2013 BCWA Data Report

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Prepared by
Tony Langowski (Evergreen Metropolitan District)
And
RNC Consulting LLC

Bear Creek Watershed Association
1529 South Telluride St
Aurora, CO 80017

Manager: Russell N Clayshulte
303-751-7144
rclayshulte@earthlink.net
www.bearcreekwatershed.org

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I. BCWA Sampling Program

Data Report Purpose

The Bear Creek Watershed Association (Association) collects annual water quality data from multiple sampling locations throughout the watershed. The monitoring program has four major water quality and environmental data generating elements:

1. Bear Creek Reservoir water quality characterization including source inputs from Bear Creek and Turkey Creek and reservoir discharge consistent with the intent of the Bear Creek Reservoir Control Regulation # 74 and as defined in the ***Water Monitoring Program and Sample Analyses Plan Version 2013.01, BCWA February 2013, and subsequent annual updates.***

2. Bear Creek Watershed surface water characterizations during selected months beginning at the headwaters of both Bear Creek and Turkey with a primary focus on nutrients and base field parameters, which is also defined in the ***Water Monitoring Program and Sample Analyses Plan Version 2013.01, BCWA February 2013, and subsequent annual updates.***

3. Bear Creek Watershed surface water temperature characterization by major stream segments for both the cold and warm seasons, which is also defined in the ***Water Monitoring Program and Sample Analyses Plan Version 2013.01, BCWA February 2013, and subsequent annual updates.***

4. Special water quality characterization and analyses studies on a site-specific basis.

The Association provides multiple reporting documents designed to meet the multiple functions of various groups. The Association produces an annual report to the Water Quality Control Commission that specifically addresses program elements identified in the control regulation. The Association produces a series of technical memorandum designed to summarize the site-specific studies.

This data reports summaries the watershed characterization program with a primary focus on the annual temperature data record. The data report summarizes the temperature and water quality compliance record for the annual program. This data report does not have detailed water quality data summaries that are found in the annual report or technical memorandum.

Surface Water Monitoring Program and Sample Analyses Plan Version 2013.01

A generally continuous collection of surface quality data began in 1990 for the Bear Creek Watershed (Figure 1). Data collection includes specific chemical, physical and biological parameters. Data is collected monthly and bi-monthly at Bear Creek Reservoir and along Turkey Creek and Bear Creek, and at selected months in the watershed. The Association meets water quality data sampling and analyses objectives established in the Bear Creek Reservoir Control Regulation # 74. The BCWA monitoring program is contained in an annually updated Sample Analyses Plan (Association, February 2013; ***Surface Water Monitoring Program and Sample Analyses Plan Version 2013.01*)**.

The *Bear Creek 2013 Sample Plan Version 2013.01* is posted on the Association website monitoring page at www.bearcreekwatershed.org. The monitoring plan is reviewed annually and updated as appropriate. The Water Quality Control Division staff reviews the annual monitoring plan (generally in December) and proposes changes as appropriate. The dual review is consistent with the requirements of the *Bear Creek Control Regulation.*

The 2013 data results are contained in the *2013 Bear Creek Master Spreadsheet* posted on the Association website monitoring page and a specific watershed spreadsheet for the temperature data. Monthly summary reports are provided to the Association Board and these data files are also posted to the website. Selected data and a summary of the water quality management program is presented in the *2013 BCWA Annual Report WQCC (BCWA,* June 2014*),* which also posted with previous Association annual reports.

The Association maintains five distinct types of monitoring efforts to characterize water and environmental quality within the Bear Creek Watershed*:*

P1- Routine water quality monitoring at Bear Creek Reservoir (multiple vertical stations), Turkey Creek inflow to reservoir, Bear Creek inflow to reservoir, and reservoir discharge into lower Bear Creek. The P1 sites are long-term reference monitoring sites consistent with the intent of the monitoring program outlined in the Bear Creek Reservoir Control Regulation #74.

P2- Supplemental sampling of restoration or other project specific sites (e.g., Coyote Gulch in cooperation with the City of Lakewood). These types of monitoring efforts can be either of limited duration, or long-term on a site-specific basis, and generally these programs monitor for specific parameters of interest to the project.

P3- Watershed surface water monitoring along Bear Creek and Turkey Creek drainages for site-specific characterizations (e.g., temperature trends, nutrient loading, flow studies). These are interim and long-term monitoring sites for watershed characterizations. Watershed monitoring stations include both long-term reference sites where multi-year data is desirable, and target sites that may provide only a couple years of data. The nutrient monitoring is on a watershed basis that begins near Summit Lake and extents through Bear Creek Reservoir.

P4- Supplemental environmental characterizations of Bear Creek watershed including, but not limited to macroinvertebrates, flow analysis, habitat characterizations, fishery evaluations, system productivity, or other environmental factors that potentially affect fisheries or watershed health.

P5- Wastewater treatment facility nutrient sampling consistent with regulation #85.

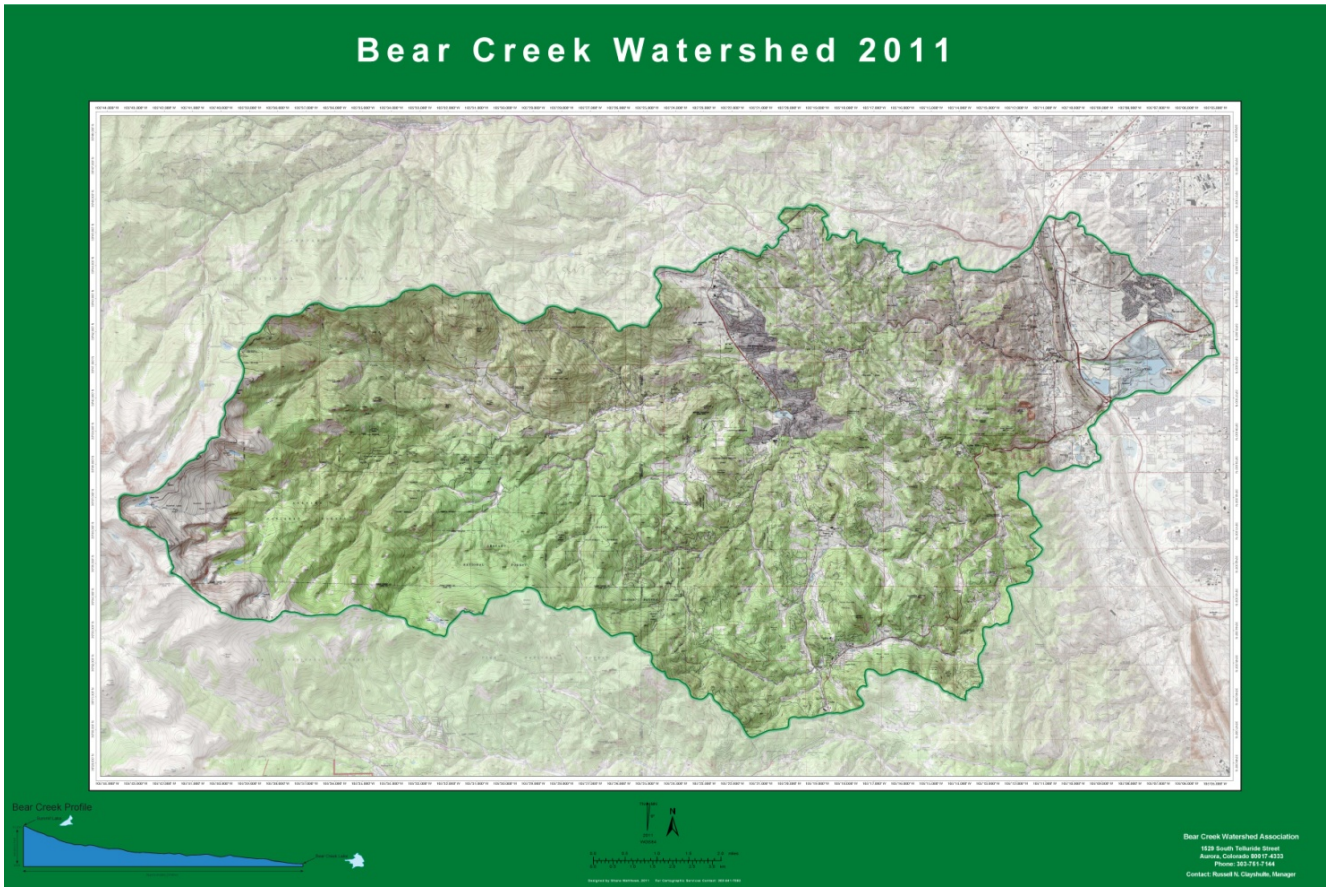

Figure 1 Bear Creek Watershed

II. Association Data Record

Data Management

Large quantities of varied data were collected during the Program: Monthly stream monitoring and sampling, laboratory results, thirty-minute temperature measurements from dataloggers, wastewater treatment plant effluent process control and permit monitoring data (from five treatment plants), weather statistics and stream flows comprise raw data. All data are stored on an office computer, using Microsoft Office XP Professional software. The majority of the data resides in and analyses occurred in Excel spreadsheet format. Data nightly backed up to a server.

Depositories

The Association data is located at two different locations. Watershed data collected with the assistance of EMD staff is maintained on computer systems at the EMD offices. All raw watershed data electronically forwarded from EMD staff to the Manager for data summary and analyses. RNC Consulting LLC maintains all monitoring data for all Association monitoring programs. Data is kept on a computer with daily back-up to an external hard drive. Additionally, a back-up set of data is kept on data discs.

Electronic Transfers WQCD/ Depositories

1. Spreadsheet watershed QA/QC spreadsheet data only (WQCD - 4); depositories (2)

2. Spreadsheet watershed QA/QC spreadsheet with summary information and standard analyses (WQCD - 2); depositories (2)

3. Temperature record (WQCD - 2); depositories (2);

4. WQCC annual report, 2013 Data Report; (WQCD - 2), depositories (2)

Reports, Technical Memorandum and Specialized Spreadsheets

The Association produces an annual data summary of watershed data, ongoing technical memorandum, a *2013 Master Data Spreadsheet (February 2014)* that includes data analyses, and raw data for Bear Creek Reservoir and watershed nutrient collect ion program (Association website www.bearcreekwatershed.org). The Association transmits this data report to the Water Quality Control Division Staff.

All of the Association annual reporting documents are available electronically and posted on the website. However, not all data can be posted due to size limitations. The annual temperature record is very large and kept in spreadsheets only available on request. The Association provides multiple reporting documents designed to meet the multiple functions of various groups. The reporting helps member entities with reporting to their respective boards, commissions and groups. There is also a citizen interest in the watershed and reporting helps keep the public informed. Many educational groups visit the watershed and it has become a widely used outdoor classroom. The Association supplies water quality and environmental materials for these various educational uses.

Spreadsheets

- 2013 Master Spreadsheet
- Temperature spreadsheet(s) contain all temperature data from 1997-2013 for Bear Creek Reservoir and the Bear Creek and Turkey Creek monitoring sites.
- Available total inorganic nitrogen (TIN) data for P1 sites (2000-2009) and selected watershed sites in 2007.
- Summary spreadsheet of all high altitude data.
- Summary spreadsheet of Bear Creek Reservoir aeration operations.
- Macroinvertebrate data summary.
- Total Phosphorus record.
- Evergreen Lake data record.
- Site 45 data record for use by the Barr/ Milton Watershed Group.
- Nitrate data record.

- E. coli record.
- Bear Creek Reservoir Dissolved Oxygen record.
- Ammonia-nitrogen record.
- Kerr/Swede Gulch Master File.
- Coyote Gulch Master File.

2013 Technical Memorandums

Technical memorandum contains data not otherwise included in this data report. The published TM by the Association in 2013 include:

2013.01	Summit Plume
2013.02	Kerr Swede Summary 2013
2013.03	Coyote Gulch Summary January 2014
2013.04	Manure Management BCP
2013.05	BCR 2013 Summary Statistics & Graphs
2013.06	MBCW 2013 Summary Graphs
2013.07	2013 Summary BCR Loading
2013.08	Barr Milton TMDL Summary
2013.09	Evergreen Lake Summary

Fact Sheets

Fact Sheet 1	BCWA Overview
Fact Sheet 2	BCR Sedimentation
Fact Sheet 3	BCR Sediment & Water Quality
Fact Sheet 4	Pine Beetle
Fact Sheet 5	BCR Dam Facts
Fact Sheet 6	BCR Aeration
Fact Sheet 7	BCR Sample Sites
Fact Sheet 8	Evergreen Lake
Fact Sheet 9	Signs Geocache
Fact Sheet 10	Control Regulation 74
Fact Sheet 11	Zebra Mussel Program
Fact Sheet 12	Fish Species
Fact Sheet 13	Water Quality is Better
Fact Sheet 14	Flood Recovery Tips
Fact Sheet 15	Watershed Sampling
Fact Sheet 16	September 2013 Flood
Fact Sheet 17	Health, Hydrology & Sediments
Fact Sheet 18	Flood Score Card
Fact Sheet 19	EHS Rain Garden
Fact Sheet 20	Instream Flow Rights
Fact Sheet 21	Pollutants of Concern 303d
Fact Sheet 22	Pollutants of Concern watershed
Fact Sheet 23	Evergreen Medical Take-back Program
Fact Sheet 24	Coyote Gulch Trade Pounds

III. Bear Creek Reservoir 2013 Data

The routine monitoring program (P1) focuses on Turkey Creek drainage and Bear Creek drainage inputs, and discharge from Bear Creek Reservoir into lower Bear Creek with a central pool characterization of the reservoir near the dam (Figure 2; BCWA site 40). The outlet structure is near BCWA site 41 with Bear Creek inflow near BCWA site 44 and Turkey Creek inflow near BCWA site 43. The reservoir chemistry and biological characterization monitoring occurs at BCWA site 40. Vertical probe samples for specific conductance, temperature, dissolved oxygen, and pH measured at ½ and 1-meter intervals at all reservoir sites. The current monitoring program optimizes data generation to evaluate reservoir inflow loading, trophic state changes within the reservoir, and reservoir outflow, while minimizing monitoring cost. The aeration sites are

visible in Figure 2. Figure 3 shows all monitoring stations within Bear Creek Park. The Association maintains maps of recent sampling sites and wastewater treatment plant locations on the Association web site.

Figure 2 Bear Creek Reservoir with Sampling Stations

Figure 3 Bear Creek Park with BCWA Sampling Sites

The P1 monitoring program is contained in a spreadsheet titled *Bear Creek Reservoir 2013 Master Spreadsheet*. The spreadsheet contains all data and analyses. Copies of the spreadsheet are distributed to Association membership, WQCD staff and interested parties in March/April 2013 after approval from the Association Board (Bear Creek Association March 2014).

The Bear Creek Reservoir data and analyses are summarized in the annual report to the Water Quality Control Commission. Table 1 summarizes the Bear Creek Reservoir monitoring data.

Table 1Bear Creek Reservoir Data Summary

Reservoir Monitoring Parameters	Reservoir
Chlorophyll (Site 40)	
Average Growing Season Chlorophyll-a [ug/l (-1m)]	26.4
Average Annual Chlorophyll-a [ug/l (-1m)]	14.6
Peak Chlorophyll-a [ug/l]	54.3
Phosphorus	
Average Annual Total Phosphorus [ug/l]: Water Column	65.6
Average Annual Total Phosphorus [ug/l] -1m	71.4
Average Annual Total Phosphorus [ug/l] -10m	59.8
Growing Season Total Phosphorus [ug/l]: Water Column	11.7
Growing Season Total Phosphorus [ug/l]: -1m	128.8
Growing Season Total Phosphorus [ug/l]: -10m	94.5
Peak Annual Total Phosphorus [ug/l] Water Column	166.0
Average Annual Ortho Phosphorus ug/l] Water Column	32.1
Growing Season Average Ortho Phosphorus [ug/l] Water Column	59.7
Peak Annual Ortho Phosphorus [ug/l] Water Column	108.0
Nitrogen	
Average Annual Nitrate-Nitrogen [ug/l] Water Column	153
Growing Season Average Nitrate-Nitrogen [ug/l] Water Column	103
Peak Annual Nitrate-Nitrogen [ug/l] Water Column	316
Average Annual Total Nitrogen [ug/l]: Water Column	752
Average Total Nitrogen [ug/l]: -1m	782
Average Total Nitrogen [ug/l]: -10m	721
Growing Season Total Nitrogen [ug/l]: Water Column	869
Growing Season Total Nitrogen [ug/l]: -1m	950
Growing Season Total Nitrogen [ug/l]: -10m	788
Clarity (All Profiles)	
Average Annual Secchi Depth (meters)	1.86
Growing Season Average Secchi Depth (meters)	1.14
Total Suspended Sediments	
Annual Average Total Suspended Sediments [mg/l]	8.9
Growing Season Average Total Suspended Sediments [mg/l]	9.5
Peak Total Suspended Sediments [mg/l]	39.8
Dissolved Oxygen (site 40 Profile)	
Annual Average at -1/2m - 2m [mg/l]	9.0
Annual Minimum at -1/2m - 2m [mg/l]	5.8
Seasonal Average at -1/2 - 2m [mg/l]	7.4
Seasonal Minimum at -1/2 - 2m [mg/l]	5.8
pH	
Annual Average at -1/2m - 2m [mg/l]	8.28
Annual Maximum at -1/2m - 2m [mg/l]	9.06
Seasonal Average at -1/2 - 2m [mg/l]	8.49
Seasonal Maximum at -1/2 - 2m [mg/l]	8.98
Specific Conductance	
Annual Average at -1/2m - 2m [uS/cm]	0.408
Annual Minimum at -1/2m - 2m [us/cm]	0.704
Seasonal Average at -1/2 - 2m [us/cm]	0.335

Reservoir Monitoring Parameters	Reservoir
Seasonal Minimum at -1/2 - 2m [us/cm]	0.397
Phytoplankton Species	
Phytoplankton Co-dominant Species - Site 40 (July- September 2013)	Aphanizomenon flos-aquae
	Microcystis aeruginosa
	Cryptomonas erosa
	Rhodomonas minuta
	Achnanthes minutissima
	Cocconeis placentula
	Cymbella minuta
	Melosira ambigua
	Melosira granulata
	Stephanodiscus niagarae
	Synedra cyclopum
	Glenodinium sp.
	Chlamydomonas sp.
	Ankistrodesmus falcatus
Peak Phytoplankton	
Aphanizomenon flos-aquae	Density cells/ml = 3,341
Aphanizomenon flos-aquae	Peak Biovolume (um^3/mL) = 5,261,667
Loading - Annual Pounds	
Total Nitrogen -Total Load In to BCR	94,110
Total Nitrogen -Total Load From BCR	80,203
Total Nitrogen -Total Deposition into BCR	13,907
Total Phosphorus -Total Load In to BCR	14,387
Total Phosphorus -Total Load From BCR	7,622
Total Phosphorus -Total Deposition into BCR	6,765
TSS -Total Load In to BCR	2,103,350
TSS -Total Load From BCR	1,611,815
TSS -Total Deposition into BCR	491,535

IV. Bear Creek Watershed 2013 Data

Sampling and Monitoring Program Notes

Data organization reflects the Colorado Water Quality Control Division's segmentation and water quality standards to water bodies in the Bear Creek Watershed per Regulation 38. Sampling and monitoring data is presented for the calendar year, compared to applicable water quality standards. Site numbers identify exact locations, but are grouped into respective segments, with segment summary tables at the beginning of a segment group. All data collected is presented in table form, with summary analyses.

