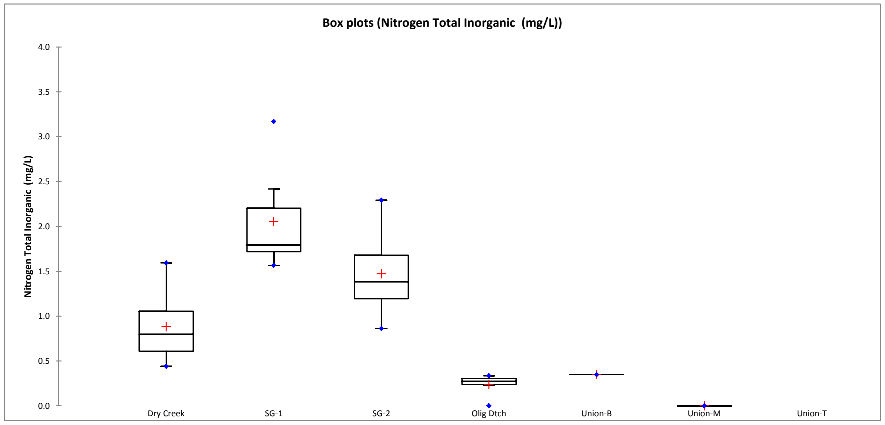

Box plots (Temperature (deg C))
Temperature (deg C)
28
26
24
22
20
18
16
14
12
Dry Creek
SG-1
SG-2
Olig Dtch
Union-B
Union-M
Union-T

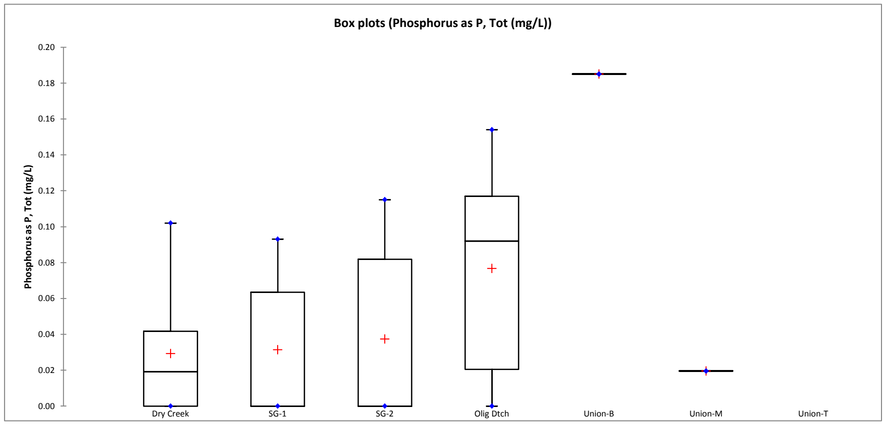

Box plots (E_ coli (MPN/100 mL))
E_ coli (MPN/100 mL)
0
200
400
600
800
1000
1200
1400
1600
1800
2000
Dry Creek
SG-1
SG-2
Olig Dtch
Union-B
Union-M
Union-T

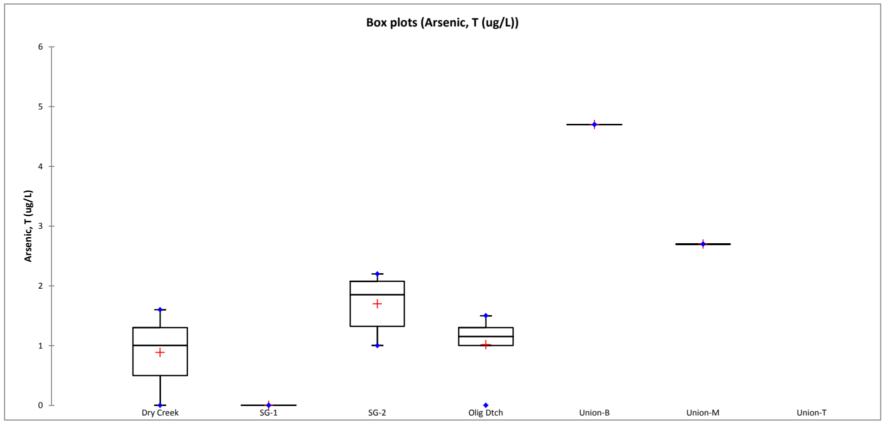

Box plots (TSS (mg/L))
TSS (mg/L)
0
10
20
30
40
50
60
70
80
90
Dry Creek
SG-1
SG-2
Olig Dtch
Union-B
Union-M
Union-T

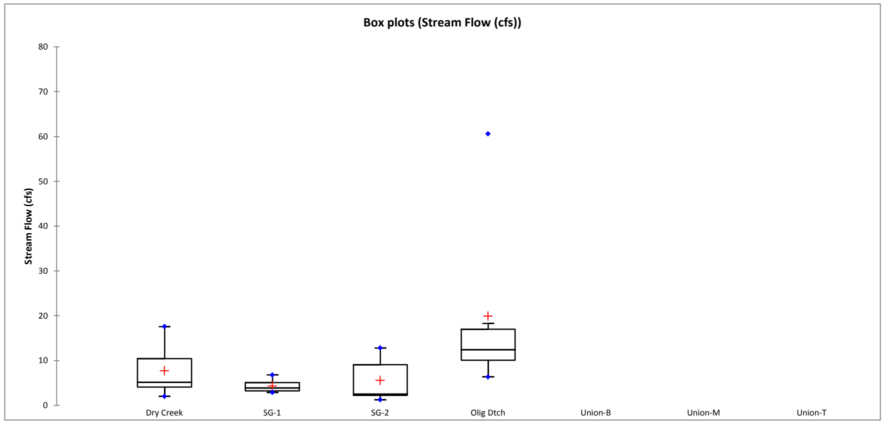

Box plots (Nitrogen Ammonia as N (mg/L))
Nitrogen Ammonia as N (mg/L)
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
Dry Creek
SG-1
SG-2
Olig Dtch
Union-B
Union-M
Union-T

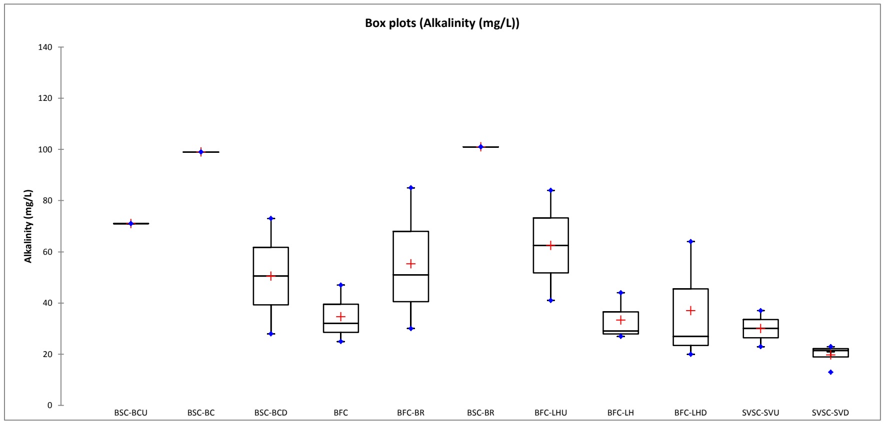

Box plots (Nitrogen Nitrate/Nitrite as N (mg/L))
Nitrogen Nitrate/Nitrite as N (mg/L)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
Dry Creek
SG-1
SG-2
Olig Dtch
Union-B
Union-M
Union-T

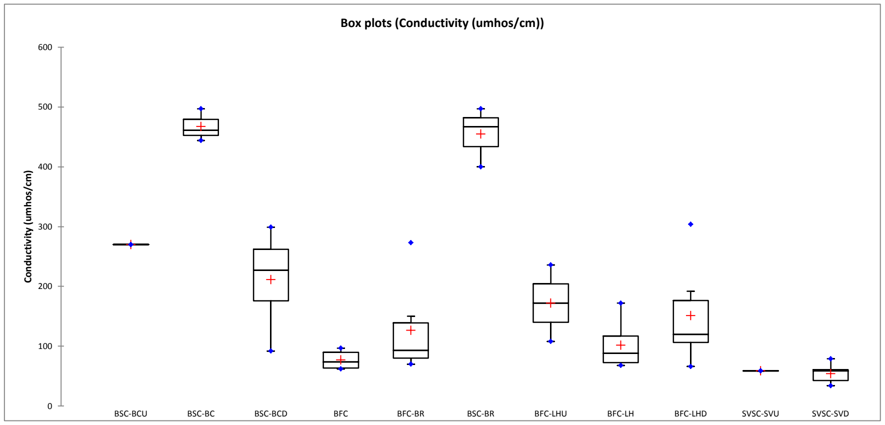

Box plots (Nitrogen Total Inorganic (mg/L))
Nitrogen Total Inorganic (mg/L)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
Dry Creek
SG-1
SG-2
Olig Dtch
Union-B
Union-M
Union-T

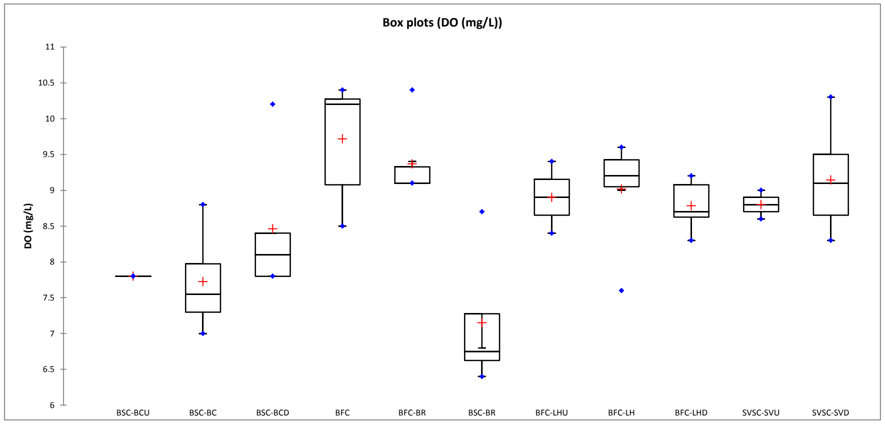

Box plots (Phosphorus as P, Tot (mg/L))
Phosphorus as P, Tot (mg/L)
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
0.18
0.20
Dry Creek
SG-1
SG-2
Olig Dtch
Union-B
Union-M
Union-T

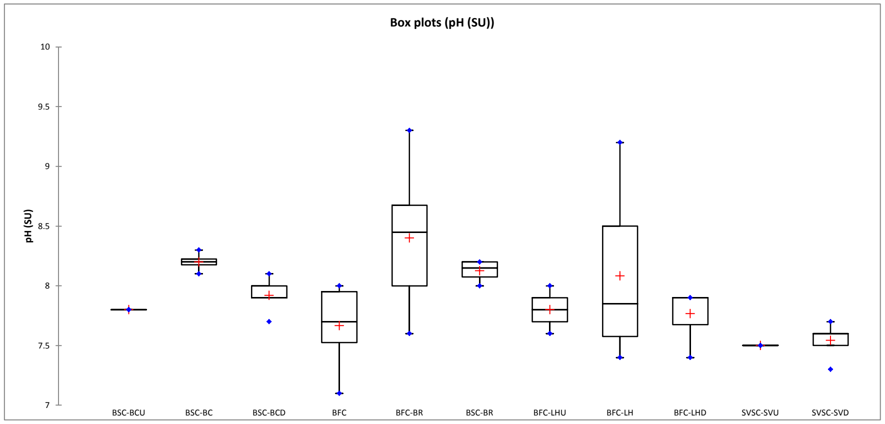

Box plots (Arsenic, T (ug/L))
Arsenic, T (ug/L)
0
1
2
3
4
5
6
Dry Creek
SG-1
SG-2
Olig Dtch
Union-B
Union-M
Union-T

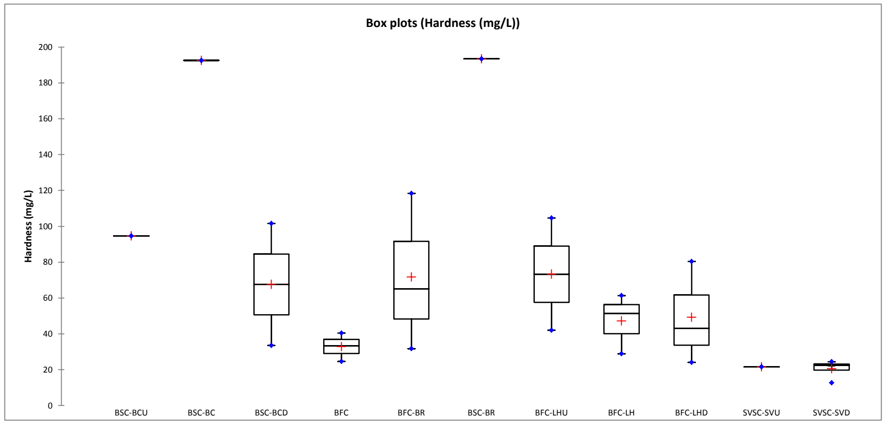

Box plots (Stream Flow (cfs))
Stream Flow (cfs)
0
10
20
30
40
50
60
70
80
Dry Creek
SG-1
SG-2
Olig Dtch
Union-B
Union-M
Union-T

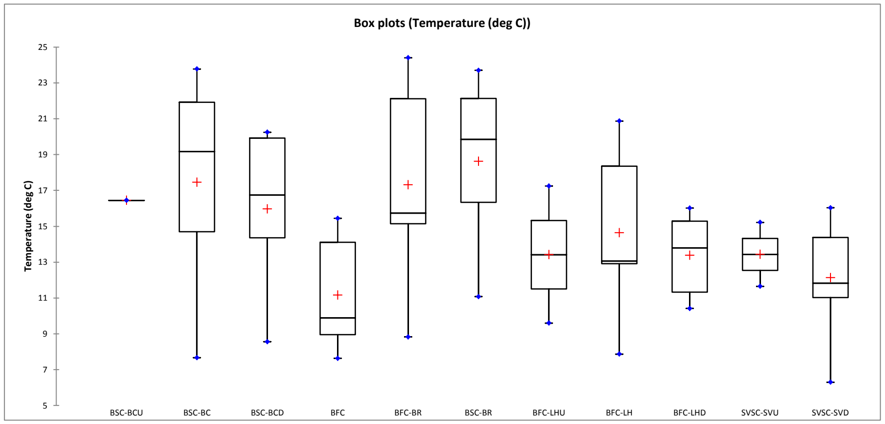

Box plots (Alkalinity (mg/L))
Alkalinity (mg/L)
BSC-BCU
BSC-BC
BSC-BCD
BFC
BFC-BR
BSC-BR
BFC-LHU
BFC-LH
BFC-LHD
SVSC-SVU
SVSC-SVD

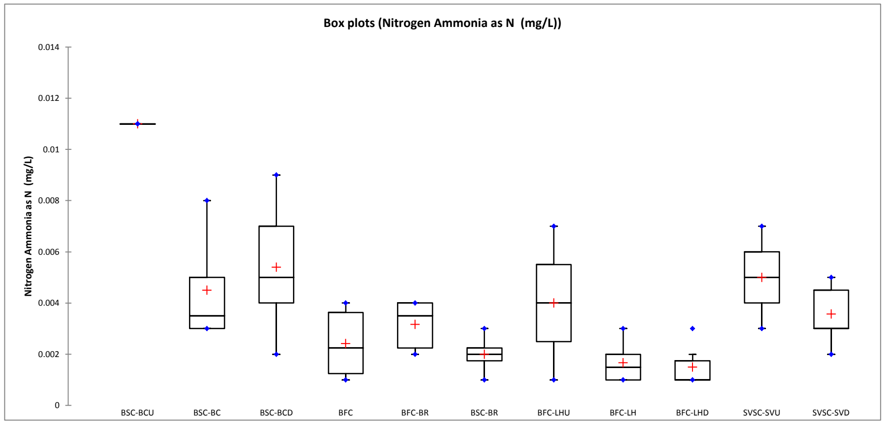

Box plots (Conductivity (umhos/cm))
Conductivity (umhos/cm)
BSC-BCU
BSC-BC
BSC-BCD
BFC
BFC-BR
BSC-BR
BFC-LHU
BFC-LH
BFC-LHD
SVSC-SVU
SVSC-SVD

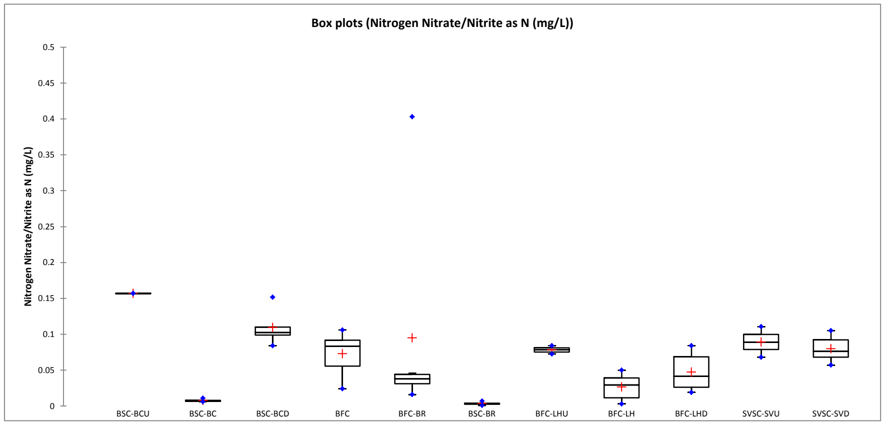

Box plots (DO (mg/L))
DO (mg/L)
BSC-BCU
BSC-BC
BSC-BCD
BFC
BFC-BR
BSC-BR
BFC-LHU
BFC-LH
BFC-LHD
SVSC-SVU
SVSC-SVD

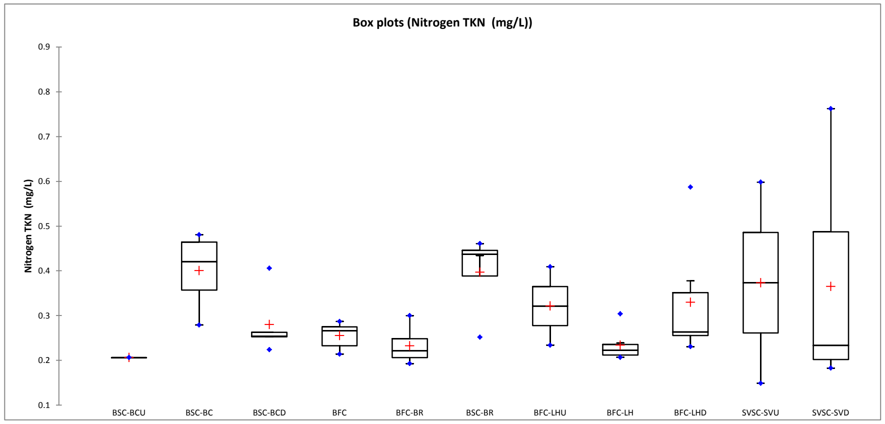

Box plots (pH (SU))
pH (SU)
BSC-BCU
BSC-BC
BSC-BCD
BFC
BFC-BR
BSC-BR
BFC-LHU
BFC-LH
BFC-LHD
SVSC-SVU
SVSC-SVD

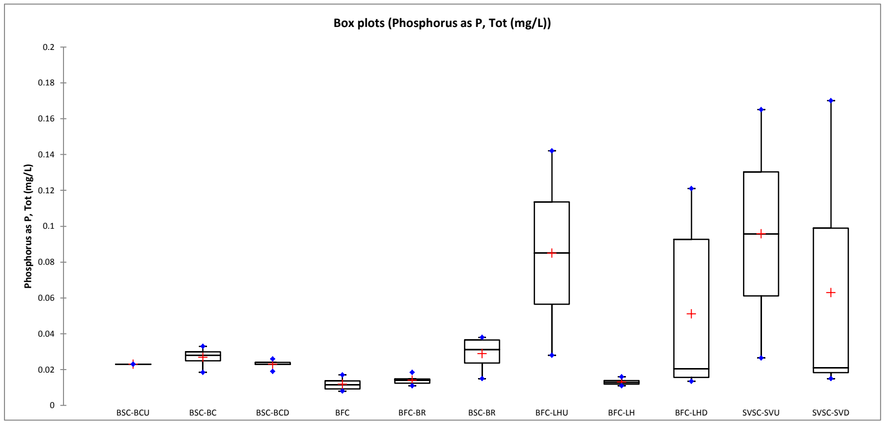

Box plots (Hardness (mg/L))
Hardness (mg/L)
BSC-BCU
BSC-BC
BSC-BCD
BFC
BFC-BR
BSC-BR
BFC-LHU
BFC-LH
BFC-LHD
SVSC-SVU
SVSC-SVD