Temperature data loggers that were in stream segments since January 1, 2013 were replaced with other loggers that had already been returned from the manufacture after being recalibrated and recertified in early February ready to begin collecting data at 30-min intervals. The additional loggers were sent to the manufacturer for annual recalibration and recertification. The loggers were returned to sites and programmed to begin data collection at 30-minute intervals on the days that they were placed at the sites. All loggers were removed and data downloaded after September 30. All stream loggers that were recovered after the flood of September, 2013 remained out of stream flow until they had been recalibrated at the manufactures.
Stream and lake sampling and monitoring data, including pH, Temperature, Dissolved Oxygen, Specific Conductance, Ammonia, Nitrate + Nitrite, Total Inorganic Nitrogen (calculated), Total Nitrogen, Dissolved Phosphorus, Total Phosphorous, and Total Suspended Solids were collected from March through November, at

22 sites. Stream and lake temperature data loggers were used at 28 sites, including the Evergreen Lake profile station, and the Bear Creek Reservoir profile station, excluding the five WWTPs. Ten selected sites collected data logger temperatures from January, but several were lost before being able to retrieve them at the end of the season. The eighteen remaining sites collected temperature data from a varying time parameter. Manual flows were measured at 22 sites in the watershed during the July to September timeframe.

Watershed Compliance Record

Temperature Compliance

The Cold- and Warm-season timeframe was redefined by the adoption Regulation 38, which assigned calendar dates by Segment for cold-season and warm season regarding water quality standards for temperature. For this reporting format, the Cold-season program is defined as approximately November to March, depending on specific stream segments (which are outlined in Appendix C of Reg. 74). Regarding temperature data loggers, Cold-season locations included sites in all segments excluding segment 1c, 1d, segment and 5, situated from above Evergreen Lake to below the outfall of Bear Creek Lake in the Bear Creek Watershed. Segment 1a (Sites 2a, 3a), Segment 1b (Site 15a), Segment 1e (Sites 5, 8a, 9, 12, 13a, 14a), Segment 2(Site 45), Segment 3(Site 25), Segment 6a (Site 18 and 16a), and Segment 16b (Site 19) comprise the Cold-season locations for temperature data loggers. It is worth mentioning that many of these sites only recorded data during the shoulder season the month before the warm season began. The program began in January of 2013 and ended in December of 2013. The data presented in this report reflects the temperature measurements collected from January 1 through December 31, 2013. (This change represents the revision of reporting data collected in a calendar year broken into cold and warm seasons).

The Warm-season program locations included twenty-eight sites in Bear Creek Segments 1a, 1b, 1c, 1d, 1e, 2, 3, 5, (including four total at the Evergreen Lake profile station, and 4 total at the Bear Creek Reservoir profile station),and three sites in Turkey Creek Segments 6a and 6b. Additionally, the five major wastewater treatment plants discharging into Segment 1e (EMD and KSWD), segment 5(WJCMD and GWSD) and 1b (Morrison) were monitored. The 2013 Warm-season program for temperature data collection began on April 1, May 1, and June 1, and concluded on September 30 and October 31 depending on the segment.

It is worth noting that several loggers were lost to the flood of September 2013 and thus the overall total temperature measurements is lacking compared to previous years. Temperature compliance, as compared to water quality standards, is presented by segment, roughly progressing from the upper reaches of the watershed to lower. Some sites only have temperature data collection during the Warm-season, while other sites have data loggers almost throughout the year.

249,995 individual temperature data points were obtained from the twenty-eight data logger sites within the watershed. The evaluating criteria used to determine potential impairment of stream temperature is detailed in the tables below, specific to segment. There were708 weekly averages calculated for the program period. 61,240 two-hour blocks were averaged and 5,099 Daily Maximum values were calculated. 87,553 individual temperature data points were obtained from the five data loggers located in the WWTP effluents that discharge into Bear Creek Segments 1e, 5, and 1b. Recognizing that Morrison wastewater treatment , Evergreen Metro District, and West Jefferson County metro district have temperature permit limits, a data summary consisting of number of measurements and calculations, Weekly Average and Daily Average temperatures are presented.

Table 2Bear Creek Watershed 2013 Temperature Compliance by Segment

	Cold-season		Warm Season	
Segment 3	**9°C WAT**	**13°C DM**	**17°C WAT**	**21.2°C DM**
# Exceedances	0	5	0	1
% Compliance	100%	80%	100%	98%
Segment 1a	**9°C WAT**	**13°C DM**	**17°C WAT**	**21.2°C DM**
# Exceedances	0	5	0	0
% Compliance	100%	98%	100%	100%
Segment 1d	**9.0°C WAT**	**13.0°C DM**	**18.2°C WAT**	**23.8°C DM**
# Exceedances			20	0
% Compliance			77%	100%

Segment 1e	9°C WAT	13°C DM	19.3°C WAT	23.8°C DM
# Exceedances	0	0	1	0
% Compliance	100%	100%	99%	100%
Segment 1b	**9°C WAT**	**13°C DM**	**19.3°C WAT**	**23.8°C DM**
# Exceedances	0	0	0	0
% Compliance	100%	100%	100%	100%
Segment 5	**9°C WAT**	**13°C DM**	**18.2°C WAT**	**23.8°C DM**
# Exceedances	0	0	6	1
% Compliance	100%	100%	93%	100%
Segment 6a	**9°C WAT**	**13°C DM**	**18.2°C WAT**	**23.8°C DM**
# Exceedances	2	0	0	0
% Compliance	97%	100%	100%	100%
Segment 6b	**9°C WAT**	**13°C DM**	**17°C WAT**	**21.2°C DM**
# Exceedances	0	3	0	0
% Compliance	100%	98%	100%	100%
Segment 2	**13.7°C WAT**	**14.3°C DM**	**27.5°C WAT**	**28.6°C DM**
# Exceedances	0	0	0	1
% Compliance	100%	100%	100%	99%
Segment 1c	**9°C WAT**	**13°C DM**	**24.0°C WAT**	**26.0°C DM**
# Exceedances			1	11
% Compliance			99%	99%

NA-Indicates no logger data obtained.

Table 3Number of Temperature Measurements

2013 Total Number of Measurements (Off- and Growing seasons)				
	# 30-min. Temps.	# Calculated WAT	# 2-Hr. Avgs. For DM calculation	# Calculated DM
Segment 3	3716	10	929	77
Segment 1a	21259	61	5313	442
Segment 1d	30048	88	7512	624
Segment 1e	56128	162	14027	1167
Segment 1b	8348	24	2087	174
Segment 1c	38512	112	9628	804
Segment 2	16256	33	2816	235
Segment 4a	5931	17	1482	123
Segment 5	31873	93	7966	662
Segment 6a	27274	77	6818	569
Segment 6b	10650	31	2662	222
Watershed totals	**249995**	**708**	**61240**	**5099**

Segment 8 (Site 36) and Segment 7 (Sites 37 and 38)

- No temperature loggers were placed in either of these segments in 2013.

Segment 3 (Site 25)

- 100% of the recorded temperature values complied with the 9.0°C Weekly Average Temperature (WAT) standard for the cold season, while the Daily Max complied 80% of the cold season.
- 100% of the recorded temperatures values complied with the 17.0°C Weekly Average Temperature(WAT) for the warm season, while 98% of the Daily Max temperature of 21.2°C complied for warm season.

Segment 1a (Sites 1a, 2, 3a)

- 100% of the recorded temperature values complied with the 9°C Weekly Average Temperature (WAT) standard Oct 1 through May 31.
- 98% of the recorded temperature values complied with the 13°C Daily Maximum (DM) Temperature standard for Oct 1 through May 31.

- 100% of the recorded temperature values complied with the 17.0°C Weekly Average Temperature (WAT) standard June 1 through September 30.
- 100% of the recorded temperature values complied with the 21.2°C Daily Maximum (DM) temperature standard for June 1 through September 30.

Segment 1d (Sites 4b, 4c and 4d)

- 77% of the recorded temperature values complied with the 18.2°C Weekly Average Temperature (WAT) standards for CLL designation.
- 100% of the recorded temperature values complied with the 23.8°C Daily Maximum (DM) Temperature standards for CLL designation.

Segment 1e (Sites 5, 7, 8a, 9, 12, and 13a)

- All cold season temperatures complied with the standards.
- 99% of the recorded temperature values complied with the 19.3°C Weekly Average Temperature (WAT) standard.
- 100% of the recorded temperature values complied with the 23.8°C Daily Maximum (DM) temperature standard for.

Segment 1b (Sites 15a and 27b)

- All cold and warm season temperatures complied with the standards.

Segment 5 (Sites 26, 35 and 50)

- All cold season temperatures complied with the standards.
- 93% of the recorded temperatures values complied with the 18.2°C Weekly Average Temperature (WAT) for the warm season, while 100% of the Daily Max temperature of 23.8°C complied for warm season.

Segment 6a (Sites 16a and 18)

- 97% of the recorded temperature values complied with the 9°C Weekly Average Temperature (WAT) standard.
- 100% of the recorded temperature values complied with the 13°C Daily Maximum (DM) Temperature standard.
- 100% of the recorded temperature values complied with the 18.2°C Weekly Average Temperature (WAT) standard.
- 100% of the recorded temperature values complied with the 23.8°C Daily Maximum (DM) temperature standard.

Segment 6b (Site 19)

- 98% of the temperatures complied with the cold season DM standard.
- All other temperatures complied with all other standards.

Segment 2(Site 45)

- 99% of the temperatures complied with the warm season DM standard of 28.6°C.
- All other temperatures complied 100% with all other temperature standards.

Segment 1c (Site 40 Profile)

- There were no cold season temperatures recorded.
- Both the warm season WAT and DM complied 99% of the time with the temperature standards.

Wastewater treatment plant effluents

Morrison WWTP, Evergreen Metro District, and West Jefferson County Metro District are the only treatment plants with a temperature limit in there permit, all five wastewater treatment plant, datalogger

measurements have been analyzed and summarized below using the representative segment standard that the wastewater treatment facility discharges into.

Table 4WWTP Number of Temperature Measurements 2013

	# 30-min. measurements	# Calculated WAT	# Daily Max
EMD WWTP(1e)	17509	347	365
WJCMD WWTP(5)	17512	347	365
KSWD WWTP(1e)	17511	51	365
GWSD WWTP(5)	17510	50	365
Morrison WWTP(1b)	17511	50	365
Totals (Jan 1-Dec. 31)	**87553**	**845**	**1825**

Table 5WWTP Logger summary 2013

	Cold-season		Growing Season	
Segment 1e	**9°C WAT**	**13°C DM**	**19.3°C WAT**	**23.8°C DM**
# Exceedances	47	0	75	0
% Compliance	71	100	68	100
Segment 1b	**9°C WAT**	**13°C DM**	**19.3°C WAT**	**23.8°C DM**
# Exceedances	10	27	14	1
% Compliance	50	82	53	100
Segment 5	**9°C WAT**	**13°C DM**	**18.2°C**	**23.8°C**
# Exceedances	153	51	48	0
% Compliance	4	83	80	100

Water Quality Compliance

Water quality compliance was determined by sampling and monitoring selected sites during the Growing season timeframe. Dissolved Oxygen, pH, Ammonia, Nitrate, Nitrite, and Total phosphorous measurements were compared to water quality standards and anticipated standards to determine compliance.

Table 6Bear Creek Watershed 2013 Water Quality Compliance by Segment

	Stream Std.	Stream Std.	Stream Std.	Stream Std.	Proposed Stream Std
	pH (6.5-9 SU)	**DO (6.0 mg/L 2-meter avg.)**	**NH3-N ug/L (TVS)**	**NO3-N (10,000ug/L)***	**Total Phosphorous(110 ug/L)**
Segment 8					
# Exceedances	0	0	0	0	0
# Measurements	4	4	4	4	4
% Compliance	100%	100%	100%	100%	100%
Segment 7					
# Exceedances	2	3	0	0	4
# Measurements	12	12	12	12	12
% Compliance	83%	75%	100%	100%	67%
Segment 3					
# Exceedances	0	0	0	0	0
# Measurements	5	5	5	5	5
% Compliance	100%	100%	100%	100%	100%
Segment 1a					
# Exceedances	0	0	0	0	1
# Measurements	20	20	20	20	20
% Compliance	100%	100%	100%	100%	95%
Segment 1d					
# Exceedances	0	0	0	0	0

	Stream Std.	Stream Std.	Stream Std.	Stream Std.	Proposed Stream Std
	pH (6.5-9 SU)	DO (6.0 mg/L 2-meter avg.)	NH3-N ug/L (TVS)	NO3-N (10,000ug/L)*	Total Phosphorous(110 ug/L)
# Measurements	60	24	12	12	12
% Compliance	100%	100%	100%	100%	100%
Segment 1e					
# Exceedances	0	0	0	0	1
# Measurements	54	54	54	54	54
% Compliance	100%	100%	100%	100%	98%
Segment 1b					
# Exceedances	0	0	0	0	0
# Measurements	15	15	15	15	15
% Compliance	100%	100%	100%	100%	100%
Segment 5					
# Exceedances	0	0	0	0	11
# Measurements	78	78	78	78	78
% Compliance	100%	100%	100%	100%	86%
Segment 6a					
# Exceedances	0	0	0	0	0
# Measurements	9	9	9	9	23
% Compliance	100%	100%	100%	100%	100%
Segment 6b					
# Exceedances	0	0	0	0	0
# Measurements	9	9	9	9	9
% Compliance	100%	100%	100%	100%	100%
Segment 4a					
# Exceedances	0	0	0	0	0
# Measurements	9	9	9	9	9
% Compliance	100%	100%	100%	100%	100%
Segment 2					
# Exceedances	0	0	0	0	4
# Measurements	15	15	15	15	15
% Compliance	100%	100%	100%	100%	73%

*- Samples were analyzed for NO3+NO2-N but compared to the Nitrate water quality standard of 10 mg/L.

Segment 8 (Site 36)

- 100% of all parameters measured complied with all water quality standards and all proposed water quality standards. Results for Ammonia-N are expected to comply with adopted water quality stream standards (TVS).

Segment 7 (Sites 37 and 38)

- 83% of the measured pH and 75% DO values complied with the adopted water quality stream standards. Results for Ammonia-N are expected to comply with adopted water quality stream standards (TVS). Samples analyzed for Nitrate+Nitrite-N resulted in 100% compliance with the adopted water quality stream standards for Nitrate. 67% of Total Phosphorous complied with the 110ug/L proposed standard.

Segment 3 (Site 25)

- 100% of all parameters measured complied with all water quality standards and all proposed water quality standards. Results for Ammonia-N are expected to comply with adopted water quality stream standards (TVS).

Segment 1a (Sites 2a and 3a)

- 100% of the measured pH and DO values complied with the adopted water quality stream standards. Results for Ammonia-N are expected to comply with adopted water quality stream standards (TVS).

Samples analyzed for Nitrate+Nitrite-N resulted in 100% compliance with the adopted water quality stream standards for Nitrate.

- 95% of Total Phosphorous complied with the 110 ug/L proposed listing criteria.

Segment 1d (Sites 4a, 4b, 4c, 4d and 4e)

- 100% of the measured pH values and DO values from the profile station complied with the adopted water quality stream standards. Results for Ammonia-N are expected to comply with adopted water quality stream standards (TVS). Samples analyzed for Nitrate+Nitrite-N resulted in 100% compliance with the adopted water quality stream standards for Nitrate. Total Phosphorous complied 100% with the anticipated standard of 110ug/L.

Segment 1e (Sites 5, 7, 8a, 9, 12, 13a and 14a)

- 100% of the measured pH and DO values complied with the adopted water quality stream standards. Results for Ammonia-N are expected to comply with adopted water quality stream standards (TVS). Samples analyzed for Nitrate + Nitrite-N resulted in 100% compliance with the adopted water quality stream standards for Nitrate. Total Phosphorous complied 98% with the anticipated standard of 110ug/L.

Segment 1b (Sites 15a)

- 100% of all parameters measured complied with all water quality standards and all proposed water quality standards. Results for Ammonia-N are expected to comply with adopted water quality stream standards (TVS).

Segment 5 (Site 35)

- 100% of the measured pH and DO values complied with the adopted water quality stream standards. Results for Ammonia-N are expected to comply with adopted water quality stream standards (TVS). Samples analyzed for Nitrate+Nitrite-N resulted in 100% compliance with the adopted water quality stream standards for Nitrate. Total Phosphorous complied 86% with the anticipated standard of 110ug/L.

Segment 6a (Site 18)

- 100% of all parameters measured complied with all water quality standards and all proposed water quality standards. Results for Ammonia-N are expected to comply with adopted water quality stream standards (TVS).

Segment 6b (Site 19)

- 100% of all parameters measured complied with all water quality standards and all proposed water quality standards. Results for Ammonia-N are expected to comply with adopted water quality stream standards (TVS).

Segment 4a (site 34)

- 100% of all parameters measured complied with all water quality standards and all proposed water quality standards. Results for Ammonia-N are expected to comply with adopted water quality stream standards (TVS).

Segment 2(site 45)

- 100% of the measured pH and DO values complied with the adopted water quality stream standards. Results for Ammonia-N are expected to comply with adopted water quality stream standards (TVS). Samples analyzed for Nitrate + Nitrite-N resulted in 100% compliance with the adopted water quality stream standards for Nitrate. Total Phosphorous complied 73% with the anticipated standard of 110ug/L.

Summary

Temperature Compliance

Segments 1a, 1b, 1c, 1d, 1e, 2, 3, 5, 7, 10, and Turkey Creek Segments 6a and 6b showed little impairment during both the Cold- and Warm Seasons. Comparisons with adopted temperature standards resulted in 96% compliance for the WAT and 99% compliance for the DM calculated for the calendar year throughout the Watershed, utilizing the 85th%-tile qualifier. Comparisons with adopted temperature standards for the Warm season resulted in 95% compliance for the calculated WAT and 99% compliance for the calculated DM. A comparison with the adopted temperature standards for the cold season resulted in 100% compliance for the calculated WAT and 100% compliance for the calculated DM, the monitored locations of

the Watershed, utilizing the 85th%-tile qualifier. A comprehensive temperature data collection effort spanning January through December, summarized in 249,995 30-minute measurements at twenty-eight in-stream/lake Sites throughout the Watershed, excluding the WWTP facilities, provided the data for analyses.