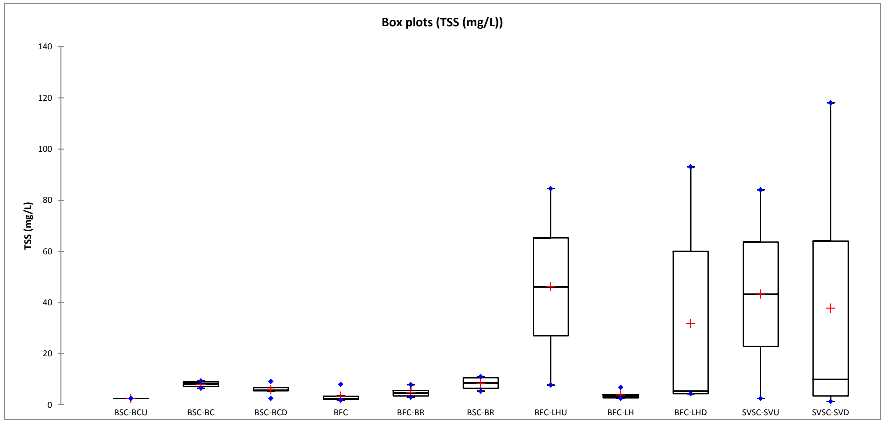

Box plots (Temperature (deg C))
Temperature (deg C)
BSC-BCU
BSC-BC
BSC-BCD
BFC
BFC-BR
BSC-BR
BFC-LHU
BFC-LH
BFC-LHD
SVSC-SVU
SVSC-SVD

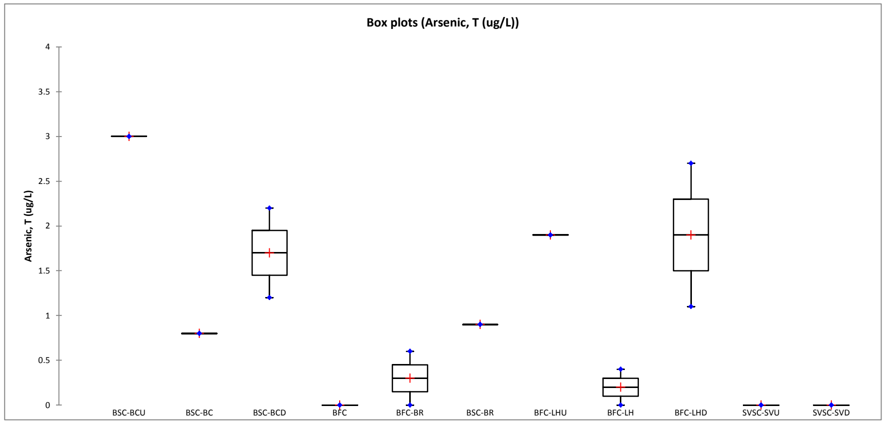

Box plots (Nitrogen Ammonia as N (mg/L))
Nitrogen Ammonia as N (mg/L)
0
0.002
0.004
0.006
0.008
0.01
0.012
0.014
BSC-BCU
BSC-BC
BSC-BCD
BFC
BFC-BR
BSC-BR
BFC-LHU
BFC-LH
BFC-LHD
SVSC-SVU
SVSC-SVD

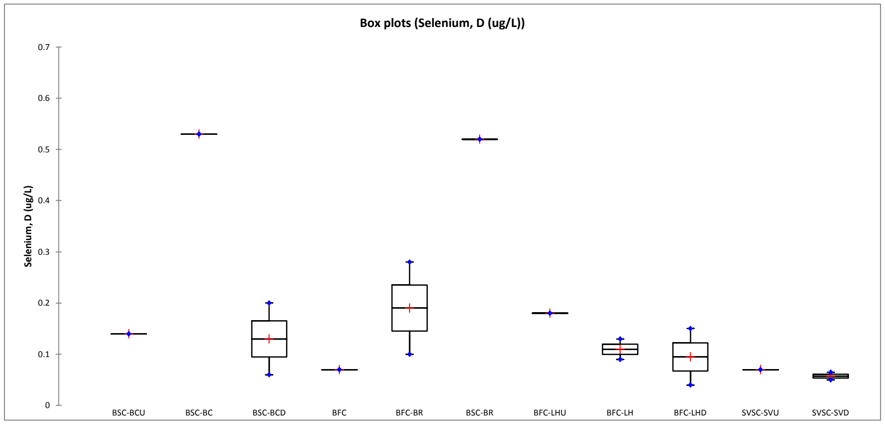

Box plots (Nitrogen Nitrate/Nitrite as N (mg/L))
Nitrogen Nitrate/Nitrite as N (mg/L)
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4
0.45
0.5
BSC-BCU
BSC-BC
BSC-BCD
BFC
BFC-BR
BSC-BR
BFC-LHU
BFC-LH
BFC-LHD
SVSC-SVU
SVSC-SVD

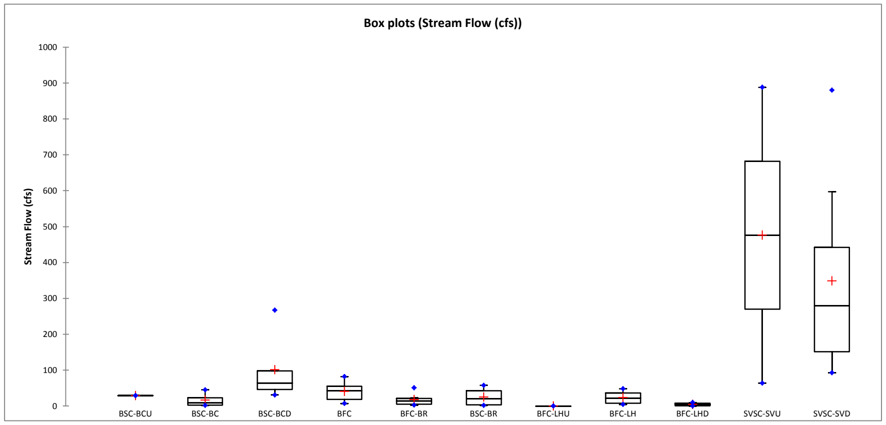

Box plots (Nitrogen TKN (mg/L))
Nitrogen TKN (mg/L)
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
BSC-BCU
BSC-BC
BSC-BCD
BFC
BFC-BR
BSC-BR
BFC-LHU
BFC-LH
BFC-LHD
SVSC-SVU
SVSC-SVD


Box plots (Phosphorus as P, Tot (mg/L))
Phosphorus as P, Tot (mg/L)
0
0.02
0.04
0.06
0.08
0.1
0.12
0.14
0.16
0.18
0.2
BSC-BCU
BSC-BC
BSC-BCD
BFC
BFC-BR
BSC-BR
BFC-LHU
BFC-LH
BFC-LHD
SVSC-SVU
SVSC-SVD

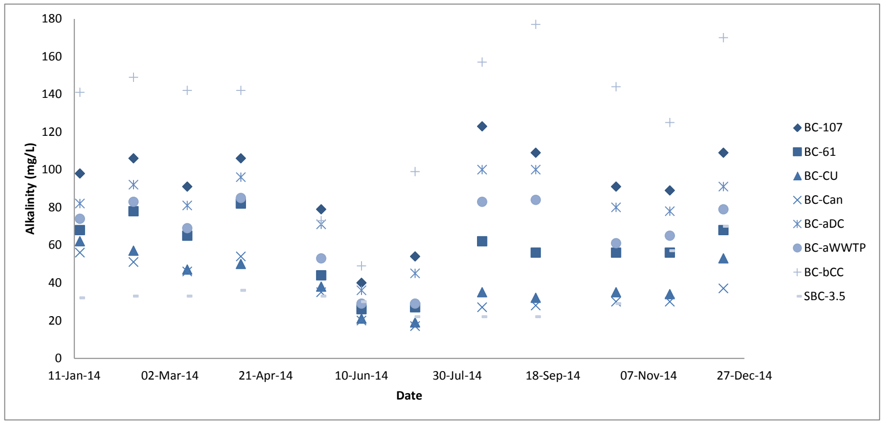

Box plots (TSS (mg/L))
TSS (mg/L)
0
20
40
60
80
100
120
140
BSC-BCU
BSC-BC
BSC-BCD
BFC
BFC-BR
BSC-BR
BFC-LHU
BFC-LH
BFC-LHD
SVSC-SVU
SVSC-SVD

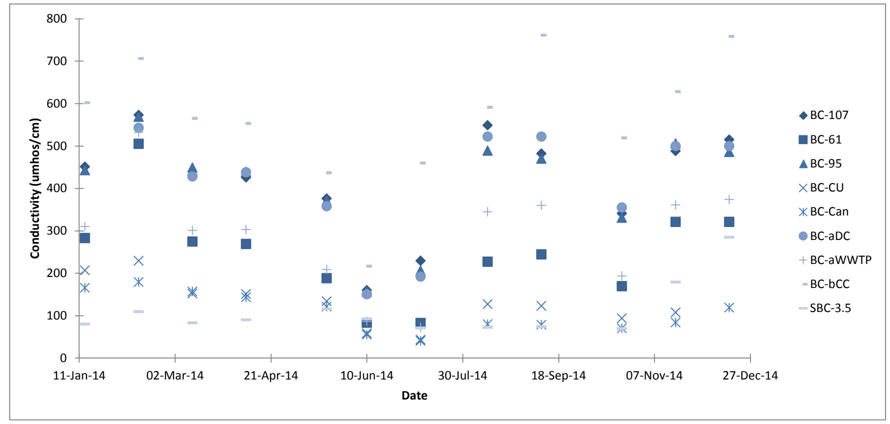

Box plots (Arsenic, T (ug/L))
Arsenic, T (ug/L)
0
0.5
1
1.5
2
2.5
3
3.5
4
BSC-BCU
BSC-BC
BSC-BCD
BFC
BFC-BR
BSC-BR
BFC-LHU
BFC-LH
BFC-LHD
SVSC-SVU
SVSC-SVD

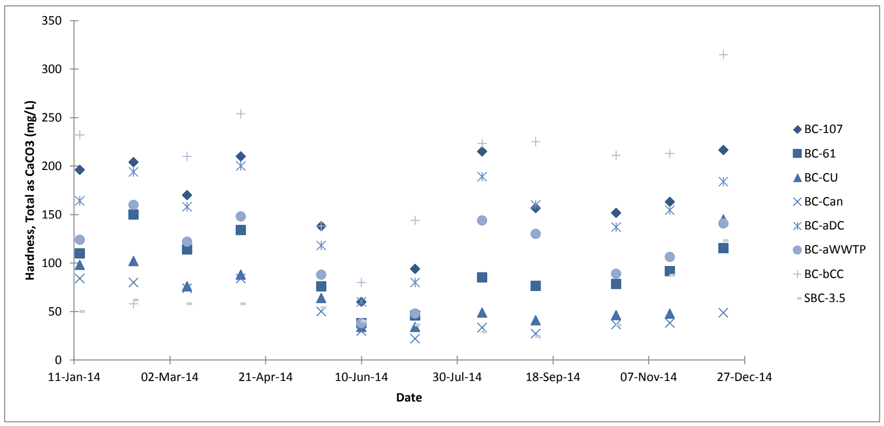

Box plots (Selenium, D (ug/L))
Selenium, D (ug/L)
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
BSC-BCU
BSC-BC
BSC-BCD
BFC
BFC-BR
BSC-BR
BFC-LHU
BFC-LH
BFC-LHD
SVSC-SVU
SVSC-SVD

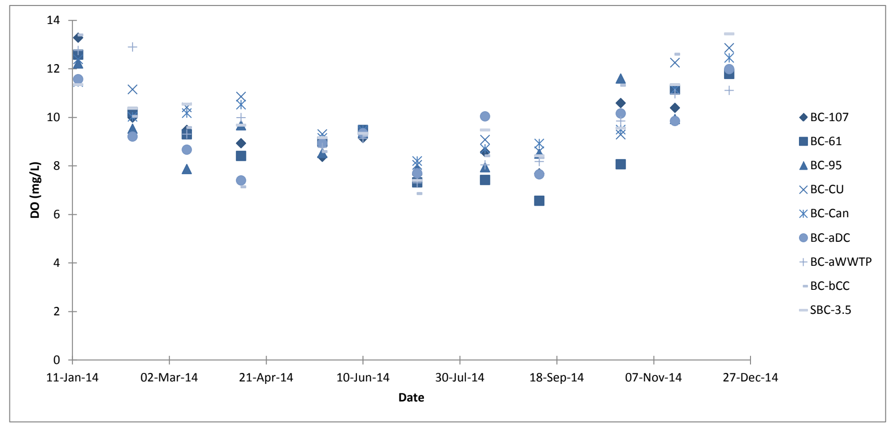

Box plots (Stream Flow (cfs))
Stream Flow (cfs)
1000
900
800
700
600
500
400
300
200
100
0
BSC-BCU
BSC-BC
BSC-BCD
BFC
BFC-BR
BSC-BR
BFC-LHU
BFC-LH
BFC-LHD
SVSC-SVU
SVSC-SVD

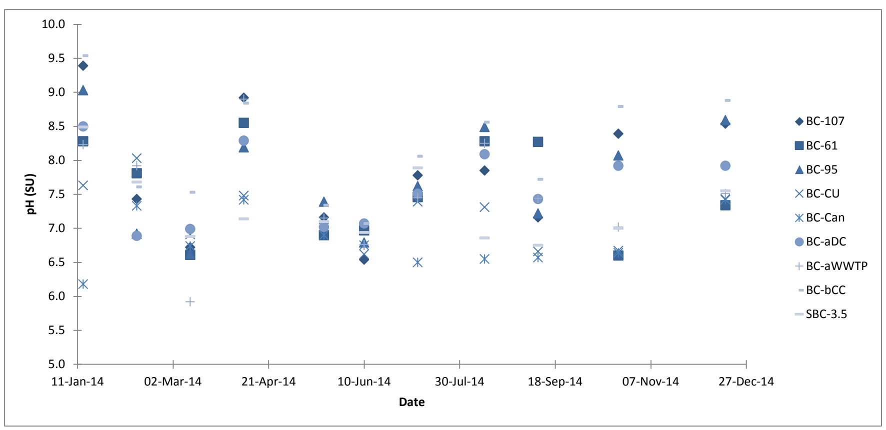
Appendix D. Time Series Plots

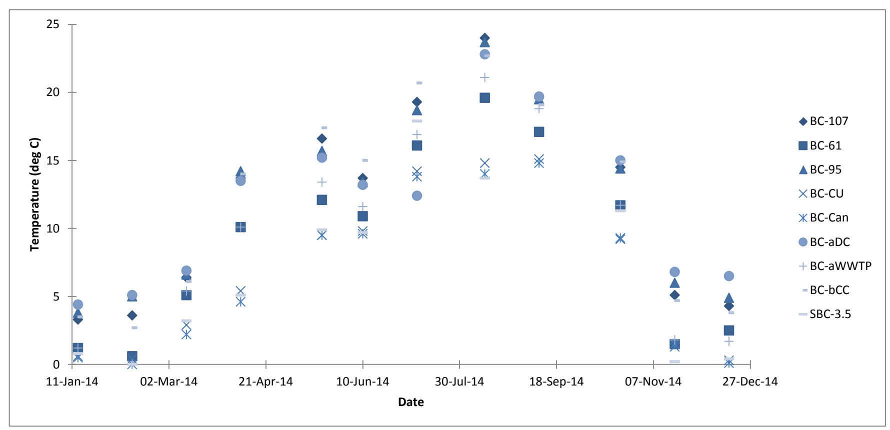

Alkalinity (mg/L)
0
20
40
60
80
100
120
140
160
180
11-Jan-14
02-Mar-14
21-Apr-14
10-Jun-14
30-Jul-14
18-Sep-14
07-Nov-14
27-Dec-14
Date
BC-107
BC-61
BC-CU
BC-Can
BC-aDC
BC-aWWTP
BC-bCC
SBC-3.5

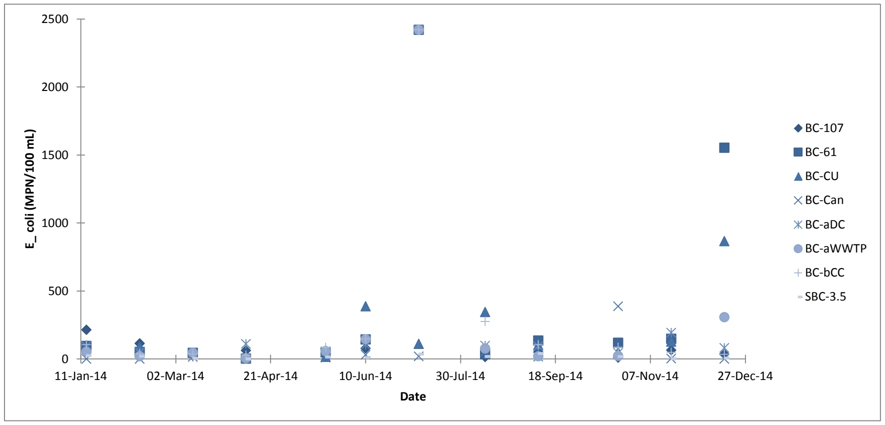

Conductivity (umhos/cm)
0
100
200
300
400
500
600
700
800
11-Jan-14
02-Mar-14
21-Apr-14
10-Jun-14
30-Jul-14
18-Sep-14
07-Nov-14
27-Dec-14
Date
BC-107
BC-61
BC-95
BC-CU
BC-Can
BC-aDC
BC-aWWTP
BC-bCC
SBC-3.5

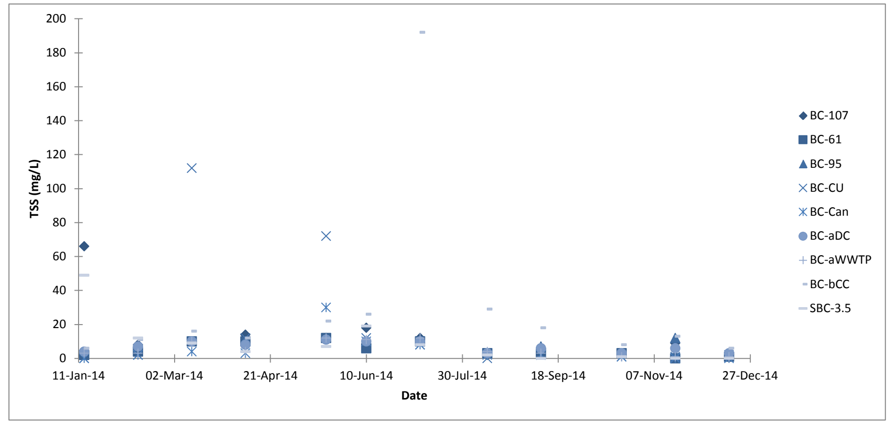

Hardness, Total as CaCO3 (mg/L)
0
50
100
150
200
250
300
350
11-Jan-14
02-Mar-14
21-Apr-14
10-Jun-14
30-Jul-14
18-Sep-14
07-Nov-14
27-Dec-14
Date
BC-107
BC-61
BC-CU
BC-Can
BC-aDC
BC-aWWTP
BC-bCC
SBC-3.5

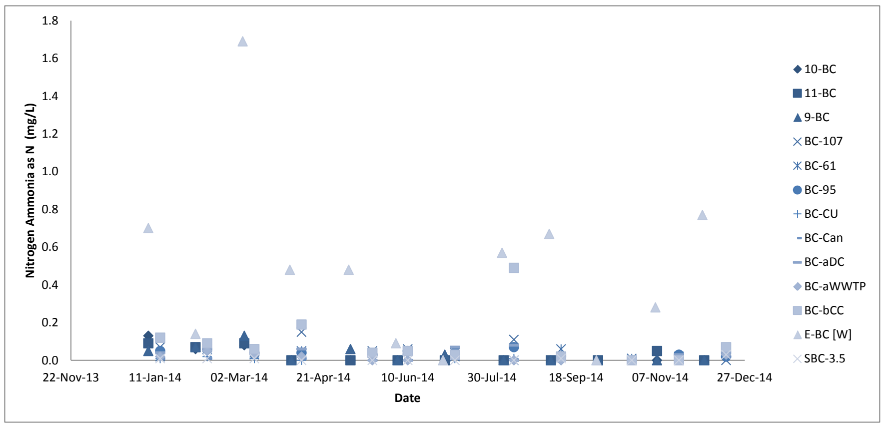

DO (mg/L)
0
2
4
6
8
10
12
14
11-Jan-14
02-Mar-14
21-Apr-14
10-Jun-14
30-Jul-14
18-Sep-14
07-Nov-14
27-Dec-14
Date
BC-107
BC-61
BC-95
BC-CU
BC-Can
BC-aDC
BC-aWWTP
BC-bCC
SBC-3.5

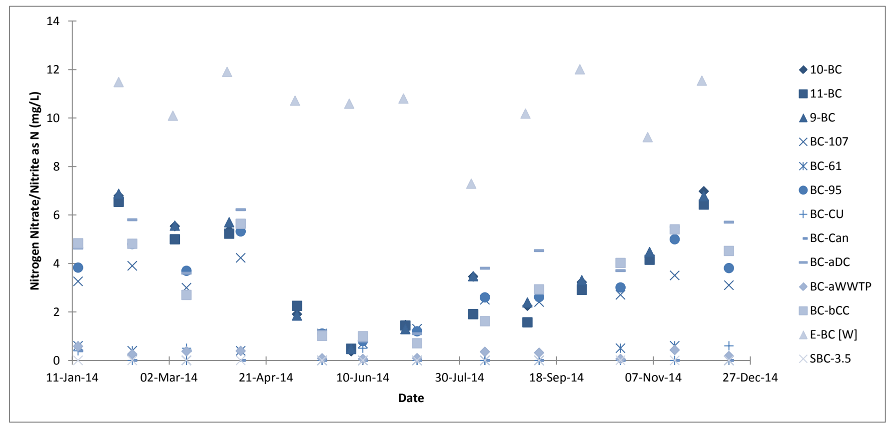

pH (SU)
5.0
5.5
6.0
6.5
7.0
7.5
8.0
8.5
9.0
9.5
10.0
11-Jan-14
02-Mar-14
21-Apr-14
10-Jun-14
30-Jul-14
18-Sep-14
07-Nov-14
27-Dec-14
Date
BC-107
BC-61
BC-95
BC-CU
BC-Can
BC-aDC
BC-aWWTP
BC-bCC
SBC-3.5

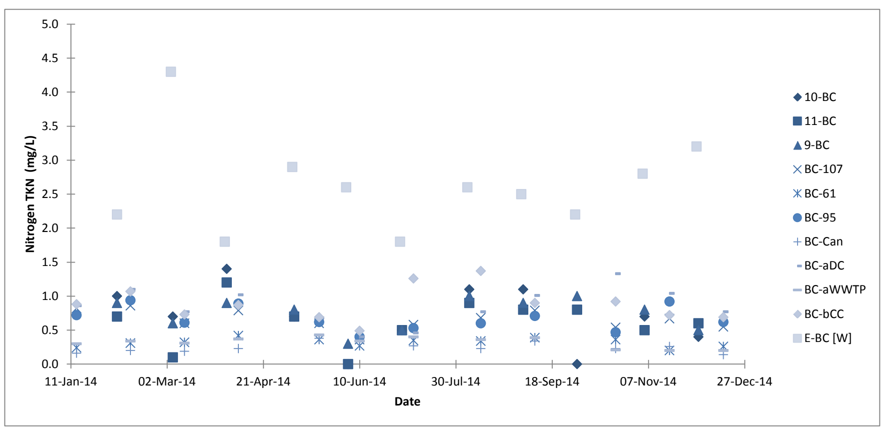

Temperature (deg C)
0
5
10
15
20
25
11-Jan-14
02-Mar-14
21-Apr-14
10-Jun-14
30-Jul-14
18-Sep-14
07-Nov-14
27-Dec-14
Date
BC-107
BC-61
BC-95
BC-CU
BC-Can
BC-aDC
BC-aWWTP
BC-bCC
SBC-3.5

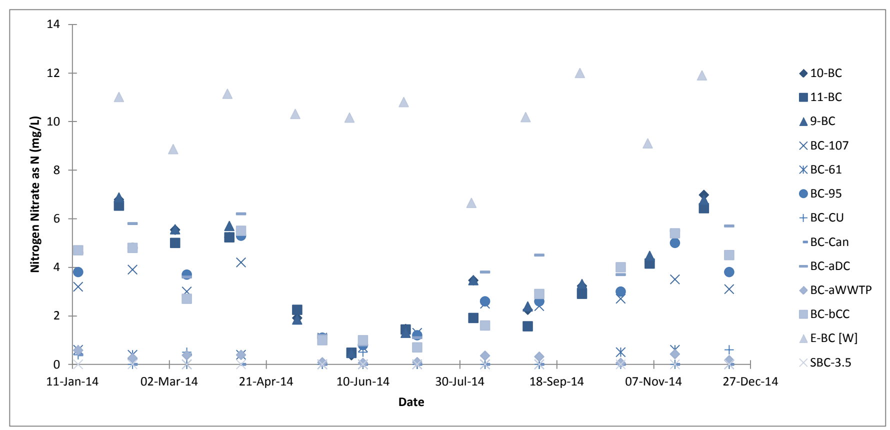

2500
2000
1500
1000
500
0
E_coli (MPN/100 mL)
11-Jan-14
02-Mar-14
21-Apr-14
10-Jun-14
30-Jul-14
18-Sep-14
07-Nov-14
27-Dec-14
Date
BC-107
BC-61
BC-CU
BC-Can
BC-aDC
BC-aWWTP
BC-bCC
SBC-3.5

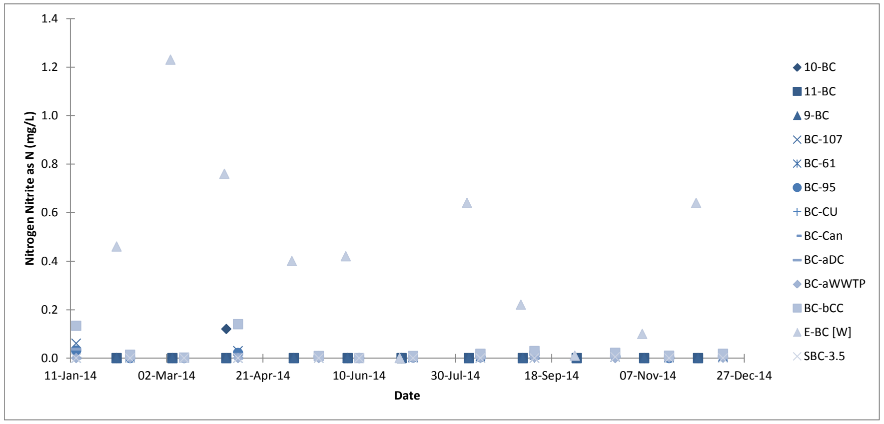

200
180
160
140
120
100
80
60
40
20
0
TSS (mg/L)
11-Jan-14
02-Mar-14
21-Apr-14
10-Jun-14
30-Jul-14
18-Sep-14
07-Nov-14
27-Dec-14
Date
BC-107
BC-61
BC-95
BC-CU
BC-Can
BC-aDC
BC-aWWTP
BC-bCC
SBC-3.5

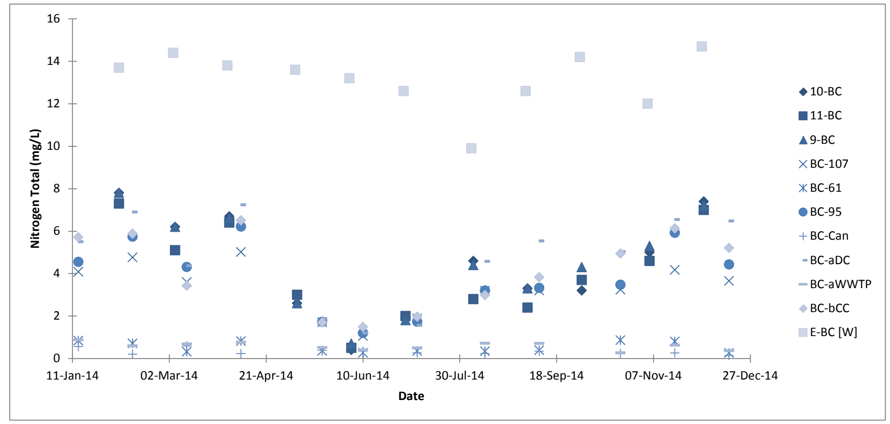

1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
Nitrogen Ammonia as N (mg/L)
22-Nov-13
11-Jan-14
02-Mar-14
21-Apr-14
10-Jun-14
30-Jul-14
18-Sep-14
07-Nov-14
27-Dec-14
Date
10-BC
11-BC
9-BC
BC-107
BC-61
BC-95
BC-CU
BC-Can
BC-aDC
BC-aWWTP
BC-bCC
E-BC [W]
SBC-3.5

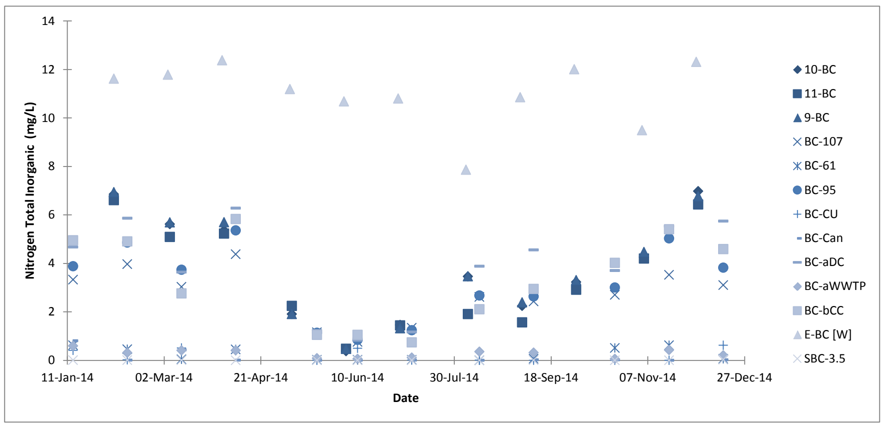

14
12
10
8
6
4
2
0
Nitrogen Nitrate/Nitrite as N (mg/L)
11-Jan-14
02-Mar-14
21-Apr-14
10-Jun-14
30-Jul-14
18-Sep-14
07-Nov-14
27-Dec-14
Date
10-BC
11-BC
9-BC
BC-107
BC-61
BC-95
BC-CU
BC-Can
BC-aDC
BC-aWWTP
BC-bCC
E-BC [W]
SBC-3.5

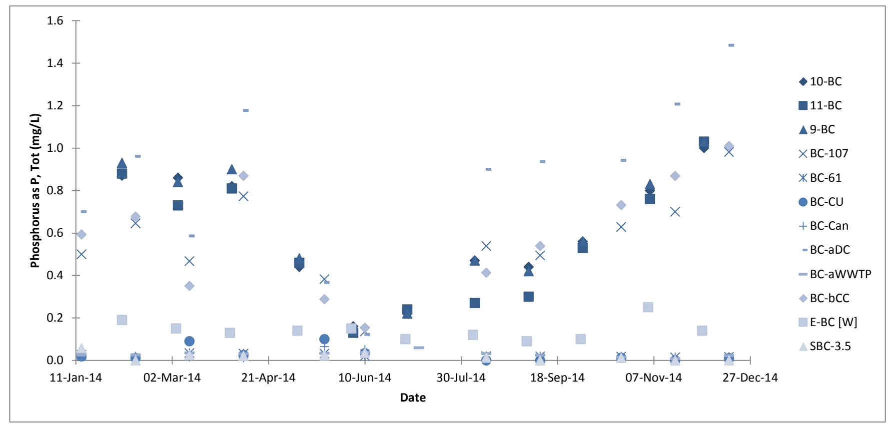

5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Nitrogen TKN (mg/L)
11-Jan-14
02-Mar-14
21-Apr-14
10-Jun-14
30-Jul-14
18-Sep-14
07-Nov-14
27-Dec-14
Date
10-BC
11-BC
9-BC
BC-107
BC-61
BC-95
BC-Can
BC-aDC
BC-aWWTP
BC-bCC
E-BC [W]

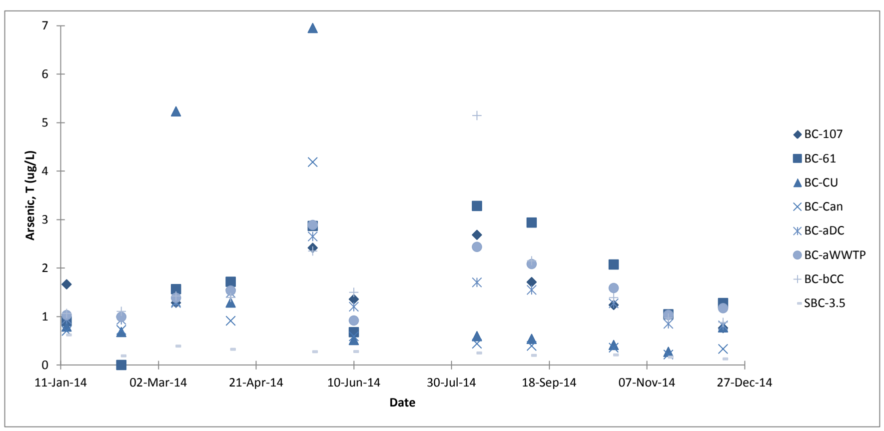

14
12
10
8
6
4
2
0
Nitrogen Nitrate as N (mg/L)
11-Jan-14
02-Mar-14
21-Apr-14
10-Jun-14
30-Jul-14
18-Sep-14
07-Nov-14
27-Dec-14
Date
10-BC
11-BC
9-BC
BC-107
BC-61
BC-95
BC-CU
BC-Can
BC-aDC
BC-aWWTP
BC-bCC
E-BC [W]
SBC-3.5

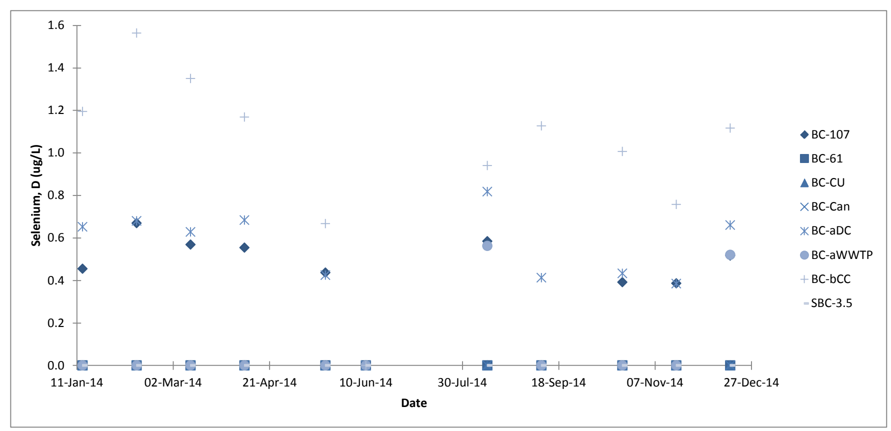

Nitrogen Nitrite as N (mg/L)
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
11-Jan-14
02-Mar-14
21-Apr-14
10-Jun-14
30-Jul-14
18-Sep-14
07-Nov-14
27-Dec-14
Date
10-BC
11-BC
9-BC
BC-107
BC-61
BC-95
BC-CU
BC-Can
BC-aDC
BC-aWWTP
BC-bCC
E-BC [W]
SBC-3.5

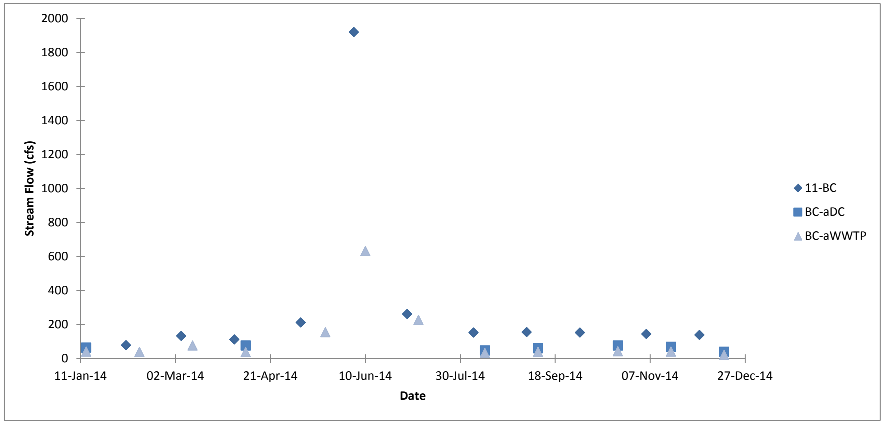

Nitrogen Total (mg/L)
16
14
12
10
8
6
4
2
0
11-Jan-14
02-Mar-14
21-Apr-14
10-Jun-14
30-Jul-14
18-Sep-14
07-Nov-14
27-Dec-14
Date
10-BC
11-BC
9-BC
BC-107
BC-61
BC-95
BC-Can
BC-aDC
BC-aWWTP
BC-bCC
E-BC [W]

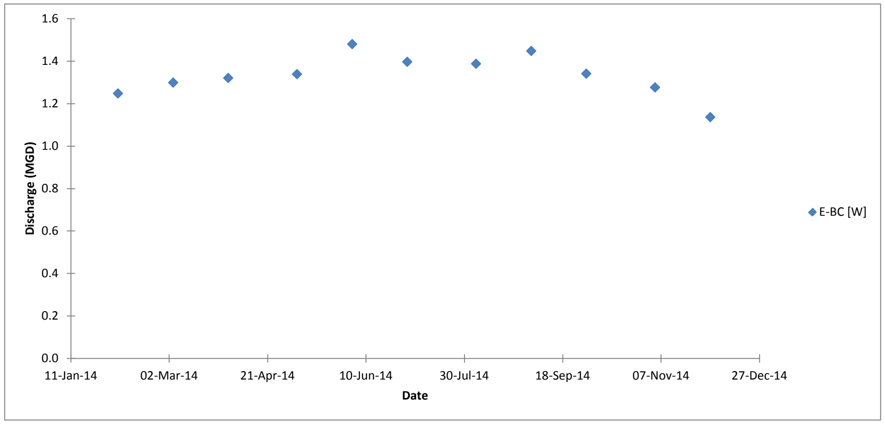

Nitrogen Total Inorganic (mg/L)
14
12
10
8
6
4
2
0
11-Jan-14
02-Mar-14
21-Apr-14
10-Jun-14
30-Jul-14
18-Sep-14
07-Nov-14
27-Dec-14
Date
10-BC
11-BC
9-BC
BC-107
BC-61
BC-95
BC-CU
BC-Can
BC-aDC
BC-aWWTP
BC-bCC
E-BC [W]
SBC-3.5

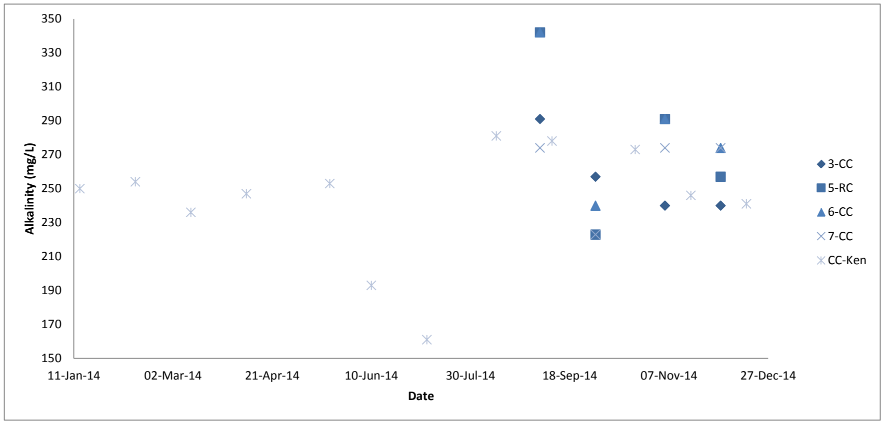

Phosphorus as P, Tot (mg/L)
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
11-Jan-14
02-Mar-14
21-Apr-14
10-Jun-14
30-Jul-14
18-Sep-14
07-Nov-14
27-Dec-14
Date
10-BC
11-BC
9-BC
BC-107
BC-61
BC-CU
BC-Can
BC-aDC
BC-aWWTP
BC-bCC
E-BC [W]
SBC-3.5

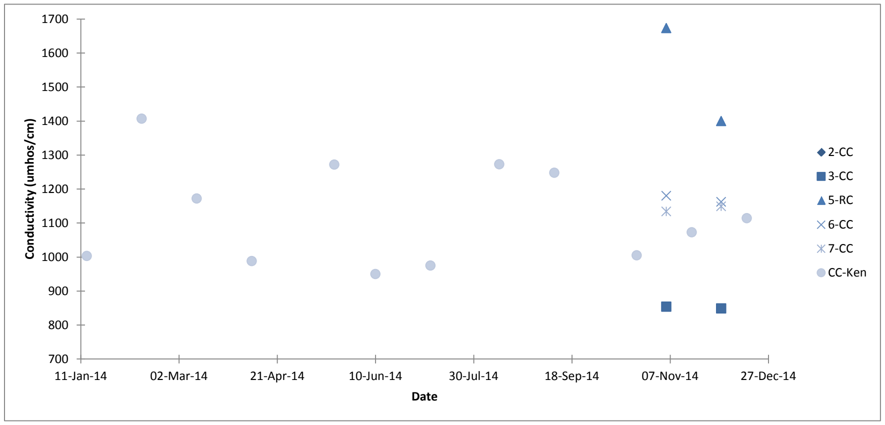

Arsenic, T (ug/L)
7
6
5
4
3
2
1
0
11-Jan-14
02-Mar-14
21-Apr-14
10-Jun-14
30-Jul-14
18-Sep-14
07-Nov-14
27-Dec-14
Date
BC-107
BC-61
BC-CU
BC-Can
BC-aDC
BC-aWWTP
BC-bCC
SBC-3.5

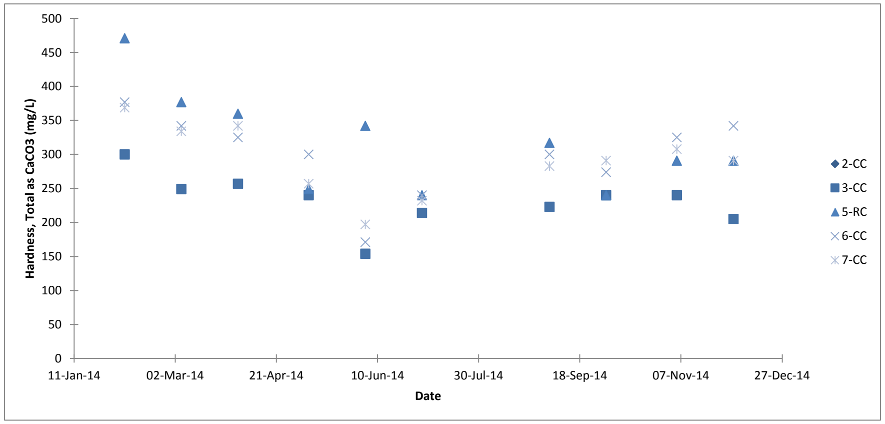

Selenium, D (ug/L)
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
11-Jan-14
02-Mar-14
21-Apr-14
10-Jun-14
30-Jul-14
18-Sep-14
07-Nov-14
27-Dec-14
Date
BC-107
BC-61
BC-CU
BC-Can
BC-aDC
BC-aWWTP
BC-bCC
SBC-3.5