The evaluation of the entirety of temperature datalogger measurements recorded during the calendar year at twenty-eight sites in the Watershed from Mt. Evans Wilderness to just below Bear Creek Lake in Morrison and Turkey Creek do not indicate that a problem exists, either man-induced or natural, when compared to water quality standards. Compliance exceedance issues occurred in segments 1a (warm season), 1d (warm season), 1e (warm season), 2 (warm season), 3(warm and cold seasons), 5 (warm season), 6a (warm season), and 6b (warm season).

Wastewater plant discharges into Bear Creek did not cause temperature impairment. A comprehensive temperature data collection effort from January through December, summarized in 87,553 30-minute measurements in five wastewater treatment plant effluents that discharge into Bear Creek Segment 1e and 1b, and 5 showed no evidence of thermal pollution. Although only three of the five WWTPs that discharge into Segments 1e, 1b, and 5 have temperature limits, the resulted data collected and presented do not indicate evidence of impairment due to temperature when analyzing the downstream data.

Water Quality Compliance

Segments 3, 1a, 1d, 1e, 1b, 5 and Turkey Creek Segments 6a and 6b showed little water quality impairment. Sampling and monitoring was performed at 36 sites within the watershed at varying intervals ranging from samples throughout the year to sampling 4 times throughout the season. 275 measurements of pH and of DO were performed at these Sites. 99% compliance for pH and 99% compliance for Dissolved Oxygen were achieved. 227 samples were analyzed for Total Ammonia and 227 samples were analyzed for Nitrate+Nitrite. Sampling results show 100% compliance with Total Ammonia TVS and 100% compliance with Nitrate water quality standards. (Stream samples were analyzed for Nitrate+Nitrite, but compared to Nitrate water quality standards.) There are no stream standards for Total Phosphorous; however 226 samples were analyzed for Total Phosphorous and ran against the proposed standard of 110ug/L, this resulted in 92% of the samples being in compliance of the proposed standard.

Wastewater plant discharges into Bear Creek result in no evidence of water quality impairment. 100% of the wastewater plant effluent pH and 100% of effluent Ammonia values met permit limits, while 100% Total Phosphorous met permit effluent limits as well. Five of the five wastewater treatment plants met discharge limits stated in their Colorado Discharge Pollutant Elimination System (CDPES) permit for pH, Total Phosphorous and Total Ammonia during 2013. There were no permit violations reported for any of the parameters from 5 wastewater treatment plants in 2013. Wastewater treatment plant effluents had no detrimental effect on the water quality of Segment 1e, 1b, and 5. There were no observed impairment issues or temperature issues in the Watershed due to wastewater plant effluents during the program.

Bear Creek stream flows were moderately lower to significantly higher from May through September in 2013. Bear Creek stream flows tracked during May through September, on daily average at the gage above Evergreen Lake, were somewhat to significantly lower than the historic daily average in May through July, and somewhat to significantly higher August and September. The stream gage above Morrison followed the Evergreen gage values. The stream flows remained well below to slightly below monthly historic averages except in September when the flood occurred. A surprising factor in the 2013 Program was the lack of snow pack to aid in the run off and the wetter than average summer in terms of inches of rainfall throughout the summer.

Weather and climate in the May through September timeframe were approximately average to below average as compared to historic averages. Measurably more precipitation was noticed verses historic averages in May through September. The Average Monthly Mean temperatures were approximately equal to historical data for May through September. The Average Monthly Maximum temperatures were approximately equal to historical averages for May through September. However, the Average Daily Minimum temperatures were slightly higher or equal to historical averages in all months. The Average Monthly temperatures were unremarkable.

Watershed Monitoring

WWTP Effluent Temperature and Water Quality

The Process Control and permit sampling and monitoring summaries in the tables below are annual summaries, from January through December. Datalogger temperature measurements of plant effluent were obtained at the identical frequency of the in-stream dataloggers (30-minute intervals) during a study period of January 1 through December 31, broken into a cold and warm season per the listing requirements. The tables are listed in a downstream direction, as the effluents enter Bear Creek, from the EMD WWTP to the Morrison WWTP. Test results for Ammonia, Nitrate, Nitrite and Phosphorous are provided by the wastewater treatment plant laboratories for EMD, WJCMD, KSWD and GWSD and are represented in ug/L. TIN was determined as the sum of Ammonia, Nitrate and Nitrite. Averaged pH values are for statistical analyses only. The town of Morrison utilizes a contract laboratory for analyses.

Table 7Evergreen Metropolitan District (Site 20)

EMD WWTP Effluent Summary 2013									
2013 Process Control and Permit Sampling and Monitoring									
Parameter	pH, SU	Temp, °C	D. O., mg/L	Total NH3-N, ug/L	NO3-N, ug/L	NO2-N, ug/L	TIN, ug/L	Total P, ug/L	Flow, MGD
Min	6.47	7	4.10	3	2160	5	2384	10	0.29
Max	7.46	20.10	6.90	1290	10400	39	10421	770	1.92
Avg	6.73	12.66	5.02	141.94	5284.76	11.10	5425.90	212.69	0.49
Std. Dev.	0.17	4.34	0.50	242.30	1669.36	5.96	1623.55	203.91	0.20
Measurements	259	243	243	52	42	42	42	52	365
Exceedances	0			0				0	

Effluent Datalogger Temperature Summary: Cold Season/Warm Season 2013						
All Temperatures in °C	30-Min Temp. Cold/Warm		Daily Avg. Temp. Cold/Warm		Weekly Avg. Temp. Cold/Warm	
Min	6.71	8.2	6.86	8.3	7.18	8.6
Max	12.82	20.0	12.78	19.9	12.48	19.8
Avg	8.92	15.1	8.92	15.1	8.87	15.2
Std. Dev.	1.56	3.8	1.55	3.8	1.50	3.8
Measurements	7237	10272	151	214	139	208

[Datalogger ID: EMD5 GPS Coordinates: 39.6376°N, 105.3150°W; Sampling/monitoring site is the EMD WWTP effluent. The datalogger is in the UV channel just upstream of the outfall. Effluent flows directly from the UV building to Bear Creek.] Notes: Discharge permit limits for Total Ammonia (NH3-N), in ug/L are as follows: Jan.-**10,100**, Feb.-**6500**, Mar.-**6400**, Apr.-**13000**, May-**17000** June-**16000** July **9400** Aug. **7700** Sept.-**7900**; Oct.-**5700**; Nov.-**6900**; Dec.-**9200**; **pH 6.1-9.0**. New methodology for calculating DM and MWAT in accordance with the new permit is now in effect.

Table 8West Jefferson County Metropolitan District (Site 21)

WJCMD WWTP Effluent Summary 2013									
2013 Process Control and Permit Sampling and Monitoring									
Parameter	pH, SU	Temp, °C	D. O., mg/L	Total NH3-N, ug/L	NO3-N, ug/L	NO2-N, ug/L	TIN, ug/L	Total P, ug/L	Flow, MGD
Min	6.55	8.9	0.00	33	14	1	640	10	0.23
Max	7.11	22.00	6.70	11100	8690	2170	8902	530	0.96
Avg	6.81	13.35	2.11	2045.92	1442.26	190.21	2895.33	157.50	0.47
Std. Dev.	0.11	3.43	0.43	2661.07	1460.28	499.60	1958.57	95.93	0.09
Measurements	259	252	252	61	42	42	42	52	365
Exceedances	0			0				0	

Effluent Datalogger Temperature Summary Cold/Warm Seasons 2013						
All Temperatures in °C	30-Min Temp. COLD/WARM		Daily Avg.Temp. COLD/WARM		Weekly Avg. Temp. COLD/WARM	
Min	0.4	9.3	6.3	9.7	7.0	10.0
Max	13.7	19.1	13.6	19.0	13.4	18.8
Avg	10.2	15.2	10.2	15.2	10.2	15.2
Std. Dev.	1.7	2.99	1.6	3.0	1.5	2.9
Measurements	7240	10272	151	214	139	208

[Datalogger ID: WJ6 GPS Coordinates: 39.6621°N, 105.3351°W; Sampling/monitoring site is the WJCMD WWTP effluent. The datalogger was located in the end of the abandoned chlorine contact chamber. (Disinfection currently occurs by UV radiation.) The effluent flows into a ditch and joins Troublesome Gulch just outside the plant boundary. Troublesome Gulch flows to Kittredge

and combines with Bear Creek at the west end of Kittredge.] Notes: Discharge permit limits for Total Ammonia (NH3-N), in ug/L are as follows: Jan.-**13,300**, Feb.-**9,000**, Mar.-**13,000**, Apr.-**5400**, May-**5000** June-**4000** July-**3200** Aug.-**3500** Sept.-**3700**; Oct.-**4300**; Nov.-**5400**; Dec.-**7400**; **pH 6.4-9.0**. New methodology for calculating DM and MWAT in accordance with the new permit is now in effect.

Table 9Kittredge Sanitation and Water District (Site 22)

KSWD WWTP Effluent Summary 2013									
2013 Process Control and Permit Sampling and Monitoring									
Parameter	pH, SU	Temp, °C	D. O., mg/L	Total NH3-N, ug/L	NO3-N, ug/L	NO2-N, ug/L	TIN, ug/L	Total P, ug/L	Flow, MGD
Min	6.29	3.30	0.58	1.16	14.20	0.36	1607.00	60.00	0.01
Max	7.95	23.70	16.13	2450	19200	605	20760	920	0.22
Avg	6.80	12.18	3.93	891.70	10190.05	228.44	11529.71	477.67	0.05
Std. Dev.	0.19	5.55	2.69	653.76	4938.01	147.60	4995.75	175.13	0.02
Measurements	233	197	202	52	42	42	41	30	365
Exceedances	0			0				0	

Effluent Datalogger Temperature Summary Cold/Warm Seasons 2013						
All Temperatures in °C	30-Min Temp. COLD/WARM		Daily Avg.Temp. COLD/WARM		Weekly Avg. Temp. COLD /WARM	
Min	2.5	7.8	2.9	8.3	3.1	9.1
Max	10.3	22.3	10.0	21.2	9.6	20.6
Avg	5.5	15.2	5.5	15.2	5.5	15.3
Std. Dev.	2.1	3.56	2.1	3.55	2.1	3.45
Measurements	7239	10272	151	214	21	30

[Datalogger ID: KSWD8 GPS Coordinates: 39.6585°N, 105.2868°W; Sampling/monitoring site is the KSWD WWTP effluent. The datalogger was located near the flow-measuring flume, just upstream of the outfall. Effluent flows from the datalogger location under Highway 74 to the outfall in Bear Creek.] Notes: Discharge permit limits for Total Ammonia (NH3-N), in ug/L are as follows: Jan.-**10,100**, Feb.-**4,500**, Mar.-**5,300**, Apr. **7400**, May-**10000** June-**12000** July-**5300** Aug.-**4300** Sept.-**4400**; Oct.-**5200**; Nov.-**17000**; Dec **14000**; **pH 6.0-9.0**

Table 10 Genesee Water and Sanitation District (Site 23)

GWSD WWTP Effluent Summary 2013									
2013 Process Control and Permit Sampling and Monitoring									
Parameter	pH, SU	Temp, °C	D. O., mg/L	Total NH3-N, ug/L	NO3-N, ug/L	NO2-N, ug/L	TIN, ug/L	Total P, ug/L	Flow, MGD
Min	7.00	10.30	7.64	150	5820	1	6167	250	0.20
Max	7.41	15.3	8.56	300	7670	47	7823	370	0.28
Avg	7.21	12.14	8.20	186	7000	12.20	7198.20	330	0.23
Std. Dev.	0.11	1.04	0.20	57.48	810.16	17.57	758.81	43.36	0.02
Measurements	31	31	31	5	5	5	5	5	31
Exceedances	0			0				0	

Effluent Datalogger Temperature Summary COLD/WARM Seasons 2013						
All Temperatures in °C	30-Min Temp. COLD/WARM		Daily Avg.Temp. COLD/WARM		Weekly Avg. Temp. COLD/WARM	
Min	10.1	10.5	10.4	10.7	10.4	11.0
Max	15.3	20.3	15.1	20.2	14.8	20.1
Avg	11.7	16.1	11.7	16.1	11.8	16.1
Std. Dev.	1.4	2.9	1.4	2.9	1.4	3.0
Measurements	7238	10272	151	214	20	30

[Datalogger ID: GWSD9A GPS Coordinates: 39.6732°N, 105.2712°W; Sampling/monitoring site is the GWSD WWTP effluent. The datalogger was located in a wet well, just upstream of the outfall at the plant. Effluent flows from the datalogger location into a drainage, down to and under Highway 74 at the west end of Lair o' the Bear Park, and into Bear Creek.] Notes: Discharge permit limits for Total Ammonia (NH3-N), in ug/L are as follows: Jan.-**13,300**, Feb.-**8,000**, Mar.-**8,500**, Apr.-**7,200**, May-**8,300** June-**12,600** July-**13,000** Aug.-**10,700** Sept.-**8,400**; Oct.-**6,500**; Nov.-**8,500**; Dec.-**6,300**; pH **6.5-9.0**

Table 11 Town of Morrison (Site 24)

Morrison WWTP Effluent Summary 2013									
2013Process Control and Permit Sampling and Monitoring									
Parameter	pH, SU	Temp, °C	D. O., mg/L	Total NH3-N, ug/L	NO3-N, ug/L	NO2-N, ug/L	TIN, ug/L	Total P, ug/L	Flow, MGD
Min	6.51	6.70	2.46	140	590	9	1300	10	0.00
Max	7.78	24.20	11.3	34590	19440	190	35400	980	0.18
Avg	7.11	15.11	6.99	3820	9285	69.33	18200	420.63	0.07
Std. Dev.	7.11	13.50	7.01	420	8555	9	18050	445	0.07
Measurements	363	363	166	16	4	3	4	16	365
Exceedances	0							0	

Effluent Datalogger Temperature Summary COLD/WARM Seasons 2013						
All Temperatures in °C	30-Min Temp. COLD/WARM		Daily Avg.Temp. COLD/WARM		Weekly Avg. Temp. COLD/WARM	
Min	6.1	10.3	6.2	10.5	6.9	11.0
Max	16.1	23.9	14.7	23.1	14.3	22.8
Avg	9.7	18.1	9.7	18.1	9.7	18.1
Std. Dev.	2.2	3.9	2.2	3.9	2.2	3.8
Measurements	7239	10272	151	214	20	30

[Datalogger ID: MORR12 GPS Coordinates: 39.6541°N, 105.1796°W; Sampling/monitoring site is the GWSD WWTP effluent. The datalogger was located in a wet well, just upstream of the outfall at the plant. Effluent flows from the datalogger location into a drainage, down to and under Highway 74 at the west end of Lair o' the Bear Park, and into Bear Creek.] Notes: Discharge permit limits for Total Ammonia (NH3-N), in ug/L are as follows: Jan.-10,000, Feb.-8,600, Mar.-10,000, Apr.-10,000, May-8,600 June-20,000 July-30,000 Aug.-28,000 Sept.-28,000; Oct.-16,000; Nov.-14,000; Dec.-10,000; pH 6.5-9.0

Other Small Treatment Facilities

Table 12 Bear Creek Cabins Effluent Summary

BEAR CREEK CABINS WWTP Effluent Summary 2013					
2013 Process Control and Permit Sampling and Monitoring					
Parameter	**pH, SU**	**Temp, °C**	**Total NH3-N, ug/L**	**Total P, ug/L**	**Flow, MGD**
Min	6.51	5.7	5.03	0.18	0.003
Max	8.98	19.2	42.26	6.5	0.002
Avg	7.35	12.45	16.89	1.81	0.008
Std. Dev.	0.78	5.04	9.35	2.00	0.004
Measurements	22	11	11	11	11
Exceedances	0			4	

Bear Creek Stream Segments

Sampling and monitoring was performed by Evergreen Metropolitan District personnel and watershed associates. Laboratory analyses were performed by a contract facility. A summary table for each Segment is presented before individual Site tables in that Segment. When there is only one Site per Segment, the summary table is omitted. Sites where only Warm Season temperature data exists have Cold-season portions of the table blacked out.

The following applies to all Segment Data tables: Existing stream standards: Table Value Standard (TVS) for Total Ammonia (NH3-N), chronic; 10 mg/L (10,000 ug/L) Nitrate (NO3-N), chronic; pH 6.5-9.0 SU; DO 6.0 mg/L; TIN was determined as the sum of Ammonia and Nitrate+Nitrite. Threshold to Evaluate Potential Temperature Impairment: WAT (Weekly Average Temperature), DM (Daily Maximum Temperature), Segment-specific; 2-HR Avg. Temperature data are calculations used to evaluate against DM.

Segments 7 and 8 (Mt Evans Wilderness)

Table 13 Summit Lake Site 36 (In Summit Lake near outlet) Segment 8

4 Monthly Sampling/Monitoring Events June 1-Sept 30, 2013									
Monthly Parameter Results	pH, SU	Temp, °C	D. O., mg/L	Sp. Cd., mS/cm	Total NH3-N, ug/L	NO3+NO2-N, ug/L	TIN, ug/L	Total P, ug/L	TN, ug/L
Min	6.82	4.4	7.54	0.02	9	52	84	2	260
Max	8.95	10.9	10.61	0.023	63	165	190	40	351
Avg	7.56	6.13	8.85	0.02	33.50	104.75	138.25	16	311.25
Std. Dev.	0.82	2.76	1.27	0	21.98	44.14	47.61	14.76	38.21
Measurements	4	4	4	4	4	4	4	4	4

[Monitoring station GPS Coordinates: 39.5979 °N, 105.6411 °W; Sampling /monitoring site is in Summit Lake, near outlet.]

Table 14 Summit Lake Site 37 Segment 7

4 Monthly Sampling/Monitoring Events June 1-Sept 30, 2013									
Monthly Parameter Results	pH, SU	Temp, °C	D. O., mg/L	Sp. Cd., mS/cm	Total NH3-N, ug/L	NO3+NO2-N, ug/L	TIN, ug/L	Total P, ug/L	TN, ug/L
Min	6.87	3	8.06	0.02	15	86	118	2	219
Max	7.44	12.1	10.3	0.023	51	228	279	12	421
Avg	7.08	6.60	9.55	0.02	32.50	146.00	178.50	6.75	326.25
Std. Dev.	0.22	3.84	0.91	0	12.74	56.74	62.97	3.56	71.80
Measurements	4	4	4	4	4	4	4	4	4

[Monitoring station GPS Coordinates: 39.5955 °N, 105.6334 °W; Sampling /monitoring site is in Bear Creek, downstream of outlet from Summit Lake.]