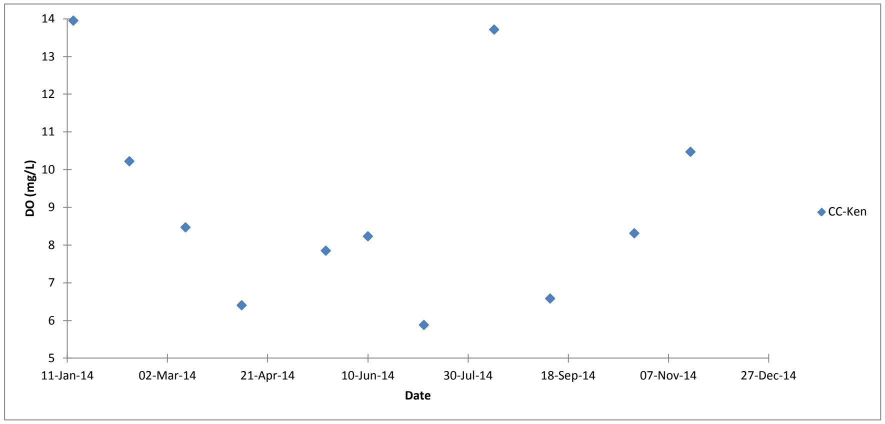

2000
1800
1600
1400
1200
1000
800
600
400
200
0
Stream Flow (cfs)
11-Jan-14
02-Mar-14
21-Apr-14
10-Jun-14
30-Jul-14
18-Sep-14
07-Nov-14
27-Dec-14
Date
11-BC
BC-aDC
BC-aWWTP

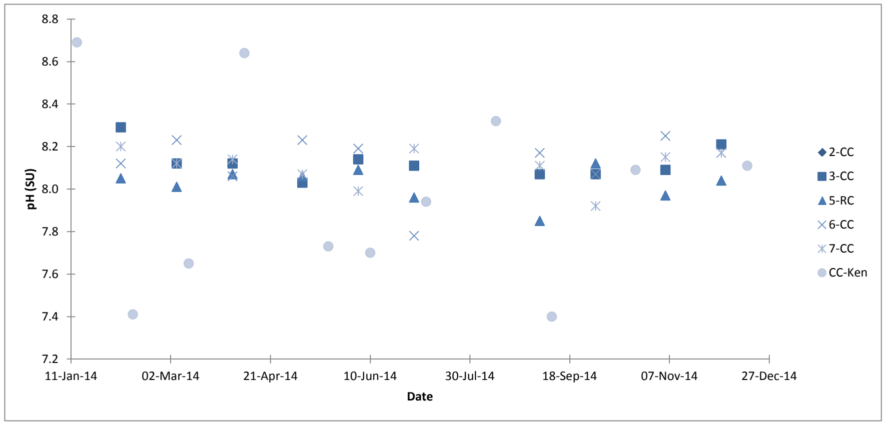

1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
Discharge (MGD)
11-Jan-14
02-Mar-14
21-Apr-14
10-Jun-14
30-Jul-14
18-Sep-14
07-Nov-14
27-Dec-14
Date
E-BC [W]

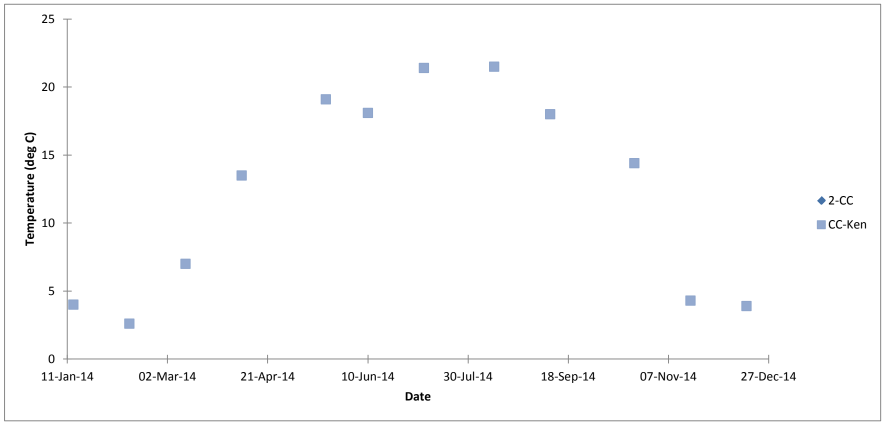

Alkalinity (mg/L)
Date
11-Jan-14
02-Mar-14
21-Apr-14
10-Jun-14
30-Jul-14
18-Sep-14
07-Nov-14
27-Dec-14
3-CC
5-RC
6-CC
7-CC
CC-Ken

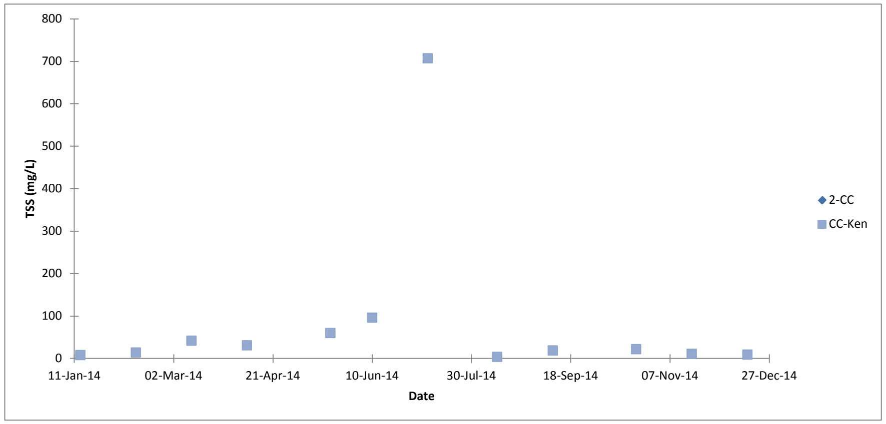

Conductivity (umhos/cm)
Date
2-CC
3-CC
5-RC
6-CC
7-CC
CC-Ken

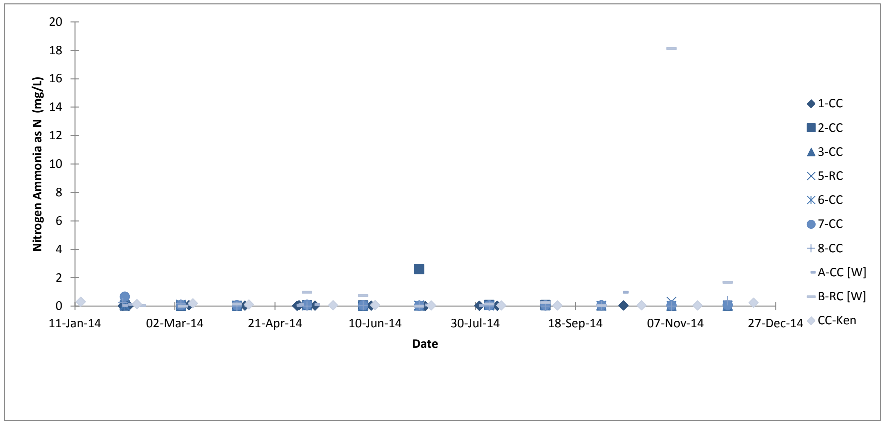

Hardness, Total as CaCO3 (mg/L)
Date
2-CC
3-CC
5-RC
6-CC
7-CC

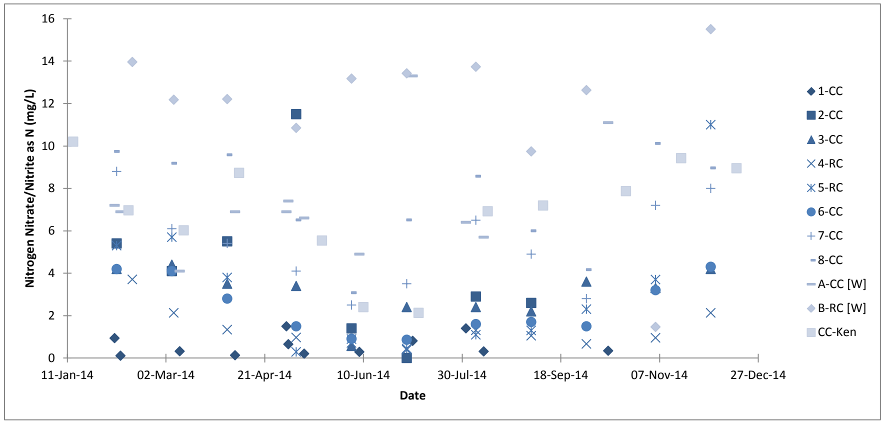

DO (mg/L)
Date
CC-Ken

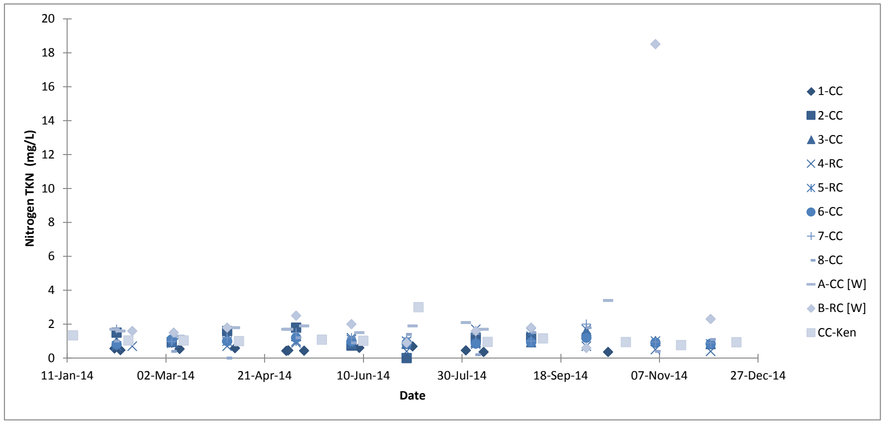

pH (SU)
Date
2-CC
3-CC
5-RC
6-CC
7-CC
CC-Ken

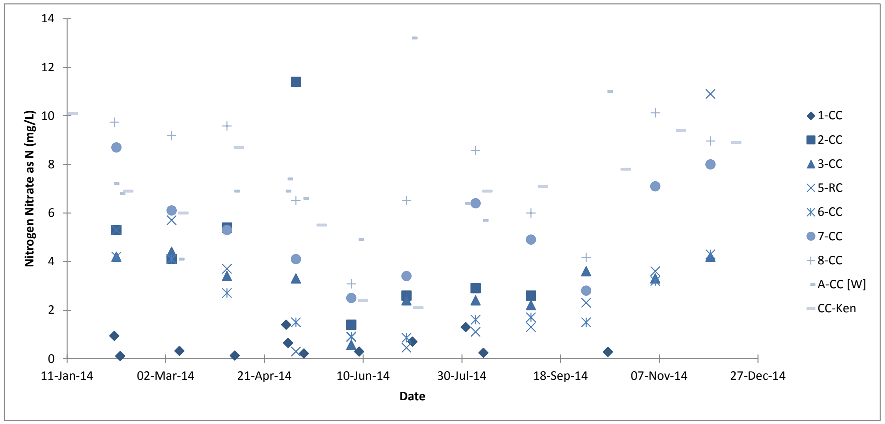

Temperature (deg C)
Date
2-CC
CC-Ken

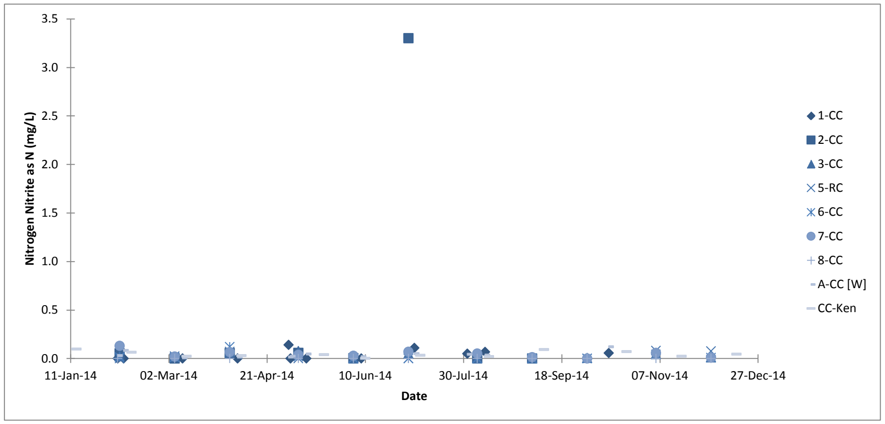

TSS (mg/L)
800
700
600
500
400
300
200
100
0
11-Jan-14
02-Mar-14
21-Apr-14
10-Jun-14
30-Jul-14
18-Sep-14
07-Nov-14
27-Dec-14
Date
2-CC
CC-Ken

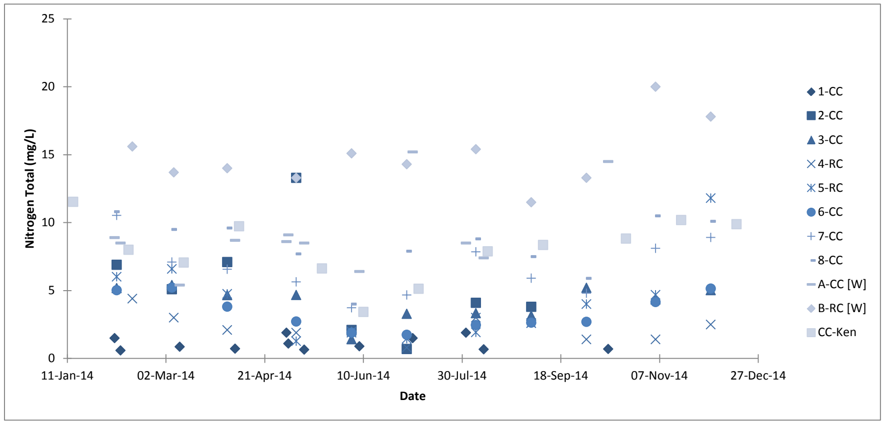

Nitrogen Ammonia as N (mg/L)
20
18
16
14
12
10
8
6
4
2
0
11-Jan-14
02-Mar-14
21-Apr-14
10-Jun-14
30-Jul-14
18-Sep-14
07-Nov-14
27-Dec-14
Date
1-CC
2-CC
3-CC
5-RC
6-CC
7-CC
8-CC
A-CC [W]
B-RC [W]
CC-Ken

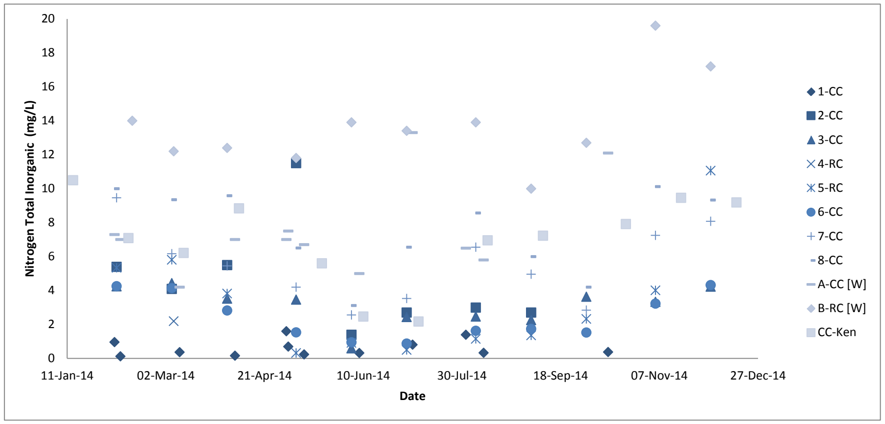

Nitrogen Nitrate/Nitrite as N (mg/L)
16
14
12
10
8
6
4
2
0
11-Jan-14
02-Mar-14
21-Apr-14
10-Jun-14
30-Jul-14
18-Sep-14
07-Nov-14
27-Dec-14
Date
1-CC
2-CC
3-CC
4-RC
5-RC
6-CC
7-CC
8-CC
A-CC [W]
B-RC [W]
CC-Ken

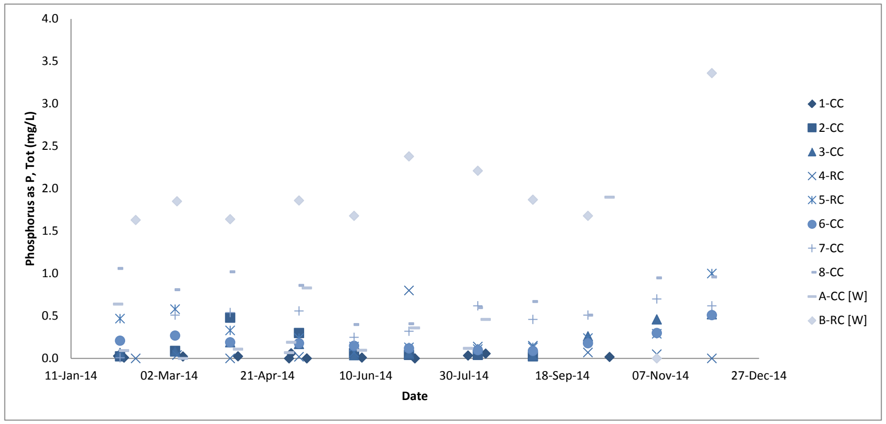

Nitrogen TKN (mg/L)
20
18
16
14
12
10
8
6
4
2
0
11-Jan-14
02-Mar-14
21-Apr-14
10-Jun-14
30-Jul-14
18-Sep-14
07-Nov-14
27-Dec-14
Date
1-CC
2-CC
3-CC
4-RC
5-RC
6-CC
7-CC
8-CC
A-CC [W]
B-RC [W]
CC-Ken

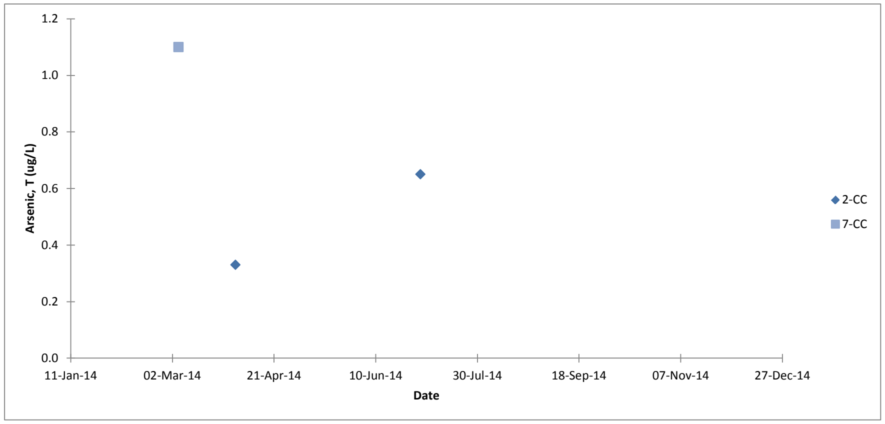

Nitrogen Nitrate as N (mg/L)
14
12
10
8
6
4
2
0
11-Jan-14
02-Mar-14
21-Apr-14
10-Jun-14
30-Jul-14
18-Sep-14
07-Nov-14
27-Dec-14
Date
1-CC
2-CC
3-CC
5-RC
6-CC
7-CC
8-CC
A-CC [W]
CC-Ken

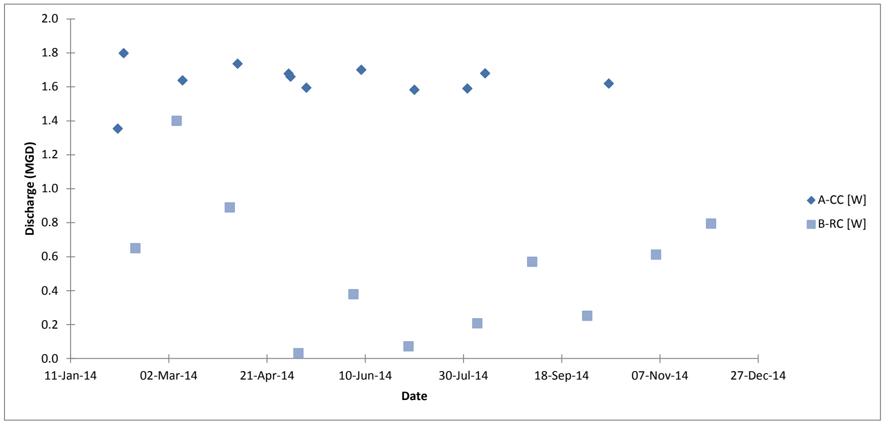

Nitrogen Nitrite as N (mg/L)
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
11-Jan-14
02-Mar-14
21-Apr-14
10-Jun-14
30-Jul-14
18-Sep-14
07-Nov-14
27-Dec-14
Date
1-CC
2-CC
3-CC
5-RC
6-CC
7-CC
8-CC
A-CC [W]
CC-Ken

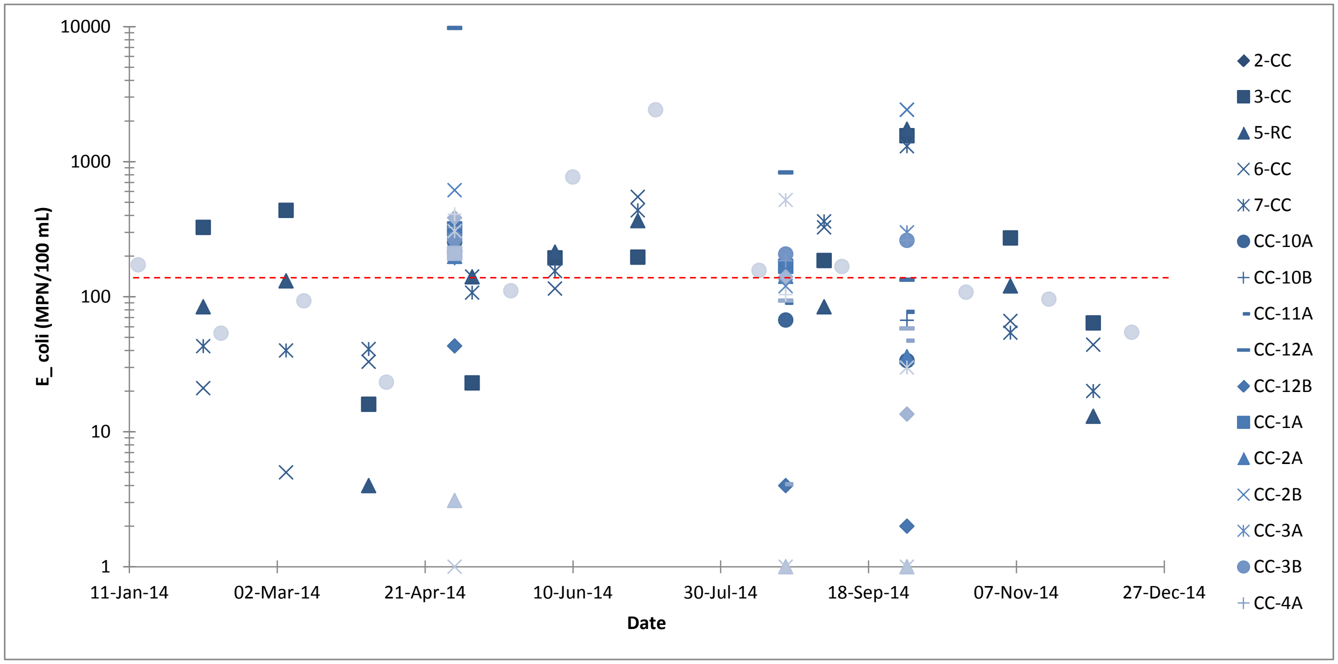

Nitrogen Total (mg/L)
Date
11-Jan-14
02-Mar-14
21-Apr-14
10-Jun-14
30-Jul-14
18-Sep-14
07-Nov-14
27-Dec-14
1-CC
2-CC
3-CC
4-RC
5-RC
6-CC
7-CC
8-CC
A-CC [W]
B-RC [W]
CC-Ken

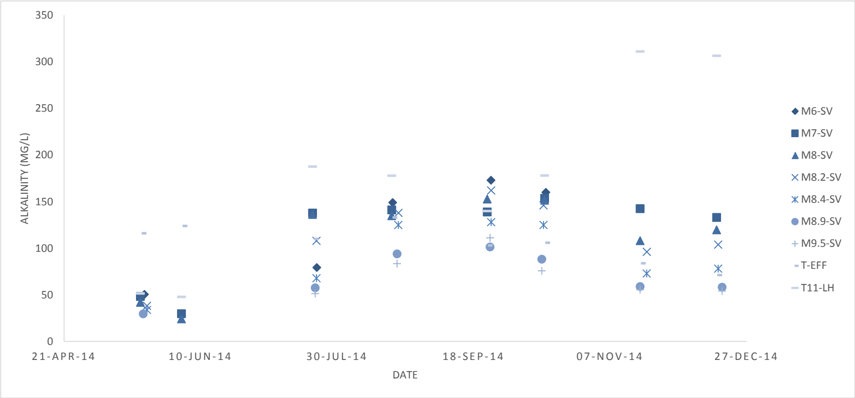

Nitrogen Total Inorganic (mg/L)
Date
11-Jan-14
02-Mar-14
21-Apr-14
10-Jun-14
30-Jul-14
18-Sep-14
07-Nov-14
27-Dec-14
1-CC
2-CC
3-CC
4-RC
5-RC
6-CC
7-CC
8-CC
A-CC [W]
B-RC [W]
CC-Ken

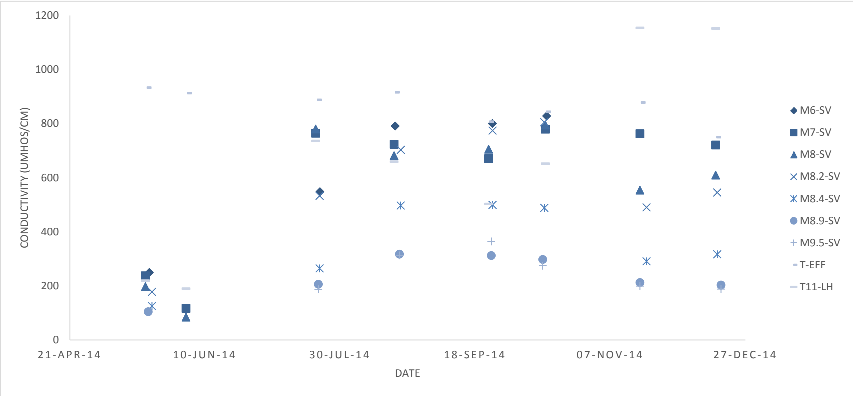

Phosphorus as P, Tot (mg/L)
Date
11-Jan-14
02-Mar-14
21-Apr-14
10-Jun-14
30-Jul-14
18-Sep-14
07-Nov-14
27-Dec-14
1-CC
2-CC
3-CC
4-RC
5-RC
6-CC
7-CC
8-CC
A-CC [W]
B-RC [W]

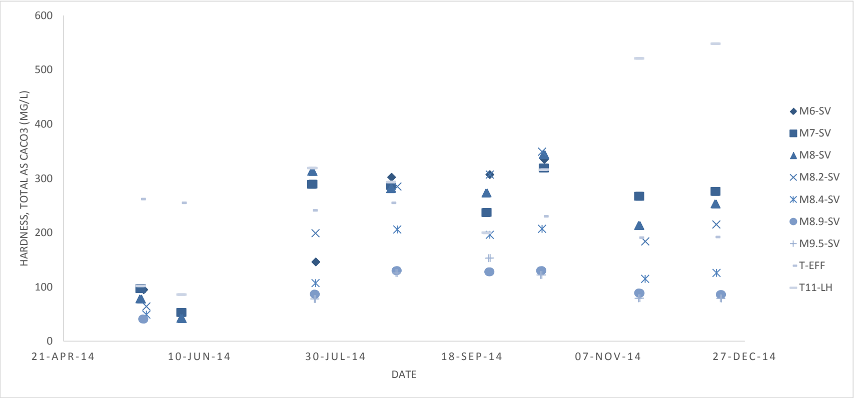

Arsenic, T (ug/L)
Date
11-Jan-14
02-Mar-14
21-Apr-14
10-Jun-14
30-Jul-14
18-Sep-14
07-Nov-14
27-Dec-14
2-CC
7-CC

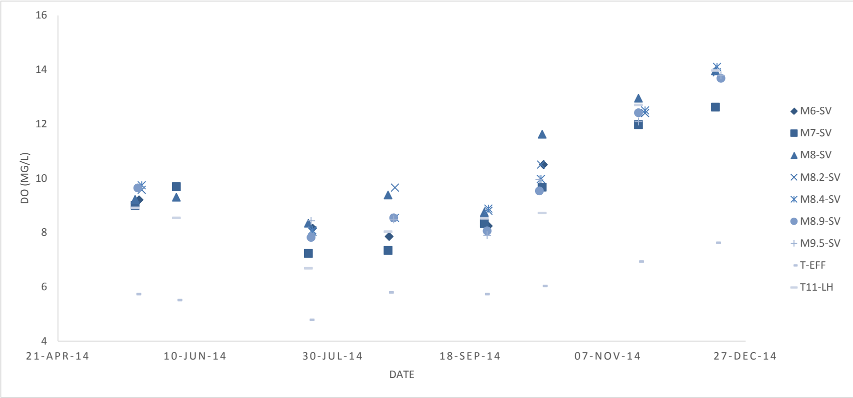

Discharge (MGD)
Date
11-Jan-14
02-Mar-14
21-Apr-14
10-Jun-14
30-Jul-14
18-Sep-14
07-Nov-14
27-Dec-14
A-CC [W]
B-RC [W]

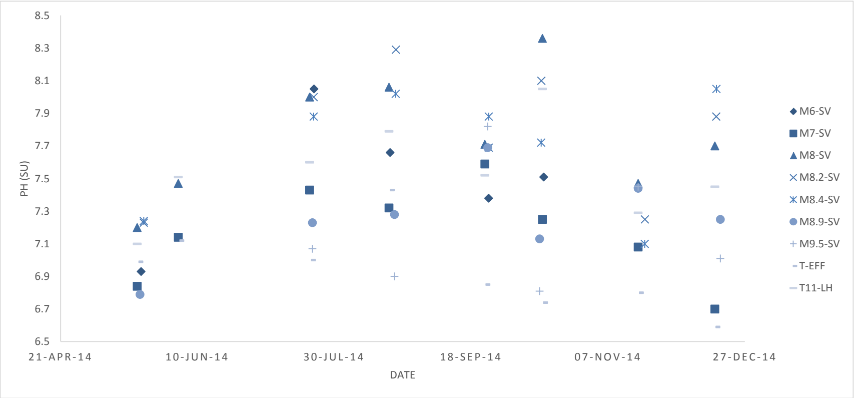

10000
1000
100
10
1
E_coli (MPN/100 mL)
11-Jan-14
02-Mar-14
21-Apr-14
10-Jun-14
30-Jul-14
18-Sep-14
07-Nov-14
27-Dec-14
Date
2-CC
3-CC
5-RC
6-CC
7-CC
CC-10A
CC-10B
CC-11A
CC-12A
CC-12B
CC-1A
CC-2A
CC-2B
CC-3A
CC-3B
CC-4A

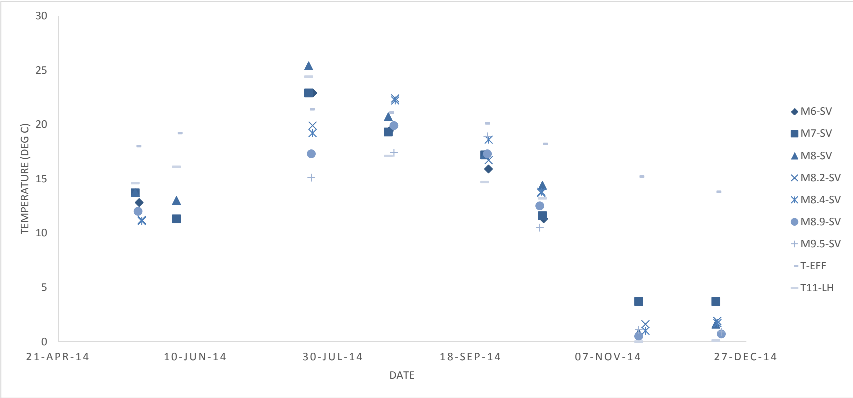

ALKALINITY (MG/L)
DATE
M6-SV
M7-SV
M8-SV
M8.2-SV
M8.4-SV
M8.9-SV
M9.5-SV
T-EFF
T11-LH

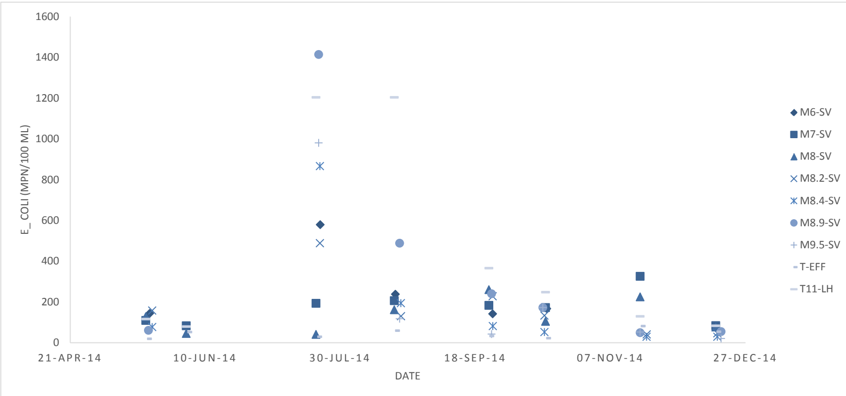

CONDUCTIVITY (UMHOS/CM)
DATE
M6-SV
M7-SV
M8-SV
M8.2-SV
M8.4-SV
M8.9-SV
M9.5-SV
T-EFF
T11-LH

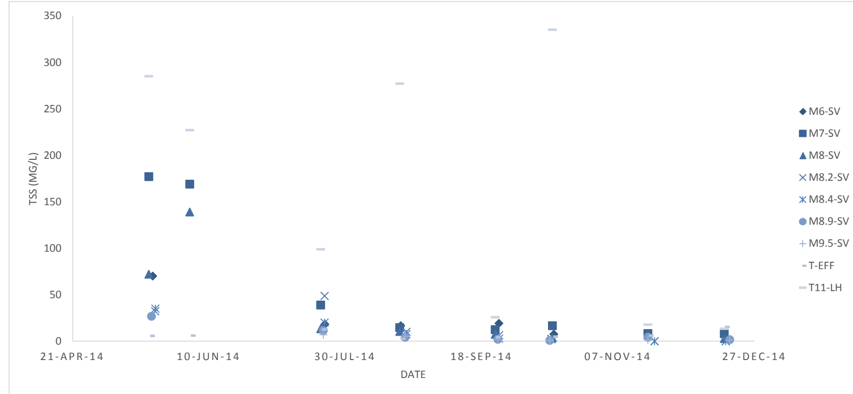

HARDNESS, TOTAL AS CACO3 (MG/L)
DATE
M6-SV
M7-SV
M8-SV
M8.2-SV
M8.4-SV
M8.9-SV
M9.5-SV
T-EFF
T11-LH

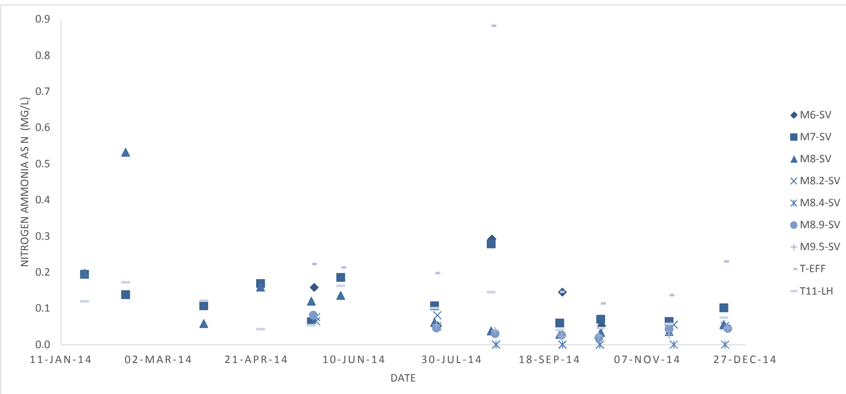

DO (MG/L)
DATE
M6-SV
M7-SV
M8-SV
M8.2-SV
M8.4-SV
M8.9-SV
M9.5-SV
T-EFF
T11-LH

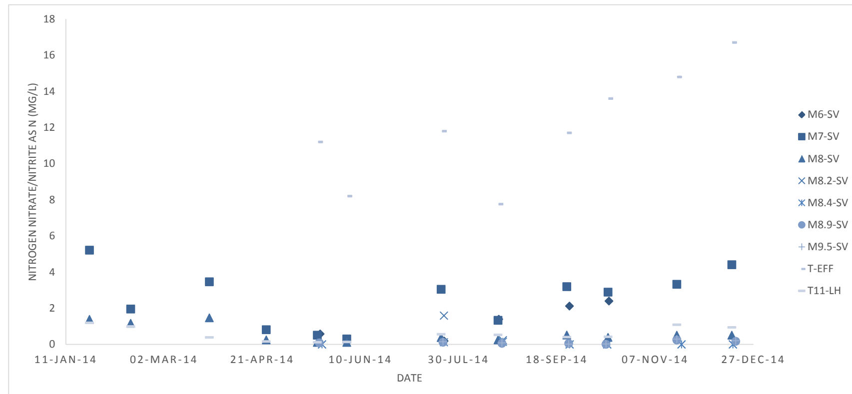

PH (SU)
DATE
M6-SV
M7-SV
M8-SV
M8.2-SV
M8.4-SV
M8.9-SV
M9.5-SV
T-EFF
T11-LH

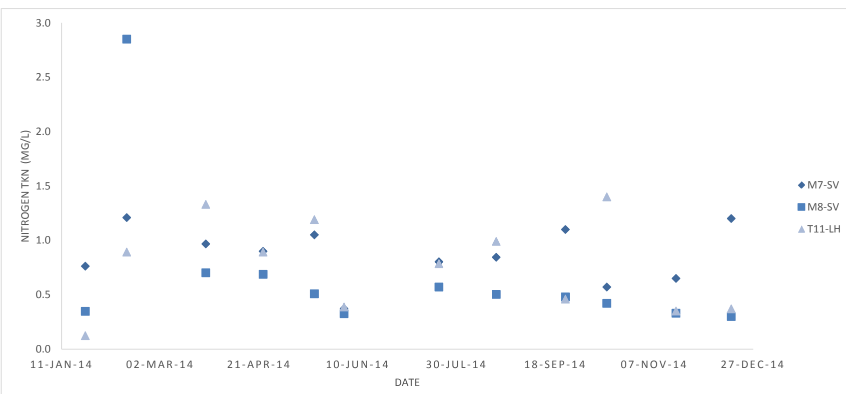

TEMPERATURE (DEG C)
DATE
M6-SV
M7-SV
M8-SV
M8.2-SV
M8.4-SV
M8.9-SV
M9.5-SV
T-EFF
T11-LH

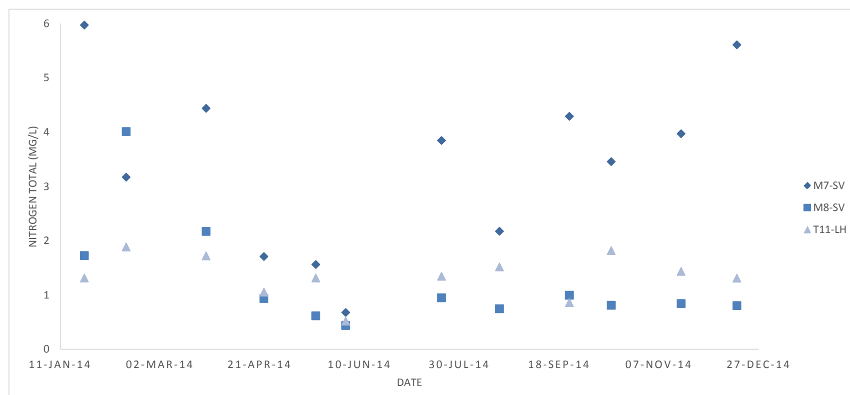

1600
1400
1200
1000
800
600
400
200
0
E_COLI (MPN/100 ML)
21-APR-14
10-JUN-14
30-JUL-14
18-SEP-14
07-NOV-14
27-DEC-14
DATE
M6-SV
M7-SV
M8-SV
M8.2-SV
M8.4-SV
M8.9-SV
M9.5-SV
T-EFF
T11-LH

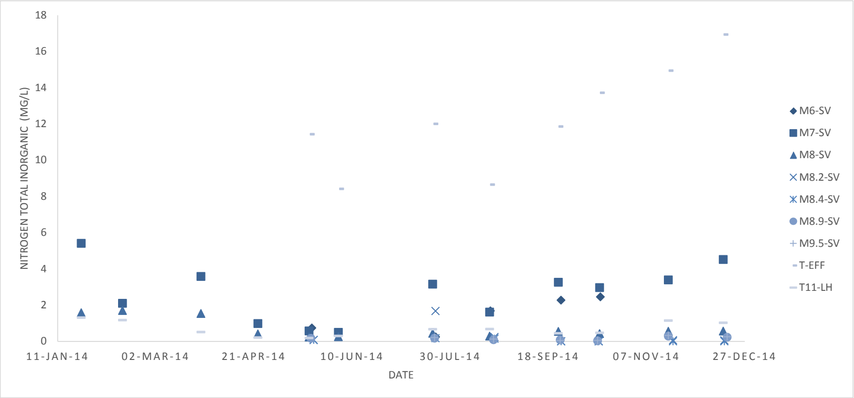

350
300
250
200
150
100
50
0
TSS (MG/L)
21-APR-14
10-JUN-14
30-JUL-14
18-SEP-14
07-NOV-14
27-DEC-14
DATE
M6-SV
M7-SV
M8-SV
M8.2-SV
M8.4-SV
M8.9-SV
M9.5-SV
T-EFF
T11-LH