Table 15 Summit Lake Site 63 (Summit Lake pollution Plume fens) Segment 7

4 Monthly Sampling/Monitoring Events June 1-Sept 30, 2013									
Monthly Parameter Results	pH, SU	Temp, °C	D. O., mg/L	Sp. Cd., mS/cm	Total NH3-N, ug/L	NO3+NO2-N, ug/L	TIN, ug/L	Total P, ug/L	TN, ug/L
Min	6	4.1	1.46	0.03	32	2	34	208	121
Max	7.8	10.9	13.9	0.035	83	4	85	4112	3108
Avg	6.62	7.26	4.85	0.03	47.60	2.60	50.20	1482.60	1199.40
Std. Dev.	0.65	2.55	4.83	0.00	19.16	0.83	18.99	1448.12	1102.65
Measurements	4	4	4	4	4	4	4	4	4

[Monitoring station GPS Coordinates:; Sampling /monitoring site

Table 16 Site 65 between 2 large ponds on east side of Summit Lake outfall Segment 7

4 Monthly Sampling/Monitoring Events June 1-Sept 30, 2013									
Monthly Parameter Results	pH, SU	Temp, °C	D. O., mg/L	Sp. Cd., mS/cm	Total NH3-N, ug/L	NO3+NO2-N, ug/L	TIN, ug/L	TN, ug/L	Total P, ug/L
Min	6.32	2.8	8.5	0.017	9	74	101	229	2
Max	7.43	12	10.65	0.023	43	251	260	517	63
Avg	6.72	6.73	9.35	0.02	20	128.40	152	343.20	18.20
Std. Dev.	0.40	3.63	0.83	0.00	13.05	73.29	62.61	119.15	24.05
Measurements	4	4	4	4	4	4	4	4	4

Segment 1a (Above Evergreen Lake)

Table 17 Segment 1a Summary

Segment 1a Sampling/Monitoring Summary 2013									
Monthly Results	pH,	Temp, °C	D. O.,	Sp. Cd.,	Total	NO3+NO	TIN,	TN	Total P,

	SU		mg/L	mS/cm	NH3-N, ug/L	2-N, ug/L	Ug/L	Ug/L	ug/L
Min	7.45	0	8.06	0.034	5	11	37	150	2
Max	8.75	14.8	13.51	0.077	59	152	168	543	114
Avg	8.01	7.44	10.81	0.05	27.05	75.20	102.25	283.10	21.90
Std. Dev.	0.36	4.93	1.59	0.01	14.11	39.53	40.09	122.04	24.07
Measurements	20	20	20	20	20	20	20	20	20

Segment 1a Datalogger Temperature Summary 2013

All Temperatures in °C	30-Min Temp. COLD/ WARM SEASONS		Oct 1-May 31 Stream Std. WAT (9°C)	Oct 1-May 31 2-Hr Avg. Temp.	Oct 1-May 31 Stream Std. DM (13°C)	June 1-Sept 30 Stream Std. WAT (17°C)	June 1-Sept 30 2-HR Avg. Temp.	June 1-Sept 30 Stream DM (21.2°C)
Min	-0.1	2.9	-0.1	-0.1	-0.1	6.5	3.1	6.6
Max	13.0	21.7	8.9	12.9	12.9	16.5	21.4	21.4
Avg	2.9	12.0	2.7	2.9	4.5	12.0	12.0	14.3
Measurements	10637	10622	31	2659	222	30	2654	220
# 9°C WAT exceeded			0					
% Compliance WAT			100%					
# 13°C DM exceeded					0			
% Compliance DM					100%			
# 17°C WAT exceeded						0		
% Compliance WAT						100%		
# 21.2°C DM exceeded								5
% Compliance DM								98%

Table 18 Above Lost & Found, Below Mount Evans Wilderness (Site 58)

6 Monthly Sampling/Monitoring Events May 1 – October 31, 2013

Monthly Results	pH, SU	Temp, °C	D. O., mg/L	Sp. Cd., mS/cm	Total NH3-N, ug/L	NO3+NO2-N, ug/L	TIN, ug/L	Total P, ug/L
Min	7.45	1.2	10.03	0.034	5	27	48	195
Max	8.75	11.1	12.33	0.041	47	152	168	526
Avg	8.3	6.3	11.0	0.0	23.5	95.0	118.5	295.3
Std. Dev.	0.45	3.60	0.73	0.00	12.76	40.59	40.63	107.46
Measurements	6	6	6	6	6	6	6	6

Datalogger Temperature Data 2013

All Temperatures in °C	30-Min Temp. Cold/Warm Season		Oct 1-May 31 Stream Std. WAT (9°C)	Oct 1-May 31 2-Hr Avg. Temp.	Oct 1-May 31 Stream Std. DM (13°C)	June 1-Sept 30 Stream Std. WAT (17°C)	June 1-Sept 30 2-HR Avg. Temp.	June 1-Sept 30 Stream DM (21.2°C)
Min	1.2	2.9	4.2	1.2	4.2	6.5	3.1	6.6
Max	9.1	16.1	5.1	9.0	9.0	12.1	16.0	16.0
Avg	4.7	10.0	4.7	4.7	7.5	10.2	10.0	11.8
Std. Dev.	2.1	2.3	0.5	2.1	1.2	1.5	2.2	2.0
Measurements	672	2	2	14	14	16	1397	116
# 9°C WAT exceeded			0					
% Compliance WAT			100%					
# 13°C DM exceeded					0			
% Compliance DM					100%			
# 17°C WAT exceeded						0		
% Compliance WAT						100%		
# 21.2°C DM exceeded								0
% Compliance DM								100%

[Monitoring station/Datalogger ID: L&F GPS Coordinates: 39.6234 °N, 105.4451 °W; Sampling /monitoring site is in Bear Creek, above Lost & Found (old Singin' River

Table 19 Golden Willow Rd (Site 2a)

7 Monthly Sampling/Monitoring Events May 1 – November 30, 2013								
Monthly Results	pH, SU	Temp, °C	D. O., mg/L	Sp. Cd., mS/cm	Total NH3-N, ug/L	NO3+NO2-N, ug/L	TIN, ug/L	Total P, ug/L
Min	7.45	0.2	8.39	0.042	9	16	44	150
Max	8.22	14.8	13.51	0.063	47	101	136	518
Avg	7.91	7.75	10.81	0.05	27.29	68	95.29	277.43
Std. Dev.	0.23	5.32	1.74	0.01	12.56	32.37	33.29	121.43
Measurements	7	7	7	7	7	7	7	7

Datalogger Temperature Data 2013								
All Temperatures in °C	30-Min Temp. Cold/Warm Season		Oct 1-May 31 Stream Std. WAT (9°C)	Oct 1-May 31 2-Hr Avg. Temp.	Oct 1-May 31 Stream Std. DM (13°C)	June 1-Sept 30 Stream Std. WAT (17°C)	June 1-Sept 30 2-HR Avg. Temp.	June 1-Sept 30 Stream DM (21.2°C)
Min	-0.06	5.7	2.04	-0.04	0.43	9.8	5.7	10.6
Max	12.61	20.3	8.24	12.52	12.52	15.5	20.3	20.3
Avg	4.75	13.7	4.68	4.75	7.69	13.5	13.7	16.5
Std. Dev.	3.36	2.9	2.20	3.34	3.22	1.9	2.9	2.3
Measurements	2736	8	8	684	57	7	629	52
# 9°C WAT exceeded			0					
% Compliance WAT			100%					
# 13°C DM exceeded					0			
% Compliance DM					100%			
# 17°C WAT exceeded						0		
% Compliance WAT						100%		
# 21.2°C DM exceeded								0
% Compliance DM								100%

Table 20 Above Evergreen Lake, at CDOW site (Site 3a)

7 Monthly Sampling/Monitoring Events May 1 – November 30, 2013								
Monthly Parameter Results	pH, SU	Temp, °C	D. O., mg/L	Sp. Cd., mS/cm	Total NH3-N, ug/L	NO3+NO2-N, ug/L	TIN, ug/L	Total P, ug/L
Min	7.63	0	8.06	0.047	8	11	37	170
Max	8.34	14.6	13.46	0.077	59	122	146	543
Avg.	7.90	8.12	10.62	0.06	29.86	65.43	95.29	278.29
Std. Dev.	0.25	5.32	1.91	0.01	15.90	39.01	41.77	133.15
Measurements	7	7	7	7	7	7	7	7

Datalogger Temperature Data 2013								
All Temperatures in °C	30-Min Temp. COLD/ WARM SEASONS		Oct 1-May 31 Stream Std. WAT (9°C)	Oct 1-May 31 2-Hr Avg. Temp.	Oct 1-May 31 Stream Std. DM (13°C)	June 1-Sept 30 Stream Std. WAT (17°C)	June 1-Sept 30 2-HR Avg. Temp.	June 1-Sept 30 Stream DM (21.2°C)
Min	-0.1	6.2	-0.1	-0.1	-0.1	10.8	6.3	11.6
Max	13.0	21.7	8.9	12.9	12.9	16.5	21.4	21.4
Avg	2.1	14.8	1.8	2.1	3.1	14.6	14.8	17.7
Std. Dev.	3.5	3.1	2.8	3.5	4.4	1.9	3.0	2.5
Measurements	7229	2515	21	1807	7	7	628	52
# 9°C WAT exceeded			0					
% Compliance WAT			100%					
# 13°C DM exceeded					0			
% Compliance DM					100%			
# 17°C WAT exceeded						0		
% Compliance WAT						100%		
# 21.2°C DM exceeded								5
% Compliance DM								90%

[Monitoring station/Datalogger ID: ALKDOW GPS Coordinates: 39.6331 °N, 105.3372 °W; Sampling /monitoring site in Bear Creek above Evergreen Lake, at the CDOW fish survey site.]

Segment 1d (Evergreen Lake)

Sites 4a-4j comprises a profile monitoring station in Evergreen Lake. During the study period, sampling and monitoring were performed monthly at the individual Site locations at this profile station. This data is presented below. Also during the study period, temperature data collected with dataloggers at the individual Site locations were analyzed and compared to state water quality standards.

Table 21 Segment 1d Summary

Segment 1d Sampling/Monitoring Summary 2013									
Monthly Results	pH, SU	Temp, °C	D. O., mg/L	Sp. Cd., mS/cm	Total NH3-N, ug/L	NO3+NO 2-N, ug/L	TIN, Ug/L	TN Ug/L	Total P, ug/L
Min	7.28	3.1	5.55	0.056	7	3	49	224	2
Max	8.69	20.1	12.47	0.84	64	106	128	477	31
Avg	7.95	10.31	9.68	0.09	38.83	50.25	89.08	349.25	17.25
Std. Dev.	0.32	5.63	1.91	0.10	18.99	41.02	26.46	92.59	11.10
Measurements	60	60	60	60	12	12	12	12	12

Segment 1d Datalogger Temperature Summary 2013							
All Temperatures in °C	30-Min Temp. WARM SEASONS	Oct 1-May 31 Stream Std. WAT (9°C)	Oct 1-May 31 2-Hr Avg. Temp.	Oct 1-May 31 Stream Std. DM (13°C)	June 1-Sept 30 Stream Std. WAT (17°C)	June 1-Sept 30 2-HR Avg. Temp.	June 1-Sept 30 Stream DM (21.2°C)
Min	2.9				5.1	2.9	3.9
Max	22.7				20.3	22.5	22.5
Avg	14.2				14.3	14.2	15.0
Measurements	30048				88	7512	624
# 9°C WAT exceeded							
% Compliance WAT							
# 13°C DM exceeded							
% Compliance DM							
# 18.2°C WAT exceeded					20		
% Compliance WAT					77%		
# 23.8°C DM exceeded							0
% Compliance DM							100%

Table 22 **Segment 1d Summary**

6 Monthly Sampling/6 Monitoring Events May 1-Oct. 31, 2013										
Monthly Parameter Results	pH, SU	Temp, °C	D. O., mg/L	Sp. Cd., mS/cm	Total NH3-N, ug/L	NO3+NO 2-N, ug/L	TIN, ug/L	TN ug/L	Total P, Ug/L	Total Dissolved P Ug/L
Min	7.77	3.2	6.52	0.056	7	3	53	243	2	2
Max	8.69	20.1	12.47	0.84	62	106	128	477	31	8
Avg	8.40	10.60	10.11	0.20	37.33	51.00	88.33	368.50	17.33	4.33
Std. Dev.	0.31	5.70	1.93	0.29	18.58	40.70	26.54	91.92	11.22	2.13
Measurements	6	6	6	6	6	6	6	6	6	6

Datalogger Temperature Summary 2013							
All Temperatures in °C	30-Min Temp. Warm Season	Jan 1-Mar 31 Stream Std. WAT (9°C)	Jan 1-Mar 31 2-Hr Avg. Temp.	Jan 1-Mar 31 Stream Std. DM (13°C)	Apr 1-Dec. 31 Stream Std. WAT (19.3°C)	Apr 1-Dec 31 2-HR Avg. Temp.	Apr 1-Dec 31 Stream DM (23.8°C)
Min	2.85				5.19	2.94	3.89

Max	22.68				20.30	22.47	22.47
Avg	14.31				14.49	14.31	15.33
Std. Dev.	4.67				4.41	1878	156
Measurements	7512				22		
# 18.2°C WAT exceeded					5		
% Compliance WAT					77%		
# 23.8°C DM exceeded							0
% Compliance DM							100%
Datalogger Temperature Summary 2013							
All Temperatures in °C	30-Min Temp. WARM SEASON	Jan 1-Mar 31 Stream Std. WAT (9°C)	Jan 1-Mar 31 2-Hr Avg. Temp.	Jan 1-Mar 31 Stream Std. DM (13°C)	Apr 1-Dec. 31 Stream Std. WAT (19.3°C)	Apr 1-Dec 31 2-HR Avg. Temp.	Apr 1-Dec 31 Stream DM (23.8°C)
Min	2.85				5.19	2.94	3.89
Max	22.68				20.30	22.47	22.47
Avg	14.31				14.49	14.31	15.33
Std. Dev.	4.67				4.41	1878	156
Measurements	7512				22		
# 18.2°C WAT exceeded					5		
% Compliance WAT					77%		
# 23.8°C DM exceeded							0
% Compliance DM							100%

[Monitoring station/Datalogger ID: EMD2A GPS Coordinates: 39.6314 °N, 105.3231 °W; Sampling /monitoring site in Evergreen Lake near the dam, on the surface, near the EMD WTP intake.] N/A* indicates temp. readings not taken. N/A** Indicates no sampling at this location.

Table 23 Evergreen Lake, 1.0m below surface, near dam (Site 4b)

6 Monthly Monitoring Events May 1-Oct. 31, 2013										
Monthly Parameter Results	pH, SU	Temp, °C	D. O., mg/L	Sp. Cd., mS/cm	Total NH3-N, ug/L	NO3+NO2-N, ug/L	TIN, ug/L	TN ug/L	Total P, ug/L	Total Dissolved P Ug/L
Min	7.64	3.1	6.37	0.056						
Max	8.41	20.1	11.99	0.084						
Avg	8.19	10.43	9.82	0.07						
Std. Dev.	0.26	5.76	1.84	0.01						
Measurements	6	6	6	6						

Datalogger Temperature Summary 2013							
All Temperatures in °C	30-Min Temp. WARM SEASON	Jan 1-Mar 31 Stream Std. WAT (9°C)	Jan 1-Mar 31 2-Hr Avg. Temp.	Jan 1-Mar 31 Stream Std. DM (13°C)	Apr 1-Dec. 31 Stream Std. WAT (19.3°C)	Apr 1-Dec 31 2-HR Avg. Temp.	Apr 1-Dec 31 Stream DM (23.8°C)
Min	2.85				5.19	2.95	3.93
Max	22.35				20.13	22.26	22.26
Avg	14.19				14.36	14.19	15.11
Std. Dev.	4.60				4.36	4.60	4.77
Measurements	7512				22	1878	156
# 18.2°C WAT exceeded					5		
% Compliance WAT					77%		
# 23.8°C DM exceeded							0
% Compliance DM							100%

[Monitoring station/Datalogger ID: EMD2B GPS Coordinates: 39.6314 °N, 105.3231 °W; Sampling /monitoring site in Evergreen Lake near the dam, 1.5m below surface, near the EMD WTP intake.]

Table 24 Evergreen Lake, 1.5m below surface, near dam (Site 4c)

6 Monthly Monitoring Events May 1-Oct. 31, 2013								
Monthly Parameter Results	pH, SU	Temp, °C	D. O., mg/L	Sp. Cd., mS/cm	Total NH3-N, ug/L	NO3+NO2-N, ug/L	TIN, ug/L	Total P, ug/L
Min	7.45	3.1	6.24	0.056				
Max	8.36	19.8	12.11	0.084				
Avg	8.09	10.37	9.81	0.07				
Std. Dev.	0.30	5.66	1.88	0.01				
Measurements	6	6	6	6				

Datalogger Temperature Summary 2013							
All Temperatures in °C	30-Min Temp. WARM SEASON	Jan 1-Mar 31 Stream Std. WAT (9°C)	Jan 1-Mar 31 2-Hr Avg. Temp.	Jan 1-Mar 31 Stream Std. DM (13°C)	Apr 1-Dec. 31 Stream Std. WAT (19.3°C)	Apr 1-Dec 31 2-HR Avg. Temp.	Apr 1-Dec 31 Stream DM (23.8°C)
Min	2.90				5.16	2.96	3.93
Max	22.30				20.04	22.04	22.04
Avg	14.11				14.28	14.11	14.90
Std. Dev.	4.57				4.33	4.57	4.66
Measurements	7512				22	1878	156
# 18.2°C WAT exceeded					5		
% Compliance WAT					77%		
# 23.8°C DM exceeded							0
% Compliance DM							100%

[Monitoring station/Datalogger ID: EMD2C GPS Coordinates: 39.6314 °N, 105.3231 °W; Sampling /monitoring site in Evergreen Lake near the dam, 2.5m below the surface, near the EMD WTP intake.]

Table 25 Evergreen Lake, 2.0m below surface, near dam (Site 4d)

6 Monthly Monitoring Events May 1-Oct. 31, 2013										
Monthly Parameter Results	pH, SU	Temp, °C	D. O., mg/L	Sp. Cd., mS/cm	Total NH3-N, ug/L	NO3+NO2-N, ug/L	TIN, ug/L	TN ug/L	Total P, ug/L	Total Dissolved P Ug/L
Min	7.47	3.2	6.44	0.056						
Max	8.19	19.9	11.88	0.085						
Avg	7.96	10.37	9.72	0.07						
Std. Dev.	0.23	5.68	1.78	0.01						
Measurements	6	6	6	6						

Datalogger Temperature Summary 2013							
All Temperatures in °C	30-Min Temp. WARM SEASON	Jan 1-Mar 31 Stream Std. WAT (9°C)	Jan 1-Mar 31 2-Hr Avg. Temp.	Jan 1-Mar 31 Stream Std. DM (13°C)	Apr 1-Dec. 31 Stream Std. WAT (19.3°C)	Apr 1-Dec 31 2-HR Avg. Temp.	Apr 1-Dec 31 Stream DM (23.8°C)
Min	2.93				5.14	2.96	3.92
Max	21.46				19.87	21.36	21.36
Avg	14.01				14.17	14.01	14.65
Std. Dev.	4.52				4.29	4.52	4.53
Measurements	7512				22	1878	156
# 18.2°C WAT exceeded					5		
% Compliance WAT					77%		
# 23.8°C DM exceeded							0
% Compliance DM							100%

[Monitoring station/Datalogger ID: EMD2D GPS Coordinates: 39.6314 °N, 105.3231 °W; Sampling /monitoring site in Evergreen Lake near the dam, 3.5m below the surface, near the EMD WTP intake.]

Table 26 Evergreen Lake, 2.5m below surface, near dam (Site 4e)

6 Monthly Monitoring Events May 1-Oct. 31, 2013				
Monthly Parameter Results	pH, SU	Temp, °C	D. O., mg/L	Sp. Cd., mS/cm
Min	7.41	3.2	6.24	0.056
Max	8.06	19.7	11.8	0.085
Avg	7.90	10.33	9.62	0.07
Std. Dev.	0.22	5.62	1.77	0.01
Measurements	6	6	6	6

[Monitoring station/Datalogger ID: EMD4E GPS Coordinates: 39.6314 °N, 105.3231 °W; Sampling /monitoring site in Evergreen Lake near the dam, 2.5m below the surface, near the EMD WTP intake.]

Table 27 Evergreen Lake, 3.0m below surface, near dam (Site 4f)

6 Monthly Monitoring Events May 1-Oct. 31, 2013				
Monthly Parameter Results	**pH, SU**	**Temp, °C**	**D. O., mg/L**	**Sp. Cd., mS/cm**
Min	7.36	3.2	5.76	0.056
Max	7.99	19.7	11.85	0.085
Avg	7.85	10.33	9.44	0.07
Std. Dev.	0.22	5.62	2.04	0.01
Measurements	6	6	6	6

[Monitoring station/Datalogger ID: EMD4f GPS Coordinates: 39.6314 °N, 105.3231 °W; Sampling /monitoring site in Evergreen Lake near the dam, 3.0m below the surface, near the EMD WTP intake.]

Table 28 Evergreen Lake, 3.5m below surface, near dam (Site 4g)

6 Monthly Monitoring Events May 1-Oct. 31, 2013				
Monthly Parameter Results	**pH, SU**	**Temp, °C**	**D. O., mg/L**	**Sp. Cd., mS/cm**
Min	7.36	3.2	6.24	0.056
Max	7.96	19.6	11.52	0.085
Avg	7.81	10.28	9.67	0.07
Std. Dev.	0.21	5.58	1.76	0.01
Measurements	6	6	6	6

Monitoring station/Datalogger ID: EMD4g GPS Coordinates: 39.6314 □N, 105.32
Evergreen Lake near the dam, 3.5m below the surface, near the EMD WTP intake.]

Table 29 Evergreen Lake, 4.0m below surface, near dam (Site 4h)

6 Monthly Monitoring Events May 1-Oct. 31, 2013				
Monthly Parameter Results	**pH, SU**	**Temp, °C**	**D. O., mg/L**	**Sp. Cd., mS/cm**
Min	7.33	3.2	5.9	0.06
Max	7.94	19.6	11.92	0.09
Avg	7.78	10.23	9.54	0.07
Std. Dev.	0.21	5.61	1.95	0.01
Measurements	6	6	6	6

Monitoring station/Datalogger ID: EMD4h GPS Coordinates: 39.6314 □N, 105.3231
Evergreen Lake near the dam, 4.0m below the surface, near the EMD WTP intake.]

Table 30 Evergreen Lake, 5.0m below surface, near dam (Site 4i)

6 Monthly Sampling/6 Monitoring Monthly Monitoring Events May 1-Oct. 31, 2013										
Monthly Parameter Results	pH, SU	Temp, °C	D. O., mg/L	Sp. Cd., mS/cm	Total NH3-N,	NO3+NO 2-N,	TIN, ug/L	TN ug/L	Total P,	Total Dissolve

					ug/L	ug/L			Ug/L	d P Ug/L
Min	7.28	3.3	5.79	0.056	9	4	49	224	2	2
Max	7.91	19.6	11.99	0.085	64	106	127	446	31	10
Avg	7.75	10.15	9.58	0.07	40.33	49.50	89.83	330.00	17.17	5.67
Std. Dev.	0.21	5.56	2.03	0.01	19.27	41.32	26.35	89.18	10.98	2.75
Measurements	6	6	6	6	6	6	6	6	6	6

Monitoring station/Datalogger ID: EMD4i GPS Coordinates: 39.6314 n N, 105.3231
Evergreen Lake near the dam, 5.0m below the surface, near the EMD WTP intake.]

Table 31 Evergreen Lake, 6.0m below surface, near dam (Site 4j)

6 Monthly Monitoring Events May 1-Oct. 31, 2013				
Monthly Parameter Results	**pH, SU**	**Temp, °C**	**D. O., mg/L**	**Sp. Cd., mS/cm**
Min	7.31	3.3	5.55	0.056
Max	7.87	19.5	11.72	0.085
Avg	7.74	10.03	9.49	0.07
Std. Dev.	0.19	5.49	2.03	0.01
Measurements	6	6	6	6

Monitoring station/Datalogger ID: EMD4j GPS Coordinates: 39.6314 [illegible] N, 105.3231 W; Sampling
Evergreen Lake near the dam, 6.0m below the surface, near the EMD WTP intake.]

Segment 1e (Mainstem below Evergreen Lake and Above Harriman Diversion)

Table 32 Segment 1e Summary

Segment 1e Sampling/Monitoring Summary 2013									
Monthly Parameter Results	pH, SU	Temp, °C	D. O., mg/L	Sp. Cd., mS/cm	Total NH3-N, ug/L	NO3+N O2-N, ug/L	TIN, ug/L	TN Ug/L	Total P, ug/L
Min	7.42	1.3	7.46	0.065	5	2	48	134	2
Max	8.67	20.8	13.28	0.313	94	725	762	997	117
Avg	8.04	9.61	10.58	0.14	34.54	246.17	280.70	515.17	30.46
Std. Dev.	0.28	6.75	1.96	0.06	19.86	174.90	171.48	200.99	22.16
Measurements	54	54	54	54	54	54	54	54	54

Segment 1e Datalogger Temperature Summary 2013								
All Temperatures in °C	30-Min Temp. COLD/ WARM SEASON		Nov 1-Mar 31 Stream Std. WAT (9°C)	Nov 1-Mar 31 2-Hr Avg. Temp.	Nov 1-Mar 31 Stream Std. DM (13°C)	Apr 1-Oct 31 Stream Std. WAT (19.3°C)	Apr 1-Oct 31 2-HR Avg. Temp.	Apr 1-Oct 31 Stream DM (23.8°C)
Min	-0.2	-0.1	-0.1	-0.2	-0.1	2.6	-0.1	1.4
Max	9.7	23.2	2.2	9.6	9.6	19.5	23.2	23.2
Avg	0.7	12.1	0.5	0.7	1.5	12.1	12.1	14.1
Measurements	22105	34023	62	5524	461	100	8503	706
# 9°C WAT exceeded			0					
% Compliance WAT			100%					
# 13°C DM exceeded					0			
% Compliance DM					100%			
# 19.3°C WAT exceeded						1		
% Compliance WAT						99%		
# 23.8°C DM exceeded								0
% Compliance DM								100%

Table 33 Downtown Evergreen, at CDOW site (Site 5)

9 Monthly Sampling/Monitoring Events March - November, 2013									
	pH, SU	Temp, °C	D. O., mg/L	Sp. Cd., mS/cm	Total NH3-N,	NO3+N O2-N,	TIN, ug/L	TN Ug/L	Total P, ug/L

					ug/L	ug/L			
Min	7.59	1.3	7.46	0.065	6	2	48	134	6
Max	8.58	20.7	12.89	0.17	94	280	293	524	37
Avg	7.93	8.99	10.40	0.10	41.11	110.67	151.78	361.56	21.44
Std. Dev.	0.32	6.87	2.02	0.03	28.35	88.45	83.79	120.40	9.93
Measurements	9	9	9	9	9	9	9	9	9

Site 5 Datalogger Temperature Summary 2013

All Temperatures in °C	30-Min Temp. COLD/ WARM SEASON		Nov 1-Mar 31 Stream Std. WAT (9°C)	Nov 1-Mar 31 2-Hr Avg. Temp.	Nov 1-Mar 31 Stream Std. DM (13°C)	Apr 1-Oct 31 Stream Std. WAT (19.3°C)	Apr 1-Oct 31 2-HR Avg. Temp.	Apr 1-Oct 31 Stream DM (23.8°C)
Min	-0.17	1.7	0.55	-0.14	0.83	3.1	1.7	2.9
Max	4.22	22.4	1.88	4.08	4.08	19.5	22.1	22.1
Avg	1.12	11.9	1.12	1.12	1.92	12.0	11.9	13.0
Measurements	2992	9862	9	748	63	29	2465	205
# 9°C WAT exceeded			0					
% Compliance WAT			100%					
# 13°C DM exceeded					0			
% Compliance DM					100%			
# 19.3°C WAT exceeded						1		
% Compliance WAT						97%		
# 23.8°C DM exceeded								0
% Compliance DM								100%

Monitoring station/Datalogger ID: LTLBAR GPS Coordinates: 39.6327 °N, 105.3183 °W; Sampling /monitoring site in Bear Creek near the west end of public parking lot, across from the Little Bear, CDOW fish survey site.]

Table 34 Bear Creek Cabins (Site 8a)

9 Monthly Sampling/Monitoring Events March - November, 2013

Monthly Parameter Results	pH, SU	Temp, °C	D. O., mg/L	Sp. Cd., mS/cm	Total NH3-N, ug/L	NO3+NO2-N, ug/L	TIN, ug/L	Total P, ug/L
Min	7.42	1.7	7.57	0.071	12	66	100	234
Max	8.27	20.8	13.05	0.192	56	652	684	927
Avg	7.84	9.39	10.47	0.11	34	258.67	292.67	487.56
Std. Dev.	0.27	6.97	1.99	0.04	15.70	208.24	208.47	219.14
Measurements	9	9	9	9	9	9	9	9

Site 8a Datalogger Temperature Summary 2013

All Temperatures in °C	30-Min Temp. COLD/ WARM SEASON		Nov 1-Mar 31 Stream Std. WAT (9°C)	Nov 1-Mar 31 2-Hr Avg. Temp.	Nov 1-Mar 31 Stream Std. DM (13°C)	Apr 1-Oct 31 Stream Std. WAT (19.3°C)	Apr 1-Oct 31 2-HR Avg. Temp.	Apr 1-Oct 31 Stream DM (23.8°C)
Min	-0.14	-0.1	0.02	-0.14	-0.03	3.1	-0.1	3.3
Max	8.07	23.2	1.87	7.71	7.71	18.9	23.0	23.0
Avg	1.03	11.3	0.92	1.03	2.74	11.2	11.3	13.3
Std. Dev.	1.33	5.9	0.55	1.31	1.74	5.7	5.9	5.7
Measurements	4316	5445	12	1079	90	16	1361	113
# 9°C WAT exceeded			0					
% Compliance WAT			100%					
# 13°C DM exceeded					0			
% Compliance DM					100%			
# 19.3°C WAT exceeded						0		
% Compliance WAT						100%		

# 23.8°C DM exceeded							0
% Compliance DM							100%

[Monitoring station/Datalogger ID: BCCDOW GPS Coordinates: 39.6425°N, 105.3084°W; Sampling/ monitoring site at bridge above the Bear Creek Cabins WWTP effluent discharge, at the CDOW fish survey site.]

Table 35 O'Fallon Park (Site 9)

9 Monthly Sampling/Monitoring Events March - November, 2013								
Monthly Parameter Results	pH, SU	Temp, °C	D. O., mg/L	Sp. Cd., mS/cm	Total NH3-N, ug/L	NO3+NO2-N, ug/L	TIN, ug/L	Total P, ug/L
Min	8.1	1.3	7.65	0.083	13	75	127	264
Max	8.67	20	13.28	0.223	59	385	444	567
Avg	8.25	9.49	10.68	0.13	39.11	199.89	239.00	454.78
Std. Dev.	0.18	6.93	2.10	0.04	16.52	89.24	88.18	95.74
Measurements	9	9	9	9	9	9	9	9

Datalogger Temperature Data 2013								
All Temperatures in °C	30-Min Temp. COLD/ WARM SEASONS		Nov 1-Mar 31 Stream Std. WAT (9°C)	Nov 1-Mar 31 2-Hr Avg. Temp.	Nov 1-Mar 31 Stream Std. DM (13°C)	Apr 1-Oct 31 Stream Std. WAT (19.3°C)	Apr 1-Oct 31 2-HR Avg. Temp.	Apr 1-Oct 31 DM (23.8°C)
Min	-0.03	8.3	-0.03	-0.03	-0.03	13.2	8.4	11.9
Max	2.53	22.3	0.42	2.49	2.49	18.1	21.9	21.9
Avg	0.15	16.5	0.07	0.15	0.34	16.5	16.5	18.9
Std. Dev.	0.43	2.2	0.18	0.43	0.67	1.4	2.2	2.2
Measurements	1853	2374	5	463	38	7	593	49
# 9°C WAT exceeded			0					
% Compliance WAT			100%					
# 13°C DM exceeded					0			
% Compliance DM					100%			
# 19.3°C WAT exceeded						0		
% Compliance WAT						100%		
# 23.8°C DM exceeded								0
% Compliance DM								100%

[Monitoring station/Datalogger ID: OFPDOW GPS Coordinates: 39.6564°N, 105.2917°W; Sampling/ monitoring site north side of the creek above ETU restoration site, at the CDOW fish survey site.]

Table 36 Lair o' the Bear (Site 12)

9 Monthly Sampling/Monitoring Events March - November, 2013								
Monthly Parameter Results	pH, SU	Temp, °C	D. O., mg/L	Sp. Cd., mS/cm	Total NH3-N, ug/L	NO3+NO2-N, ug/L	TIN, ug/L	Total P, ug/L
Min	7.86	1.7	7.59	0.1	9	177	195	349
Max	8.47	19.5	13.26	0.272	80	725	762	937
Avg	8.11	9.66	10.74	0.16	33.56	324.22	357.78	630.33
Std. Dev.	0.22	6.60	2.03	0.06	20.60	180.87	177.02	219.18
Measurements	9	9	9	9	9	9	9	9

Datalogger Temperature Data 2013								
All Temperatures in °C	30-Min Temp. COLD/WARM SEASON		Nov 1-Mar 31 Stream Std. WAT (9°C)	Nov 1-Mar 31 2-Hr Avg. Temp.	Nov 1-Mar 31 Stream Std. DM (13°C)	Apr 1-Oct 31 Stream Std. WAT (19.3°C)	Apr 1-Oct 31 2-HR Avg. Temp.	Apr 1-Oct 31 Stream DM (23.8°C)
Min	-0.1	-0.1	-0.1	-0.1	-0.1	2.6	0.0	2.3
Max	8.4	22.6	1.5	8.2	8.2	18.8	22.4	22.4
Avg	0.5	11.6	0.3	0.5	1.2	11.5	11.6	14.2
Std. Dev.	1.2	6.0	0.5	1.2	1.6	5.5	6.0	5.7

Measurements	4314	5447	12	1078	90	16	1361	113
# 9°C WAT exceeded			0					
% Compliance WAT			100%					
# 13°C DM exceeded					0			
% Compliance DM					100%			
# 19.3°C WAT exceeded						0		
% Compliance WAT						100%		
# 23.8°C DM exceeded								0
% Compliance DM								100%

[Monitoring station/Datalogger ID: LOBDOW GPS Coordinates: 39.6672°N, 105.2687°W; Sampling/ monitoring site in Bear Creek at the end of main path to Bear Creek from the parking lot, at the CDOW fish survey site.]

Table 37 Idledale (Shady Lane-Site 13a)

9 Monthly Sampling/Monitoring Events March - November, 2013								
Monthly Parameter Results	pH, SU	Temp, °C	D. O., mg/L	Sp. Cd., mS/cm	Total NH3-N, ug/L	NO3+NO2-N, ug/L	TIN, ug/L	Total P, ug/L
Min	7.87	1.8	8.3	0.083	8	147	193	236
Max	8.55	20.3	12.92	0.27	59	720	756	997
Avg	8.07	10.02	10.54	0.16	31.11	299.33	330.44	592.67
Std. Dev.	0.23	6.62	1.80	0.06	14.87	171.39	169.37	206.13
Measurements	9	9	9	9	9	9	9	9

Datalogger Temperature Data 2013								
All Temperatures in °C	30-Min Temp. COLD/ WARM SEASONS		Nov 1-Mar 31 Stream Std. WAT (9°C)	Nov 1-Mar 31. 2-Hr Avg. Temp.	Nov 1-Mar 31 Stream Std. DM (13°C)	Apr 1-Oct 31 Stream Std. WAT (19.3°C)	Apr 1-Oct 31 2-HR Avg. Temp.	Apr 1-Oct 31 Stream DM (23.8°C)
Min	-0.1	0.0	0.0	-0.1	0.0	2.7	0.0	2.2
Max	9.3	23.2	1.5	9.1	9.1	19.2	23.2	23.2
Avg	0.5	11.8	0.3	0.5	1.0	11.7	11.8	14.5
Std. Dev.	1.3	6.0	0.5	1.3	2.0	5.5	6.0	5.8
Measurements	4315	5447	12	1078	90	16	1361	113
# 9°C WAT exceeded			0					
% Compliance WAT			100%					
# 13°C DM exceeded					0			
% Compliance DM					100%			
# 19.3°C WAT exceeded						0		
% Compliance WAT						100%		
# 23.8°C DM exceeded								0
% Compliance DM								100%

[Monitoring station/Datalogger ID: IDLE GPS Coordinates: 39.6621°N, 105.2406°W; Sampling/ monitoring site in Bear Creek at the CDOW fish survey site.]

Table 38 West End of Morrison (Site 14a)

9 Monthly Sampling/Monitoring Events March - November, 2013								
Monthly Parameter Results	pH, SU	Temp, °C	D. O., mg/L	Sp. Cd., mS/cm	Total NH3-N, ug/L	NO3+NO2-N, ug/L	TIN, ug/L	Total P, ug/L
Min	7.73	1.9	7.72	0.111	5	161	195	296
Max	8.55	19.9	12.9	0.313	50	687	719	880
Avg	8.03	10.11	10.67	0.17	28.33	284.22	312.56	564.11
Std. Dev.	0.25	6.40	1.77	0.07	16.80	176.84	173.86	174.62
Measurements	9	9	9	9	9	9	9	9

Datalogger Temperature Data 2013								
All Temperatures in °C	30-Min Temp. COLD/ WARM SEASONS		Nov 1-Mar 31 Stream Std. WAT (9°C)	Nov 1-Mar 31 2-Hr Avg. Temp.	Nov 1-Mar 31 Stream Std. DM (13°C)	Apr 1-Oct 31 Stream Std. WAT (19.3°C)	Apr 1-Oct 31 2-HR Avg. Temp.	Apr 1-Oct 31 Stream DM (23.8°C)
Min	-0.20	-0.09	-0.09	-0.20	-0.09	2.80	-0.07	1.40
Max	9.73	22.49	2.16	9.56	9.56	19.23	22.47	22.47
Avg	0.55	12.05	0.33	0.55	1.18	11.96	12.05	14.43
Std. Dev.	1.50	5.87	0.71	1.50	2.21	5.40	5.86	5.53
Measurements	4315	5448	12	1078	90	16	1362	113
# 9°C WAT exceeded			0					
% Compliance WAT			100%					
# 13°C DM exceeded					0			
% Compliance DM					100%			
# 19.3°C WAT exceeded						0		
% Compliance WAT						100%		
# 23.8°C DM exceeded								0
% Compliance DM								100%

[Monitoring station/Datalogger ID: MORR10 GPS Coordinates: 39.6529°N, 105.2003°W; Sampling/ monitoring site west end of Morrison, at the gated bridge to Denver Mountain parks Headquarters, at the CDOW fish survey site.]