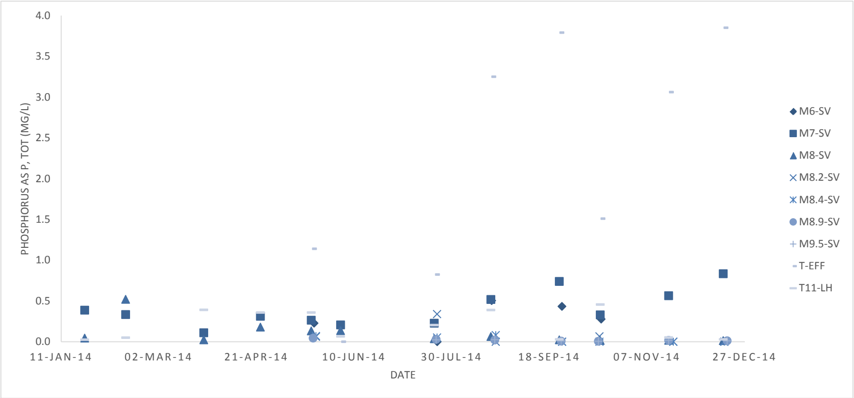

0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
NITROGEN AMMONIA AS N (MG/L)
11-JAN-14
02-MAR-14
21-APR-14
10-JUN-14
30-JUL-14
18-SEP-14
07-NOV-14
27-DEC-14
DATE
M6-SV
M7-SV
M8-SV
M8.2-SV
M8.4-SV
M8.9-SV
M9.5-SV
T-EFF
T11-LH

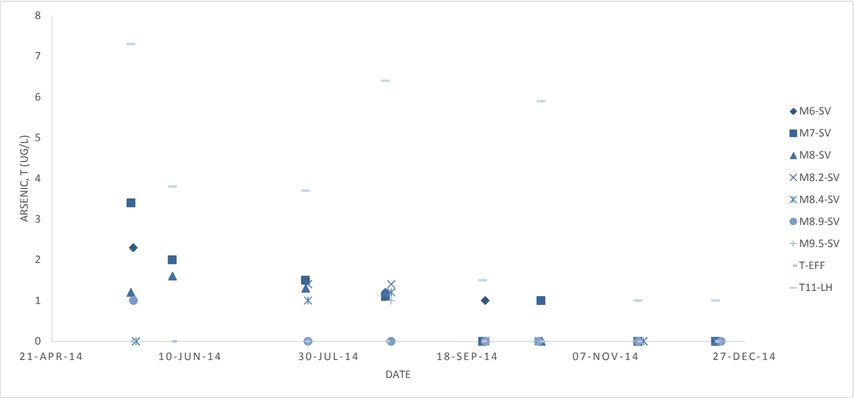

18
16
14
12
10
8
6
4
2
0
NITROGEN NITRATE/NITRITE AS N (MG/L)
11-JAN-14
02-MAR-14
21-APR-14
10-JUN-14
30-JUL-14
18-SEP-14
07-NOV-14
27-DEC-14
DATE
M6-SV
M7-SV
M8-SV
M8.2-SV
M8.4-SV
M8.9-SV
M9.5-SV
T-EFF
T11-LH

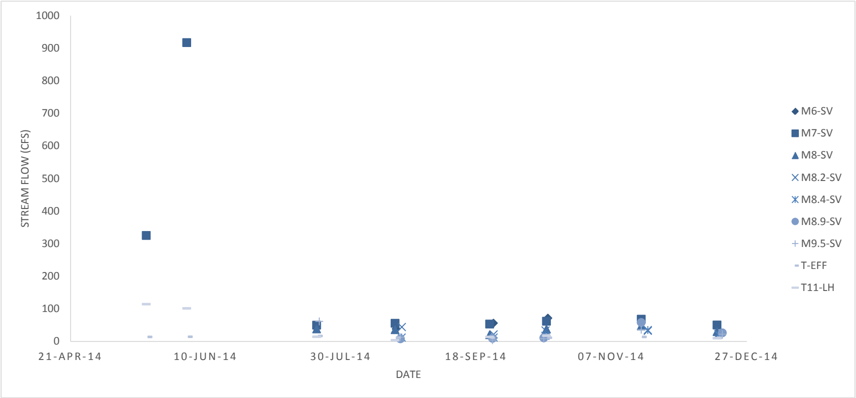

3.0
2.5
2.0
1.5
1.0
0.5
0.0
NITROGEN TKN (MG/L)
11-JAN-14
02-MAR-14
21-APR-14
10-JUN-14
30-JUL-14
18-SEP-14
07-NOV-14
27-DEC-14
DATE
M7-SV
M8-SV
T11-LH


6
5
4
3
2
1
0
NITROGEN TOTAL (MG/L)
11-JAN-14
02-MAR-14
21-APR-14
10-JUN-14
30-JUL-14
18-SEP-14
07-NOV-14
27-DEC-14
DATE
M7-SV
M8-SV
T11-LH


NITROGEN TOTAL INORGANIC (MG/L)
0
2
4
6
8
10
12
14
16
18
11-JAN-14
02-MAR-14
21-APR-14
10-JUN-14
30-JUL-14
18-SEP-14
07-NOV-14
27-DEC-14
DATE
M6-SV
M7-SV
M8-SV
M8.2-SV
M8.4-SV
M8.9-SV
M9.5-SV
T-EFF
T11-LH


PHOSPHORUS AS P, TOT (MG/L)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
11-JAN-14
02-MAR-14
21-APR-14
10-JUN-14
30-JUL-14
18-SEP-14
07-NOV-14
27-DEC-14
DATE
M6-SV
M7-SV
M8-SV
M8.2-SV
M8.4-SV
M8.9-SV
M9.5-SV
T-EFF
T11-LH


ARSENIC, T (UG/L)
0
1
2
3
4
5
6
7
8
21-APR-14
10-JUN-14
30-JUL-14
18-SEP-14
07-NOV-14
27-DEC-14
DATE
M6-SV
M7-SV
M8-SV
M8.2-SV
M8.4-SV
M8.9-SV
M9.5-SV
T-EFF
T11-LH


STREAM FLOW (CFS)
0
100
200
300
400
500
600
700
800
900
1000
21-APR-14
10-JUN-14
30-JUL-14
18-SEP-14
07-NOV-14
27-DEC-14
DATE
M6-SV
M7-SV
M8-SV
M8.2-SV
M8.4-SV
M8.9-SV
M9.5-SV
T-EFF
T11-LH

Appendix E. Regulation 38 Stream Standards for Boulder Creek and St. Vrain Creek (After June 2015 Rulemaking Hearing)

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS

REGION: 3 AND 4 BASIN: **BOULDER CREEK** Stream Segment Description	DESIG	CLASSIFICATIONS	NUMERIC STANDARDS						TEMPORARY MODIFICATIONS AND QUALIFIERS
			PHYSICAL and BIOLOGICAL	INORGANIC mg/l		METALS µg/l			
1. All tributaries to Boulder Creek, including all wetlands, within the Indian Peaks and James Peak Wilderness Areas.	OW	Aq Life Cold 1 Recreation E Water Supply Agriculture	T=TVS(CS-I) ^{o}C D.O.=6.0 mg/l D.O.(sp)=7.0 mg/l pH=6.5-9.0 E.Coli=126/100ml Chla=150 mg/m^2	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.05 NO_3=10 Cl=250 SO_4=WS P=110ug/l (tot)	As(ac)=340 As(ch)=0.02(Trec) Cd(ac)=5.0(Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrIII(ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac)=50(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot) Mo(ch)=150(Trec)	Ni(ac/ch)=TVS Ni(ch)=100(Trec) Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac/ch)=TVS	Temporary modification: As(ch)=hybrid Expiration date of 12/31/21.
2a. Mainstem of Boulder Creek, including all tributaries and wetlands, from the boundary of the Indian Peaks Wilderness Area to a point immediately below the confluence with North Boulder Creek, except for the specific listings in Segment 3.		Aq Life Cold 1 Recreation E Water Supply Agriculture	T=TVS(CS-I) ^{o}C D.O.=6.0 mg/l D.O.(sp)=7.0 mg/l pH=6.5-9.0 E.Coli=126/100ml Chla=150 mg/m^2 [C]	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.05 NO_3=10 Cl=250 SO_4=WS P=110ug/l (tot)[C]	As(ac)=340 As(ch)=0.02(Trec) Cd(ac)=5.0(Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrIII(ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac)=50(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot) Mo(ch)=150(Trec)	Ni(ac/ch)=TVS Ni(ch)=100(Trec) Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac/ch)=TVS	Temporary modification: As(ch)=hybrid Expiration date of 12/31/21.
2b. Mainstem of Boulder Creek, including all tributaries and wetlands, from the a point immediately below the confluence with North Boulder Creek to a point immediately above the confluence with South Boulder Creek.		Aq Life Cold 1 Recreation E Water Supply Agriculture	T=TVS(CS-II) ^{o}C D.O.=6.0 mg/l D.O.(sp)=7.0 mg/l pH=6.5-9.0 E.Coli=126/100ml Chla=150 mg/m^2 [C]	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.05 NO_3=10 Cl=250 SO_4=WS P=110ug/l (tot)[C]	As(ac)=340 As(ch)=0.02(Trec) Cd(ac)=5.0(Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrIII(ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac)=50(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot) Mo(ch)=150(Trec)	Ni(ac/ch)=TVS Ni(ch)=100(Trec) Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac/ch)=TVS	Temporary modification: As(ch)=hybrid Expiration date of 12/31/21.
3. Mainstem of Middle Boulder Creek, including all tributaries and wetlands, from the source to the outlet of Barker Reservoir, except for specific listings in Segment 1.		Aq Life Cold 1 Recreation E Water Supply Agriculture	T=TVS(CS-I) ^{o}C D.O.=6.0 mg/l D.O.(sp)=7.0 mg/l pH=6.5-9.0 E.Coli=126/100ml Chla=150 mg/m^2 [C]	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.05 NO_3=10 Cl=250 SO_4=WS P=110ug/l (tot)[C]	As(ac)=340 As(ch)=0.02(Trec) Cd(ac)=5.0(Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrIII(ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac)=50(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot) Mo(ch)=150(Trec)	Ni(ac/ch)=TVS Ni(ch)=100(Trec) Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac/ch)=TVS	Temporary modification: As(ch)=hybrid Expiration date of 12/31/21.
4a. Mainstem of South Boulder Creek, including all tributaries and wetlands, from the source to the outlet of Gross Reservoir except for specific listings in Segment 1.		Aq Life Cold 1 Recreation E Water Supply Agriculture	T=TVS(CS-I) ^{o}C D.O.=6.0 mg/l D.O.(sp)=7.0 mg/l pH=6.5-9.0 E.Coli=126/100ml Chla=150 mg/m^2	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.05 NO_3=10 Cl=250 SO_4=WS P=110ug/l (tot)	As(ac)=340 As(ch)=0.02(Trec) Cd(ac)=5.0(Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrIII(ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac)=50(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot) Mo(ch)=150(Trec)	Ni(ac/ch)=TVS Ni(ch)=100(Trec) Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac/ch)=TVS	Temporary modification: As(ch)=hybrid Expiration date of 12/31/21.
4b. Mainstem of South Boulder Creek, including all tributaries and wetlands, from the outlet of Gross Reservoir to South Boulder Road, except for specific listings in Segments 4c and 4d.		Aq Life Cold 1 Recreation E Water Supply Agriculture	T=TVS(CS-II) ^{o}C D.O.=6.0 mg/l D.O.(sp)=7.0 mg/l pH=6.5-9.0 E.Coli=126/100ml Chla=150 mg/m^2 [C]	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.05 NO_3=10 Cl=250 SO_4=WS P=110ug/l (tot)[C]	As(ac)=340 As(ch)=0.02(Trec) Cd(ac)=5.0(Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrIII(ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac)=50(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot) Mo(ch)=150(Trec)	Ni(ac/ch)=TVS Ni(ch)=100(Trec) Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac/ch)=TVS	Temporary modification: As(ch)=hybrid Expiration date of 12/31/21.

REGION: 3 AND 4 BASIN: **BOULDER CREEK** Stream Segment Description	DESIG	CLASSIFICATIONS	NUMERIC STANDARDS PHYSICAL and BIOLOGICAL	INORGANIC mg/l		METALS µg/l			TEMPORARY MODIFICATIONS AND QUALIFIERS
4c. Mainstem of Cowdrey Drainage from the source below Cowdrey Reservoir #2 to the Davidson Ditch.	UP	Aq Life Warm 2 Recreation E Water Supply Agriculture	T=TVS(WS-II) °C D.O.=5.0 mg/l pH=6.5-9.0 E.Coli=126/100ml Chla=150 mg/m^2	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.5 NO_3=10 Cl=250 SO_4=WS P=170ug/l (tot)	As(ac)=340 As(ch)=0.02-10(Trec)[A] Cd(ac)=5.0(Trec) Cd(ac/ch)=TVS CrIII(ac)=50(Trec) CrIII(ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac)=50(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot) Mo(ch)=150(Trec)	Ni(ac/ch)=TVS Ni(ch)=100(Trec) Se(ac/ch)=TVS Ag(ac/ch)=TVS Zn(ac/ch)=TVS	
4d. Mainstem of Cowdrey Drainage from immediately downstream of the Davidson Ditch to the confluence with South Boulder Creek.	UP	Aq Life Warm 2 Recreation E Water Supply Agriculture	T=TVS(WS-II) °C D.O.=5.0 mg/l pH=6.5-9.0 E.Coli=126/100ml Chla=150 mg/m^2	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.5 NO_3=10 Cl=250 SO_4=WS P=170ug/l (tot)	As(ac)=340 As(ch)=0.02-10(Trec)[A] Cd(ac)=5.0(Trec) Cd(ac/ch)=TVS CrIII(ac)=50(Trec) CrIII(ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac)=50(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot) Mo(ch)=150(Trec)	Ni(ac/ch)=TVS Ni(ch)=100(Trec) Se(ac/ch)=TVS Ag(ac/ch)=TVS Zn(ac/ch)=TVS	
5. Mainstem of South Boulder Creek from South Boulder Road to the confluence with Boulder Creek.		Aq Life Warm 1 Recreation E Water Supply Agriculture	T=TVS(WS-II) °C D.O.=5.0 mg/l pH=6.5-9.0 E.Coli=126/100ml	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.5 NO_3=10 Cl=250 SO_4=WS	As(ac)=340 As(ch)=0.02(Trec) Cd(ac)=5.0(Trec) Cd(ac/ch)=TVS CrIII(ac)=50(Trec) CrIII(ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac)=50(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot) Mo(ch)=150(Trec)	Ni(ac/ch)=TVS Ni(ch)=100(Trec) Se(ac/ch)=TVS Ag(ac/ch)=TVS Zn(ac/ch)=TVS	Temporary modification: As(ch)=hybrid Expiration date of 12/31/21.
6. Mainstem of Coal Creek, including all tributaries and wetlands, from the source to Highway 93.		Aq Life Cold 2 Recreation E Water Supply Agriculture	T=TVS(CS-II) °C D.O.=6.0 mg/l D.O.(sp)=7.0 mg/l pH=6.5-9.0 E.Coli=126/100ml Chla=150 mg/m^2	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.05 NO_3=10 Cl=250 SO_4=WS P=110ug/l (tot)	As(ac)=340 As(ch)=0.02-10(Trec)[A] Cd(ac)=5.0(Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrIII(ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac)=50(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot) Mo(ch)=150(Trec)	Ni(ac/ch)=TVS Ni(ch)=100(Trec) Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac/ch)=TVS	
7a. Mainstem of Coal Creek from Highway 93 to Highway 36 (Boulder Turnpike).	~~UP~~	Aq Life Warm 1 Recreation E Water Supply Agriculture	T=TVS(WS-II) °C D.O.=5.0 mg/l pH=6.5-9.0 E.Coli=126/100ml Chla=150 mg/m^2	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.5 NO_3=10~~0~~ Cl= 250 SO_4=WS P=170ug/l (tot)	As(ac)=340 As(ch)=~~7.6~~0.02(Trec) Cd(ac)=5.0(Trec) Cd(ac/ch)=TVS CrIII(ac)=50(Trec) CrIII(~~ac/~~ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS (dis) Fe(ch)=1000(Trec) Pb(ac)=50(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS (dis) Hg(ch)=0.01(Tot) Mo(ch)=150(Trec)	Ni(ac/ch)=TVS Ni(ch)=100(Trec) Se(ac/ch)=TVS Ag(ac/ch)=TVS Zn(ac/ch)=TVS	Temporary modification: As(ch)=hybrid Expiration date of 12/31/21.
7b. Mainstem of Coal Creek from Highway 36 to the confluence with Boulder Creek.		Aq Life Warm 2 Recreation E Water Supply Agriculture	T=TVS(WS-II) °C D.O.=5.0 mg/l pH=6.5-9.0 E.Coli=126/100ml	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.5 NO_3=10~~0~~ Cl=250 SO_4=WS	As(ac)=340 As(ch)=~~100~~0.02-10(Trec)[A] Cd(ac)=5.0(Trec) Cd(ac/ch)=TVS CrIII(ac)=50(Trec) CrIII(~~ac/~~ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS (dis) Fe(ch)=1000(Trec) Pb(ac)=50(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS (dis) Hg(ch)=0.01(Tot) Mo(ch)=150(Trec)	Ni(ac/ch)=TVS Ni(ch)=100(Trec) Se(ac/ch)=TVS Ag(ac/ch)=TVS Zn(ac/ch)=TVS	
8. All tributaries to South Boulder Creek, including all wetlands from South Boulder Road to the confluence with Boulder Creek and all tributaries to Coal Creek, including all wetlands from Highway 93 to the confluence with Boulder Creek.	UP	Aq Life Warm 2 Recreation E Agriculture	T=TVS(WS-II) °C D.O.=5.0 mg/l pH=6.5-9.0 E.Coli=126/100ml Chla=150 mg/m^2 [C]	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.5 NO_3=100 ~~Cl=250~~ ~~SO_4=250~~ P=170ug/l (tot)[C]	As(ac)=340 As(ch)=100(Trec) Cd(ac/ch)=TVS ~~CrIII(ac)=50(Trec)~~ CrIII(ac/ch)=TVS CrIII(ch)=100(Trec) CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	~~Fe(ch)=WS(dis)~~ Fe(ch)=1000(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS ~~Mn(ch)=WS(dis)~~ Hg(ch)=0.01(Tot) Mo(ch)=150(Trec)	Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac/ch)=TVS Zn(ac/ch)=TVS	Temporary modification: Se(ch)=current condition Expiration date of 12/31/~~2015~~20.

REGION: 3 AND 4 BASIN: **BOULDER CREEK** Stream Segment Description	DESIG	CLASSIFICATIONS	NUMERIC STANDARDS PHYSICAL and BIOLOGICAL	INORGANIC mg/l		METALS µg/l			TEMPORARY MODIFICATIONS AND QUALIFIERS
9. Mainstem of Boulder Creek from a point immediately above the confluence with South Boulder Creek to the confluence with Coal Creek.		Aq Life Warm 1 Recreation E Water Supply Agriculture	T=TVS(WS-II) °C D.O.=5.0 mg/l pH=6.5-9.0 E.Coli=126/100ml	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.5 NO_3=10 Cl=250 SO_4=WS	As(ac)=340 As(ch)=0.02(Trec) Cd(ac)=5.0(Trec) Cd(ac/ch)=TVS CrIII(ac)=50(Trec) CrIII(ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac)=50(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot) Mo(ch)=150(Trec)	Ni(ac/ch)=TVS Ni(ch)=100(Trec) Se(ac/ch)=TVS Ag(ac/ch)=TVS Zn(ac/ch)=TVS	Temporary modifications: ~~Cu (ac/ch)=Current Condition. (Type iii).~~ ~~Expiration date of 12/31/2015.~~ T=current condition, Dec-Feb Expiration date of 12/31/20. As(ch)=hybrid Expiration date of 12/31/21.
10. Mainstem of Boulder Creek from the confluence with Coal Creek to the confluence with St. Vrain Creek.		Aq Life Warm 1 Recreation E Water Supply Agriculture	T=TVS(WS-II) °C D.O.=5.0 mg/l pH=6.5-9.0 E.Coli=126/100ml	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.5 NO_3=10 Cl=250 SO_4=WS	As(ac)=340 As(ch)=0.02(Trec) Cd(ac)=5.0(Trec) Cd(ac/ch)=TVS CrIII(ac)=50(Trec) CrIII(ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac)=50(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot) Mo(ch)=150(Trec)	Ni(ac/ch)=TVS Ni(ch)=100(Trec) Se(ac/ch)=TVS Ag(ac/ch)=TVS Zn(ac/ch)=TVS	Temporary modification: As(ch)=hybrid Expiration date of 12/31/21.
11. All tributaries to Boulder Creek, including all wetlands from a point immediately above the confluence with South Boulder Creek to the confluence with St. Vrain Creek, except for specific listings in Segments 5, 7a and 7b.	UP	Aq Life Warm 2 Recreation E Water Supply Agriculture	T=TVS(WS-II) °C D.O.=5.0 mg/l pH=6.5-9.0 E.Coli=126/100ml	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.5 NO_3=10 Cl=250 SO_4=WS	As(ac)=340 As(ch)=0.02-10(Trec)[A] Cd(ac)=5.0(Trec) Cd(ac/ch)=TVS CrIII(ac)=50(Trec) CrIII(ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac)=50(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot) Mo(ch)=150(Trec)	Ni(ac/ch)=TVS Ni(ch)=100(Trec) Se(ac/ch)=TVS Ag(ac/ch)=TVS Zn(ac/ch)=TVS	
12. Deleted.									
13. All lakes and reservoirs tributary to Boulder Creek that are within the boundary of the Indian Peaks and James Peak Wilderness Areas.	OW	Aq Life Cold 1 Recreation E Water Supply Agriculture	T=TVS(CL) °C D.O.=6.0 mg/l D.O.(sp)=7.0 mg/l pH=6.5-9.0 E.Coli=126/100ml Chla= 8 ug/l [B]	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.05 NO_3=10 Cl=250 SO_4=WS P= 25ug/l (tot)[B]	As(ac)=340 As(ch)=0.02(Trec) Cd(ac)=5.0(Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrIII(ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac)=50(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot) Mo(ch)=150(Trec)	Ni(ac/ch)=TVS Ni(ch)=100(Trec) Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac/ch)=TVS	
14. All lakes and reservoirs tributary to Boulder Creek from the source to a point immediately above the South Boulder Creek confluence, except as specified in Segment 13. This segment includes Barker and Lakewood Reservoir.		Aq Life Cold 1 Recreation E Water Supply Agriculture DUWS*	T=TVS(CL,CLL) °C D.O.=6.0 mg/l D.O.(sp)=7.0 mg/l pH=6.5-9.0 E.Coli=126/100ml Chla= 8 ug/l [B,C]	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.05 NO_3=10 Cl=250 SO_4=WS P= 25ug/l(tot)[B,C]	As(ac)=340 As(ch)=0.02(Trec) Cd(ac)=5.0(Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrIII(ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac)=50(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot) Mo(ch)=150(Trec)	Ni(ac/ch)=TVS Ni(ch)=100(Trec) Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac/ch)=TVS	*DUWS applies to Lakewood Reservoir only. Temporary modification: As(ch)=hybrid Expiration date of 12/31/21.
15. All lakes and reservoirs tributary to South Boulder Creek from the source to Highway 93. All lakes and reservoirs tributary to Coal Creek from the source to Highway 93 except for specific listings in segments 13 and 18.		Aq Life Cold 2 Recreation E Water Supply Agriculture DUWS*	T=TVS(CL) °C D.O.=6.0 mg/l D.O.(sp)=7.0 mg/l pH=6.5-9.0 E.Coli=126/100ml Chla= 8 ug/l [B,C]	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.05 NO_3=10 Cl=250 SO_4=WS P=25ug/L(tot)[B,C]	As(ac)=340 As(ch)=0.02-10(Trec) Cd(ac)=5.0(Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrIII(ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac)=50(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot) Mo(ch)=150(Trec)	Ni(ac/ch)=TVS Ni(ch)=100(Trec) Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac/ch)=TVS	*DUWS applies to Kossler Lake only.