Table 39 Segment 1b (Below Harriman Diversion summary) (Site 15a)

Segment 1b Sampling/Monitoring Summary 2013									
Monthly Parameter Results	pH, SU	Temp, °C	D. O., mg/L	Sp. Cd., mS/cm	Total NH3-N, ug/L	NO3+NO2-N, ug/L	TIN, ug/L	TN Ug/L	Total P, ug/L
Min	7.46	0	6.87	0.57	5	207	234	406	2
Max	8.77	22.5	14.2	2.62	602	2637	2701	3154	79
Avg	8.21	9.91	10.59	1.55	116.33	777.67	894	1217.13	45.53
Std. Dev.	0.33	7.33	2.23	0.61	173.93	813.40	802.98	864.86	22.87
Measurements	15	15	15	15	15	15	15	15	15

Segment 1b Datalogger Temperature Summary 2013								
All Temperatures in °C	30-Min Temp. COLD/WARM SEASONS		Nov 1-Mar 31 Stream Std. WAT (9°C)	Nov 1-Mar 31 2-Hr Avg. Temp.	Nov 1-Mar 31 Stream Std. DM (13°C)	Apr 1-Oct 31 Stream Std. WAT (19.3°C)	Apr 1-Oct 31 2-HR Avg. Temp.	Apr 1-Oct 31 Stream DM (23.8°C)
Min	-0.14	-0.09	0.29	-0.10	0.36	3.40	-0.09	1.99
Max	12.78	22.27	4.24	12.70	12.70	18.95	22.18	22.18
Avg	1.83	12.08	1.56	1.83	3.88	11.86	12.08	14.40
Measurements	3136	5212	9	784	66	15	1303	108
# 9°C WAT exceeded			0					
% Compliance WAT			100%					
# 13°C DM exceeded					0			
% Compliance DM					100%			
# 19.3°C WAT exceeded						0		
% Compliance WAT						100%		
# 23.8°C DM exceeded								0
% Compliance DM								100%

[Monitoring station/Datalogger ID: MORR11 GPS Coordinates: 39.6522 °N, 105.1731 °W; Monitoring site in Bear Creek near USGS gage in Bear Creek Park.]

Segment 3 (Vance Creek)

Table 40 Mt. Evans Wilderness Drainage, Vance Creek (Site 25)

5 Monthly Sampling/Monitoring Events June 1 – October 31, 2013								
Monthly Parameter Results	pH, SU	Temp, °C	D. O., mg/L	Sp. Cd., mS/cm	Total NH3-N, ug/L	NO3+NO2-N, ug/L	TIN, ug/L	Total P, ug/L
Min	7.83	1.8	8.09	0.06	16	2	28	62
Max	8.37	13.6	13.51	0.082	47	57	92	353
Avg	8.07	9.15	10.42	0.07	29.20	25.80	55.00	200.80
Std. Dev.	0.22	4.36	1.77	0.01	10.83	20.29	25.27	98.78
Measurements	5	5	5	5	5	5	5	5

Datalogger Temperature Data 2013								
All Temperatures in °C	30-Min Temp. COLD/ WARM SEASON		Oct 1-May 31 Stream Std. WAT (9°C)	Oct 1-May 31 2-Hr Avg. Temp.	Oct 1-May 31 Stream Std. DM (13°C)	June 1-Sept 30 Stream Std. WAT (17°C)	June 1-Sept 30 2-HR Avg. Temp.	June 1-Sept 30 DM (21.2°C)
Min	0.4	4.3	4.9	0.5	5.1	10.1	4.4	11.2
Max	14.6	21.3	8.6	14.3	14.3	15.4	21.2	21.2
Avg	6.9	13.5	6.6	6.9	10.9	13.4	13.5	17.3
Std. Dev.	3.30	3.3	1.54	3.27	2.56	1.6	3.3	2.2
Measurements	1200	2516	3	300	25	7	629	52
# 9°C WAT exceeded			0					
% Compliance WAT			100%					
# 13°C DM exceeded					5			
% Compliance DM					80%			
# 17°C WAT exceeded						0		
% Compliance WAT						100%		
# 21.2°C DM exceeded								1
% Compliance DM								98%

[Monitoring station/Datalogger ID: ALKMEL GPS Coordinates: 39.6322°N, 105.4558°W; Sampling/ monitoring site in Vance Creek.]

Segment 5 (Cub Creek)

Table 41 Segment 5 Summary

Segment 5 Sampling/Monitoring Summary 2013								
Monthly Parameter Results	pH, SU	Temp, °C	D. O., mg/L	Sp. Cd., mS/cm	Total NH3-N, ug/L	NO3+NO2-N, ug/L	TIN, ug/L	Total P, ug/L
Min	7.43	0	6.25	0.061	5	2	26	133
Max	8.82	20	13.15	1.13	222	1325	1547	2147
Avg	8.15	7.43	10.49	0.70	32.91	253.51	286.42	573.04
Std. Dev.	0.27	6.12	1.69	0.31	30.22	252.07	269.60	425.64
Measurements	78	78	78	78	78	78	78	78

Segment 5 Datalogger Temperature Summary 2013								
All Temperatures in °C	30-Min Temp. COLD/ WARM SEASON		Nov 1-Mar 31 Stream Std. WAT (9°C)	Nov 1-Mar 31 2-Hr Avg. Temp.	Nov 1-Mar 31 Stream Std. DM (13°C)	Apr 1-Oct 31 Stream Std. WAT (18.2°C)	Apr 1-Oct 31 2-HR Avg. Temp.	Apr 1-Oct 31 DM (23.8°C)
Min	-0.1	-0.1	0.0	-0.1	0.0	0.6	-0.1	0.0
Max	8.2	27.6	4.9	8.1	8.1	15.6	25.8	25.8
Avg	2.5	10.5	3.0	2.5	3.9	10.6	10.5	13.3

Measurements	4010	27863	12	1001	82	81	6965	580
# 18.2°C WAT exceeded						0		
% Compliance WAT						100%		
# 23.8°C DM exceeded								1
% Compliance DM								100%
# 9 □C				0				
% Compliance WAT				100%				
# 13 □C					0			
% Compliance DM					100%			

Table 42 Little Cub Creek above Brook Forest Inn (Site 35)

6 Monthly Sampling/Monitoring Events June 1 – November 30, 2013								
Monthly Parameter Results	pH, SU	Temp, °C	D. O., mg/L	Sp. Cd., mS/cm	Total NH3-N, ug/L	NO3+NO2-N, ug/L	TIN, ug/L	Total P, ug/L
Min	7.7	0.2	8.49	0.061	8	76	103	255
Max	8.12	17.6	12.2	0.131	56	339	386	826
Avg	7.96	9.78	10.31	0.09	27.60	221.83	249.33	415.50
Std. Dev.	0.14	5.98	1.29	0.02	19.85	77.72	86.41	192.53
Measurements	6	6	6	6	5	6	6	6

Datalogger Temperature Data 2013								
All Temperatures in °C	30-Min Temp. Cold/Warm season.		Nov 1-Mar 31 Stream Std. WAT (9°C)	Nov 1-Mar 31 2-Hr Avg. Temp.	Nov 1-Mar 31 Stream Std. DM (13°C)	Apr 1-Oct 31 Stream Std. WAT (18.2°C)	Apr 1-Oct 31 2-HR Avg. Temp.	Apr 1-Oct 31 DM (23.8°C)
Min	-0.1	0.0	0.3	0.0	0.0	1.7	0.0	2.0
Max	3.9	18.8	0.9	3.7	3.7	13.5	18.1	18.1
Avg	0.5	9.2	0.6	0.5	1.3	9.3	9.2	11.5
Std. Dev.	0.7	4.1	0.2	0.7	1.1	3.7	4.1	4.3
Measurements	1181	8160	3	295	24	24	2040	170
# 18.2°C WAT exceeded						6		
% Compliance WAT						75%		
# 23.8°C DM exceeded								0
% Compliance DM								100%
# 9□C WAT exceeded			0					
% Compliance WAT			100%					
# 13 □C					0			
% Compliance DM					100%			

[Monitoring station/Datalogger ID: (ABFI) GPS Coordinates: 39.5795°N, 105.3817°W; Sampling/ monitoring site in Little Cub Creek above Brook Forest Inn WWTP discharge.]

Table 43 Cub Creek Park on Little Cub Creek (site 50)

6 Monthly Sampling/Monitoring Events June 1 – November 30, 2013								
Monthly Parameter Results	pH, SU	Temp, °C	D. O., mg/L	Sp. Cd., mS/cm	Total NH3-N, ug/L	NO3+NO2-N, ug/L	TIN, ug/L	Total P, ug/L
Min	7.82	0.5	7.43	0.164	14	97	124	133
Max	8.18	20	13.1	0.214	48	375	396	758
Avg	8.04	11.65	9.97	0.19	27.83	230.17	258.00	474.33
Std. Dev.	0.12	6.73	1.84	0.02	11.25	93.99	91.78	225.07
Measurements	6	6	6	6	6	6	6	6

Datalogger Temperature Data 2013							
All Temperatures in °C	30-Min Temp. Cold/ Warm Season	Oct 1-May 31 Stream Std. WAT (9°C)	Oct 1-May 31 2-Hr Avg.	Oct 1-May 31 Stream Std. DM	June 1-Sept 30 Stream Std. WAT (17°C)	June 1-Sept 30 2-HR Avg.	June 1-Sept 30 DM

				Temp.	(13°C)		Temp.	(21.2°C)
Min	-0.1	-0.1	0.0	-0.1	0.0	0.6	-0.1	0.0
Max	3.9	21.4	0.0	3.7	3.7	15.6	21.3	21.3
Avg	0.1	8.7	0.0	0.1	0.7	8.6	8.7	11.5
Std. Dev.	0.6	6.0	0.0	0.6	1.2	5.5	6.0	6.4
Measurements	480	5453	1	120	10	16	1363	113
# 9°C WAT exceeded			0					
% Compliance WAT			100%					
# 13°C DM exceeded					0			
% Compliance DM					100%			
# 17°C WAT exceeded						0		
% Compliance WAT						100%		
# 21.2°C DM exceeded								0
% Compliance DM								100%

Table 44 **Upper Troublesome Creek (site 64)**

9 Monthly Sampling/Monitoring Events March 1- November 30, 2013								
Monthly Parameter Results	pH, SU	Temp, °C	D. O., mg/L	Sp. Cd., mS/cm	Total NH3-N, ug/L	NO3+NO2-N, ug/L	TIN, ug/L	Total P, ug/L
Min	7.84	1.6	8.83	0.576	11	78	121	619
Max	8.72	12.38	13.11	0.734	70	507	550	902
Avg	8.26	7.04	10.46	0.65	33.56	334.33	367.89	721.22
Std. Dev.	0.28	4.24	1.40	0.05	18.62	128.36	135.70	78.84
Measurements	9	9	9	9	9	9	9	9

Datalogger Temperature Data 2013								
All Temperatures in °C	30-Min Temp. Cold/ Warm Season		Oct 1-May 31 Stream Std. WAT (9°C)	Oct 1-May 31 2-Hr Avg. Temp.	Oct 1-May 31 Stream Std. DM (13°C)	June 1-Sept 30 Stream Std. WAT (17°C)	June 1-Sept 30 2-HR Avg. Temp.	June 1-Sept 30 DM (21.2°C)
Min	0.8	3.0	3.3	0.8	3.0	6.2	3.0	5.9
Max	8.2	22.6	4.2	8.1	8.1	14.8	22.3	22.3
Avg	3.6	11.8	3.8	3.6	6.0	11.9	11.8	15.3
Std. Dev.	1.5	3.4	0.4	1.5	1.4	2.3	3.4	3.4
Measurements	1174	8544	3	293	24	25	2136	178
# 9°C WAT exceeded			0					
% Compliance WAT			1005					
# 13°C DM exceeded					0			
% Compliance DM					100%			
# 17°C WAT exceeded						0		
% Compliance WAT						100%		
# 21.2°C DM exceeded								0
% Compliance DM								100%

Table 45 **Lower Troublesome Creek (Site 32)**

9 Monthly Sampling/Monitoring Events March 1- November 30, 2013								
Monthly Parameter Results	pH, SU	Temp, °C	D. O., mg/L	Sp. Cd., mS/cm	Total NH3-N, ug/L	NO3+NO2-N, ug/L	TIN, ug/L	Total P, ug/L
Min	7.88	2.1	8.07	0.09	20	267	304	674
Max	8.58	19.2	12.93	0.704	222	1325	1547	2147
Avg	8.1	9.5	10.7	0.6	65.6	720.3	785.9	1377.4
Std. Dev.	0.2	5.7	1.7	0.2	57.4	344.5	384.5	495.4
Measurements	9	9	9	9	9	9	9	9

Datalogger Temperature Data 2013							
All Temperatures in °C	30-Min Temp. COLD/ WARM	Oct 1-May 31 Stream Std. WAT (9°C)	Oct 1-May 31 2-Hr Avg. Temp.	Oct 1-May 31 Stream Std. DM	June 1-Sept 30 Stream Std. WAT (17°C)	June 1-Sept 30 2-HR Avg.	June 1-Sept 30 DM

	SEASON				(13°C)		Temp.	(21.2°C)
Min	1.0	3.8	3.8	1.0	3.6	6.4	3.8	6.2
Max	7.4	27.6	4.9	7.3	7.3	15.0	25.8	25.8
Avg	4.2	12.2	4.4	4.2	5.8	12.3	12.2	14.5
Std. Dev.	1.4	3.5	0.4	1.4	1.0	2.9	3.5	3.5
Measurements	1175	5706	5	293	24	16	1426	119
# 9°C WAT exceeded			0					
% Compliance WAT			100%					
# 13°C DM exceeded					0			
% Compliance DM					100%			
# 17°C WAT exceeded						0		
% Compliance WAT						100%		
# 21.2°C DM exceeded								1
% Compliance DM								99%

Table 46 Kerr Gulch at Mouth (Site 52)

12 Monthly Sampling/Monitoring Events January 1- December 31, 2013										
Monthly Parameter Results	pH, SU	Temp, °C	D. O., mg/L	Sp. Cd., mS/cm	Total NH3-N, ug/L	NO3+NO 2-N, ug/L	TIN ug/L,	TN Ug/L	Total P, ug/L	Ecoli
Min	7.87	0	8.17	0.128	5	84	115	338	2	1
Max	8.66	14.65	13.15	1.02	76	810	886	1717	105	21
Avg	8.24	5.76	11.24	0.84	28.00	332.67	360.67	629.92	27.08	4.25
Std. Dev.	0.27	5.40	1.49	0.24	18.95	191.00	199.96	359.05	26.91	6.15
Measurements	12	12	12	12	12	12	12	12	12	12

Table 47 Kerr Gulch @ Riefenburg Property (Site 53)

12 Monthly Sampling/Monitoring Events January 1- December 31, 2013										
Monthly Parameter Results	pH, SU	Temp, °C	D. O., mg/L	Sp. Cd., mS/cm	Total NH3-N, ug/L	NO3+NO 2-N, ug/L	TIN ug/L,	TN Ug/L	Total P, ug/L	Ecoli
Min	7.91	0.2	7.27	0.793	5	30	63	187	2	1
Max	8.71	15.48	13.12	1.01	43	219	224	612	49	37
Avg	8.20	5.99	10.86	0.92	24.17	101.83	126	327.08	17.08	7.50
Std. Dev.	0.23	5.74	1.71	0.07	10.95	57.01	52.27	116.27	12.35	11.52
Measurements	12	12	12	12	12	12	12	12	12	12

Table 48 Kerr Gulch Top End (Site 54)

12 Monthly Sampling/Monitoring Events January 1- December 31, 2013										
Monthly Parameter Results	pH, SU	Temp, °C	D. O., mg/L	Sp. Cd., mS/cm	Total NH3-N, ug/L	NO3+NO 2-N, ug/L	TIN ug/L,	TN Ug/L	Total P, ug/L	Ecoli
Min	7.43	0	6.25	0.67	5	9	53	199	22	1
Max	8.76	17.4	11.78	1	45	285	290	540	122	66
Avg	8.08	6.56	9.69	0.86	24.17	123.33	147.50	346.42	47.83	15.50
Std. Dev.	0.32	6.49	1.71	0.09	12.91	84.99	80.84	106.26	29.43	21.75
Measurements	12	12	12	12	12	12	12	12	12	12

Table 49 Swede Gulch (Site 55)

12 Monthly Sampling/Monitoring Events January 1- December 31, 2013										
Monthly Parameter Results	pH, SU	Temp, °C	D. O., mg/L	Sp. Cd., mS/cm	Total NH3-N, ug/L	NO3+NO 2-N, ug/L	TIN ug/L,	TN Ug/L	Total P, ug/L	Ecoli
Min	7.74	0	7.21	0.065	6	2	26	149	2	1
Max	8.82	17.28	12.1	1.13	148	310	458	1530	262	17

Avg	8.15	6.83	10.36	0.86	35.58	73.00	108.58	402.42	41.67	4.75
Std. Dev.	0.28	6.33	1.64	0.27	36.39	96.53	123.45	357.85	68.62	5.36
Measurements	12	12	12	12	12	12	12	12	12	12

Turkey Creek Stream Segments

Segment 6a South Turkey Creek

Table 50 Segment 6a Summary

Segment 6a Sampling/Monitoring Summary 2013									
Monthly Parameter Results	pH, SU	Temp, °C	D. O., mg/L	Sp. Cd., mS/cm	Total NH3-N, ug/L	NO3+NO2-N, ug/L	TIN, ug/L	TN Ug/L	Total P, ug/L
Min	7.46	0	6.87	0.57	5	2	31	363	2
Max	8.77	22.5	14.2	2.62	55	851	904	1250	86
Avg	8.17	9.78	10.31	1.38	32.79	289.67	322.46	698.75	24.52
Std. Dev.	0.28	7.18	2.08	0.56	14.88	286.69	291.82	251.85	21.90
Measurements	24	24	24	24	24	24	24	24	23

Datalogger Temperature Summary 2013								
All Temperatures in °C	30-Min Temp. COLD/WARM SEASONS		Nov 1-Mar 31 Stream Std. WAT (9°C)	Nov 1-Mar 31 2-Hr Avg. Temp.	Nov 1-Mar 31 Stream Std. DM (13°C)	Apr 1-Oct 31 Stream Std. WAT (18.2°C)	Apr 1-Oct 31 2-HR Avg. Temp.	Apr 1-Oct 31 DM (23.8°C)
Min	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	-0.1	-0.1
Max	11.5	23.9	5.9	11.2	11.2	21.3	23.5	23.5
Avg	2.9	11.3	3.1	2.9	4.4	11.5	11.3	13.4
Measurements	6730	20544	17	1682	141	60	5136	428
# 9°C WAT exceeded			0					
% Compliance WAT			100%					
# 13°C DM exceeded					0			
% Compliance DM					100%			
# 18.2°C WAT exceeded						4		
% Compliance WAT						93%		
# 23.8°C DM exceeded								0
% Compliance DM								100%

Table 51 South Turkey Creek in Bear Creek Lake Park (Site 16a)

15 Monthly Sampling/Monitoring Events January 1-December 31, 2013									
Monthly Parameter Results	pH, SU	Temp, °C	D. O., mg/L	Sp. Cd., mS/cm	Total NH3-N, ug/L	NO3+NO 2-N, ug/L	TIN, ug/L	TN Ug/L	Total P, ug/L
Min	7.46	0	6.87	0.57	5	16	43	367	2
Max	8.77	22.5	14.2	2.62	55	851	904	1250	72
Avg	8.21	9.91	10.59	1.55	34.67	446.60	481.27	751.40	22.29
Std. Dev.	0.33	7.33	2.23	0.61	15.98	256.02	261.91	277.82	19.58
Measurements	15	15	15	15	15	15	15	15	14

Datalogger Temperature Data 2013								
All Temperatures in °C	30-Min Temp. COLD/WARM SEASONS		Nov 1-Mar 31 Stream Std. WAT (9°C)	Nov 1-Mar 31 2-Hr Avg. Temp.	Nov 1-Mar 31 Stream Std. DM (13°C)	Apr 1-Oct 31 Stream Std. WAT (18.2°C)	Apr 1-Oct 31 2-HR Avg. Temp.	Apr 1-Oct 31 DM (23.8°C)
Min	-0.06	0.83	0.75	-0.06	0.34	5.07	0.88	4.22
Max	11.47	23.91	5.85	11.21	11.21	21.35	23.50	23.50
Avg	3.44	12.72	3.38	3.45	5.23	12.87	12.72	14.60
Std. Dev.	2.12	5.24	1.32	2.11	2.21	4.88	5.24	5.03
Measurements	5314	10272	15	1328	111	30	2568	214

15 Monthly Sampling/Monitoring Events January 1-December 31, 2013							
# 9°C WAT exceeded		0					
% Compliance WAT		100%					
# 13°C DM exceeded				0			
% Compliance DM				100%			
# 18.2°C WAT exceeded					2		
% Compliance WAT					93%		
# 23.8°C DM exceeded							0
% Compliance DM							100%

[Monitoring station/Datalogger ID: TURK2 GPS Coordinates: 39.6394°N, 105.161°W; Sampling/ monitoring site in Turkey Creek, inside Bear Creek Lake Park, at the maintenance shop site.]

Table 52 Aspen Park Metropolitan District, South Turkey Creek (Site 18)

9 Monthly Sampling/Monitoring Events March 1-November 30, 2013									
Monthly Parameter Results	pH, SU	Temp, °C	D. O., mg/L	Sp. Cd., mS/cm	Total NH3-N, ug/L	NO3+ NO2-N, ug/L	TIN, ug/L	TN Ug/L	Total P, ug/L
Min	7.87	0	7.23	0.7	13	5	31	363	6
Max	8.41	19.3	12.05	1.44	49	70	109	873	86
Avg	8.12	9.55	9.84	1.11	29.67	31.38	57.56	611.00	28.00
Std. Dev.	0.16	6.92	1.71	0.27	12.21	20.87	26.12	167.90	24.69
Measurements	9	9	9	9	9	8	9	9	9

Datalogger Temperature Data 2013								
All Temperatures in °C	30-Min Temp. COLD/WARM SEASONS		Nov 1-Mar 31 Stream Std. WAT (9°C)	Nov 1-Mar 31 2-Hr Avg. Temp.	Nov 1-Mar 31 Stream Std. DM (13°C)	Apr 1-Oct 31 Stream Std. WAT (18.2°C)	Apr 1-Oct 31 2-HR Avg. Temp.	Apr 1-Oct 31 DM (23.8°C)
Min	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	-0.1	-0.1
Max	4.6	21.6	1.3	4.5	4.5	16.0	21.5	21.5
Avg	0.8	9.9	0.6	0.8	1.5	10.0	9.9	12.2
Std. Dev.	0.9	5.5	0.7	0.9	1.3	5.0	5.5	5.5
Measurements	1416	10272	2	354	30	30	2568	214
# 9 ☐C W			0					
% Compliance WAT			100%					
# 13 ☐C D					0			
% Compliance DM					100%			
# 18.2 ☐(						0		
% Compliance WAT						100%		
# 23.8 ☐C I								0
% Compliance DM								100%

[Monitoring station/Datalogger ID: APMD1 GPS Coordinates: 39.5461°N, 105.2708°W; Sampling/ monitoring site in South Turkey Creek downstream of the APMD WWTP.]

Segment 6b North Turkey Creek

Table 53 Conifer Metropolitan District, North Turkey Creek (Site19)

9 Monthly Sampling/Monitoring Events March 1-November 30, 2013									
Monthly Parameter Results	pH, SU	Temp, °C	D. O., mg/L	Sp. Cd., mS/cm	Total NH3-N, ug/L	NO3+NO2-N, ug/L	TIN, ug/L	TN Ug/L	Total P, ug/L
Min	8.05	0	7.06	0.227	12	15	50	234	2
Max	8.35	17.3	13.37	0.744	61	760	821	1075	54
Avg	8.15	8.92	9.97	0.46	32.89	276.33	309.22	544.56	25.22
Std. Dev.	0.11	6.23	1.95	0.15	16.00	250.85	255.55	253.31	17.84

Measurements	9		9	9	9	9	9	9	9	9
Datalogger Temperature Data 2013										
All Temperatures in °C	30-Min Temp. Cold/ Warm Seasons		Oct 1-May 31 Stream Std. WAT (9°C)		Oct 1-May 31 2-Hr Avg. Temp.	Oct 1-May 31 Stream Std. DM (13°C)	June 1-Sept 30 Stream Std. WAT (17°C)		June 1-Sept 30 2-HR Avg. Temp.	June 1-Sept 30 DM (21.2°C)
Min	-2.2	4.3	0.1		-1.7	0.1	8.9		4.3	8.2
Max	11.3	21.6	7.4		11.0	11.0	15.4		21.5	21.5
Avg	3.1	13.2	2.8		3.1	4.6	13.3		13.2	15.9
Std. Dev.	2.8	2.9	2.4		2.8	3.1	1.9		2.9	2.7
Measurements	4794	5856	14		1198	100	17		1464	122
# 9°C WAT exceeded			0							
% Compliance WAT			100%							
# 13°C DM exceeded						0				
% Compliance DM						100%				
# 17°C WAT exceeded							0			
% Compliance WAT							100%			
# 21.2°C DM exceeded										3
% Compliance DM										98%

Bear Creek Reservoir

Table 54 Segment 1c: Bear Creek Reservoir Temperature Summary 2013

Segment 1c Datalogger Temperature Summary 2013							
All Temperatures in °C	30-Min Temp. WARM SEASON	Nov 1-Mar 31 Stream Std. WAT (9°C)	Nov 1-Mar 31 2-Hr Avg. Temp.	Nov 1-Mar 31 Stream Std. DM (13°C)	Apr 1-Oct 31 Stream Std. WAT (19.3°C)	Apr 1-Oct 31 2-HR Avg. Temp.	Apr 1-Oct 31 Stream DM (23.8°C)
Min	6.9				7.7	6.9	7.6
Max	25.2				23.4	24.8	24.8
Avg	16.4				16.6	16.4	16.9
Measurements	38512				112	9628	804
# 9°C WAT exceeded							
% Compliance WAT							
# 13°C DM exceeded							
% Compliance DM							
# 23.3°C WAT exceeded					1		
% Compliance WAT					99%		
# 23.8°C DM exceeded							11
% Compliance DM							99%

Table 55 Bear Creek Reservoir profile Station (Site 40T 0.5)

Datalogger Temperature Data 2013							
All Temperatures in °C	30-Min Temp. WARM SEASONs	Oct 1-May 31 Stream Std. WAT (9°C)	Oct 1-May 31 2-Hr Avg. Temp.	Oct 1-May 31 Stream Std. DM (13°C)	June 1-Sept 30 Stream Std. WAT (23.3°C)	June 1-Sept 30 2-HR Avg. Temp.	June 1-Sept 30 DM (23.8°C)
Min	6.9				8.1	6.9	7.8
Max	25.2				23.4	24.8	24.8
Avg	16.6				16.8	16.6	17.2
Std. Dev.	5.1				5.0	5.1	5.1
Measurements	9628				28	2407	201
# 9°C WAT exceeded							
% Compliance WAT							
# 13°C DM exceeded							

Datalogger Temperature Data 2013							
All Temperatures in °C	30-Min Temp. WARM SEASONs	Oct 1-May 31 Stream Std. WAT (9°C)	Oct 1-May 31 2-Hr Avg. Temp.	Oct 1-May 31 Stream Std. DM (13°C)	June 1-Sept 30 Stream Std. WAT (23.3°C)	June 1-Sept 30 2-HR Avg. Temp.	June 1-Sept 30 DM (23.8°C)
% Compliance DM							
# 23.3C WAT exceeded					1		
% Compliance WAT					96%		
# 23.8°C DM exceeded							7
% Compliance DM							97%

[Monitoring station/Datalogger ID: 40T (0.5) GPS Coordinates: 39° 39’06.27”N 105°08’30.60”W; Sampling/ monitoring site in Bear Creek Reservoir by dam at profile station.]

Table 56 Bear Creek Reservoir profile Station (Site 40T 1.0)

Datalogger Temperature Data 2013							
All Temperatures in °C	30-Min Temp. WARM SEASONs	Oct 1-May 31 Stream Std. WAT (9°C)	Oct 1-May 31 2-Hr Avg. Temp.	Oct 1-May 31 Stream Std. DM (13°C)	June 1-Sept 30 Stream Std. WAT (23.3°C)	June 1-Sept 30 2-HR Avg. Temp.	June 1-Sept 30 DM (23.8°C)
Min	6.9				7.9	7.0	7.8
Max	24.3				23.3	24.2	24.2
Avg	16.5				16.7	16.5	17.0
Std. Dev.	5.1				4.9	5.1	5.1
Measurements	9628				28	2407	201
# 9°C WAT exceeded							
% Compliance WAT							
# 13°C DM exceeded							
% Compliance DM							
# 23.3C WAT exceeded					0		
% Compliance WAT					100%		
# 23.8°C DM exceeded							3
% Compliance DM							99%

[Monitoring station/Datalogger ID: 40T (1.0) GPS Coordinates: 39° 39’06.27”N 105°08’30.60”W; Sampling/ monitoring site in Bear Creek Reservoir by dam at profile station.]

Table 57 Bear Creek Reservoir profile Station Site 40T (1.5)

Datalogger Temperature Data 2013							
All Temperatures in °C	30-Min Temp. WARM SEASONs	Oct 1-May 31 Stream Std. WAT (9°C)	Oct 1-May 31 2-Hr Avg. Temp.	Oct 1-May 31 Stream Std. DM (13°C)	June 1-Sept 30 Stream Std. WAT (23.3°C)	June 1-Sept 30 2-HR Avg. Temp.	June 1-Sept 30 DM (23.8°C)
Min	6.9				7.8	6.9	7.7
Max	23.9				23.1	23.9	23.9
Avg	16.4				16.5	16.4	16.7
Std. Dev.	5.08				4.96	5.08	5.06
Measurements	9628				28	2407	201
# 9°C WAT exceeded							
% Compliance WAT							
# 13°C DM exceeded							
% Compliance DM							
# 23.3C WAT exceeded					0		
% Compliance WAT					100%		
# 23.8°C DM exceeded							1
% Compliance DM							100%

[Monitoring station/Datalogger ID: 40T (1.5) GPS Coordinates: 39° 39'06.27"N 105°08'30.60"W; Sampling/ monitoring site in Bear Creek Reservoir by dam at profile station.]

Table 58 Bear Creek Reservoir profile Station Site 40T (2.0)

Datalogger Temperature Data 2013							
All Temperatures in °C	30-Min Temp. WARM SEASONs	Oct 1-May 31 Stream Std. WAT (9°C)	Oct 1-May 31 2-Hr Avg. Temp.	Oct 1-May 31 Stream Std. DM (13°C)	June 1-Sept 30 Stream Std. WAT (23.3°C)	June 1-Sept 30 2-HR Avg. Temp.	June 1-Sept 30 DM (23.8°C)
Min	6.9				7.7	7.0	7.6
Max	23.8				23.1	23.7	23.7
Avg	16.3				16.5	16.3	16.6
Std. Dev.	5.1				5.0	5.1	5.1
Measurements	9628				28	2407	201
# 9°C WAT exceeded							
% Compliance WAT							
# 13°C DM exceeded							
% Compliance DM							
# 23.3C WAT exceeded					0		
% Compliance WAT					100%		
# 23.8°C DM exceeded							0
% Compliance DM							100%

[Monitoring station/Datalogger ID: 40T (2.0) GPS Coordinates: 39° 39'06.27"N 105°08'30.60"W; Sampling/ monitoring site in Bear Creek Reservoir by dam at profile station.]

Lower Bear Creek Segment 2

Table 59 Below Bear Creek Reservoir Trace weir in Bear Creek (Site 45)

15 Monthly Sampling/Monitoring Events January 1-December 31, 2013										
Monthly Parameter Results	pH, SU	Temp, □	D.O mg/L	Sp. Cd.,	Total NH3-N, ug/L	NO3+NO2-N, ug/L	TIN, ug/L	TN Ug/L	Total P, ug/L	ECOLI Colonies
Min	7.8	3.4	6.09	0.159	11	21	32	450	15	1
Max	8.86	22.9	12.68	0.71	288	427	487	2241	259	41
Avg	8.33	13.06	9.96	0.42	101.27	179.87	281.13	866.33	77.87	6.42
Std. Dev.	0.33	7.35	2.29	0.15	77.09	112.58	135.08	411.40	68.03	11.21
Measurements	15	15	15	15	15	15	15	15	15	12

Datalogger Temperature Data 2013								
All Temperatures in °C	30-Min Temp. Cold/ Warm Seasons		Oct 1-May 31 Stream Std. WAT (9°C)	Oct 1-May 31 2-Hr Avg. Temp.	Oct 1-May 31 Stream Std. DM (13°C)	June 1-Sept 30 Stream Std. WAT (17°C)	June 1-Sept 30 2-HR Avg. Temp.	June 1-Sept 30 DM (21.2°C)
Min	2.6	5.9	4.1	2.7	3.7	7.7	5.9	7.5
Max	10.9	39.6	6.7	10.6	10.6	22.8	33.4	33.4
Avg	5.2	17.1	5.1	5.2	6.6	17.1	17.1	18.3
Std. Dev.	1.5	5.3	0.8	1.5	1.6	5.2	5.3	5.4
Measurements	3136	8128	9	784	66	24	2032	169
# 9°C WAT exceeded			0					
% Compliance WAT			100%					
# 13°C DM exceeded					0			
% Compliance DM					100%			
# 17°C WAT exceeded						0		
% Compliance WAT						100%		
# 21.2°C DM exceeded								1
% Compliance DM								99%

USGS Stream Flow Data Tables

During the Program, stream flows for Bear Creek were tracked using three gaging stations. The stations are the USGS station above Evergreen Lake (Segment 1a), the DWR/U.S. Army COE station above Morrison (Segment 1e) and the USGS station within Bear Creek Lake Park (Segment 1b). Weekly downloads of flow graphs were printed to document flows. Downloads were obtained at www.waterdata.usgs.gov. The available historic record for the gage above Evergreen Lake is 25 years. The available historic record for the gage above Morrison is 90 years (1899-2006— however, permanent reliable data was recorded from 1919). The available historic record for the USGS gage in Bear Creek Lake Park is 25 years. NOTE: Operation of this gage was discontinued on September 30, 2009. For the 2009 Program period, historical Minimum, Maximum and Average were calculated. A Deviation from Historic averages was also calculated; however, when both the Minimum and Maximum values for Deviation from Historic were negative, these values are interchanged to reflect the desired interpretation.