REGION: 3 AND 4 BASIN: **BOULDER CREEK**	DESIG	CLASSIFICATIONS	NUMERIC STANDARDS						TEMPORARY MODIFICATIONS AND QUALIFIERS
Stream Segment Description			PHYSICAL and BIOLOGICAL	INORGANIC mg/l		METALS µg/l			
16. All lakes and reservoirs tributary to South Boulder Creek system from Highway 93 to the confluence with Boulder Creek. All lakes and reservoirs tributary to Coal Creek system from Highway 93 to the confluence with Boulder Creek.		Aq Life Warm 2 Recreation E Water Supply Agriculture	T=TVS(WL) °C D.O.=5.0 mg/l pH=6.5-9.0 E.Coli=126/100ml	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.5 NO_3=10 Cl=250 SO_4=WS	As(ac)=340 As(ch)=0.02-10(Trec)[A] Cd(ac)=5.0(Trec) Cd(ac/ch)=TVS CrIII(ac)=50(Trec) CrIII(ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac)=50(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot) Mo(ch)=150(Trec)	Ni(ac/ch)=TVS Ni(ch)=100(Trec) Se(ac/ch)=TVS Ag(ac/ch)=TVS Zn(ac/ch)=TVS	
17. All lakes and reservoirs tributary to Boulder Creek from a point immediately below the confluence with South Boulder Creek to the confluence with St. Vrain Creek, except as specified in Segments 15 and 16.		Aq Life Warm 2 Recreation E Water Supply Agriculture DUWS*	T=TVS(WL) °C D.O.=5.0 mg/l pH=6.5-9.0 E.Coli=126/100ml	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.5 NO_3=10 Cl=250 SO_4=WS	As(ac)=340 As(ch)=0.02~~-10~~(Trec) Cd(ac)=5.0(Trec) Cd(ac/ch)=TVS CrIII(ac)=50(Trec) CrIII(ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac)=50(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot) Mo(ch)=150(Trec)	Ni(ac/ch)=TVS Ni(ch)=100(Trec) Se(ac/ch)=TVS Ag(ac/ch)=TVS Zn(ac/ch)=TVS	Water + Fish Standards *DUWS applies to Baseline, Marshall, Thomas and Waneka Reservoirs only.
18. Gross Reservior		Aq Life Cold 1 Recreation E Water Supply Agriculture	T=TVS(CLL) °C Gross Reservoir April-Dec T(WAT)=19.4°C[D] D.O.=6.0 mg/l D.O.(sp)=7.0 mg/l pH=6.5-9.0 E.Coli=126/100ml Chla= 8 ug/l [B,C]	NH3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO2=0.05 NO3=10 Cl=250 SO4=WS P=25ug/L(tot)[B,C]	As(ac)=340 As(ch)=0.02(Trec) Cd(ac)=5.0(Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrIII(ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac)=50(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot) Mo(ch)=150(Trec))	Ni(ac/ch)=TVS Ni(ch)=100(Trec) Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac/ch)=TVS	

REGION: 3 AND 4 BASIN: **ST. VRAIN CREEK** Stream Segment Description	DESIG	CLASSIFICATIONS	NUMERIC STANDARDS PHYSICAL and BIOLOGICAL	INORGANIC mg/l		METALS μg/l			TEMPORARY MODIFICATIONS AND QUALIFIERS
1. All tributaries to St. Vrain Creek, including all wetlands, which are within the Indian Peaks Wilderness Area and Rocky Mountain National Park.	OW	Aq Life Cold 1 Recreation E Water Supply Agriculture	T=TVS(CS-I) ^{o}C D.O.=6.0 mg/l D.O.(sp)=7.0 mg/l pH=6.5-9.0 E.Coli=126/100ml Chla=150 mg/m^2	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.05 NO_3=10 Cl=250 SO_4=WS P=110ug/l (tot)	As(ac)=340 As(ch)=0.02(Trec) Cd(ac)=5.0(Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrIII(ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac)=50(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot) Mo(ch)=150(Trec)	Ni(ac/ch)=TVS Ni(ch)=100(Trec) Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac/ch)=TVS	Temporary modification: As(ch)=hybrid Expiration date of 12/31/21.
2a. Mainstem of St. Vrain Creek, including all tributaries and wetlands, from the boundary of the Indian Peaks Wilderness Area and Rocky Mountain National Park to the eastern boundary of Roosevelt National Forest.		Aq Life Cold 1 Recreation E Water Supply Agriculture	T=TVS(CS-I) ^{o}C D.O.=6.0 mg/l D.O.(sp)=7.0 mg/l pH=6.5-9.0 E.Coli=126/100ml Chla=150 mg/m^2 C	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.05 NO_3=10 Cl=250 SO_4=WS P=110ug/l (tot)C	As(ac)=340 As(ch)=0.02(Trec) Cd(ac)=5.0(Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrIII(ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac)=50(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot) Mo(ch)=150(Trec)	Ni(ac/ch)=TVS Ni(ch)=100(Trec) Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac/ch)=TVS	Temporary modification: As(ch)=hybrid Expiration date of 12/31/21.
2b. Mainstem of St. Vrain Creek, including all tributaries and wetlands, from the eastern boundary of Roosevelt National Forest to Hygiene Road.		Aq Life Cold 1 Recreation E Water Supply Agriculture	T=TVS(CS-II) ^{o}C D.O.=6.0 mg/l D.O.(sp)=7.0 mg/l pH=6.5-9.0 E.Coli=126/100ml Chla=150 mg/m^2 C	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.05 NO_3=10 Cl=250 SO_4=WS P=110ug/l (tot)C	As(ac)=340 As(ch)=0.02(Trec) Cd(ac)=5.0(Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrIII(ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac)=50(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot) Mo(ch)=150(Trec)	Ni(ac/ch)=TVS Ni(ch)=100(Trec) Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac/ch)=TVS	~~Temporary modification:~~ ~~Cu(ch)=6.0 μg/l (dis).~~ ~~(Type iii).~~ ~~Expiration date of 12/31/2015.~~ Temporary modification: As(ch)=hybrid Expiration date of 12/31/21.
3. Mainstem of St. Vrain Creek from Hygiene Road to the confluence with the South Platte River.		Aq Life Warm 1 Recreation E Agriculture	T=TVS(WS-I) ^{o}C D.O.=5.0 mg/l pH=6.5-9.0 E.Coli=126/100ml	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.5 NO_3=100	As(ac)=340 As(ch)=7.6(Trec) Cd(ac/ch)=TVS CrIII(ac/ch)=TVS CrIII(ch)=100(Trec) CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=1000(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Hg(ch)=0.01(Tot) Mo(ch)=150(Trec)	Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac/ch)=TVS Zn(ac/ch)=TVS	
4a. Mainstem of Left Hand Creek, including all tributaries and wetlands, from the source to a point immediately below the confluence with James Creek, except for specific listings in Segment 4b.	UP	Aq Life Cold 1 Recreation E Water Supply Agriculture	T=TVS(CS-I) ^{o}C D.O.=6.0 mg/l D.O.(sp)=7.0 mg/l pH=6.5-9.0 E.Coli=126/100ml Chla=150 mg/m^2	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.05 NO_3=10 Cl=250 SO_4=WS P=110ug/l (tot)	As(ac)=340 As(ch)=0.02(Trec) Cd(ac)=5.0(Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrIII(ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac)=50(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot) Mo(ch)=150(Trec)	Ni(ac/ch)=TVS Ni(ch)=100(Trec) Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac/ch)=TVS	
4b. Mainstem of James Creek, including all tributaries and wetlands, from the source to the confluence with Left Hand Creek.		Aq Life Cold 1 Recreation E Water Supply Agriculture	T=TVS(CS-I) ^{o}C D.O.=6.0 mg/l D.O.(sp)=7.0 mg/l pH=6.5-9.0 E.Coli=126/100ml Chla=150 mg/m^2	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.05 NO_3=10 Cl=250 SO_4=WS P=110ug/l (tot)	As(ac)=340 As(ch)=0.02(Trec) Cd(ac)=5.0(Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrIII(ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac)=50(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot) Mo(ch)=150(Trec)	Ni(ac/ch)=TVS Ni(ch)=100(Trec) Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac/ch)=TVS	Temporary modification: As(ch)=hybrid Expiration date of 12/31/21.

REGION: 3 AND 4 BASIN: **ST. VRAIN CREEK** Stream Segment Description	DESIG	CLASSIFICATIONS	NUMERIC STANDARDS PHYSICAL and BIOLOGICAL	INORGANIC mg/l		METALS µg/l			TEMPORARY MODIFICATIONS AND QUALIFIERS
4c. Mainstem of Left Hand Creek, including all tributaries and wetlands, from a point immediately below the confluence with James Creek to Highway 36.		Aq Life Cold 1 Recreation E Water Supply Agriculture	T=TVS(CS-II) °C D.O.=6.0 mg/l D.O.(sp)=7.0 mg/l pH=6.5-9.0 E.Coli=126/100ml Chla=150 mg/m^2	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.05 NO_3=10 Cl=250 SO_4=WS P=110ug/l (tot)	As(ac)=340 As(ch)=0.02(Trec) Cd(ac)=5.0(Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrIII(ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac)=50(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot) Mo(ch)=150(Trec)	Ni(ac/ch)=TVS Ni(ch)=100(Trec) Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac/ch)=TVS	Temporary modification: As(ch)=hybrid Expiration date of 12/31/21.
5. Mainstem of Left Hand Creek, including all tributaries and wetlands from Highway 36 to the confluence with St. Vrain Creek.		Aq Life Warm 2 Recreation E Water Supply Agriculture	T=TVS(WS-I) °C D.O.=5.0 mg/l pH=6.5-9.0 E.Coli=126/100ml Chla=150 mg/m^2	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.5 NO_3=10 Cl=250 SO_4=WS P=170ug/l (tot)	As(ac)=340 As(ch)=0.02-10(Trec)[A] Cd(ac)=5.0(Trec) Cd(ac/ch)=TVS CrIII(ac)=50(Trec) CrIII(ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac)=50(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot) Mo(ch)=150(Trec)	Ni(ac/ch)=TVS Ni(ch)=100(Trec) Se(ac/ch)=TVS Ag(ac/ch)=TVS Zn(ac/ch)=TVS	
6. All tributaries to St. Vrain Creek, including wetlands from Hygiene Road to the confluence with the South Platte River, except for specific listings in the Boulder Creek subbasin and in Segments 4a, 4b, 4c and 5.	UP	Aq Life Warm 2 Recreation E Agriculture	T=TVS(WS-II) °C D.O.=5.0 mg/l pH=6.5-9.0 E.Coli=126/100ml	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.5 NO_3=100	As(ac)=340 As(ch)=100(Trec) Cd(ac/ch)=TVS CrIII(ac/ch)=TVS CrIII(ch)=100(Trec) CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=1000(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS ~~Mn(ch)=WS(dis)~~ Hg(ch)=0.01(Tot) Mo(ch)=150(Trec)	Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac/ch)=TVS Zn(ac/ch)=TVS	~~Temporary modifications:~~ ~~Se(ch)=6.6µg/l (dis).~~ ~~(Type iii). Expiration date of 12/31/2015~~
7. Boulder Reservoir, Coot Lake~~, and~~ Left Hand Valley Reservoir and Spurgeon Reservoir.		Aq Life Warm 1 Recreation E Water Supply Agriculture DUWS*	T=TVS(WL) °C D.O.=5.0 mg/l pH=6.5-9.0 E.Coli=126/100ml	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.5 NO_3=10 Cl=250 SO_4=WS	As(ac)=340 As(ch)=0.02(Trec) Cd(ac)=5.0(Trec) Cd(ac/ch)=TVS CrIII(ac)=50(Trec) CrIII(ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac)=50(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot) Mo(ch)=150(Trec)	Ni(ac/ch)=TVS Ni(ch)=100(Trec) Se(ac/ch)=TVS Ag(ac/ch)=TVS Zn(ac/ch)=TVS	*DUWS applies to Boulder, Spurgeon and Left Hand Valley Reservoirs only. Temporary modification: As(ch)=hybrid Expiration date of 12/31/21.
8. All lakes and reservoirs tributary to St. Vrain Creek that are within the boundary of the Indian Peaks Wilderness Area and Rocky Mountain National Park.	OW	Aq Life Cold 1 Recreation E Water Supply Agriculture	T=TVS(CL) °C D.O.=6.0 mg/l D.O.(sp)=7.0 mg/l pH=6.5-9.0 E.Coli=126/100ml	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.05 NO_3=10 Cl=250 SO_4=WS	As(ac)=340 As(ch)=0.02(Trec) Cd(ac)=5.0(Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrIII(ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac)=50(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot) Mo(ch)=150(Trec)	Ni(ac/ch)=TVS Ni(ch)=100(Trec) Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac/ch)=TVS	
9. All lakes and reservoirs tributary to St. Vrain Creek from sources to Hygiene Road, including Button Rock Reservoir, except as specified in Segment 8.		Aq Life Cold 1 Recreation E Water Supply Agriculture	T=TVS(CL,CLL) °C D.O.=6.0 mg/l D.O.(sp)=7.0 mg/l pH=6.5-9.0 E.Coli=126/100ml	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.05 NO_3=10 Cl=250 SO_4=WS	As(ac)=340 As(ch)=0.02(Trec) Cd(ac)=5.0(Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrIII(ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac)=50(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot) Mo(ch)=150(Trec)	Ni(ac/ch)=TVS Ni(ch)=100(Trec) Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac/ch)=TVS	Temporary modification: As(ch)=hybrid Expiration date of 12/31/21.
10. All lakes and reservoirs tributary to Left Hand Creek from sources to Highway 36.		Aq Life Cold 1 Recreation E Water Supply Agriculture DUWS*	T=TVS(CL) °C D.O.=6.0 mg/l D.O.(sp)=7.0 mg/l pH=6.5-9.0 E.Coli=126/100ml Chla=8ug/l [B,C]	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.05 NO_3=10 Cl=250 SO_4=WS P=25ug/l (tot)[B,C]	As(ac)=340 As(ch)=0.02(Trec) Cd(ac)=5.0(Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrIII(ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac)=50(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot) Mo(ch)=150(Trec)	Ni(ac/ch)=TVS Ni(ch)=100(Trec) Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac/ch)=TVS	*DUWS applies to Joder Reservoir only.

REGULATION #38 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS

REGION: 3 AND 4 BASIN: **ST. VRAIN CREEK** Stream Segment Description	DESIG	CLASSIFICATIONS	NUMERIC STANDARDS PHYSICAL and BIOLOGICAL	INORGANIC mg/l		METALS µg/l			TEMPORARY MODIFICATIONS AND QUALIFIERS
11. Barbour Ponds.		Aq Life Warm 1 Recreation E Water Supply Agriculture	T=TVS(WL) °C D.O.=5.0 mg/l pH=6.5-9.0 E.Coli=126/100ml	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.5 NO_3=10 Cl=250 SO_4=WS	As(ac)=340 As(ch)=0.02(Trec) Cd(ac)=5.0(Trec) Cd(ac/ch)=TVS CrIII(ac)=50(Trec) CrIII(~~ac/~~ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac)=50(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot) Mo(ch)=150(Trec)	Ni(ac/ch)=TVS Ni(ch)=100(Trec) Se(ac/ch)=TVS Ag(ac/ch)=TVS Zn(ac/ch)=TVS	
12. All lakes and reservoirs tributary to Left Hand Creek from Highway 36 to the confluence with St. Vrain Creek, except as specified in Segment 7.		Aq Life Warm 2 Recreation E Water Supply Agriculture	T=TVS(WL) °C D.O.=5.0 mg/l pH=6.5-9.0 E.Coli=126/100ml	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.5 NO_3=10 Cl=250 SO_4=WS	As(ac)=340 As(ch)=0.02~~-10~~(Trec) Cd(ac)=5.0(Trec) Cd(ac/ch)=TVS CrIII(ac)=50(Trec) CrIII(ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac)=50(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot) Mo(ch)=150(Trec)	Ni(ac/ch)=TVS Ni(ch)=100(Trec) Se(ac/ch)=TVS Ag(ac/ch)=TVS Zn(ac/ch)=TVS	Water + Fish Standards
13. All lakes and reservoirs tributary to St. Vrain Creek from Hygiene Road to the confluence with the South Platte River, except as specified in Segments 7, 10, 11 and 12.		Aq Life Warm 2 Recreation E Water Supply Agriculture DUWS*	T=TVS(WL) °C D.O.=5.0 mg/l pH=6.5-9.0 E.Coli=126/100ml	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.011 CN=0.005	S=0.002 B=0.75 NO_2=0.5 NO_3=10 Cl=250 SO_4=WS	As(ac)=340 As(ch)=0.02-10(Trec)[A] Cd(ac)=5.0(Trec) Cd(ac/ch)=TVS CrIII(ac)=50(Trec) CrIII(~~ac/~~ch)=TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac)=50(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot) Mo(ch)=150(Trec)	Ni(ac/ch)=TVS Ni(ch)=100(Trec) Se(ac/ch)=TVS Ag(ac/ch)=TVS Zn(ac/ch)=TVS	*DUWS applies to Burch lake only.

Appendix F. 2012 303(d) List

Appendix F. Boulder Creek and St. Vrain Creek Stream Segments Listed on the 2012 303(d) List and Monitoring and Evaluation List

WBID	Description	Portion	M&E	303(d)	Priority
Boulder Creek Watershed					
COSPBO01	All tribs to Boulder Creek within the Indian Peaks Wilderness Area	all	Pb, Zn		
COSPBO02a	Mainstem of Boulder Creek,from the boundary of the Indian Peaks Wilderness Area to a point immediately below the confluence with North Boulder Creek	all	Cd, **Cu**		
COSPBO02b	Boulder Creek, from below the confluence with North Boulder Creek to above the confluence with South Boulder Creek	all	**Cd, Cu**		
COSPBO03	Mainstem of Middle Boulder Creek from source to the outlet of Barker Reservoir	all	Cd, Cu		
COSPBO07b	Coal Creek, HWY 36 to Boulder Creek	all	Aquatic Life	*E. coli*	H
COSPBO08	All tribs to South Boulder Creek and all tribs to Coal Creek	Rock Creek	*E. coli*	Se	M
COSPBO09	Mainstem of Boulder Creek, from South Boulder Creek to Coal Creek	all	Cd, As		
COSPBO09	Mainstem of Boulder Creek, from South Boulder Creek to Coal Creek	From 107th Street to the confluence with Coal Creek		Aquatic Life (provisional)	L
COSPBO10	Boulder Creek, Coal Creek to St. Vrain Creek	all	Aquatic Life, Cd	*E. coli*	H
COSPBO14	Lakes and reservoirs tributary to Boulder Creek from source to South Boulder Creek.	Barker Reservoir	Cd, Cu		
COSPBO15	South Boulder Creek and tributaries from source to outlet of Gross Reservoir	Gross Reservoir	Aquatic Life Use (Hg Fish Tissue)		
St. Vrain Creek Watershed					
COSPSV02a	Mainstem of St. Vrain from Indian Peaks Wilderness Area and RMNP to eastern boundary of Roosevelt Ntl Forest	all		Zn	H
COSPSV02b	St. Vrain Creek, RMNP to Hygiene Road	all		Cu, Temperature	H
COSPSV03	St. Vrain Creek, Hygiene Rd. to S. Platte River	From the confluence with Left Hand Creek to the confluence with Boulder Creek		Aquatic Life Use (provisional)	L
COSPSV03	St. Vrain Creek, Hygiene Rd. to S. Platte River	From Hover Road to the confluence with Left Hand Creek	Aquatic Life Use		
COSPSV04a	Left Hand Creek, from source to blw confluence with James Creek	Hwy 72 to James Ck		pH, Cu, Zn	M
COSPSV04b	James Creek, Little James Creek	Little James Creek		Cu, Pb	M
COSPSV04c	Left Hand Creek from James Creek to HWY 36	all		Cu, As	H
COSPSV05	Mainstem of Left Hand Creek, including all tributaries and wetlands from Highway 36 to the confluence with St. Vrain Creek.	Upstream Lefthand Feeder Canal		Mn (WS)	L
COSPSV05	Mainstem of Left Hand Creek, including all tributaries and wetlands from Highway 36 to the confluence with St. Vrain Creek.	Downstream Lefthand Feeder Canal		Cu	M
COSPSV06	Tributaries to the St Vrain River	Dry Creek		*E. coli*	H
COSPSV06	Tributaries to the St Vrain River	all		Se	L
COSPSV13	All lakes and reservoirs tributary to Left Hand Creek from Hwy 36 to St. Vrain Creek.	Lake Thomas	D.O.		