Table 60 2013 May Bear Creek Evergreen vs. Historic Bear Creek Flow

Date	Daily Mean Flow (cfs) May 2013	Historic Daily Mean Flow (cfs) 25 Years for May	Deviation from Historic Flow (cfs)
1	30	68	-38
2	23	62	-39
3	23	56	-33
4	26	54	-28
5	23	55	-32
6	22	59	-37
7	23	53	-30
8	31	48	-17
9	52	49	3
10	54	52	2
11	58	48	10
12	64	52	12
13	78	60	18
14	94	70	24
15	99	64	35
16	99	68	31
17	108	67	41
18	105	70	35
19	76	125	-49
20	70	105	-35
21	61	98	-37
22	63	97	-34
23	70	95	-25
24	79	105	-26
25	82	116	-34
26	77	125	-48
27	69	132	-63
28	66	124	-58
29	58	127	-69
30	51	128	-77
31	44	112	-68
MIN	22	48	-77
MAX	108	132	41
AVG	60.58	82.06	-21.48

USGS 06710385 GPS Coordinates: 39.6228°N, 105.3361°W

Table 61 2013 June Bear Creek Evergreen vs. Historic Bear Creek Flow

Date	Daily Mean Flow (cfs) June 2013	Historic Daily Mean Flow (cfs) 25 Years for June	Deviation from Historic Flow (cfs)
1	40	104	-64
2	42	99	-57
3	48	102	-54
4	53	108	-55
5	56	112	-56

Date	Daily Mean Flow (cfs) June 2013	Historic Daily Mean Flow (cfs) 25 Years for June	Deviation from Historic Flow (cfs)
6	53	101	-48
7	46	98	-52
8	44	94	-50
9	42	97	-55
10	41	116	-75
11	39	104	-65
12	38	100	-62
13	36	96	-60
14	34	89	-55
15	34	100	-66
16	33	92	-59
17	31	87	-56
18	30	87	-57
19	28	99	-71
20	27	89	-62
21	26	87	-61
22	26	97	-71
23	25	92	-67
24	26	99	-73
25	24	99	-75
26	22	115	-93
27	22	98	-76
28	21	129	-108
29	22	110	-88
30	22	95	-73
MIN	21	87	-108
MAX	56	129	-48
AVG	34.37	99.83	-65.47

USGS 06710385 GPS Coordinates: 39.6228°N, 105.3361°W

Table 62 2013 July Bear Creek Evergreen vs. Historic Bear Creek Flow

Date	Daily Mean Flow (cfs) July 2013	Historic Daily Mean Flow (cfs) 25 Years for July	Deviation from Historic Flow (cfs)
1	23	86	-63
2	28	79	-51
3	24	77	-53
4	25	74	-49
5	23	73	-50
6	24	72	-48
7	22	82	-60
8	26	81	-55
9	23	75	-52
10	23	72	-49
11	24	70	-46
12	66	63	3
13	38	60	-22
14	49	64	-15
15	40	60	-20
16	36	56	-20
17	31	54	-23
18	28	51	-23
19	28	53	-25
20	27	56	-29
21	25	50	-25
22	22	44	-22
23	21	42	-21
24	21	41	-20
25	24	39	-15
26	27	39	-12
27	24	39	-15
28	26	41	-15

Date	Daily Mean Flow (cfs) July 2013	Historic Daily Mean Flow (cfs) 25 Years for July	Deviation from Historic Flow (cfs)
29	31	44	-13
30	32	46	-14
31	26	39	-13
MIN	21	39	-63
MAX	66	86	3
AVG	28.61	58.77	-30.16

USGS 06710385 GPS Coordinates: 39.6228°N, 105.3361°W

Table 63 2013 August Bear Creek Evergreen vs. Historic Bear Creek Flow

Date	Daily Mean Flow (cfs) August 2013	Historic Daily Mean Flow (cfs) 25 Years for August	Deviation from Historic Flow (cfs)
1	24	38	-14
2	24	37	-13
3	22	38	-16
4	24	49	-25
5	29	41	-12
6	27	52	-25
7	26	52	-26
8	28	46	-18
9	26	38	-12
10	28	35	-7
11	27	32	-5
12	32	31	1
13	38	30	8
14	36	27	9
15	29	24	5
16	26	29	-3
17	24	46	-22
18	24	46	-22
19	24	32	-8
20	23	27	-4
21	23	25	-2
22	27	27	0
23	44	24	20
24	46	22	24
25	38	21	17
26	37	28	9
27	51	28	23
28	41	28	13
29	40	27	13
30	48	27	21
31	51	26	25
MIN	22	21	-26
MAX	51	52	25
AVG	31.84	33.32	-1.48

USGS 06710385 GPS Coordinates: 39.6228°N, 105.3361°W

Table 64 2013 September Bear Creek Evergreen vs. Historic Bear Creek Flow

Date	Daily Mean Flow (cfs) September 2013	Historic Daily Mean Flow (cfs) 25 Years for September	Deviation from Historic Flow (cfs)
1	48	26	48
2	48	28	20
3	46	31	15
4	46	34	12
5	45	39	6
6	42	36	6
7	40	32	8
8	39	33	6
9	44	52	-8
10	155	75	80
11	305	98	207

Date	Daily Mean Flow (cfs) September 2013	Historic Daily Mean Flow (cfs) 25 Years for September	Deviation from Historic Flow (cfs)
12	423	70	353
13	1140	34	1106
14	844	46	798
15	968	37	931
16	1020	32	988
17	781	30	751
18	618	27	591
19	506	24	482
20	438	24	414
21	385	26	359
22	342	29	313
23	313	29	284
24	264	28	236
25	238	27	211
26	214	25	189
27	203	24	179
28	186	25	161
29	169	25	144
30	155	24	131
MIN	39	68	-8
MAX	1140	195	1106
AVG	335.50	116.23	300.70

USGS 06710385 GPS Coordinates: 39.6228°N, 105.3361°W

Table 65 2013 May Bear Creek Morrison vs. Historic Bear Creek Flow

Date	Daily Mean Flow (cfs) May 2013	Historic Daily Mean Flow (cfs) 25Years for May	Deviation from Historic Flow (cfs)
1	45.2	96	-50.8
2	35.5	97	-61.5
3	36.9	86	-49.1
4	39.7	80	-40.3
5	35.7	75	-39.3
6	33.6	80	-46.4
7	33.2	77	-43.8
8	39.4	71	-31.6
9	76.5	68	8.5
10	93.8	68	25.8
11	97.8	71	26.8
12	102	70	32
13	111	75	36
14	132	82	50
15	133	78	55
16	137	79	58
17	146	81	65
18	139	81	58
19	99.4	179	-79.6
20	89.4	195	-105.6
21	78.2	171	-92.8
22	74.6	160	-85.4
23	80.5	151	-70.5
24	89.2	159	-69.8
25	91	171	-80
26	86.9	182	-95.1
27	78.7	183	-104.3
28	74.1	169	-94.9
29	67	164	-97
30	57.1	162	-104.9
31	44.1	142	-97.9
MIN	33.2	48	-105.6
MAX	146	132	65
AVG	79.92	82.06	-36.31

USGS 06710500 GPS Coordinates: 39.6530°N, 105.1950°W

Table 66 2013 June Bear Creek Morrison vs. Historic Bear Creek Flow

Date	Daily Mean Flow (cfs) June 2013	Historic Daily Mean Flow (cfs) 25 Years for June	Deviation from Historic Flow (cfs)
1	39.7	132	-92.3
2	40.1	123	-82.9
3	45.3	119	-73.7
4	47.8	121	-73.2
5	55.9	130	-74.1
6	54.1	119	-64.9
7	45.4	112	-66.6
8	43.2	105	-61.8
9	39.9	107	-67.1
10	36.7	128	-91.3
11	35.5	116	-80.5
12	32.4	110	-77.6
13	31.9	107	-75.1
14	28.9	107	-78.1
15	29.2	118	-88.8
16	28.7	105	-76.3
17	28.7	100	-71.3
18	26.8	91	-64.2
19	26.7	103	-76.3
20	23.4	92	-68.6
21	22.7	91	-68.3
22	22.2	94	-71.8
23	21.8	94	-72.2
24	22.1	94	-71.9
25	22.1	98	-75.9
26	18.2	108	-89.8
27	17.9	98	-80.1
28	17.4	119	-101.6
29	17.3	112	-94.7
30	19.9	100	-80.1
MIN	17.3	91	-101.6
MAX	55.9	132	-61.8
AVG	31.40	108.43	-77.04

USGS 06710500 GPS Coordinates: 39.6530°N, 105.1950°W

Table 67 2013 July Bear Creek Morrison vs. Historic Bear Creek Flow

Date	Daily Mean Flow (cfs) July 2013	Historic Daily Mean Flow (cfs) 25 Years for July	Deviation from Historic Flow (cfs)
1	19.8	89	-69.2
2	23.3	84	-60.7
3	22.3	79	-56.7
4	21.6	80	-58.4
5	20.9	77	-56.1
6	20.4	76	-55.6
7	20.5	84	-63.5
8	22.6	88	-65.4
9	21.9	81	-59.1
10	23.2	85	-61.8
11	23.1	81	-57.9
12	68.7	72	-3.3
13	46.7	67	-20.3
14	64.5	71	-6.5
15	50.4	70	-19.6
16	39.2	66	-26.8
17	32.8	63	-30.2
18	29.5	60	-30.5
19	30.3	64	-33.7

Date	Daily Mean Flow (cfs) July 2013	Historic Daily Mean Flow (cfs) 25 Years for July	Deviation from Historic Flow (cfs)
20	31	62	-31
21	27.3	58	-30.7
22	24.1	50	-25.9
23	20.2	47	-26.8
24	20.5	45	-24.5
25	23.6	42	-18.4
26	28.2	43	-14.8
27	24.5	43	-18.5
28	23.3	52	-28.7
29	27.6	52	-24.4
30	32.2	53	-20.8
31	26.7	45	-69.2
MIN	19.8	42	-69.2
MAX	68.7	89	-3.3
AVG	29.38	65.45	-36.66

USGS 06710500 GPS Coordinates: 39.6530°N, 105.1950°W

Table 68 2013 August Bear Creek Morrison vs. Historic Bear Creek Flow

Date	Daily Mean Flow (cfs) August 2013	Historic Daily Mean Flow (cfs) 25 Years for August	Deviation from Historic Flow (cfs)
1	21.9	39	-17.1
2	22.9	36	-13.1
3	21.3	46	-24.7
4	22	68	-46
5	26	49	-23
6	24.8	56	-31.2
7	23.1	65	-41.9
8	24.6	58	-33.4
9	25.6	47	-21.4
10	25.8	42	-16.2
11	23.7	37	-13.3
12	55.9	37	18.9
13	55.6	36	19.6
14	39.2	31	8.2
15	30.6	28	2.6
16	24.9	35	-10.1
17	23	56	-33
18	22.1	54	-31.9
19	22.2	42	-19.8
20	22.4	37	-14.6
21	21.3	35	-13.7
22	24.8	34	-9.2
23	49.1	34	15.1
24	51	30	21
25	38.3	30	8.3
26	34.3	30	4.3
27	43.9	28	15.9
28	41.9	29	12.9
29	35.1	28	7.1
30	40.9	27	13.9
31	50.7	25	25.7
MIN	21.3	25	-46
MAX	55.9	68	25.7
AVG	31.90	39.65	-7.75

USGS 06710500 GPS Coordinates: 39.6530°N, 105.1950°W

Table 69 2013 September Bear Creek Morrison vs. Historic Bear Creek Flow

Date	Daily Mean Flow (cfs) September 2013	Historic Daily Mean Flow (cfs) 25 Years for August	Deviation from Historic Flow (cfs)
1	44.4	25	19.4
2	46	26	20

Date	Daily Mean Flow (cfs) September 2013	Historic Daily Mean Flow (cfs) 25 Years for August	Deviation from Historic Flow (cfs)
3	46.1	23	23.1
4	44.2	23	21.2
5	42.6	22	20.6
6	39.4	20	19.4
7	36.1	19	17.1
8	36.3	18	18.3
9	48	17	31
10	132	20	112
11	391	19	372
12	405	49	356
13	flood	41	flood
14	flood	47	flood
15	flood	43	flood
16	flood	36	flood
17	flood	33	flood
18	-845.3	30	-875.3
19	747	28	719
20	551	27	524
21	427	24	403
22	345	24	321
23	315	24	291
24	248	22	226
25	216	20	196
26	191	19	172
27	188	21	167
28	183	21	162
29	160	21	139
30	146	21	125
MIN	-845.3	17	-875.3
MAX	747	49	719
AVG	167.31	26.10	143.99

USGS 06710500 GPS Coordinates: 39.6530°N, 105.1950°W

Weather Data

Local weather data was documented at the Evergreen Metropolitan District's WWTP. The plant has been operating the National Weather Service reporting station since EMD assumed operations of the plant in 1974. Online historical records however, are available from 1961 through 2006. Historical weather data obtained from the National Oceanographic and Atmospheric Administration/National Weather Service, High Plains Climate Center.

Maximum and minimum air temperature values along with precipitation measurements recorded each morning. Daily readings entered into a NWS software program. Local weather statistics are summarized, comparing 2013 monthly maximum, minimum and mean air temperatures and monthly precipitation to 52-year (1961-2013) historical data.

Table 70 Weather Data May-September 2013 Summary

Monthly Weather Data	May 2013	June 2013	July 2013	August 2013	September 2013
Air Temp Low Max (°F)	39	50	66	70	46
Air Temp High Max (°F)	80	89	91	88	88
Air Temp High Avg (°F)	64.23	78.03	79.58	80.48	72.17
Total Precip (in.)	1.96	0.77	3.32	4.29	7.18
Days of Precip.	7	5	17	17	13

Table 71 2013 Weather Data vs. Historical Weather Data (52 years 1961-2013)

	Avg Daily Max (°F)	Avg Daily Min (°F)	Avg Mon. (°F)	Precip (in.)
May 2013	64.23	33.68	48.95	1.96
May Hist	65.2	33.9	49.6	2.57
% Deviation	99%	99%	99%	76%
June 2013	78.03	42.77	60.40	0.77
June Hist	75.3	41.1	58.2	2.14
% Deviation	104%	104%	104%	36%
July 2013	79.58	49.81	64.69	3.32
July Hist	81.6	46.8	64.2	2.23
% Deviation	98%	106%	101%	149%
August 2013	80.48	47.32	63.90	4.29
August Hist	79.3	45.3	62.4	2.31
% Deviation	101%	104%	102%	186%
Sept. 2013	72.17	44.13	58.15	7.18
Sept. Hist	72.1	37.1	54.6	1.47
% Deviation	100%	119%	107%	488%

Stream Flow vs. Local Weather

Stream flows, as measured at the USGS gage above Evergreen Lake, were compared to local weather observations obtained from the NWS reporting station located at the EMD WWTP. The following tables illustrate the relationship between high air temperatures and measured precipitation, and their effect on stream flows measured above Evergreen Lake.

Table 72 2013 May Bear Creek Evergreen vs. Weather Data

Date	May 2013 Daily Mean Flow (cfs)	May 2013 Daily Air Max Temp (°F)	May 2013 Precip. (in.)
1	30	53	0.23
2	23	53	0.37
3	23	39	
4	26	55	
5	23	51	
6	22	50	
7	23	60	
8	31	64	0.06
9	52	52	0.67
10	54	47	0.37
11	58	57	0.05
12	64	62	
13	78	69	
14	94	75	
15	99	77	
16	99	75	0.05
17	108	74	
18	105	79	
19	76	69	
20	70	63	
21	61	62	
22	63	66	
23	70	69	0.09
24	79	65	

Date	May 2013 Daily Mean Flow (cfs)	May 2013 Daily Air Max Temp (°F)	May 2013 Precip. (in.)
25	82	79	
26	77	80	
27	69	77	
28	66	74	
29	58	74	
30	51	60	0.07
31	44	61	0.23
MIN	22	39	0.05
MAX	108	80	0.67
AVG	60.58	64.23	0.22
TOTAL			1.96

USGS 06710385 GPS Coordinates: 39.6228°N, 105.3361°W Daily Mean flows were obtained from the USGS gaging station above Evergreen Lake. Weather data obtained from the NWS reporting station located at the EMD WWTP.

Table 73 2013 June Bear Creek Evergreen vs. Weather Data

Date	June 2013 Daily Mean Flow (cfs)	June 2013 Daily Max Air Temp (°F)	June 2013 Precip (in.)
1	40	64	
2	42	63	
3	48	76	
4	53	83	
5	56	66	0.4
6	53	50	0.01
7	46	71	
8	44	74	0.01
9	42	71	
10	41	84	
11	39	87	
12	38	89	
13	36	83	
14	34	85	
15	34	81	
16	33	72	
17	31	75	0.13
18	30	73	
19	28	77	
20	27	89	
21	26	81	
22	26	85	
23	25	77	
24	26	79	0.04
25	24	80	
26	22	85	
27	22	89	
28	21	89	
29	22	87	0.17
30	22	76	0.01
MIN	21	50	0.01
MAX	56	89	0.4
AVG	34.37	78.03	0.11
TOTAL			0.77

USGS 06710385 GPS Coordinates: 39.6228°N, 105.3361°W Daily Mean flows were obtained from the USGS gaging station above Evergreen Lake. Weather data obtained from the NWS reporting station located at the EMD WWTP.

Table 74 2013 July Bear Creek Evergreen vs. Weather Data

Date	July 2013 Daily Mean Flow (cfs)	July 2013 Daily Max Air Temp (°F)	July 2013 Precip (in.)
1	23	73	
2	28	71	0.12
3	24	75	
4	25	82	0.05
5	23	82	0.01
6	24	84	0.01
7	22	82	0.1
8	26	78	0.18
9	23	87	
10	23	86	
11	24	81	0.79
12	66	91	0.57
13	38	82	0.07
14	49	81	0.55
15	40	72	0.18
16	36	72	
17	31	77	
18	28	82	
19	28	84	
20	27	77	
21	25	83	
22	22	85	
23	21	90	
24	21	86	
25	24	74	0.04
26	27	73	0.06
27	24	78	
28	26	79	0.2
29	31	66	0.08
30	32	72	0.19
31	26	82	0.12
MIN	21	66	0.01
MAX	66	91	0.79
AVG	28.61	79.58	0.20
TOTAL			3.32

USGS 06710385 GPS Coordinates: 39.6228°N, 105.3361°W Daily Mean flows were obtained from the USGS gaging station above Evergreen Lake. Weather data obtained from the NWS reporting station located at the EMD WWTP.

- Data Missing Not Recorded

Table 75 2013August Bear Creek Evergreen vs. Weather Data

Date	August 2013 Daily Mean Flow (cfs)	August 2013 Daily Max Air Temp (ºF)	August 2013 Precip (in.)
1	24	82	
2	24	83	
3	22	87	
4	24	81	0.03
5	29	84	0.01

Date	August 2013 Daily Mean Flow (cfs)	August 2013 Daily Max Air Temp (ºF)	August 2013 Precip (in.)
6	27	81	0.02
7	26	82	0.02
8	28	71	0.04
9	26	71	0.46
10	28	71	0.18
11	27	80	
12	32	75	0.05
13	38	75	1.85
14	36	70	0.04
15	29	75	
16	26	78	
17	24	83	
18	24	87	
19	24	84	0.01
20	23	87	
21	23	88	
22	27	82	
23	44	79	0.67
24	46	79	0.09
25	38	77	0.02
26	37	81	
27	51	83	0.16
28	41	83	0.1
29	40	85	
30	48	87	
31	51	84	0.54
MIN	24	70	0.01
MAX	24	88	1.85
AVG	22	80.48	0.25
TOTAL			4.29

USGS 06710385 GPS Coordinates: 39.6228°N, 105.3361°W Daily Mean flows were obtained from the USGS gaging station above Evergreen Lake. Weather data obtained from the NWS reporting station located at the EMD WWTP.

Table 76 2013 September Bear Creek Evergreen vs. Weather Data

Date	September 2013 Daily Mean Flow (cfs)	September 2013 Daily Max Air Temp (ºF)	September 2013 Precip (in.)
1	48	81	
2	48	69	0.02
3	46	83	
4	46	86	0.34
5	45	84	
6	42	85	
7	40	88	
8	39	86	
9	44	84	0.05
10	155	77	1.74
11	305	62	0.75
12	423	62	0.63
13	1140	63	1.65
14	844	69	0.35
15	968	71	0.28

Date	September 2013 Daily Mean Flow (cfs)	September 2013 Daily Max Air Temp (ºF)	September 2013 Precip (in.)
16	1020	57	0.87
17	781	70	0.04
18	618	77	
19	506	79	
20	438	59	
21	385	67	
22	342	77	
23	313	73	0.24
24	264	61	
25	238	70	
26	214	78	
27	203	63	
28	186	46	0.22
29	169	64	
30	155	74	
MIN	39	46	0.02
MAX	1140	88	1.74
AVG	335.50	72.17	0.55
TOTAL			7.18

USGS 06710385 GPS Coordinates: 39.6228°N, 105.3361°W Daily Mean flows were obtained from the USGS gaging station above Evergreen Lake. Weather data obtained from the NWS reporting station located at the EMD WWTP.