Grey-shaded entries are Segments with monitoring data included in 2014 report.

Appendix G. Louisville Special *E. coli* Sampling (2007-2014)

Appendix G. Louisville E. coli Special Study Locations (2007-2014)

Plot_ID	Sample_ID	ocation Typ	Description
CC-Superior	Superior	Stream	HW 36 SOUTH OF BRIDGE
CC-1A	1A	Stream	HW 36 NORTH OF BRIDGE CREEK SAMPLE
CC-2A	2A	Stream	DILLON RD AT FOOT BRIDGE CREEK SAMPLE
CC-2B	2B	Drainage	DILLON RD. AT FOOT BRIDGE DRAINAGE SAMPLE
CC-3A	3A	Stream	ANDREWS ST. CREEK SAMPLE
CC-3B	3B	Drainage	ANDREWS ST. DRAINAGE
CC-4A	4A	Stream	FOOT BRIDGE GOLF COURSE CREEK SAMPLE
CC-4B	4B	Drainage	GOODHUE DITCH (dam downstream at foot bridge)
CC-5A	5A	Stream	CREEK SAMPLE (Augusta ln.)
CC-5B	5B	Drainage	DRAINAGE (Augusta ln.)
CC-6A	6A	Stream	Near Dutch Creek Coal Creek sample
CC-6B	6B	Drainage	Drainage Near Dutch Creek
CC-7B	7B	Drainage	DRAINAGE (green pipe 10 inch) (Jefferson ln.)
CC-8B	8B	Drainage	DRAINAGE (white pipe 6 inch) (Jefferson ln.)
CC-8C	8C	Drainage	DRAINAGE ON SOUTH OF 8B
CC-9B	9B	Drainage	DRAINAGE (Aspen way)
CC-10A	10A	Stream	COAL CREEK UPSTREAM (96th Street)
CC-10B	10B	Drainage	DRAINAGE (96th Street)
CC-11A	11A	Stream	FOOT BRIGDE HW 42 CREEK SAMPLE
CC-12A	12A	Stream	UPSTREAM OF DRAINAGE (before may hoffer spring)
CC-12B	12B	Drainage	DRAINAGE FROM MAY HOFFER SPRING

Appendix G. Louisville E. coli Special Study Locations (2007-2014)

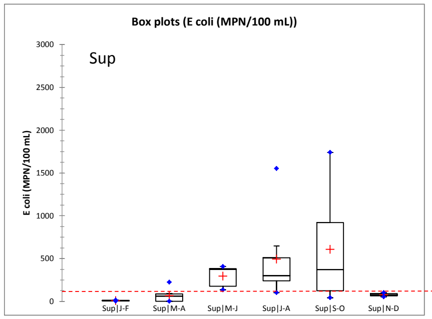
Site	Bimonthly Period	No.	Minimum	Maximum	Geometric Mean
Sup	J-F	5	4	16	8
Sup	M-A	7	1	225	19
Sup	M-J	5	135	408	268
Sup	J-A	7	104	1553	349
Sup	S-O	7	44	1741	304
Sup	N-D	2	54	102	74
1A	J-F	6	25	1954	293
1A	M-A	7	22	475	100
1A	M-J	6	166	1203	539
1A	J-A	9	168	**9678**	1395
1A	S-O	9	91	**9678**	1555
1A	N-D	3	35	496	201
2A	J-F	7	1	980	5
2A	M-A	7	3	308	39
2A	M-J	6	53	1300	219
2A	J-A	9	42	2420	427
2A	S-O	10	3	365	28
2A	N-D	4	1	2	1
2B	J-F	7	1	96	12
2B	M-A	7	11	186	55
2B	M-J	6	47	1046	190
2B	J-A	9	128	2420	582
2B	S-O	10	30	2420	156
2B	N-D	4	1	548	41
3A	J-F	7	4	167	26
3A	M-A	7	2	551	49
3A	M-J	5	108	472	215
3A	J-A	9	120	1986	618
3A	S-O	10	8	498	108
3A	N-D	4	2	210	23
3B	J-F	6	10	**4839**	365
3B	M-A	7	21	**6932**	164
3B	M-J	5	269	2176	717
3B	J-A	9	207	**2897**	1447
3B	S-O	9	50	**7215**	541
3B	N-D	3	45	**3106**	734
4A	J-F	4	1	70	10
4A	M-A	7	20	649	100
4A	M-J	6	161	1300	326
4A	J-A	9	184	2420	900
4A	S-O	10	28	2419	261
4A	N-D	4	4	248	33
4B	J-F	4	1	6	2
4B	M-A	7	11	2420	88
4B	M-J	5	48	214	136
4B	J-A	9	4	2420	142
4B	S-O	8	2	1300	90

Appendix G. Louisville E. coli Special Study Locations (2007-2014)

Site	Bimonthly Period	No.	Minimum	Maximum	Geometric Mean
4B	N-D	1	2	2	2
5A	J-F	3	1	17	5
5A	M-A	6	12	770	78
5A	M-J	6	74	2420	367
5A	J-A	9	93	2420	507
5A	S-O	10	3	2420	114
5A	N-D	4	2	7	4
5B	J-F	2	4	2420	98
5B	M-A	5	4	95	27
5B	M-J	6	48	**9678**	976
5B	J-A	8	62	**3266**	431
5B	S-O	7	14	**4185**	608
5B	N-D	1	**9678**	**9678**	9678
6A	J-F	2	1	53	7
6A	M-A	5	1	461	20
6A	M-J	4	18	276	90
6A	J-A	3	225	1046	450
6A	S-O	3	2	118	22
6A	N-D	0			
6B	J-F	1	8	8	8
6B	M-A	3	2	61	14
6B	M-J	2	15	67	31
6B	J-A	1	276	276	276
6B	S-O	2	52	125	81
6B	N-D	0			
7B	J-F	7	1	4	2
7B	M-A	7	1	6	2
7B	M-J	6	2	6	3
7B	J-A	8	1	18	3
7B	S-O	9	1	82	3
7B	N-D	2	1	2	1
8B	J-F	7	1	248	4
8B	M-A	7	1	10	2
8B	M-J	5	1	23	4
8B	J-A	6	1	109	15
8B	S-O	8	1	70	3
8B	N-D	2	1	11	3
8C	J-F	1	80	80	80
8C	M-A	2	26	154	64
8C	M-J	1	166	166	166
8C	J-A	2	110	2420	516
8C	S-O	2	1	1459	38
8C	N-D	0			
9B	J-F	7	420	**17329**	1481
9B	M-A	7	121	**12098**	1034
9B	M-J	6	11	**17329**	343
9B	J-A	9	160	**11199**	1324

Appendix G. Louisville E. coli Special Study Locations (2007-2014)

Site	Bimonthly Period	No.	Minimum	Maximum	Geometric Mean
9B	S-O	10	30	**24196**	2017
9B	N-D	4	**4839**	**24196**	9732
10A	J-F	7	1	880	38
10A	M-A	7	32	387	91
10A	M-J	6	63	517	183
10A	J-A	9	67	2420	255
10A	S-O	10	34	839	159
10A	N-D	4	49	74	63
10B	J-F	5	6	2407	50
10B	M-A	7	22	291	68
10B	M-J	6	9	192	56
10B	J-A	7	15	1733	141
10B	S-O	6	14	496	86
10B	N-D	1	206	206	206
11A	J-F	7	24	93	49
11A	M-A	7	26	345	81
11A	M-J	6	78	1300	248
11A	J-A	8	90	2420	275
11A	S-O	10	22	1095	161
11A	N-D	4	13	46	28
12A	J-F	7	13	**3106**	51
12A	M-A	7	13	288	83
12A	M-J	6	102	**9764**	817
12A	J-A	8	91	2420	589
12A	S-O	10	26	1454	222
12A	N-D	4	13	58	26
12B	J-F	7	2	2240	42
12B	M-A	7	8	372	68
12B	M-J	6	32	1034	181
12B	J-A	5	4	2420	351
12B	S-O	11	1	2420	23
12B	N-D	4	1	29	4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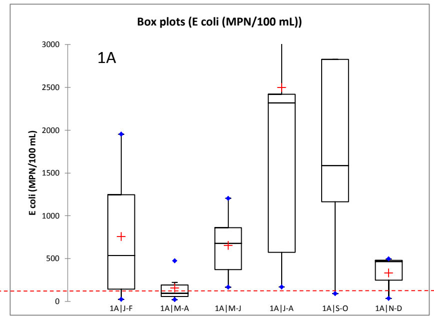
Sup
E coli (MPN/100 mL)
3000
2500
2000
1500
1000
500
0
Sup|J-F
Sup|M-A
Sup|M-J
Sup|J-A
Sup|S-O
Sup|N-D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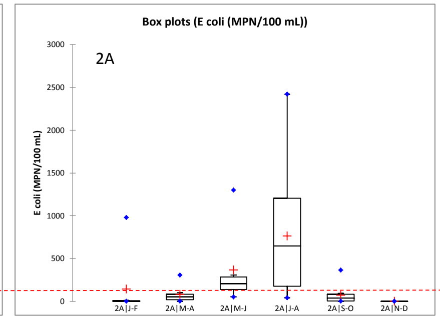
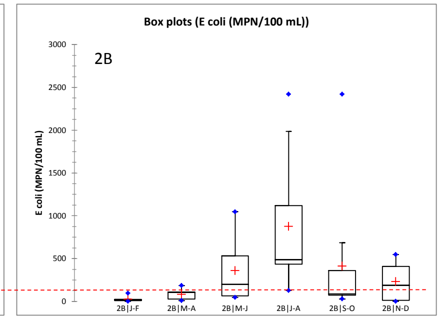
1A
E coli (MPN/100 mL)
3000
2500
2000
1500
1000
500
0
1A|J-F
1A|M-A
1A|M-J
1A|J-A
1A|S-O
1A|N-D


Box plots (E coli (MPN/100 mL))
2A
E coli (MPN/100 mL)
3000
2500
2000
1500
1000
500
0
2A|J-F
2A|M-A
2A|M-J
2A|J-A
2A|S-O
2A|N-D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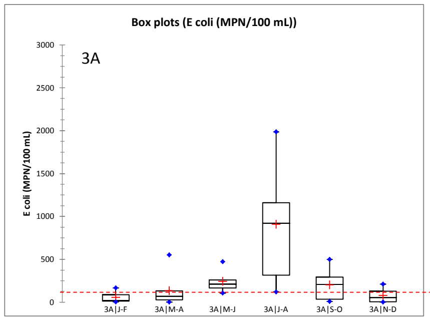
2B
E coli (MPN/100 mL)
3000
2500
2000
1500
1000
500
0
2B|J-F
2B|M-A
2B|M-J
2B|J-A
2B|S-O
2B|N-D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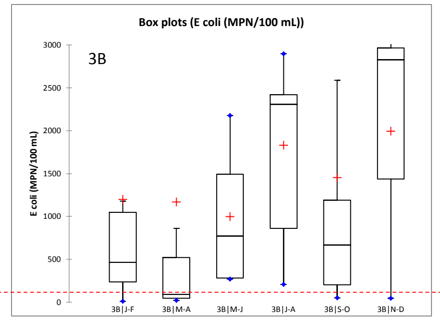
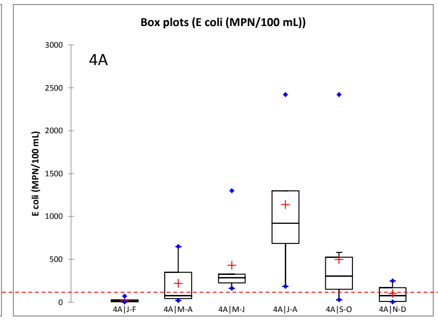
3A
E coli (MPN/100 mL)
3000
2500
2000
1500
1000
500
0
3A|J-F
3A|M-A
3A|M-J
3A|J-A
3A|S-O
3A|N-D


Box plots (E coli (MPN/100 mL))
3B
E coli (MPN/100 mL)
3000
2500
2000
1500
1000
500
0
3B|J-F
3B|M-A
3B|M-J
3B|J-A
3B|S-O
3B|N-D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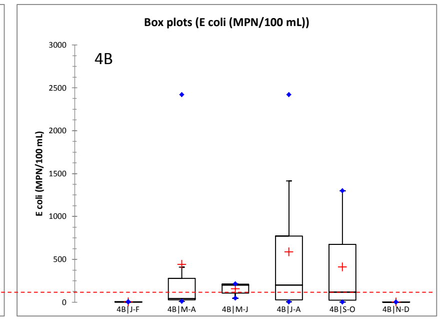
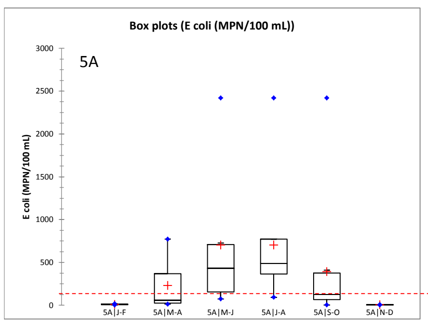
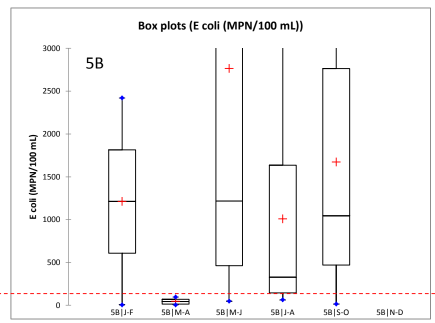
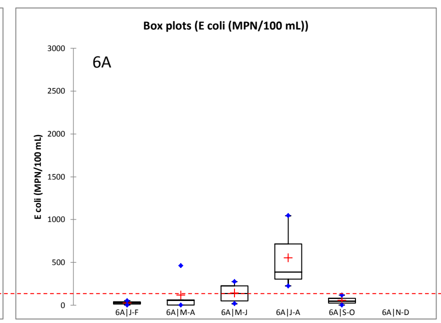
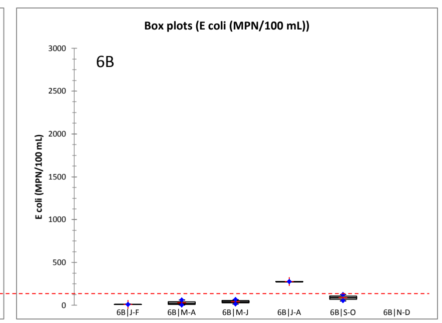
4A
E coli (MPN/100 mL)
3000
2500
2000
1500
1000
500
0
4A|J-F
4A|M-A
4A|M-J
4A|J-A
4A|S-O
4A|N-D

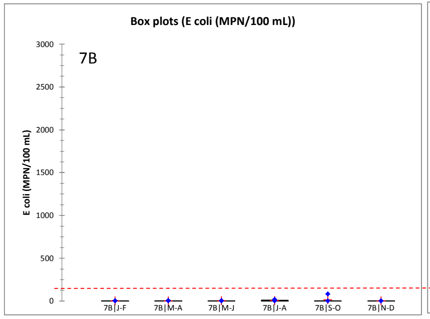

Box plots (E coli (MPN/100 mL))
4B
E coli (MPN/100 mL)
3000
2500
2000
1500
1000
500
0
4B|J-F
4B|M-A
4B|M-J
4B|J-A
4B|S-O
4B|N-D

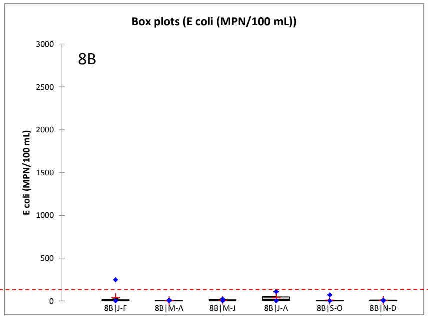

Box plots (E coli (MPN/100 mL))
5A
E coli (MPN/100 mL)
3000
2500
2000
1500
1000
500
0
5A|J-F
5A|M-A
5A|M-J
5A|J-A
5A|S-O
5A|N-D

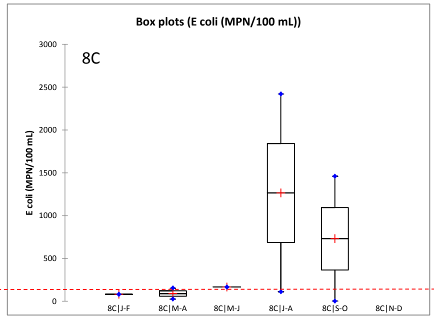

Box plots (E coli (MPN/100 mL))
5B
E coli (MPN/100 mL)
3000
2500
2000
1500
1000
500
0
5B|J-F
5B|M-A
5B|M-J
5B|J-A
5B|S-O
5B|N-D

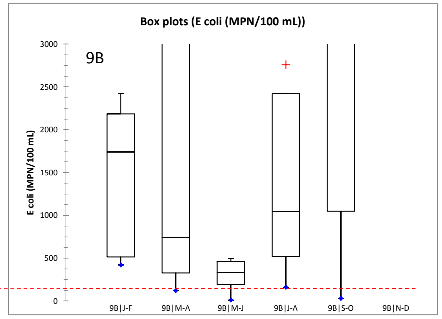

Box plots (E coli (MPN/100 mL))
6A
E coli (MPN/100 mL)
3000
2500
2000
1500
1000
500
0
6A|J-F
6A|M-A
6A|M-J
6A|J-A
6A|S-O
6A|N-D

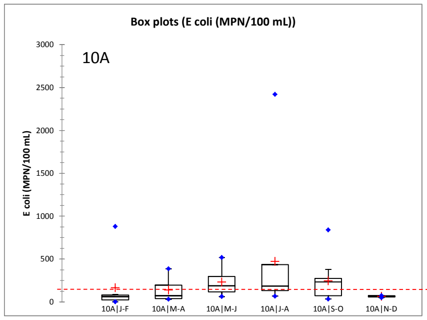

Box plots (E coli (MPN/100 mL))
6B
E coli (MPN/100 mL)
3000
2500
2000
1500
1000
500
0
6B|J-F
6B|M-A
6B|M-J
6B|J-A
6B|S-O
6B|N-D

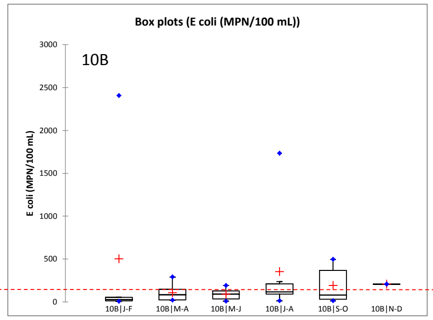


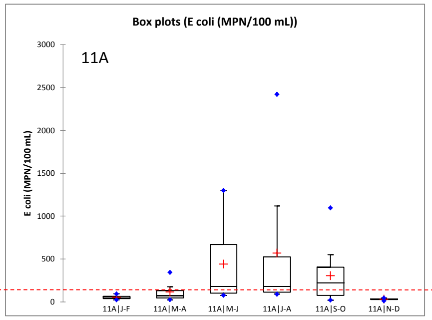


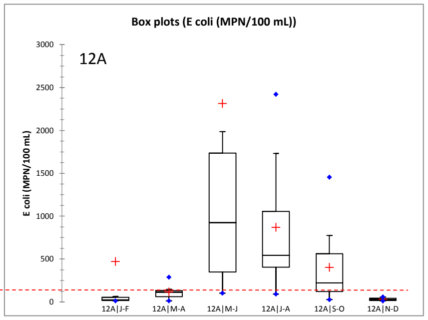


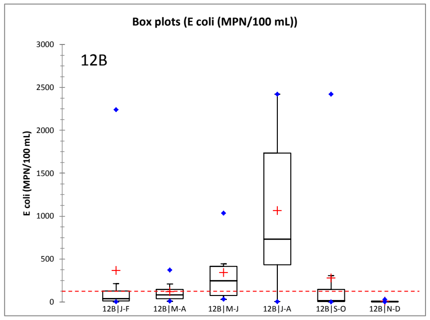












Notes:

"A" and "C" sites are instream, "B" sites are drainages or pipes discharging to stream.
Sample sizes vary.
Upper quantitation limit varies. Y-axis truncated at 3,000, since most UQLs = 2,419 MPN/100 mL.